universität
wien

WU WIRTSCHAFTS UNIVERSITÄT WIEN VIENNA UNIVERSITY OF ECONOMICS AND BUSINESS

The Effects of a Tax Allowance for Growth and Investment – Empirical Evidence from a Firm-Level Analysis

Matthias Petutschnig
Silke Rünger

Research Papers

The Effects of a Tax Allowance for Growth and Investment –

Empirical Evidence from a Firm-Level Analysis

Matthias Petutschnig / Silke Rünger

ABSTRACT

We contribute to the empirical literature on the debt bias of corporate income taxation through a firm-level evaluation of the European Commission's recent proposal of an Allowance for Growth and Investment (AGI). We use the introduction, the application and the repeal of a similar allowance in Austria during the early 2000s to evaluate the effects of the AGI on corporate equity and profit distribution. Our analysis provides evidence that such an allowance could increase corporate equity ratios by 5.5 percentage points and reduce profit distributions by 7.6 percentage points. These effects are stronger than those the previous literature for traditional Allowance for Corporate Equity (ACE) tax systems has identified. Additionally, we contribute to the recently expanding literature on the influence of ownership on tax planning as we find significant differences in the utilization of the AGI depending on individual specifics of the majority shareholder as well as depending on the number of shareholders of the respective firms.

Dr. Matthias Petutschnig
WU Vienna University of Economics and Business
Department Finance, Accounting and Statistics
A-1020 Vienna - Austria
matthias.petutschnig@wu.ac.at

Dr. Silke Rünger
University of Graz
Institute of Taxation
A-8010 Graz - Austria
silke.ruenger@uni-graz.at

1

1. Introduction

This paper investigates whether and to what extent a tax allowance for growth of corporate equity incentivizes companies to accumulate additional equity. This is an important issue since the financial crisis has shown that many companies are highly leveraged and that low levels of corporate equity escalate the risk of bankruptcy. Several papers[1], the IMF (2011) and also the European Commission (EU 2016b) regard asymmetric taxation of equity and debt as the main reason for the existence of very low equity levels, whereby interest paid on loans is tax deductible while profit distributions paid on equity are not. A tax allowance for the annual growth of equity could help to mitigate this debt bias.

We exploit the experience with a tax allowance for increase of equity (AIE) during the early 2000s in Austria. We use the introduction of the AIE in 2000, the years of its application (2000-2003) and the repeal of the AIE in 2004 to analyze the firm-level effects of such a legal measure specifically aimed at incentivizing the build-up of additional equity. We find that, on average, the introduction of AIE led to a significant increase of equity ratios by 5.55 percentage points and by 11 percentage points for firms with the lowest pre-AIE equity ratios over the application period. At the same time, the profit distribution ratio was, on average, reduced by 7.55 percentage points and by about 20 percentage points for firms with the lowest pre-AIE equity ratios over the application period. For the years after the AIE's repeal we find a strong and significant reverse effect on equity growth and profit distribution ratios. In addition, we find the ownership structure of the firm to have a significant influence on the utilization of the AIE and thus on equity growth and profit distributions. The increase in equity is highest for firms that are part of a multinational group. For stand-alone firms, the increase in equity and the decrease in profit distribution ratios is the lower, the higher the number of individual shareholders of the firm. Agency conflicts and diverging interests of individual shareholders appear to limit the tax benefits of the AIE.

Our primary motivation is to contribute to the debate on the effectiveness of such legal measures as they have been introduced more frequently into the tax policy debate over the last few years (see eg IMF (2011); IFA (2012); Shay et al. (2015); EU (2016b)). Especially, the EU Commission's proposal (EU 2016b) for an Allowance for Growth and Investment (AGI)[2] necessitates examining the effects of tax rules intended to incentivize the build-up of additional equity. We contribute to the existing literature in terms of contents and implemented estimation strategies. First, we study the firm-level development of equity directly (and not indirectly through leverage ratios). Second, we expand the existing literature on Equity Allowances and relate it to the currently growing literature on the influence of ownership structure on tax planning decisions by incorporating the ownership structure of the firm into our analysis. With that, we find a muting effect of ownership on equity growth, profit distribution ratios and tax

---

[1] See for example Auerbach (2012); Brekke et al. (2017); De Mooij and Devereux (2009); De Mooij and Devereux (2011); Devereux (2012); Devereux and Freeman (1991); Devereux and Vella (2014); Devereux et al. (2002); Fehr and Wiegard (2003); Mirrlees et al. (2011); Wagner and Wenger (1996); see also IFA (2012)

[2] Available for download at https://ec.europa.eu/taxation_customs/business/company-tax/common-consolidated-corporate-tax-base-ccctb_en (Aug 8th, 2017).

planning decisions. We provide evidence that companies with more than one individual shareholder are less successful in reacting to the introduction of the AIE regime. Third, at the methodological level, the introduction and subsequent repeal of the AIE in Austria provides two separate yet related events within a very short time frame. This allows investigating the effects of an AIE with two alternative estimation strategies without having to extensively control or adjust for economic variations between the subjects.

The remainder of the paper is structured as follows: Section 2 gives an overview of the existing literature on allowance for corporate equity regimes. Section 3 provides an insight into the Austrian AIE rule and theoretically analyzes the firm-specific decision making and strategies to maximize the tax advantage of the AIE rule. This theoretical analysis in section 3 also constitutes the basis for the development of our hypotheses. The empirical analysis and its results are presented in sections 4 and 5. A conclusion in section 6 completes the paper.

2. Allowances for Equity and the Related Literature

The Allowance for Growth and Investment (AGI) as proposed by the EU Commission provides for a notional interest deduction based on the annual increase in equity of the taxpayer.[3] The proposed AGI has its roots in one of the most intriguing corporate income tax reform concepts of the last decades: the Allowance for Corporate Equity (ACE). ACE has been on and off tax reformers' agendas since the 1980s, when its theoretical foundations were developed by Wenger (1983) and Boadway and Bruce (1984). Their idea was to abolish the deductibility of actual interest payments and to replace it by an allowance for the normal return, applied to the book value of the entire firm's capital. The ACE is slightly different in that it maintains the deductibility of interest payments for loans (IFS 1991; Devereux and Freeman 1991). However, it adds to this a notional return on equity to be deductible against corporate profits. Since the tax advantage associated with the deduction for equity is certain, the appropriate notional return of the ACE is the risk-free nominal interest rate, e.g. the rate on government bonds (Bond and Devereux 1995).

Among economists, a number of proponents have repeatedly argued in favor of such a rule that provides for a deduction of notional interest on equity (Devereux and Freeman 1991; Wagner and Wenger 1996; Devereux et al. 2002; Fehr and Wiegard 2003; De Mooij and Devereux 2009; Mirrlees et al. 2011; De Mooij and Devereux 2011; Devereux 2012; Auerbach 2012; Devereux and Vella 2014; Brekke et al. 2017). ACE is argued to have several attractive features (De Mooij and Devereux 2011): First, it obtains neutrality between debt and equity finance. Thus, ACE makes thin capitalization rules redundant. Second, ACE is neutral with respect to marginal investment decisions. In fact, by allowing a deduction for both debt interest and the normal rate of return on equity, the ACE system leaves capital income

---

[3] Available for download at https://ec.europa.eu/taxation_customs/business/company-tax/common-consolidated-corporate-tax-base-ccctb_en (Aug 8th, 2017).

untaxed and is a tax on economic rent. A third characteristic of the ACE is that it offsets investment distortions induced by differences between economic depreciation and depreciation for tax purposes.

There have also been skeptics, however, who worried about the difficulties that an ACE system may encounter in practice. Isaac (1997) points out difficulties that arise as a result of the interactions between ACE and standard tax systems if only a few countries adopt ACE taxes. An ACE system necessarily narrows the tax base, by focusing on the taxation of economic rents. To collect the same revenue as under a classical corporate income tax system, the tax rate needs to be higher (Finke et al. 2014). In a closed economy, this should not distort investment. In a globalized economy in which multinationals decide on where to undertake their profitable discrete investment projects, the statutory income tax rates are regularly used as important benchmarks (Chetty et al. 2009; Blaufus et al. 2013; Graham et al. 2017; Petutschnig 2017).

During the late 1990s and early 2000s a small number of (mostly) European countries experimented with ACE and ACE-type rules. One of the main issues in implementing an ACE system is the definition of the corresponding ACE base, i.e. the question whether to consider the whole book value of equity or only the annual increase in equity as the basis for the notional interest deduction. This distinction is used to differentiate so-called "*hard*" and "*soft*" ACE regimes (Klemm 2007; Hebous and Ruf 2015). A *hard* ACE regime is based on the whole book value of equity, while a *soft* ACE regime only considers the recent equity increase. The European Commission's AGI proposal is a *soft* ACE regime as it only considers the annual growth in equity. *Hard* ACE regimes have been introduced by Belgium (since 2006), Croatia (1994-2000) and Liechtenstein (since 2011). Austria (2000-2004), Brazil (since 1996), Italy (1998-2003 and since 2012), Latvia (2009-2014)[4] and Portugal (2010-2013)[5] have maintained *soft* ACE regimes over different periods (Massimi and Petroni 2012; Hebous and Ruf 2015).

While the theoretical literature discussed ACE very broadly during the 1990s and early 2000s, the empirical literature has only recently started to focus more strongly on ACE and ACE-type regulations. Based on the early experience in Croatia, Italy and Belgium, the macro-economic literature has evidenced strong decreases in tax revenues after the introduction of an ACE system on the one hand, but on the other hand has also shown macro-economic welfare gains (De Mooij and Devereux 2011; Keen et al. 2010; Keen and King 2002; EU 2014; IMF 2011; De Mooij 2012).

The micro-economic literature as well as the taxation and accounting literature have also just recently started to empirically analyze the consequences of an ACE introduction on corporate decision making and on specific balance sheet items and financial ratios. The papers by Auclert and Struyven (2012),

---

[4]   The Latvian (*soft*) ACE variant was based on retained profits, but not only of the respective tax year but of all previous taxable years following the introduction of the notional interest deduction (Massimi and Petroni 2012; Kronbergs 2014). So it was actually a hybrid ACE variant that incorporates aspects of a *soft* (only additional equity accumulation) and of a *hard* (consideration of total equity increases over more than one year) ACE regime.

[5]   The Portuguese (*soft*) ACE was only applicable to small and medium sized companies, whereby the base for the notional interest deduction was not retained earnings but rather equity increases by additional cash contributions by the shareholders (Massimi and Petroni 2012)

Princen (2012), Van Campenhout and Van Caneghem (2013) and Panier et al. (2015) focus on finance decisions of Belgian companies after the introduction of the Belgian (*hard*) ACE system. Basically, the results of these studies suggest that the Belgian system led to an increase in corporate equity and to a corresponding decrease of the debt-equity-ratio. These studies also suggest that the Belgian ACE reduced the overall effective tax rates of the companies applying the provision. Aus dem Moore (2014) finds "*highly significant and robust estimates that correspond to an increase in investment activity by small and medium-sized firms of about 3 percent in response to the ACE reform*". Focusing on domestic affiliates of multinational firms, Hebous and Ruf (2015), however, find no effect – neither on production nor investment after the introduction. Andries et al. (2017) focus on the Belgian capital market's reaction to the announcement and enactment of the tax reform and on inter-temporal profit shifting of the firms subject to the ACE. They provide evidence for both, abnormal share price increases during the announcement phase and profit-shifting from the last year prior to the reform to the first year of the application. Zangari (2014) concludes that while the Belgian ACE type has possibly benefitted investment by SMEs, multinationals seem to have used the notional interest deduction mostly as a tax-planning device.[6] However, these papers evaluate a *hard* ACE system, which limits the explanatory power of their results with respect to a *soft* ACE regime as proposed by the European Commission.

The empirical analyses of the Italian (*soft*) ACE also find reactions of firms regarding their financing decisions. Panteghini et al. (2012) focus on the effects of the Italian ACE on debt finance. They report an average elasticity of the leverage ratio to the introduction of ACE of -0.064. This translates to an average leverage reduction of 3.2% for loss-making firms while profit-making firms reduce leverage by 2.5%. Bernasconi et al. (2005) also focus on leverage ratios and find a reduction of 4.1% (4.2%) in 1998 (1999) and estimate a strong reduction of the probability of issuing new debt following the enactment of the Italian ACE. Bontempi et al. (2004) report results similar to those of Bernasconi et al. (2005) and Panteghini et al. (2012), although they are based on a micro-simulation.

