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**Future Orientation and Taxes:  
Evidence from Big Data**

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# Future Orientation and Taxes: Evidence from Big Data

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## Abstract

The paper analyses whether various aspects of a country's tax system have a positive or negative influence on individuals' attitudes towards the future. These attitudes are measured by an analysis of *Google* search queries derived from *Google Trends* which allow constructing an online future-orientation index for a sample of 58 countries. The results of this analysis indicate that capital gains taxes and value added taxes discourage future-oriented behaviour. Also, high personal income tax rates at the lowest income brackets discourage, whereas – surprisingly – the top marginal rates could positively influence an individual's future orientation. The paper contributes to existing research in three ways: First, it expands the existing tax literature by providing evidence that taxes can influence very fundamental personal values, such as individuals' general attitudes towards their future. Second, it contributes to a vast body of cross-cultural studies on future orientation by introducing tax law. Third, by using Internet search patterns the paper introduces these large, automatically gathered data sets into scientific tax research, thereby opening the possibility for further research opportunities.

**Keywords:** Future orientation, Personal income tax, VAT, Capital gains tax, Google searches.

**JEL Classification:** H24, H25, L26, Z13

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## 1. Introduction

Taxes and tax policy are very frequent subjects in the daily press, as they increasingly dominate political debates and election campaigns. Taxes even found their way into pop culture when George Harrison sang the Beatles' song "Taxman".<sup>1</sup> Yet it is not only the classic Beatles who have sung about their issues with tax law. Indeed, more contemporaneous artists like rappers 50 Cent and Jay-Z use taxes as linguistic code for struggles with the government or to distinguish different societal groups.<sup>2</sup> So one could argue that individuals, both in their private lives as well as in their capacities as employees, employers or managers, must cope with taxes almost every day. This regular contact with taxes – albeit often rather unconsciously and only seldom deliberately – might have some influence on a person's basic attitudes, values and overall composure. However, whereas the effects of tax rates, tax legislation and case law on specific business decisions are broadly discussed in economic literature and law reviews, the more basal effect of such continuing exposure to taxes on an individual's and, in aggregate, a society's fundamental values and attitudes have been the subject of only very little attention thus far. However, the fundamental values and attitudes of individuals determine their predisposition towards business endeavours and entrepreneurial activities, as well as their propensity to saving and to investing in the future.

As first identified by Schumpeter (1911), investing in the future, creating new businesses and starting up companies is a fundamental force for economic growth. Economic policies aimed at fostering the creation of new businesses are high on any government's agenda for their potential benefits for innovation, competition, employment and economic growth. Yet, not only the creation of new businesses but also the ongoing management of any organization in a way that its long-term interests are not thwarted by any short-term expedience is critical for sustainable economic growth.

Both dimensions – starting up and ongoing management – require a certain degree of future orientation. The concept of future orientation is used in sociology and in cross-cultural management theory (see House et al., 2004) to describe the extent to which a culture encourages and rewards such behaviour as planning, investing in the future and delaying gratification. Future orientation seems to be a driver of economic success, as sociological literature shows that the greater a society's

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<sup>1</sup> *The Beatles*, Revolver (1966), "Taxman".

<sup>2</sup> *50 Cent*, Power of the Dollar (2000), "Ghetto Quran"; *Jay-Z*, The Blueprint 3 (2009), "Already Home".

future orientation the higher is its average GDP per capita and its levels of innovativeness, happiness, confidence and competitiveness.

Future orientation is the necessary underpinning to recognize and imagine future contingencies, formulate future goals and develop strategies to meet future aspirations (Keough et al., 1999). The degree of future orientation is therefore an essential basis of any decision-making regarding business endeavours, innovations, saving, investing or consuming. Individuals with a lesser degree of future orientation will less frequently face investment decisions, as they tend to favour immediate consumption over saving and investing than individuals with a higher degree of future orientation.

As a society's degree of future orientation is positively correlated with the country's GDP per capita, understanding the effect of specific policy instruments on people's basic attitudes towards the future and their predisposition towards business endeavours could help to create legal surroundings that do not deter future-oriented behaviour. This understanding could thus aide in establishing a tax policy mix that simultaneously ensures tax revenues and fosters future-oriented behaviour.

In this study, an online future-orientation index (FOI) for a sample of 58 countries is derived from logs of Internet search patterns using *Google Trends*. The country scores of this online future-orientation index are very similar to traditional future-orientation measures derived with classical research methods such as standardized interviews. The results of this paper suggest that taxes influence individuals' attitudes towards the future on a very basal and covert level. These effects could hamper investments and deter long-term oriented management, leading to less entrepreneurial activity, to the use of inferior management techniques and thus – on a macroeconomic level – to a smaller GDP per capita, less economic growth and diminished economic competitiveness.

The contributions of this paper to the economic literature are thus threefold. First, the paper expands the existing tax literature, which primarily focuses on the influence of taxes on specific business decisions, by providing evidence that taxes can influence individuals on a very fundamental level: the general attitude of individuals towards their future which is a necessary predisposition for any business endeavours. Second, it contributes to a vast body of cross-cultural studies evaluating people's attitudes and perceptions towards the future by incorporating policy measures of the respective country, namely tax law, into the evaluation. Third, by using Internet search patterns the paper introduces these large, real-time and rapidly expanding data sets gathered automatically by

Internet providers, search engines and social media outlets into scientific tax research, thereby opening the possibility for further research opportunities.

After providing a brief overview of related literature in section 2, section 3 develops the hypotheses, followed by a presentation of the economic model and the variables employed in the econometric analysis (section 4) and the results of the econometric analysis, including robustness checks in section 5.

## **2. Related Literature**

### **2.1. The concept of future orientation**

Future orientation was first scholarly discussed by Lewin (1926), who described the factors that would help an individual to develop a “future time orientation”. Developing a “future time orientation” is one of three aspects (past, present and future) of a cognitive process of differentiating personal and social experience into temporal frames, thereby giving order, coherence and meaning to those experiences, called “time perspective” (Frank, 1939; Fraisse, 1963).

Individuals with low future orientation show the capability to enjoy the moment and be spontaneous (Kluckhohn and Strodtbeck, 1961). They are free of future anxieties and may seek hedonistic pleasures. They show incapacity or unwillingness to plan a sequence to realize their desired goals, and may not appreciate that their current behaviour (negatively) influences the realization of their goals in the future (Keough et al., 1999). In contrast, individuals with high future orientation have a strong capability and willingness to imagine future contingencies, formulate future goals and seek to achieve goals and develop strategies to meet their future aspirations. Raynor and Entin (1982) conclude that individuals with higher future orientation tend to become more persistent over a period of time, resulting in high achievement motivation. Future oriented people engage in more planning. They are more cautious in initiating new tasks, as they seek stronger linkages between their current tasks and their desired states in a distant future. Moreover, if success in present tasks is necessary to achieve future goals, then more future-oriented individuals may also strive to work harder on the current task.

On an organizational level, future orientation represents the problem of intertemporal choice, i.e. the problem of allocating resources over time (Lavery, 1996). A vast body of literature such as

Quinn and McGrath (1985), Lim and Seers (1993), Trompenaars and Hampden-Turner (1998), Bluedorn (2000) and House et al. (2004) has emphasized the importance of the future orientation construct for organizations. Future orientation in an organizational setting involves preparing the organization to meet future changes in the business environment (Brommer and de la Porte, 1992) and is therefore an essential leadership attribute. Scholarly work has shown that future orientation of organizations is associated with better performance. Lim and Seers (1993) find that future orientation is a positive predictor of organizational performance.

Several publications have studied the importance of future orientation at the societal level. Kluckhohn and Strodtbeck (1961) have demonstrated that time orientation is an important value orientation which differentiates cultures and societies. On a country-by-country level, Hofstede (1980 and 2001), Hofstede and Bond (1988) and Ralstan et al. (1992) develop a measure of “long-term orientation” that is positively correlated with the propensity to save and invest. House et al. (2004) find that the two future orientation dimensions they define, namely Society Practices and Society Values, are both strongly correlated with various elements of economic health (such as GDP per capita and (un-)employment rates, etc). Furthermore, House et al. (2004) find positive and significant correlations of their future orientation scores with the World Economic Forum's Global Competitiveness Index, leading to the suggestion that a higher degree of future orientation leads to a higher level of economic wealth and economic growth.

