

WHU – Otto Beisheim School of Management

The influence of tax regimes on corporate
distribution policy – An empirical analysis of
Germany, Switzerland and the United States

Dissertation

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List of abbreviations

ADRI	Anti Directors Rights Index
AG	Aktiengesellschaft
AMEX	American Stock Exchange
BaFin	Bundesanstalt für Finanzdienstleistungsaufsicht
CDAX	Composite DAX
DAX	Deutscher Aktienindex
DFG	Deutsche Forschungsgemeinschaft
DM	Deutsche Mark
e.g.	exempli gratia
et al.	et alia
etc.	et cetera
GDP	Gross domestic product
i.e.	id est
ID	Identifier
JGTRRA 2003	Jobs and Growth Tax Relief Reconciliation Act of 2003
KonTraG	Gesetz zur Kontrolle und Transparenz im Unternehmensbereich
MM	Miller and Modigliani
NASDAQ	National Association of Securities Dealers Automated Quotations
NYSE	New York Stock Exchange
OECD	Organization for Economic Co-operation and Development
p.	page
pp.	pages
RRA 1993	Revenue Reconciliation Act 1993
SE	Societas Europaea
SEC	Securities and Exchange Commission
SIC	Standard Industrial Classification
SPI	Swiss Performance Index
TRA 1986	Tax Reform Act 1986
U.K.	United Kingdom
U.S.	United States

List of symbols

α	Constant
α_i	Constant for firm i
<i>Admin.</i>	Public administration
<i>Agr./Min.</i>	Agriculture, forestry, fishing and mining
β_i	Coefficient i
<i>Cash</i>	Cash and cash-equivalent holdings
<i>Cashdummy</i>	Dummy variable identifying high cash firms
<i>Cashflow</i>	Net income and non-cash charges or credits
<i>Cashflowdummy</i>	Dummy variable identifying high cashflow firms
<i>CL</i>	Classical system
<i>CL, HI</i>	Classical system with shareholder relief in form of a half-income system
<i>Closely</i>	Closely held shares
<i>Constr.</i>	Construction
<i>corp</i>	Corporate
<i>DEP</i>	Dependent variable
<i>Div_{i,t}</i>	Placeholder for <i>Divyield_{i,t}</i> , <i>Divpaid_{i,t}</i> or <i>Divinit_{i,t}</i>
<i>Divinit</i>	Dummy variable identifying dividend initiators
<i>Divpaid</i>	Dummy variable identifying dividend payers
<i>Divyield</i>	Dividend yield
<i>DPS</i>	Dividends per share
$\varepsilon_{i,t}$	Error term
<i>EPS</i>	Earnings per share
<i>Expsign</i>	Expected sign
<i>FI</i>	Full imputation system
<i>Finance</i>	Finance, insurance, and real estate
<i>FT</i>	Flat tax system
<i>GDPgrowth</i>	Yearly change in gross domestic product
H_i	Hypothesis i
<i>HI</i>	Half-income system
<i>i</i>	Financial investment return, indicator for firm i
<i>Income</i>	Pre-tax income divided by total assets
<i>ind</i>	Individual
<i>IND</i>	Independent variable
<i>Index</i>	National all-share price index

<i>Indextrend</i>	Yearly change of the national all-share price index
<i>Interestchange</i> ..	Yearly change of long-term government bond yields
<i>Lev</i>	Total debt divided by total assets
<i>Log GDP</i>	Natural logarithm of the gross domestic product
<i>Log Index</i>	Natural logarithm of the national all-share price index
<i>Log Totalpayout</i> .	Natural logarithm of the sum of dividends and share repurchases
<i>Manuf.</i>	Manufacturing
<i>MarketCap.</i>	Market capitalization
<i>max</i>	Maximum tax bracket
<i>Max</i>	Maximum value
<i>Mdn</i>	Median
<i>min</i>	Minimum tax bracket
<i>Min</i>	Minimum value
<i>n</i>	Number of observations
<i>nsub</i>	Non-substantial interest
<i>Op.Inc.</i>	Operating income
<i>Payout_{i,t}</i>	Placeholder for <i>Divyield_{i,t}</i> , <i>Divpaid_{i,t}</i> , <i>Divinit_{i,t}</i> , <i>Repyield_{i,t}</i> , <i>Reppaid_{i,t}</i> , <i>Repinit_{i,t}</i> , <i>Relativediv</i> or <i>Totalpayout</i>
<i>Prob</i>	Probability
<i>Q</i>	Market capitalization divided by common equity
<i>r</i>	Corporate return
<i>R²</i>	Coefficient of determination
<i>Regime</i>	Effective tax regime
<i>Relativediv</i>	Percentage of dividends on total payouts
<i>Repinit</i>	Dummy variable identifying repurchase initiators
<i>Reppaid</i>	Dummy variable identifying repurchasers
<i>Repyield</i>	Share repurchase yield
<i>s</i>	Indicator for investor group s
Σ	Combined tax variable
Σ^*	Weighted combined tax variable
Σ^{avg}	Average combined tax variable
Σ_t^{avg}	Average combined tax variable in year t
Σ^{firm}	Firm-specific combined tax variable
$\Sigma_{i,t}^{firm}$	Firm-specific combined tax variable for firm i in year t
Σ_{mean}^{firm}	Mean of the firm-specific combined tax variable
<i>S.D.</i>	Standard deviation
<i>Service</i>	Services
<i>Sol</i>	Solidarity surcharge
<i>sub</i>	Substantial interest
<i>Subst</i>	Substantiality limit
<i>t</i>	Indicator for period t
<i>t_{cg}</i>	Total tax burden on capital gains
<i>t_{cg}^{corp}</i>	Total tax burden on capital gains for a corporate

	investor
t_{cg}^{ind}	Total tax burden on capital gains for an individual investor
t_{cg}^{max}	Total tax burden on capital gains for an investor in the maximum tax bracket
t_{cg}^{min}	Total tax burden on capital gains for an investor in the minimum tax bracket
t_{corp}	Corporate income tax rate
t_{corp}^{dis}	Corporate income tax rate on distributed profits
t_{corp}^{ret}	Corporate income tax rate on retained profits
t_{corp}^{state}	Corporate income tax rate on the level of the state
$t_{corp}^{subcentral}$	Combined corporate income tax rate on the cantonal and communal level
t_{corp}^{sum}	Sum of corporate income tax rates on the state, cantonal and communal level
t_{div}	Total tax burden on dividends
t_{div}^{corp}	Total tax burden on dividends for a corporate investor
t_{div}^{ind}	Total tax burden on dividends for an individual investor
t_{div}^{max}	Total tax burden on dividends for an investor in the maximum tax bracket
t_{div}^{min}	Total tax burden on dividends for an investor in the minimum tax bracket
t_{int}	Tax rate on interest income
t_{pers}	Personal income tax rate
t_{pers}^{cg}	Personal income tax rate on capital gains
t_{pers}^{div}	Personal income tax rate on dividends
t_{pers}^{max}	Personal income tax rate in the highest tax bracket
t_{pers}^{min}	Personal income tax rate in the lowest tax bracket
t_{pers}^{state}	Personal income tax rate on the level of the state
$t_{pers}^{subcentral}$	Combined personal income tax rate on the cantonal and communal level
t_{pers}^{sum}	Sum of personal income tax rates on the state, cantonal and communal level
θ	Relative tax variable
θ^*	Weighted relative tax variable
θ^{avg}	Average relative tax variable
θ_t^{avg}	Average relative tax variable in year t
θ^{firm}	Firm-specific relative tax variable
$\theta_{i,t}^{firm}$	Firm-specific relative tax variable for firm i in year t
θ_{mean}^{firm}	Mean of the firm-specific relative tax variable
$\theta_{(i),t}$	Placeholder for $\theta_{i,t}^{firm}$ or θ_t^{avg}
θ_{corp}	Relative tax variable for corporate investors

θ_{ind}	Relative tax variable for individual investors
θ_j	Relative tax variable for investor group j
θ_{nsub}^{max}	Relative tax variable for individual investors without substantial interest in the maximum tax bracket
θ_{nsub}^{min}	Relative tax variable for individual investors without substantial interest in the minimum tax bracket
θ_{sub}^{max}	Relative tax variable for individual investors with substantial interest in the maximum tax bracket
θ_{sub}^{min}	Relative tax variable for individual investors with substantial interest in the minimum tax bracket
TA	Total assets
$Tax_{(i),t}$	Placeholder for $\theta_{i,t}^{firm}$, θ_t^{avg} , $\Sigma_{i,t}^{firm}$ or Σ_t^{avg}
$TDebt$	Total debt
$Totalpayout$	Sum of dividends and share repurchases
$Trade$	Wholesale trade and retail trade
$Trend$	Yearly change in share price
$Type$	Type of variable
$Utility$	Transportation, communications, electric, gas, and sanitary services
w_{corp}	Weight of corporate investors
w_j	Weight of investor group j
w_{nsub}^{max}	Weight of individual investors
$Year$	Year of the observation

Chapter 1

Introduction

The fundamental function of a tax system is to finance government expenditure. However, according to economic theory, there are several requirements for a tax system to fulfill this function efficiently. One of the most basic requirements demanded in public economics is neutrality.¹ Under a perfectly neutral tax system, market participants' decisions are solely based on the economic properties of a particular problem, the presence of taxes does not alter their considerations. For example, investment neutrality demands that an investor's choice between different investment alternatives is not depending on taxation.² A non-neutral tax system leads to deviations from the market solution and results in a distorted allocation of resources compared to the case without taxation.³

One important aspect of a neutral tax system is neutrality with respect to the corporate choice between payout and retention, between dividends and capital

¹ Schanz and Schanz (2011) provide a detailed overview over the objective of neutrality in income taxation in chapter five of their book. They emphasize the importance of neutral tax systems for efficient markets, classify different forms of decision neutrality and introduce several theoretical approaches to neutral tax systems.

² See Samuelson (1964), p. 604 and Knirsch (2007), p. 154.

³ See Harberger (1962), p. 217.

gains.⁴ In a neoclassical world without taxes, market participants should be indifferent between income from dividends and income from capital gains.⁵ In reality, however, income derived through either of the two alternatives is taxed in most countries. Further, dividends and capital gains are oftentimes taxed differently, violating the principle of tax neutrality and leading to possible distortions. Still, the question whether payout taxation actually influences corporate payout policy is debated. In the literature, there are two conflicting theories on the matter. The “old view” predicts distortions in the corporate allocation of earnings introduced by payout taxes, while the “new view” leaves payout policy neutral to taxation.⁶ The contrary predictions of the two theories directly lead to the empirical problem whether taxes actually do influence corporate distribution policy in a given setting.⁷ This question, situated at the junction of business taxation, corporate finance and public economics, is the fundamental research question underlying this thesis.

The question which of the two views holds in reality is not merely a theoretical issue, but has profound implications for fiscal policy. In the instance that non-neutral systems of corporate taxation distort the choice between retention and distribution, policymakers might intentionally use payout taxes as a tool to exert influence on corporate payout policy and, ultimately, the economy. In fact,

⁴ See Schanz and Schanz (2011), p. 160.

⁵ See Miller and Modigliani (1961), p. 414.

⁶ See Gerardi, Graetz and Rosen (1990) for a very condensed introduction into the incidence of corporate taxation and on the possibly distortive influence of taxation on corporate financial policy. The two views are further discussed in detail in sections 2.3.2 and 2.3.3 of this thesis.

⁷ Additional doubt on tax-induced distortions of corporate payouts is cast by survey studies. Section 2.6.2 provides evidence showing that payout taxes may not be a prime factor in the distribution decision of financial managers.

policymakers have motivated tax reforms with the existence of tax-induced distortions in the past. The Jobs and Growth Tax Relief Reconciliation Act of 2003 (JGTRRA 2003) in the U.S. was introduced to the congress with the explicit goal to increase economic growth by removing existing distortions caused by payout taxation. This was specifically stated in a report presented to the congress on the 8th of May 2003, explaining and motivating the proposal of a significant decrease in the tax rate applicable to income from dividends:

“The Committee believes it is important that tax policy be conducive to economic growth. The Committee believes that reducing the individual tax on dividends lowers the cost of capital and will lead to economic growth and the creation of jobs. Economic growth is impeded by tax-induced distortions in the capital markets. Mitigating these distortions will improve the efficiency of the capital markets.”

– U.S. House of Representatives Committee Report 108-94 on the
Jobs and Growth Reconciliation Tax Act of 2003, p. 30.

Clearly, this reasoning assumes an existing distortive influence on corporate payouts in line with the old view of payout taxation.

In recent years, the literature on tax influences on distribution policy was dominated by research on the JGTRRA 2003.⁸ However, there are two fundamental issues many of the predominantly U.S. papers face. The first problem stems from

⁸ There are numerous papers on the reform analyzing whether the tax cut did influence corporate payout policy. Section 2.6.1 provides an overview over the extensive literature.

the particular composition of the JGTRRA 2003. The bill was originally designed as a temporary tax reform, endowed with provisions to revoke most of the measures included after five years. In the special case of temporary tax reforms, however, both predominant theories predict an identical reaction of corporate payouts to the changing taxation of dividends and capital gains. Thus, although the bill was motivated with the assumption of existing distortions due to payout taxation, the reform itself is theoretically not suited to discern whether economics along the old view or the new view underly the tax influence on corporate payout policy. The second problem is connected with the nature of tax law itself. As all market participants within a given jurisdiction are subject to the same tax law, traditional single-country studies oftentimes suffer from missing cross-sectional heterogeneity in their tax variables.⁹ This makes the empirical detection of reactions to tax reforms difficult, as other economy-wide influences may interfere and overlay possible tax effects.

This thesis contributes to the literature by presenting approaches to overcome both of these problems, shedding new empirical light on the question whether payout taxation distorts the market participants' decisions and whether payout taxation is a viable alternative for policymakers to influence the economy. The potential use of payout taxes as a tool for fiscal policy leads to additional important questions about the exact nature of a possible tax effect. Consequently, based on the fundamental research question expressed above, this work also analyzes the

⁹ The equal treatment of tax payers is based on the basic principle of "horizontal equity" in public finance. It dictates that individuals with an identical capability to pay taxes should pay identical taxes.

economic magnitude of the market participants' reaction, how the economic environment influences corporate distribution policy and whether it interferes with tax-induced incentives.

This thesis is structured in a quasi-cumulative way. This means that the main part of the thesis in chapters 2, 3 and 4 is constituted by three separate but thematically closely related research papers on the influence of payout taxation on corporate distributions. This introduction, as well as a concluding summary in chapter 5, serve as a joint framework to put the three papers into perspective. The studies underlying the main chapters of this thesis are based on manuscripts developed in close cooperation with Deborah Schanz, the advisor of this dissertation project. Her continuous and valuable feedback has helped tremendously to shape and develop this thesis. The manuscripts underlying the chapters 3 and 4 of this work will be submitted as joint publications to international, peer-reviewed journals. Because of this, the first person plural is used for the remainder of this thesis.

Chapter 2 is based on the unpublished working paper Theßeling (2012). It provides the theoretical foundation for the empirical analyses presented in the following chapters. It contains a review study that condenses the vast literature on possible determinants of payout policy with an explicit focus on topics relevant for researchers and practitioners interested in tax influences on corporate payouts. Building on a neoclassical foundation, various theories lifting one or several neoclassical assumptions are discussed. Specifically, we review the literature on tax-, signaling-, agency- and behavioral explanations of payout policy. Having es-

established the theoretical framework, the chapter then provides a broad overview over empirical studies on the economic influence of tax reforms and over surveys of managers deciding on their firm's payout policy.

Chapter 3 explicitly deals with the fundamental research question whether tax-induced distortions of corporate payout policy do exist. As was already discussed above, a significant fraction of current research focusses on the JGTRRA 2003 tax reform, which is not ideally suited to answer the question if the old view or the new view holds. We try to shed some light on the discussion by presenting new empirical results based on the two non-temporary tax reforms of 2002 and 2009 in Germany. Building on a detailed overview over the development of the taxation of dividends and capital gains in Germany, we elaborately model the tax environment during our observation period and analyze whether the payout policy of German firms shows evidence of tax influences induced by the reforms. Our sample contains all firms listed at the Frankfurt stock exchange in the years from 1993 to 2009. By exploiting a unique setting of exceptional tax heterogeneity introduced by two major tax reforms and increasing payouts due to changes in the capital market environment, we find robust evidence that the switch from a split-rate tax system with full imputation to a shareholder relief system in 2002 and the change to a flat tax system in 2009 led to significant changes in the payout behavior of German firms. The reform of 2002 reduced the former tax advantageousness of dividends compared to capital gains in Germany. In line with the traditional view, the dividend yield, the propensity to pay dividends and the propensity to initiate dividend distributions declined in the wake of the

reform of 2002, while share repurchases, a payout alternative taxed as capital gains, developed in the opposite direction.

Chapter 3 is based on the unpublished working paper Schanz and Theßeling (2012a). Earlier versions of the paper were presented at the European Accounting Association conference in Rome 2011, the American Accounting Association conference in Denver 2011, the VHB conference in Kaiserslautern 2011 and in various seminars at the WHU – Otto Beisheim School of Management in Vallendar.

In chapter 4 of this thesis, we turn to the continuative question of practicability of payout taxation as an instrument for economic policy. Specifically, we reassess whether the JGTRRA 2003, the single largest payout tax reform in U.S. history, achieved its political goal of increasing payouts to investors. As argued above, traditional single-country studies oftentimes face problems of isolating tax effects from other economy-wide influences on payout policy, like the macroeconomic environment or changing investor sentiment. To overcome this issue, we analyze a unique multi-national dataset with two almost simultaneous but contrary tax reforms in the U.S. and Germany. Switzerland serves as a non-reform benchmark. We model the respective tax systems in high detail to account for tax preferences of different investors in the firms' shareholder structure. We analyze the sample of all 18,475 U.S., German and Swiss companies included in the WorldScope database from the year 1998 to 2009. Our robust results show that firms react to tax reforms by significantly increasing their overall activity on the relatively tax-favored payout channel without reducing their aggregate payouts, confirming the

applicability of payout taxes as a policy tool. According to our data, the JGTRRA 2003 achieved its goal of eliminating distortive lock-in effects by increasing the overall level of payouts in the economy.

Chapter 4 is based on the unpublished working paper Schanz and Theßeling (2012b). Earlier versions of the paper were presented at the 7th arqus-conference in Würzburg and in seminars at the WHU – Otto Beisheim School of Management in Vallendar and the Ludwig Maximilian University of Munich.

Chapter 5 concludes this work. We provide a brief summary of the findings of the previous chapters and discuss limitations of our analysis. The thesis ends with a presentation of possible avenues for further research.

The manuscripts underlying the chapters 3 and 4 of this thesis contain the helpful and highly appreciated feedback of Igor Goncharov, Stefan Hahn, Martin Jacob, Sara Keller, Maximilian Müller, Caspar David Peter, John Robinson, Thorsten Sellhorn, Douglas Shackelford and delegates of the respective conferences and workshops the manuscripts were presented at. We further want to thank the German research foundation “Deutsche Forschungsgemeinschaft (DFG)” for the generous support of our research.

Chapter 2

Payout taxation and payout policy – a survey of selected papers¹⁰

2.1 Introduction

Along with the analysis of firms' capital structure, the corporate choice between payout and retention of earnings has been one of the major topics discussed in corporate finance and has generated an abundance of scholarly literature over the last 50 years. In their seminal work, Modigliani and Miller (1958) and Miller and Modigliani (1961) show that, in a neoclassical world with a given investment policy, payouts do not alter firms' cost of capital and are thus irrelevant.¹¹ Thus, Miller and Modigliani (1961) provide the natural theoretical starting point for an analysis of market imperfections on the determinants and consequences of payout policy. Since then, researchers have gradually relaxed many of the neoclassical assumptions to find out what exactly drives the massive amount of payouts carried out by firms all over the world each year. The search for a simple answer proved difficult, leading to Black's (1976) famous statement:

¹⁰ Chapter 2 is based on the unpublished working paper Theßeling (2012).

¹¹ See Modigliani and Miller (1958), p. 288 and Miller and Modigliani (1961), p. 425.

“The harder we look at the dividend picture, the more it seems like a puzzle, with pieces that just don’t fit together.”

– Fischer Black (1976), p. 5.

Today, prominent payout theories cover tax-motives, explanations based on asymmetric information between management and shareholders and explanations along insights from the observation and modeling of human behavior, the subject of behavioral economics. Naturally, when discussing one of the mainstay topics of corporate finance, there already exist a number of detailed literature reviews on the matter. There are rather general papers discussing literature on different kinds of empirical tax research like Hanlon and Heitzman (2010), who provide a broad overview over the field, or like Shackelford and Shevlin (2001) and Maydew (2001), who focus on empirical tax research from the accounting perspective. Then, there are more specific reviews of literature on the influence of taxation on various aspects of corporate finance also covering corporate payout policy, like Auerbach (2002) and Graham (2003). Further, there are reviews specifically aimed at the topic of payout policy, like Allen and Michaely (2003) and DeAngelo et al. (2008), covering tax motives as one explanation amongst many. Finally, there are reviews like Dharmapala (2009) and Shackelford (2009) who collect and present a host of empirical results on the impact of the Jobs and Growth Tax relief Reconciliation Act of 2003 (JGTRRA 2003) in the U.S., one of the most widely studied tax reforms in recent history. However, none of these reviews explicitly focusses on the literature on payout tax influences on corporate payout

policy. The following review aims at combining and further condensing the vast literature, providing scholars and practitioners with a short but solid theoretical background for empirical research on the influence of taxation on distributions.

The paper continues as follows: As a starting point, section 2 introduces the neoclassical framework of Miller and Modigliani (1961). Section 3 analyzes the theoretical consequences of introducing the market imperfection of taxation of dividends and capital gains. By lifting the assumption of symmetric information between managers and shareholders, section 4 discusses the information content of distributions and payout implications of agency costs. Section 5 provides an overview over findings from behavioral economics, lifting different neoclassical assumptions about market participants, such as perfect rationality or unlimited information processing capability. Based on the literature discussed in the previous sections, section 6 analyzes the actual role of taxes in managers' decisions by presenting empirical evidence from different tax reforms and surveys from financial officers. Section 7 concludes.

2.2 A neoclassical look on payout policy

The neoclassical approach of Modigliani and Miller (1958) and Miller and Modigliani (1961) (MM) provides a neutral benchmark for discussing and analyzing possible determinants of corporate payout policy. Under the basic assumptions of perfect markets, rational behavior and perfect certainty, Miller and Modigliani (1961) show that only investment policy and not current or future distribution

policy alters a firm's value.¹² Basically, the reasoning goes along the lines that a given investor can realize any desired income stream by reinvesting a dividend or borrowing against a capital gain at the market rate, rendering the two alternatives essentially equivalent. Thus, the corporate choice between retention and distribution is ultimately irrelevant. Of course, this result is the outcome of the neoclassical assumptions underlying the model and Miller and Modigliani's (1961) findings can not directly be transferred into the real world. By introducing market imperfections such as taxes, asymmetric information, uncertainty about the future, transaction costs, powerful market participants or irrational agents into the theory, researchers have subsequently obtained a deeper understanding of the factors driving real payouts in financial markets around the world.

However, although still a cornerstone of corporate finance, the findings of Miller and Modigliani (1961) have not been without critique. In an early empirical study, Gordon (1962) provides evidence contrary to Miller and Modigliani's (1961) notion of irrelevance and underlines the importance of corporate payout policy for firm values. He uses data of 48 food and 48 machinery corporations from the years 1954 to 1957 to derive an optimum dividend rate, maximizing the firm's value.¹³ Gordon (1963) discusses Miller and Modigliani's (1961) findings and particularly criticizes their assumption of certainty.¹⁴ Introducing risk aversion and uncertainty, Gordon (1963) provides explanations why investors could prefer immediate dividend payouts to uncertain future capital gains. DeAngelo and

¹² See Miller and Modigliani (1961), p. 414.

¹³ See Gordon (1962), p. 44 and p. 47.

¹⁴ See Gordon (1963), p. 265.

DeAngelo (2006) postulate the “irrelevance of the MM dividend irrelevance theorem”. They show that even in frictionless markets, dividend policy is not irrelevant and that Miller and Modigliani (1961) come to this conclusion only because their assumptions implicitly demand the full distribution of free cash flow. This reduces dividend policy to the choice between optimal strategies and thus inherently creates irrelevance between payout and retention.¹⁵

2.3 Taxation

In the neoclassical world, the impact of introducing the market imperfection of payout taxation into the model is very straightforward. Payout policy becomes relevant and, in order to maximize their value, corporations should make exclusive use of the tax advantaged alternative when deciding on distribution or retention. In tax systems around the world, capital gains are oftentimes treated more favorable than dividends tax-wise. This is due to two reasons. First, the tax burden on dividends is traditionally higher than the burden on capital gains in many jurisdictions. La Porta et al. (2000) find a tax advantage for capital gains in 25 of the 33 countries analyzed in their sample in the year 1994.¹⁶ Jacob and Jacob (2012) analyze payout taxes in a panel of 25 countries from 1990 to 2008. They report a positive dividend tax penalty for 217 of their 468 country-year observations, with the remainder being predominantly tax neutral.¹⁷ Second, while dividends continuously accrue to the shareholder during the time of the investment and are

¹⁵ See DeAngelo and DeAngelo (2006), p. 296.

¹⁶ See La Porta et al. (2000), p. 14, table 3.

¹⁷ See Jacob and Jacob (2012), p. 33, table 2.

thus taxed in each period, capital gains are only taxed at the time of realization, when the shareholder finally sells his share. Theoretically, payout taxation can be avoided completely by continuous retention of corporate profits, delaying the realization of the capital gain indefinitely. This way, the net present value of the tax burden converges to zero. For instance, Miller (1977) states that already 10 years of tax deferral render capital gains essentially tax-exempt.¹⁸ To finance their consumption during the time of retention, shareholders may simply borrow, as in the original Modigliani and Miller (1961) logic. However, this argument has been challenged. DeAngelo (1991) emphasizes that in this reasoning, tax deferral implies consumption deferral and shows that the forgoing of dividends in favor of financing consumption over the capital market may not be possible when viewed from a macroeconomic perspective. With payouts delayed indefinitely, aggregate current consumption needs will gravely exceed current consumption possibilities and, given the assumption of homogeneous market participants, no one will be willing to lend.¹⁹

Under neoclassical assumptions, when capital gains are tax-advantaged compared to dividends as discussed above, corporations should consequently refrain completely from dividend payouts. However, as DeAngelo et al. (2008) and many others note, dividends have been and continue to be substantial,²⁰ which constitutes the aforementioned “dividend puzzle”. The puzzle indicates that either the role of taxes is more differentiated and complex, or that factors apart from taxes

¹⁸ See Miller (1977), p. 270.

¹⁹ See DeAngelo (1991), p. 358 and p. 363.

²⁰ See DeAngelo et al. (2008), p. 127.

play an important role in the actual decision process of financial managers.

Pertaining to the influence of payout taxation on corporate distributions, three different schools of thought on the matter have emerged over the years, the “tax irrelevance view”, the “old view” or “traditional view” and the “new view” of dividend taxation. Each of these theories is based on a different set of assumptions and comes to different conclusions. Amongst others, the papers of Auerbach (1983), Poterba and Summers (1985), Gerardi et al. (1990), Sinn (1991a), Zodrow (1991) and Sørensen (1995) analyze and compare the assumptions and implications of the three theories, providing a good overview over the subject.

2.3.1 The irrelevance view

Introducing taxation into the neoclassical world makes payout policy relevant. However, already Miller and Modigliani (1961) mention the potential building of tax clienteles in this context.²¹ The clientele theory, formulated and analyzed in detail by Elton and Gruber (1970), follows the reasoning that specific investor clienteles form around each firm, composed of investors preferring the particular distribution policy of the company for tax reasons. For instance, given progressive personal income tax rates on dividends and a fixed rate on capital gains as in the U.S. for many years, shareholders in higher tax brackets will rather hold shares of corporations that retain significant amounts of their earnings so that they profit from lower tax rates on capital gains, while shareholders in lower tax brackets or tax-exempt institutions will hold dividend paying stock.²² With

²¹ See Miller and Modigliani (1961), p. 431.

²² See Elton and Gruber (1970), p. 71.

the implications of clientele theory in mind, Black and Scholes (1974) extend the conclusions of Miller and Modigliani's (1961) irrelevance theorem by showing that in their distribution decision, managers do not have to consider tax consequences because their clientele will simply change in adaption to the new policy and every clientele values their respective firm in the same way. In this setting, distribution policy is irrelevant, even in the presence of taxation.²³

There are many studies assessing the actual importance of clientele theory in the real world, analyzing whether tax clienteles exist, and whether they dissipate tax influences on payout policy in line with Black and Schole's (1974) reasoning. Empirical evidence is mixed. Lewellen et al. (1978) test the influence of different investor characteristics on firms' dividend yield. They find evidence of influential age clienteles formed by investors in different stages of their lives, however they find no compelling evidence of tax clienteles.²⁴ Dhaliwal et al. (1999) show that aggregate institutional ownership, a common proxy for tax-deferred or tax-exempt investors, increases in reaction to a firm's decision to initiate dividends.²⁵ They interpret their findings as evidence supporting the existence of tax clienteles. DeAngelo et al. (2004) show that firms' payout policy is very homogenous when grouping them by their profitability. Almost all profitable firms pay out dividends while non-payers either realize losses, or are young, still unprofitable firms in their growth phase. DeAngelo et al. (2004) argue that this missing heterogeneity in firms' payout policy makes it hard for investors to construct well

²³ See Black and Scholes (1974), p. 2 and p. 21.

²⁴ See Lewellen et al. (1978), p. 1393.

²⁵ See Dhaliwal et al. (1999), p. 183.

diversified, dividend-tax reducing portfolios.²⁶ Grinstein and Michaely (2005) provide evidence against the classical clientele theory notion that tax-exempt institutions rather hold shares with a high dividend yield or that they induce the firms' management to increase dividends.²⁷ However, contrary to Grinstein and Michaely (2005), Moser and Puckett (2009) report that comparatively high dividend taxation attracts institutional investors to high dividend yield stocks.²⁸ DeAngelo et al. (2008) review the existing evidence and conclude that tax clienteles are not likely to be a major driver in firms' payout policy.²⁹ Lightner et al. (2008) analyze the shareholder structure of U.S. corporations around important events leading to the JGTRRA 2003. They show a significant increase in the trading activity of shares with high dividend yield, decreasing in the presence of institutional investors not affected by the reform. Lightner et al. (2008) attribute this effect to a clientele change in response to the tax cut.³⁰ Desai and Jin (2011) present further evidence of investors forming tax clienteles by explicitly analyzing differences in institutional investors' tax preferences. They show that institutions not tax-exempt on dividend income rather hold shares of firms with low dividend payouts.³¹

The question whether clienteles turn payout policy irrelevant in line with Black and Scholes (1974) is disputed. From the perspective of the state, the existence of tax clienteles directly reduces tax revenues in their reasoning, as each firms'

²⁶ See DeAngelo et al. (2004), p. 453.

²⁷ See Grinstein and Michaely (2005), p. 1399 and p. 1406.

²⁸ See Moser and Puckett (2009), p. 15.

²⁹ See DeAngelo (2008), p. 209.

³⁰ See Lightner et al. (2008), p. 28 and p. 34.

³¹ See Desai and Jin (2011), p. 73.

distributions flow exclusively to tax-optimized investors. However, Poterba and Summers (1984) point out that tax authorities' revenues from payout taxation are substantial.³² Allen et al. (2000) provide a comprehensive theoretical model of corporate payout illustrating how clientele effects reduce the overall tax burden on a firm's dividend distributions. However, they include the aspect of beneficial portfolio diversification later also brought forward in DeAngelo et al. (2004) and show that in equilibrium, dividend taxes are not irrelevant.³³

Other forms of tax irrelevance aim at the tax status of the marginal investor. Miller and Scholes (1978) state that several features of tax law allowing different forms of tax sheltering lead to irrelevance of distribution policy because they effectively reduce the tax rate on both, dividends and capital gains, to zero, turning investors indifferent between the two alternatives.³⁴ However, this line of reasoning has been criticized on the grounds that the marginal shareholder is unlikely to be completely tax-exempt, as in Feldstein and Green (1983).³⁵ Additionally, as will be presented in more detail later, there is abundant empirical evidence documenting that shareholders consider payout taxes in stock valuation, which is incompatible to tax-exempt and thus indifferent marginal shareholders. For instance, explicitly analyzing the identity of the marginal investor, Bell and Jenkinson (2002) show that the valuation of dividends changes significantly with changes in the tax system, providing strong evidence that the marginal investor

³² See Poterba and Summers (1984), p. 1397.

³³ See Allen et al. (2000), p. 2524.

³⁴ See Miller and Scholes (1978), p. 337 and p. 339.