While equity and debt finance are related to each other, investigating the reactions of leverage ratios after an ACE introduction can only provide indirect results on the ACE's effects on additional equity accumulation. Despite the relation between equity and debt, the empirical investigations of the Italian ACE do not further investigate whether the reduction in leverage was due to a decrease in debt finance or due to an increase in equity. Additionally, due to the lack of a counterfactual, the empirical results from Italy cannot be compared to a control group, which limits the explanatory power of those results. We use firms not affected by the law change as a control group and apply a difference-in-difference analysis, which provides evidence that the increase in equity is indeed attributable to the AIE introduction and not related to mere time trends. We also utilize the repeal of the AIE after the year 2004 to disentangle the AIE's effect from random time trends.

---

[6] With respect to the 2015 US ACE Proposal, Shay et al. (2015) also criticize the potential tax-planning opportunities of an ACE introduction.

Additionally, a certain level of political and legislative instability influences the Italian setting, at least during the first period of ACE application (1998-2003). In 2001, general elections led to a change in legislative power and government, which affected the ACE regulations (Ballancin and Caumont Caimi 2002). And, in 1999, a regional tax on productive activities (IRAP) was introduced, which also affected the applicability of the Italian ACE (Pandolfini 1999). In contrast, the Austrian ACE was applicable during a relatively stable political, legislative and economic period.[7]

The Austrian AIE has so far not been examined empirically. The micro-economic literature as well as the accounting and finance literature have used mostly theoretical models to predict the consequences of the AIE introduction (Kiesewetter and Niemann 2004; Bogner et al. 1999; Knoll 2001; Bogner et al. 2002) in Austria. Studying firm-level data of the AIE-era in Austria provides new insights into the ramifications of such a specific legal measure. In addition, given the similarities of the AGI proposal and the Austrian AIE-rule, analyzing the Austrian AIE-rule helps in understanding the potential firm level effects of the AGI introduction.[8]

3. Legal Background and Hypotheses Development

3.1. The Austrian Allowance for Increase in Equity

Austria introduced the AIE in 2000.[9] The Austrian rules were applicable for corporations and partnerships as well as for sole traders subject to mandatory double entry book-keeping. The AIE provided for a notional interest deduction on the increase of equity effectuated during the fiscal year. The basis for the notional interest was the increase of the book-value of equity during the respective taxable year compared to the average of the book values of equity over the preceding seven years starting with the year 1998. So, in the first year of application (2000), the basis was the average equity book value of the two years 1999 and 1998, in 2001 it was the average equity book value of the three years 2000, 1999 and 1998, and so on.

The Allowance for Increase in Equity was abolished in 2003 for individuals and in 2004 for corporations. For corporations, the repeal was part of a broader reform, which also reduced the standard corporate tax rate to 25%. The tax incentive for retaining earnings and maintaining higher levels of equity was repealed without replacement. For individuals, the AIE was replaced by a different type of allowance for retained earnings.

---

[7] The 2002 general elections did not lead to a government change.
[8] While the European Commission has conducted several impact assessment studies prior to publishing the draft directive, these impact assessment studies primarily focus on macro-economic effects of the C(C)CTB introduction on national tax revenue, consumption and welfare; see EU (2011); ZEW (2016); EU (2016a)
[9] For further information regarding the legal background and details see Taferner (1999); Gassner (2002); Eberhartinger et al. (2004); Lehner et al. (2004).

The tax incentive was not structured as a full deduction of the notional interest on the increase in equity, as proposed by the AGI, but rather as a special (reduced) tax rate for this notional interest. The notional interest was first deducted from the regular taxable income and then taxed at a reduced rate. For corporations (and corporate partners of a partnership) the reduced rate was a fixed reduced rate of 25% (compared to the regular rate of 34%) while for sole traders (and individuals as partners of a partnership) the rate was reduced to the half of the individual effective tax rate.[10] As partnerships are pass-through entities, the partner's standard tax rate and reduced tax rate according to the AIE depended on their personal characteristics – mainly whether they were corporations or individuals.

3.2. Hypotheses on the Effect of the Allowance for Increase in Equity on Equity and Profit Distribution

The tax advantage from applying the AIE can be calculated as follows:

Equation (1) depicts the regular calculation of the after-tax profit P_S without any allowances for equity:

$$P_S = P * (1 - \tau) \tag{1}$$

Equation (2) introduces the notional interest deduction for the increase in equity ($IE * r$) to the calculation of the after-tax profit:

$$P_S = P - [(P - IE * r) * \tau + (IE * r * \bar{\tau})] \tag{2}$$

Equation (2) can further be simplified providing equation (3):

$$P_S = P * (1 - \tau) + [IE * r * (\tau - \bar{\tau})] \tag{3}$$

The tax advantage of the AIE is thus dependent on the amount of the increase in equity (IE), the notional interest rate (r) and the difference between the regular tax rate (τ) and the reduced tax rate ($\bar{\tau}$). For Austrian corporations the difference between regular ($\tau = 34\%$) and reduced tax rate ($\bar{\tau} = 25\%$) amounted to 9 percentage points, while for individuals $\bar{\tau} = \frac{\tau}{2}$. The application of the AIE directly incentivized increasing the amount of equity. Thus, our first hypothesis reads as follows:

H1a: During the period of its application (2000-2003), the AIE leads to an increase in equity for firms.

The basis for the increase in equity constituted an important factor within the Austrian AIE-system. The Austrian tax law provided for a comparison of the average amount of equity over a period of (statutorily up to seven) preceding years. The fact that not the amount of equity as such was subject to a tax allowance, but only the amount of the annual increase aimed at incentivizing retaining earnings.

---

[10] The highest statutory marginal tax rate for individuals at that time was 50%, so the reduced rate could never exceed 25%.

However there might be certain limits to this behavior. For firms that have already high amounts of equity (in terms of equity ratios) accumulating additional equity, even with the tax advantage attached to it, might not be reasonable (Bogner et al. 1999, 2002; Panteghini et al. 2012).

H1b: For firms with higher ratios of equity the increase in equity is lower than for firms with lower ratios of equity.

Prior empirical research has shown that smaller firms tend to have lower absolute amounts of equity than larger firms (Frank and Goyal 2009). The incentive to accumulate additional equity is therefore higher for smaller firms. In line with the argumentation for H1b, we therefore expect the increase in equity to be higher for smaller firms.

H1c: For small firms, the increase in equity is higher than for large firms.

While the application of the AIE generally incentivized retaining earnings, the shareholders and partners of the firm might demand the distribution of at least a certain share of the annual profits, which limits the amount of profit that could effectively be retained. Especially in the last year before the first application, we expect extraordinarily high distributions because of the shareholders' expectations of lower levels of future distributions due to the allowance.

H2a: In the year prior to the application of the AIE (1999), profit distributions of firms increased.

H2b: During the years of the application of the AIE (2000-2003), profit distributions of firms decreased.

In line with the findings of Jacob and Michaely (2017), we expect the ownership structure of a firm to have a muting effect on corporate decisions with respect to taxes. In our analysis, we distinguish between three types of firms: firms that are predominantly held by individual shareholders (stand-alone firms), firms that are predominantly held by a domestic corporate shareholder (firms that are part of a domestic group) and firms that are held by a foreign corporate shareholder (firms that are part of a multinational group).

As shown above, the tax benefit resulting from the AIE was the higher, the higher the difference between the regular tax rate (τ) and the reduced tax rate ($\bar{\tau}$). If the firm was predominantly held by domestic corporate shareholders, the tax rate benefit accounted for 9 percentage points. If, however, the firm was predominantly held by individual shareholders the tax benefit could be as high as 25 percentage points. We therefore expect firms held by individual shareholders to have a higher increase in equity than domestic firms held by domestic corporate shareholders.

H3a: The increase in equity is higher for domestic firms that are held by individual shareholders than for domestic firms that are held by domestic corporate shareholders.

As shown for a Belgian sample by Zangari (2014), multinational firms use the notional interest deduction as a tax-planning device. If a firm is predominantly held by a foreign corporate shareholder

and thus belongs to a multinational group, we expect the group parent to shift equity and/or profits to the Austrian firm in order to benefit from the AIE. We therefore expect firms held by foreign corporate shareholders to have a higher increase in equity than firms held by domestic corporate shareholders.

H3b: The increase in equity is higher for firms that are part of a multinational group than for firms that are held by a domestic corporate shareholder.

Jacob and Michaely (2017) also show that the higher the number of individual shareholders, the more likely conflicts among shareholders due to different individual tax preferences arise. In our setting, individual shareholders face the trade-off between the benefit of a notional interest deduction on retained earnings and a reduction in profit distributions. If preferences among individual shareholders differ, firms might not be able to increase equity, even though retaining profits would reduce the tax payments of the firms. Thus, as the number of individual shareholders increases, it is more difficult to accumulate additional equity by retaining profits.

H3c: The increase in equity after the introduction of the AIE is the lower, the higher the number of individual shareholders.

In addition, as the number of individual shareholders increases, agency conflicts among shareholders make it more difficult to decrease profit distributions.

H3d: The reduction in profit distributions after the introduction of the AIE is the lower, the higher the number of individual shareholders.

Since we expect the introduction of the AIE to lead to an increase in equity of firms, we expect the opposite effect after the repeal of the AIE in 2004.

H4: After the repeal of the AIE, there is a decrease in equity for firms.

4. Data and Research Design

4.1. Sample Selection

We collect data on Austrian firms from the AMADEUS database over the period 1996-2003. Sample 1 contains 5,680 firm-year observations of 1,091 firms with available unconsolidated financial statement data for at least one year before (1996-1999) and one year after the introduction (2000-2003) of the AIE. 63 out of the 1,091 firms are partnerships primarily held by individuals, the other 1,028 consist of corporations and partnerships primarily held by corporations. To investigate each of the hypotheses developed in section 3.2 we need to further modify the primary sample (sample 1) and adjust it to the specific research questions of the respective hypothesis.

In order to eliminate time trend effects, we add a control group to our analysis. Since all Austrian firms could make use of the notional interest deduction, forming a control group within the same jurisdiction is not possible. Instead, we choose firms from Sweden as our control group, mainly for two reasons: First, there have been no changes in tax rates relevant for our analysis (corporate income tax, individual dividend tax, capital gains tax) or changes with respect to interest deduction over the whole observation period in Sweden.[11] Second, the macroeconomic environment in Sweden (population, GDP per capita, GDP growth, etc) as well as the structure of the capital market (market capitalization of prime index, trading volume) is very similar to that of Austria and both countries joined the European Union at the same time in 1995.

We collect unconsolidated financial statement data for 3,815 Swedish firms with at least one observation available for the years prior (1996-1999) and subsequent to (2000-2003) the introduction of the Austrian AIE and perform one-to-one propensity score matching with no replacement to identify Swedish firms similar to the Austrian sample firms. The matching approach is based on three financial statement variables (size, profit, and revenues, each from the year 1996) and the firms' two digit NACE rev. 1.1. industry code. As the industry codes are not available for all 1,091 Austrian firms in sample 1, we end up with 1,996 firms in the matched sample (Sample 1a), 998 from Austria and 998 from Sweden and 10,855 firm-year observations. Due to the matching process, the overall mean bias declines form 5.4 in the unmatched sample to 2.6 in the matched sample.

In order to analyze the effects of the introduction of the AIE on the profit distributions of Austrian firms (hypotheses H2a and H2b), financial statement data of at least two subsequent years for the period before (1996-1999) and after (2000-2003) the introduction of the Austrian AIE is necessary. Our sample analyzing the effects on profit distributions therefore shrinks to 3,529 firm-year observations of 512 firms (sample 2).

For analyzing the ownership structure of the firm (hypotheses H3a to H3d), additional information on all shareholders of the firm is necessary. We therefore use sample 1 and exclude Austrian firms with no shareholder information from the analysis. This reduces our sample to 2,345 observations of 459 firms (sample 3).

Since we hypothesize that the introduction of the AIE leads to an increase in equity of Austrian firms, one would expect the opposite effect after its repeal in 2004. To test this hypothesis (hypothesis H4), we create two additional samples of Austrian firms of the AMADEUS database. Sample 4a contains 9,123 firm-year observations of 1,185 firms with available unconsolidated financial statement data for at least one year during the AIE-era (2000-2003)[12] and for at least one year after its repeal (2005-2009).

---

[11] Using firms from other European countries is not possible due to significant changes to their overall legal and economic systems such as Hungary, the Czech Republic, or Slovakia, or to their tax laws or accounting rules such as Germany, Italy, or Switzerland for example.

[12] Since the AIE was repealed in 2003 for individuals and only in 2004 for corporations, we do not include the year 2004 in the analysis to avoid distorting effects.