In summary, future orientation is fundamental to the well-being of an individual and to sustainable (business) success of organizations, as well as to economic growth and competitiveness of societies and nation states.

## **2.2. The effects of taxes on future-oriented behaviour**

The effect of taxes on future-oriented behaviour has previously been addressed in the literature, predominantly as the effect of income taxes on investment and entrepreneurial decisions. An extensive body of literature, starting with Jorgenson (1963), has addressed this issue in various methodological ways (among others Summers, 1981; Feldstein et al., 1983; Auerbach, 1983; King and Fullerton, 1984; Slemrod, 1990; Barro, 1991; Cummins et al., 1996; Devereux et al., 2002; Gordon and Hines, 2002; Hasset and Hubbard, 2002; Desai et al., 2004; and Hines, 2007). Generally speaking, this body of literature finds ambiguous effects of corporate and personal income taxes on investment decisions and offers different estimates of the magnitude of these adverse effects.

Cullen and Gordon (2007) identify three channels through which corporate income taxation affects the entry by incorporation, which is used as proxy for entrepreneurial activity. First, as corporate income tax rates are in general often lower than personal income tax rates, entry by incorporation is encouraged when the expected profits from the new business are sufficiently high. Second, the combination of progressive personal income tax rates and flat corporate income tax rates creates a "risk subsidy" to entry by incorporation. And third, corporate income taxation allows sharing entrepreneurial risk with the government in a way that higher corporate income taxes lower the entrepreneur's risk-premium and encourages entry. While for the first two channels low corporate income tax rates encourage entrepreneurial activity, for the third channel lower corporate income tax rates theoretically discourage entry by incorporation.

Regarding personal income taxes Gordon (1998) posits that high personal income taxes favour entrepreneurial activity. The basic proposition of Gordon's (1998) model is that differences in corporate income tax rates and personal income tax rates incentivize incorporation, which is used as a proxy for entrepreneurial activity. In the same direction point Blau (1987), Parker (1996), Cowling and Mitchell (1997), Schuetze (2000) and Parker and Robson (2003), which all suggest that higher personal income tax rates give greater incentives for entrepreneurs to start up a business or at least to incorporate. Cullen and Gordon (2007) further argue that a cut in the personal income tax rate can reduce entrepreneurial activities, as it reduces the value of potentially deductible business expenses and losses.

A negative relationship between higher personal income tax rates or tax rate progressivity, is found by Robson and Wren (1999), Gentry and Hubbard (2000), Keuschnigg and Nielsen (2002) and Bruce and Mohsin (2006), plausibly because high tax rates and tax rate progressivity reduce financial returns of successful entrepreneurship and hence reduce the probability of entry.

Summing up, the existing literature finds that (i) higher personal income tax rates increase entrepreneurial activity, (ii) there are positive relations between high average tax rates and high self-employment volume, but higher marginal tax rates reduce self-employment and (iii) tax rate progressivity has positive as well as negative effects on self-employment and entrepreneurial activity.

Besides the taxation of annual profits, the taxation of capital gains can influence the original decision



to start up a business altogether. For (individual) taxpayers capital gains taxation reduces the available funds for reinvestment or consumption, and may thus affect the future orientation of the seller. Spulber (2009) shows that most of the economic return from the successful formation of high-growth firms comes in the form of a steeply increased market value of its stock rather than from annual profit distributions. Therefore, the taxation of capital gains should have negative effects on the incentives to create wealth through the establishment of a new business. A tax system with low tax rates on capital gains provides strong incentives for entrepreneurs to create value by investing money and effort in their own business (Henrekson et al., 2010). Additionally, high capital gains taxes lock in capital, discouraging shareholders to realize capital gains and invest the funds into new business ventures (Meade 1990; Daunfeldt et al., 2010).

Even though the taxation of capital gains has a larger effect on the incentive to start up new ventures, a high tax rate on dividends also discourages entrepreneurial activities (Spulber, 2009). High taxation of distributed profits encourages entrepreneurs to rely on retained earnings to finance expansion. This punishes new ventures and locks in retained earnings. Furthermore, taxing dividends at a high rate favours projects in incumbent ventures, shrinking the flow of capital to the most promising projects, diminishes possibilities of financing new business ventures and thus discourages entrepreneurial activity (Henrekson et al., 2010).

The investment effects of value added taxes (VAT) or goods and services taxes (GST) have received only very limited attention in the scientific literature. For a business, VAT/GST is regularly perceived as neutral, as it is designed to tax only the consumption of goods and services by private individuals (see Cnossen, 2011). Yet, VAT/GST might affect investment, especially start-ups and entrepreneurial activity on various levels. First, the existence of VAT/GST reduces an individual's available funds for investment and entrepreneurship. Second, any VAT/GST system produces compliance costs for businesses. Several papers find that VAT compliance cost fall disproportionately on small firms (Sandford et al., 1989; Malmer, 1995) and relate this effect economies of scale. Chittenden et al. (1999) and Poutziouris et al. (1999) have presented evidence from the United Kingdom suggesting that one key factor constraining economic growth of small firms is the VAT registration threshold leading to an artificial barrier to the growth of small businesses (see also Kauser et al., 2001).

Finally, there is a small strand of literature postulating that the existence of VAT/GST or specific features of a VAT/GST system hamper investment. Gottfried and Wiegard (1991) posit that the difference between VAT-exemption and VAT-zero rating could deter investment. Genser and Haufler

(1996) show distortive effects of the EU VAT system on investment. Narayan (2003) finds that the increase of the standard VAT rate in Fiji led to a decline in investments, as well as to a reduction in real consumption and national welfare. Claus and Sloan (2008) substantiate that VAT could influence intertemporal decisions to save and invest. And most recently, Bye et al. (2012), based on empirical data from Norway, show investment hampering effects of VAT/GST systems.

### **3. Theory and Hypotheses**

The literature provides evidence that individuals and organizations which are more future oriented tend to generate higher investments, engage in greater entrepreneurial activities and use more sustainable management techniques. Various future-orientation measures are in general positively correlated with direct or indirect measures of economic growth. The tax literature, on the other hand, provides evidence that taxation itself and different types of taxes influence investment decisions and entrepreneurial activity.

The fact that individuals must cope with taxes almost every day might have some covert and subconscious influence on a person's attitudes, values and overall composure. The findings from the literature studying the influence of taxes on investment decisions can be used to identify specific types of taxes that may influence the degree of an individual's future orientation, which is a basic precondition for any investment decision. Even though the (effective) tax burden is determined by the tax rate and by regulations governing the tax base, the regulations governing the tax base (e.g. loss-offset rules, deductions, depreciation and exemptions) are usually rather complex, detailed and widely opaque to the general public. Tax rates, however, are usually rather transparent and self-explanatory. Thus, tax rates are easy to remember, compare and apply. They have a signalling effect as to how investment friendly and, consequently, how future-orientation friendly a country's tax system might be. Therefore the first hypothesis *H1* can be expressed as:

*H1: Taxes expressed by tax rates influence the degree of a society's future orientation.*

This rather broad hypothesis can be further developed into a set of sub-hypotheses (*H1a-H1c*) that take the different types of taxes and the different types of taxable incidences into account. As the findings of the economic literature on the effects of personal income taxes on entrepreneurial activity are rather ambiguous, it is difficult to predict the sign of any effect. However, the majority of the literature suggests that higher personal income tax rates (*H1a*) encourage, while high capital gains taxes (*H1b*) and higher dividend taxes (*H1c*) discourage, entrepreneurial activities and

investment.