³⁵ See Feldstein and Green (1983), p. 18.

is actually tax-sensitive.³⁶

Under the irrelevance view of dividend taxation, differential taxation of dividends and capital gains has no effect on the corporate choice between distribution and retention. Although there is some empirical evidence for tax clienteles to exist, they do not seem to turn payout policy irrelevant as in Black and Scholes (1974). Further, the marginal investor can not be assumed to be tax-exempt as in Miller and Scholes (1978), as payout taxes can not fully be evaded. Consequently, tax irrelevance in its pure form is largely objected in the scientific community today, not at least because of the continuing positive tax revenues from the taxation of payouts.

2.3.2 The old view

The old view or traditional view of dividend taxation is based on insights from fundamental work by Harberger (1962, 1966) and Shoven (1976), who provide detailed analytical studies on the incidence of classical corporate tax systems with double taxation on the corporate level and the shareholder level. They show that the taxation of corporate payouts leads to distorted decisions in the corporate sector, implying relevance of payout taxes.³⁷ The main assumption underlying the old view is that firms' investments are financed by external equity through the issue of new shares. The essential consequence of this assumption is that a potential outside investor decides whether to invest into a firm by buying these new shares, rendering his payouts subject to double taxation, or to invest into an

³⁶ See Bell and Jenkinson (2002), p. 1339.

³⁷ See Harberger (1962), p. 227 and Shoven (1976), p. 1274 and p. 1276, table 4.

alternative financial investment, not subject to double taxation. For a simplified example based on calculations by Sinn (1991a),³⁸ suppose an investor who faces the personal tax rate t_{pers} on dividends investing into a corporation facing the corporate tax t_{corp} on its earnings. Given an investment of one unit of currency and a corporate return of r , the investor receives an after-tax dividend of $r(1 - t_{corp})(1 - t_{pers})$. Alternatively, the investor can invest into a financial investment with return i , subject to the tax rate on interest income t_{int} , yielding an after-tax return of $i(1 - t_{int})$. Assuming equilibrium returns for both investments ($r = i$) and the inclusion of interest income in the tax base of the personal income tax ($t_{pers} = t_{int}$), a tax on payouts clearly influences the decision. In this setting, distribution policy is relevant for the investor because payout taxes directly alter the cash flow received out of the stock investment.

As discussed above, in many tax systems around the world, capital gains are tax-favored compared to dividends. With all else equal, under the old view, just as in the neoclassical setting with taxes, firms should not pay out dividends and instead retain their earnings to generate tax advantaged capital gains for their investors. The old view solves the resulting puzzle by attributing additional shareholder benefits to dividends, which the retention of corporate profits does not generate. As will be discussed in detail in later sections, dividends, inter alia, signal profitability as in Battacharya (1979), reduce agency costs as in Jensen (1986) and generally better cater to investors' not necessarily rational demands as in Shefrin

³⁸ See Sinn (1991a), p. 28.

and Statman (1984).³⁹ Shareholders value these benefits and, consequently, reward the distribution of dividends with higher share prices, raising the value of the firm. However, *ceteris paribus*, dividend taxes do reduce firm value. Thus, under the old view, corporate payout policy is dependent on payout taxation because it is defined by the equilibrium between the additional firm value generated through dividend payouts and the additional costs induced by the dividend tax penalty.

There is a large body of literature employing valuation models and testing stock returns for a possible influence of payout taxes. Empirical results have been mixed. Bar-Yosef and Kolodny (1976) use a refined version of Brennan's (1970) after-tax capital asset pricing model⁴⁰ to analyze the influence of a firm's dividend policy on its stock return. They point out that the use of capital asset pricing models implies acceptance of the irrelevance theorem, but nevertheless find a statistically significant positive relation between dividend yield and stock return in their subsequent empirical analysis, refuting the irrelevance view.⁴¹ Litzenberger and Ramaswamy (1979) emphasize the importance of taxes for these findings by showing that this positive relation is fluctuating with changes of the particular characteristics of the effective tax regime, indicating relevance of dividend taxation for firm values.⁴² Miller and Scholes (1982) have criticized Litzenberger and Ramaswamy's (1979) results, arguing that the positive coefficient is not evidence

³⁹ See Battacharya (1979), p. 260; Jensen (1986), p. 323 and Shefrin and Statman (1984), p. 253.

⁴⁰ See Brennan (1970), p. 420.

⁴¹ See Bar-Yosef and Kolodny (1976), p. 181 and p. 188.

⁴² See Litzenberger and Ramaswamy (1979), p. 186.

of the influence of dividend taxes, but merely an artifact driven by information effects. When correcting for information biases, Miller and Scholes (1982) report insignificant coefficients.⁴³ Poterba and Summers (1984) analyze the British tax system in the period from 1955 to 1981. Employing methods based on both, daily and monthly data, they, too, find significant positive relations between dividend yields and stock market returns, in line with Litzenberger and Ramaswamy (1979) and in contrast to Miller and Scholes (1982).⁴⁴ Ang et al. (1991) analyze a special class of investment trusts paying either stock dividends, ultimately taxed as capital gains, or cash dividends in the period from 1969 to 1982. They find that the valuation of the two alternatives varies significantly over time, in accordance with the effective tax system, although the two shares are equivalent in every aspect apart from the tax treatment of the payout.⁴⁵ Naranjo et al. (1998) document a large and statistically robust yield effect of dividends. However they argue that the effect is far too large to be explained by dividend taxation alone. In fact, they report problems in connecting the dividend yield to tax effects at all.⁴⁶ Dhaliwal et al. (2003) employ a specific setting that enables them to discern the tax status of a firms' marginal investor. They, too, report a positive influence of dividends on stock returns. Further, this influence is changing with the tax status of the respective marginal investor, which Dhaliwal et al. (2003) interpret as evidence in favor of the old view.⁴⁷ In summary, most of these studies report a positive yield effect of dividends, although the influence of taxes remains ambiguous.

⁴³ See Miller and Scholes (1982), p. 1125 and p. 1130.

⁴⁴ See Poterba and Summers (1984), p. 1402 and p. 1407.

⁴⁵ See Ang et al. (1991), p. 390 and p. 394.

⁴⁶ See Naranjo et al. (1998), p. 2051.

⁴⁷ See Dhaliwal et al. (2003), p. 158 and p. 168.

Under the old view, dividend policy is tax-dependent. A reduction of dividend taxes, for example, will lower the price of obtaining the benefits of dividend distributions and managers will consequently raise the firm's payout level after the tax cut. The old view has been subject to criticism, mostly on the grounds of its assumption of marginal financing through new share issues. Zodrow (1991) points out that the aggregate contribution of new equity to the financing of corporate investments is, in fact, negligible.⁴⁸ Another frequent subject of skepticism is the need for a mechanism that gives dividends an intrinsic value above other forms of payout. Dharmapala (2009) expresses some doubt on the established theories.⁴⁹ Specifically, it remains unclear why share repurchases do not provide similar utility benefits when used for signaling or to lower agency costs.

2.3.3 The new view

In some ways, the new view constitutes the direct opposite to the irrelevance view discussed earlier. It is conceptually based on Gordon's (1959) notion that dividend payments to the shareholder are not irrelevant, but instead the only relevant factor in the valuation of a firm. Independent from the holding period, an investor is solely interested in the discounted future stream of dividends. A sale of shares is nothing more than the redirection of the dividend stream to a different owner and capital gains stem from different future expectations of the market participants only. Thus, future dividends fully determine the price of stock at any given time.⁵⁰

⁴⁸ See Zodrow (1991), p. 503.

⁴⁹ See Dharmapala (2009), p. 204.

⁵⁰ See Gordon (1959), p. 101.

The crucial assumption underlying the new view is that marginal corporate investments are financed internally through retained earnings. In this case, the difference between the alternative of a continued investment inside the firm in combination with a future distribution and the alternative of an immediate distribution combined with a financial investment by the shareholder lies only in the timing of the payout tax payment, as both investment alternatives are subject to double taxation. In the end, dividend distribution has to take place sometime and payout taxes are inevitable. Investors anticipate this and consequently account for payout taxation in their share valuation. Thus, taxes are fully capitalized into the value of the firm at each point in time, which is why models along the new view of dividend taxation are oftentimes referred to as “tax capitalization models”. However, payout taxes do not influence a firm’s payout policy, as payout taxes reduce the value of both alternatives simultaneously. For example, we turn to a simplified version of the already simplified calculations in Zodrow (1991).⁵¹ To underline the neutrality of payout taxes under the new view, imagine a firm that chooses to immediately distribute one unit of currency. The shareholder invests the distribution into an alternative financial investment and, in the end, receives a cash flow of $(1 - t_{pers})(1 + i(1 - t_{int}))$ after taxes. Now compare this to the cash flow of $(1 + r(1 - t_{corp}))(1 - t_{pers})$, which the shareholder receives if the investment is carried out inside the firm and distribution takes place afterwards. Assuming that the tax rate on dividends t_{pers} remains constant during the time of the investment, it simply cancels out when comparing the two alternatives.

⁵¹ See Zodrow (1991), p. 499.

Prominent pioneers of the new view include King (1974a, 1977), Auerbach (1979) and Bradford (1981). Under the assumption of absence of external financing possibilities, King (1974a) shows that taxes on distributions do not influence a firm's investments but that they alter the value of a firm, as they effectively reduce the value of the stream of payouts reaching the shareholders.⁵² Auerbach (1979) shows, under the assumption that firms do neither issue new shares nor repurchase existing shares, that payout taxes are not relevant in the determination of a firm's cost of capital but are capitalized into a firm's value at all times.⁵³ In contrast to the findings of Harberger (1962) and Shoven (1976), Bradford (1981) concludes, in his incidence analysis of corporate taxation based on a rational expectations model of valuation, that in equilibrium, taxes on distributions do not necessarily distort the corporate choice between retention and distribution.⁵⁴

In summary, just as the old view, the new view predicts a negative tax effect on firm value. Consequently, the studies of tax-effects on stock returns and firm value presented in the previous section can mostly be interpreted as supporting the new view as well. Still, there is a strand of literature explicitly analyzing if taxes are capitalized into firm values as advocated under the new view logic. Erickson and Maydew (1998) report changes in stock prices connected with changing dividend taxation for corporate investors.⁵⁵ Harris and Kemsley (1999) show that dividend taxes are capitalized into the valuation of a firm's retained earnings.⁵⁶ Sialm

⁵² See King (1974a), p. 33.

⁵³ See Auerbach (1979), p. 439 and p. 440.

⁵⁴ See Bradford (1981), p. 21.

⁵⁵ See Erickson and Maydew (1998), p. 446.

⁵⁶ See Harris and Kemsley (1999), p. 284.

(2009) analyzes the validity of the irrelevance view using long time series of tax data from 1913 to 2006 from the U.S. He provides further evidence that payout taxes influence firm valuation.⁵⁷ However, the assumptions underlying the new view or tax capitalization view turn payout policy independent of taxes, which is were the old view and the new view differ.

The new view has been criticized mainly because it renders dividends and dividend taxes inevitable as it does not allow for any other means of corporate payout. Shackelford and Shevlin (2001) mention that, in practice, there are several ways for firms to distribute their earnings that do not trigger dividend taxation, the most prominent being corporate share repurchase programs.⁵⁸ In fact, Brav et al. (2008) report that share repurchases have become an important and widely used tool for corporate payout policy today.⁵⁹

2.3.4 Life-cycle theory

Beginning with work by Sinn (1991a, 1991b), scholars have combined the theories of the old view and the new view into a more comprehensive life-cycle theory of the firm. Here, as time passes, a firm undergoes different stages in its development with changing implications for the impact of taxes on payouts.⁶⁰ Firms typically begin with a start-up phase, where investment opportunities gravely exceed available funds and they thus rely heavily on capital markets to provide new equity for financing. For these firms, the old view of dividend taxation applies.⁶¹

⁵⁷ See Sialm (2009), p. 1367.

⁵⁸ See Shackelford and Shevlin (2001), p. 352.

⁵⁹ See Brav et al. (2008), p. 386, figure 3.

⁶⁰ See Sinn (1991b), p. 282.

⁶¹ See Sinn (1991a), p. 27.

Later during their development, firms go through a phase of intense growth where their investment opportunities are approximately aligned with funds available and firms are able to finance their investments with internal equity. As during their start-up phase, firms typically do not distribute in their growth-phase, as they need all available funds for investment. Finally, firms enter a stage of maturity and profitability, with earnings exceeding internal investment opportunities. At this stage, firms generate substantial free cash flows which they distribute to their shareholders. These distributions, however, are not affected by payout taxation, as mature firms finance their investments through retained earnings and the new view of dividend taxation applies for them.⁶²

In the literature, there are some indications of the validity of the life-cycle theory of the firm. Fama and French (2001) find that the observable decline of dividend payments in the U.S. in the last 25 years can partly be explained by a change in average firm characteristics caused by an ever increasing fraction of small, high growth firms with good investment opportunities that do not pay dividends.⁶³ Grullon et al. (2002) state that distribution policy naturally varies over time, in accordance to the evolution of a firm. Young, fast growing companies retain the bulk of their earnings to finance their investments. Mature, slower growing and more profitable firms generate more free cash flows and pay out more dividends.⁶⁴ DeAngelo et al. (2006) show that the probability of a company to pay dividends is significantly and positively correlated to profitability and size, but negatively

⁶² See Sinn (1991a), p. 29.

⁶³ See Fama and French (2001), p. 4 and p. 11.

⁶⁴ See Grullon et al. (2002), p. 413 and p. 422.

related to growth.⁶⁵ In an international study, Denis and Osobov (2008) find that the largest, most profitable firms in their sample are the major contributors to aggregate dividends paid.⁶⁶ Chetty and Saez (2010) explicitly separate between cash-constrained or old view and cash-rich or new view firms in their model.⁶⁷

Overall, when analyzing tax-effects on payout policy on a broader scale, the life-cycle theory rather points to effects in the direction of the new view. The old view applies to start-up firms and firms in their growth phase that usually do not engage in intense payout activity. The new view applies to mature firms who are not affected by payout taxes because they rather finance their investments through retained earnings. Korinek and Stiglitz (2009) argue that mature firms are responsible for the overwhelming majority of payouts in the economy. Consequently, they relate only a small part of observable payouts to tax considerations.⁶⁸

2.4 Asymmetric information

One of the main assumptions underlying perfect neoclassical capital markets is symmetric distribution of information. It implies that all market participants, corporate insiders like managers as well as outside shareholders, are endowed with the same information at any given time. In the real world, this is obviously not the case and, accordingly, researchers lifted the assumption of symmetric information and analyzed the consequences. Theoretically, two distinct problems

⁶⁵ See DeAngelo et al. (2006), p. 236.

⁶⁶ See Denis and Osobov (2008), p. 77.

⁶⁷ See Chetty and Saez (2010), p. 5.

⁶⁸ See Korinek and Stiglitz (2009), p. 149 and p. 158.

may arise. First, asymmetric information can lead to issues of adverse selection, meaning that two parties may undergo suboptimal decisions before contracting, caused by missing information on either one or both sides. Second, it is possible that asymmetric information causes the phenomenon of moral hazard, which comes into effect after a contract has been signed and generates additional agency costs that can lead to second-best results for both contracting parties. The two phenomena play a potentially important role in the corporate decision on payout policy and have been the subject of intense studies in corporate finance. In summary, it has been found that payouts can serve as a remedy for both issues. Dividends can help to reduce the possibility of adverse selection by signaling information and they can reduce agency costs through the extraction of funds at risk of opportunistic use.

2.4.1 Signaling

One possibility to solve the problems entailed by an asymmetric distribution of information is to signal information to the other contracting party, as already mentioned by Lintner (1956) and Miller and Modigliani (1961).⁶⁹ In the context of corporate payout policy, the signaling theory was extensively analyzed and pushed forward by Watts (1973), Battacharya (1979), Hakansson (1982), John and Williams (1985) and Miller and Rock (1985). Following the theory, corporate insiders use dividends to communicate information about the type of their firm to outsiders.⁷⁰ Given a differential and unfavorable taxation of dividends

⁶⁹ See Lintner (1956), p. 102 and Miller and Modigliani (1961), p. 430.

⁷⁰ See Watts (1973), p. 192 and John and Williams (1985), p. 1055.

relative to capital gains as in many countries around the world, more profitable companies are more likely to be able to afford distributions via costly dividends.⁷¹ Dividend payouts thus discriminate profitable from less profitable companies and the value of distributing companies rises as investors associate dividend payments with elevated future earnings. Miller and Rock (1985) provide a comprehensive theoretical analysis of the impact of asymmetric information on optimal financing and payout decisions. Under the assumption of exploitable insider information, they derive a time consistent signaling equilibrium and are able to show that payout levels are inflated and investment levels are lower in comparison to the full information equilibrium.⁷²

Concerning the influence of payout taxation on firm-values, it is noteworthy that signaling theory introduces an additional level of complexity. In contrast to other prominent theories of corporate payout, there are two opposing effects of the dividend tax penalty on the value of a firm in the signaling theory. First, as demonstrated in the sections on the old view and the new view, there is a negative tax effect. All else equal, a higher tax on dividends lowers the value of dividend distributing firms. Second, there is an incrementally positive effect of taxes on the signaling effect. A credible signal demands inevitable costs to be associated with the transmission of the signal. The higher the cost, the more efficient the separation between profitable and non profitable firms. Thus, a higher dividend tax penalty increases the value of the signal and incrementally raises distributing firms' values. Bernheim and Wantz (1995) probe the interrelation

⁷¹ See Battacharya (1979), p. 260 and Hakansson (1982), p. 419 and p. 425.

⁷² See Miller and Rock (1985), p. 1045.

between the two conflicting effects. They underline the necessity of a dividend tax penalty as a separation tool for a functioning signal and find that the stock price reaction to a dividend distribution is overall positively depending on the tax rate on dividend income, implying an incremental signaling effect that is stronger than the direct tax effect. As this effect is not predicted by other theories of corporate payout, Bernheim and Wantz (1995) see their results as strong evidence in favor of the signaling theory.⁷³ However, Li (2007) challenges these results. Using a sophisticated event study methodology, he finds a significantly negative relation between the dividend tax penalty and the unexpected part of a dividend announcement, clearly supporting the notion that dividend taxes overall reduce firm value, as originally predicted by the old view and the new view.⁷⁴ Amihud and Murgia (1997) analyze dividend signaling in Germany. They state that from 1988 to 1992, the necessary condition of sufficiently high signaling costs through a dividend tax penalty was not fulfilled. Therefore, dividend signaling effects should not be observable. However, they still find an overall positive reaction to dividend announcements that is similar to the effect in the U.S., providing further evidence on the relevance of effects apart from signaling theory for the valuation process.⁷⁵ Fama and French (1998) try to isolate the original negative tax effect on the value of dividend paying firms by using ample control variables for profitability. However, they, too, find a positive and significant connection between dividend distributions and firm value, which they attribute to complex

⁷³ See Bernheim and Wantz (1995), p. 543.

⁷⁴ See Li (2007), p. 15.

⁷⁵ See Amihud and Murgia (1997), p. 398 and p. 405.

interactions of tax-, signaling- and agency effects.⁷⁶

Signaling effects are dependent on the signals' recipient. Allen et al. (2000) argue in their model that in the presence of major shareholders who are less dependent on signals as a source of information, firms will substitute dividends in favor of other payout forms.⁷⁷ Amihud and Li (2006) extend this view and emphasize that the efficiency of a signal is depending on the degree of new information that is conveyed. In line with Allen et al. (2000), they show that the positive value effect of dividend signals declines with the fraction of institutional investors in the shareholder structure because they are often already well informed and dividends provide less additional information for them.⁷⁸ Kale et al. (2012) report evidence that especially firms that are new to the stock market use dividend initiations, committing them to a possibly long period of continued future dividend payments as in Lintner (1956), as a particularly strong signal to convince their still rather uninformed shareholders of their future profitability.⁷⁹

Empirically, signaling theory is not beyond dispute. Many researchers have probed the fundamental question whether dividends effectively indicate increased future profitability. DeAngelo et al. (1996) deny that dividends are a reliable signal of future earnings. They explicitly analyze a group of firms with a reduction in earnings after a long time of sustained growth, firms with theoretically increased incentives for signaling activity. However, even in this special sample, DeAngelo et al. (1996) find no compelling evidence for a functioning separat-

⁷⁶ See Fama and French (1998), p. 835.

⁷⁷ See Allen et al. (2000), p. 2502 and p. 2519.

⁷⁸ See Amihud and Li (2006), p. 645.

⁷⁹ See Kale et al. (2012), p. 374 and p. 392.

ing mechanism through dividend signaling.⁸⁰ Benartzi et al. (1997) analyze the information content of dividends. They find, using the full New York stock exchange (NYSE) sample from 1979-1991, that dividends do not reliably indicate a positive evolution of future earnings, but rather show how earnings developed in the years before the dividend announcement.⁸¹ In accord with these findings, Grullon et al. (2005), in a comprehensive study analyzing the entirety of dividend announcements by all firms listed on the NYSE and the American stock exchange (AMEX) from 1963 to 1997, conclude that the analysis of changes in dividend policy does not help in assessing the development of future earnings.⁸² DeAngelo et al. (2008) follow a very intuitive argumentation. They assert that the bulk of aggregate payouts is concentrated amongst the largest firms in the economy. Information on the financial status of these large corporations is readily available for everyone interested, as they are committed to the strictest disclosure requirements, they are excessively monitored by analysts, credit rating agencies and various other institutions and they generally enjoy high coverage in the media and the public. As already Allen et al. (2000) and Amihud and Li (2006) have pointed out, these huge corporations should have less need to signal information via relatively costly dividends because of their already high level of information supply. Thus, DeAngelo et al. (2008) conclude that signaling alone does not convincingly explain their enormous payouts.⁸³ In summary, although there is considerable supporting evidence of positive price reactions to dividend

⁸⁰ See DeAngelo et al. (1996), p. 352 and p. 356.

⁸¹ See Benartzi et al. (1997), p. 1022 and p. 1031.

⁸² See Grullon et al. (2005), p. 1670.

⁸³ See DeAngelo et al. (2008), p. 185.

announcements, it remains unclear whether dividend signaling is the fundamental cause for this phenomenon.

2.4.2 Agency theory

Jensen and Meckling (1976) opened a new train of thought about the interrelations between firm ownership and management using principal agent theory. The theory addresses the problem of two parties, separated by an uneven distribution of information, each maximizing their respective utility functions, which are not necessarily aligned. When it is not possible to establish complete contracts, the principal, because of his lack of information, has to control managerial behavior. This generates agency costs, possibly leading to a suboptimal result for both parties.⁸⁴

With this setting in mind, Rozeff (1982), Easterbrook (1984) and Jensen (1986) reviewed the problem of distribution policy. Managers, as agents of their shareholders, are theoretically obliged to entirely distribute the cash flows that remain after the realization of all investment projects with a positive net present value. These “free cash flows” can more profitably be invested outside of the company. In fact, Miller and Modigliani (1961) implicitly assume the distribution of full free cash flows in each period, which was heavily criticized by DeAngelo and DeAngelo (2006).⁸⁵ However, because of possibly conflicting interests between principal and agents, the funds could remain inside the company and be invested in suboptimal pet projects that mainly benefit the managers personally, like empire building

⁸⁴ See Jensen and Meckling (1976), p. 312.

⁸⁵ See DeAngelo and DeAngelo (2006), p. 296.

or consumption on the job. Stulz (1990) identifies two basic problems stemming from misaligned incentive constellations. Managers tend to overinvest in periods of high cash flows and underinvest in periods of low cash flows.⁸⁶ Another important agency problematic is the active expropriation of minor shareholders by majority shareholders and managers, a phenomenon Johnson et al. (2000) term “tunneling”.⁸⁷ However, sources of agency costs are not limited to opportunistic behavior. Managerial actions to the shareholders’ detriment may simply be the consequence of mistakes caused by overconfident or overly optimistic managers as in Roll (1986) and Heaton (2002).⁸⁸ To prevent opportunistic actions or unintended mistakes, the principal has to monitor management behavior, generating agency costs. Rozeff (1982) explains how the distribution of dividends reduces the agency problem mechanically by simply withdrawing free cash flows from the power of disposal of possibly opportunistic managers, which helps to save agency costs.⁸⁹ Consequently, under the agency theory, the value of a distributing firm rises as agency problems are mitigated.

The strength of the agency cost reducing effect of dividends is influenced by the financial policy and the shareholder structure of the respective firm. Easterbrook (1984) emphasizes that the distribution of dividends also reduces the extent to which new investments can be financed with retained earnings and thus increases the demand for external capital. This capital is usually provided only after extensive assessment by potential investors, further reducing agency costs for existing

⁸⁶ See Stulz (1990), p. 8.

⁸⁷ See Johnson et al. (2000), p. 22.

⁸⁸ See Roll (1986), p. 201 and Heaton (2002), p. 37.

⁸⁹ See Rozeff (1982), p. 250.

shareholders.⁹⁰ Jensen (1986) notes that high leverage can serve as an alternative to dividend payments, as additional monitoring by banks and the pressure induced by the possibility of bankruptcy or takeover can effectively substitute dividends as a tool to reduce agency costs.⁹¹ Further, Allen et al. (2000) point out that the presence of strong shareholders can also substitute dividend payments, as major individual shareholders or institutional investors extensively monitor managerial behavior themselves.⁹² Chetty and Saez (2010) explicitly analyze the influence of changes in dividend taxation on the agency aspect. The old view of dividend taxation predicts lowered overall payouts in reaction to a dividend tax increase. From an agency viewpoint, this aggravates the principal-agent problem, as more funds remain inside the firm and thus, under managerial control. Chetty and Saez (2010) assert that the resulting increase in agency costs is an even more important source of inefficiency than the distortions predicted by the old view.⁹³

Lang and Litzenberger (1989) directly test the implications of dividend signaling theory against agency theory implications. They employ different tests to explain market reactions to corporate dividend announcements and assert that explanations along the lines of agency theory are more compelling.⁹⁴ Gordon and Dietz (2006) follow a similar approach and compare the performance of different models of corporate payout with each other. They, too, find agency theory explanations to be more compelling than signaling theory or tax explanations along the new

⁹⁰ See Easterbrook (1984), p. 654.

⁹¹ See Jensen (1986), p. 324.

⁹² See Allen et al. (2000), p. 2509 and p. 2519.

⁹³ See Chetty and Saez (2010), p. 2 and p. 27.

⁹⁴ See Lang and Litzenberger (1989), p. 188 and p. 190.

view.⁹⁵ Additional confirming evidence for the implications of agency theory is provided by Dewenter and Warther (1998). They compare the payout policy of U.S. and Japanese firms and, in line with the majority of observers at the time, assume that Japanese firms suffer less from asymmetric information problems because of their seemingly more efficient management structures. They show that, in line with the agency model of dividends, Japanese shareholders' reaction to dividend announcement is generally smaller than in the U.S.⁹⁶ La Porta et al. (2000) give an international overview of the agency problem. They compare the influence of different legal systems with varying degrees of shareholder protection on dividend distribution activity. They find that economies with higher developed shareholder protection overall show significantly higher dividend payouts, contrasting the agency model of Easterbrook (1984).⁹⁷ Johnson et al. (2000) analyze the phenomenon of controlling-shareholders transferring cash flows and assets out of the firm to the minority-shareholders' harm. They find that the agency problem caused by tunneling is substantial, that tunneling is oftentimes even legal, and that the problem is intensified in civil-law countries with comparably weak shareholder protection.⁹⁸ Faccio et al. (2001), analyze agency problems in the light of the crisis of several aspiring economies in South East Asia in the late nineties. They compare data from 14 European and Asian economies with relatively condensed and concentrated ownership structures. Faccio et al. (2001) find that the phenomenon of expropriation or tunneling is much more severe in

⁹⁵ See Gordon and Dietz (2006), p. 24.

⁹⁶ See Dewenter and Warther (1998), p. 880 and p. 894.

⁹⁷ See La Porta et al. (2000), p. 5 and p. 23.

⁹⁸ See Johnson et al. (2000), p. 26.

South East Asia compared to Europe, as the relatively high level of dividend payouts in Europe effectively reduces agency problems.⁹⁹

The classical agency considerations presented above have led to further theories introducing agency problems into other aspects of firms' financial policy. Notably, Myers and Majluf (1984) and Myers (1984) incorporate agency theory into the realm of corporate finance by developing a ranking of financing alternatives that accounts for possible information asymmetries. According to this "pecking order theory", firms generally prefer financing with retained earnings because this alternative is associated with the lowest agency costs.¹⁰⁰ In accordance with the life cycle theories of the firm presented previously, firms with more promising investment projects will retain a higher fraction of their earnings to build up reserves for financing purposes and thus pay out less.¹⁰¹ Fama and French (2002) provide ample empirical evidence for this connection. Analyzing a broad sample of more than 3000 U.S. firms from 1965 to 1999, they find that the dividend payout ratio is significantly and positively connected to profitability and negatively connected to investment opportunities.¹⁰²

The prime role of dividends in the classical agency context of Easterbrook (1984) is to ensure the distribution of free cash flows to the shareholders. Many scholars see this mechanism as an important driver behind the bulk of payouts in the economy, carried out by large, mature and profitable corporations on a very regular basis.

⁹⁹ See Faccio et al. (2001), p. 71.

¹⁰⁰ See Myers (1984), p. 581.

¹⁰¹ See Myers and Majluf (1984), p. 194 and p. 217.

¹⁰² See Fama and French (2002), p. 3 and p. 14.

2.5 Behavioral economics

As discussed earlier, the old view of payout taxation solves the dividend puzzle by attributing an intrinsic value to dividends that is not generated by capital gains. In the neoclassical world of Miller and Modigliani (1961), this is not possible, as dividends and capital gains are actually equivalent. However, literature surveying managers or shareholders about their payout preferences generally hints at a strong preference for dividends. In the following, researchers have consecutively turned away from the traditional “homo economicus” in order to analyze corporate payout policy under more realistic conditions and possibly provide new explanations for the apparent benefits of dividends.

The object of behavioral economics is the observation, analysis and prediction of human behavior in situations of choice, at the junction of economics and psychology. Ritter (2003) provides a condensed introduction to the field by describing different forms of irrational behavior amongst market participants.¹⁰³ Barberis and Thaler (2003) and Baker et al. (2007a) provide a comprehensive overview over the literature on behavioral issues in corporate finance. Both also elaborate on the topic of corporate payout decisions.¹⁰⁴ Baker et al. (2007a) differentiate the field into two fundamental issues, the problem of irrationality on the investors’ and on the managers’ side.¹⁰⁵

A preference towards dividends amongst investors, as already suspected by Lint-

¹⁰³ See Ritter (2003), p. 431.

¹⁰⁴ See Barberis and Thaler (2003), p. 1107 and Baker et al. (2007a), p. 164.

¹⁰⁵ See Baker et al. (2007a), p. 148 and p. 168.

ner (1956) and later confirmed by Brav et al. (2005),¹⁰⁶ has been the object of thorough analysis in the field of behavioral economics. Shefrin and Statman (1984) propose several explanations for a relatively higher dividend valuation. They argue that investors may face problems to save and thus try to control their consumption by only consuming out of dividends. In this context, Baker et al. (2007b) provide solid evidence for a dividend demand for consumption purposes.¹⁰⁷ The second explanation for increased dividend demand in Shefrin and Statman (1984) introduces Kahneman and Tversky's (1979) prospect theory¹⁰⁸ into the realm of distribution policy. Investors value dividend paying stocks higher because they attribute a strong fundamental value to "safe" dividends. Capital gains and capital losses are valued differently. A capital gain of the underlying asset is merely seen as a form of additional benefit, while a capital loss is seen as a more serious issue. Third, Shefrin and Statman (1984) argue that investors favor dividends because the realization of capital gains ultimately involves the sale of shares. Investors might regret this if at a later time, the share price rises substantially.¹⁰⁹

Baker and Wurgler (2004a) introduce a new behavioral approach to explain corporate payout policy with their "catering theory". They propose a setting in which the demand for dividends is fluctuating with the sentiment of partially uninformed or irrational investors, leading to a varying valuation of distributing firms over time. Managers, after evaluating cost and utility, rationally react to

¹⁰⁶ See Lintner (1956), p. 100 and Brav et al. (2005), p. 490.

¹⁰⁷ See Baker et al. (2007b), p. 250.

¹⁰⁸ See Kahneman and Tversky (1979), p. 277 and p. 279, figure 3.

¹⁰⁹ See Shefrin and Statman (1984), p. 255, p. 258 and p. 268.

the investors' demand by adjusting their payout according to the prevailing sentiment.¹¹⁰ Gombola and Liu (1993) already hint at a connection of investors' sentiment to dividend valuation by showing that the relation between dividend yield and stock performance varies with the upward or downward development of the respective stock market.¹¹¹ Baker and Wurgler (2004b) provide evidence for catering theory motives explaining Fama and French's (2001) observation of disappearing dividends.¹¹² Li and Lie (2006) provide further empirical evidence for managers catering to their shareholders' demands. They show that the prevailing investor sentiment is connected to the probability of dividend initiation and the volume of dividends paid.¹¹³ However, catering theory is not uncontested. DeAngelo et al. (2008) argue that in a context of careful and conservative dividend policy with a strong reluctance to cut dividends as in Lintner (1956), managerial catering to changing investor sentiment seems only plausible in the upward direction.¹¹⁴ Empirically, international studies such as Denis and Osobov (2008) and von Eije and Megginson (2008) have reported problems of providing evidence for catering mechanisms in their samples not explicitly focused on observations from the U.S.¹¹⁵

As already discussed previously, agency theory demands the distribution of free cash flows in order to prevent the utilization of corporate funds detrimental to the shareholders' interest. However, besides the issue of opportunistic managers,

¹¹⁰ See Baker and Wurgler (2004a), p. 1127 and p. 1147.