Additionally, sample 4b includes the period prior to the introduction of the AIE and consists of 10,814 firm-year observations of 1,011 firms with data for at least one year before the introduction of the AIE (1996-1999), one year during the AIE-era (2000-2004) and one year after its repeal (2005-2009).

4.2. Regression Model and Definition of Variables

We use four different measures to capture the effect of the introduction of the AIE on a firm's equity. Our first measure is the equity ratio of the firm, $ER_{i,t}$, calculated as total equity divided by total assets. Alternatively, we use the relative change in equity, $\Delta Eq_{i,t}$, defined as the change in total equity divided by total equity of the previous year. Both variables are winsorized at the 1% level and at the 99% level. The two other measures are categorical variables: $IncrEq_{i,t}$ is an indicator variable taking the value 1 if the total equity of the firm has increased compared to the year before and 0 otherwise. $IncrER_{i,t}$ is an indicator variable taking the value 1 if the equity ratio of the firm has increased compared to the year before and 0 otherwise.

In order to test the effect of the introduction of the AIE on equity of Austrian firms (Hypotheses H1a to H1c), we run the following regression models:

$$ER_{i,t} = \alpha + \beta_1 \cdot Reform_t + \beta \cdot X_{i,t} + \beta \cdot Y_t + \delta_i + \varepsilon_{i,t} \tag{4}$$

$$\Delta Eq_{i,t} = \alpha + \beta_1 \cdot Reform_t + \beta \cdot X_{i,t} + \beta \cdot Y_t + \delta_i + \varepsilon_{i,t} \tag{5}$$

We estimate regressions (4) and (5) using OLS to examine the influence of the introduction of the AIE on equity ratios. Since only the amount of the annual increase (and not the total amount of equity) was subject to the tax allowance, we additionally estimate two logit regressions that test the probability of an increase in equity (6) and in equity ratios (7).

$$Prob(IncrEq)_{i,t} = \alpha + \beta_1 \cdot Reform_t + \beta \cdot X_{i,t} + \beta \cdot Y_t + \delta_i + \varepsilon_{i,t} \tag{6}$$

$$Prob(IncrER)_{i,t} = \alpha + \beta_1 \cdot Reform_t + \beta \cdot X_{i,t} + \beta \cdot Y_t + \delta_i + \varepsilon_{i,t} \tag{7}$$

Since we are interested in the effects of the introduction of the AIE on equity, the variable $Reform_t$ is the main variable of interest. It is a categorical variable taking the value 1 for the years 2000-2003 and 0 otherwise.

Our control variables are taken from prior research. Panteghini et al. (2012) have shown that $Profit_{i,t}$, measured as profit/loss per period, as well as $Rev_{i,t}$, measured as the firm's revenues (sales), and $Size_{i,t}$, measured as total assets, are all positively related to the equity ratio of a firm. We do not include $Size_{i,t}$ in the regressions using $ER_{i,t}$ as the dependent variable, since we use total assets to calculate the equity ratio of the firm. We measure differences in ownership structures of the firms by using three variables. $ForeignOwned_{i,t}$ is a dummy variable taking the value 1 if the firm is held by a foreign corporate

shareholder, and $IndividualOwned_{i,t}$ is a dummy variable taking the value 1 if the firm is held by individual shareholders. $Individual_{i,t}$ is the total number of individual shareholders of the firm.

We include two macroeconomic control variables: $Inflation_t$, the annual rate of inflation and $GDPGrowth_t$, the annual increase in the Gross Domestic Product, to control for macroeconomic factors influencing firm's equity.

To separate time trend effects from the effects of the introduction of the AIE, we add firms from Sweden as a control group to our analysis and perform difference-in-difference (DiD) regressions, using equations (4) to (7). We include $Austria_i$, an indicator variable taking the value 1 for Austrian firms and 0 otherwise, and the DiD interaction term $Austria_i \cdot Reform_t$ in the analysis.

Additionally, we test the effect of the AIE on profit distributions (Hypotheses H2a and H2b) running the following regression model:

$$Div_{i,t} = \alpha + \beta_1 \cdot Reform_t + \beta_2 \cdot Y1999_t + \beta \cdot X_{i,t} + \beta \cdot Y_t + \delta_i + \varepsilon_{i,t} \tag{8}$$

As we have mainly non-listed firms in the sample, we cannot directly observe profit distributions from the database. Instead, we follow the approach of Haring et al. (2016) and calculate the firm-specific profit distribution ratio as a function of the firms' profit/loss per period, $Profit_{i,t}$, and total equity, $Eq_{i,t}$, as follows:

$$Div_{i,t} = \begin{cases} 0 \text{ if } Profit_{i,t} < 0 \\ 1 \text{ if } Profit_{i,t} > 0 \text{ and } Eq_{i,t} - Eq_{i,t-1} < 0 \\ 0 \text{ if } 0 < Profit_{i,t} < Eq_{i,t} - Eq_{i,t-1} \\ \text{otherwise } \dfrac{Profit_{i,t} - (Eq_{i,t} - Eq_{i,t-1})}{Profit_{i,t}} \end{cases} \tag{9}$$

According to equation (9) values for $Div_{i,t}$ vary between 0 (no profits distributed) and 1 (all profits distributed).[13] We additionally control for effects on profit distribution in the year 1999 using the indicator variable $Y1999_t$, which takes the value 1 for the year 1999 and 0 otherwise.

To capture the effect of the AIE repeal after 2004, we estimate regressions (4) to (7) but replace $Reform_t$ with $Repeal_t$ as the main tax variable of interest. $Repeal_t$ takes the value 1 for the years 2005-2009 and 0 otherwise.

All regressions include firm-fixed effects and we estimate heteroscedasticity-robust standard errors clustered at firm level.

---

[13] If the increase in shareholder funds from *t-1* to *t* is larger than the observed profit in *t*, we assume that all profits have been retained and additional shareholder funds have been contributed to the capital reserves, which we cannot directly observe separately from retained earnings.

5. Results

5.1. Descriptive Statistics

Tables 1a and 1b show mean values for the four dependent variables used in the regression models (equations (4) to (7)) measuring the influence of the introduction (repeal) of the AIE on equity of the 1,091 (1,185) Austrian sample firms as well as mean values of the profit distribution ratio, used in the regression model depicted in equation (8), for 512 Austrian sample firms over the sample period 1996-2003 (2000-2009).

[Insert Tables 1a and 1b about here]

Although there is a small decline in average equity ratios in the year 2000, we find an overall increase in the mean of the dependent variables measuring the effect of the AIE on equity, $ER_{i,t}$ and $\Delta Eq_{i,t}$, after the introduction of the AIE. A similar trend, though less prominent, can be found for the mean of the two dependent variables measuring the probability of an increase in equity and equity ratios, $Prob(IncrEq)_{i,t}$ and $Prob(IncrER)_{i,t}$. The probability of an increase in equity ratios declines over the years 2000 and 2001, the first two years after the introduction of the AIE. It reaches its highest levels during the years 2002 and 2003, which closely corresponds to the overall development of the mean equity ratio.

With respect to profit distribution ratios, we find the highest values for the years prior to the reform, followed by a reduction in profit distribution ratios over the years 2000-2003. The analysis of the descriptive statistics does not provide extraordinarily high average profit distribution ratios for 1999, the year prior to the introduction of the AIE, compared to the years 1996-1998. However, the profit distribution ratio in 1999 is higher than that in three out of the four years after the introduction of the AIE.

We find opposite effects for the repeal of the AIE, over the years 2005-2009, as shown in table 1b. Although we do not observe a decline in equity ratios $ER_{i,t}$, all other variables measuring changes in equity show an overall decline over the years 2005-2009.

In table 2 we present descriptive statistics for all variables in samples 1 to 4.

[Insert Table 2 about here]

On average, our sample firms show an equity ratio of 30.32% and an average relative increase in equity of 25.71% annually. On average, the majority of firms experience an increase in the absolute value of equity (66.85%) and in the equity ratio (53.84%). The average profit distribution ratio accounts to 38.76% and, by definition, varies between 0 and 1. 27.84% of our sample firms are held by a foreign parent company, 23.58% are stand-alone firms held by individuals and the remaining 45.58% are held

by domestic parent companies. Our sample firms have 0.9 individual shareholders on average, the minimum value being 0 and the maximum 32.

We expect the number of individual shareholders to have an influence on the equity ratio as well as on the profit distribution ratio, as prior research has shown that firms' response to tax law changes depends significantly on the number of individual shareholders of a firm. For our analysis, we divide all firms into three groups: firms fully held by one individual shareholder (Individual=1), firms held by two individual shareholders (Individual=2) and firms held by more than two individual shareholders (Individual>2).[14] We have chosen these categories according to the distribution of the number of individual shareholders in our data: 23.86% of all firm-year observations in our sample refer to firms with one shareholder, 36.16% refer to firms with two shareholders and 39.98% of all firm-year observations to those with more than two individual shareholders. Table 3 provides descriptive statistics on equity ratios with respect to the different ownership structures for sample 3.

[Insert Table 3 about here]

Throughout the sample period we find increasing mean values for equity ratios for firms with a higher number of individual shareholders. One explanation for this finding is that as the number of individual shareholders increases, firms have better access to additional equity and are therefore able to raise (additional) equity more easily than firms held by a single individual shareholder. Comparing average equity ratios for the years before the introduction of the AIE (1996-1999) to the years after its introduction (2000-2003), we find an average increase of about four percentage points for all shareholder groups. The effect is largest for firms with only one individual shareholder, but effects for firms with two and more than two individual shareholders are rather similar. The more individual shareholders a firm has, the lower the profit distribution ratio of the firm. Comparing average ratios for the years before the introduction of the AIE (1996-1999) to the years after its introduction (2000-2003), we find a general decrease in profit distribution ratios for all shareholder groups, the reduction being highest for firms with more than two individual shareholders.

5.2. Regression Results

5.2.1. The Effect of the Introduction of the AIE on Equity

We first analyze the effects of the introduction of the AIE on corporate equity over the years 1996-2003 with four different measures of the dependent variable. According to hypothesis H1a, we expect an increase in equity after the introduction of the AIE. Table 4 presents the results of these analyses.

[Insert Table 4 about here]

---

[14]   We do not distinguish between the sizes of ownership blocks. That means that firms with two owners could be firms for which both owners each hold 50% of the shares, but also firms with a majority owner holding 99% of the shares and a minority owner holding 1% of the shares.

All four dependent variables show a significant positive coefficient for $Reform_t$. In specifications (a) and (b), the coefficients provide evidence that after the introduction of the AIE equity ratios of Austrian firms are 5.55 percentage points higher and the relative increase in equity is 25.09 percentage points higher. Calculating marginal effects for the logit estimations in specifications (c) and (d), we find the probability of an increase in equity (equity ratios) to be 9.76 (7.75) percentage points higher after the introduction of the AIE than in the preceding years. Our results indicate a strong and positive effect of the introduction of the AIE on equity of Austrian firms. Among the control variables, firms with higher profits and larger firms show higher equity ratios, yet we do not find significant effects of annual revenues on equity and equity growth. Our results support hypothesis H1a by showing that the introduction of the AIE led to an increase in equity of Austrian firms starting in 2000.

As we observe increasing equity ratios over the whole observation period 1996-2003 in general, one concern might be that our results are related to a random time trend rather than caused by the introduction of the AIE. In order to eliminate time trend effects, we match sample 1 with data of Swedish firms that serve as a control group in our analysis. We perform a DiD analysis based on equations (4) to (7). To assess the common trend assumption of the DiD analysis, we graphically compare the average equity ratio of Austrian firms (treatment group) and Swedish firms (control group).

[Insert Figure 1 about here]

Figure 1 provides first evidence that equity ratios increase faster for Austrian firms than for Swedish firms after the introduction of the AIE. It also shows a rather parallel trend of equity ratios prior to the introduction of the AIE. We therefore do not expect other correlated, unobservable variables to affect the results of the DiD analysis. In table 5 we present the results of the DiD estimation based on the matched sample.

[Insert Table 5 about here]

The main coefficient of interest in the DiD model is $Austria_i \cdot Reform_t$, showing the effect of the introduction of the AIE on equity of Austrian firms compared to the equity of matched Swedish firms. Due to the inclusion of firm-fixed effects, it is not possible to report a separate coefficient for $Austria_i$.

We find the expected positive significant coefficient for $Austria_i \cdot Reform_t$ in two out of four specifications. Results for specification (a) show that after the introduction of the AIE equity ratios of Austrian firms are 3.44 percentage points higher than equity ratios of Swedish firms. We calculate marginal effects for specification (c) and find that the probability of an increase in equity is about 4.21% higher for Austrian firms after the introduction of the AIE than for Swedish firms. In both specifications the coefficients for $Austria_i$ and $Austria_i \cdot Reform_t$ are jointly significant at the 1% level. The results of our DiD analysis support the results in table 4 and show that the increase in equity of Austrian firms is triggered by the introduction of the AIE in 2000 and not just related to a mere time trend.