*H1a: Higher personal income tax rates lead to a higher level of future orientation.*

*H1b: Higher capital gains taxes lead to a lower level of future orientation.*

*H1c: Higher tax rates on dividends lead to a lower level of future orientation.*

Even though corporate taxpayers do not have self-contained attitudes and values, the personal attitudes and values of their managers might be influenced by corporate income taxation. Additionally, corporate income taxes have a signalling effect that could spill over to the individual level. Following the economic literature on the effects of corporate income taxes on entrepreneurial activity which suggests that a higher corporate income tax is negatively correlated with a higher number of business start-ups and incorporations, hypothesis *H2* reads as follows:

*H2: Higher corporate income tax rates lead to a lower level of future orientation.*

The third hypothesis (*H3*) focuses on VAT/GST that could also hamper economic growth, entrepreneurial activity and could interfere with investment decisions:

*H3: Higher VAT rates lead to a lower level of future orientation.*

## **4. Model and Variables**

To test the hypotheses a TOBIT regression model with a number of various specifications for the respective set of hypotheses is employed. The online (*FOI*) is used as dependent variable and a vector of tax-related variables (*TaxVariables*), as explanatory variable is used together with a standard set of control variables (*ControlVariables*):

$$FOI = \alpha + \beta_i * TaxVariables + \beta_j * ControlVariables + \varepsilon$$

### **4.1. The Online Future Orientation Index**

The concept of future orientation as previously described has been investigated using classical methods of qualitative social science research, such as questionnaire-based surveys. The evolution of the Internet, however, generates huge volumes of data through people's extensive interactions with technological systems. The analysis of such "Big Data" opens up new opportunities to research social phenomena and to reveal patterns of individual behaviour. Only very recently has scholarly work begun focusing on the analysis of Internet user search activity, as logged by search engines like

*Google*. Strong links have been found between the information that users seek online and real world events, ranging from reports of flu infections across the United States to detect influenza epidemics (Ginsberg et al., 2009) to trading volume and trends in US stock markets (Preis et al., 2010).

A recently published study (Preis et al., 2012) analyses *Google* search queries and finds a strong link between online search behaviour and real-world economic indicators. Preis et al. (2012) compare the predisposition of Internet users in different countries to look more often to the future or to the past. They establish an online future orientation index (FOI) by dividing the number of *Google* search queries containing the following year (represented in Arabic numerals) by the number of *Google* search queries containing the previous year. The online future orientation index for the year 2011 ( $FOI_{2011}$ ), for instance, is calculated as the ratio of the volume of search queries including "2012" to the volume of search queries including "2010" logged in the year 2011:

$$FOI_{2011} = \frac{\text{Volume of searches including "2012"}}{\text{Volume of searches including "2010"}}$$

Figures 1 and 2 show positive relations of FOI calculated following Preis et al. (2012) with per capita gross domestic product (GDP per capita) and with the Global Competitiveness Index (GCI)<sup>3</sup> for the sample used in this paper (see section 5.1. for descriptive statistics of the sample). The values of FOI are hand-collected individually for the countries in the sample by using *Google Trends*.

[Insert Figures 1 and 2 about here]

The notion that the online future orientation of a specific country is positively correlated with the country's GDP per capita and its GCI score, is consistent with findings of previous sociological literature established with more traditional research methods. Table 1 presents statistically significant Pearson correlation coefficients for FOI, GDP and GCI, as well as the two future-orientation dimensions, *society practices* and *society values*, developed by House et al. (2004). The correlations between FOI, GCI and GDP, respectively, are above 0.6. The absolute values of the correlations with the scores from House et al. (2004) are below 0.5. However, when relating the House et al. (2004) scores to FOI, it is necessary to bear in mind that the scores from House et al. (2004) are based on interviews conducted in the 1990s and the online FOI is a measure derived in 2011 and 2012.

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<sup>3</sup> The *Global Competitiveness Index (GCI)* is published annually by the World Economic Forum.

[Insert Table 1 about here]

The main advantage of using Internet search queries is that huge volumes of automatically gathered data can be made available for analysis. However, drawbacks of this method can be seen in the reduction of the basic population to individuals having access to the Internet and to those individuals using *Google*. This self-selection bias is controlled for by the percentage of the population having access to the Internet. The market share of *Google*, however, is not included, as in almost every country in the sample it is approximately 90%. Additionally, the origin of the person using *Google* is assigned by *Google Trends* based on the location of the IP address of the PC. However, the geographic location of the device might not always be the same as the user's cultural origin.

Certain special and non-annual events might change the online search activities of individuals in the respective region in which the event is held. For example the search queries in 2011 including "2012" in the United Kingdom were significantly higher than search queries in 2010 including "2011", which might be related to the build-up to and actual celebration of the 2012 London Olympic Games (see also Preis et al., 2012). The same escalating effects are detectable, for instance, in Poland and Ukraine in 2011 (European Soccer Championships in 2012). To control for these effects, FOI in the analysis is the average of FOI for 2012 and of FOI for 2011.

As further described under section 5.1., the study contains 58 jurisdictions from all continents and aims at covering all different stages of economic development. Figure 3 shows FOI scores for the sample. While Germany has the highest score (at 1.175), the lowest is calculated for Pakistan (at 0.250). This observation, however, does not reflect any general geographical or developmental trend, as, for instance, European countries such as Estonia and Hungary can be found at the bottom third and countries such as Malaysia, Brazil and Thailand can be found at the upper end of the scale.

[Insert Figure 3 about here]

## **4.2. Tax variables**

The tax data used in this study are obtained from the *Global Corporate Tax Handbook* and the *European Tax Handbook*, both published by the International Bureau of Fiscal Documentation (IBFD). The tax data are completed and cross-checked using publications from the Big 4 accounting firms. Additionally, the annual publication from the German Ministry of Finance covering tax rates worldwide, as well as the OECD tax database are used. Whenever sources provide ambiguous

information, the source presenting the most details is relied upon. All data are collected for 2011 (see Table 2 for further information).

[Insert Table 2 about here]

*Statutory personal income tax (PIT)*. This is the tax rate that individual taxpayers must pay on marginal income, assuming that they are in the highest tax bracket,<sup>4</sup> taking into account federal, state and local taxes (such as US state and municipal income taxes and Swiss cantonal and municipal taxes) by including the tax rates of representative regions.<sup>5</sup> Even though many taxpayers do not actually face these top rates, they are very clear and easily measurable policy signals.

*Statutory dividend tax (DIV)*. This is the tax rate on distributions of corporate profits to an individual. Profit distributions might be tax exempt or taxable either as ordinary income at the regular personal income tax rate or as extraordinary income at a special rate.<sup>6</sup>

*Statutory capital gains tax (CAPGAIN)*. This is the tax rate that an individual taxpayer must pay on profits from the sale of stock and other types of shareholdings. Capital gains might be tax exempt or taxable, and they are either taxed as ordinary income at the regular personal income tax rate or as extraordinary income at a special rate.<sup>7</sup>

*Statutory corporate income tax (CIT)*. This is the tax rate that a corporation must pay on marginal income, assuming that it is in the highest tax bracket, and taking into account federal, state and local taxes.<sup>8</sup> Thus, US state income taxes, Swiss cantonal taxes as well as regional trade taxes (levied, for instance, in Germany) are included.<sup>9</sup>

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<sup>4</sup> Additional surcharges such as solidarity surcharges as imposed for example in Germany and Hungary are only used if precise numbers and detailed information is available.

<sup>5</sup> New York state and New York City for the United States, Zurich for Switzerland.

<sup>6</sup> Countries that exempt capital gains from personal income taxation such as Croatia, Switzerland and Taiwan enter the regression at a rate of 0% while for countries that tax dividends as ordinary personal income such as Colombia or Hungary the highest statutory tax rate is used.

<sup>7</sup> Countries that exempt capital gains from personal income taxation such as Argentina, New Zealand or Switzerland enter the regression at a rate of 0% while for countries that tax capital gains as ordinary personal income such as Australia the highest statutory tax rate is used.

<sup>8</sup> In Estonia no corporate income taxes are imposed on retained earnings. Instead, corporate taxpayers are subject to a tax levied on distributed profits. In this case the statutory tax rate is not assumed to be zero, but the distribution tax levied on distributed profits is considered as statutory tax rate.