¹¹¹ See Gombola and Liu (1993), p. 310.

¹¹² See Baker and Wurgler (2004b), p. 277.

¹¹³ See Li and Lie (2006), p. 300 and p. 304.

¹¹⁴ See DeAngelo et al. (2008), p. 199.

¹¹⁵ See Denis and Osobov (2008), p. 77 and von Eije and Megginson (2008), p. 368 and p. 372.

there are additional behavioral reasons why investors might demand the full payout of free cashflows. Roll (1986) abandons the assumption of managers being fully rational and analyzes the influence of managerial mistakes. He argues that managers, under the influence of hubris and overconfidence, might overstate their ability to appropriately value assets and thus pay excessive prices in firm takeovers. These inappropriate prices might reduce the shareholders' value.¹¹⁶ Heaton (2002) provides a model that shows that optimistic managers, having significant resources in the form of retained earnings at hand, start to overly discount internal financing and thus may carry out investments with negative net present value.¹¹⁷ Empirical evidence in line with managerial hubris and overconfidence is presented by Malmendier and Tate (2005). They show that the sensitivity of a firm's investments decreases with its financial constraint. Overconfident managers overinvest when endowed with excessive internal funds, but underinvest when internal funds are scarce.¹¹⁸ Ben-David et al. (2007) provide evidence that overconfident managers carry out lower return investments and pay dividends more infrequently as they retain earnings to finance further investments.¹¹⁹ As in the original agency setting, payouts can help to mitigate these problems by simply reducing the funds exposed to possible managerial mistakes.

In summary, while they do not provide a definite answer to the question why investors seem to prefer dividends over capital gains, behavioral theories have shed some light on the issue from many different angles and enriched the discussion.

¹¹⁶ See Roll (1986), p. 202 and p. 212.

¹¹⁷ See Heaton (2002), p. 41.

¹¹⁸ See Malmendier and Tate (2005), p. 2679 and p. 2690.

¹¹⁹ See Ben-David et al. (2007), p. 25 and p. 26.

Shefrin and Statman (1984) provide several reasons why dividends may provide additional utility that capital gains do not, which is a basic assumption of the old view. Roll (1986) and Heaton (2002) add an important factor to agency theories of corporate payout by introducing the possibility of managerial mistakes as an additional source for agency costs besides deliberate opportunistic actions.

2.6 Do taxes really matter?

Starting with the original framework of Miller and Modigliani (1961), studies presented in the previous sections have successively lifted different neoclassical assumptions, giving rise to various theories explaining corporate payouts. Concerning the influence of taxation on the choice between distribution and retention, there are two conflicting theories. The old view predicts a reaction while the new view leaves taxation neutral. Empirically, there is still considerable debate over which of the views is better suited to explain actual payouts in the economy. Both views have repeatedly been criticized for their assumptions. The old view is criticized mainly because its assumption of new shares as the source of marginal financing, while opponents of the new view question the assumption of dividends as the sole method for corporate payout. Further, the previous sections have shown that payout policy is influenced by various factors apart from taxation which introduces additional complexity to the field.

In order to assess if taxes drive corporate payout and which influence they exert in a given setting, researchers mainly follow two different approaches. The first method uses major tax reforms as a form of a natural experiment to analyze

the market participants' reactions to tax changes. The second method relies on surveys. Here, corporate decisionmakers are directly questioned about the determinants of their payout policy.

2.6.1 Empirical evidence from tax reforms

The literature utilizing tax reforms to study the influence of taxes on payout policy can be classified into two different strands. The first approach analyzes the influence of taxation in a rather long-term environment. As tax law is identical for all market participants within an economy, tax variables oftentimes provide rather little cross-sectional heterogeneity, which renders empirical testing challenging. Because furthermore, tax rates and tax systems typically change quite slowly, many studies make use of considerably long observation periods to increase the heterogeneity in the time-series of taxes, oftentimes modeling the respective countries' tax systems over many years. In an early study analyzing the British tax system during the time from 1953 to 1964, Feldstein (1970) reports a substantial positive trend in firms' dividend payouts connected to diminishing tax incentives for corporate retention.¹²⁰ He further finds that the adaption of dividend levels to changing tax incentives takes a considerable amount of time, consistent with the notion of "sticky dividends" as in Lintner (1956).¹²¹ Poterba and Summers (1984) analyze British data from 1955 until 1981, a period including two major tax reforms in 1965 and 1973. They show that changes in taxation significantly influence the premium shareholders require to hold divi-

¹²⁰ See Feldstein (1970), p. 62.

¹²¹ See Lintner (1956), p. 99.

dend distributing stock.¹²² In a later study, Poterba and Summers (1985) exploit the British setting to assess the empirical validity of the three views on dividend taxation presented earlier in this paper. They find that throughout their whole observation period, dividend levels were positively correlated to the relative tax advantageousness of dividends compared to capital gains, in line with the old view of dividend taxation.¹²³ Ang et al. (1991) present further evidence from the two British reforms. They support the previous findings by reporting a clear investor preference for the tax-favored distribution alternative.¹²⁴ Rau and Vermaelen (2002) analyze British share repurchase programs from 1985 to 1998. They find that these programs are heavily tax driven, with a clear peak in share repurchase activity between 1994 and 1996, when repurchases were especially advantageous tax-wise.¹²⁵ However, Oswald and Young (2004) refute these results, denying that share repurchases at the time were primarily carried out due to tax reasons and explaining Rau and Vermaelen's (2002) results with considerable selection biases in their sample. According to Oswald and Young (2004), perceived underpricing is mainly responsible for the specific share repurchase patterns.¹²⁶ In two papers employing particularly long observation periods, Poterba (1987, 2004) analyzes U.S. payout taxation from 1935 to 1986 and from 1935 to 2002, respectively. In both studies, he finds solid evidence that the relative taxation of the two alternatives affects the firms' choice between distribution and retention.¹²⁷

¹²² See Poterba and Summers (1984), p. 1410.

¹²³ See Poterba and Summers (1985), p. 62.

¹²⁴ See Ang et al. (1991), p. 394.

¹²⁵ See Rau and Vermaelen (2002), p. 248 and p. 267.

¹²⁶ See Oswald and Young (2004), p. 281 and p. 284.

¹²⁷ See Poterba (1987), p. 477 and p. 482, table 6 and Poterba (2004), p. 173.

However, the use of long time series to analyze tax effects on payout policy is not without problems. The longer the observation period around a tax reform, the more likely it is that, apart from the tax environment, other factors influencing corporate distributions have also changed, which might distort possible tax effects.

The second approach tries to avoid these issues by focussing on the immediate impact of a particular tax reform in a much narrower time frame. Papaioannou and Savarese (1994) and Wu (1996) analyze the impact of the Tax Reform Act (TRA) of 1986 in the U.S. which lowered the tax rate on dividends and raised the tax rate on capital gains. Both report evidence of significant dividend increases after the reform.¹²⁸ Lie and Lie (1999) support these findings by showing that the use of share repurchases as a payout vehicle decreased substantially with the TRA 1986.¹²⁹ Ayers et al. (2002) review the U.S. Revenue Reconciliation Act (RRA) of 1993 which increased the tax burden on dividends from 31% to 39.6%. In line with the old view, they show a significantly negative influence of the RRA 1993 on dividend payouts of U.S. corporations.¹³⁰ Bell and Jenkinson (2002) analyze the dividend tax reform of 1997 in the U.K. They find significant effects of the reform on the valuation of dividends.¹³¹

One of the most widely studied tax reforms is the Jobs and Growth Tax Relief Reconciliation Act of 2003, which radically reformed the taxation of corporate payouts in the U.S. It aligned the personal tax liability on dividends and capi-

¹²⁸ See Papaioannou and Savarese (1994), p. 58 and Wu (1996), p. 297.

¹²⁹ See Lie and Lie (1999), p. 546.

¹³⁰ See Ayers et al. (2002), p. 941.

¹³¹ See Bell and Jenkinson (2002), p. 1339.

tal gains with the largest drop in the personal tax burden on dividend income in U.S. history. In the following, many researchers seized the opportunity to reassess previous findings of payout literature in the light of the JGTRRA 2003. Many studies report a decisive, positive influence of the tax cut on dividend payouts in the economy. For instance, Poterba (2004) predicts aggregate dividend payments to increase by almost a third in the long run response to the reform.¹³² Auerbach and Hassett (2005) provide an in depth, theoretical and empirical analysis of the announcement effects of the JGTRRA 2003 tax reform on firm value. They compile a set of eight critical events on which news concerning the likelihood of passage of the dividend tax cut was made public. They find positive abnormal returns for dividend paying firms whenever the reform became more likely.¹³³ In a subsequent study, Auerbach and Hassett (2006) confirm their finding of increased share prices of distributing firms following the tax reform.¹³⁴ Chetty and Saez (2005) probe the influence of the JGTRRA on the aggregated dividends distributed in the economy. They find a significant increase in dividend initiations as well as the overall extent of distribution activity. They calculate a tax elasticity of dividend distributions of about -0.5, indicating a half percent rise in the economy wide dividend volume for every percent of tax relief.¹³⁵ Moser (2007) shows, by adopting and extending Lie and Lie's (1999) analysis of payout channels to the observation period from 1986 to 2004, that the popularity of different payout alternatives fluctuates with the effective tax regime. He finds a significantly neg-

¹³² See Poterba (2004), p. 174.

¹³³ See Auerbach and Hassett (2005), p. 17 and p. 20.

¹³⁴ See Auerbach and Hassett (2006), p. 123.

¹³⁵ See Chetty and Saez (2005), p. 803, figure 2, p. 811, figure 6 and p. 813.

ative relation between the dividend tax penalty and the probability for a firm to distribute its earnings via dividends.¹³⁶ Brown et al. (2007) show that after the tax cut of 2003, firms substituted share repurchases for dividends, in line with the changing tax advantageousness of the two alternatives.¹³⁷ Blouin et al. (2011) simultaneously estimate managers' and shareholders' response to the JGTRRA 2003 tax cut. They find that both parties reacted in line with the changing tax advantageousness of payouts. Corporate insiders increased their holdings of dividend-heavy stocks while dividends were increasingly used as means of payout after the reform.¹³⁸

Although the evidence supporting the notion of increasing dividends induced by the tax cut is vast, there are some studies that question the impact of the JGTRRA 2003 on corporate payout. Julio and Ikenberry (2004) confirm that the reform entailed an increase both in dividend initiations and the aggregated amounts of dividends distributed. But, in reference to Fama and French's (2001) observation of disappearing dividends, they underline that these reappearing dividends can not wholly be attributed to the tax cut because payouts already started to increase before the government's plans of reducing taxes became public.¹³⁹ However, Chetty and Saez (2006) respond to Julio and Ikenberry's (2004) doubts by pointing to problems concerning their data structure. After making the necessary adjustments, Chetty and Saez (2006) show a clear surge in dividends directly

¹³⁶ See Moser (2007), p. 1009.

¹³⁷ See Brown et al. (2007), p. 1954.

¹³⁸ See Blouin et al. (2011), p. 904.

¹³⁹ See Fama and French (2001), p. 6 and Julio and Ikenberry (2004), p. 94.

connected to the reform.¹⁴⁰ Brav et al. (2008) provide further evidence that dividends rose sharply after the JGTRRA 2003. However, they also report that share repurchases, the payout alternative relatively tax-disadvantaged by the reform, increased even more after the tax cut. Brav et al. (2008) conclude that this development is hard to explain with taxation as a main driver of corporate payout policy.¹⁴¹ Edgerton (2010) argues that the increasing payouts after the reform were not primarily caused by the tax cut, but rather a natural consequence of increasing earnings and increasing investor demand for dividends during the years after the reform.¹⁴²

More recently, some studies have followed an international approach, turning away from traditional single-country analyses and increasing tax-heterogeneity through the inclusion of tax systems from multiple jurisdictions, oftentimes in combination with longer time frames. Von Eije and Megginson (2008) provide some evidence for tax effects in their sample of 4153 companies from 15 states in the European Union from 1989 to 2005. Interestingly, they report a positive effect of advantageous dividend taxation on the probability to pay dividends but a negative effect on the amount of dividends distributed.¹⁴³ Jacob and Jacob (2012) analyze a broad panel of 6,035 firms from 25 countries over the period from 1990-2008. They find clear evidence for tax effects in line with the old view of dividend taxation, which is robust to various forms of alternative specification strategies. They report a tax effect on corporate payout in line with previous

¹⁴⁰ See Chetty and Saez (2006), p. 126.

¹⁴¹ See Brav et al. (2008), p. 385 and p. 386, figure 3.

¹⁴² See Edgerton (2010), p. 27 and p. 29.

¹⁴³ See von Eije and Megginson (2008), p. 369 and p. 371.

long-term estimates.¹⁴⁴

Overall, most of the empirical studies on tax systems and tax reforms seem to agree to the notion that taxes do matter for managerial decisions. Although there is some debate on the results and the effectiveness of particular tax reforms, there is compelling empirical evidence from international, long-term analyses that generally confirms corporate reactions in line with the old view of dividend taxation.

2.6.2 Empirical evidence from surveys

Another well-established approach to analyze the connection between taxes and payouts is to survey financial decisionmakers. The method is especially popular in empirical tax research as it generates specific data where conventional data sources oftentimes fail as tax-information is usually not publicly available. In his groundbreaking study, Lintner (1956) provides evidence that U.S. managers follow a very careful and conservative dividend policy. Shareholders generally interpret dividend cuts as a very negative sign and thus, dividends are only raised when managers expect to be able to continue the increased payouts in the future. Specifically, Lintner finds that most firms pursue a rather fixed target payout rate which is only adjusted when managers expect severe changes in the firm's long term growth path. Taxes play a residual role and only influence distributions through reducing the earnings available for payout. Based on these findings, Lintner constructs a simple model which properly describes the distribution policy of corporations.¹⁴⁵ Fama and Babiak (1968) reassess Lintner's findings and test

¹⁴⁴ See Jacob and Jacob (2012), p. 18 and p. 20.

¹⁴⁵ See Lintner (1956), p. 99 and p. 107.

several alternative formulations of the model on simulated data. They generally confirm the validity of Lintner's approach but propose some modifications which slightly enhance the model's explanatory power.¹⁴⁶ Almost 50 years after Lintner's (1956) study, Brav et al. (2005) reconfirm Lintner's findings in a survey of 384 U.S. managers. Dividend policy is still rather conservative, distributions strongly depend on previous years' values and share repurchases are used as a more flexible instrument for distribution. However, they are unable to confirm the importance of a target payout ratio.¹⁴⁷ Goergen et al. (2005) analyze the dividend policy of German firms. They show that, despite the aforementioned aversion to reduce dividends, over 80% of German firms omit their dividend the year after incurring a loss, indicating that, internationally, dividends might not be as sticky as in the U.S. However, they also point out that most of the firms return to their previous payout level within the next two years.¹⁴⁸ Michaely and Roberts (2012) provide empirical evidence that the stock markets' negative reaction to dividend cuts discussed above effectively curtails financial managers' dividend decision. They show that public firms' payout policy is much more conservative than the payout policy of private firms which are not subject to the stock market reaction.¹⁴⁹

The payout theories presented in earlier sections of this paper have intensively been tested in the survey literature. In their analysis, Baker et al. (1985), question 318 managers from different U.S. industries. They show that dividends are actively used for signaling and to reduce agency costs. Concerning taxes, they re-

¹⁴⁶ See Fama and Blacomin (1968), p. 1155 and p. 1160.

¹⁴⁷ See Brav et al. (2005), p. 499 and p. 501.

¹⁴⁸ See Goergen et al. (2005), p. 388 and p. 392.

¹⁴⁹ See Michaely and Roberts (2012), p. 726 and p. 730.

port that the majority of managers does not view their shareholders' tax status as important for their distribution decision.¹⁵⁰ Abrutyn and Turner (1990) indirectly let 163 U.S. managers evaluate different theoretical explanations of the dividend puzzle by asking for their judgement on statements representing established theories on corporate payout. They find that only 18% of their respondents agreed that shareholder taxation influences their payout policy. Contrary to Baker et al. (1985), they assert that none of the prevalent theories can convincingly describe the dividend policy of the firms analyzed.¹⁵¹ Frankfurter et al. (2002) provide confirming evidence for Abrutyn and Turner's (1990) findings from Germany. They survey 420 managers of listed German corporations and show that a significant fraction of the answers is ambivalent or inconsistent. Most managers do not see taxes as a first-order determinant of their dividend policy. Frankfurter et al. (2002), too, conclude that the available models are insufficient to describe observed dividend policy.¹⁵² Brav et al. (2005) have also analyzed the importance of the established drivers behind corporate payout. They are unable to provide evidence for signaling-, agency- or clientele effects in their sample. Tax effects only play a minor role.¹⁵³ Chiang et al. (2006) analyze dividend perception from a shareholder's perspective. Of the 122 professional investors that responded to their survey, 79% disagree with the notion that tax reforms will not affect the payout policy of the firms invested in. This evidence in favor of the importance of taxes possibly indicates a differential perception of dividend taxes

¹⁵⁰ See Baker et al. (1985), p. 79 and p. 82.

¹⁵¹ See Abrutyn and Turner (1990), p. 494.

¹⁵² See Frankfurter et al. (2002), p. 205, table 1 and p. 208.

¹⁵³ See Brav et al. (2005), p. 507.

by financial managers and their shareholders. However, Chiang et al. (2006) still conclude that none of the traditional academic hypotheses satisfyingly explains the shareholders' demand for dividends.¹⁵⁴

More recently, hybrid approaches between the impact analysis of tax reforms discussed earlier and traditional management surveys have become quite popular. Frankfurter et al. (2008) survey 1206 managers from Germany, Hong-Kong, Turkey, the U.K. and the U.S. on their dividend perception and use these findings to explain the increase in dividend activity around the JGTRRA 2003. They conclude that, although taxes may have driven part of the dividend response, other factors must have played an important role as well.¹⁵⁵ To complement their findings on the JGTRRA 2003 discussed above, Brav et al. (2008) also conduct a survey, asking 328 U.S. financial executives about the determinants of their dividend decision. In accordance with their empirical findings, taxes do seem to play a role for corporate payouts, but their importance is relatively small compared to other influences. For most managers, dividend stability is more important than the tax opportunity generated by the reform.¹⁵⁶

To summarize, studies surveying managers mostly report a strong tendency to stable dividends and conservative dividend policy. Many surveys report problems to explain dividend changes with established theories. Taxes, if at all, do seem to be only of secondary importance in the payout decision of financial managers.

¹⁵⁴ See Chiang et al. (2006), p. 68, table 1 and p. 77.

¹⁵⁵ See Frankfurter et al. (2008), p. 41.

¹⁵⁶ See Brav et al. (2008), p. 387.

2.7 Conclusion

Differential taxation of dividends and capital gains provides one possible explanation for corporate payout policy. However, the decision between distribution and retention is also influenced by various factors inside and outside the firm apart from taxes. Managers might use payouts to signal information to their shareholders, to reduce agency costs and to cater to their shareholders' behavioral needs. Literature surveying financial managers frequently confirms that taxes represent only one, oftentimes rather minuscule, of many determinants of their payout decision. This multiplicity of influences makes it difficult to empirically identify the exact nature of the relation between taxes and payouts. Nevertheless, there is compelling evidence of tax influences on corporate payouts provided by empirical analyses of real tax systems and the impact of tax reforms. On aggregate, firms seem to react to tax cuts by increasing their overall use of the tax-favored payout channel, in line with the old view of payout taxation.

Chapter 3

The influence of tax regimes on distribution policy of corporations – evidence from German tax reforms¹⁵⁷

3.1 Introduction

For decades, the relation between payout taxes and firms' distribution policy has been one of the most debated questions in the literature on corporate finance and business taxation. At first, it was not clear why firms paid out tax disadvantaged dividends at all. Miller and Modigliani (1961) show that, under the assumption of perfect markets, dividends and capital gains are literally the same and distribution policy is irrelevant.¹⁵⁸ However, under many corporate tax systems worldwide, a clearly preferential tax treatment of capital gains compared to dividends can be observed.¹⁵⁹ In the neoclassical world of the irrelevance theorem, the implications of this market imperfection are clear. Asymmetric taxation of

¹⁵⁷ Chapter 3 is based on the unpublished working paper Schanz and Theßeling (2012a). Earlier versions of the paper were presented at the European Accounting Association conference in Rome 2011, the American Accounting Association conference in Denver 2011, the VHB conference in Kaiserslautern 2011 and in various seminars at the WHU – Otto Beisheim School of Management in Vallendar.

¹⁵⁸ See Miller and Modigliani (1961), p. 414.

¹⁵⁹ See La Porta et al. (2000), p. 14, table 3.

the two alternatives makes distribution policy relevant and in this case, dividend payments can not be an optimal policy in equilibrium.¹⁶⁰ Consequently, a firm should not pay out any dividend to its shareholders, leading to Black's (1976) famous "dividend puzzle".¹⁶¹ Since then, the dividend puzzle was largely explained by non-tax reasons along signaling theories, agency theories and behavioral theories of dividends.¹⁶²

In the last years, the analysis of changes in taxation and their influence on the behavior of market participants has received renewed interest amongst scientists.¹⁶³ The Jobs and Growth Tax Relief Reconciliation Act (JGTRRA) of 2003 in the United States created a valuable opportunity for research in a setting of a natural experiment, exploited by numerous recent papers. From a theoretical perspective, there are two major schools of thought on the impact of tax reforms on firms' distributions, coming to different conclusions due to their differential assumptions. The "traditional view" of dividend taxation predicts a corporate reaction to changes in tax rates, while the "new view" of dividend taxation predicts no reaction. Many studies analyzing the JGTRRA 2003 find evidence for influences on firms' payout policy which they specifically attribute to tax effects.¹⁶⁴ However, the reform of the year 2003 in the U.S. was temporary in nature. Under these

¹⁶⁰ See Brennan (1970), p. 424.

¹⁶¹ See Black (1976), p. 5.

¹⁶² See Allen and Michaely (2003) for an extensive overview over the relevant literature.

¹⁶³ There are a number of studies analyzing different tax reforms, mostly from the U.K. and the U.S. See Poterba and Summers (1984) and Ang et al. (1991) for an analysis of British tax policy from 1955 to 1981, Lie and Lie (1999) for the Tax Reform Act of 1986 in the U.S., Ayers et al. (2002) for the Revenue Reconciliation Act of 1993 in the U.S. and Bell and Jenkinson (2002), who analyze the tax reform of 1997 in the U.K.

¹⁶⁴ See, to present only a few exemplary studies out of the vast literature, Poterba (2004), p. 174; Chetty and Saez (2005), p. 813; Chetty and Saez (2006), p. 125; Auerbach and Hassett (2006), p. 123; Moser (2007), p. 1009 and Brown et al. (2007), p. 1940.

circumstances, even the new view predicts changes in corporate payout behavior. This makes it difficult to assess whether the new view, or the old view of dividend taxation lie at the foundation of the observed effects.

In Germany, the institutional environment differs from the U.S. and the U.K. for several reasons, making Germany a unique and interesting setting for a new analysis of corporate payout behavior. For an empirical study on the economic theories driving the payout reactions to tax reforms, these two differences are the most striking: First, both German tax reforms, the switch from a split-rate tax system with full imputation to a shareholder relief system in 2002 and the change to a flat tax system in 2009 were permanent in scope and had a profound impact on the investors' tax burden. Because of the two systematic reforms and a number of additional tax rate changes in the observation period, the German setting shows an exceptionally high level of heterogeneity in the taxation of dividends and capital gains. This heterogeneity exists over time, but also between different types of investors. Second, already starting a decade before and peaking at about the time of the reform, the German stock market underwent a period of change, both in structure and size. During the nineties, facilitated by a number of structural and legal reforms steadily improving transparency and investor protection, the German equity markets slowly but continuously developed in the direction of U.S. and U.K. stock markets, turning into a more market oriented financial system with stock markets gradually opening for smaller shareholders.¹⁶⁵

¹⁶⁵ Another minor difference refers to the timing of dividend payments. In Germany, dividends are distributed once per year in contrast to quarterly U.S. payments. This might result in different market reactions to dividend payments, e.g. regarding signaling effects or agency effects.

This development is well documented in the literature. La Porta et al. (1998) quantize investor protection in 49 countries and develop their influential Anti Directors Rights Index (ADRI).¹⁶⁶ In subsequent publications, stronger shareholder protection was connected to, *inter alia*, higher dispersion of ownership as in La Porta et al. (1999) and higher dividend payouts as in La Porta et al. (2000).¹⁶⁷ In the original ADRI measure, comparing the legal rules of the years 1993 and 1994, Germany scored only 1 out of 6 points, one of the lowest scores in the whole sample, while the U.S. and the U.K. both scored 5 points.¹⁶⁸ However, many authors emphasize that much has changed in German corporate governance since then and that the poor rating is not longer justified.¹⁶⁹ Indeed, the German stock market has opened for smaller investors. Nowak (2004) shows that the number of direct shareholders grew by about 65% from 1988 to 2002 and that the number of individuals invested in investment funds more than tripled in the five years from 1997 to 2002.¹⁷⁰

According to the outcome agency model of dividends,¹⁷¹ this development has implications for German firms' payouts. Increased investor protection should result in higher overall payouts, as shareholders have more power to force companies to distribute excess earnings. Further, in a setting like this, cash flow signaling theory also predicts higher payouts to overcome information asymmetries between

¹⁶⁶ See La Porta et al. (1998), p. 1126.

¹⁶⁷ See La Porta et al. (1999), p. 491 and La Porta et al. (2000), p. 19.

¹⁶⁸ It should be noted that there is an ongoing debate about the quality of the legal data constituting the ADRI of La Porta et al. (1998). For the original observation period, Spamann (2010) presents a corrected version of the index.

¹⁶⁹ See Schmidt (2004), p. 407 and Nowak (2004), p. 425.

¹⁷⁰ See Nowak (2004), p. 427.

¹⁷¹ See La Porta et al. (2000), p. 5.

managers and new, supposedly relatively uninformed small shareholders.¹⁷² In fact, when looking at aggregate payouts of all firms listed, combined dividends and share repurchases grew from about 8.9 billion Euros in 1995 to about 69.9 billion Euros in 2005.¹⁷³

In this special setting of combined reforms of the tax system and the corporate governance system, our research question is to find out if the two German tax reforms influenced the way these increased distributions were carried out. This enables us to assess whether economic theory along the traditional view or the new view of dividend taxation better describes the observable reality in Germany. We examine the payout policy of the whole set of firms that constitute the German stock index Composite DAX (CDAX) each year since its introduction in 1993. The CDAX includes all German firms listed at the Frankfurt stock exchange. We find evidence that the two tax reforms of 2002 and 2009 led to significant changes in German firms' payout policy. The reform of 2002 reduced the tax advantageousness of dividends compared to capital gains for many investors. The reform of 2009 aligned the tax burden on the two alternatives for all investors. The dividend yield, the likelihood to pay a dividend and the likelihood to initiate dividend payments are significantly and positively correlated to the relative tax advantageousness of dividends compared to capital gains, while scaled share repurchases, the likelihood to repurchase shares and the likelihood to initiate share repurchase programs are significantly and negatively correlated.

¹⁷² See Battacharya (1979), p. 260.

¹⁷³ This immense growth is heavily influenced by German Banks starting to trade with their own shares after the year 1998. However, excluding the financial sector, total payouts still grew by more than 360% from 5.3 billion Euros in 1995 to 19.2 billion Euros in 2005.

These results are in line with the traditional view of dividend taxation.

Of course, there exist studies addressing the influence of taxation on payout behavior in Germany. In their international study of 33 countries, La Porta et al. (2000) also analyze the effect of the German legal system on agency theory explanations of dividend policy.¹⁷⁴ Goergen et al. (2005) find evidence for a higher flexibility of German distribution decisions.¹⁷⁵ Amongst 14 other countries in the European Union, von Eije and Megginson (2008) also cover Germany and find evidence of a tax effect on payout policy in their sample.¹⁷⁶ Jacob and Jacob (2012) provide the most comprehensive international survey of tax-induced effects on payout policy to date by analyzing firms from 25 countries including Germany. They find robust evidence for tax effects in line with the traditional view of dividend taxation.¹⁷⁷ There is a recent study by Kaserer et al. (2012) that presents an in-depth analysis of changes in payout policy after the German tax reform of 2002. However, they focus primarily on the effect of insiders or large stockholders on German firms' payout reaction to the tax cut. Consequently, they don't go into too much detail in their discussion of the German tax system and rely on a simple post-reform-dummy for their analysis.¹⁷⁸ However, with this approach, all explaining heterogeneity in the German tax system is effectively

¹⁷⁴ See La Porta et al. (2000), p. 4 and p. 14, table 3.

¹⁷⁵ See Goergen et al. (2005), p. 388 and p. 392.

¹⁷⁶ See von Eije and Megginson (2008), p. 369.

¹⁷⁷ See Jacob and Jacob (2012), p. 18.

¹⁷⁸ See Kaserer et al. (2012), p. 97.

ignored.¹⁷⁹ To some extent or another, all of these studies lack a detailed modeling of the German tax environment concerning dividends and capital gains. Either they focus on different questions and cover tax implications on dividend policy aside their main analysis, or they have to model the tax environment in a rather simple way, oftentimes because of a broad international setting. This is especially interesting as the detailed modeling of the German tax system generates tax variables with exceptionally high heterogeneity, creating a valuable opportunity for econometric research.

The contribution of our paper is twofold. First, to the best of our knowledge, we are the first to specifically analyze tax-induced effects on payout policy during an increase in payouts due to systematic changes in the capital market environment in Germany. Second, we model the relevant decision environment of managers deciding on payout policy as detailed and closely as possible. We consider taxation of dividends and capital gains on the corporate and the personal level for three different classes of investors for each of the three tax systems in force in Germany during our observation period. Further, we weigh the computed marginal tax burdens with the shareholder structure in two different ways. In the calculation of our main tax variable θ^{firm} , we use firm-specific information on the shareholder structure, further increasing heterogeneity in the tax variable. This sets us apart from other recent papers, such as Jacob and Jacob (2012) or Kaserer et

¹⁷⁹ For example, Kaserer et al. (2012) do not consider the tax exemption for intercorporate capital gains introduced with the reform (Sørensen (2002), p. 359, table 3 and Schmidt (2004), p. 410). At that time, way over 60% of German shares were held by other German corporations and the exemption was one of the most eagerly anticipated measures of the reform (Nowak (2004), p. 437). It entailed a considerable influence on the corporate tax burden on capital gains and therefore, is an important element in the analysis of tax influences on payout policy.

al. (2012) and allows us to contribute to the question whether economics along the traditional view or the new view better describe the payout behavior of firms.

The paper will be proceeding as follows: Section 2 will give a brief overview over the literature on possible tax effects on distribution policy and develop the hypothesis. Section 3 describes the major legal reforms concerning German corporate governance and will provide a description of the legal regulations regarding the taxation of dividends and capital gains in Germany during our observation period. Section 4 presents the empirical analysis. We describe the sample and provide the univariate and multivariate analysis. In section 5, we summarize the results and provide an outlook on possible further research.

3.2 Literature review and hypothesis

In the literature, theoretical approaches for explaining tax influences on corporations' payout policy can be separated into two different views, the new view and the traditional view of dividend taxation. These two major schools of thought are classified based on different assumptions.¹⁸⁰

¹⁸⁰ In fact, under the assumption of perfect capital markets, there exists a third view of dividend taxation in the literature (Miller and Modigliani (1961), p. 425 and p. 431). The tax irrelevance view (Poterba and Summers (1985), p. 11) states that distribution policy is irrelevant because it only adjusts the weight between two equivalent alternatives. This reasoning was later extended by clientele theories which lead to irrelevance even in the presence of taxation (Black and Scholes (1974), p. 2 and p. 21). Today, the tax irrelevance view is no longer prominently discussed in the literature, as it has largely been objected by empirical evidence.

3.2.1 The new view of dividend taxation

The new view focusses on the distribution of free cash flows through dividends by mature firms.¹⁸¹ These firms have profits exceeding their investment possibilities and finance investments with retained earnings.¹⁸² Equity is literally “trapped” inside the firm, as accumulated funds can only be distributed by means of dividend payments and the tax burden on dividends is inevitable.¹⁸³ The taxation of dividends reduces a shareholders income, but at the same time, it also reduces the opportunity-cost of retention.¹⁸⁴ Thus, dividend taxation does not influence the cost of capital.¹⁸⁵ Auerbach (1979) demonstrates, using a discrete-time infinite-horizon model with differential taxation of dividends and capital gains, that dividend policy is independent from the dividend tax rate and, in the end, irrelevant for stockholders.¹⁸⁶

Under the new view, only temporary tax reforms can influence the payout decision of firms because they create one-time opportunities for payout. This was the case in the JGTRRA 2003, which was endowed with sunset provisions to revoke the tax reform after the year 2008.¹⁸⁷ However, the two tax reforms of 2002 and 2009 in Germany showed no indications of a temporary nature. Consequently, German firms should not have changed their payout policy according to the new view.