Due to the fact that not the amount of equity as such was subject to the tax allowance but only the amount of the annual increase, firms with high equity ratios prior to the reform have lower incentives and possibilities to increase equity (hypothesis H1b). We test hypothesis H1b by splitting sample 1 into quartiles according to the average equity ratio for the years prior to the reform (1996-1999). We then test equations (4) to (7) for all quartiles separately. According to hypothesis H1b, we expect the highest effects on equity for firms in the lowest quartile and decreasing effects for upper quartiles. In table 6 we present the regression results.

[Insert Table 6 about here]

Splitting sample 1 into quartiles and regressing equations (4) to (7) we consistently find significant positive results for the lowest quantile of all four dependent variables. The effect of the AIE is thus strongest for firms with the lowest equity ratio before the tax reform. Considering the equity ratio of the firm ($ER_{i,t}$) as the dependent variable, we also find a significant positive effect for the second quartile. For the third and fourth quartiles, representing firms with the highest equity ratios prior to the reform, we do not find significant results. As hypothesized, we find companies with lower equity ratios to have a higher increase in equity after the introduction of the AIE and non-significant effects for companies with already high equity levels prior to the reform.[15]

As prior empirical research has shown, small firms have lower equity ratios than large firms. We therefore expect the increase in equity to be higher for small firms (hypothesis H1c). We test hypothesis H1c by splitting sample 1 into quartiles according to the average amount of total assets for the years prior to the reform (1996-1999). We then test equations (4) to (7) for all quartiles separately. According to hypothesis H1c, we expect the highest effects on equity for firms in the lowest quartile and decreasing effects for upper quartiles. In table 7 we present the regression results.

[Insert Table 7 about here]

In line with our results in table 6, we consistently find significant positive coefficients for the lowest quantile of all four dependent variables. The effect of the introduction of the AIE on equity is thus strongest for small firms. We do not find significant effects of the introduction of the AIE on equity for any of the four specifications for the top quartile (largest firms).

Not only do these results support our hypotheses H1b and H1c, they also provide evidence that the AIE-rule was an effective legal measure to mitigate the risks of indebtedness for small and medium-sized firms as especially those small firms extensively used the tax allowance to improve their equity positions.

---

[15]   Note that when alternatively using the average absolute amount of equity over the years 1996-1999 to sort our sample firms into quartiles (not tabulated) the results remain the same.

5.2.2.   The Effect of the Introduction of the AIE on Profit Distribution

We analyze the effect of the introduction of the AIE on corporate profit distribution over the years 1996-2003 using a proxy variable for the profit distribution ratio (equation (9)) as the dependent variable. According to hypotheses H2a und H2b, we expect abnormally high profit distribution ratios for the year prior to the introduction of the AIE (1999) and a significant reduction thereafter (2000-2003). In order to test these hypotheses, we estimate equation (8), using $Div_{i,t}$, a proxy for the firm's profit distribution ratio, as the dependent variable and data from sample 2 (3,529 firm-year observations of 512 firms). We present the results of our estimation in table 8.

[Insert Table 8 about here]

Our results show a significant negative coefficient for $Reform_t$, indicating that profit distribution ratios were about 7.55 percentage points lower after the introduction of the AIE than during the years 1996-1998. For the year 1999 ($Y1999_t$), the coefficient is negative, yet not significant. We therefore do not find any significant evidence that companies prepared for the application of the AIE during the announcement phase of the reform by distributing significantly more profits than in previous years. One explanation for this might lie in the fact that the reform passed parliament in June 1999 and therefore firms had very limited time to react to and prepare for the application of the tax reform.

When splitting sample 2 into quartiles based on the mean value of the equity ratio over the years 1996-1998, we find the expected significant decrease in profit distribution ratios for firms in the first quartile (specification (b)) after the reform, but not for firms with the largest equity positions (Specification (c)). For the year 1999 we again do not find any significant evidence that firms, irrespective of their pre-reform equity ratio, purposefully prepared for the AIE introduction by increasing their profit distributions. For quartiles 2 and 3 (not tabulated), we obtain non-significant negative coefficients as well.

Splitting our sample into quartiles of mean equity ratios thus shows two main results: First, over the whole period of the AIE application (2000-2003; $Reform_t$) the significant reduction in profit distribution ratios is mainly driven by the lowest quartile of firms (specification (b)). This result supports our hypothesis H2b and it supports the findings reported in table 6 that present evidence that especially firms with low amounts of equity made use of the AIE, which might be due to firms with high equity ratios not making (full) use of the notional interest deduction, as shown in table 6, and to the tax benefit of retaining profits having been smaller than the agency benefits resulting from constant profit distributions to shareholders. Secondly, we do not find any significant evidence for hypothesis H2a, which expects a purposeful preparation of firms for the AIE application during the announcement phase ($Y1999_t$) by increasing profit distributions to compensate shareholders for lower distributions in the subsequent years.

To assure that our results are not related to a random time trend we again use the matched sample with Swedish firms serving as a control group for our analysis, and perform a DiD analysis based on equation (8). In table 9 we present the results of the DiD estimation based on the matched sample.

[Insert Table 9 about here]

We find the expected significantly negative coefficient for $Austria_i \cdot Reform_t$. Our results show that after the introduction of the AIE profit distribution ratios of Austrian firms are 8.59 percentage points lower than ratios of Swedish firms. The coefficients for $Austria_i$ and $Austria_i \cdot Reform_t$ are jointly significant at the 1% level. The results of our DiD analysis support the results from table 8 and show that the decrease in profit distribution ratios of Austrian firms is triggered by the introduction of the AIE in 2000, rather than being merely related to a time trend.

5.2.3.   The Effect of the Firm's Ownership Structure

In order to analyze the effect of the ownership structure on equity growth and profit distributions of Austrian firms during the AIE era we classify the sample firms into three groups according to the ownership structure.[16] Group 1 consists of 604 firm-year observations of firms that are held by a foreign corporate shareholder (subsidiaries of a multinational group, $ForeignOwned_{i,t}$). Group 2 consists of 604 firm-year observations of firms that are held by domestic individual shareholders (domestic stand-alone firms, $IndividualOwned_{i,t}$). Group 3 consists of 1,218 firm-year observations of firms that are held by a domestic corporate shareholder (domestic group). According to hypotheses H3a and H3b, we expect higher effects for subsidiaries of multinational groups (group 1) than those of domestic corporate groups (group 3) and we expect higher effects for domestic stand-alone firms (group 2) than for domestic corporate groups (group 3). We estimate equation (4) using sample 3 and include $ForeignOwned_{i,t}$, $IndividualOwned_{i,t}$ as well as the interaction of these two variables with $Reform_t$ in the analysis.

[Insert Table 10 about here]

Our results in table 10 show that there is a significant increase in equity ratios by about 6.4% for Austrian firms that are part of a domestic group, represented by the positive and significant coefficient for $Reform_t$. For subsidiaries of multinational groups, we find an even stronger reaction. The coefficient of the interaction $ForeignOwned_{i,t} \cdot Reform_t$ is positive and significant and indicates that equity ratios of subsidiaries of multinational groups are about 3.80 percentage points higher than equity ratios of domestic group companies after the AIE introduction. Austrian stand-alone firms, however, did not react significantly differently to the introduction of the AIE compared to subsidiaries of domestic corporate groups. The interaction coefficient for $IndividualOwned_{i,t} \cdot Reform_t$ is positive, but only significant at the 12% level.

---

[16]   We use data on sample 3 (2,345 observations from 459 firms) as described in section 4.1.

We find similar results for profit distribution ratios ($Div_{i,t}$). Again, we do find significant differences between domestic and foreign shareholders but we do not find significant differences between corporate and individual shareholders. Overall, we find a significant reduction in profit distribution ratios of Austrian firms that are part of a multinational group of 10.95 percentage points (=–0.0369–0.0726) after the introduction of the AIE.

To shed further light on our non-results for (domestic) stand-alone firms, we perform an additional analysis and focus on the subsample of firms that are held by individuals. In line with Jacob and Michaely (2017) we expect the effect of the introduction of the AIE on these firms to depend on the number of individual shareholders of the firm. With the number of individual shareholders, the level and intensity of agency conflicts increase, which necessitates regular profit distributions. Therefore the probability of reduced profit distributions to benefit from the AIE regime decreases with the number of individual shareholders. We estimate equations (4) and (8) using the subsample of domestic stand-alone firms and add the following variables to the estimation: $Individual1_{i,t}$, a dummy variable taking the value 1 for firm-years with only one individual shareholder and 0 otherwise, $Individual2_{i,t}$ ($Individual3_{i,t}$) , a dummy variable taking the value 1 for firm-years in which the firm has two (three) individual shareholders and 0 otherwise, and $Individual > 3_{i,t}$, a dummy variable taking the value 1 for firm-years in which the firm has more than three individual shareholders and 0 otherwise. We use $Individual > 3_{i,t}$ as the reference category and interact all shareholder variables with $Reform_t$ to analyze whether reactions to the introduction of the AIE differ as a function of the number of individual shareholders of the firm. We present our regression results in table 11.

[Insert Table 11 about here]

Our results support the hypothesis (H3c) that the effect of the introduction of the AIE on equity ($ER_{i,t}$) decreases as the number of individual shareholders increases. We find a significant positive coefficient for $Indiivdual1_{i,t} \cdot Reform_t$, showing that equity ratios of firms with only one individual shareholder are about 19 percentage points higher after the reform than equity ratios of firms with more than three individual shareholders. Our results also provide evidence that once a firm has more than one individual shareholder, there is still a positive effect of the introduction of the AIE on equity ratios, although the differences are not significant and the effect decreases with the number of shareholders. The overall effect of the introduction of the AIE for firms with only one shareholder (0.2751 = 0.0838+0.1913) is jointly significant and more than three times as high as the effect for firms with more than three shareholders (0.0838). It appears that, as the number of individual shareholders rises, the beneficial tax effects of the AIE are mitigated by conflicting interests of shareholders.

With respect to profit distribution ratios ($Div_{i,t}$) we find the reduction in profit distribution ratios after the introduction of the AIE to be muted by the number of individual shareholders. The overall effect for firms with only one individual shareholder accounts for –0.0852 (–0.2916+0.2064). For firms with more

than one individual shareholder we also observe an overall negative but smaller effect of the introduction of the AIE on profit distribution ratios. For firms with two individual shareholders the overall effect accounts for –0.0641 (0.2916+0.2275), and –0.0278 (–0.2916+0.02638) for firms with three individual shareholders. Our results show that as the number of individual shareholders rises, the reduction in profit distribution decreases. We thus find ownership to have the expected muting effect on tax planning represented by both, equity ratios and profit distributions as stated in hypotheses H3c and H3d.

5.2.4. The Effect of the Repeal of the AIE on Equity

Our results in section 5.2.1 have shown that the introduction of the AIE leads to an increase in equity of Austrian firms over the period 2000-2003. Due to a general corporate tax rate cut from 34% to 25% in 2005, the AIE was repealed for corporations after 2004. With the 2005 tax reform, the statutory tax rate was decreased to the level of the preferential tax rate for the notional interest deduction during the AIE-era. Although the reduction of the corporate tax rate was substantial (minus 9 percentage points), no notional interest deduction was allowed after 2004 and the tax incentive to build up additional equity disappeared. Since the introduction of the AIE leads to an increase in equity of Austrian firms, we would expect the opposite effect after the AIE repeal, starting in 2005. To test this hypothesis, we use samples 4a and 4b and estimate regressions (4) to (7). Sample 4a contains all firms with available unconsolidated financial statement data for at least one year during the AIE-era (2000-2003)[17] and for at least one year after its repeal (2005-2009). We use $Repeal_t$ as the main variable of interest and compare equity of firms during the reform to the post-reform period. In line with hypothesis H4, we expect a negative coefficient for $Repeal_t$.

Additionally, we use sample 4b, which consists of firms with available unconsolidated financial statement data for at least one year before the introduction of the AIE (1996-1999), one year during the AIE-era (2000-2004) and for at least one year after its repeal (2005-2009). We use $Repeal_t$ and $Reform_t$ to compare equity levels during the reform period to equity levels from both the post-reform and the pre-reform period. We expect a positive coefficient for $Reform_t$ and a non-significant coefficient for $Repeal_t$ indicating that there is no statistical difference in a firm's equity before and after the reform and that equity levels revert to their pre-reform levels after the repeal. The results of our analysis are presented in table 12.