<sup>9</sup> In case those taxes vary across sub-federal tax authorities figures of the economically most important territorial communities (New York state and New York City for the United States, Zurich for Switzerland) are used.

*Value added tax/goods and services tax (VAT)*. This variable includes general consumption taxes that an individual taxpayer might be faced with. VAT/GST is imposed by 56 of 58 countries in the sample. For countries with multiple VAT rates, the standard rate (which is, in general, the highest rate) is used.

### 4.3. Control variables

This paper seeks to evaluate the effects of a country's tax system on the respective society's future orientation. However, a society's future orientation is influenced by a myriad of economic, socio-economic, cultural and demographic specifics, as well as regulatory and political aspects of the respective country. To control for these factors a set of standard control variables used in tax literature, entrepreneurship literature and cross-cultural management literature is used in the econometric analysis. These control variables comprise of *GDP per capita (GDP)*; *population (POP)*; *percentage of Internet users (INTERNET)*; *the economic freedom index (ECONFREE)* published by the Heritage Foundation; a measure for the *number of procedures (STARTUP)* as well as the *time (STARTUPTIME)* necessary to start up a new business; an indicator for the *availability (TECHAVAIL)* and *absorption (ABSORBTECH)* of new technologies; measures for *political rights (POLITRIGHTS)* and *civil liberties (CIVILLIB)*; and two dummy variables for *EU membership (EU)* and *OECD membership (OECD)*, respectively. See Table 2 for the definition of these control variables.

## 5. Empirical Analysis

### 5.1. Descriptive statistics

The sample contains 58 countries from around the world and includes every major geographical region. The sample selection is inspired by Preis et al. (2012) and is further extended to cover the entire OECD and EU. Due to limitations on the available data, however, four OECD and/or EU member countries, as well as one country from the Preis et al. (2012) sample have been excluded.<sup>10</sup> The sample includes 14 countries from Asia, 3 countries from Africa, 6 South American and 3 North American countries, 2 countries from Oceania and 30 European countries; among these 58 countries

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<sup>10</sup> These excluded countries are Iceland (OECD member), Luxembourg (EU and OECD member), Malta (EU member) and Cyprus (EU member) due to the non-availability of information from *Google Trends* and Iran (included in Preis et al., 2012) due to limited publicly available information on the country's tax system.

there are 25 EU Member States, 31 OECD member countries and 21 countries that are neither EU nor OECD member states. Descriptive statistics are presented in Table 3.

[Insert Table 3 about here]

Pearson correlations with significance levels denoted by \*, \*\* and \*\*\* for 10%, 5% and 1% are presented in the correlation matrix in Table 4. The correlations between FOI, PIT and CIT are significant at the 1% level. The correlation matrix also reveals that some of the tax variables are significantly correlated with each other. Yet the correlations are below 0.5 throughout.

[Insert Table 4 about here]

## 5.2. Results

Table 5 presents the main TOBIT regression results for the influence of various tax rates on a society's future orientation. All estimations include a set of control variables which, as mentioned, are frequently used in tax literature dealing with entrepreneurship and investment decisions, as well as and in socio-economic literature.

Column (1) presents results from a basic specification, which includes all tax rates that have been identified as factors potentially influencing future orientation. The results show that the various items of a country's tax system affect the online future orientation index. The coefficients of CAPGAIN and VAT are negative and significant at the 1% level, providing evidence that capital gains taxes and value added taxes (sales taxes) could restrain future-oriented thinking and behaviour. CIT has a positive coefficient significant at the 1% level, suggesting that higher corporate income taxes could encourage future orientation. The results of specification (1) are coherent with existing tax literature finding that high corporate income tax rates could have positive, and capital gains taxes and value added taxes have negative, effects on business decisions which are closely related to a high degree of future orientation.

Specification (2) includes only taxes directly relevant for individuals. The coefficients for CAPGAIN and VAT are again negative and significant at the 1% level, confirming the findings from specification (1) suggesting that capital gains taxes and value added taxes restrain future-oriented economic thinking. The findings from specification (2) that the statutory top rate of the personal income tax has a positive coefficient (significant at the 5% level) provide evidence that PIT could enhance future-oriented thinking and behaviour. Therefore hypothesis *H1a*, which posits a positive effect of



higher personal income tax rates on economic behaviour closely related to a high degree of future orientation, can be confirmed.

[Insert Table 5 about here]

In specification (2) the statutory top rate of the personal income tax has a significant effect on future orientation. Even though the top rate is a very clear policy signal that affects individuals' decisions, many inhabitants of the respective country do not actually face these top rates. Therefore, in Table 5a TOBIT regression results are presented that show in specification (3) the effect of the statutory tax rate of the lowest tax bracket (PIT\_LOW) in progressive personal income tax systems;<sup>11</sup> specifications (4) and (5) report effective tax rates at an annual income of USD 100,000 (PIT\_100) and of USD 300,000 (PIT\_300). These data are taken from KPMG's *Individual Income Tax and Social Security Rate Survey 2011*.<sup>12</sup> Specification (6) combines all different (effective) tax rates in one model.

Dissecting the personal income tax rate progressivity into various sections allows a more in-depth analysis of an individual's tax burden and it allows a further investigation of the influence of personal income tax rates on future orientation for individuals in different income segments and in different tax brackets. PIT\_LOW (specification (3)) shows a negative effect that is significant at the 10% level. Specifications (4) and (5) present positive effects for PIT\_100 and PIT\_300 on FOI that are significant at the 5% (PIT\_100) and 1% (PIT\_300) levels. Specification (6) provides basically identical results.

These results show the influence of tax rate progressivity on future-oriented thinking and behaviour. The direction of this influence changes with the increase of the tax rate. Higher marginal tax rates in lower tax brackets discourage future-oriented behaviour, while higher tax rates in higher tax brackets encourage such behaviour. This significant change in the direction of the influence on future orientation can be explained by the well-established higher marginal propensity to consume of lower income individuals and by the higher propensity to save of higher income individuals. An

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<sup>11</sup> The data was derived from the *IBFD* worldwide tax database. In cases of a flat rate personal income tax which is applied in nine countries of the sample including Bulgaria, Czech Republic, Estonia, Hungary, Kazakhstan, Lithuania, Romania, Russia and Slovakia the flat rate was included in the regression. The tax rates for PIT\_LOW range from 1% (Switzerland) to 36.5% (Austria) with a mean of 13.1% and a median of 12.5%.

<sup>12</sup> The effective rates were derived by taking total income tax over gross income of USD 100,000 and USD 300,000, respectively prior to any deductions. In addition to federal taxes, the US calculation factors in the state of New York, the Canadian calculation factors in the Province of Ontario and the Swiss calculation factors in Zurich canton and city. Tax rate information for each country provided by the KPMG member firm in each respective country.

alternative explanation might be that tax rate progressivity of the personal income tax might also initiate higher future-oriented behaviour by high income individuals that is directed towards tax planning and tax avoidance.

[Insert Table 5a about here]

The econometric analysis presented in Tables 5 and 5a shows five main results that allow to confirm five of the six hypotheses developed in section 3. First, taxes do have an effect on individuals' attitudes towards the future (*H1*). Second, the strongest negative effects on future orientation are found for capital gains taxes (*H1b*) and value added taxes (*H3*). Third, a significant effect of dividend taxes on future orientation cannot be found (*H1c*). Fourth, the results suggest that corporate income taxes (*H2*) and top marginal personal income tax rates (*H1a*) have a positive effect on future orientation. And fifth, personal income tax rate progressivity has changing effects on future orientation as higher personal income taxes on lower annual incomes have a negative effect, while higher top rates have positive effects.

### **5.3. Robustness checks**

At first to check for differences in future orientation that are caused by different levels of economic development a subsample that contains only countries that are either EU member states or OECD member states is drawn. These countries are considered as being the most developed and thus form a more homogeneous subsample than the worldwide sample. The results are presented in Table 6.

[Insert Table 6 about here]

For this subsample the main results from section 5.2. (Table 5) can be confirmed for basically all specifications. The different (effective) personal income tax rates employed in specifications (3) to (5) show increasing positive coefficients with increasing tax rates as well as an increase of the significance levels for higher tax rates. This confirms the increasing effect of personal income tax rates on future orientation, although this effect is not as pronounced as in the basic sample (Table 5a).