¹⁸¹ See Poterba and Summers (1985), p. 14 and Sinn (1991a), p. 29.

¹⁸² This fundamental assumption of the new view of dividend taxation was pioneered by Gordon (1959), King (1974a), King (1974b) and King (1977).

¹⁸³ See Zodrow (1991), p. 498.

¹⁸⁴ See Sørensen (1995), p. 283.

¹⁸⁵ See Bradford (1981), p. 18 and Auerbach (1983), p. 925.

¹⁸⁶ See Auerbach (1979), p. 441.

¹⁸⁷ Until today, the act has been prolonged two times and is now set to expire at the end of the year 2012.

3.2.2 The traditional view of dividend taxation

In the traditional view of dividend taxation, newly issued shares are the marginal source of investment funding.¹⁸⁸ Dividend taxation influences the cost of capital in this setting, because investors compare the cash flow they receive from a stock investment to the cash flow of other possible investments.¹⁸⁹ Differential taxation of capital gains and dividends creates a preference towards the tax-favored alternative amongst the shareholders.¹⁹⁰ A reform altering the relative taxation of dividends compared to capital gains will directly influence the payout policy of firms.

When reviewing empirical literature on the impact of actual tax reforms on payouts, there is ample evidence of tax-induced reactions in the distribution policy of firms.¹⁹¹ In reaction to the JGTRRA tax reform of 2003 in the United States, Chetty and Saez (2005) report an immediate increase in total dividends of more than 20% in the first six quarters after the reform.¹⁹² Poterba (2004) further predicts a long-run increase of 31% or \$111 billion in dividend payouts.¹⁹³ Both studies directly attribute these increases to the tax reform. These reactions seemingly support the traditional view of dividend taxation. However, given the temporary nature of the tax cut, the observed increases in dividend payout can

¹⁸⁸ Early proponents of this assumption include Harberger (1962), Harberger (1966) and Shoven (1976).

¹⁸⁹ See Sinn (1991a), p. 27.

¹⁹⁰ See Sørensen (1995), p. 280.

¹⁹¹ We have already briefly mentioned some publications on different tax reforms in our introduction. For a more comprehensive overview concerning work on the JGTRRA 2003, see Dharmapala (2009) and Shackelford (2009).

¹⁹² See Chetty and Saez (2005), p. 813.

¹⁹³ See Poterba (2004), p. 174.

also be explained along the lines of the new view of dividend taxation.

Beginning in the nineties, German equity markets developed in the direction of a more market oriented financial system with stock markets continually opening for smaller shareholders. In the following years, aggregate payouts in Germany increased dramatically. The German reform of 2002 significantly reduced the advantageousness of dividends compared to capital gains. Considering prior empirical evidence on tax effects, we expect a response in line with the traditional view. Following the reform, a smaller part of the increasing German payouts should be carried out via dividends. The reform of 2009 aligned the tax burden on both distribution alternatives. Capital gains were treated less favorable than before for some investors. This should lead to an increased use of dividend payouts.

H₁: If a reform changes the relative taxation of dividends and capital gains in favor of dividends (capital gains), firms will increase (reduce) their use of dividend distributions as a means of payout.

Neither of the two German tax reforms was temporary in nature. Thus, observations along H_1 can be interpreted as an indicator that the traditional view of dividend taxation lies at the heart of payout policy responses to taxation in Germany.

3.2.3 Non-tax influences on distribution policy

Capital gains are tax advantaged compared to dividends in many tax systems, creating a preference for capital gains amongst investors and making dividend payout less attractive. The traditional view explains the resulting dividend puzzle with a simple economic opportunity-cost approach.¹⁹⁴ For various reasons not directly related to taxation, dividends intrinsically generate utility beyond their basic function of transferring invested funds back to the shareholders.¹⁹⁵ Decision-makers weigh the benefits provided by dividends against their cost, the often unfavorable taxation. The result of this cost-utility analysis defines the firms' payout rate, which is thus dependent on the tax rates. The literature under asymmetric information as well as the analysis of human behavior has produced various explanations for this mechanism. DeAngelo et al. (2008) provide an extensive survey of possible motives to pay out dividends.

One significant body of literature states for instance that managers use dividends to signal profitability to their investors. According to the signaling theory, more profitable firms will pay out higher dividends.¹⁹⁶

One of the key elements of agency theory is the likely divergence of incentives between principal and agent, inducing the danger of managerial behavior in conflict to the goal of maximized shareholder value. Monitoring this behavior generates agency costs. Dividend distributions can be used to mitigate these agency costs

¹⁹⁴ See Poterba and Summers (1985), p. 20.

¹⁹⁵ See Gerardi et al. (1990), p. 310.

¹⁹⁶ For an introduction to signaling theory, see Lintner (1956), Watts (1973), Battacharya (1979), Hakansson (1982), Miller and Rock (1985) and Bernheim and Wantz (1995).

by simply reducing the cash flows which could be sub-optimally invested by managers. However, if decision-makers own a significant part of the shares of their firm, the incentives of shareholders and managers will be better aligned and the necessity for dividends as a method of control declines. Further, the presence of strong shareholders or the financing of investments through the capital market reduce the need to pay dividends because both extensively control managerial behavior.¹⁹⁷

According to pecking order theories and life-cycle theories of dividend policy, firms preferentially finance their investments with retained earnings and in turn, managers adapt their distribution policy to the availability of advantageous investment opportunities. Particularly young, fast growing firms will retain a large proportion of their earnings to finance their investments and consequently pay lower dividends.¹⁹⁸

By relaxing assumptions such as unlimited information processing capability or perfect rationality, the relatively new field of behavioral economics provides further possible explanations for a preference towards dividends amongst investors.¹⁹⁹

¹⁹⁷ See Jensen and Meckling (1976), Rozeff (1982), Easterbrook (1984), Jensen (1986), Stulz (1990) and Allen et al. (2000) for an overview.

¹⁹⁸ Important contributions to pecking order and life-cycle theories include Myers and Majluf (1984), Myers (1984), and Grullon et al. (2002).

¹⁹⁹ See Shefrin and Statman (1984), Roll (1986), Heaton (2002), Ritter (2003), Baker and Wurgler (2004a) and Baker et al. (2007a).

3.3 Legal framework: Evolution of corporate governance and taxation in Germany

This section will present some of the key changes in German corporate governance during the slow and continuing evolution of the German financial system towards a more market based system like in the U.S. or the U.K. It will also provide a description of the legal regulations regarding the taxation of dividends and capital gains in Germany from 1993 to 2009.

3.3.1 Changes in German corporate governance after 1990

There exist a large number of different corporate governance systems around the world. Shleifer and Vishny (1997) characterize and compare possible characteristics of corporate governance systems, specifically referring to differences between the U.S. and U.K. system and the German system.²⁰⁰ Traditionally, the German financial system is viewed as a prime example of an “insider controlled and stakeholder oriented system”.²⁰¹ Edwards and Nibler (2000) argue that in the early nineties, German corporate governance strongly depended on control exerted by strong owners and banks. They show that over 50% of the firms in their sample, comprising 156 of the 200 largest firms in Germany in 1992, were controlled by an owner with a share of at least 50% and that dispersed ownership was an uncommon phenomenon.²⁰² However, beginning after the German reunification, a number of reforms led the way to higher developed stock markets, more open

²⁰⁰ See Shleifer and Vishny (1997), p. 769.

²⁰¹ See Schmidt (2004), p. 388.

²⁰² See Edwards and Nibler (2000), p. 246.

for small investors. Nowak (2004) presents a complete overview over the reforms and new institutions that redefined corporate governance and investor protection in Germany during the 1990s and the beginning of the following decade.²⁰³ For reasons of brevity, we only mention a selected few of the measures.

Over time, German authorities adopted a total of four bills directly aimed at enhancing the development of German financial markets. The First (passed on the 22nd of February, 1990), Second (26th of July, 1994), Third (24th of March, 1998) and Fourth (21st of June, 2002) Financial Market Promotion Act “Finanzmarktförderungsgesetz” introduced major changes to the system. Measures brought forward included the abolition of capital transfer and turnover taxes; the introduction of a Federal Securities Supervisory Office, the predecessor of today’s “Bundesanstalt für Finanzdienstleistungsaufsicht” (BaFin), the German equivalent to institutions like the Securities and Exchange Commission (SEC) in the U.S.; the introduction of severe penalties on insider trading and price manipulation; several improvements in disclosure, such as the introduction of mandatory ad hoc disclosure of price relevant information like major changes in stockholdings or director dealings and increased disclosure requirements concerning accounting information; the introduction of private litigation by shareholders and several regulations that advanced the use of trusts and mutual funds and augmented the use of private equity and venture capital funding in Germany. On the fifth of March 1998, the Corporate Control and Transparency Act “Gesetz zur Kontrolle und Transparenz im Unternehmensbereich” (KonTraG) was adopted. The bill

²⁰³ See Nowak (2004), p. 428.

redefined the role of German management boards and supervisory boards and introduced measures to align the number of shares and votes as well as measures to assure the independence of auditors. It also deregulated the use of share repurchases, turning them into a valid alternative to dividend payouts for the first time.

3.3.2 Taxation of dividends and capital gains in Germany

This section provides the tax framework necessary for calculating the total tax burden on dividends relative to capital gains on the shareholder level. This relation is expressed in form of the tax variable θ .²⁰⁴ To get an adequate picture of the tax environment in which distribution policy is made, the relative tax burden θ will be modeled with respect to the tax-status of three types of shareholders: individual investors without substantial interest, individual investors with substantial interest and corporate investors.²⁰⁵

In Germany, there have been two major reforms of the taxation of capital income since 1993. On the 14th of July 2000, the federal council “Bundesrat” passed the tax reduction act “Steuersenkungsgesetz” into law, which established the transfer from a split-rate full imputation system to a classical system with shareholder relief, the half-income system “Halbeinkünfteverfahren”, first effective in the assessment period of 2002. On the 6th of July 2007, the Bundesrat passed the business tax reform act of 2008 “Unternehmensteuerreformgesetz 2008”, which

²⁰⁴ See Poterba and Summers (1984), p. 1399.

²⁰⁵ In these calculations we assume that retained earnings induce appreciations of the stock at the value of the retention. A shareholder can always realize this capital gain through the sale of his share, rendering dividends and capital gains equal alternatives for distribution.

again reformed the taxation of distributions in Germany with the transfer to a flat tax system “Abgeltungsteuer” in 2009. Additionally, there have been several minor changes mostly regarding variations in the tax rates. Table 3.1 provides an overview over the evolution of individual and corporate tax rates from 1993 to 2009.

Table 3.1: Evolution of tax rates in Germany 1993-2009

This table shows the evolution of individual and corporate tax rates from 1993 on. The column *Regime* shows the effective tax system in each year. FI stands for full imputation system, HI for half-income system and FT denotes a flat tax system. The columns t_{pers}^{min} and t_{pers}^{max} show the personal income tax rate for individuals in the lowest and the highest income tax bracket, respectively. The columns t_{corp}^{ret} and t_{corp}^{dis} show the corporate income tax rates for retained and distributed profits. *Sol* depicts the rate of the solidarity surcharge imposed, *Subst* denotes the percentage of ownership that qualifies a shareholder as having substantial interest in a corporation. All values are given as percentages.

Year	Regime	t_{pers}^{min}	t_{pers}^{max}	t_{corp}^{ret}	t_{corp}^{dis}	Sol	Subst
1993	FI	19.0	53.0	50.0	36.0	0.0	25.0
1994	FI	19.0	53.0	45.0	30.0	0.0	25.0
1995	FI	19.0	53.0	45.0	30.0	7.5	25.0
1996	FI	25.9	53.0	45.0	30.0	7.5	25.0
1997	FI	25.9	53.0	45.0	30.0	7.5	25.0
1998	FI	25.9	53.0	45.0	30.0	5.5	25.0
1999	FI	23.9	53.0	40.0	30.0	5.5	10.0
2000	FI	22.9	51.0	40.0	30.0	5.5	10.0
2001	FI	19.9	48.5	25.0	25.0	5.5	10.0
2002	HI	19.9	48.5	25.0	25.0	5.5	1.0
2003	HI	19.9	48.5	26.5	26.5	5.5	1.0
2004	HI	16.0	45.0	25.0	25.0	5.5	1.0
2005	HI	15.0	42.0	25.0	25.0	5.5	1.0
2006	HI	15.0	42.0	25.0	25.0	5.5	1.0
2007	HI	15.0	45.0	25.0	25.0	5.5	1.0
2008	HI	15.0	45.0	15.0	15.0	5.5	1.0
2009	FT	15.0	45.0	15.0	15.0	5.5	1.0

Source: Based on Bundesministerium der Finanzen (2007): Datensammlung zur Steuerpolitik Ausgabe 2007, Neuaufgabe 2008, Berlin; German tax codes.

With the corporate tax reform act “Körperschaftsteuerreformgesetz” of 1976, the then effective classical corporate tax system was replaced with a new full imputation system. The aim of the reform was to eliminate the double taxation of corporate profits by crediting the corporate taxes paid on the firm level against

the income tax liability of the shareholders. In case of a dividend distribution, the shareholder received the dividend and a tax credit corresponding to the corporate tax payment. In effect, the corporate tax burden was completely neutralized and the total tax burden equaled the marginal income tax rate of the particular shareholder. Capital gains did not qualify for a tax credit. However, capital gains were not taxable in Germany if the shareholder privately held a minor share in the company, i.e. his share of voting stock was smaller than the threshold for substantial interest and if the investor held the asset long enough to exceed the speculative period.²⁰⁶ An individual investor with substantial interest receiving a dividend faced exactly the same tax liability as a shareholder without substantial interest. Capital gains, however, were reclassified as business income and were subject to full personal income tax. Under these circumstances, the tax burden on capital gains in Germany was comparably high and the German tax code provided different measures of relief. However, all these options were either marginal or entailed strict requirements or limitations, technically resulting in only minor reductions of the tax burden.²⁰⁷ Dividend distributions to corporations were generally treated in the same way as dividends distributed to individual investors

²⁰⁶ We assume a holding period exceeding the respective speculative period for the calculations in this paper.

²⁰⁷ Until 1999, it was allowed to apply a reduced rate of 50% of the particular average personal income tax rate on capital gains stemming from the sale of a substantial share of a corporation. However, this relief was only applied to capital gains below 15 million Deutsche Mark (DM). Given a threshold for substantial interest of 25% at the time and an average goodwill of around 380 million Euros in the sample, the effect of this option is negligible for the calculation of the marginal tax burden. Further, the so called fifth-part rule "Fünftelregelung" alleviated the burden of unfavorable progression-peaks by mathematically distributing the taxable capital gain over a period of five years. Here, a relief only occurred, if the investor was not already in the maximum tax bracket. The German tax code also granted an allowable deduction of 20,000 DM. But this deduction was multiplied by the fraction of the share of the corporation that was sold and bounded by an upper limit. Because of these heavy constraints, these measures are not explicitly modeled in this paper.

with substantial interest under the German full imputation system. Capital gains stemming from the sale of shares of resident corporations were taxed as ordinary business income, subject to the full corporate tax rate on both levels. They did not qualify for a tax credit in the imputation system. This led to a relatively high burden for corporations, too.

Passed in the year 2000, the tax reduction act “Steuersenkungsgesetz” installed the half-income system, a classic system with shareholder relief. It was first effective for shareholders in 2002, the first year in which distributions of earnings generated under the new corporate tax law were possible. The primary goal of the reform was to reduce personal and corporate tax rates in order to strengthen the competitiveness of the German tax system. Under the new system, the problem of double taxation was solved by the combined effect of lower tax rates and a partial exemption of distributions from the tax base of the shareholder. In case of an investor without substantial interest receiving dividend income, the total tax burden on the shareholder level consisted of the new uniform corporate tax, and the personal tax rate levied on 50% of the dividend. The combined burden was comparable to the burden on income from other sources. As in the preceding full imputation system, the disposal of privately held shares was not taxable, so the tax burden on capital gains consisted of the corporate tax only. Conceptually, the new tax code was designed to implement an identical tax burden on dividends and capital gains. Therefore, apart from the case presented above, the two alternatives were treated equally. This was achieved by recognizing only 50% of all capital gains as taxable income. For investors with substantial interest, the tax burden

on dividends and capital gains was calculated in the same way, as a combination of the full corporate tax and the personal tax, levied on 50% of the respective income. The problem of double or multiple taxation of distributions between corporations was solved by the “dividend privilege”. Dividends paid from one corporation to another were exempt from tax. This regulation applied to foreign and domestic dividends alike and was not bound to any form of minimum share or holding period. However, 5% of the dividend received were deemed as non-deductible business expense and had to be taxed by the receiving corporation. Moreover, corporate capital gains from the disposal of shares were also 95% tax-free, resulting in an equal treatment of dividends and capital gains for corporate investors.

With the business tax reform act “Unternehmensteuerreformgesetz 2008”, the shareholder relief system was abolished in favor of a new flat tax system effective for shareholders from the first of January 2009. The aim of the reform was to continually increase Germany’s attractiveness as a business location, to provide neutrality regarding the legal form and the financing structure of firms and to simplify tax planning for both, firms and the government. The new system is designed as a classical corporate tax system with a flat tax rate for individual investors with non-substantial interest. The problem of double taxation of distributed corporate profits is mitigated by a reduced rate on the shareholder level. First, the corporate income tax is levied on the full corporate profit. Second, a flat rate of 25% is applied to all income from dividends and capital gains received by individuals privately holding shares. For investors with substantial interest, a

partial inclusion system is applied. In addition to the corporate tax, 60% of all income from dividends or capital gains is taxed at the personal income tax rate, the remaining 40% of income are exempt from taxation. If another corporation is the shareholder, dividends as well as capital gains are not taxed, as in the former system. Again, 5% of the distribution are deemed as non-deductable business expense and subject to corporate tax at the receiving corporation. Table 3.2 shows the tax burden for all three types of shareholders under the different German tax regimes from 1993 until 2009.

Table 3.2: Tax burden in Germany 1993-2009

This table shows the tax burden for individual investors without substantial interest, for individual investors with substantial interest and for corporate investors since 1993. The column *Year* shows the year in which the shareholder acquires the distribution. Earnings generated and taxed on the corporate level in year t are distributed and taxed on the shareholder level in year $t + 1$. The column *Regime* shows the tax system effective on the shareholder level in each year. FI stands for full imputation system, HI for half-income system and FT denotes flat tax system. t_{div}^{min} stands for the total tax burden on dividends on the shareholder level, received by a shareholder in the minimum tax bracket. t_{div}^{max} denotes the same for a shareholder in the maximum tax bracket. t_{cg}^{min} and t_{cg}^{max} stand for the total tax burden on capital gains received by a shareholder in the minimum or maximum tax bracket, respectively. The columns t_{div} and t_{cg} show the burden on dividends and capital gains for the corporation retaining the payment. All values are given as percentages.

Year	Regime	Individual investor without substantial interest				Individual investor with substantial interest				Corporate investor	
		t_{div}^{min}	t_{div}^{max}	t_{cg}^{min}	t_{cg}^{max}	t_{div}^{min}	t_{div}^{max}	t_{cg}^{min}	t_{cg}^{max}	t_{div}	t_{cg}
1993	FI	19.0	53.0	51.9	51.9	19.0	53.0	61.0	77.4	50.0	75.9
1994	FI	19.0	53.0	50.0	50.0	19.0	53.0	59.5	76.5	45.0	72.5
1995	FI	20.4	57.0	45.0	45.0	20.4	57.0	56.2	76.3	48.4	71.6
1996	FI	27.8	57.0	48.4	48.4	27.8	57.0	62.7	77.8	48.4	73.3
1997	FI	27.8	57.0	48.4	48.4	27.8	57.0	62.7	77.8	48.4	73.3
1998	FI	27.3	55.9	48.4	48.4	27.3	55.9	62.5	77.2	47.5	72.9
1999	FI	25.2	55.9	47.5	47.5	25.2	55.9	60.7	76.8	42.2	69.6
2000	FI	24.2	53.8	42.2	42.2	24.2	53.8	56.2	73.3	42.2	66.6
2001	FI	21.0	51.2	42.2	42.2	21.0	51.2	54.3	71.8	42.2	66.6
2002	HI	34.1	45.2	26.4	26.4	34.1	45.2	34.1	45.2	27.3	27.3
2003	HI	34.1	45.2	26.4	26.4	34.1	45.2	34.1	45.2	27.4	27.4
2004	HI	34.0	45.1	28.0	28.0	34.0	45.1	34.0	45.1	28.9	28.9
2005	HI	32.2	42.7	26.4	26.4	32.2	42.7	32.2	42.7	27.3	27.3
2006	HI	32.2	42.7	26.4	26.4	32.2	42.7	32.2	42.7	27.3	27.3
2007	HI	32.2	43.9	26.4	26.4	32.2	43.9	32.2	43.9	27.3	27.3
2008	HI	32.2	43.9	26.4	26.4	32.2	43.9	32.2	43.9	27.0	27.0
2009	FT	38.0	38.0	38.0	38.0	23.8	39.8	23.8	39.8	16.5	16.5

3.3.3 The relative tax burden

To analyze the effect of different tax regimes on the distribution policy of corporations, a variable depicting the taxation of the alternatives a manager faces in his decision process is needed. In the literature, the relative tax burden θ is often calculated by relating the marginal tax rates on dividends (t_{div}) and capital gains (t_{cg}) on the shareholder level to each other:²⁰⁸

$$\theta = \frac{1 - t_{div}}{1 - t_{cg}}$$

In this equation, a value of one indicates equal taxation of dividends and capital gains, while values below one indicate a preferential treatment of capital gains. The relative tax burden θ will change with time, depicting the influence of tax reforms through tax rates and regimes described in the previous section.²⁰⁹ Table 3.3 shows the evolution of the tax variable θ in Germany from 1993 until 2009.

However, in most tax systems, the tax variable θ will fluctuate not only with time, but also between different groups of shareholders. Different values of θ result in dissimilar preferences amongst the groups concerning the way corporate earnings should be distributed. These differences pose a potential problem for managers deciding upon the optimal distribution policy of their company. They have only one tool, the decision between either retention or distribution of earnings, to satisfy multiple, possibly conflicting demands. In this setting, reasonable managers will make their decision considerate of the actual structure of their shareholders'

²⁰⁸ See King (1974b), p. 23 and Poterba (1987), p. 475.

²⁰⁹ See Li (2007), p. 8.

Table 3.3: Evolution of the tax variable θ in Germany 1993-2009

This table shows the evolution of the tax variable θ in Germany for individual investors without substantial interest, for individual investors with substantial interest and for corporate investors from 1993 on. The column *Year* shows the year in which the shareholder acquires the distribution. Earnings generated and taxed on the corporate level in year t are distributed and taxed on the shareholder level in year $t + 1$. The column *Regime* shows the effective tax system in each year. FI stands for full imputation system, HI for half-income system and FT denotes flat tax system. θ shows the relative taxation of dividends to capital gains for different groups of shareholders. *min* and *max* denote shareholders in the minimum and maximum tax bracket, while *nsub* stands for individual investors without substantial interest, *sub* for individual investors with substantial interest and *corp* for corporate investors.

Year	Regime	Individual investor without substantial interest		Individual investor with substantial interest		Corporate investor
		θ_{nsub}^{min}	θ_{nsub}^{max}	θ_{sub}^{min}	θ_{sub}^{max}	θ_{corp}
1993	FI	1.683	0.977	2.078	2.078	2.078
1994	FI	1.620	0.940	2.000	2.000	2.000
1995	FI	1.447	0.782	1.818	1.818	1.818
1996	FI	1.398	0.833	1.937	1.937	1.937
1997	FI	1.398	0.833	1.937	1.937	1.937
1998	FI	1.408	0.854	1.937	1.937	1.937
1999	FI	1.424	0.839	1.904	1.904	1.904
2000	FI	1.312	0.799	1.730	1.730	1.730
2001	FI	1.367	0.845	1.730	1.730	1.730
2002	HI	0.895	0.744	1.000	1.000	1.000
2003	HI	0.895	0.744	1.000	1.000	1.000
2004	HI	0.916	0.763	1.000	1.000	1.000
2005	HI	0.921	0.778	1.000	1.000	1.000
2006	HI	0.921	0.778	1.000	1.000	1.000
2007	HI	0.921	0.763	1.000	1.000	1.000
2008	HI	0.921	0.763	1.000	1.000	1.000
2009	FT	1.000	1.000	1.000	1.000	1.000

tax status.²¹⁰ Therefore, the decision has to be based on a weighted tax variable θ^* , an average of the values of θ_j for the s different groups of shareholders of each company, weighted by their respective relative magnitude in the shareholder structure of the company w_j .²¹¹

$$\theta^* = \sum_{j=1}^s w_j \theta_j$$

As observable in table 3.3, the values of the relative tax burden θ for corporations and individual investors holding a substantial share of stock in the form of busi-

²¹⁰ See Lie and Lie (1999), p. 536.

²¹¹ See Bernheim and Wantz (1995), p. 539 and Poterba (2004), p. 171.

ness property are identical. Both of these investor classes have to tax their income from distributions as business income. For the sake of simplicity, we pool them into the class “commercial investors”. This leaves us with two classes of investors, individual investors without substantial interest and commercial investors. We assume the marginal individual investor holding a non-substantial share in the company ($nsub$) to be in the highest tax bracket (max), leaving θ_{nsub}^{max} as the relevant tax variable for this class. The relevant tax variable for commercial investors is θ_{corp} .

To be able to adequately depict the decision environment around distribution policy, we employ two different strategies to weigh our tax variable. First, we use the variable *Closely* as a proxy for each firm’s shareholder structure and individually weigh the two tax variables for each firm.²¹² Corresponding to our definition of commercial investors, *Closely* includes shares held by other corporations and shares held by individuals holding more than 5%. Also, it explicitly excludes shares held in a fiduciary capacity by banks or other financial institutions, correctly attributing these shares to individual investors. By weighing the tax variable for commercial investors, θ_{corp} , with *Closely* and the tax variable for individual investors without substantial interest, θ_{nsub}^{max} , with $(1 - Closely)$, we attain the firm-specific tax variable θ^{firm} . Unfortunately, *Closely* is not a perfect weight for our needs, as the threshold of 5% does not exactly equal the percentage that qualifies as substantial interest and the variable also includes

²¹² The variable *Closely* corresponds to the WorldScope variable “Closely Held Shares” (ID: 05475) divided by “Common Shares Outstanding” (ID: 05301).

shares of shareholders not clearly attributable to one of our classes.²¹³ As table 3.1 denotes, the threshold for substantial interest decreased from 25% in 1993 to 1% from 2002 on. However, as the misclassified shareholders should not react uniformly to tax reforms, this increased noise introduced by the lack of precision of the variable should bias our results against finding significant tax effects on payout policy.

Second, to strengthen our results against concerns connected with the firm-specific weights used in the calculation of θ^{firm} , we present an alternative proxy for a firm's shareholder structure. Similar to the approach of Poterba (2004), we utilize aggregate data from macroeconomic financing statistics provided by the German central Bank "Bundesbank" to calculate a tax variable for a German firm with an average shareholder structure, θ^{avg} .²¹⁴ The statistics show the total holdings of German stocks by different sectors. We subsume the sectors of private households and other domestic financial institutions, which mainly consist of investment funds that in turn are primarily held by private households, under the investor class of individual investors. The holdings of all other sectors are subsumed under the class of commercial investors, namely non-financial domestic corporations, domestic financial institutions and insurance institutions and public authorities. For both investor classes, we determine the fraction of the shares held in the respective sectors on the total shares held in Germany.²¹⁵ Similar to

²¹³ According to its description, the variable also includes "shares held by officers, directors and their immediate families; shares held in trust and shares held by pension/benefit plans".

²¹⁴ See Poterba (2004), p. 171.

²¹⁵ The holdings of foreign investors are not modeled in this paper and are therefore excluded from the calculation.

the calculation of θ^{firm} presented above, these fractions serve as our weights w_{nsub}^{max} and w_{corp} when calculating the average tax variable θ^{avg} . Table 3.4 shows each year's mean of the firm-specific tax variable θ^{firm} , as well as each year's value for the average tax variable θ^{avg} .

Table 3.4: Firm-specific tax variable and average tax variable in Germany 1993-2009

This table shows the development of the firm-specific tax variable and the average tax variable for German firms from 1993 on. The column *Year* shows the year in which the shareholder acquires the distribution. Earnings generated and taxed on the corporate level in year t are distributed and taxed on the shareholder level in year $t + 1$. The column *Regime* shows the effective tax system in each year. FI stands for full imputation system, HI for half-income system and FT denotes flat tax system. θ_{nsub}^{max} and θ_{corp} depict the relevant tax variables for the investor classes of individual investors and commercial investors, respectively. θ_{mean}^{firm} shows the mean of the firm-specific tax variable. w_{nsub}^{max} and w_{corp} depict the weights used for the investor classes of individual investors and corporate investors in the calculation of the average tax variable. θ^{avg} shows the tax variable for a firm with an average shareholder structure in Germany.

Year	Regime	θ_{nsub}^{max}	θ_{corp}	θ_{mean}^{firm}	w_{nsub}^{max}	w_{corp}	θ^{avg}
1993	FI	0.977	2.078	1.615	0.280	0.720	1.770
1994	FI	0.940	2.000	1.550	0.274	0.726	1.709
1995	FI	0.782	1.818	1.348	0.266	0.734	1.542
1996	FI	0.833	1.937	1.467	0.274	0.726	1.634
1997	FI	0.833	1.937	1.392	0.293	0.707	1.613
1998	FI	0.854	1.937	1.376	0.306	0.694	1.605
1999	FI	0.839	1.904	1.325	0.343	0.657	1.539
2000	FI	0.799	1.730	1.171	0.355	0.645	1.399
2001	FI	0.845	1.730	1.176	0.327	0.673	1.440
2002	HI	0.744	1.000	0.845	0.331	0.669	0.915
2003	HI	0.744	1.000	0.847	0.342	0.658	0.912
2004	HI	0.763	1.000	0.860	0.337	0.663	0.920
2005	HI	0.778	1.000	0.866	0.336	0.664	0.925
2006	HI	0.778	1.000	0.858	0.345	0.655	0.923
2007	HI	0.763	1.000	0.874	0.326	0.674	0.922
2008	HI	0.763	1.000	0.882	0.268	0.732	0.936
2009	FT	1.000	1.000	1.000	0.269	0.731	1.000

Source: Calculated using data from Deutsche Bundesbank (2010): Ergebnisse der gesamtwirtschaftlichen Finanzierungsrechnung für Deutschland 1991 bis 2009, Statistische Sonderveröffentlichung 4, Frankfurt am Main.

When looking at the development of the two tax variables over the years, the impact of the tax reforms is clearly visible. The reform of 2002 significantly reduced the disadvantageous taxation of capital gains for individual investors with substantial interest and corporate investors by alleviating the former double

taxation of capital gains on the corporate level and the shareholder level. This results in a decline in the mean value of θ^{firm} of around 28% and a decline of θ^{avg} of more than 36% between 2001 and 2002. The reform of 2009 abolished the beneficial taxation of capital gains for individual investors without substantial interest. This aligned the tax burden on dividends and capital gains for all investors. Consequently, both tax variables show a value of 1 for this year.

3.4 Empirical analysis

3.4.1 Sample

We examine the whole set of firms that constitute the German stock index CDAX, which includes all German firms listed at the Frankfurt stock exchange, for the period from 1993 until 2009. We choose this sample for two reasons. First, the year 1993 is the year the CDAX was introduced by the Frankfurt stock exchange as a broader alternative to the established German stock index DAX, which includes the 30 largest German firms only. Second, in the empirical literature about the impact of tax reforms there is evidence that the behavioral adjustment to a change in tax regimes takes a considerable amount of time. Feldstein (1970) shows that in the first year after the British tax reform of 1958, only 43% of the adjustment took place.²¹⁶ Miller and Scholes (1982) note that the analysis of short run responses to dividends faces timing problems because the alternative of capital gains is traditionally realized over longer timescales.²¹⁷ Poterba (2004, 174) predicts that in a period of three years after the reform of dividend taxation

²¹⁶ See Feldstein (1970), p. 63.

²¹⁷ See Miller and Scholes (1982), p. 1138.

by the JGTRRA 2003 in the U.S., only a quarter of the adjustment process to the new equilibrium will have occurred.²¹⁸ Our time horizon covers 9 years before and 8 years after the fundamental reform of the taxation of distributions in 2002. This allows us to draw meaningful conclusions about the long term impact of the reform. By considering every firm existing for at least one year in the period from 1993 to 2009, we avoid possible issues of survivorship bias in our sample.²¹⁹ In our observation period, a total of 931 firms was included in the CDAX at one time or the other, providing us with 10,129 firm-years. We collect capital market and financial statement data from the September 2010 edition of the WorldScope database.²²⁰ We eliminate all firm-years with missing data for at least one variable, which leaves us with 6,371 observations. Finally, to reduce the impact of outliers on our findings, we truncate the 1st and/or 100th percentile, as theoretically plausible, which brings us to our final sample of 5,646 firm-year observations. Table 3.5 summarizes the composition of our sample and the necessary adjustments.²²¹

²¹⁸ See Poterba (2004), p. 174.