[Insert Table 12 about here]

We find mixed results of the repeal of the AIE on equity of Austrian firms. In sample 4a, the coefficient of the equity ratio (specifications (a)) indicates that there has been a significant increase in equity ratios after the repeal of the AIE. On the other hand, both, the relative change in equity as well as the

---

[17] Since the AIE was repealed in 2003 for individuals and only in 2004 for corporations, we do not include the year 2004 in the analysis.

probability of an equity increase, significantly decrease after the repeal (specifications (b) and (c)). In sample 4b, we find a significant positive coefficient for $Reform_t$ in all four specifications, which supports hypothesis 1a. Yet, we also find a significant positive coefficient for specifications (a), (c) and (d), indicating that the equity levels are significantly higher after the repeal than prior to the reform. These results might be driven by the general tax cut along with the AIE repeal, which allowed equity levels to increase due to lower tax expenses.

To separate these two overlapping yet countervailing effects, we apply a micro-simulation approach to calculate corporate equity, assuming that the tax rate cut had not taken place. We therefore adjust profits after taxes for the tax rate cut of 9 percentage points and calculate corporate equity as if no tax cut had taken place.[18] For the simulation we need data on profits and equity for at least two subsequent years during the period 2005-2009, which reduces the sample to 4,183 (4,935) firm-year observations of 527 (437) firms in sample 4a (4b). Table 13 presents the results of the simulation.

[Insert Table 13 about here]

Adjusting the data for the 9 percentage points statutory tax rate cut after the year 2004 significantly reduces the mean values for all dependent equity variables in both samples. We repeat regressions (4) to (7) for the post-AIE era as in table 12 using the simulated values for equity for the years 2005-2009 as reported in table 13. The results of this analysis are reported in table 14.

[Insert Table 14 about here]

Using the simulated equity values for the post-AIE era to adjust for the equity-increasing effect of the tax rate cut in 2005 allows us to disentangle the two overlapping yet countervailing effects of the repeal of the AIE and the tax rate cut. While a tax rate cut has an increasing effect on equity as after-tax profits increase, the repeal of the AIE revokes the tax incentive to accumulate additional equity by retaining earnings. The adjusted equity figures for the post-AIE era in sample 4a provide evidence that the repeal itself without the countervailing effect of the tax rate cut would have led to a significant decrease of corporate equity. The indicator variable $Repeal_t$ has a significant negative effect on equity in three out of four specifications ((b)-(d)). Results for $\Delta Eq_{i,t}$ show that the relative change in equity is about 4.91 percentage points lower after the repeal than during the years of the AIE. Calculating marginal effects, we are able to show that the probability of an increase of equity (of the equity ratio) is about 11.30 (22.95) percentage points lower after the repeal of the notional interest deduction than during the AIE era.

Results for sample 4b again show a significant increase in equity during the reform, represented by a significant positive coefficient for $Reform_t$ in three out of four specifications. Additionally, we find no significant difference in a firm's equity prior to the reform and after the reform. The coefficient for

---

[18]   Our approach uses observed profit distribution ratios in order to determine the effect of profits after taxes on equity. We are therefore not able to account for the fact that the tax cut might have had an effect on profit distributions.

$Repeal_t$ is not significant in three out of four specifications and significantly negative in specification (b). Considering all of the results, there is empirical evidence that without the effect of the tax rate cut, equity of firms would have dropped back to pre-reform values after the repeal of the AIE.

6. Conclusion

The paper at hand is the first empirical analysis of the Allowance for Increase of Equity (AIE) which was applied in Austria during the early 2000s. While the AIE has not received much attention since its repeal in 2005, the European Union has recently proposed a very similar measure as part of its C(C)CTB draft Directive. Against the backdrop of that draft Directive, this paper analyzes the impact of the Austrian AIE which resembles the proposed Allowance for Growth and Investment (AGI).

We find that on average the introduction of the AIE led to an increase of equity ratios of 5.55 percentage points and an increase in the average annual equity growth of 25 percentage points. We also provide evidence that the probability of increasing equity ratios is higher during the AIE-era. Closely connected to the increase in equity is our finding that the profit distribution ratio of firms is affected by the law change. During the observation period companies reduced their profit distributions by 7.55 percentage points on average.

Both, the increase in equity and the decrease in profit distributions are especially strong for companies with low pre-AIE equity ratios. This supports the hypothesis that companies with lower equity ratios utilize the AIE benefit more strongly, as they face difficulties raising additional equity on the capital market. The analyses further show that firms did not purposefully prepare their equity positions during the announcement phase as they did not distribute more profits in the year preceding the AIE introduction.

We also find a muting effect of ownership, with which our paper also adds to the recently growing literature on the influence of ownership structure and number of owners on profit distribution and tax planning decisions. As we do not find any significant inter-temporal changes in equity ratios of stand-alone firms with more than one individual shareholder, we conclude that such companies were less successful in reacting to the law change than firms with only one individual shareholder. Additionally, we find firms that are part of a multinational group to have a higher increase in equity and a higher reduction in profit distribution ratios during the AIE period.

Our results are highly robust. We use firms not affected by the law change as a control group and apply a difference-in-difference analysis, which provides evidence that the increase in equity ratios is indeed attributable to the AIE introduction and not related to a mere time trend. We also utilize the repeal of the AIE after the year 2004 to disentangle the AIE's effect from random time trends. The analysis of the

repeal shows a significant reduction in annual equity growth rates and a decrease in equity back to pre-reform levels.

While the Austrian AIE as well as the EU AGI do not implement a full, traditional ACE tax system and thus do not promote full financing neutrality both measures aim specifically at increasing companies' equity to mitigate the risks of indebtedness. Compared to findings of prior research focusing on the traditional Belgian ACE-system, which reports an increase of investment activity of Belgian companies of around 3%, the results of our research provide evidence that a legal measure which directly incentivizes the accumulation of additional equity by allowing for a tax deduction based on the new equity exclusively seems to be more efficient with respect to that very teleological aim.

References

Andries, K., M. Cools, and S. Van Uytbergen. 2017. To shift or not to shift? - Intertemporal income shifting as a response to the introduction of the risk capital allowance in Belgium. *European Accouning Review* 26 (3):531-559.

Auclert, A., and D. Struyven. 2012. ACE Hit: Does the Corporate Tax Bias Impact Leverage? In *Massachusetts Institute of Technology Working Papers*.

Auerbach, A. J. 2012. The Mirrlees Review: a US Perspective. *National Tax Journal* 65 (3):685-708.

Aus dem Moore, N. 2014. Taxes and Corporate Financing Decisions: Evidence from the Belgian ACE Reform. In *Ruhr Economic Papers*: Rheinisch-Westfälisches Institut für Wirtschaftsforschung (RWI).

Ballancin, A., and C. Caumont Caimi. 2002. Italy - Comprehensive Tax Reform before the Parliament. *European Taxation* 42 (8):358-363.

Bernasconi, M., A. Marenzi, and L. Pagani. 2005. Corporate Financing Decisions and Non-Debt Tax Shields: Evidence from Italian Experiences in the 1990s. *International Tax and Public Finance* 12 (6):741-773.

Blaufus, K., J. Bob, J. Hundsdörfer, D. Kiesewetter, and J. Weimann. 2013. Decision heuristics and tax perception – An analysis of a tax-cut-cum-base-broadening policy. *Journal of Economic Psychology* 35:1-16.

Boadway, R., and N. Bruce. 1984. A general proposition on the design of a neutral business tax. *Journal of Public Economics* 24 (2):231-239.

Bogner, S., M. Frühwirth, and A. Höger. 1999. Die geplante Abzugsfähigkeit der Eigenkapitalzuwachsverzinsung nach § 11 EStG bzw § 11 KStG. *Steuer- und Wirtschaftskartei* 74 (16):383-392.

———. 2002. Die optimale Kapitalstruktur österreichischer Kapitalgesellschaften nach der Steuerreform 2000 unter besonderer Berücksichtigung der Eigenkapitalzuwachsverzinsung. *Zeitschrift für Betriebswirtschaftliche Forschung* 54 (5):233-245.

Bond, S. R., and M. P. Devereux. 1995. On the design of a neutral business tax under uncertainty. *Journal of Public Economics* 58 (1):57-71.

Bontempi, M. E., S. Giannini, and R. Golinelli. 2004. Corporate taxation and its reform: the effects on corporate financing decisions in Italy. In *Societa italiana di economia pubblica - working paper*.

Brekke, K. R., A. J. Garcia Pires, D. Schindler, and G. Schjelderup. 2017. Capital Taxation and Imperfect Competition: ACE vs CBIT. *Journal of Public Economics* 147 (1):1-15.

Chetty, R., A. Looney, and K. Kroft. 2009. Salience and taxation: Theory and evidence. *The American Economic Review* 99 (4):1145-1177.

De Mooij, R. A. 2012. Tax Biases to Debt Finance: Assessing the Problem, Finding Solutions. *Fiscal Studies* 33 (4):489-512.

De Mooij, R. A., and M. Devereux. 2009. Alternative Systems of Business Tax in Europe: An applied analysis of ACE and CBIT reforms. In *European Commission Taxation papers, No 17-2009*.

De Mooij, R. A., and M. Devereux. 2011. An applied analysis of ACE and CBIT reforms in the EU. *International Tax and Public Finance* 18 (1):93-120.

Devereux, M. 2012. Issues In The Design of Taxes on Corporate Profit. *National Tax Journal* 65 (3):709-730.

Devereux, M., and H. Freeman. 1991. A General Neutral Profits Tax. *Fiscal Studies* 12 (3):1-15.

Devereux, M., P., and J. Vella. 2014. Are We Heading towards a Corporate Tax System Fit for the 21st Century? *Fiscal Studies* 35 (4):449-475.

Devereux, M. P., R. Griffith, and A. Klemm. 2002. *Corporate income tax reforms and international tax competition*. Vol. 17.

Eberhartinger, E., P. Quantschnigg, and R. Rief. 2004. Determination of Company Profits in Austria. *Bulletin for International Taxation* 58 (8):408-417.

EU. 2011. Impact Assessment - Accompanying document to the Council Directive on a Common Consolidated Corporate Tax Base - SEC(2011) 315 final.

———. 2014. Addressing the Debt Bias: A Comparison between the Belgian and the Italian ACE Systems. In *European Commission Taxation Papers Nr 44-2014*.

———. 2016a. Impact Assessment - Accompanying the document Proposals for a Council Directive on a Common Corporate Tax Base and a Common Consolidated Corporate Tax Base (CCCTB) - SWD(2016) 341 final.

———. 2016b. Proposal for a COUNCIL DIRECTIVE on a Common Corporate Tax Base - COM(2016) 685 final.

Fehr, H., and W. Wiegard. 2003. ACE for Germany? Fighting for a better tax system. In *Steuerpolitik — Von der Theorie zur Praxis*, edited by M. Ahlheim, H.-D. Wenzel and W. Wiegard: Springer Berlin Heidelberg, 297-324.

Finke, K., J. H. Heckemeyer, and C. Spengel. 2014. Assessing the Impact of Introducing an ACE Regime A Behavioural Corporate Microsimulation Analysis for Germany. In *ZEW Dicussion Paper 14-033*.

Frank, M. Z., and V. K. Goyal. 2009. Capital structure decisions: which factors are reliably important? *Financial management* 38 (1):1-37.

Gassner, W. 2002. Company Taxation in the Internal Market - An Austrian Perspective. *European Taxation* 42 (8):317-321.

Graham, J. R., M. Hanlon, T. J. Shevlin, and N. Shroff. 2017. Tax rates and corporate decision making. *Review of Financial Studies* (forthcoming).

Haring, M., R. Niemann, and S. Rünger. 2016. Investor taxation, firm heterogeneity and capital structure choice. In *arqus Discussion Paper No 210*.

Hebous, S., and M. Ruf. 2015. Evaluating the Effects of ACE Systems on Multinational Debt Financing and Investment: CESifo Working Papers No 5360.

IFA. 2012. *Cahiers de droit fiscal international - The debt-equity conundrum*. Vol. 97b.

IFS. 1991. Equity for Companies: A Corporation Tax for the 1990s: Institute for Fiscal Studies.

IMF. 2011. Tax Biases to Debt Finance: Assessing the Problem, Finding Solutions. In *IMF Staff Discussion Note SDN/11/11*: International Monetary Fund, Fiscal Affairs Department.

Isaac, J. 1997. A Comment on the Viability of the Allowance for Corporate Equity. *Fiscal Studies* 18 (3):303-318.