In contrast to the worldwide sample, the results for EU Member States and OECD member countries show throughout all specifications a highly significant negative effect of dividend taxes (DIV) on future orientation. This suggests that the importance of dividend taxation for individual taxpayers increases with the economic development of the respective home country.

As a second robustness check the sample is split into halves at the median of FOI (0.6725), resulting in two subsamples of 29 countries each. Panel A of Table 7 reports the results for the subsample with FOI values above the median, while Panel B of Table 7 reports the results for the subsample below the median. Notwithstanding the general diminished explanatory power due to the small sample sizes, the findings from the econometric analysis in section 5.2. are supported by the analyses of these two subsamples. The negative effects of VAT and CAPGAIN on future orientation are further substantiated. The positive effect of the PIT top rate (specifications (1) and (2)), as well as the changing effect of personal income tax progressivity (specifications (3) to (5)) on future orientation, even if the coefficient of PIT\_LOW in Panel B is marginally insignificant (p-value = 0.148), can be found again in both subsamples.

[Insert Table 7 about here]

## 6. Conclusion

This paper has presented evidence that taxes have an influence on an individual's and – in aggregate – on a society's degree of future orientation. The econometric analysis of the worldwide sample shows that capital gains taxes and value added taxes have a highly negative influence on future orientation, while corporate income taxes and personal income taxes can have positive effects on future orientation. Progressive personal income tax rates, however, influence future orientation differently depending on the individual tax bracket: higher personal income taxes on lower annual incomes have a negative effect, while higher top rates have positive effects on future orientation.

These results suggest that tax law influences people's behaviour on a very fundamental and rather intangible level by affecting individuals' dispositions and propensities. These effects on individuals' basic attitudes, general perceptions and overall values resonate in individual decision-making and predetermine investment and consumption decisions.

As future orientation is, in general, positively correlated to business success and economic development, a tax policy mix that considers the relations between taxes and future orientation could very well foster positive attitudes and perceptions towards the future, leading to more future-oriented thinking and behaviour, and thus to higher economic growth and faster development in the long run while preserving tax revenues in the short and medium term.

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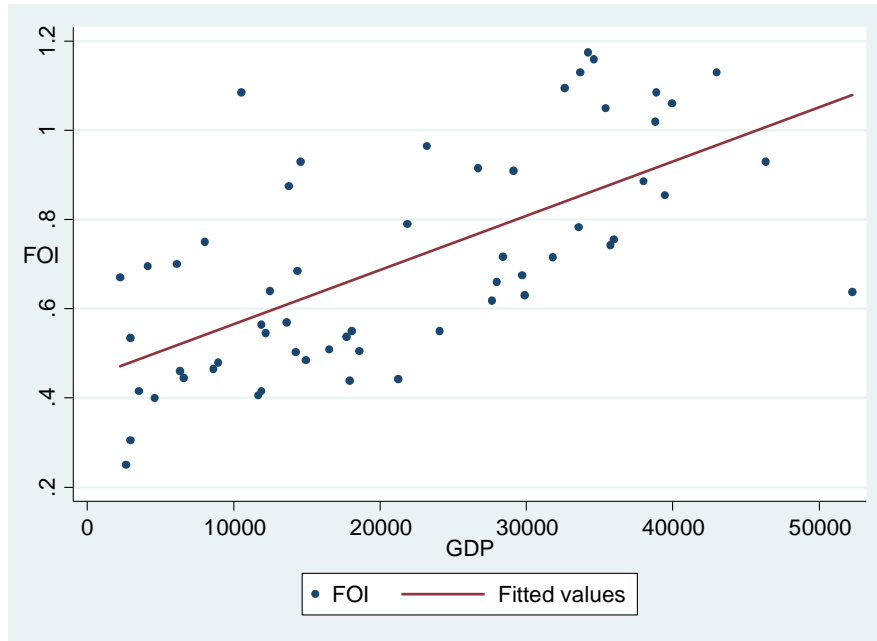
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## Appendix

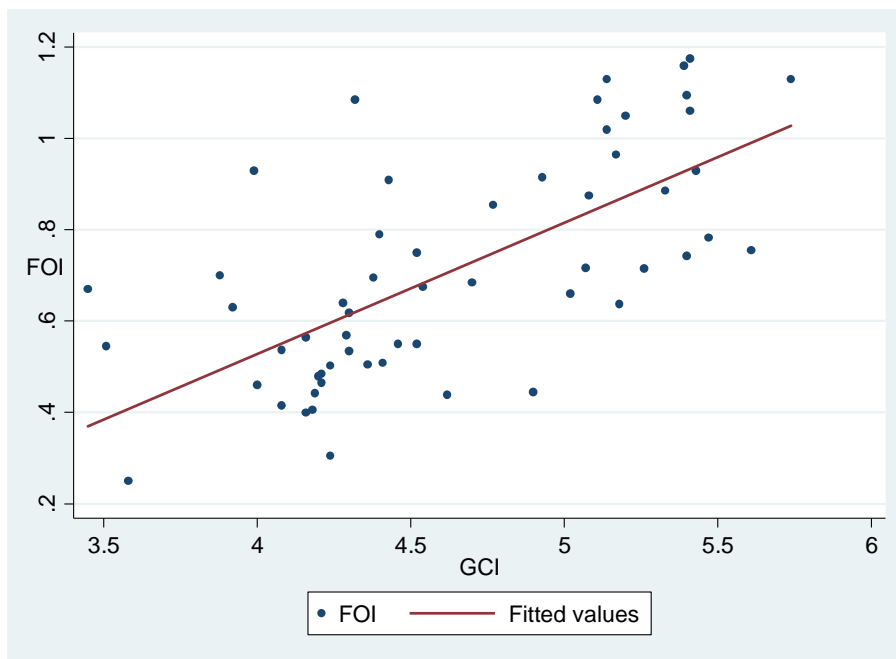
**Figure 1: Correlation FOI-GDP**

This figure presents the correlation of online Future Orientation with GDP per capita (for 2011) for all 58 countries in the sample. For further information and descriptive statistics of the sample, see Table 2.



**Figure 2: Correlation FOI-Global Competitiveness Index**

This figure presents the correlation of online Future Orientation with the Global Competitiveness Index published by the World Economic Forum (Global Competitiveness Report 2011-2012) for all 58 countries in the sample. For further information and descriptive statistics of the sample, see Table 2.



**Table 1: Alternative Future Orientation Measures – Correlations**

This table presents Pearson correlations alternative measures for future orientation and economic success. The Global Competitiveness Index (GCI) is published annually by the World Economic Forum. The data for GCI scores is taken for 2011. GLOBE\_Values and GLOBE\_Practices are the scores for the two properties of future orientation published by House et al. (2004). Coefficients significant at the 10%, 5% and 1% levels are marked with \*, \*\* and \*\*\*, respectively.