²¹⁹ See Elton et al. (1996) for a literature overview concerning survivorship bias in the empirical analysis of stocks and estimates of the impact of survivorship bias.

²²⁰ We use the following items (the respective WorldScope ID's are given in parentheses): Total Assets (02999), Total Debt (03255), Market Price - Year End (05001), Common Shares Outstanding (05301), Market Capitalization (08001), Closely Held Shares (05475), Common Equity (03501), Pre-tax Income (01401), Cash Dividends Paid (04551) and Common/Preferred Stock Redeemed, Retired, Converted, etc. (04751).

²²¹ Because of exceptional capital structures and special regulations for banks and insurance companies possibly affecting payout behavior, many studies exclude financial firms from their sample (Fama and French (2001), p. 6; Amihud and Li (2006), p. 639 and Moser (2007), p. 1000). However, about 16% of our observations are from the financial sector and German financial firms traditionally are substantial dividend payers, commonly included in shareholders' portfolios. Because of the significant weight of this subgroup, we opt to include these observations in our sample. We have run all regressions excluding firms from the financial sector, excluding firms from the utility sector and excluding both, financial and utility firms. In all cases, the results do not change significantly.

Table 3.5: Composition of the sample and adjustments

This table shows the composition of our sample of all firms listed at the Frankfurt stock exchange (CDAX) from 1993 until 2009 and the adjustments due to missing data and outliers. In each step, the number of remaining observations is given.

CDAX, 1993-2009: 931 firms	Observations
Total	10,129
Elimination due to missing data	
Cash Dividends Paid	-2,491
Pre-tax Income	-377
Market Price - Year End	-432
Closely Held Shares	-450
Total Debt/Total Assets	-6
Market Capitalization/Common Equity	-2
Total	6,371
Handling of outliers	
Truncation of the 1. and/or 100. percentile (Cash Dividends Paid, Pre-tax Income, Market Price - Year End, Closely Held Shares, Total Debt/Total Assets, Market Capitalization/Common Equity)	-725
Total	5,646

Source: WorldScope, September 2010.

Our sample includes a broad set of German firms from different sectors. Panel A of table 3.6 provides a breakdown of firm-years by sectors, divided using the first digit of the Standard Industrial Classification (SIC). With almost 48% of the firm-years observed, the manufacturing sector is the largest by far. Over 82% of all firms are active in the manufacturing, service or financial sector. Panel B of table 3.6 gives an overview over a selection of basic firm parameters. The average firm in our panel possesses total assets of over 12.7 billion Euros and has a market capitalization of just over 2 billion Euros. Of course, these high numbers are heavily influenced by huge financial firms like the “Allianz SE” or the “Deutsche Bank AG”, with total assets of around one and two trillion Euros in 2008, respectively. The values for the 75th percentile show that three quarters

Table 3.6: Selected firm characteristics

This table shows selected characteristics of the firms in our sample. Panel A describes the breakdown of observed firm-years to different sectors. The division was carried out by using the Standard Industrial Classification (SIC), the relevant divisions are given in parentheses. *Agr./Min.* stands for Agriculture, Forestry, and Fishing and Mining (Division A and B), *Constr.* stands for Construction (Division C), *Manuf.* stands for Manufacturing (Division D), *Utility* stands for Transportation, Communications, Electric, Gas, and Sanitary Services (Division E), *Trade* stands for Wholesale Trade and Retail Trade (Division F and G), *Finance* stands for Finance, Insurance, and Real Estate (Division H), *Service* stands for Services (Division I), *Admin.* stands for Public Administration (Division J). Panel B provides some basic parameters of firms in our sample. All monetary variables are deflated by the consumer price index. *n* indicates the number of observations for each variable. *MarketCap.* denotes the Market Capitalization, *TA* stands for Total Assets, *TDebt* denotes Total Debt, *Op.Inc.* stands for Operating Income, *EPS* denotes Earnings per Share and *DPS* denotes Dividends per Share.

Panel A: Observations by sectors

Sector	Agr./Min.	Constr.	Manuf.	Utility	Trade	Finance	Service	Admin.
	54	94	2,703	353	507	945	990	0

Panel B: Basic firm parameters (in thousands of Euros)

Variable	n	Mean	S.D.	Min	.25	Mdn	.75	Max
Market Cap.	5,646	2,062,645	7,860,176	190	37,918	146,284	709,352	213,793,904
TA	5,646	12,731,075	76,716,360	742	69,668	236,596	1,287,620	2,193,953,000
TDebt	5,642	4,413,065	28,148,502	0	3,834	32,859	212,100	605,997,100
Op.Inc.	5,579	134,183	714,929	-5,605,000	-3,194	3,748	35,902	15,383,000
EPS	5,640	1.3731	53.9175	-1,570	-0.0700	0.5275	1.7665	3,184.5000
DPS	5,646	0.8246	2.6950	0.0000	0.0000	0.1800	0.6832	71.4273

of the sample observations possess a market capitalization lower than 709 million Euros and total assets below 1.29 billion Euros, with median values of more than 52% and 18% for earnings and dividends per share, respectively.

3.4.2 Descriptive statistics

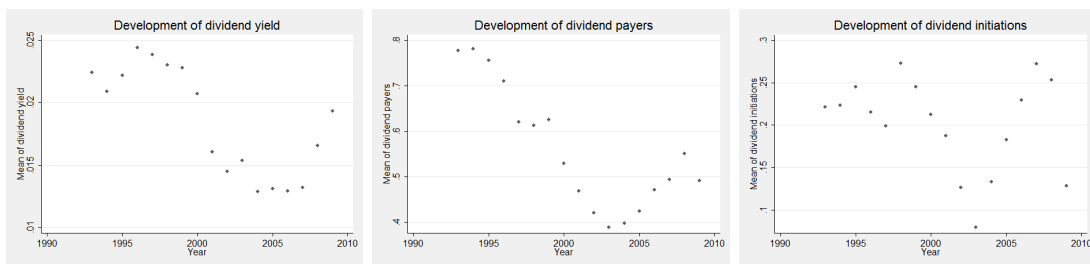
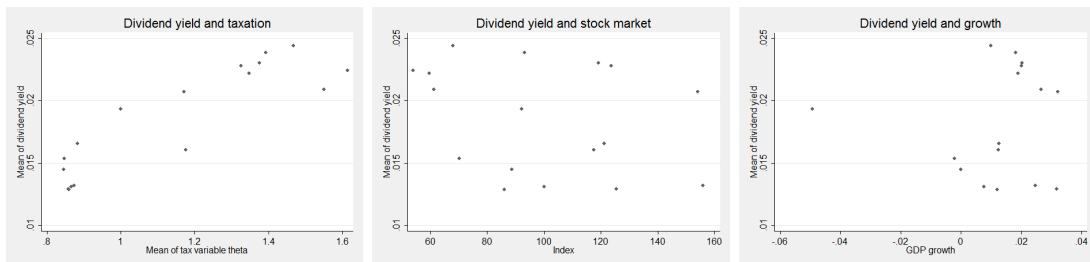
We use a set of reliable and well established variables to test our hypotheses and control for major non-tax influences on distribution policy. As dependent variable, we use three different measures of dividend payments in our regressions.²²² Our first measure is *Divyield*, which simply expresses the dividend yield, calculated by dividing the total dividends paid by a company by its market capitalization extracted at the 31st of December in each year. The mean of this measure is about 1.8%, with minimum and maximum values at 0% and 9.6%, respectively. These values reflect the traditional high dividend yield of German firms. The second measure we employ is *Divpaid*, a dummy variable that equals 1 if a firm paid a dividend in a given year. The mean shows that over our whole sample, almost 60% of the firms are dividend payers. Our third measure of dividend payout is *Divinit*, a dummy with the value 1 for firms that initiated payments. We define an initiation as a positive payment preceded by no payment or, in line with Chetty and Saez (2005), as an intensive increase in dividend payout of at least 20%.²²³ In more than one fifth of the firm-years in our sample, firms have initiated or raised dividend payments by at least 20%. The development of our measures of dividend payments over time is illustrated in panel A of figure 3.1.

²²² See Chetty and Saez (2005), p. 800 and p. 809; Brav et al. (2008), p. 383 and Jacob and Jacob (2012), p. 11.

²²³ See Chetty and Saez (2005), p. 830.

Figure 3.1: Development of dividend measures

Panel A provides an overview over the development of the means of our three dividend measures, the dividend yield $Divyield$, the number of dividend payers $Divpaid$ and the number of dividend initiations $Divinit$, over time. Panel B plots the dividend yield $Divyield$ against each year's mean of the firm-specific tax variable θ^{firm} , against $Index$, a national all-share price index taken from OECD.stat and against $GDPgrowth$, the yearly change in gross domestic product, also taken from OECD.stat.

Panel A: Development of the dividend measures**Panel B: Controlling for stock market and growth effects**

The first figure of panel A shows the development of the mean of the dividend yield over time. Two observations are especially interesting. First, there is a step drop of the mean dividend yield from around 2.25% in the years before 2000 to around 1.5% after the year 2000, exactly at the time the tax reduction act “Steuersenkungsgesetz” passed, which severely reduced the advantageous taxation of dividends compared to capital gains.²²⁴ The correlation between the mean of the dividend yield and time is negative and highly significant. Second, there is

²²⁴ Aggregate, unscaled dividends rose between 12 years and only declined between 4 years in our sample period. The severe drop after the tax reform is also very noticeable here with two consecutive years of decline. However, the values recovered rather quickly and continued on their growth path after the year 2004.

a steep increase in dividend yield in the years after 2008, when the business tax reform act “Unternehmensteuerreformgesetz 2008” passed and aligned the tax treatment of the two alternatives. However, this seems to be an effect mainly driven by falling stock prices during the economic crisis rather than an increase in dividend payouts. The second figure plots the mean of *Divpaid*, our dummy variable indicating whether dividends have been paid or not. In Germany, the fraction of firms paying dividends is traditionally very high. Over 80% of the firms in our sample paid a dividend in 1993. However, the plot clearly shows a declining trend, with only 39% of firms paying dividends in 2003. As we have shown in table 3.4, the values of our tax variables θ^{firm} and θ^{avg} have been declining until 2008 as well, rendering distributions via dividends less favorable from year to year. Taxation provides one possible explanation for the disappearance of dividend paying firms in Germany.²²⁵ Finally, the third figure shows the evolution of the mean of *Divinit*, our dividend initiation dummy. Especially remarkable in this figure is the steep increase in initiations from about 20% in 1997 to almost 27.5% in 1998, the continual descent to a value of only 8% during the time of the reform and the return to values of the same magnitude as before the reform shortly thereafter. It can be argued that firms anticipated the upcoming reform and

²²⁵ Fama and French (2001) present an additional explanation with evidence from their U.S. sample from 1926 to 1999. They attribute the disappearance of dividend paying firms to a change in the status of the marginal firm in their sample and a generally lower propensity to pay dividends for all firms (see Fama and French (2001), p. 7, figure 1, p. 19 and p. 24). This effect is probable for Germany as well. The first half of our observation period is characterized by a steady increase in the number of firms through new listings. According to life-cycle approaches to dividend policy, these young firms are not likely to pay out dividends. With the burst of the “dotcom” bubble in 2000, many of these newly listed firms disappeared and the fraction of dividend payers once again rose to a (significantly lower) level of about 50%. We control for this influence by implementing measures of growth in our multivariate analysis.

preliminary distributed a significant amount of their reserves to take advantage of the favorable conditions for dividends prior to the reform of 2002.²²⁶ Overall, the figures show characteristics of a negative impact on our dividend measures around the year 2002, when the reform of the taxation of capital income took place.

However, there are possible explanations for reduced dividend payments during this period besides the tax reform. The burst of the U.S. “dotcom” bubble in the year 2000 hit Germany with some delay and it is possible that the following economic slump dampened payouts. To address this possibility, panel B of figure 3.1 controls for stock market and growth effects by plotting our dividend measure *Divyield* against each year’s mean of θ^{firm} , against *Index*, a national all-share price index taken from OECD.stat and against *GDPgrowth*, the yearly change in gross domestic product, also taken from OECD.stat. The first figure shows a positive relation between the means of θ^{firm} and the dividend yield that is statistically significant at the 1% level. The other two relations are not significant at conventional levels of confidence. These results confirm our univariate findings of tax effects in line with the traditional view of dividend taxation around the reform of 2002. However, the conclusions taken from these figures can only serve as a sign post because of the small sample size of only 16 and 17 observations. The following multivariate analysis will provide much broader evidence.

To control for the most prominent non-tax influences on distribution policy, we

²²⁶ German authorities tried to avert this effect by implementing a transition period of 15 years in which earnings retained and taxed at the higher rate before the reform still qualified for the old tax credit when distributed after the reform. However, many firms still opted to pay out their reserves as soon as possible.

subject our regressions to a set of control variables. To control for signaling, we include the variable *Income*, representing the pre-tax income divided by total assets. Concerning agency effects, we include the variable *Closely*, which includes shares held by insiders, substantial shareholders and other corporations in order to account for possible influences of executive stock holdings or strong shareholders on dividend payouts.²²⁷ We further include *Lev*, representing Total Debt divided by Total Assets, to control for the influence of external financing on distributions. Finally, to control for the impact of growth and investment opportunities on payouts, we introduce the variables *Trend*, representing the development of share prices over the last year and *Q*, which stands for Tobin's *Q* or market capitalization divided by common equity, into our regressions.

All monetary variables are deflated by the consumer price index, taken from the OECD.stat online database and scaled by total assets, following Fama and French (1998) and Fama and French (2002).²²⁸ To allow for easier interpretation, total dividends paid and total shares repurchased are scaled by market capitalization, giving the dividend yield and share repurchase yield, respectively. We lag our scale variables by one year to account for the causality of the assets of period t for the dividends and share repurchases of period $t + 1$. Descriptive statistics for all the variables used in our regressions are presented in table 3.7, table 3.8 provides the correlation matrix.

²²⁷ The variable *Closely* is also used to weigh the different tax variables in the calculation of θ^{firm} . The two variables show a correlation coefficient of 0.6745. Variance inflation factors remain well below 8. Nevertheless, to check for possible effects of high multicollinearity, we have also estimated all regressions excluding *Closely*. The coefficients of our tax variable does barely change, sign and significance remain the same in all regressions.

²²⁸ See Fama and French (1998), p. 822 and Fama and French (2002), p. 7.

Table 3.7: Descriptive statistics of regression variables

This table provides descriptive statistics for the variables used in the multivariate analysis. The column *Expsign* presents the sign expected for the coefficients of the multivariate analysis. *Divyield* stands for Cash Dividends Paid scaled by Market Capitalization, *Divpaid* is a dummy variable that equals 1 if a firm paid out a dividend and *Divinit* is a dummy variable that equals 1 if a firm has initiated dividend payments or raised its dividend for at least 20%. *Income* denotes Pre-tax Income and is scaled by Total Assets, θ^{firm} is the firm-specific tax variable, θ^{avg} is the average tax variable, *Trend* is the relative change between Market Price - Year End in t and $t - 1$, *Closely* denotes Closely Held Shares, *Lev* stands for Total Debt divided by Total Assets, *Q* stands for Tobin's Q. The index $t - 1$ indicates a variable that is lagged by one year.

Variable	n	Mean	S.D.	Min	.25	Mdn	.75	Max	Expsign
Divyield	5,646	0.0185	0.0211	0.0000	0.0000	0.0128	0.0322	0.0963	
Divpaid	5,646	0.5925	0.4914	0.0000	0.0000	1.0000	1.0000	1.0000	
Divinit	5,613	0.2117	0.4085	0.0000	0.0000	0.0000	0.0000	1.0000	
Income _{$t-1$}	5,646	0.0329	0.1474	-1.1488	0.0016	0.0392	0.0949	0.7462	+
θ^{firm}	5,646	1.0836	0.3368	0.7442	0.8355	0.9439	1.3381	1.9311	+
θ^{avg}	5,646	1.1788	0.3026	0.9124	0.9201	0.9363	1.5387	1.6344	+
Trend _{$t-1$}	5,646	0.0342	0.4933	-0.9309	-0.2609	-0.0097	0.2388	2.4737	-
Closely _{$t-1$}	5,646	0.4663	0.3287	0.0000	0.1443	0.5037	0.7499	0.9955	-
Lev _{$t-1$}	5,646	0.2065	0.1920	0.0000	0.0315	0.1671	0.3279	0.8508	-
Q _{$t-1$}	5,646	2.2546	2.0786	-3.9200	1.0800	1.6800	2.7000	17.4100	-

3.4.3 Regression analysis

To test our main hypothesis of a positive relation between the tax variables θ^{firm} and θ^{avg} and our three measures of dividend payments, *Divyield*, *Divpaid* and *Divinit*, we employ standard ordinary least squares panel regressions with firm fixed effects. In order to avoid problems due to heteroscedasticity, we use robust standard errors throughout all our regressions. Specifically, we test the following regression equation:

$$\begin{aligned}
 Div_{i,t} = & \alpha_0 + \alpha_i + \beta_1 Income_{i,t-1} + \beta_2 \theta_{(i),t} + \beta_3 Trend_{i,t-1} + \beta_4 Closely_{i,t-1} \\
 & + \beta_5 Lev_{i,t-1} + \beta_6 Q_{i,t-1} + \varepsilon_{i,t}
 \end{aligned}$$

Table 3.8: Correlation Matrix

This table provides the correlation matrix for the variables used in the multivariate analysis. *Divyield* stands for Cash Dividends Paid scaled by Market Capitalization, *Divpaid* is a dummy variable that equals 1 if a firm paid out a dividend and *Divinit* is a dummy variable that equals 1 if a firm has initiated dividend payments or raised its dividend for at least 20%. *Income* denotes Pre-tax Income and is scaled by Total Assets, θ^{firm} is the firm-specific tax variable, θ^{avg} is the average tax variable, *Trend* is the relative change between Market Price - Year End in t and $t - 1$, *Closely* denotes Closely Held Shares, *Lev* stands for Total Debt divided by Total Assets, *Q* stands for Tobin's Q. The index $t - 1$ indicates a variable that is lagged by one year. Significance levels are given in parentheses.

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) Divyield	1.0000									
(2) Divpaid	0.7341 (0.0000)	1.0000								
(3) Divinit	0.3269 (0.0000)	0.4800 (0.0000)	1.0000							
(4) $Income_{t-1}$	0.3020 (0.0000)	0.3634 (0.0000)	0.2316 (0.0000)	1.0000						
(5) θ^{firm}	0.1573 (0.0000)	0.2295 (0.0000)	0.0504 (0.0000)	0.1072 (0.0000)	1.0000					
(6) θ^{avg}	0.1672 (0.0000)	0.2057 (0.0000)	0.0566 (0.0000)	0.1030 (0.0000)	0.6937 (0.0000)	1.0000				
(7) $Trend_{t-1}$	-0.0017 (0.8935)	0.1298 (0.0000)	0.1815 (0.0000)	0.3109 (0.0000)	0.0087 (0.4951)	0.0142 (0.2278)	1.0000			
(8) $Closely_{t-1}$	0.1019 (0.0000)	0.1546 (0.0000)	0.0199 (0.1075)	0.0992 (0.0000)	0.6745 (0.0000)	0.1057 (0.0000)	0.0247 (0.0532)	1.0000		
(9) Lev_{t-1}	0.0461 (0.0001)	0.0147 (0.2031)	-0.0119 (0.3065)	-0.0721 (0.0000)	-0.0272 (0.0212)	0.0046 (0.6737)	-0.0526 (0.0000)	-0.0192 (0.1044)	1.0000	
(10) Q_{t-1}	-0.1048 (0.0000)	0.0629 (0.0000)	0.0794 (0.0000)	0.1657 (0.0000)	0.1172 (0.0000)	0.1876 (0.0000)	0.2496 (0.0000)	0.0470 (0.0001)	-0.1200 (0.0000)	1.0000

where $\theta_{(i),t}$ stands for either the firm-specific tax variable $\theta_{i,t}^{firm}$ or the average tax variable θ_t^{avg} and $Div_{i,t}$ stands for one of the dividend measures $Divyield_{i,t}$, $Divpaid_{i,t}$ or $Divinit_{i,t}$ for firm i in year t . The first three columns of table 3.9 show the results of the regressions using the firm-specific tax variable θ^{firm} . The results are in line with tax effects according to the traditional view of dividend taxation. In the regression on *Divyield*, presented in column (1), the coefficient for θ^{firm} is positive and statistically significant at the 1% level. A relative increase in the tax burden on dividends, compared to the burden on capital gains as, for example, in the German tax reform of 2002, has a negative influence on the dividend yield of German firms. A decline of θ^{firm} by a value of 0.33, approximately the average value of the decline caused by the reform of 2002,²²⁹ will reduce the average dividend yield by about 0.0018 or about 9.7% of the mean dividend yield of 0.0185 in our sample. To control for possible signaling effects, we introduced the control variable *Income*. Its coefficient is positive and highly significant, consistent with the notion of profitable firms paying higher dividends to signal their profitability brought forward in the literature. Further, in order to control for agency effects, we included *Closely* and *Lev*. Both coefficients are negative and significant at the 5% or the 1% level, respectively. This is consistent with the notion of executive stockholdings and outside control through stock markets both reducing the need for dividend payouts as a measure of managerial control, presented in the agency literature. Finally, we included *Trend* and *Q* to account for possible effects of growth and investment opportunities, as stated in

²²⁹ Between 2001 and 2002, the mean of θ^{firm} declined by a value of 0.331. See table 3.4 for reference.

pecking order and life-cycle theories. In line with the literature, both coefficients are negative and highly significant at the 1% level. Fast growing firms with good investment opportunities pay out significantly lower dividends.

Table 3.9: Taxation and dividend distribution 1993-2009

This table shows the results of the fixed effects panel regressions of our three measures of dividend distribution behavior. The first three columns present the results using the firm-specific tax variable, the last three columns present the results using the average tax variable. Columns (1) and (4) present the results for *Divyield*, which stands for Cash Dividends Paid scaled by Market Capitalization. Columns (2) and (5) present the results for *Divpaid*, a dummy variable that equals 1 if a firm paid out a dividend. Columns (3) and (6) present the results for *Divinit*, a dummy variable that equals 1 if a firm has initiated dividend payments or raised its dividend by at least 20%. *Income* denotes Pre-tax Income and is scaled by Total Assets, θ^{firm} is the firm-specific tax variable, θ^{avg} is the average tax variable, *Trend* is the relative change between Market Price - Year End in t and $t - 1$, *Closely* denotes Closely Held Shares, *Lev* stands for Total Debt divided by Total Assets, Q stands for Tobin's Q. The index $t - 1$ indicates a variable that is lagged by one year. One star, two stars and three stars denote significance at the 10%, 5% and the 1% level, respectively. Robust standard errors are given in parentheses.

Variable	Firm-specific tax variable			Average tax variable		
	(1) Divyield	(2) Divpaid	(3) Divinit	(4) Divyield	(5) Divpaid	(6) Divinit
$Income_{t-1}$	0.0309*** (0.0029)	0.6051*** (0.0606)	0.3986*** (0.0518)	0.0307*** (0.0029)	0.6020*** (0.0608)	0.3979*** (0.0520)
θ^{firm}	0.0055*** (0.0018)	0.1620*** (0.0404)	0.0721** (0.0286)			
θ^{avg}				0.0053*** (0.0016)	0.1540*** (0.0328)	0.0641** (0.0253)
$Trend_{t-1}$	-0.0037*** (0.0004)	-0.0032 (0.0102)	0.0898*** (0.0137)	-0.0035*** (0.0004)	0.0004 (0.0102)	0.0911*** (0.0137)
$Closely_{t-1}$	-0.0070*** (0.0018)	-0.1805*** (0.0427)	-0.0760** (0.0337)	-0.0040** (0.0015)	-0.0896** (0.0353)	-0.0359 (0.0315)
Lev_{t-1}	-0.0088*** (0.0031)	-0.2600*** (0.0814)	-0.1926*** (0.0636)	-0.0084*** (0.0031)	-0.2486*** (0.0806)	-0.1884*** (0.0636)
Q_{t-1}	-0.0010*** (0.0002)	0.0052 (0.0045)	0.0031 (0.0038)	-0.0011*** (0.0002)	0.0029 (0.0045)	0.0023 (0.0039)
Constant	0.0191*** (0.0019)	0.5233*** (0.0394)	0.1857*** (0.0320)	0.0174*** (0.0022)	0.4778*** (0.0430)	0.1706*** (0.0365)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,646	5,646	5,613	5,646	5,646	5,613
Adjusted R ²	0.516	0.624	0.115	0.517	0.625	0.115
F-statistic	30.19	28.00	30.26	30.15	28.52	30.35
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

The results for our second measure of dividend payout, the dummy variable *Divpaid* indicating positive dividend payments, is presented in column (2). Again, the coefficient of the tax variable θ^{firm} is positive and significant at the 1% level.

A reduction of θ^{firm} of 0.33, which is about equal to one standard deviation of θ^{firm} , reduces the fraction of dividend payers by about 0.053 or 8.9% of the sample mean. As observable in column (3), the coefficient for the measure of dividend initiations *Divinit* is positive and significant at the 5% level with a t-value of 2.521. A reduction of θ^{firm} in the magnitude of the tax reform 2002 lowers the likelihood of a firm to initiate dividend payments by about 0.024 or 11.3% of the sample mean. The columns (4) to (6) present the regressions using the average tax variable θ^{avg} . The results do not change considerably. As in the regressions before, the coefficients of our tax measures are all positive and highly significant. The coefficients of the control variables also show similar characteristics as in the regressions using θ^{firm} .

In our regressions on the dividend yield and the payout dummy, we obtain exceptionally high values for the adjusted R^2 of over 51.6% and 62.4%, respectively. This is because we opt to include the firm fixed effects in the calculation of the coefficient of determination. There are good reasons to do this. In our sample, models using only firm dummies as explanatory variables for *Divyield* and *Divpaid* already explain 47.60% and 58.99% of the variability in the data. This is in line with the overall notion in the literature that dividend policy is very conservative and that dividends are “sticky”. Present dividend policy is very dependent on the policy in the past.²³⁰ This high consistency in a firm’s dividend policy explains why simple firm dummies serve as a very good explanatory variable for dividend payouts. The inclusion of other explanatory variables such as θ^{firm} ,

²³⁰ See Lintner (1956), p. 99 and p. 107.

θ^{avg} or *Income* mainly helps to better explain the fluctuations around this rather constant level of payouts. Dividend initiations, however, are not constantly recurring events by nature. Consequently, when analyzing regressions on the initiation dummy *Divinit*, firm fixed effects only produce an adjusted R^2 of 7.51%.

3.4.4 Robustness: share repurchases

Institutionalized share repurchase programs are the most important alternative to dividend distributions.²³¹ Brav et al. (2008) show that after a surge of activity in the mid 1990's, aggregate share repurchases exceed the sum of dividends paid in the U.S. today.²³² For a deeper understanding of the effects of taxation on payout policy, and to further back up the evidence presented in the previous paragraphs, we will take a brief look at tax implications on share repurchases. If a shareholder receives income from the disposal of his shares in a share repurchase program, the difference between the acquisition costs and the share price the repurchase offers has to be taxed as a capital gain. Looking at our tax variables θ^{firm} and θ^{avg} , a reduction of dividend taxes will reduce the relative advantageousness of repurchases. Following the traditional view of dividend taxation, firms will reduce their payouts via share repurchases after a dividend tax cut. We expect a negative sign for the tax variables in the regressions.

In Germany, share repurchases were heavily restricted for the most part of the 20th century and were only deregulated in 1998 with the enactment of the Cor-

²³¹ For an introduction to the literature on share repurchases as a payout vehicle in general and tax influences on share repurchases in special, see Dittmar (2000), Grullon and Ikkenberry (2000), Jagannathan et al. (2000), Grullon and Michaely (2002), Brav et al. (2005) and Pick et al. (2009).

²³² See Brav et al. (2008), p. 386, figure 3.

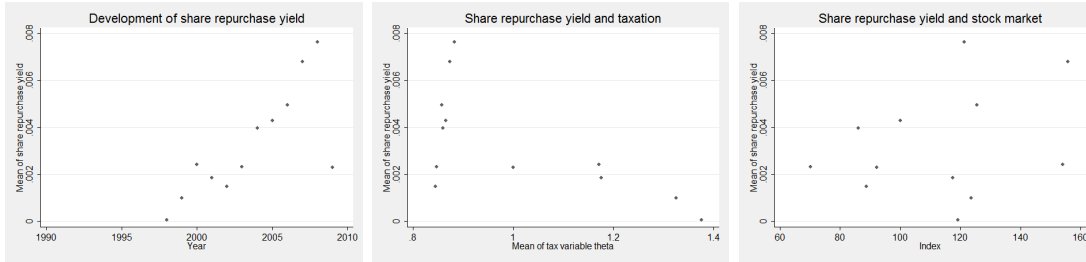
porate Control and Transparency Act (KonTraG). Because of this, we eliminate all firm-years prior to 1998, leaving us with a sample of 3,337 firm-years for our regressions on share repurchases. We employ the same methodology as in the dividend regressions before, and test three different measures of share repurchases. *Repyield* is the share repurchase yield and is calculated by scaling the total shares repurchased by a firm by its market capitalization. *Reppaid* is a dummy variable that equals 1 if a firm repurchased shares and *Repinit* is a dummy variable that equals 1 if a firm has initiated share repurchases or raised its repurchases by at least 20%. Compared to dividend payouts, share repurchases are still a fairly rare phenomenon in Germany. In our sample, the mean of the share repurchase yield, *Repyield*, is only 0.27% with a maximum at about 4.3%. In the years from 1998 to 2009, we identify 416 firm-years with active share repurchase programs, implying a mean of 12.5% for *Reppaid*. In 289 of our firm-years, share repurchase programs were initiated or extended by at least 20%, the mean value for *Repinit* is about 8.8%.²³³

Table 3.10 shows the development of the mean of the share repurchase measure *Repyield* and the results of the fixed effects panel regressions of our three share repurchase measures. Panel A presents some univariate analyses. The first figure shows the development of the mean of the share repurchase yield over time. Apparently, share repurchases in Germany only started in the year 1998. From then, the share repurchase yield grew each year, except for a minor slow-down in the years 2001 and 2002, possibly in conjunction with the difficult situation on

²³³ Due to spatial limitations, we do not report full univariate statistics on our share repurchase measures. These data are available upon request.

Table 3.10: Taxation and share repurchases 1998-2009

This table provides an overview over our univariate and multivariate analysis of share repurchases from 1998 to 2009. The first graph in panel A shows the development of the mean of the share repurchase measure *Repyield*, which stands for the share repurchase yield or Common/Preferred Stock Redeemed, Retired, Converted, Etc. scaled by Market Capitalization. The two following graphs provide plots of *Repyield* against each year's mean of the firm-specific tax variable θ^{firm} and against *Index*, a national all-share price index taken from OECD.stat. Panel B shows the results of the fixed effects panel regressions of our three measures of share repurchases. The first three columns present the results using the firm-specific tax variable, the last three columns present the results using the average tax variable. Columns (1) and (4) present the results for *Repyield*. Columns (2) and (5) present the results for *Reppaid*, a dummy variable that equals 1 if a firm repurchased shares. Columns (3) and (6) present the results for *Repinit*, a dummy variable that equals 1 if a firm has initiated share repurchases or raised its repurchases by at least 20%. *Income* denotes Pre-tax Income and is scaled by Total Assets, θ^{firm} is the firm-specific tax variable, θ^{avg} is the average tax variable, *Trend* is the relative change between Market Price - Year End in t and $t - 1$, *Closely* denotes Closely Held Shares, *Lev* stands for Total Debt divided by Total Assets, *Q* stands for Tobin's Q. The index $t - 1$ indicates a variable that is lagged by one year. One star, two stars and three stars denote significance at the 10%, 5% and the 1% level, respectively. Robust standard errors are given in parentheses.