Jacob, M., and R. Michaely. 2017. Taxation and Dividend Policy: The Muting Effect of Agency Issues and Shareholder Conflicts. *The Review of Financial Studies* forthcoming.

Keen, M., and J. King. 2002. The Croatian profit tax: an ACE in practice. *Fiscal Studies* 23 (3):401-418.

Keen, M., A. Klemm, and V. Perry. 2010. Tax and the Crisis. *Fiscal Studies* 31 (1):43-79.

Kiesewetter, D., and R. Niemann. 2004. Die versehentliche Einführung einer konsumorientierten Einkommensteuer in Österreich und Lehren für die Abgeltungssteuer in Deutschland. In *Steuern, Rechnungslegung und Kapitalmarkt*, edited by H. Dirrigl, D. Wellisch and E. Wenger: Deutscher Universitätsverlag, 63-84.

Klemm, A. 2007. Allowances for Corporate Equity in Practice. *CESifo Economic Studies* 53 (2):229-262.

Knoll, L. 2001. Unternehmensgewinnbesteuerung in Kroatien, Italien und Österreich. *Die Betriebswirtschaft* 61 (3):335-348.

Kronbergs, Z. G. 2014. Latvia - 2014 Corporate Tax Changes. *European Taxation* 54 (11):522-524.

Lehner, G., K. E. Bruckner, P. Quantschnigg, B. M. Gierlinger, and H. Kofler. 2004. Tax Reform Policy in Austria. *Bulletin for International Taxation* 58 (8):354-363.

Massimi, F., and C. Petroni. 2012. Real-World ACE Reforms and the Italian Experience towards a General Trend. *intertax* 40 (11):632-642.

Mirrlees, J., S. Adam, T. Besley, R. Blundell, S. Bond, R. Chote, M. Gammie, P. Johnson, G. Myles, and J. Poterba. 2011. The Mirrlees Review: Conclusions and Recommendations for Reform. *Fiscal Studies* 32 (3):331-359.

Pandolfini, I. 1999. IRAP: The Regional Tax on Productive Activities-International Issues. *European Taxation* 39 (7):249-255.

Panier, F., F. Perez-Gonzalez, and P. Villanueva. 2015. Capital Structure and Taxes: What happens when you (also) subsidize equity? In *working paper Stanford University*.

Panteghini, P. M., M. L. Parisi, and F. Pighetti. 2012. Italy's ACE Tax and Its Effect on a Firm's Leverage. In *CESifo Working Paper Series No. 3869*.

Petutschnig, M. 2017. Future Orientation and Taxes: Evidence from Big Data. *Journal of International Accounting, Auditing and Taxation* 29 (1):14-31.

Princen, S. 2012. Taxes do affect corporate financing decisions: The case of Belgian ACE. In *CESifo working paper: Public Finance No 3713*.

Shay, S. E., J. C. Fleming, and R. J. Peroni. 2015. Designing a 21st Century Corporate Tax - An Advance U.S. Minimum on Foreign Income and Other Measures to Protect the Base. *Florida Tax Review* 17 (9):669-723.

Taferner, A. 1999. What's Going On In... Austria. *European Taxation* 39 (9):358-361.

Van Campenhout, G., and T. Van Caneghem. 2013. How did the notional interest deduction affect Belgian SMEs' capital structure? *Small Business Economics* 40 (2):351-373.

Wagner, F. W., and E. Wenger. 1996. Theoretische Konzeption und legislative Transformation eines marktwirtschaftlichen Steuersystems in der Republik Kroatien. In *Regulierung und Unternehmenspolitik*, edited by D. Sadowski, H. Czap and H. Wächter: Gabler Verlag, 399-415.

Wenger, E. 1983. Gleichmäßigkeit der Besteuerung von Arbeits- und Vermögenseinkünften. *FinanzArchiv* 41 (2):207-252.

Zangari, E. 2014. Addressing the Debt Bias: A Comparison between the Belgian and the Italian ACE Systems. In *European Commission Taxation papers, No 44-2104*.

ZEW. 2016. The Effects of Tax Reforms to Address the Debt-equity Bias on the Cost of Capital and on Effective Tax Rates. In *European Commission Taxation Papers, No 65-2016*.

Appendix

Table 1a: Total Equity and Profit Distribution, 1996-2003.

This table shows mean values for equity ratios, $ER_{i,t}$, relative changes in equity, $\Delta Eq_{i,t}$, and the probability of an increase in equity, $Prob(IncrEq)_{i,t}$, as well as the probability of an increase in the equity ratio, $Prob(IncrER)_{i,t}$, for the 1,091 sample firms over the observation period 1996-2003 (sample 1). It also shows mean values for the profit distribution ratio, $Div_{i,t}$, for the 512 sample firms over the observation period 1996-2003 (sample 2).

Year	Obs.	$ER_{i,t}$	$\Delta Eq_{i,t}$	$Prob(IncrEq)_{i,t}$	$Prob(IncrER)_{i,t}$	$Div_{i,t}$
1996	744	28.89%	5.52%	58.45%	48.74%	49.41%
1997	917	28.58%	10.84%	62.18%	48.91%	42.34%
1998	878	29.07%	22.72%	70.67%	55.31%	38.98%
1999	742	31.59%	29.67%	69.01%	57.90%	38.31%
2000	570	30.75%	26.62%	67.36%	49.35%	35.01%
2001	406	30.65%	28.13%	69.21%	53.48%	38.19%
2002	646	32.17%	37.92%	66.87%	60.51%	35.09%
2003	928	31.65%	35.44%	68.21%	57.51%	36.42%

Table 1b: Total Equity, 2000-2009.

This table shows mean values for equity ratios, $ER_{i,t}$, relative changes in equity, $\Delta Eq_{i,t}$, and the probability of an increase in equity, $Prob(IncrEq)_{i,t}$, as well as the probability of an increase in the equity ratio, $Prob(IncrER)_{i,t}$, for the 1,185 sample firms over the observation period 2000-2009 (sample 4a).

Year	Obs.	$ER_{i,t}$	$\Delta Eq_{i,t}$	$Prob(IncrEq)_{i,t}$	$Prob(IncrER)_{i,t}$
2000	668	29.26%	25.22%	68.65%	50.78%
2001	427	32.89%	25.43%	68.14%	53.84%
2002	685	33.79%	37.18%	68.90%	60.79%
2003	980	32.66%	36.26%	70.81%	58.55%
2005	976	35.19%	18.39%	65.88%	58.02%
2006	1,115	37.17%	22.33%	70.85%	56.27%
2007	1,133	37.89%	18.09%	69.72%	55.19%
2008	1,108	37.85%	6.02%	60.46%	52.75%
2009	972	37.59%	5.89%	61.62%	58.74%

Table 2: Summary Statistics, 1996-2003.

This table shows summary statistics (number of observations, mean, standard deviation, minimum and maximum value) for the five dependent variables (equity ratio: $ER_{i,t}$, relative change in equity: $\Delta Eq_{i,t}$, the probability of an increase in equity: $Prob(IncrEq)_{i,t}$, the probability of an increase in the equity ratio: $Prob(IncrER)_{i,t}$, and profit distribution ratio: $Div_{i,t}$) and all independent variables used in the regression analysis over the observation period 1996-2003. $Reform_t$ ($Y1999_t$) is a categorical variable taking the value 1 for years 2000-2003 (year 1999) and 0 otherwise. $Profit_{i,t}$ is the profit/loss per period, $Rev_{i,t}$, the firm's revenues, and $Size_{i,t}$, the total assets, all measured in thd Euro. $ForeignOwned_{i,t}$ is a dummy variable taking the value 1 if the firm is held by a foreign parent company, $IndividualOwned_{i,t}$ is a dummy variable taking the value 1 if the firm is held by individual shareholders. $Individual_{i,t}$ is the number of the firm's individual shareholders. Our two macroeconomic control variables are $Inflation_t$, the annual rate of inflation and $GDPGrowth_t$, the annual increase in the Gross Domestic Product.

Variable	Obs.	Mean	Std. dev.	Min	Max
$ER_{i,t}$	5,680	0.3032	0.3719	−5.84	1
$\Delta Eq_{i,t}$	5,680	0.2571	1.2657	−2.65	9.43
$Prob(IncrEq)_{i,t}$	5,680	0.6685	0.4708	0	1
$Prob(IncrER)_{i,t}$	5,680	0.5384	0.4985	0	1
$Div_{i,t}$	3,529	0.3876	0.4298	0	1
$Reform_t$	5,680	0.4373	0.4961	0	1
$Y1999_t$	3,529	0.1451	0.3522	0	1
$Profit_{i,t}$	5,680	3,907.82	19,562.97	−273,432	393,000
$Rev_{i,t}$	5,680	112,398.1	333,995.9	0	6,544,267
$Size_{i,t}$	5,680	138,359.7	530,926.6	0	9,381,200
$ForeignOwned_{i,t}$	2,345	0.2784	0.4483	0	1
$IndividualOwned_{i,t}$	2,345	0.2358	0.4246	0	1
$Individual_{i,t}$	2,345	0.8997	1.7872	0	32
$Inflation_t$	5,680	1.4862	0.6075	0.5624	2.6634
$GDPGrowth_t$	5,680	2.3727	1.0237	0.7561	3.5901

Table 3: Equity Ratio and Profit Distribution Ratio by Number of Individual Shareholders, 1996-2003.

This table shows mean values for equity ratios, $ER_{i,t}$, and profit distribution ratios, $Div_{i,t}$, for our 459 sample companies in sample 3 over the years 1996-2003, clustered according to the number of individual shareholders. Individual=1 refers to firms with one individual shareholder, Individual=2 to firms with two individual shareholders and Individual>2 to firms with more than two individual shareholders.

Year	Obs.	$ER_{i,t}$			$Div_{i,t}$		
		Indi-vidual=1	Indi-vidual=2	Indi-vidual>2	Indi-vidual=1	Indi-vidual=2	Indi-vidual>2
1996	286	0.2532	0.2648	0.2844	0.4533	0.4105	0.4188
1997	320	0.2468	0.2587	0.2977	0.4793	0.4234	0.4303
1998	361	0.2647	0.2893	0.3056	0.3990	0.3589	0.3158
1999	324	0.3327	0.3260	0.3144	0.3984	0.3811	0.2902
2000	242	0.3060	0.3052	0.3490	0.3423	0.4121	0.2595
2001	227	0.3001	0.2831	0.3387	0.4124	0.3879	0.3399
2002	267	0.3170	0.3575	0.3274	0.4106	0.2605	0.2417
2003	318	0.3578	0.3411	0.3488	0.3749	0.4037	0.2694
avg. 1996-1999	1,291	0.2743	0.2847	0.3005	0.4325	0.3934	0.3637
avg. 2000-2003	1,054	0.3202	0.3217	0.3409	0.3850	0.3660	0.2776
avg. change from 1996-1999 to 2000-2003	2,345	0.0458	0.0370	0.0404	−0.0474	−0.0274	−0.0861

Table 4: Effects of AIE on Equity, 1996-2003.

This table shows regression results for the effect of the introduction of the AIE, starting in 2000, on corporate equity for the 1,091 sample firms in sample 1 over the observation period 1996-2003. We estimate equations (4) to (7) from section 4.2. and use four different dependent variables (equity ratio: $ER_{i,t}$, relative change in equity: $\Delta Eq_{i,t}$, the probability of an increase in equity: $Prob(IncrEq)_{i,t}$, and the probability of an increase in the equity ratio: $Prob(IncrER)_{i,t}$. Our independent variables are $Reform_t$, a categorical variable taking the value 1 for years 2000-2003 and 0 otherwise, $Profit_{i,t}$, the profit/loss per period, $Rev_{i,t}$, the firm's revenues and $Size_{i,t}$, the total assets, all measured in thd Euro. Our two macroeconomic control variables include $Inflation_t$, the yearly inflation and $GDPGrowth_t$, the annual increase in the Gross Domestic Product. In all regressions, firm-fixed effects are included.