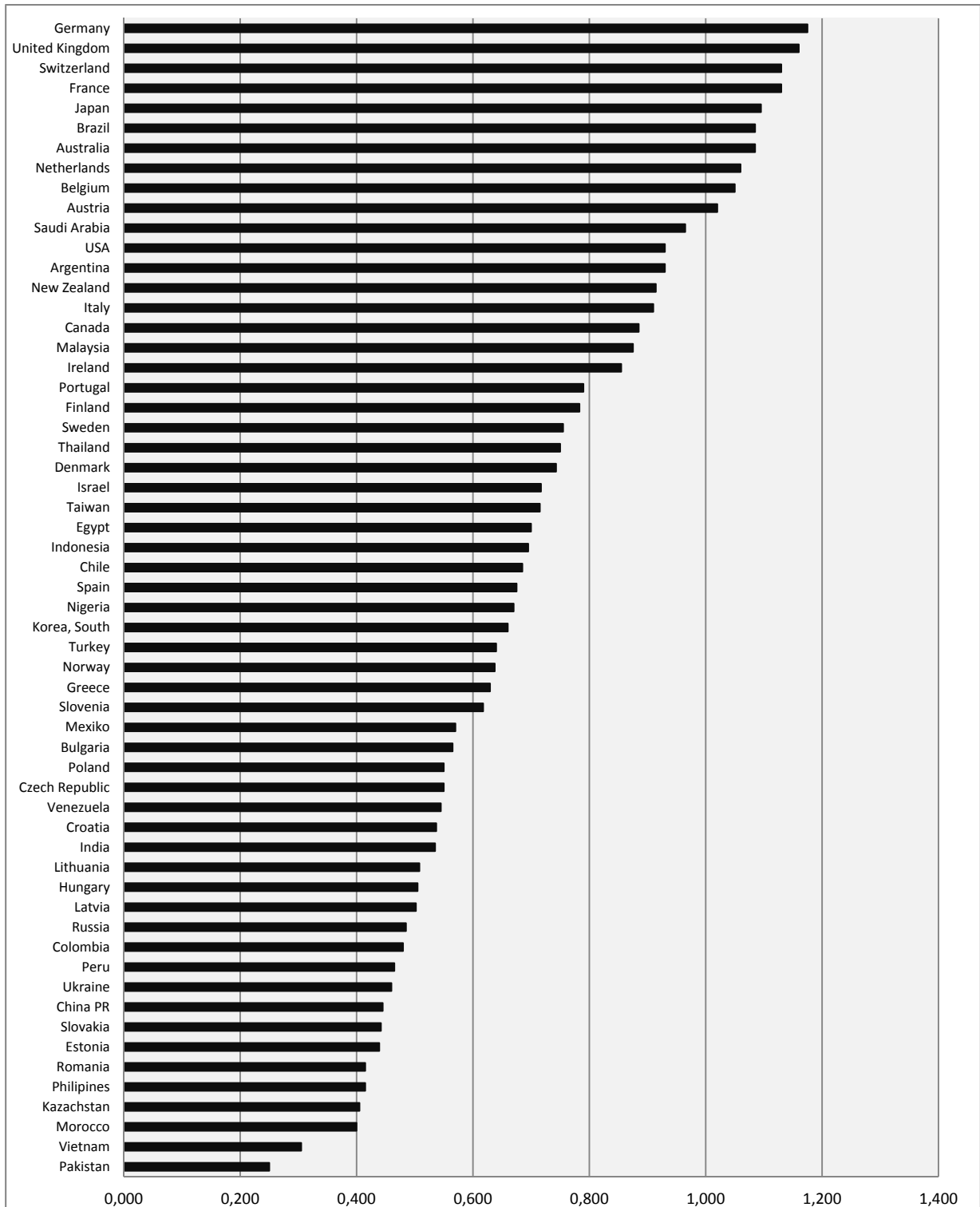
	FOI	GCI	GLOBE_ values	GLOBE_ practices	GDP
FOI	1				
GCI	0.679***	1			
GLOBE_Values	-0.300*	-0.668***	1		
GLOBE_Practices	0.488***	0.655***	-0.398***	1	
GDP	0.656***	0.788***	-0.639***	0.443***	1

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$



**Figure 3: Online Future Orientation Index per Country**

This figure presents an overview of online future orientation index scores for all 58 countries in the sample. For further information and descriptive statistics of the sample, see Table 2.



**Table 2 - Variables**

Variable name	Source	Definition
<i>Tax Variables</i>		
CIT	PwC, <i>Corporate Taxes – Worldwide Summaries</i> ; Ernst & Young, <i>Worldwide Corporate Tax Guide</i> ; Deloitte, <i>Taxation and Investment Guides</i> ; KPMG, <i>Corporate Tax Rate Survey</i> ; IBFD, <i>Global Corporate Tax Handbook</i> ; IBFD, <i>European Tax Handbook</i> ; PwC, <i>Individual Taxes – Worldwide Summaries</i> ; Deloitte, <i>Taxation and Investment Guides</i> ; KPMG, <i>Individual Income Tax Rate Survey</i> ; IBFD, <i>European Tax Handbook</i>	Statutory marginal corporate income tax rate for 2011
PIT		Top statutory marginal personal income tax rate for 2011
DIV		Top statutory marginal tax rate on Dividends for 2011
CAPGAIN		Statutory marginal tax rate on Capital Gains for 2011
VAT		Standard rate of local Value Added Tax or General Sales Tax for 2011
<i>Control Variables</i>		
ECONFREE	Heritage Foundation, Index of Economic Freedom 2011	The Index of Economic Freedom is constructed through analysis of 10 specific components of economic freedom (Business Freedom, Trade Freedom, Fiscal Freedom, Government Spending, Monetary Freedom, Investment Freedom, Financial Freedom, Property Rights, Freedom from Corruption, Labor Freedom) some of which are themselves composites of additional quantifiable measures. Each of the 10 economic freedoms is graded on a scale from 0 to 100. The 10 component scores are equally weighted and averaged to obtain an overall economic freedom score for each economy, with 100 being the score for the most economically free country.
STARTUP	World Bank (Doing Business Data)	This variable includes all procedures that are officially required for an entrepreneur to start up and formally operate an industrial or commercial business.
STARTUPTIME	World bank (Doing Business Data)	The total number of days required to register a firm. The measure captures the median duration that incorporation lawyers indicate is necessary to complete a procedure with minimum follow-up with government agencies and no extra payments.
INTERNET	World Economic Forum, The Global Competitiveness Report 2011-2012	Percentage of population regularly using the Internet
EU	www.europe.eu	Dummy variable, coded 1 if the country is a member of the European Union and 0 otherwise
OECD	www.oecd.org	Dummy variable, coded 1 if the country is a member of the OECD and 0 otherwise
POLITRIGHTS	Freedom House, 2011	Political Rights are measured on a one-to-seven scale, with one representing the highest degree of Freedom and seven the lowest.
CIVILLIB	Freedom House, 2011	Civil Liberties are measured on a one-to-seven scale, with one representing the highest degree of Freedom and seven the lowest.
TECHAVAIL	World Economic Forum, The Global Competitiveness Report 2011-2012	The data are derived from an Executive Opinion survey asking to what extent the latest technologies are available in the respective home country, using a seven-point Likert scale with 1 being “not available” and 7 being “widely available”.
ABSORBTECH	World Economic Forum, The Global Competitiveness Report 2011-2012	The data are derived from an Executive Opinion survey asking to what extent businesses in the respective home country absorb new technology using a seven point Likert scale with 1 being „not at all“ and 7 being „aggressively absorb“.
GDP	Heritage Foundation, Index of Economic Freedom 2011	Natural logarithm of Gross Domestic Product divided by population
POP	UNFPA, State of World Population, 2011	Population in millions is the de facto population in millions of a country as of 1 July 2011. It is based on a medium variant projection.

**Table 3: Descriptive Statistics**

This table reports descriptive statistics for Future Orientation Index (*FOI*), the various tax variables included in the empirical analysis and for the set of control variables. Each variable presented in the table is collected for 2011. For a detailed description of the respective measure, see Table 1. *FOI* is a measure for the degree of future orientation of a country's society derived from *Google Trends*. *CIT* is the statutory corporate income tax. *PIT* represents the marginal statutory personal income tax. *CAPGAIN* is the capital gains tax rate, *DIV* is the dividend tax rate for individuals. *VAT* represents the standard tax rate of value added tax or goods and services tax.