Panel A: Share repurchase measure *Repyield***Panel B: Regression results**

Variable	Firm-specific tax variable			Average tax variable		
	(1) Repyield	(2) Reppaid	(3) Repinit	(4) Repyield	(5) Reppaid	(6) Repinit
$Income_{t-1}$	0.0129*** (0.0048)	0.2489*** (0.0783)	0.2264*** (0.0592)	0.0130*** (0.0047)	0.2524*** (0.0774)	0.2277*** (0.0590)
θ^{firm}	-0.0042*** (0.0013)	-0.1007*** (0.0331)	-0.0282 (0.0231)			
θ^{avg}				-0.0052*** (0.0014)	-0.1349*** (0.0353)	-0.0419* (0.0239)
$Trend_{t-1}$	0.0006 (0.0006)	-0.0115 (0.0155)	-0.0022 (0.0129)	0.0006 (0.0006)	-0.0133 (0.0155)	-0.0028 (0.0129)
$Closely_{t-1}$	0.0005 (0.0014)	-0.0345 (0.0423)	-0.0253 (0.0305)	-0.0013 (0.0014)	-0.0793* (0.0412)	-0.0380 (0.0299)
Lev_{t-1}	-0.0123*** (0.0038)	-0.1086 (0.1003)	-0.0595 (0.0714)	-0.0125*** (0.0038)	-0.1160 (0.0998)	-0.0628 (0.0716)
Q_{t-1}	-0.0001 (0.0002)	0.0017 (0.0053)	-0.0018 (0.0040)	-0.0000 (0.0002)	0.0044 (0.0055)	-0.0009 (0.0040)
Constant	0.0094*** (0.0017)	0.2787*** (0.0442)	0.1404*** (0.0323)	0.0115*** (0.0021)	0.3403*** (0.0534)	0.1622*** (0.0382)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,337	3,337	3,290	3,337	3,337	3,290
Adjusted R ²	0.110	0.287	0.0997	0.112	0.291	0.100
F-statistic	3.673	3.384	3.288	3.616	4.075	3.469
Prob > F	0.0014	0.0027	0.0034	0.0016	0.0008	0.0022

the financial markets due to the dotcom crisis. The second figure plots the share repurchase yield *Repyield* against each year's mean of the firm-specific tax variable θ^{firm} . In line with our prior findings, there is a highly significant negative relation. However, this time, when plotting *Repyield* against *Index* in the third figure, we find a significant positive relation. This may indicate the importance of the stock market environment for share repurchase decisions. Panel B presents the results of the regressions on the three share repurchase measures *Repyield*, *Reppaid* and *Repinit*. The first three columns show the results using θ^{firm} as the tax variable. As expected, the coefficient of θ^{firm} is negative for all three share repurchase measures, although highly significant for *Repyield* and *Reppaid* only. The columns (4) to (6) present the regressions with θ^{avg} . Again, the coefficients for all three measures are negative and, for our measures *Repyield* and *Reppaid*, highly significant.

It is noteworthy that throughout our share repurchase regressions and despite using the exact same data source and regression techniques, the adjusted R^2 is considerably lower than in our dividend regressions. This is because firm fixed effects do not contribute as much to the coefficient of determination as in case of dividends. Share repurchases are used as more flexible means of payout and are not “sticky”, a firms past repurchases are not a good indication of future repurchases.²³⁴ Consequently, firm fixed effects are not as effective in explaining share repurchases and thus their contribution to the coefficient of determination is smaller. The evidence presented in panel B clearly backs up our earlier findings

²³⁴ See Jagannathan et al. (2000), p. 367 and Brav et al. (2005), p. 500.

from the analysis of dividend payouts and again is in line with the traditional view of dividend taxation. A tax reform reducing the relative tax-advantageousness of dividends compared to share repurchases, as in Germany in the year 2002, induces increased payouts via share repurchases.

3.4.5 Ruling out unobserved systematic influences

It is possible that the effects of θ^{firm} and θ^{avg} on distribution policy found in our previous regressions are influenced by the development of unobserved systematic effects like the slow but continuous evolution of corporate governance in Germany, a change in investor sentiment like the ongoing trend towards increased payouts via share repurchases reported in Fama and French (2001),²³⁵ or by macroeconomic variables, as for instance the GDP, the key interest rate or the development of national or international stock markets over the observation period. We have already provided preliminary evidence of the robustness of the tax effect to some macroeconomic variables when presenting the univariate analysis. However, we also want to address these issues in a multivariate setting. For reasons of brevity, we constrain the analysis to the dividend measure of *Divyield* in all following regressions. All regressions include the set of control variables described above.

For the firm-specific tax variable θ^{firm} , the approach is very straightforward. To control for possible macroeconomic effects, we include *GDPgrowth*, the yearly change in gross domestic product, *Indextrend*, the yearly change of a national all-share price index and *Interestchange*, the yearly change of long-term gov-

²³⁵ See Fama and French (2001), p. 6.

ernment bond yields into our regressions, one at the time. As a proxy variable for systematic effects not covered by these macroeconomic variables, we also include the year of the observation, *Year*, as a control variable, like in von Eije and Megginson (2008).²³⁶ *Year* should absorb systematic effects that are hard to measure otherwise, like the evolution of corporate governance or changes in investor sentiment. In all regressions, after controlling for systematic influences, the coefficient for θ^{firm} remains positive and highly significant. Panel A of table 3.11 provides the results.

Unfortunately, this direct approach is not possible for our average tax variable θ^{avg} .²³⁷ Instead, we tackle the problem in the form of a differences in differences approach. We divide our sample into two subgroups with differential tax sensitivity and assume that both of these groups react uniformly to the systematic, macroeconomic influences in question. In the literature, it is stated that a firm's financing structure depends on the stage of its development.²³⁸ Young, fast growing firms often have investment opportunities exceeding their funds and thus rely on equity financing. They will react in line with the traditional view, which predicts a change in firms' dividend policy in response to a tax reform. In contrast, slower growing, more mature firms with extensive funds and relatively lower investment opportunities are able to finance their investments with retained earnings. Their reaction will be in line with the new view, which pre-

²³⁶ See von Eije and Megginson (2008), p. 364.

²³⁷ In our setting, θ^{avg} is the same for all firms in a given year and a given value of the tax variable uniquely identifies a certain year. This means that θ^{avg} can also be interpreted as a dummy variable for each year, depicting the influence of time. Thus, it is not possible to include other variables that have the same value for all firms in a given year.

²³⁸ See Sinn (1991a), p. 39.

dicts no policy change in response to a reform. When differentiating firms by their ability to self-finance their investments and thus, by separating “traditional view firms” from “new view firms”, a divergent reaction of the two groups concerning tax reforms would point to a tax effect not biased by unobserved systematic influences.

Table 3.11: Taxation and systematic influences 1993-2009

This table analyzes possible systematic influences on our previous results by employing fixed effects panel regressions. In all regressions, the dependent variable is given by *Divyield*, standing for Cash Dividends Paid scaled by Market Capitalization. All regressions include the set of control variables used in our previous regressions. Panel A presents results of our standard regression setup for the years 1993 to 2009, including different controls for systematic influences. θ^{firm} is the firm-specific tax variable. Column (1) includes *GDPgrowth*, the yearly change in gross domestic product. Column (2) includes *Indextrend*, the yearly change of a national all-share price index. Column (3) includes *Interestchange*, the yearly change of long-term government bond yields. All macroeconomic variables are taken from OECD.stat. Column (4) includes *Year*, the year of the observation. Panel B shows the influence of taxation on the distributions of different types of firms in the period from 1999 to 2005. θ^{avg} is the average tax variable. Column (1) presents the results using *Cash* as a control variable and $Cash \times \theta^{avg}$ as an interaction term, with *Cash* standing for the Cash and Cash-equivalent Holdings of a company. Column (2) shows the results including *Cashdummy*, a dummy variable that equals 1 for observations in the top 33 deciles. Column (3) presents the results using *Cashflow*, which stands for Net Income and Non-cash Charges or Credits. Column (4) shows the results including *Cashflowdummy*, a dummy variable that equals 1 for observations in the top 33 deciles. The index $t - 1$ indicates a variable that is lagged by one year. In both panels, one star, two stars and three stars denote significance at the 10%, 5% and the 1% level, respectively. Robust standard errors are given in parentheses.

Panel A: Systematic influences and θ^{firm}				
Variable	(1) Divyield	(2) Divyield	(3) Divyield	(4) Divyield
θ^{firm}	0.0057*** (0.0018)	0.0061*** (0.0018)	0.0055*** (0.0019)	0.0045** (0.0021)
GDPgrowth	-0.0194 (0.0157)			
Indextrend		-0.0030** (0.0012)		
Interestchange			-0.0001 (0.0018)	
Year				-0.0001 (0.0001)
Constant	0.0191*** (0.0019)	0.0187*** (0.0019)	0.0191*** (0.0019)	0.2134 (0.2663)
Control Variables	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Observations	5,646	5,646	5,646	5,646
Adjusted R ²	0.516	0.517	0.516	0.516
F-statistic	25.97	25.97	25.93	25.78
Prob > F	0.0000	0.0000	0.0000	0.0000

Panel B: Systematic influences and θ^{avg}				
Variable	Cash		Cashflow	
	(1) Divyield	(2) Divyield	(3) Divyield	(4) Divyield
θ^{avg}	0.0082*** (0.0021)	0.0087*** (0.0021)	0.0083*** (0.0020)	0.0090*** (0.0021)
Cash $_{t-1}$	0.0135 (0.0096)			
Cash $_{t-1} \times \theta^{avg}$	-0.0137* (0.0077)			
Cashdummy $_{t-1}$		0.0084** (0.0038)		
Cashdummy $_{t-1} \times \theta^{avg}$		-0.0080** (0.0033)		
Cashflow $_{t-1}$			0.0318** (0.0131)	
Cashflow $_{t-1} \times \theta^{avg}$			-0.0219** (0.0091)	
Cashflowdummy $_{t-1}$				0.0139*** (0.0035)
Cashflowdummy $_{t-1} \times \theta^{avg}$				-0.0087*** (0.0030)
Constant	0.0116*** (0.0028)	0.0111*** (0.0027)	0.0113*** (0.0026)	0.0097*** (0.0026)
Control Variables	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Observations	3,009	3,009	2,969	2,969
Adjusted R ²	0.600	0.601	0.603	0.608
F-statistic	9.417	9.912	9.559	10.97
Prob > F	0.0000	0.0000	0.0000	0.0000

To concentrate on the reactions immediately connected with a tax reform, we tighten our time horizon around the reform of the year 2002. In the years from 1999 to 2005, we use two measures to separate the firms in our sample. *Cash* is a stock figure standing for the cash and cash-equivalent holdings of a company. *Cashflow* is a flow figure which stands for the sum of net income and all non-cash charges or credits of a company. From these values, we construct two dummy variables, *Cashdummy* and *Cashflowdummy*, which equal 1 for observations in the top 33 percentiles of the sample, indicating high cash firms or new view firms.²³⁹ Panel B of table 3.11 provides the results of the regressions including

²³⁹ In the Worldscope database, *Cash* is equivalent to Cash and Equivalents - Generic (ID: 02005); *Cashflow* is equivalent to Funds From Operations (ID: 04201). Univariate statistics for *Cash*, *Cashflow* and the two dummies are available upon request.

these new controls.

For both, *Cashdummy* and *Cashflowdummy*, the coefficient is positive and significant at the 5% and the 1% level respectively. This is in line with the notion in the literature that firms with extensive cash holdings or high cash flows are mature firms, which pay out higher dividends.²⁴⁰ Both interaction variables, $Cashdummy \times \theta^{avg}$ and $Cashflowdummy \times \theta^{avg}$, show coefficients with a negative sign which are significant at the 5% and the 1% level respectively.²⁴¹ Firms' reaction to a tax reform is considerably lower, when their cash holdings or cash flows lie in the top third of the sample. This is in line with the new view of dividend taxation, predicting that these firms self-finance their investment needs and thus, are not affected by changes in dividend taxation. The results for the original variables *Cash* and *Cashflow* point into the same direction. These results are evidence of a clear effect of θ^{avg} on distribution policy. Groups of firms with different tax sensitivity reacted differently to the reform of 2002, while they were all exposed to the same systematic, macroeconomic influences.

3.5 Conclusion

This paper provides evidence that taxation is an important factor for managers deciding on their firm's payout policy. The switch from a split-rate tax system with full imputation to a shareholder relief system in 2002 significantly re-

²⁴⁰ See Grullon et al. (2002), p. 422.

²⁴¹ We have also estimated the regressions for the full period from 1993 to 2009. All coefficients show the same signs as in the regressions for the reduced observation period. However, only the coefficients of *Cashflowdummy* and $Cashflowdummy \times \theta^{avg}$ are statistically significant.

duced the former disadvantageous taxation of capital gains for many investors in Germany. In line with the traditional view of dividend taxation, German decision-makers reacted to the declining tax advantageousness of dividends compared to capital gains through a reduction in dividend yield, the propensity to pay dividends and the propensity to initiate dividend payments. From 2008 on, distributions have been plummeting in the wake of the recent economic crisis. The change to a flat tax system in 2009 aligned the taxation of dividends and capital gains for all investors by abolishing the beneficial taxation of capital gains for individual investors. Our results predict that this will have a positive effect on dividend distributions in the economy.

To study the impact of taxation on payout behavior, we analyze a sample of all 931 firms listed at the Frankfurt stock exchange from 1993 to 2009. We choose this sample, because both, the German capital market environment as a whole and the corporate tax system in special, experienced a period of profound change during that time, yielding a unique opportunity for research in a natural experiment. While the German equity markets slowly but steadily developed into a more market oriented financial system with increased payouts, the German corporate tax system was reformed twice, providing exceptionally high heterogeneity in the taxation of dividends and capital gains. By analyzing how the tax reforms influenced the way the increased distributions were carried out, we provide some new evidence on the old discussion whether the traditional view or the new view of dividend taxation better describes the observable reality.

To model the environment around payout policy decisions as closely as possible,

we carefully calculate the tax burden on dividends and share repurchases, which are taxed as capital gains, for different investor classes under all three tax regimes in force during our observation period. We then weigh the tax burdens using two alternative methods to incorporate a firm's shareholder structure. First, we consider the individual firm's shareholder structure, yielding a firm-specific tax variable. Second, in order to ensure the robustness of our results, we use aggregate data to calculate the tax variable under consideration of an average German firm's shareholder structure.

The consideration of firm-specific data on the shareholder structure in combination with the two major German tax reforms creates an exceptionally high level of heterogeneity in our tax variable θ^{firm} . Our results provide evidence for a solid link between taxation and payout policy. The dividend yield, the likelihood to pay a dividend and the likelihood to initiate dividend payments are significantly and positively correlated to the relative tax advantageousness of dividends compared to capital gains. To test the robustness of our findings, we apply the underlying economic theory to share repurchases, the most important alternative to dividend payments. We obtain corroborative results. We further strengthen our conclusions with evidence from a differences in differences approach. Again, the results show a clear tax influence on distribution policy along the lines of the theory.

There is plenty of opportunity for further research. Particularly, it would be interesting to see if an extension to a more international setting, including detailed models of the tax systems of other countries, confirmed the results. In an

international setting, it would also be possible to better control for systematic effects. Additionally, a more distinguished modeling of a firms shareholder structure could prove very helpful. All of these approaches will most likely help to further enhance future research on the link between taxation and payout policy.

Chapter 4

The influence of tax regimes on corporate distribution policy – reassessing the U.S. payout tax reduction of 2003 in a multi-country setting²⁴²

4.1 Introduction

As part of the “Bush tax cut”, the Jobs and Growth Tax Relief Reconciliation Act of 2003 (JGTRRA 2003) was the single largest payout tax reform in U.S. history. The bill lowered the tax rate on dividends from 38.6% to 15% and the rate on capital gains from 20% to 15% for individuals.²⁴³ The U.S. House of Representatives Committee Report on the JGTRRA 2003 explains the motivation behind the bill along the following reasoning: The comparably high tax rate on distributions discourages dividend payouts and share repurchases and leads to shareholders preferring corporate management to retain earnings, even if they

²⁴² Chapter 4 is based on the unpublished working paper Schanz and Theßeling (2012b). Earlier versions of the paper were presented at the 7th arqus-conference in Würzburg and in seminars at the WHU – Otto Beisheim School of Management in Vallendar and the Ludwig Maximilian University of Munich.

²⁴³ Auerbach and Hassett (2005) provide a detailed description of the genesis of the bill.

were able to invest the funds more profitably outside the firm. Excess funds are “locked in” inside the firm and are not available to new, promising investments, distorting the capital markets and impeding economic growth. The reduction of the tax rates on dividends and capital gains to a uniform level contained in the JGTRRA 2003 is expected to influence firms’ payout policy in a way that increases overall payouts and thereby eliminates harmful distortions in the economy, resulting in increased economic growth and employment.²⁴⁴

The fundamental aspect in this reasoning is the capability of tax cuts to raise the overall level of distributions in the corporate sector.²⁴⁵ Economic theory along the “old view” and the “new view” of payout taxation claims that tax cuts on payouts will increase distributions in the case of the JGTRRA 2003.²⁴⁶ However, it is unclear if this effect is observable in reality. There is ample evidence from surveys of managers stating that shareholder taxation plays no first order role in firms’ payout decisions, indicating a possible conflict between theoretical predictions and practitioners’ behavior. For example, in their survey of 384 financial executives, Brav et al. (2005) find that only 21.1% of dividend paying managers agree to the notion that their shareholders’ tax burden is an important factor in their dividend decision.²⁴⁷ Further, previous studies oftentimes do not explicitly address the fact that managers deciding on payout policy have different methods of distribution at their hands. Besides the classical dividend, corporations have

²⁴⁴ See the explanation of the bill beginning on p. 28 of the U.S. House of Representatives Committee Report 108-94 on the JGTRRA 2003.

²⁴⁵ See Brown et al. (2007), p. 1954.

²⁴⁶ A more detailed explanation of the assumptions and the theory underlying the two views is presented in section 4.2.1.

²⁴⁷ See Brav et al. (2005), p. 495, table 5.

been using institutionalized share repurchase programs to distribute earnings to their shareholders for decades. The option of payouts via share repurchases adds another dimension to the question of tax effects on distributions. Given that corporations' policy was in equilibrium before the reform, it is possible that managers, in order to maximize the firm's value, simply switched payouts to the channel that relatively benefitted from the reform instead of increasing overall payouts. In this case, the JGTRRA 2003 may not have had the stimulating effects on the combined payout level desired by the policymakers and the reform may have failed its goal as the seemingly excessive funds would remain inside the firm and the distortionary lock-in effects would persist.

Empirical evidence on the impact of tax reforms on the corporate choice of payout channels is ambiguous. Moser (2007) summarizes the state of empirical research:

“Despite the quantity of academic research, comments from the business press, and survey evidence, the influence of shareholder taxes [...] on a firm's choice between distributing funds to shareholders through share repurchases or dividends remains essentially unexplained in the accounting and finance literature.”

– William J. Moser (2007), p. 992.

Given the possibility of future tax reforms in reaction to the recent government debt crisis in the U.S. and the European Union it seems that a better understanding of the effects of changes in the tax system on corporate behavior and,

ultimately, the economy is an interesting and important research objective more than ever.

The JGTRRA 2003 created a valuable setting of a natural experiment for scientific research with a host of subsequent publications.²⁴⁸ However, a problem researchers oftentimes face when analyzing the impact of tax reforms is that, as tax variables are naturally derived from the respective tax law in force, they are typically identical for all firms observed in a given year. This missing cross-sectional variation in the tax variables makes it difficult to separate tax effects from other economy-wide influences that affect all firms in the sample, like the overall situation of the economy or changing investor sentiment. In fact, apart from general macroeconomic influences, there is a well documented overall trend of “disappearing dividends” in firms’ payout policy.²⁴⁹ Dividend payouts have continuously been declining in the last decades and have gradually been left behind by institutionalized share repurchase programs which have become the dominant payout channel in many countries today.²⁵⁰ Continuing shifts in corporations’ payout policy like this and the influences of macroeconomic developments may superimpose and thus blur tax effects on the choice of distribution channels. This possibly biases empirical results and may be one explanation for the difficulties studies on the matter have faced thus far.²⁵¹

²⁴⁸ See Dharmapala (2009) and Shackelford (2009) for a detailed overview over the literature on the JGTRRA 2003.

²⁴⁹ See Fama and French (2001), p. 6.

²⁵⁰ See Brav et al. (2008), p. 383.

²⁵¹ Chetty and Saez (2006) state that previous efforts to analyze the impact of the JGTRRA 2003 on corporate behavior “[...] have obtained divergent, empirical results, despite using the same underlying data.” (see Chetty and Saez (2006), p. 124).

We contribute to the literature by following two approaches to increase the cross-sectional variation in our tax variables. First, unlike most prior literature on tax reforms that employ a single-country setting only,²⁵² we internationalize our sample and add observations from Germany and Switzerland as controls. We analyze the payout policy of all firms from the U.S., Germany and Switzerland included in the February 2011 edition of Thomson Reuter's Worldscope database from 1998 to 2009. We specifically choose two countries that have undergone contrary tax reforms at roughly the same time and in a comparable economic environment. The JGTRRA tax reform of 2003 in the U.S. increased the advantageousness of dividends which, in theory, should increase dividend payments and dampen share repurchases against the overall trend. In contrast, the German tax reform of 2002 significantly reduced the former tax advantage of dividends compared to share repurchases. Following the old view, this should result in a shift away from dividends and to share repurchases. As a benchmark, we include observations from Switzerland, a country without major tax reforms in the observation period.

Second, we employ firm-specific tax variables in our regressions and model the tax systems of the countries in our sample with high detail. Unlike many prior studies, we do not simply indicate tax reforms with a pre/post dummy-variable or stop at collecting and analyzing raw statutory tax rates from our countries. Instead, we model the respective tax systems considering taxation of dividends and capital gains on the corporate and the personal level, resulting in distinct tax burdens on dividends and share repurchases for all relevant investor classes

²⁵² Notable exceptions include von Eije and Megginson (2008), Denis and Osobov (2008) and Jacob and Jacob (2012).

of each country in each year. To account for different investors' tax preferences influencing the choice of a firm's payout channel, we weigh the calculated tax burdens with data on each firms' shareholder structure, yielding firm-specific tax variables. As an alternative approach, we approximate an average firms' shareholder structure using data derived from macroeconomic financing statistics provided by the respective countries' central banks.

Exploiting a multi-country setup by pooling observations from two contrary tax reforms and the Swiss control into one sample and employing firm-specific tax variables in our analysis enables us to separate tax effects from large-scale, economy-wide influences on payout policy more effectively. Accounting for the influence of the macroeconomic environment and changes in investor sentiment improves our empirical results. The paper will be proceeding as follows: Section 2 will give a brief overview over the literature and develop the hypotheses. Section 3 introduces into the legal framework of the different countries and discusses the major tax reforms. Section 4 presents the univariate and multivariate analysis. Section 5 concludes.

4.2 Literature review and hypotheses

4.2.1 Is there a tax influence on payouts at all?

The theoretical literature on the influence of taxation on firms' distribution policy is nowadays mainly divided into two different sets of assumptions. The main difference between the two views lies in the source of funds firms use to finance

their investments.²⁵³ Under the old view, external equity in the form of newly issued shares is the marginal source of investment funding.²⁵⁴ In this setting, investors decide between an investment inside the firm, subject to payout tax, and an alternative investment outside the firm. Payout taxation influences the investors' choice and therefore the cost of capital and the firm's investments, profits and payout policy. Consequently, under the old view, firms will adjust their payout policy in reaction to a tax reform.²⁵⁵ In contrast, the new view assumes that investments are financed through retained earnings.²⁵⁶ Here, the funds are already inside the firm. They can either be distributed, subject to payout tax, to the shareholder immediately and then be invested in an alternative investment or they can be reinvested inside the firm and be distributed at a later time, again subject to payout tax. The tax reduces a shareholders immediate income, but at the same time it also reduces the opportunity-cost of retention. Thus, taxes on distributed profits are neutral and do not influence the firm's cost of capital and payout policy.²⁵⁷ In this setting, firms generally do not react to a tax reform. However, even under the new view, tax reforms can influence the payout decision of firms if they are temporary and create nonrecurring opportunities for payout. The JGTRRA 2003 was arranged with a sunset provision stating that the law shall cease to have effect after the year 2008, rendering the tax cuts temporary in

²⁵³ The old view of dividend taxation evolved out of the contributions of Harberger (1962), Harberger (1966) and Shoven (1976). The new view is based on work from Gordon (1959), King (1974a), King (1974b) and King (1977).

²⁵⁴ See Poterba and Summers (1985), p. 22.

²⁵⁵ See Feldstein (1970), p. 58.

²⁵⁶ See Poterba and Summers (1985), p. 15.

²⁵⁷ See Auerbach (1979), p. 441 and Bradford (1981), p. 18.

nature.²⁵⁸ Under these circumstances, both theories predict a rise in aggregate payouts in reaction to the tax cut.²⁵⁹ Poterba and Summers (1985), Sinn (1991a) and Sørensen (1995) provide a good overview of the implications of the two views on payout policy.

These theoretical predictions are backed up by a number of empirical studies on the influence of the JGTRRA 2003 on corporations' payouts.²⁶⁰ Most of these studies report a clear increase in dividend payouts following the dividend tax cut. However, there is some concern about the causality of the reform for the increase in dividends. For example, Julio and Ikenberry (2004) are cautious in directly attributing rising dividends to the tax cut as they find that the trend already started before the tax cut was even announced. They provide alternative explanations along investment opportunity and lifecycle theories.²⁶¹ Edgerton (2010) shows that even dividends not qualifying for the tax cut rose sharply after JGTRRA 2003. He argues that excess cash holdings, not tax reasons, were the main driver behind the dividend increases.²⁶² Blouin et al. (2011) provide a whole set of possible reasons why the reform might have had no first order impact on corporate payouts. They reason that distortive side effects of dividend increases on other corporate goals might deter firms from adjusting their payout policy.²⁶³

²⁵⁸ The "Tax Increase Prevention and Reconciliation Act of 2005" postponed the sunset of the law until the end of 2010 and the "Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010" prolonged the law for another two years.

²⁵⁹ The tax reform in Germany was not temporary in nature. In this case, the new view would predict no behavioral response.

²⁶⁰ For just a glimpse on the vast empirical literature on the payout impact of JGTRRA 2003 see Poterba (2004), Chetty and Saez (2005), Auerbach and Hassett (2006), Brown et al. (2007) and Blouin et al. (2011).

²⁶¹ See Julio and Ikenberry (2004), p. 94.

²⁶² See Edgerton (2010), p. 27 and p. 29.

²⁶³ See Blouin et al. (2011), p. 892.

Another reason why some cautiousness in the connection between the JGTRRA 2003 tax reform and the reported increase in payouts may be in order results from surveys of decisionmakers. The tenor in many of these studies is that managers presume a strong preference towards a smooth stream of dividends amongst their shareholders and adopt a very conservative distribution policy that is mainly dependent on long term growth prospects and investment opportunities.²⁶⁴ In an environment of “sticky” dividends and severe punishment of dividend decreases on stock markets, tax cuts that are potentially dependent on political business cycles and thus generally of a rather temporary nature, may not warrant adjustments to payout policy as they commit managers to sustain increased payments over a long period of time. Other surveys show more directly that shareholder taxes on distributions are not a prime concern in managers’ payout policy. Abrutyn and Turner (1990) report that the majority of managers is not informed about their shareholders’ tax status.²⁶⁵ Frankfurter et al. (2002) show that over 43% of their respondents agree with the statement that tax reforms will not affect their distribution policy.²⁶⁶ Frankfurter et al. (2008) and Brav et al. (2008) both survey managers on the impact of the JGTRRA 2003 tax reform on distributions. They are unable to clearly attribute observed changes in payout activity to the tax reform and conclude that the tax reduction only had a second-order impact on payout policy.²⁶⁷ In consideration of these doubts concerning tax effects on payouts, we ask our first research question: Do firms react to tax changes by

²⁶⁴ See Lintner (1956), p. 99; Baker et al. (1985), p. 79 and Brav et al. (2005), p. 499.

²⁶⁵ See Abrutyn and Turner (1990), p. 494.

²⁶⁶ See Frankfurter et al. (2002), p. 207, table 2.

²⁶⁷ See Frankfurter et al. (2008), p. 41 and Brav et al. (2008), p. 388.

altering their payout behavior at all? Or, more specifically, did the tax cuts on dividends and capital gains introduced by the JGTRRA 2003 induce higher dividend payouts and share repurchases? Based on this question, we formulate our first hypothesis.

H₁: If a reform changes the relative taxation of dividends and capital gains in favor of dividends (capital gains), firms will increase their use of dividend distributions (share repurchases) as a means of payout.

4.2.2 The choice between payout channels and the phenomenon of disappearing dividends

Now we want to focus more closely on the relation between the two main alternatives for corporate payout. The most prominent alternative to classical dividends are share repurchase programs, where corporations buy back their own stock from their shareholders.²⁶⁸ However, for a considerable period of time, share repurchases were not primarily used for distributions. In an early survey, Baker et al. (1981) report that decisionmakers overwhelmingly disagree with the notion that repurchases are a viable alternative to dividends.²⁶⁹ This has changed over time. In the U.S., share repurchases started to become more and more important as a tool for distribution after the year 1982, when the SEC clarified conditions under which repurchase programs were no longer in danger of being interpreted

²⁶⁸ Grullon and Ikenberry (2000) provide a comprehensive overview over the main theories concerned with the question why firms repurchase shares. DeAngelo et al. (2008) discuss possible advantages of stock repurchases over dividend distributions.

²⁶⁹ See Baker et al. (1981), p. 239, table 2.

as share price manipulations.²⁷⁰ Today, share repurchases are seen as a major payout alternative, mostly because of their presumed higher flexibility in comparison to rather conservative dividends.²⁷¹ Brav et al. (2008) show that by now, aggregate share repurchases exceed aggregate dividends paid.²⁷² In fact, this large scale trend in corporate payout policy is well observed and documented in the literature. Fama and French (2001) prominently termed this phenomenon “disappearing dividends”. They report that the fraction of firms in the NYSE, AMEX, and NASDAQ indices that pay dividends has gone down from 66.5% in 1978 to 20.8% in 1999 and attribute a significant part of this decline to a general change in corporate payout policy.²⁷³ DeAngelo et al. (2004) confirm these findings but emphasize that aggregate dividends continue to grow, driven by huge dividend payouts by the largest of corporations.²⁷⁴ Nevertheless, it seems like the “typical” firm’s propensity to pay dividends has declined over time. The U.S. evidence is backed up by international surveys that find similar, albeit less pronounced, developments. Denis and Osobov (2008) provide evidence in line with Fama and French (2001) in their sample comprising firms from the U.S., Canada, the U.K., Germany, France, and Japan.²⁷⁵ In their paper from 2008, von Eije and Megginson provide evidence for disappearing dividends in the European Union.²⁷⁶ Grullon et al. (2011) specifically link the phenomenon to the corporate choice of

²⁷⁰ Share repurchases were heavily restricted and virtually nonexistent in Germany until they were deregulated in the year 1998. Kim et al. (2005) give a brief overview over the legal regulations related to share repurchases in different countries.

²⁷¹ See Brav et al. (2005), p. 500.

²⁷² See Brav et al. (2008), p. 386, figure 3.

²⁷³ See Fama and French (2001), p. 39.

²⁷⁴ See DeAngelo et al. (2004), p. 429, table 1 and p. 430, figure 1.

²⁷⁵ See Denis and Osobov (2008), p. 64.

²⁷⁶ See von Eije and Megginson (2008), p. 352.

payout channels by showing that firms overall propensity to pay out, either in terms of dividends or share repurchases, has not faded, but that firms more and more rely on repurchases as their tool for distributions.²⁷⁷

These developments suggest that share repurchases are steadily growing in importance as a tool of corporate payout. However, some dispute about the precise relation between dividends and share repurchases remains in the empirical literature. Jagannathan et al. (2000) show that repurchases are far more volatile and procyclical than dividends and that they are used in addition to stable dividends to flexibly pay out excess cash, indicating a complementary character of repurchases.²⁷⁸ In contrast, Grullon and Michaely (2002) report that managers as well as investors see dividends and share repurchases as substitutes.²⁷⁹ The question if dividends and share repurchases show a substitutional or complementary relation is especially important for policymakers. The JGTRRA 2003 was designed with the intention of neutralizing tax-induced distortions by increasing aggregate payouts in the economy to enhance growth and lower unemployment. In order to reach the reform's political goals, it is essential that firms react by altering their overall distributions and not simply by switching payouts from one payout channel to the other. Based on these intentions and keeping in mind the results of the literature discussed above, we formulate our second research question: Do firms raise their overall payouts in response to a lowered tax burden on distributions, or do they simply switch to the tax favored alternative? This research questions

²⁷⁷ See Grullon et al. (2011), p. 11 and p. 16.

²⁷⁸ See Jagannathan et al. (2000), p. 374 and p. 377.

²⁷⁹ See Grullon and Michaely (2002), p. 1656, figure 1, p. 1660, and p. 1665.

leads us to the second hypothesis of our analysis.

H₂: Dividends and share repurchases show a (non perfect) complementary relation. Firms will increase the fraction of payouts via the tax-favored payout channel but also increase their aggregate payouts after a favorable tax reform.

There are some prior studies on the choice between corporate payout channels. Lie and Lie (1999) are among the first to specifically analyze tax effects on the corporate choice between payout channels empirically. Analyzing the impact of the Tax Reform Act of 1986 in the U.S., they find that managers are more likely to distribute earnings via share repurchases if the firm's shareholders have a tax preference for capital gains relative to dividends.²⁸⁰ Sarig (2004) finds, analyzing U.S. time-series data from 1950 to 1997, that changes in the relative taxation of the two alternatives lead to corresponding shifts in the split between dividends and share repurchases.²⁸¹ Chetty and Saez (2005) show that firms increased their dividends considerably after JGTRRA 2003. They are very careful in assessing the question of substitution of share repurchases by dividends but find signs of a complementary relation between share repurchases and dividends for a subset of their data, hinting at an impact of the reform on total payouts.²⁸² Moser (2007) confirms Lie and Lie's (1999) findings in the JGTRRA 2003 setting. Firms choose their payout channel considerate of their shareholders tax status.²⁸³

²⁸⁰ See Lie and Lie (1999), p. 546.