Specification	(a)	(b)	(c)	(d)
Sample	(1)	(1)	(1)	(1)
Dependent variable	$ER_{i,t}$	$\Delta Eq_{i,t}$	$Prob(IncrEq)_{i,t}$	$Prob(IncrER)_{i,t}$
$Reform_t$	0.0555*** (0.0107)	0.2509*** (0.0610)	0.4278*** (0.1135)	0.3217*** (0.1136)
$Profit_{i,t}$	0.0006*** (0.0002)	0.0002* (0.0001)	0.0041*** (0.0005)	0.0002*** (0.0004)
$Rev_{i,t}$	−0.0003 (0.0002)	−0.0008 (0.0131)	−0.0006 (0.0031)	−0.0006** (0.0002)
$Size_{i,t}$		0.0002** (0.0001)	0.0001*** (0.0051)	0.0074** (0.0031)
$GDPGrowth_t$	−0.0033 (0.004)	0.0555** (0.0228)	0.1488*** (0.0432)	−0.0095 (0.0415)
$Inflation_t$	−0.0261*** (0.0073)	−0.0905** (0.0397)	−0.2146*** (0.0745)	−0.2725*** (0.0733)
FE Firm	Yes	Yes	Yes	Yes
firm-years	5,680	5,680	5,680	5,680
no. firms	1,091	1,091	1,091	1,091

Robust standard errors, clustered at firm level, in parentheses.
***, **, and * indicate the statistical significance at the 1%, 5%, and 10% levels, respectively.

Figure 1: Trends in Equity Ratios for Austria and Sweden, 1996-2003.

This figure compares the average equity ratio (in %) of Austrian companies (treatment group) with that of Swedish companies (control group) over the sample period 1996-2003. We separately present the average equity ratio for Austrian companies (line with circles) and for Swedish companies (line with squares).
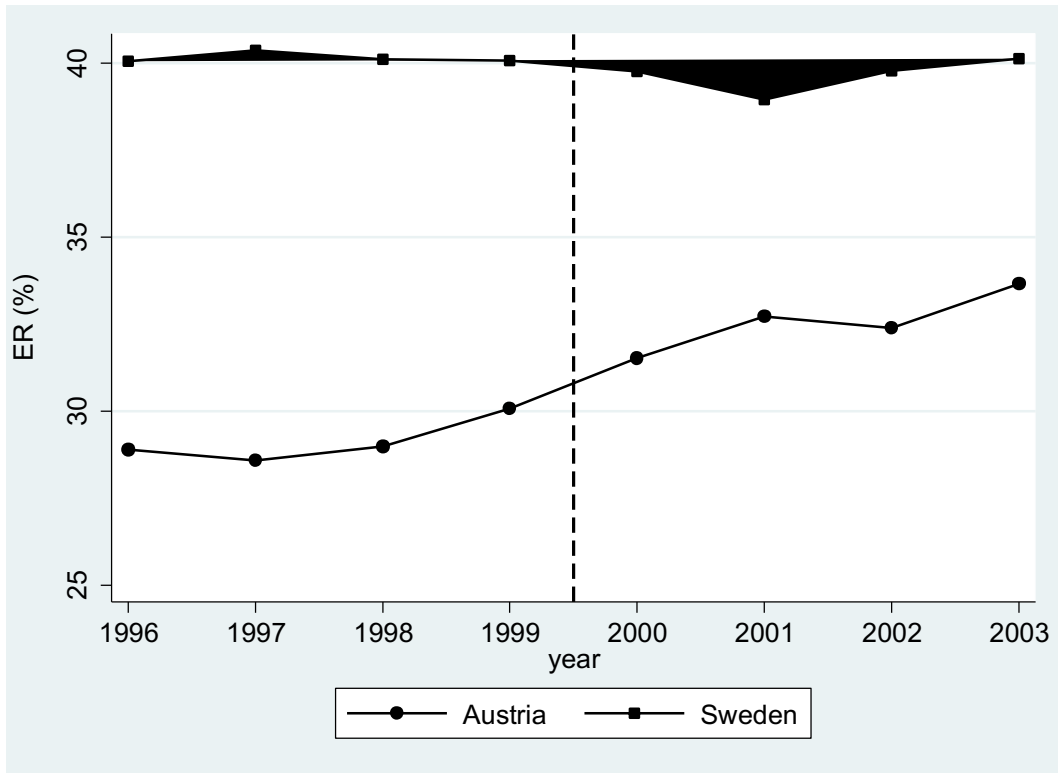
Table 5: DiD Analysis of AIE on Equity, 1996-2003.

This table shows DiD regression results for the effect of the introduction of the AIE, starting in 2000, on corporate equity for our matched sample of 998 Austrian and 998 Swedish firms over the observation period 1996-2003. We estimate equations (4) to (7) from section 4.2. and use four different dependent variables (equity ratio: $ER_{i,t}$, relative change in equity: $\Delta Eq_{i,t}$, the probability of an increase in equity: $Prob(IncrEq)_{i,t}$, and the probability of an increase in the equity ratio: $Prob(IncrER)_{i,t}$). Our tax variables are $Reform_t$, a categorical variable taking the value 1 for years 2000-2003 and 0 otherwise, $Austria_i$, an indicator variable taking the value 1 for Austrian firms and 0 otherwise and the DiD interaction term $Austria_i \cdot Reform_t$. We also include all non-tax control variables described in section 4.2. in the analysis, but do not report coefficients. In all regressions, firm-fixed effects are included.

Specification	(a)	(b)	(c)	(d)
Sample	(1) (matched)	(1) (matched)	(1) (matched)	(1) (matched)
Dependent variable	$ER_{i,t}$	$\Delta Eq_{i,t}$	$Prob(IncrEq)_{i,t}$	$Prob(IncrER)_{i,t}$
$Reform_t$	−0.0034 (0.0057)	−0.0292** (0.0132)	−0.1662*** (0.0528)	0.1190*** (0.0509)
$Austria_i \cdot Reform_t$	0.0344*** (0.0102)	0.0111 (0.0227)	0.1709* (0.0906)	−0.1039 (0.0911)
non-tax controls	Yes	Yes	Yes	Yes
FE Firm	Yes	Yes	Yes	Yes
firm-years	10,855	10,855	10,855	10,855
no. firms	1,996	1,996	1,996	1,996

Robust standard errors, clustered at firm level, in parentheses.
***, **, and * indicate the statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 6: Effects of AIE on Equity by Quartiles of Equity Ratio, 1996-2003.

This table shows regression results for the effect of the introduction of the AIE, starting in 2000, on corporate equity for our sample 1 over the observation period 1996-2003. We split sample 1 into quartiles according to mean values of equity ratios prior to the introduction of the reform (1996-1999). We estimate equations (4) to (7) from section 4.2. and use four different dependent variables (equity ratio: $ER_{i,t}$, relative change in equity: $\Delta Eq_{i,t}$, the probability of an increase in equity: $Prob(IncrEq)_{i,t}$, and the probability of an increase in the equity ratio: $Prob(IncrER)_{i,t}$). Our tax variable is $Reform_t$, a categorical variable taking the value 1 for years 2000-2003 and 0 otherwise. We also include all non-tax control variables as described in section 4.2. in the analysis, but do not report coefficients. In all regressions, firm-fixed effects are included.

Sample 1	Quartiles by Equity Ratio			
Dependent variable	$ER_{i,t}$			
Quartile	1	2	3	4
$Reform_t$	0.1113*** (0.0392)	0.0107*** (0.0032)	0.0048 (0.0041)	−0.0033 (0.0077)
non-tax controls	Yes	Yes	Yes	Yes
FE Firm	Yes	Yes	Yes	Yes
Observations	1,411	1,429	1,427	1,413
Dependent variable	$\Delta Eq_{i,t}$			
Quartile	1	2	3	4
$Reform_t$	0.4158** (0.2048)	0.1450 (0.1069)	−0.1478* (0.0844)	−0.0878 (0.1189)
non-tax controls	Yes	Yes	Yes	Yes
FE Firm	Yes	Yes	Yes	Yes
observations	1,411	1,429	1,427	1,413
Dependent variable	$Prob(IncrEq)_{i,t}$			
Quartile	1	2	3	4
$Reform_t$	0.7426*** (0.2729)	0.2620 (0.2874)	−0.4771 (0.3051)	0.0882 (0.2927)
non-tax controls	Yes	Yes	Yes	Yes
FE Firm	Yes	Yes	Yes	Yes
observations	1,411	1,429	1,427	1,413
Dependent variable	$Prob(IncrER)_{i,t}$			
Quartile	1	2	3	4
$Reform_t$	1.0682*** (0.3166)	0.1561 (0.2836)	−0.0023 (0.2706)	−0.4161 (0.2618)
non-tax controls	Yes	Yes	Yes	Yes
FE Firm	Yes	Yes	Yes	Yes
observations	1,411	1,429	1,427	1,413

Robust standard errors, clustered at firm level, in parentheses.
***, **, and * indicate the statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 7: Effects of AIE on Equity by Quartiles of Total Assets, 1996-2003.

This table shows regression results for the effect of the introduction of the AIE, starting in 2000, on corporate equity for our sample 1 over the observation period 1996-2003. We split sample 1 into quartiles according to mean values of total assets prior to the introduction of the reform (1996-1999). We estimate equations (4) to (7) from section 4.2. and use four different dependent variables (equity ratio: $ER_{i,t}$, relative change in equity: $\Delta Eq_{i,t}$, the probability of an increase in equity: $Prob(IncrEq)_{i,t}$, and the probability of an increase in the equity ratio: $Prob(IncrER)_{i,t}$). Our tax variable is $Reform_t$, a categorical variable taking the value 1 for years 2000-2003 and 0 otherwise. We also include all non-tax control variables as described in section 4.2. in the analysis, but do not report coefficients. In all regressions, firm-fixed effects are included.

Sample	1, Quartiles by Total Assets			
Dependent variable	$ER_{i,t}$			
Quartile	1	2	3	4
$Reform_t$	0.1378*** (0.0517)	0.0718*** (0.0105)	0.0277*** (0.0081)	0.0071 (0.0091)
non-tax controls	Yes	Yes	Yes	Yes
FE Firm	Yes	Yes	Yes	Yes
observations	1,414	1,425	1,428	1,413
Dependent variable	$\Delta Eq_{i,t}$			
Quartile	1	2	3	4
$Reform_t$	0.4486** (0.1945)	0.3759*** (0.1347)	−0.0862 (0.1132)	−0.0317 (0.0789)
non-tax controls	Yes	Yes	Yes	Yes
FE Firm	Yes	Yes	Yes	Yes
observations	1,414	1,425	1,428	1,413
Dependent variable	$Prob(IncrEq)_{i,t}$			
Quartile	1	2	3	4
$Reform_t$	0.5975* (0.3587)	0.3704 (0.3115)	0.0464 (0.2630)	−0.0427 (0.2220)
non-tax controls	Yes	Yes	Yes	Yes
FE Firm	Yes	Yes	Yes	Yes
observations	1,414	1,425	1,428	1,413
Dependent variable	$Prob(IncrER)_{i,t}$			
Quartile	1	2	3	4
$Reform_t$	0.9784** (0.4254)	0.5980* (0.3330)	0.7423*** (0.2861)	0.2040 (0.2086)
non-tax controls	Yes	Yes	Yes	Yes
FE Firm	Yes	Yes	Yes	Yes
observations	1,414	1,425	1,428	1,413

Robust standard errors, clustered at firm level, in parentheses.
***, **, and * indicate the statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 8: Effects of AIE on Profit Distribution Ratio, 1996-2003.

This table shows regression results for the effect of the introduction of the AIE, starting in 2000, on profit distribution ratios for the 512 sample firms in sample 2 over the observation period 1996-2003. We estimate equation (8) from section 4.2. and use $Div_{i,t}$, a proxy for the firm's profit distribution ratio, as the dependent variable. Our independent variables are $Reform_t$, a categorical variable taking the value 1 for years 2000-2003 and 0 otherwise and $Y1999_t$, a categorical variable taking the value 1 for the year 1999 and 0 otherwise. Additionally, we include $Profit_{i,t}$, the profit/loss per period, $Rev_{i,t}$, the firm's revenues and $Size_{i,t}$, the total assets, all measured in thd Euro into our analysis. Our two macroeconomic control variables are $Inflation_t$, the annual rate inflation and $GDPGrowth_t$, the annual increase in the Gross Domestic Product. In all regressions, firm-fixed effects are included.

Specification	(a)	(b)	(c)
Sample	(2) (Full)	(2) (Quartile 1 by Equity Ratio)	(2) (Quartile 4 by Equity Ratio)
Dependent variable	$Div_{i,t}$	$Div_{i,t}$	$Div_{i,t}$
$Reform_t$	−0.0755*** (0.0248)	−0.2033*** (0.0518)	0.0645 (0.0529)
$Y1999_t$	−0.0370 (0.0242)	0.0107 (0.00542)	−0.0562 (0.0481)
$Profit_{i,t}$	0.0001 (0.0003)	−0.0005** (0.0003)	−0.0005 (0.0008)
$Rev_{i,t}$	0.0078** (0.0003)	0.0019 (0.0013)	0.0003 (0.0009)
$Size_{i,t}$	−0.0007** (0.0003)	−0.0009 (0.0039)	−0.0014 (0.0023)
$GDPGrowth_t$	−0.0079 (0.0084)	−0.0238 (0.0188)	0.0075 (0.0165)
$Inflation_t$	0.0206 (0.0183)	0.0848** (0.0419)	−0.0511 (0.0404)
FE Firm	Yes	Yes	Yes
firm-years	3,529	812	878
no. firms	512	190	159

Robust standard errors, clustered at firm level, in parentheses.
***, **, and * indicate the statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 9: DiD Analysis of AIE on Profit Distribution Ratio, 1996-2003.