Variable	Mean	Std. dev.	Min	25th perc.	Median	75th perc.	Max	Obs
FOI	0.705	0.244	0.25	0.505	0.6725	0.91	1.175	58
CIT	0.251	0.067	0.10	0.20	0.25	0.30	0.399	58
PIT	0.352	0.134	0.025	0.26	0.36	0.472	0.566	58
DIV	0.136	0.090	0	0.05	0.14	0.20	0.33	58
CAPGAIN	0.207	0.116	0	0.15	0.2	0.29	0.45	58
VAT	0.167	0.066	0	0.103	0.193	0.21	0.27	58
GDP (per capita)	21500	13156	2249	11693	18139	33556	52261	58
ECONFREE	65.85	9.59	37.6	59.6	66.45	71.9	82.5	58
STARTUP	6.65	3.47	1	4	6	8	17	58
STARTUPTIME	19.67	23.72	1	7	14.5	23	144	58
TECHAVAIL	5.51	0.795	3.8	4.8	5.5	6.3	6.9	58
ABSORBTECH	5.17	0.673	3.8	4.6	5.2	5.7	6.5	58
INTERNET	0.564	0.237	0.075	0.36	0.612	0.793	0.934	58
POLITRIGHTS	2.241	1.857	1	1	1	3	7	58
CIVILLIB	2.293	1.533	1	1	2	3	6	58
EU	0.431	0.499	0	0	0	1	1	58
OECD	0.534	0.503	0	0	1	1	1	58
POP (in million)	94.7	24	1.3	8.4	29.5	74.5	1353.6	58

**Table 4: Correlation Matrix**

This table reports Pearson correlation coefficients for Future Orientation Index (FOI) and the various tax variables included in the empirical analysis. Each variable presented in the table is collected for 2011. For a detailed description of the respective measure, see Table 1. FOI is a measure of the degree of future orientation of a country's society derived from *Google Trends*. CIT is the statutory corporate income tax. PIT represents the marginal statutory personal income tax. CAPGAIN is the capital gains tax rate, while DIV is the dividend tax rate for individuals. VAT represents the standard tax rate of value added tax or goods and services tax

	FOI	CIT	PIT	DIV	CAPGAIN	VAT
FOI	1					
CIT	0.346***	1				
PIT	0.496***	0.474***	1			
DIV	0.185	0.078	0.296*	1		
CAPGAIN	0.111	0.173	0.405***	0.308**	1	
VAT	-0.145	-0.125	0.160	0.427***	-0.0198	1

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

**Table 5: Regression Results (I)**

This table presents tobit regression results for three different specifications. The dependent variable throughout the specifications is FOI. The independent variables are defined in Table 1. Specification (1) includes all tax rates used in the empirical analysis. Specification (2) focuses on taxes applicable only to individual taxpayers. Standard errors (shown in parentheses) are cluster-robust clustered for political rights. Coefficients significant at the 10%, 5% and 1% levels are marked with \*, \*\* and \*\*\*, respectively.

	Predicted Sign	(1) FULL	(2) INDIV
CIT	?	1.3085*** (0.1729)	
PIT	?	0.2053 (0.2201)	0.5278** (0.2013)
DIV	-	-0.0946 (0.2670)	0.2086 (0.2330)
CAPGAIN	-	-0.3599*** (0.1177)	-0.4524*** (0.1358)
VAT	-	-1.2373*** (0.3079)	-1.4937*** (0.4173)
LnGDP		0.2467*** (0.0405)	0.1911*** (0.0592)
ECONFREE		0.0010 (0.0035)	-0.0018 (0.0014)
STARTUP		-0.0097 (0.0068)	-0.0081 (0.0060)
STARTUPTIME		0.0018 (0.0012)	0.0024* (0.0012)
TECHAVAIL		-0.0097 (0.0528)	0.0830 (0.0755)
ABSORBTECH		0.1435*** (0.0465)	0.0536 (0.0695)
INTERNET		-0.6419*** (0.0970)	-0.5105** (0.1904)
POLITRIGHTS		0.0753*** (0.0239)	0.0595* (0.0310)
CIVILLIB		-0.1189** (0.0481)	-0.1048* (0.0566)
EU		0.1356** (0.0589)	0.0410 (0.0649)
OECD		-0.0616 (0.0417)	-0.0252 (0.0615)
POP		0.0000 (0.0000)	0.0000 (0.0000)
<i>N</i>		58	58
Pseudo R2		-773.523	-663.141
Log pseudolikelihood		37.192	31.892

Standard errors in parentheses

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

**Table 5a: Regression Results (II)**

This table reports the tobit regression results for two specifications (4) and (5) that employ effective tax rates for PIT, one that uses the lowest statutory tax rate (3) and one specification that uses all three measures together (6). The dependent variable throughout the specifications is FOI. The independent variables are defined in Table 1. Specification (3) includes the tax rate for the lowest tax bracket. The data are taken from the IBFD worldwide tax database. Specifications (4) and (5) include effective personal income tax rates on an annual income of USD 100,000 (4) and of USD 300,000 (5). The data are taken from KPMG's *Individual Income Tax and Social Security Rate Survey 2011*. The effective rates were derived by taking total income tax over gross income of USD 100,000 and USD 300,000 prior to any deductions. In addition to federal taxes, the US calculation factors in the state of New York, the Canadian calculation factors in the Province of Ontario and the Swiss calculation factors in Zurich canton and community. Specification (6) includes all different (effective) tax rates used in specification (3), (4) and (5). Standard errors (shown in parentheses) are cluster-robust clustered for political rights. Coefficients significant at the 10%, 5% and 1% levels are marked with \*, \*\* and \*\*\*, respectively.

	Predicted Sign	(3) INDIV_LOW	(4) INDIV_100	(5) INDIV_300	(6) INDIV_ALL
PITlow	?	-0.3649* (0.1871)			-0.3377** (0.1334)
PIT100	?		0.6572** (0.2743)		-0.7017 (0.4935)
PIT300	?			0.7628*** (0.2027)	1.2004*** (0.4141)
DIV	-	0.3762 (0.2621)	0.1042 (0.2779)	0.0867 (0.2429)	0.2070 (0.2460)
CAPGAIN	-	-0.3257* (0.1671)	-0.1822 (0.1294)	-0.2633* (0.1359)	-0.2959** (0.1443)
VAT	-	-1.3727*** (0.5012)	-1.9167*** (0.4274)	-1.9178*** (0.4296)	-1.7288*** (0.3519)
LnGDP		0.2069*** (0.0603)	0.3196*** (0.0594)	0.2716*** (0.0700)	0.2480*** (0.0729)
ECONFREE		-0.0048*** (0.0014)	-0.0056*** (0.0012)	-0.0049*** (0.0012)	-0.0051*** (0.0015)
STARTUP		-0.0081* (0.0048)	-0.0047 (0.0045)	-0.0071 (0.0046)	-0.0099** (0.0045)
STARTUPTIME		0.0021* (0.0011)	0.0040*** (0.0007)	0.0042*** (0.0009)	0.0044*** (0.0010)
TECHAVAIL		0.1032 (0.0708)	0.1402 (0.1257)	0.1464 (0.1063)	0.1487 (0.0981)
ABSORBTECH		0.0688 (0.0808)	-0.0109 (0.1309)	-0.0575 (0.1161)	-0.0741 (0.1232)
INTERNET		-0.4795*** (0.1376)	-0.4919** (0.1916)	-0.4600** (0.1997)	-0.4998*** (0.1564)
POLITRIGHTS		0.0402 (0.0257)	0.0518* (0.0304)	0.0640* (0.0353)	0.0661* (0.0345)
CIVILLIB		-0.0881* (0.0489)	-0.0952** (0.0464)	-0.1214** (0.0498)	-0.1315*** (0.0425)
EU		0.0345 (0.0692)	0.0378 (0.0427)	0.0243 (0.0378)	0.0239 (0.0361)
OECD		0.0100 (0.0639)	-0.0588 (0.0505)	-0.0507 (0.0456)	-0.0211 (0.0533)
POP		0.0001 (0.0001)	0.0001*** (0.0000)	0.0001*** (0.0000)	0.0001** (0.0000)
N		58	51	51	51
Pseudo R2		-606.908	-307.179	-326.560	-338.699
Log pseudolikelihood		29.191	28.708	30.513	31.644

Standard errors in parentheses

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

**Table 6: Robustness Checks – Developmental Differences**

This table reports the tobit regression results for two subsamples. PANEL A shows results for all specifications for countries in the sample that are either EU Member States or OECD member countries. PANEL B shows results for countries that are neither EU Member States nor OECD member countries. Specification (1) includes all tax rates; specification (2) focuses on taxes applicable only to individual taxpayers; specifications (3), (4), (5) and (6) employ different effective or statutory PIT rates (for further information, see Table 5a). Standard errors (shown in parentheses) are cluster-robust clustered for political rights. Coefficients significant at the 10%, 5% and 1% levels are marked with \*, \*\* and \*\*\*, respectively.