²⁸¹ See Sarig (2004), p. 522.

²⁸² See Chetty and Saez (2005), p. 824.

²⁸³ See Moser (2007), p. 1001 and p. 1009.

What all these studies have in common is that they analyze tax influences on payout policy and managers' reaction to reforms in a single-country setting. As already discussed, this is problematic, as missing cross-sectional variation in the tax variable makes it difficult to control for economy-wide effects like macroeconomic influences or the phenomenon of disappearing dividends. Sarig (2004) tackles the issue by aggregating firm-level data on the economy level and by analyzing the time series only.²⁸⁴ This approach is a compromise as it eliminates any explaining cross-sectional variation in the sample. Like Jacob and Jacob (2012), who find robust evidence of tax effects in their international sample of 25 countries,²⁸⁵ we follow a different approach to increase the variation in our tax variables and internationalize our sample by introducing observations from Germany and Switzerland as controls. However, what sets our study apart from previous literature is the introduction of additional variation in the tax variables through the combination of a detailed analysis of a multi-country setting and the careful modeling of the different tax systems under inclusion of firm-specific data on firms' shareholder structure.

4.3 Legal framework: Taxation of dividends and capital gains in the U.S., Germany and Switzerland

To deal with the problem of separating tax effects from macroeconomic influences and changes in investor sentiment, we consider additional, carefully chosen coun-

²⁸⁴ See Sarig (2004), p. 516.

²⁸⁵ See Jacob and Jacob (2012), p. 18 and p. 20.

tries in our analysis. By including observations from Germany, we are able to compare two similarly developed, western economies with similar infrastructure and institutions. Both, the U.S. and Germany have experienced major reforms of payout taxation with profound influences on investors' tax burden at roughly the same time. Furthermore, these two tax reforms show characteristics especially suited to balance possible problems connected to the phenomenon of disappearing dividends. The JGTRRA 2003 considerably decreased the tax rate for dividends in the U.S. Economic theory along the old view and the new view suggests that this should increase dividend payments against the trend of disappearing dividends. In contrast, the German tax reform of 2002, introduced by the tax reduction act "Steuersenkungsgesetz" of 2001, reduced the advantageousness of dividends leading to reduced dividend payments, in line with the overall trend. As an additional control, we have included observations from Switzerland. Apart from its size, both economically and geographically, and a noticeable emphasis towards the financial industry, Switzerland is still very comparable to the two countries already mentioned in terms of economy, infrastructure and institutional framework. What sets Switzerland apart, is an extraordinarily stable tax system with no major reforms and only relatively small changes in the tax rates during the last decades. Thus, observations from Switzerland act as a benchmark in our sample. The following paragraphs will provide a brief introduction to the tax systems in force in the three countries during our observation period from 1998 to 2009. Table 4.1 provides an overview over the evolution of the relevant tax rates in the U.S., Germany and Switzerland.

Table 4.1: Evolution of tax rates in the U.S., Germany and Switzerland

These tables show the evolution of individual and corporate tax rates in the U.S., Germany and Switzerland from 1998 to 2009. In each table, the column *Regime* shows the effective tax system in each year. CL stands for classical system, FI stands for full imputation system, CL,HI stands for a classical system with shareholder relief in form of a half-income system. The column t_{pers} shows the personal income tax rate for individuals in the highest income tax bracket while t_{corp} shows the corporate income tax rate. For the U.S., the columns t_{pers}^{cg} and t_{pers}^{div} show the reduced tax rates on capital gains and dividends, respectively. For Germany, the column $t_{pers}^{div,cg}$ shows the flat tax on dividends and capital gains introduced in 2009, the columns t_{corp}^{ret} and t_{corp}^{dis} show the corporate income tax rates for retained and distributed profits. For Switzerland, the columns t_{pers}^{state} and $t_{pers}^{subcentral}$ show the personal income tax rates on the level of the state and the combined rate on the cantonal and communal level respectively. t_{pers}^{sum} is the sum of the two and the effective tax rate for individuals. The columns t_{corp}^{state} and $t_{corp}^{subcentral}$ show the corporate income tax rates on the level of the state and the combined rate on the cantonal and communal level respectively. t_{corp}^{sum} is the sum of the two and the effective tax rate for corporations. All values are given as percentages.

Year	Regime	U.S.				Regime	Germany			
		t_{pers}	t_{pers}^{cg}	t_{pers}^{div}	t_{corp}		t_{pers}	$t_{pers}^{div,cg}$	t_{corp}^{ret}	t_{corp}^{dis}
1998	CL	39.60	20.00		35.00	FI	53.00		45.00	30.00
1999	CL	39.60	20.00		35.00	FI	53.00		40.00	30.00
2000	CL	39.60	20.00		35.00	FI	51.00		40.00	30.00
2001	CL	38.60	20.00		35.00	FI	48.50		25.00	25.00
2002	CL	38.60	20.00		35.00	CL,HI	48.50		25.00	25.00
2003	CL	35.00	15.00	15.00	35.00	CL,HI	48.50		26.50	26.50
2004	CL	35.00	15.00	15.00	35.00	CL,HI	45.00		25.00	25.00
2005	CL	35.00	15.00	15.00	35.00	CL,HI	42.00		25.00	25.00
2006	CL	35.00	15.00	15.00	35.00	CL,HI	42.00		25.00	25.00
2007	CL	35.00	15.00	15.00	35.00	CL,HI	45.00		25.00	25.00
2008	CL	35.00	15.00	15.00	35.00	CL,HI	45.00		15.00	15.00
2009	CL	35.00	15.00	15.00	35.00	CL	45.00	25.00	15.00	15.00

Year	Regime	Switzerland						
		t_{pers}^{state}	$t_{pers}^{subcentral}$	t_{pers}^{sum}	t_{corp}^{state}	$t_{corp}^{subcentral}$	t_{corp}^{sum}	
1998	CL	11.50	30.94	42.44	8.50	21.66	27.80	
1999	CL	11.50	30.94	42.44	8.50	18.73	25.09	
2000	CL	11.50	30.55	42.05	8.50	18.54	24.93	
2001	CL	11.50	30.03	41.53	8.50	18.30	24.70	
2002	CL	11.50	29.51	41.01	8.50	17.99	24.42	
2003	CL	11.50	28.86	40.36	8.50	17.65	24.10	
2004	CL	11.50	28.86	40.36	8.50	17.65	24.10	
2005	CL	11.50	28.86	40.36	8.50	14.64	21.32	
2006	CL	11.50	28.86	40.36	8.50	14.64	21.32	
2007	CL	11.50	28.86	40.36	8.50	14.64	21.32	
2008	CL	11.50	28.47	39.97	8.50	14.47	21.17	
2009	CL	11.50	28.47	39.97	8.50	14.47	21.17	

Source: Based on Bundesministerium der Finanzen (2007): Datensammlung zur Steuerpolitik Ausgabe 2007, Neuauflage 2008, Berlin; various issues of the following tax resources: KPMG Global Individual Tax Handbook, IBFD, Amsterdam; KPMG Global Corporate Tax Handbook, IBFD, Amsterdam; KPMG European Tax Handbook, IBFD, Amsterdam; Coopers & Lybrand International Tax Summaries, Wiley, New York; PricewaterhouseCoopers Individual Taxes – Worldwide Summaries, Wiley, New York; PricewaterhouseCoopers Corporate Taxes – Worldwide Summaries, Wiley, New York; Ernst & Young – Worldwide individual tax guide, EYGM Limited, London; Ernst & Young – Worldwide corporate tax guide, EYGM Limited, London; U.S., German and Swiss tax codes.

4.3.1 Taxation of dividends and capital gains in the U.S.

Traditionally, the U.S. employ a classical corporate tax system with double taxation on the corporate level and on the shareholder level. Although there have been a number of changes in the tax rates over the last decades, the tax system itself remains unchanged. Individual investors' dividend income is regularly taxed as ordinary income at the personal income tax rate. Capital gains realized from assets held longer than 12 months, however, are taxed at a reduced rate.²⁸⁶ Consequently, over our whole observation period until the year 2003, capital gains have been tax-favored compared to dividends for individual investors, resulting in the familiar "dividend tax penalty". The JGTRRA 2003 lowered the maximum tax rate on dividends from 38.6% to 15% by introducing a separate income tax rate for "qualified dividends", which includes a very wide array of dividends.²⁸⁷ At the same time, the personal rate on capital gains was reduced from 20% to 15%, ensuring equal taxation of both payout channels for individual investors. Originally, the bill was arranged with sunset provisions fading out the rate-reductions by 2008. However, the tax cuts were prolonged two times and are still in force today.

Corporate taxation was not directly influenced by the JGTRRA 2003 and has

²⁸⁶ In all our calculations of the tax burden on capital gains, we assume a holding period that exceeds one year, classifying a capital gain as "long term" in all three countries during our observation period. We further assume all investors to be in the respective highest tax bracket.

²⁸⁷ To qualify, the dividend has to be paid after the first of January 2003, has to be paid by a U.S. corporation, a corporation from a country the U.S. maintains a tax treaty with, or a corporation that is traded on an established U.S. stock market. Further, the stock underlying the dividend has to be held for at least 61 days in the 121-day period beginning 60 days before the ex-dividend date. We assume dividends to qualify for the reduced rate.

not changed during our observation period. Corporations have to tax all their income at the same rate, including dividends and capital gains. For intercorporate dividends, there exists a so called “dividend received deduction”, allowing a firm to exempt 70%, 80% or even 100% of the dividend received from its taxable income, depending on the fraction of corporate stock held by the receiving corporation.²⁸⁸ There is no equivalent rule for intercorporate capital gains. However, a redemption of stock to the issuing company with a corresponding payment is taxed as a dividend if the circumstances indicate the redemption to be “essentially equivalent” to a dividend. As we focus on the role of share repurchases as an equivalent alternative to dividends, we assume this condition to be met. The resulting equal treatment of both payout channels implies that corporations show no tax-preference for either dividends or share repurchases. This is also true for another important class of investors. In the U.S., there is a number of tax-exempt institutional investors, such as pension funds, universities or charitable endowments.²⁸⁹ As these institutions were not taxed on either of the two alternatives before and after the reform, they show no tax-preference for a given payout channel.

²⁸⁸ For the following calculations, we assume a dividends received deduction of 70%, the maximum deduction not dependent on a certain minimum fraction of stocks held. To be eligible for a dividends received deduction, an intercorporate investment has to meet certain criteria pertaining to the holding period, the tax status and the nationality of the corporation invested in. Further, the dividends received deduction is reduced in case of debt-financed portfolio stocks. We assume these criteria to be met and abstract from possible reductions.

²⁸⁹ Moser and Puckett (2009) provide a detailed overview of tax free entities in the U.S. and analyze possible consequences for corporate payout behavior.

4.3.2 Taxation of dividends and capital gains in Germany

In Germany, there have been two major reforms of the corporate tax system in our observation period. Before the year 2002, a split-rate full imputation system was in force. Individual and corporate shareholders receiving a dividend were allowed to credit the corporate tax paid on the underlying earnings against their personal or corporate tax liability. In the end, investors receiving dividends were taxed with their personal or corporate income tax rate. For individual investors, capital gains from holdings smaller than the substantiality limit were not taxable.²⁹⁰ If the holding exceeded the substantiality limit, the capital gain was reclassified as taxable business income. Corporate investors also had to tax their capital gains as business income. However, the full imputation system did not allow for a corporate tax credit in case of business income, resulting in a strong preference towards dividends as a vehicle for payout for individual investors with substantial holdings and corporate investors.

After the switch from the full imputation system to a classical system with shareholder relief in 2002, the tax burden on dividends and capital gains was aligned for all investors with one exception. Individual investors generally had to tax half of their dividends and capital gains with their personal income tax rate while the other half remained untaxed. However, capital gains realized by individual investors without substantial interest were still tax-free, as in the old system. For corporations, both, income from dividends and from capital gains, was 95% tax

²⁹⁰ The substantiality limit was continually lowered during our observation period, from 25% to 10% in 1999 and again to 1% in 2002.

exempt. This exemption applied to all intercorporate distributions and was not subject to a minimum share or holding period. While the reform eliminated the strong tax preference for dividends by individual investors with substantial interest and corporate investors, individual investors without substantial interest still favored income from capital gains for tax reasons.

In 2009, the corporate tax system was reformed again with a transfer to a classical tax system introducing a reduced, flat tax on income from dividends and capital gains for individual investors without substantial interest. The system is still in force today. Individual investors with substantial interest have to tax 60% of their dividends and capital gains with their personal income tax. Intercorporate dividends and capital gains remain 95% tax free. The reform of 2009 aligned the tax burden on dividends and capital gains for all investors in Germany, eliminating previous tax-induced preferences for a certain payout channel.²⁹¹

4.3.3 Taxation of dividends and capital gains in Switzerland

Switzerland employs a highly federalistic tax system. According to the Swiss constitution, both, the state and the individual provinces called “cantons”, enjoy fiscal sovereignty and thus are entitled to levy taxes. Sub-central income taxes levied by cantons and communities play a significant role in Switzerland. This is why, for the calculation of Swiss tax burdens, we have included these taxes in our

²⁹¹ Since the year 1991, Germany levies a “solidarity surcharge” on personal and corporate income taxes. The measure was introduced to help finance the German reunification. During our whole observation period, it amounted to a surcharge of 5.5% on the personal and corporate income tax due and is included in our calculations.

models.²⁹² The combination of different cantonal and communal taxes leads to immense complexity and an abundance of different possible tax burdens.²⁹³ As an approximation to the different tax codes, we use the tax rates of the canton and community of Zurich, being the highest populated and economically strongest region in Switzerland by far.

Like the U.S., Switzerland employs a classical corporate tax system with double taxation of distributions. Traditionally, Swiss income taxes are levied on the entirety of income. Specific tax rates on dividends and capital gains do not exist. For individual investors, dividend income is subject to the full personal income tax. In contrast, individual investors' capital gains are not taxed, independent from certain holding periods or minimum holding requirements.²⁹⁴ For corporate investors, dividends and capital gains are generally taxed at the corporate income tax rate. However, dividends are tax exempt if the holding underlying the income qualifies as a substantial participation. Since 1998, there is a similar rule for intercorporate capital gains. However, the requirements for a substantial participation and the resulting tax exemption are not identical for the two alternatives.

For dividends, a holding of 20% or 2 million Swiss francs qualifies as a substantial

²⁹² For the calculations of U.S. and German tax burdens, we have excluded sub-central (corporate) taxes. They are levied on income from dividends and capital gains alike and would only have increased the complexity of our tax models without improving the validity of the resulting tax variables at all.

²⁹³ In fact, there are 27 different tax laws in force in Switzerland today. Although there have been some efforts of tax alignment beginning after the "Tax Harmonization Law" came into effect in 2003, tax harmonization mostly affects standardization of procedural law, criminal tax law, legislative principles and the definition of the tax base. However, the determination of key items like tax rates, allowances or deductions explicitly remains in the hands of the cantons. This is intended to promote tax competition between the different cantons.

²⁹⁴ Since 2008, the canton of Zurich charges half the income tax rate on dividends received by individual investors holding more than 10% of the distributing corporation. Since 2009, this rate also applies on the state level, subject to the same limitations. We have not included these tax rate reductions because of the high participation requirement.

participation. In case of capital gains, a minimum holding of 20% must be held for at least one year and a minimum share of 20% of a company must be sold to qualify for tax exemption. There is no value-based criterion for capital gains as there is for dividends. In case of intercorporate holdings, a share of 2 million Swiss francs does not seem too extraordinary. However, a sale of a participation of at least 20% sure does. In our analysis of managers' choice between payout channels, we do not focus on big, singular sales of shares but rather on share repurchases as a tool for regular distributions. Because of this, we assume tax exemption for dividends, but not for capital gains for Swiss corporations. The Swiss tax system is relatively stable. During our observation period, there has been no major tax reform and there were only slight adjustments to the tax rates. Based on the tax-data provided in table 4.1, we calculate tax burdens for dividends t_{div} and capital gains t_{cg} on the shareholder level for two main types of investors, individual investors *ind* and corporate investors *corp* in Switzerland, Germany and the U.S. for each year from 1998 to 2009.²⁹⁵ In these calculations, we introduce one year of lag between realization and distribution of corporate earnings. Earnings generated and taxed on the corporate level in year t are distributed and taxed on the shareholder level in year $t + 1$. Table 4.2 shows the results.

²⁹⁵ We only need two investor classes, as in the U.S. and in Germany, some investors show identical tax preferences concerning dividends and capital gains. For simplicity, these investors are pooled, as described in more detail below.

Table 4.2: Evolution of tax burdens in the U.S., Germany and Switzerland

This table shows the tax burden on distributions for individual investors and for corporate investors in the U.S., Germany and Switzerland from 1998 to 2009. The column *Year* shows the year in which the shareholder acquires the distribution. Earnings generated and taxed on the corporate level in year t are distributed and taxed on the shareholder level in year $t + 1$. The columns t_{div}^{ind} and t_{cg}^{ind} stand for the total tax burden of an individual shareholder receiving dividends or capital gains, respectively. The columns t_{div}^{corp} and t_{cg}^{corp} show the burden on dividends and capital gains for the corporation retaining the payment. All values are given as percentages.

Year	U.S.				Germany				Switzerland			
	t_{div}^{ind}	t_{cg}^{ind}	t_{div}^{corp}	t_{cg}^{corp}	t_{div}^{ind}	t_{cg}^{ind}	t_{div}^{corp}	t_{cg}^{corp}	t_{div}^{ind}	t_{cg}^{ind}	t_{div}^{corp}	t_{cg}^{corp}
1998	60.74	48.00	41.83	41.83	55.92	48.38	47.48	72.88	58.83	28.47	27.80	48.35
1999	60.74	48.00	41.83	41.83	55.92	47.48	42.20	69.64	58.44	27.80	25.09	45.92
2000	60.74	48.00	41.83	41.83	53.81	42.20	42.20	66.59	56.59	25.09	24.93	43.76
2001	60.09	48.00	41.83	41.83	51.17	42.20	42.20	66.59	56.10	24.93	24.70	43.47
2002	60.09	48.00	41.83	41.83	45.21	26.38	27.35	27.35	55.58	24.70	24.42	43.08
2003	44.75	44.75	41.83	41.83	45.21	26.38	27.40	27.40	54.92	24.42	24.10	42.63
2004	44.75	44.75	41.83	41.83	45.06	27.96	28.91	28.91	54.73	24.10	24.10	42.39
2005	44.75	44.75	41.83	41.83	42.69	26.38	27.35	27.35	54.73	24.10	21.32	40.28
2006	44.75	44.75	41.83	41.83	42.69	26.38	27.35	27.35	53.08	21.32	21.32	38.09
2007	44.75	44.75	41.83	41.83	43.85	26.38	27.35	27.35	53.08	21.32	21.32	38.10
2008	44.75	44.75	41.83	41.83	43.85	26.38	26.96	26.96	52.77	21.32	21.17	37.98
2009	44.75	44.75	41.83	41.83	38.03	38.03	16.49	16.49	52.68	21.17	21.17	37.87

4.3.4 Calculation of the tax variables

One way to analyze the impact of tax reforms and the resulting changes in tax preferences of different investors is to simply relate the shareholders' tax burden on dividends and share repurchases, which are taxed as capital gains, to each other.²⁹⁶ From a strict tax perspective, a corporation will generally chose the payout channel that is relatively tax advantageous for its shareholders to maximize its share value.²⁹⁷ Thus, when a reform changes the relative taxation of the two alternatives, a corresponding change in the corporate choice between dividends and share repurchases is an indicator of tax effects. We follow the popular

²⁹⁶ See Poterba (1987), p. 475.

²⁹⁷ See Blouin et al. (2011), p. 891.

notation of King (1974b) and many others.²⁹⁸ The relative tax burden θ is calculated by dividing the after tax value of one unit of dividend income $(1 - t_{div})$ by the after tax value of one unit of capital gains $(1 - t_{cg})$:

$$\theta = \frac{1 - t_{div}}{1 - t_{cg}}$$

If θ is bigger than one, the respective investor has a tax preference for dividends, if it is smaller than one, capital gains are preferred. In the U.S., for the sake of this study, we have to discern three types of investors. Individual investors, corporate investors, and institutional investors. Neither corporate investors, who are taxed with the corporate tax rate on 30% of their dividends and capital gains, nor institutional investors, who do not pay taxes on income from any of the two payout channels, show a tax preference for either dividends or capital gains. As both show a θ of one during our whole observation period, for the sake of simplicity, institutional investors are pooled into the class of corporate investors in our study. In Germany, we also have to discern three kinds of investors. Individual investors that hold a nonsubstantial share, individual investors with a substantial share and corporations. However, the last two types of investors show identical tax preferences concerning the two payout channels as both of them have to tax distributions as business income. To simplify, we pool individual investors with a substantial share into the class of corporate investors. In Switzerland, we distinguish between two types of investors. This leaves us with two classes of investors and two tax variables in each country, θ_{ind} for individual investors and θ_{corp} for corporate investors.

²⁹⁸ See King (1974b), p. 23.

As the two classes oftentimes show different tax preferences for each of the two payout vehicles, a firm that is held mostly by individual investors might chose a different method of payout than a firm held by corporate investors, even in the same year and the same country. Thus, it is important to account for possible tax clienteles within a firm’s shareholder structure when analyzing tax influences on corporate payout policy.²⁹⁹ We incorporate the shareholder structure in θ^* by weighing the relative tax variables for the two investor classes with their respective fraction w amongst the shareholders.

$$\theta^* = \theta_{corp} * w + \theta_{ind} * (1 - w)$$

To determine the weight w , we follow two alternative approaches. First, we weigh the tax variable θ with firm-specific data, using the WorldScope variable “Closely Held Shares” (ID: 05475) as a proxy for a firms’ shareholder structure. The variable includes intercorporate holdings, shares held by individuals with holdings above 5% and shares held by institutions. Further, it excludes shares held in a fiduciary capacity by banks or other financial institutions and thus comes very close to our definition of the investor class of corporate investors in the U.S., Germany and Switzerland. We weigh the tax variables for each firm by multiplying θ_{corp} with the percentage of closely held shares and θ_{ind} with the percentage of the rest of shares. For each year and each single firm, this gives us the firm-specific relative tax variable θ^{firm} , used as one of the main variables of interest in our regressions. Compared to uniform tax rates oftentimes used in

²⁹⁹ For an introduction into the formation of tax clienteles and the effects of clienteles on corporate payout, see Elton and Gruber (1970) and Black and Scholes (1974). DeAngelo et al. (2008) provide a recent discussion of the literature on tax clienteles.

prior literature, the greatly increased heterogeneity in θ^{firm} enables us to better separate tax effects from large-scale, economy-wide influences on payout policy. Second, as a check for robustness and for our results to be comparable to existing literature, we use an approach similar to Poterba (2004),³⁰⁰ based on aggregate data on different economic sectors' stock holdings from macroeconomic financing statistics provided by the U.S. Federal Reserve, the German Bundesbank and the Swiss Nationalbank. By weighing the different values of θ for each investor class with the fraction of shares held in the corresponding sectors on total shares held in the economy, we attain a tax variable for a firm with an average shareholder structure, θ^{avg} , for each country.³⁰¹ Table 4.3 shows the development of θ for the investor classes of individual and corporate investors as well as the evolution of the firm-specific relative tax variable θ^{firm} and the average relative tax variable θ^{avg} over time.

The relation of the tax burdens expressed in θ^{firm} and θ^{avg} is useful in analyzing possible tax effects on the corporate choice of payout channels. However, as a relative measure, it is not designed to capture tax effects on the aggregate level of payouts of a firm. In order to assess the question whether firms increase their overall payouts in reaction to a favorable tax reform or, more specifically, whether the JGTRRA 2003 achieved the goal of eliminating harmful lock-in effects, a

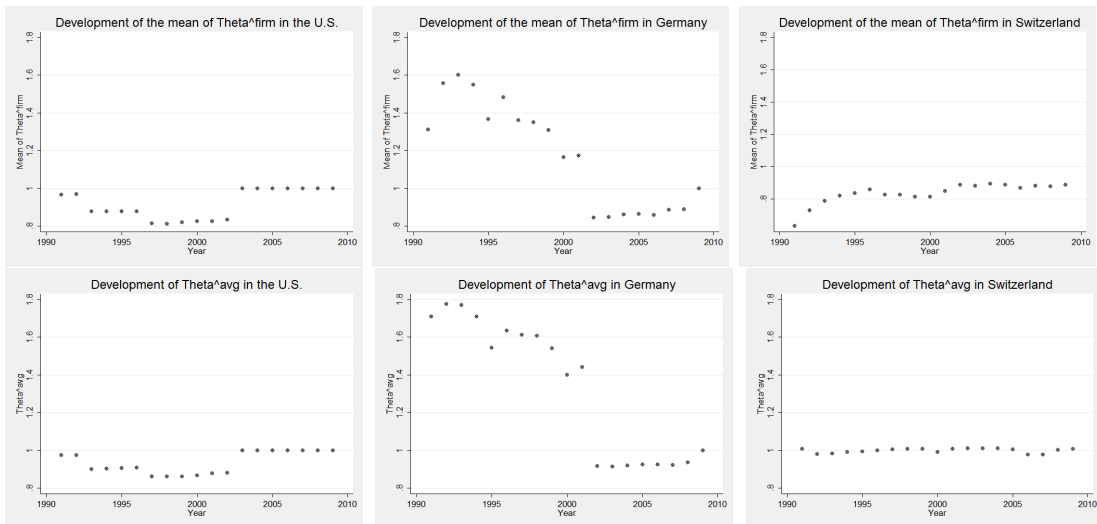
³⁰⁰ See Poterba (2004), p. 171.

³⁰¹ The definitions of the different sectors are very similar in the three countries. We attribute the sectors of private households and other domestic financial institutions, mainly consisting of investment funds that again are primarily held by private households, to the investor class of individual investors. The holdings of all other sectors, namely non-financial domestic corporations, domestic financial institutions and insurance institutions and public authorities, are attributed to the class of corporate investors. Shares held by foreign investors are excluded from the calculation.

Table 4.3: Evolution of the relative tax burden θ

This table shows the evolution of the relative tax burden θ in the U.S., Germany and Switzerland from 1998 to 2009. The column *Year* shows the year in which the shareholder acquires the distribution. Earnings generated and taxed on the corporate level in year t are distributed and taxed on the shareholder level in year $t + 1$. θ_{ind} and θ_{corp} show the relative taxation of dividends and capital gains for individual investors and corporate investors. The column θ_{mean}^{firm} shows the mean of the firm-specific relative tax variable. The column θ^{avg} shows the average relative tax variable.

Year	U.S.				Germany				Switzerland			
	θ_{ind}	θ_{corp}	θ_{mean}^{firm}	θ^{avg}	θ_{ind}	θ_{corp}	θ_{mean}^{firm}	θ^{avg}	θ_{ind}	θ_{corp}	θ_{mean}^{firm}	θ^{avg}
1998	0.755	1.000	0.812	0.862	0.854	1.937	1.349	1.605	0.576	1.398	0.826	1.009
1999	0.755	1.000	0.820	0.862	0.839	1.904	1.307	1.539	0.576	1.385	0.812	1.007
2000	0.755	1.000	0.825	0.867	0.799	1.730	1.164	1.399	0.580	1.335	0.813	0.990
2001	0.768	1.000	0.826	0.877	0.845	1.730	1.172	1.440	0.585	1.332	0.847	1.006
2002	0.768	1.000	0.833	0.879	0.744	1.000	0.846	0.915	0.590	1.328	0.886	1.011
2003	1.000	1.000	1.000	1.000	0.744	1.000	0.848	0.912	0.596	1.323	0.878	1.011
2004	1.000	1.000	1.000	1.000	0.763	1.000	0.860	0.920	0.596	1.317	0.891	1.009
2005	1.000	1.000	1.000	1.000	0.778	1.000	0.863	0.925	0.596	1.317	0.885	1.005
2006	1.000	1.000	1.000	1.000	0.778	1.000	0.859	0.923	0.596	1.271	0.866	0.977
2007	1.000	1.000	1.000	1.000	0.763	1.000	0.885	0.923	0.596	1.271	0.881	0.977
2008	1.000	1.000	1.000	1.000	0.763	1.000	0.888	0.936	0.600	1.271	0.875	1.002
2009	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.600	1.269	0.885	1.007



Source: Calculated using data from WorldScope, February 2011; Deutsche Bundesbank (2010): Ergebnisse der gesamtwirtschaftlichen Finanzierungsrechnung für Deutschland 1991 bis 2009, Statistische Sonderveröffentlichung 4, Frankfurt am Main; various issues of the following publications: Federal Reserve System, Statistical release Z.1, Flow of Funds Accounts of the United States, Washington DC; Schweizerische Nationalbank, Finanzierungsrechnung der Schweiz, Zürich.

variable combining the tax burden on dividends and capital gains is needed.³⁰²

Hence, we calculate the combined tax burden Σ^* , standing for the sum of the tax burdens on dividends t_{div} and capital gains t_{cg} for both investor classes, again weighed by their respective magnitude w in the shareholder structure:

$$\Sigma^* = (t_{div}^{corp} + t_{cg}^{corp}) * w + (t_{div}^{ind} + t_{cg}^{ind}) * (1 - w)$$

As in the calculation of the relative tax variable, we use two different ways to incorporate a firms shareholder structure. Σ^{firm} is the combined tax burden, weighed using firm-specific weights derived from the “Closely Held Shares” variable, while Σ^{avg} is the combined burden of an average firm, calculated by using aggregate data from macroeconomic financing statistics. Table 4.4 presents the development of the two combined tax variables.

When looking at the values of table 4.3 and table 4.4, the influence of the two big tax reforms in the U.S. and Germany is clearly visible. In the U.S., the JGTRRA 2003 abolished the former tax penalty for dividends by aligning the personal income tax rates on dividends and capital gains. Hence, θ^{firm} and θ^{avg} show a value of one after the reform. The reduction of the personal tax on capital gains by 5% and the personal tax on dividends by 23.6% further resulted in a notable drop in the combined tax variables Σ^{firm} and Σ^{avg} in 2003. In Germany, the tax reform of 2002 introduced a tax exemption for capital gains that were restated as business income. This dramatically lowered the tax burden on capital

³⁰² Brown et al. (2007) also analyze the question whether dividends and share repurchases show a substitutive or complementary relation in the wake of the JGTRRA 2003. They find evidence for a tax-induced switch from share repurchases to dividends in their sample. However, they do not directly model the tax environment but rely on executive stock holdings as a proxy for the firms’ tax target function (see Brown et al. (2007), p. 1957).

Table 4.4: Evolution of the combined tax burden Σ

This table shows the evolution of the combined tax burden on dividends and capital gains Σ in the U.S., Germany and Switzerland from 1998 to 2009. The column *Year* shows the year in which the shareholder acquires the distribution. Earnings generated and taxed on the corporate level in year t are distributed and taxed on the shareholder level in year $t + 1$. The column Σ_{mean}^{firm} shows the mean of the firm-specific combined tax variable. The column Σ^{avg} shows the average combined tax variable.

Year	U.S.		Germany		Switzerland	
	Σ_{mean}^{firm}	Σ^{avg}	Σ_{mean}^{firm}	Σ^{avg}	Σ_{mean}^{firm}	Σ^{avg}
1998	1.029	0.977	1.116	1.154	0.839	0.814
1999	1.021	0.978	1.071	1.089	0.818	0.781
2000	1.016	0.973	1.010	1.042	0.777	0.746
2001	1.019	0.966	0.991	1.037	0.765	0.738
2002	1.012	0.964	0.649	0.603	0.752	0.730
2003	0.878	0.867	0.647	0.606	0.744	0.722
2004	0.879	0.867	0.668	0.629	0.738	0.718
2005	0.879	0.867	0.636	0.595	0.719	0.691
2006	0.879	0.867	0.638	0.596	0.684	0.659
2007	0.878	0.866	0.622	0.598	0.681	0.660
2008	0.877	0.865	0.616	0.583	0.680	0.651
2009	0.877	0.864	0.521	0.446	0.675	0.649



Source: Calculated using data from WorldScope, February 2011; Deutsche Bundesbank (2010): Ergebnisse der gesamtwirtschaftlichen Finanzierungsrechnung für Deutschland 1991 bis 2009, Statistische Sonderveröffentlichung 4, Frankfurt am Main; various issues of the following publications: Federal Reserve System, Statistical release Z.1, Flow of Funds Accounts of the United States, Washington DC; Schweizerische Nationalbank, Finanzierungsrechnung der Schweiz, Zürich.

gains for individual investors with substantial interest and for corporate investors. Consequently, θ^{firm} and θ^{avg} show a steep drop in 2002. Until 2009, both tax variables showed values well below one, because of the ongoing tax exemption for individual investor's capital gains. The German reform of 2002 also reduced the corporate tax rate by 15% for retained earnings and 5% for distributed earnings, resulting in a drop of more than 34.5% and 41.9% in the combined tax burdens Σ^{firm} and Σ^{avg} . In contrast to these two countries, Switzerland shows a very stable development with both relative tax variables hovering around a value of one. However, even devoid of any major tax reforms, a continuous decline of the combined tax burdens is noticeable, as Swiss tax rates have slowly been declining from year to year.