This table shows DiD regression results for the effect of the introduction of the AIE, starting in 2000, on profit distribution ratios for our matched sample of 998 Austrian and 998 Swedish firms over the observation period 1996-2003. We estimate equation (8) from section 4.2. and we use $Div_{i,t}$, a proxy for the firm's profit distribution ratio, as the dependent variable. Our tax variables are $Reform_t$, a categorical variable taking the value 1 for years 2000-2003 and 0 otherwise, $Austria_i$, an indicator variable taking the value 1 for Austrian firms and 0 otherwise and the DiD interaction term $Austria_i \cdot Reform_t$. We also include all non-tax control variables described in section 4.2. in the analysis, but do not report coefficients. In the regression, firm-fixed effects are included.

Sample	(1) (matched)
Dependent variable	$Div_{i,t}$
$Reform_t$	0.0575***
	(0.0117)
$Austria_i \cdot Reform_t$	−0.0859***
	(0.0174)
non-tax controls	Yes
FE Firm	Yes
firm-years	10,855
no. firms	1,996

Robust standard errors, clustered at firm level, in parentheses.
***, **, and * indicate the statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 10: Effects of AIE for Different Owner Groups, 1996-2003.

This table shows regression results for the effect of the introduction of the AIE, starting in 2000, on corporate equity for our sample 3 over the observation period 1996-2003, controlling for different ownership structures of the firm. We estimate equations (4) and (8) from section 4.2. and we use the equity ratio ($ER_{i,t}$) and the profit distribution ratio ($Div_{i,t}$) of the firm as dependent variables. Our tax variable is $Reform_t$, a categorical variable taking the value 1 for years 2000-2003 and 0 otherwise. We additionally include $ForeignOwned_{i,t}$, a dummy variable taking the value 1 if the firm is held by a foreign parent company and $IndividualOwned_{i,t}$, a dummy variable taking the value 1 if the firm is held by individual domestic shareholders, in the analysis and interact both variables with $Reform_t$. We also include all non-tax control variables as described in section 4.2. in the analysis, but do not report coefficients. In all regressions, firm-fixed effects are included.

Sample	(3)	(3)
Dependent variable	$ER_{i,t}$	$Div_{i,t}$
$Reform_t$	0.0641*** (0.0179)	−0.0369 (0.0390)
$ForeignOwned_{i,t} \cdot Reform_t$	0.0380*** (0.0193)	−0.0726*** (0.0402)
$IndividualOwned_{i,t} \cdot Reform_t$	0.3338 (0.0216)	−0.0166 (0.0464)
non-tax controls	Yes	Yes
FE Firm	Yes	Yes
firm-years	2,345	2,345
no. firms	459	459

Robust standard errors, clustered at firm level, in parentheses.
***, **, and * indicate the statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 11: Effects of AIE by Number of Individual Shareholders, 1996-2003.

This table shows regression results for the effect of the introduction of the AIE, starting in 2000, on corporate equity and profit distribution for stand-alone domestic firms in sample 3 over the observation period 1996-2003, considering the number of individual shareholders. We estimate equations (4) and (8) from section 4.2. and use the equity ratio ($ER_{i,t}$) and the profit distribution ratio ($Div_{i,t}$) of the firm as dependent variables. Our independent variables are $Reform_t$, a categorical variable taking the value 1 for years 2000-2003 and 0 otherwise, $Individual1_{i,t}$ ($Individual2_{i,t}$ and $Individual3_{i,t}$), a dummy variable taking the value 1 for firm-years with only one (two and three) individual shareholder(s) and 0 otherwise, and the interaction of $Reform_t$ with all three shareholder dummies ($Individual1_{i,t}$, $Individual2_{i,t}$ and $Individual3_{i,t}$)). We also include all non-tax control variables as described in section 4.2. in the analysis, but do not report coefficients. In all regressions, firm-fixed effects are included.

Sample	(3)	(3)
Dependent variable	$ER_{i,t}$	$Div_{i,t}$
$Reform_t$	0.0838 (0.0701)	−0.2916*** (0.0967)
$Individual1_{i,t}$	−0.4767*** (0.1084)	−0.0811 (0.0776)
$Individual2_{i,t}$	−0.1441* (0.0846)	−0.0659 (0.0639)
$Individual3_{i,t}$	0.0455 (0.0883)	−0.0559 (0.0893)
$Individual1_{i,t} \cdot Reform_t$	0.1913** (0.0810)	0.2064** (0.1022)
$Individual2_{i,t} \cdot Reform_t$	0.1021 (0.0741)	0.2275*** (0.0870)
$Individual3_{i,t} \cdot Reform_t$	0.0268 (0.0980)	0.2638* (0.1401)
non-tax controls	Yes	Yes
FE Firm	Yes	Yes
firm-years	604	604
no. firms	139	139

Robust standard errors, clustered at firm level, in parentheses.
***, **, and * indicate the statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 12: Effect of the Repeal of the AIE on Equity, 2000-2009.

This table shows regression results for the effect of the repeal of the AIE, starting in 2005, on corporate equity for 1,185 (1,011) sample firms in sample 4a (4b) over the observation period 2000-2009 (1996-2009). We estimate equations (4) to (7) from section 4.2. and use four different dependent variables (equity ratio: $ER_{i,t}$, relative change in equity: $\Delta Eq_{i,t}$, the probability of an increase in equity: $Prob(IncrEq)_{i,t}$, and the probability of an increase in the equity ratio: $Prob(IncrER)_{i,t}$). Our tax variable is $Repeal_t$, a categorical variable taking the value 1 for years 2005-2009 and 0 otherwise. When using sample 4b, we add $Reform_t$, a categorical variable taking the value 1 for years 2000-2004, to the analysis. We also include all non-tax control variables as described in section 4.2. in the analysis, but do not report coefficients. In all regressions, firm-fixed effects are included.

Sample	(4a)			
Specification	(a)	(b)	(c)	(d)
Dependent variable	$ER_{i,t}$	$\Delta Eq_{i,t}$	$Prob(IncrEq)_{i,t}$	$Prob(IncrER)_{i,t}$
$Repeal_t$	0.0413*** (0.0092)	−0.1604*** (0.0246)	−0.1825*** (0.0562)	−0.0361 (0.0572)
non-tax controls	Yes	Yes	Yes	Yes
FE Firm	Yes	Yes	Yes	Yes
firm-years	9,123	9,123	9,123	9,123
no. firms	1,185	1,185	1,185	1,185
Sample	(4b)			
Specification	(a)	(b)	(c)	(d)
Dependent variable	$ER_{i,t}$	$\Delta Eq_{i,t}$	$Prob(IncrEq)_{i,t}$	$Prob(IncrER)_{i,t}$
$Repeal_t$	0.0854*** (0.0082)	0.0112 (0.0358)	0.1721** (0.0813)	0.1990*** (0.0771)
$Reform_t$	0.0513*** (0.0081)	0.1370*** (0.0351)	0.3027*** (0.0790)	0.2113*** (0.0772)
non-tax controls	Yes	Yes	Yes	Yes
FE Firm	Yes	Yes	Yes	Yes
firm-years	10,814	10,814	10,814	10,814
no. firms	1,011	1,011	1,011	1,011

Robust standard errors, clustered at firm level, in parentheses.
***, **, and * indicate the statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 13: Real versus Simulated Values for Equity, 2005-2009.

This table shows means for our four dependent variables (equity ratio: $ER_{i,t}$, relative change in equity: $\Delta Eq_{i,t}$, the probability of an increase in equity: $Prob(IncrEq)_{i,t}$, and the probability of an increase in the equity ratio: $Prob(IncrER)_{i,t}$) for observed and simulated values for 527 (437) sample firms in sample 4a (4b) with subsequent data on profits and equity over the observation period 2005-2009. All values are given in %. For all years and variables, a t-test is performed to compare the means of the original and simulated values for equity (t-values not tabulated).

Sample	(4a)							
Dependent variable	$ER_{i,t}$		$\Delta Eq_{i,t}$		$Prob(IncrEq)_{i,t}$		$Prob(IncrER)_{i,t}$	
	orig.	simul.	orig.	simul.	orig.	simul.	orig.	simul.
2005	36.42	33.57	14.80	12.05	67.93	63.75	59.77	53.88*
2006	37.75	35.37	15.32	10.50	70.52	66.22	55.78	48.01**
2007	38.74	35.99	12.63	6.23**	69.31	65.97	53.65	50.10
2008	38.62	34.99	10.24	4.54	61.11	56.25	54.39	48.84*
2009	39.73	35.42	6.75	-1.04*	63.82	59.30	60.37	56.38
Mean	38.13	35.03**	12.34	7.02***	66.89	62.66***	56.72	51.26***

Sample	(4b)							
Dependent variable	$ER_{i,t}$		$\Delta Eq_{i,t}$		$Prob(IncrEq)_{i,t}$		$Prob(IncrER)_{i,t}$	
	orig.	simul.	orig.	simul.	orig.	simul.	orig.	simul.
2005	38.11	36.85	18.35	14.40	67.27	63.15	58.81	52.86*
2006	39.02	36.43	16.64	12.38	70.25	65.67	55.14	47.13**
2007	39.44	36.66	15.75	8.90	69.21	65.87	54.41	50.59
2008	39.59	36.38	14.09	8.31	61.92	57.34	53.98	48.75
2009	40.91	37.62	9.22	-0.08*	62.29	58.28	57.96	55.21
Mean	39.36	36.71**	14.98	8.96**	66.33	62.19***	56.04	50.80***

***, **, and * indicate the statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 14: Effect of the AIE Repeal on Equity using Simulated Values, 2000-2009.

This table shows regression results for the effect of the repeal of the AIE, starting in 2005, on corporate equity for 527 (437) sample firms in sample 4a (4b) with subsequent data on profits and equity over the observation period 2000-2009 (1996-2009). We estimate equations (4) to (7) from section 4.2. and use four different dependent variables (equity ratio: $ER_{i,t}$, relative change in equity: $\Delta Eq_{i,t}$, the probability of an increase in equity: $Prob(IncrEq)_{i,t}$, and the probability of an increase in the equity ratio: $Prob(IncrER)_{i,t}$). Our tax variable is $Repeal_t$, a categorical variable taking the value 1 for years 2005-2009 and 0 otherwise. When using sample 4b, we add $Reform_t$, a categorical variable taking the value 1 for years 2000-2004, to the analysis. We also include all non-tax control variables as described in section 4.2. in the analysis, but do not report coefficients. In all regressions, firm-fixed effects are included.

Sample	(4a)			
Specification	(a)	(b)	(c)	(d)
Dependent variable	$ER_{i,t}$	$\Delta Eq_{i,t}$	$Prob(IncrEq)_{i,t}$	$Prob(IncrER)_{i,t}$
$Repeal_t$	0.0078 (0.0129)	−0.0491** (0.0213)	−0.4542*** (0.0772)	−0.1130*** (0.0190)
non-tax controls	Yes	Yes	Yes	Yes
FE Firm	Yes	Yes	Yes	Yes
firm-years	4,183	4,183	4,183	4,183
no. firms	527	527	527	527
Sample	(4b)			
Specification	(a)	(b)	(c)	(d)
Dependent variable	$ER_{i,t}$	$\Delta Eq_{i,t}$	$Prob(IncrEq)_{i,t}$	$Prob(IncrER)_{i,t}$
$Repeal_t$	0.0317 (0.0240)	−0.0969** (0.0398)	−0.1012 (0.1137)	−0.1624 (0.1027)
$Reform_t$	0.0334** (0.0170)	0.0572 (0.0395)	0.3064*** (0.1136)	0.8413*** (0.1058)
non-tax controls	Yes	Yes	Yes	Yes
FE Firm	Yes	Yes	Yes	Yes
firm-years	4,935	4,935	4,935	4,935
no. firms	437	437	437	437

Robust standard errors, clustered at firm level, in parentheses.
***, **, and * indicate the statistical significance at the 1%, 5%, and 10% levels, respectively.