Only EU+OECD							
	Predicted Sign	(1) FULL	(2) INDIV	(3) INDIV_LOW	(4) INDIV_100	(5) INDIV_300	(6) INDIV_ALL
CIT	?	0.7860* (0.3852)					
PIT	?	0.5432*** (0.1546)	0.6636*** (0.0948)				
PITlow	?			0.2277** (0.1062)			0.3626*** (0.0979)
PIT100	?				0.7953** (0.3061)		-0.8145** (0.3675)
PIT300	?					0.9448*** (0.1595)	1.5559*** (0.1333)
DIV	-	-1.0120*** (0.1424)	-0.9919*** (0.0767)	-1.1228*** (0.0626)	-1.0129*** (0.0682)	-0.9236*** (0.0651)	-1.0178*** (0.0619)
CAPGAIN	-	-0.1136** (0.0455)	-0.1209*** (0.0252)	0.0642*** (0.0185)	-0.0968* (0.0494)	-0.1370*** (0.0193)	-0.1639*** (0.0334)
VAT	-	-2.4916*** (0.4310)	-2.7095*** (0.2359)	-2.9785*** (0.3008)	-3.8995*** (0.2698)	-3.8589*** (0.1567)	-3.7624*** (0.2333)
LnGDP		0.4080*** (0.0434)	0.4070*** (0.0295)	0.5445*** (0.0197)	0.6438*** (0.0229)	0.5016*** (0.0392)	0.4084*** (0.0236)
ECONFREE		-0.0012 (0.0049)	-0.0047** (0.0021)	-0.0041 (0.0028)	-0.0160*** (0.0031)	-0.0156*** (0.0022)	-0.0123*** (0.0017)
STARTUP		0.0065 (0.0073)	0.0040 (0.0050)	-0.0043* (0.0024)	-0.0071* (0.0041)	-0.0016 (0.0045)	0.0010 (0.0054)
STARTUPTIME		-0.0070*** (0.0017)	-0.0076*** (0.0011)	-0.0073*** (0.0011)	-0.0067*** (0.0006)	-0.0074*** (0.0006)	-0.0093*** (0.0013)
TECHAVAIL		-0.1733** (0.0642)	-0.1511*** (0.0401)	-0.0507 (0.0485)	-0.1379*** (0.0316)	-0.1499*** (0.0247)	-0.1447*** (0.0328)
ABSORBTECH		0.2617*** (0.0572)	0.2501*** (0.0347)	0.2277*** (0.0543)	0.3019*** (0.0391)	0.2677*** (0.0264)	0.2435*** (0.0382)
INTERNET		-0.2617* (0.1293)	-0.1919*** (0.0641)	-0.4219*** (0.0631)	-0.3446** (0.1305)	-0.2728** (0.0975)	-0.2062** (0.1031)
POLITRIGHTS		0.2686*** (0.0137)	0.2736*** (0.0059)	0.2295*** (0.0153)	0.3262*** (0.0264)	0.3316*** (0.0140)	0.3394*** (0.0296)
CIVILLIB		-0.1387*** (0.0404)	-0.1500*** (0.0238)	-0.0690** (0.0258)	-0.1887*** (0.0309)	-0.2516*** (0.0279)	-0.2569*** (0.0266)
EU		0.3814*** (0.0236)	0.3756*** (0.0213)	0.4564*** (0.0119)	0.4366*** (0.0168)	0.3800*** (0.0220)	0.3961*** (0.0079)
OECD		-0.0167 (0.0131)	0.0197 (0.0151)	0.0305 (0.0236)	-0.0914*** (0.0315)	-0.0844*** (0.0164)	-0.0482 (0.0371)
POP		-0.0007*** (0.0001)	-0.0004*** (0.0001)	-0.0002** (0.0001)	-0.0005*** (0.0001)	-0.0004*** (0.0001)	0.0002*** (0.0000)
N		37	37	37	35	35	35
Pseudo R2		-19.90	-18.812	-17.258	-36.566	-38.492	-39.748
Log pseudolikelihood		33.271	31.539	29.065	29.912	31.446	32.447

Standard errors in parentheses

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

**Table 7: Robustness Checks – Sample Split at Median**

This table reports the tobit regression results for two subsamples. PANEL A shows results for all specifications for countries in the sample with an FOI value above the median of 0.6725 and PANEL B shows results for all specifications for countries in the sample with an FOI value below the median of 0.6725. Specification (1) includes all tax rates; specification (2) focuses on taxes applicable only to individual taxpayers; specifications (3), (4), (5) and (6) employ different effective or statutory PIT rates (for further information, see Table 5a). Standard errors (shown in parentheses) are cluster-robust clustered for political rights. Coefficients significant at the 10%, 5% and 1% levels are marked with \*, \*\* and \*\*\*, respectively. Control variables are included but not reported due to space constraints.

## PANEL A: FOI = Greater than median

	Predicted Sign	(1) FULL	(2) INDIV	(3) INDIV_low	(4) INDIV_100	(5) INDIV_300	(6) INDIV_ALL
CIT	?	1.9781*** (0.0800)					
PIT	?	0.4310** (0.2123)	0.8368*** (0.2061)				
PITlow	?			-0.4602** (0.2020)			-0.2850* (0.1424)
PIT100	?				1.7177*** (0.4541)		0.2735 (0.4631)
PIT300	?					1.3088*** (0.2933)	1.3102*** (0.3056)
DIV	-	-0.5057** (0.2008)	-0.0442 (0.1645)	0.1370 (0.2069)	-0.3923** (0.1726)	-0.1740 (0.1481)	-0.3137* (0.1846)
CAPGAIN	-	-0.4059** (0.1599)	-0.6199** (0.2348)	-0.4454 (0.2791)	-0.4000** (0.1754)	-0.3949** (0.1657)	-0.5255*** (0.1850)
VAT	-	-1.1358*** (0.2273)	-1.8304*** (0.5027)	-1.8005*** (0.5322)	-3.1820*** (0.8900)	-2.5775*** (0.7983)	-2.8547*** (0.8609)
Control variables		Yes	Yes	Yes	Yes	Yes	Yes
N		29	29	29	27	27	27
Pseudo R2		1.356	1.101	1.004	1.221	1.278	1.291
Log pseudolikelihood		8.834	2.497	0.091	4.698	5.921	6.195

Standard errors in parentheses

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ 

## PANEL B: FOI = Less than median

	Predicted Sign	(1) FULL	(2) INDIV	(3) INDIV_low	(4) INDIV_100	(5) INDIV_300	(6) INDIV_ALL
CIT	?	0.5958 (0.3731)					
PIT	?	0.3622** (0.1485)	0.4963*** (0.1230)				
PITlow	?			-0.2509 (0.1699)			-0.1727 (0.1399)
PIT100	?				0.9962*** (0.1868)		0.6741 (0.6707)
PIT300	?					0.6790*** (0.1286)	0.2424 (0.4365)
DIV	-	-0.0177 (0.2677)	0.0977 (0.2226)	0.1876 (0.2482)	-0.0170 (0.1612)	0.0038 (0.1506)	0.0571 (0.1656)
CAPGAIN	-	-0.2883* (0.1603)	-0.3240** (0.1563)	-0.2145 (0.1683)	0.1167 (0.0692)	0.0200 (0.1049)	0.0657 (0.0607)
VAT	-	-1.4546*** (0.4654)	-1.3745*** (0.4474)	-1.2616*** (0.4182)	-1.9473*** (0.4458)	-1.8073*** (0.5235)	-1.8166*** (0.4482)
Control variables		Yes	Yes	Yes	Yes	Yes	Yes
N		29	29	29	24	24	24
Pseudo R2		2.829	2.747	2.361	3.078	3.069	3.118
Log pseudolikelihood		25.397	24.245	18.893	25.968	25.849	26.462

Standard errors in parentheses

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$