4.4 Empirical analysis

4.4.1 Sample

Our empirical analysis comprises all U.S., German and Swiss firms available in the February 2011 edition of Thomson Reuter's WorldScope database. We collect capital market and financial statement data directly from WorldScope.³⁰³ Additional macroeconomic data is taken from online databases of the OECD and the respective countries' central banks. All monetary values have been deflated by the consumer price index and converted into U.S. currency by using each year's

³⁰³ The following items are the main variables used in our study (WorldScope ID's in parentheses): Pre-tax Income (01401), Total Assets (02999), Total Debt (03255), Common Equity (03501), Cash Dividends Paid (04551), Common/Preferred Stock Redeemed, Retired, Converted, etc. (04751), Market Price - Year End (05001), Common Shares Outstanding (05301), Closely Held Shares (05475) and Market Capitalization (08001).

average of daily interbank closing rates, both provided by OECD.stat. On the firm level, all monetary variables have been scaled by total assets with the exception of dividends and share repurchases, which have been scaled by market capitalization.³⁰⁴ The scale variables used in our regressions are lagged by one year to allow for the causality of the assets of period t for the distributions of period $t + 1$. We collect data from every firm active for at least one year in the period from 1998 to 2009. We chose 1998 as our starting year, because this was the year in which the Corporate Control and Transparency Act (KonTraG) re-defined the use of share repurchases in Germany. Before 1998, share repurchases were practically non-existent because of heavy legal regulations aimed at the prevention of insider-trading. With our focus on the JGTRRA tax reform of 2003, we chose to end our observation period in 2009 in order to ensure about equal periods before and after the reform.

During the period from 1998 to 2009, a total of 18,475 firms was active for at least one year in the three countries, providing us with 147,377 firm-year observations. After eliminating all observations with missing data for at least one of our regression variables, we end up with 66,499 complete observations. In a next step, we opt to follow Chetty and Saez (2005), Moser (2007), Blouin et al. (2011) and many other studies on payout behavior in excluding all observations from the financial sector and the utility sector.³⁰⁵ Excluding these firms leaves us with 46,845 observations. To reduce the impact of outliers on our findings, we

³⁰⁴ See Fama and French (1998), p. 822 and Fama and French (2002), p. 7.

³⁰⁵ See Chetty and Saez (2005), p. 798; Moser (2007), p. 1000 and Blouin et al. (2011), p. 897.

proceed in carefully eliminating apparent data errors and extreme values, similar to Jacob and Jacob (2012).³⁰⁶ We eliminate 151 observations with total assets under 1000 \$, 220 observations with negative share repurchases or share repurchases exceeding market capitalization, 8 observations with a pre-tax return on total assets below -50 or over 50 and 235 observations with a value for Tobin's Q (market capitalization divided by common equity) below -50 or over 50. Finally, we truncate the 1st and/or 100th percentile, as theoretically plausible. This generates our final sample of 38,550 firm-year observations. Table 4.5 summarizes our sample composition and the steps we have taken to deal with data errors and outliers.

Since we analyze the entire population of WorldScope firms available for the three countries, the firms in our sample naturally come from the full range of different sectors apart from the financial industry and the utility industry. Panel A of table 4.6 provides a simple distribution of firm-years by different industries, defined by the first digit of the Standard Industrial Classification (SIC). In the absence of observations from the financial sector and the utility sector, firm-years from the manufacturing sector dominate the sample. Panel B of table 4.6 provides statistics on a selection of basic key figures. The average firm in our sample is rather big, with both, market capitalization and total assets exceeding 3 billion \$. Not surprisingly, the largest firms in the sample are major U.S. corporations like General Electric, Exxon Mobil and Wal-Mart with a market capitalization of up to 500 billion \$ in some years. The largest German firm is Deutsche Telekom

³⁰⁶ See Jacob and Jacob (2012), p. 7.

Table 4.5: Composition of the sample and adjustments

This table shows the composition of our sample of all U.S., German and Swiss firms available in the February 2011 edition of Thomson Reuter's WorldScope database in the period from 1998 to 2009. It further documents the adjustments due to missing data and outliers. After each step, the number of remaining observations is given.

Worldscope coverage for the U.S., Germany and Switzerland, 1998 - 2009	Observations
Switzerland (404 firms)	3,662
Germany (1,424 firms)	12,765
U.S. (16,647 firms)	130,950
Total (18,475 firms)	147,377
Elimination due to missing data	
Cash Dividends Paid	-56,342
Common/Preferred Redeemed, Retired, Converted, Etc.	-6,554
Pre-tax Income	-10,331
Market Price - Year End	-4,001
Closely Held Shares	-3,442
Total Debt/Total Assets	-196
Market Capitalization/Common Equity	-12
Total	66,499
Elimination due to sector	
Financial	-14,165
Utility	-5,489
Total	46,845
Handling of outliers and data errors	
Elimination of data errors and extreme outliers	
Total Assets < 1000 \$	-151
Cash Dividends Paid/Market Capitalization < 0 or > 1	-0
Common or Preferred Redeemed, Retired, Converted, Etc./Market Capitalization < 0 or > 1	-220
Closely Held Shares % < 0 or > 1	-0
Pre-tax Income/Total Assets > 50 or < -50	-8
Market Price Year End _t - Market Price Year End _{t-1} > 50 or < -50	-0
Total Debt/Total Assets < 0 or > 50	-0
Market Capitalization/Common Equity > 50 or < -50	-235
Truncation of the 1. and/or 100. percentile	
(Cash Dividends Paid, Common/Preferred Redeemed, Retired, Converted, Etc., Pre-tax Income, Market Price - Year End, Closely Held Shares, Total Debt/Total Assets, Market Capitalization/Common Equity)	-7,681
Total	38,550

Source: WorldScope, February 2011.

and the largest Swiss firm is Nestle. While the average firm distributes about 39.6 cents per share each year, it, surprisingly, realizes a loss of 4.48 \$ per share. However, this value is influenced by strong negative outliers. The median shows

Table 4.6: Selected firm characteristics

This table shows a variety of selected characteristics of the observations composing our sample. Panel A describes the distribution of observed firm-years by different industries, defined by the Standard Industrial Classification (SIC). The relevant divisions are given in parentheses. *Agr./Min.* stands for Agriculture, Forestry, and Fishing and Mining (Division A and B), *Constr.* stands for Construction (Division C), *Manuf.* stands for Manufacturing (Division D), *Utility* stands for Transportation, Communications, Electric, Gas and Sanitary Services (Division E), *Trade* stands for Wholesale Trade and Retail Trade (Division F and G), *Finance* stands for Finance, Insurance, and Real Estate (Division H), *Service* stands for Services (Division I), *Admin.* stands for Public Administration (Division J). Panel B provides statistics on a selection of basic key figures. n indicates the number of observations for each variable. *MarketCap.* denotes the Market Capitalization, *TA* stands for Total Assets, *TDebt* denotes Total Debt, *Op.Inc.* stands for Operating Income, *EPS* denotes Earnings per Share and *DPS* denotes Dividends per Share.

Panel A: Observations by sectors

Sector	Agr./Min.	Constr.	Manuf.	Utility	Trade	Finance	Service	Admin.
	2,459	715	21,337	0	4,991	0	8,968	80

Panel B: Basic firm parameters (in thousands of U.S. Dollars)

Variable	n	Mean	S.D.	Min	.25	Mdn	.75	Max
Market Cap.	38,550	3,376,313	15,253,064	1.0000	27,263	183,953	1,124,385	504,239,580
TA	38,550	3,003,049	12,947,798	3.0000	42,978	246,938	1,252,624	324,115,367
TDebt	38,550	805,056	4,431,788	1.0000	4,558	39,989	310,225	179,804,000
Op.Inc.	38,533	270,653	1,455,049	-8,167,000	-1,323	9,427	94,188	66,290,000
EPS	38,528	-4,4830	278,6689	-45,500	-0.3400	0.2300	1.1499	598.3703
DPS	38,550	0.3961	3.0216	0.0000	0.0000	0.0000	0.1620	197.6479

that more than 50% of our firm-year observations report positive earnings in the period from 1998 to 2009.

4.4.2 Descriptive statistics

To analyze tax influences on payout policy in general and on the choice between dividends and share repurchases in particular, we employ 8 different measures of payout activity. Further, we utilize a set of established control variables, both on the firm level and the macroeconomic level, to account for possible non-tax influences. Descriptive statistics for all the variables used in our multivariate analysis are reported in table 4.7.

To test our first hypothesis of a positive relation between the use of a given payout alternative and its relative tax advantageousness, we use three different established measures for each of the two payout channels.³⁰⁷ To measure dividend payout activity, we use the dividend yield *Divyield*, given by the ratio of dividends paid by market capitalization. Our second measure is *Divpaid*, a dummy variable indicating if a firm paid dividends. As a third measure, we employ *Divinit*, a dummy variable indicating if a firm initiated payments.³⁰⁸ In our sample, the average firm has a dividend yield of about 0.8%, 35.7% of the firms are dividend payers and 9.3% of the firms have initiated dividend payments or raised their payout by at least 20% during our observation period. To analyze share repurchases, we construct the three measures *Repyield*, *Reppaid* and *Repinit* in

³⁰⁷ See Chetty and Saez (2005), p. 800 and p. 809 and Jacob and Jacob (2012), p. 11.

³⁰⁸ Following Chetty and Saez (2005), an initiation is defined as a payout in t with no payout in $t - 1$ or as an increase in dividend payout of at least 20%.

Table 4.7: Descriptive statistics of regression variables

This table provides descriptive statistics of our regression variables. The column *Type* defines the type of the variable, with *DEP* standing for a dependent variable and *IND* for an independent variable. *n* indicates the number of observations for each variable. *Divyield* stands for Cash Dividends Paid scaled by Market Capitalization, *Divpaid* is a dummy variable that equals 1 if a firm paid out a dividend and *Divinit* is a dummy variable that equals 1 if a firm has initiated dividend payments or raised its dividend for at least 20%. *Repyield*, *Reppaid* and *Repinit* are defined accordingly. *Totalpayout* is the sum of dividends and share repurchases, *Relativediv* is the percentage of payouts carried out as a dividend. *Income* denotes Pre-tax Income and is scaled by Total Assets. θ^{avg} is the average relative tax variable, θ^{firm} is the firm-specific relative tax variable, Σ^{avg} is the average combined tax variable and Σ^{firm} is the firm-specific combined tax variable. *Trend* is the relative change between Market Price - Year End in $t - 1$ and t , *Closely* denotes Closely Held Shares, *Lev* stands for Total Debt divided by Total Assets and *Q* stands for Tobin's Q. *Log GDP* and *Log Index* represent the natural logarithms of the gross domestic product and the broad stock index, respectively. The index $t - 1$ indicates a variable that is lagged by one year.

Variable	Type	n	Mean	S.D.	Min	.25	Mdn	.75	Max
Divyield	DEP	38,550	0.0082	0.0158	0.0000	0.0000	0.0000	0.0112	0.1617
Divpaid	DEP	38,550	0.3565	0.4790	0.0000	0.0000	0.0000	1.0000	1.0000
Divinit	DEP	38,550	0.0926	0.2898	0.0000	0.0000	0.0000	0.0000	1.0000
Repyield	DEP	38,550	0.0103	0.0260	0.0000	0.0000	0.0000	0.0047	0.2681
Reppaid	DEP	38,550	0.3421	0.4744	0.0000	0.0000	0.0000	1.0000	1.0000
Repinit	DEP	38,550	0.1969	0.3977	0.0000	0.0000	0.0000	0.0000	1.0000
Totalpayout	DEP	38,550	121,939	780,510	0.0000	0.0000	47.7711	15,148	39,721,860
Relativediv	DEP	20,055	0.5175	0.4414	0.0000	0.0000	0.5218	1.0000	1.0000
Income _{t-1}	IND	38,550	-0.1959	1.5941	-48.9230	-0.0872	0.0426	0.1204	0.8899
θ^{avg}	IND	38,550	0.9521	0.1016	0.8616	0.8767	1.0000	1.0000	1.6052
θ^{firm}	IND	38,550	0.9252	0.1248	0.5756	0.8222	1.0000	1.0000	1.9344
Σ^{avg}	IND	38,550	0.8972	0.0963	0.4456	0.8662	0.8674	0.9726	1.1544
Σ^{firm}	IND	38,550	0.9236	0.1104	0.3318	0.8741	0.8935	1.0169	1.2032
Trend _{t-1}	IND	38,550	0.0990	0.8554	-0.9998	-0.3571	-0.0309	0.3198	15.000
Closely _{t-1}	IND	38,550	0.3020	0.2474	0.0000	0.0931	0.2567	0.4802	0.9976
Lev _{t-1}	IND	38,550	0.3178	0.4994	0.0000	0.0969	0.2338	0.3860	12.626
Q _{t-1}	IND	38,550	2.4271	5.2526	-49.7100	0.9200	1.7899	3.2699	49.7500
Log GDP	IND	38,550	15.9581	0.6965	12.4294	16.0671	16.1369	16.2270	16.2726
Log Index	IND	38,550	4.5274	0.1728	4.2505	4.3716	4.4896	4.6052	5.0486

the same way as the dividend measures. With a value of about 1%, the mean share repurchase yield is a little higher than the mean dividend yield. 34.2% of the firms in our sample repurchase shares and 19.7% have initiated share repurchase programs. While the number of repurchasing firms is comparable to the number of dividend payers, more than twice the number of firms initiated repurchases. This is especially noticeable for two reasons. First, the high number of initiations can be seen as an indicator of the continually growing importance of repurchase

programs.³⁰⁹ Second, the number can be interpreted as an actual sign of higher flexibility of share repurchases, as frequently stated by scientists and practitioners alike.³¹⁰ Panels A and B of figure 4.1 provide an overview over the development of these six measures of payout activity by plotting the measures' means against time.

Looking at the development of the dividend yield in the first plot of Panel A, the phenomenon of disappearing dividends immediately comes to mind. The mean of the dividend yield has almost continuously been declining over the years. However, the decline seems to have slowed down in the last years. The plots of the variables on dividend payers and dividend initiations both show an articulate kink in their curves around the year 2003, possibly influenced by the tax reforms in the U.S. and in Germany. The plots of our three share repurchase measures, presented in Panel B, show distinct features as well. All three curves seem to rise constantly until the year 1999/2000, then decline rather rapidly from there, and rise again until the year 2007/2008, followed by a second decline. This pattern hints at a connection of share repurchase activity to the performance of stock markets as in Dittmar (2000), with the "dotcom burst" of 2000 and the global financial crisis beginning in 2007 as possible explanations for the shape of the curve.³¹¹

To analyze our second hypothesis of firms increasing their relative and combined payouts after a favorable tax reform, we construct the variables *Relativediv* and

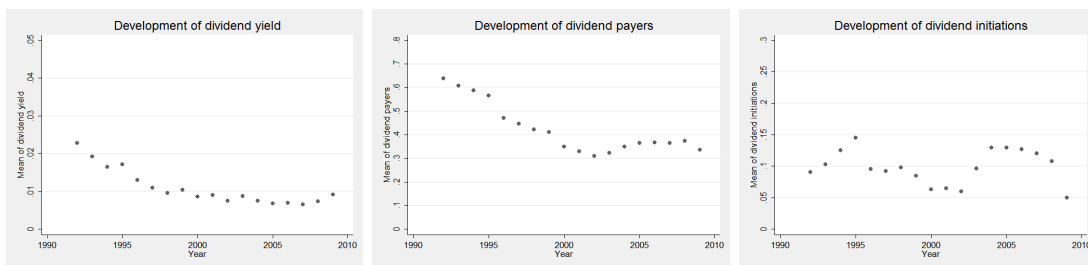
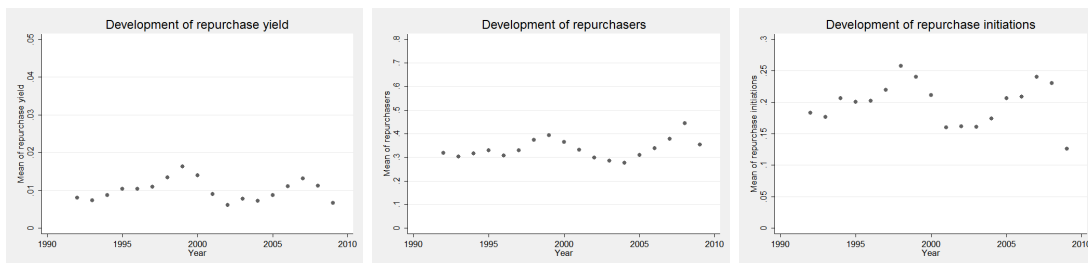
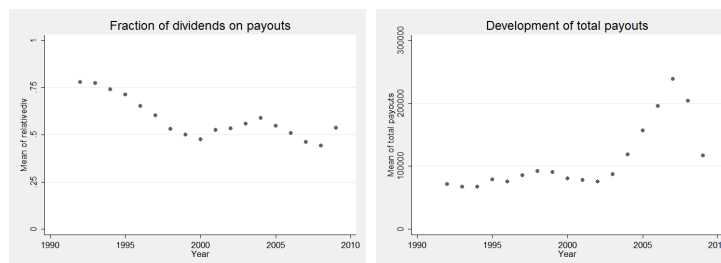
³⁰⁹ See Grullon and Michaely (2002), p. 1649.

³¹⁰ See Jagannathan et al. (2000), p. 368 and Brav et al. (2005), p. 485.

³¹¹ See Dittmar (2000), p. 334.

Figure 4.1: Development of payout measures

Panel A provides an overview over the development of the means of our three dividend measures. *Divyield* stands for Cash Dividends Paid scaled by Market Capitalization, *Divpaid* is a dummy variable that equals 1 if a firm paid out a dividend and *Divinit* is a dummy variable that equals 1 if a firm has initiated dividend payments or raised its dividend for at least 20%. Panel B shows the development of the means of our three repurchase measures. *Repyield*, *Reppaid* and *Repinit*, are defined accordingly to the dividend measures. Panel C provides an overview over the development of the means of our two measures on payout policy. *Relativediv* is the percentage of payouts carried out as a dividend, *Totalpayout* is the sum of dividends and share repurchases.

Panel A: Development of the dividend measures**Panel B: Development of the share repurchase measures****Panel C: Development of the measures on payout policy**

Totalpayout. *Relativediv* is defined as the amount of payouts carried out in the form of a dividend divided by the sum of all payouts. Following Blouin et al. (2011), we eliminate all observations where firms did not distribute via either

of the two channels,³¹² reducing the number of observations to 20,055 for this variable. The mean value of 51.8% and the median of 52.2% indicate that overall, the firms in our sample use a well balanced combination of the two channels for their payouts. Our last measure *Totalpayout* is defined as the sum of dividends distributed and shares repurchased. The average firm distributes over 121 million \$ in a given year. Again, this value is influenced by outliers with huge payouts of over 39 billion \$ (Exxon Mobil in 2008) at the maximum. The median lies at total payouts slightly below 48,000 \$.

Panel C of figure 4.1 shows plots of the mean values of *Relativediv* and *Totalpayout* over time. The graph of *Relativediv* shows characteristics of a combination of the plots in Panel A and Panel B, with a continuous decline and a possible connection to the financial turmoils of 2000 and 2007. Again, the phenomenon of disappearing dividends is apparent, as the fraction of payouts carried out as a dividend declined from well over 75% in the early nineties to about 50% towards the end of our observation period. Total payouts show an immense increase after the year 2003, peaking in the year 2007 at a value over three times as high as the level of the whole period before the year 2003. This sharp increase is a potential consequence of the tax cuts in the U.S. and in Germany in 2003 and 2002, respectively. Especially the JGTRRA 2003, with its presumably short time window for tax benefits due to its temporary nature, possibly induced firms to seize the “one time opportunity” for payout.³¹³ The almost identically steep decline after

³¹² See Blouin et al. (2011), p. 897.

³¹³ This reaction is in line with the old view as well as the new view, as both theories predict a payout policy response in reaction to temporary tax reforms (see Poterba and Summers (1985), p. 17; Chetty and Saez (2005), p. 828 and Auerbach and Hassett (2006), p. 6).

the year 2007 supports this interpretation, with dividends and share repurchases returning to their normal level.

There are a number of influences on corporate payout behavior discussed in the literature that are only secondarily connected to taxation. To account for these effects, we add a set of control variables to our regressions, both on the firm level and the macroeconomic level. Following signaling theory, managers use differences in the taxation of payout channels, like the dividend tax penalty in the U.S. before the year 2003, to convey information about future cash flows to possible investors. Payout policy discriminates profitable firms from less profitable firms by their ability to distribute through the costly channel.³¹⁴ To control for dividends being used for signaling, we include a measure of profitability, the pre-tax income divided by total assets, expressed in the variable *Income*. Along the lines of agency-theory it is possible that managers refrain from the distribution of free cash flows and instead try to keep funds inside the company to invest in projects catering to their very own agenda, which is not necessarily in line with the interests of the shareholders. In this setting, payouts reduce agency costs because they extract funds from managerial control. However, executive stock holdings or strong outside control might reduce the necessity of distributions in order to decrease agency costs.³¹⁵ To control for the agency-influence of external financing, strong shareholders and inside ownership, we use the variables *Closely*, derived from the variable “Closely Held Shares” and the corporate leverage *Lev*,

³¹⁴ For an introduction into signaling theory, see Watts (1973), Battacharya (1979) and Hakansson (1982).

³¹⁵ For an introduction into agency theory, see Jensen and Meckling (1976), Easterbrook (1984) and Jensen (1986).

defined by total debt scaled by total assets. The combination of pecking order theories and life-cycle theories introduces the possibility that high growth firms with plenty of profitable future investment opportunities will generally prefer to finance their projects internally and therefore rather retain their earnings.³¹⁶ We introduce the variables *Trend*, defined as the yearly development of share prices and *Q*, standing for Tobin's Q or market capitalization scaled by common equity to account for possible influences of growth prospects on payout policy. To account for influences of the economic environment on the distribution decision of a firm, we introduce two additional macroeconomic variables. We use the natural logarithm of the gross domestic product, *Log GDP* and the natural logarithm of the value of the broad stock market index *Log Index*³¹⁷, to account for possible influences on payouts caused by the development of the overall economy, like increased revenues or investment opportunities due to overall economic growth. We use natural logarithms here, as neither of the two variables are scaled like all our other variables, and for easier economic interpretation.

Table 4.8 provides the correlation matrix for the variables used in our regressions. All correlations are based on the 38,550 observations of our final sample, with the exception of the correlations for *Relativediv*, with only 20,055 observations. Not surprisingly, some definitions of our dividend measures and tax variables are fairly high correlated to their alternatives. However, these variables never appear

³¹⁶ For an introduction into pecking order and life-cycle theories, see Myers (1984) and Grullon et al. (2002).

³¹⁷ The variable *Index* represents the Standard & Poor's 500 index for observations from the U.S., the Composite DAX for observations from Germany and the Swiss Performance Index SPI for observations from Switzerland.

Table 4.8: Correlation Matrix

This table presents the correlation matrix for our sample. The numbers in parentheses given in the first column identify the variables in the first row. Values higher than 0.5 appear in bold font. The correlations on *RelativeDiv* are based on 20,055 observations, all other correlations are based on 38,550 observations. *Divyield* stands for Cash Dividends Paid scaled by Market Capitalization, *Divpaid* is a dummy variable that equals 1 if a firm paid out a dividend and *Divinit* is a dummy variable that equals 1 if a firm has initiated dividend payments or raised its dividend for at least 20%. *Repyield*, *Reppaid* and *Reppinit* are defined accordingly. *Totalpayout* is the sum of dividends and share repurchases, *RelativeDiv* is the percentage of payouts carried out as a dividend. *Income* denotes Pre-tax Income and is scaled by Total Assets. θ^{avg} is the average relative tax variable, θ^{firm} is the firm-specific relative tax variable, Σ^{avg} is the average combined tax variable and Σ^{firm} is the firm-specific combined tax variable. *Trend* is the relative change between Market Price - Year End in $t - 1$ and t , *Closely* denotes Closely Held Shares, *Lev* stands for Total Debt divided by Total Assets and *Q* stands for Tobin's Q. *Log GDP* and *Log Index* represent the natural logarithms of the gross domestic product and the broad stock index, respectively. The index $t - 1$ indicates a variable that is lagged by one year.

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	
(1) Divyield	1.00																			
(2) Divpaid	0.70	1.00																		
(3) Divinit	0.28	0.43	1.00																	
(4) Repyield	0.06	0.13	0.04	1.00																
(5) Reppaid	0.12	0.25	0.07	0.55	1.00															
(6) Repinit	0.04	0.13	0.06	0.51	0.69	1.00														
(7) Totalpayout	0.16	0.18	0.06	0.17	0.18	0.12	1.00													
(8) RelativeDiv	0.57	0.79	0.27	-0.51	-0.79	-0.54	-0.03	1.00												
(9) Income _{t-1}	0.09	0.13	0.05	0.07	0.12	0.08	0.03	0.02	1.00											
(10) θ^{avg}	0.11	0.11	0.11	-0.08	-0.08	-0.06	0.02	0.18	-0.02	1.00										
(11) θ^{firm}	0.01	0.00	0.05	-0.08	-0.09	-0.06	-0.01	0.08	-0.04	0.80	1.00									
(12) Σ^{avg}	-0.07	-0.08	-0.12	0.06	0.05	0.03	-0.02	-0.14	0.01	-0.12	-0.14	1.00								
(13) Σ^{firm}	-0.02	-0.02	-0.11	0.09	0.08	0.05	0.01	-0.12	0.02	-0.24	-0.35	0.91	1.00							
(14) Trend _{t-1}	-0.05	0.01	0.07	-0.02	-0.01	0.03	0.00	0.01	0.01	-0.01	-0.01	-0.01	-0.01	1.00						
(15) Closely _{t-1}	-0.07	-0.12	0.00	-0.11	-0.16	-0.10	-0.13	0.06	-0.04	0.12	0.39	-0.12	-0.41	-0.01	1.00					
(16) Lev _{t-1}	-0.06	-0.10	-0.05	-0.07	-0.12	-0.08	-0.03	0.08	-0.32	0.02	0.04	0.00	-0.03	-0.03	0.07	1.00				
(17) Q _{t-1}	-0.01	0.05	0.04	0.02	0.06	0.04	0.07	-0.04	0.13	-0.02	-0.04	0.04	0.06	0.16	-0.07	-0.19	1.00			
(18) Log GDP	-0.21	-0.21	-0.17	0.04	0.05	0.02	0.02	-0.24	-0.06	-0.26	-0.01	0.45	0.39	0.00	-0.16	0.06	0.00	1.00		
(19) Log Index	0.03	0.08	0.09	0.02	0.01	0.02	0.05	0.05	-0.03	0.44	0.37	-0.24	-0.28	0.07	0.05	0.01	0.03	-0.15	1.00	

on the same side of one of our regression equations. Our two macroeconomic control variables are moderately high correlated to each other. However, we do not see the coefficient of 0.51 as too problematic, as the connection between economic growth and stock market performance is well established in economic theory. Overall, extensive multicollinearity does not appear to be a problem in our sample.

4.4.3 Regression analysis

Our univariate analysis has shown first indications of tax effects on distributions. To analyze these relations more deeply, we turn to multivariate regression analysis in the following. Throughout all our panel regressions, we employ basic ordinary least squares estimators with firm fixed effects and robust standard errors. We also include firm fixed effects in the calculation of the coefficients of determination. To test our first hypothesis of increased use of a given distribution alternative after a favorable tax reform, namely a positive (negative) relation between the three dividend (repurchase) measures and our two tax variables θ^{firm} and θ^{avg} , we use the following equations:

$$\begin{aligned} Payout_{i,t} = & \alpha_0 + \alpha_i + \beta_1 Income_{i,t-1} + \beta_2 \theta_{(i),t} + \beta_3 Trend_{i,t-1} + \beta_4 Closely_{i,t-1} \\ & + \beta_5 Lev_{i,t-1} + \beta_6 Q_{i,t-1} + \beta_7 LogGDP_t + \beta_8 LogIndex_t + \varepsilon_{i,t}, \end{aligned}$$

where $Payout_{i,t}$ stands for one of our payout measures $Divyield_{i,t}$, $Divpaid_{i,t}$, $Divinit_{i,t}$, $Repyield_{i,t}$, $Reppaid_{i,t}$ or $Repinit_{i,t}$ for firm i in year t and $\theta_{(i),t}$ stands for the firm-specific relative tax variable $\theta_{i,t}^{firm}$ or the average relative tax variable θ_t^{avg} . Table 4.9 shows the results of the regressions with θ^{firm} as the tax variable.

Table 4.9: Taxes and the use of payout channels: θ^{firm}

This table shows the results of fixed effects panel regressions of the firm-specific relative tax variable on six measures of payout activity. *Divyield* stands for Cash Dividends Paid scaled by Market Capitalization. *Divpaid* is a dummy variable that equals 1 if a firm paid out a dividend and *Divinit* is a dummy variable that equals 1 if a firm has initiated dividend payments or raised its dividend by at least 20%. *Repyield*, *Reppaid* and *Repinit* are defined accordingly. *Income* denotes Pre-tax Income and is scaled by Total Assets. θ^{firm} is the firm-specific relative tax variable. *Trend* is the relative change between Market Price - Year End in $t - 1$ and t , *Closely* denotes Closely Held Shares, *Lev* stands for Total Debt divided by Total Assets and *Q* stands for Tobin's Q. *Log GDP* and *Log Index* represent the natural logarithms of the gross domestic product and the broad stock index, respectively. The index $t - 1$ indicates a variable that is lagged by one year. One star, two stars and three stars denote significance at the 10%, 5% and the 1% level, respectively. Robust standard errors are given in parentheses.

Variable	Divyield	Divpaid	Divinit	Repyield	Reppaid	Repinit
$Income_{t-1}$	0.0000 (0.0000)	0.0023** (0.0010)	0.0025** (0.0010)	0.0002*** (0.0001)	0.0049*** (0.0015)	0.0034*** (0.0013)
θ^{firm}	0.0026* (0.0015)	0.0984*** (0.0299)	0.1186*** (0.0271)	-0.0108*** (0.0016)	-0.1915*** (0.0305)	-0.1044*** (0.0234)
$Trend_{t-1}$	-0.0007*** (0.0001)	0.0032** (0.0016)	0.0203*** (0.0020)	-0.0009*** (0.0001)	-0.0124*** (0.0026)	0.0099*** (0.0025)
$Closely_{t-1}$	-0.0013** (0.0006)	-0.0594*** (0.0151)	-0.0272** (0.0125)	-0.0004 (0.0011)	-0.0357* (0.0193)	-0.0287* (0.0160)
Lev_{t-1}	-0.0002** (0.0001)	-0.0228*** (0.0041)	-0.0195*** (0.0032)	-0.0020*** (0.0003)	-0.0409*** (0.0057)	-0.0347*** (0.0048)
Q_{t-1}	-0.0001*** (0.0000)	0.0006* (0.0004)	0.0014*** (0.0003)	-0.0001*** (0.0000)	-0.0006 (0.0005)	-0.0008 (0.0005)
Log GDP	-0.0067*** (0.0019)	-0.1167*** (0.0391)	0.1262*** (0.0345)	-0.0111*** (0.0020)	0.1252*** (0.0418)	-0.1002*** (0.0310)
Log Index	-0.0019*** (0.0005)	0.1094*** (0.0117)	0.0299** (0.0134)	0.0149*** (0.0011)	0.1355*** (0.0176)	0.1676*** (0.0158)
Constant	0.1229*** (0.0277)	1.6556*** (0.5982)	-2.1575*** (0.5200)	0.1320*** (0.0313)	-2.0643*** (0.6435)	1.1552** (0.4731)
Observations	38,550	38,550	38,550	38,550	38,550	38,550
Adjusted R ²	0.681	0.781	0.151	0.234	0.413	0.0788
F-statistic	30.61	19.26	29.74	36.65	24.26	26.60
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

While the coefficients for the three dividend measures are all positive, the coefficients for the repurchase measures are negative. All coefficients are statistically significant at the 1% level, with the exception of the coefficient for *Divyield*, showing significance at the 10% level. These results concordantly indicate tax effects on distribution policy and are in line with our first hypothesis. Firms react to tax reforms by increasing their use of the payout channel that relatively benefitted from the reform. For example, an increase in the tax variable, cor-

responding to increased tax-advantageousness of dividends compared to capital gains, leads to higher dividend yields, a higher likelihood to pay dividends and a higher likelihood to initiate dividend payments. Our results are also economically significant. The JGTRRA 2003 increased θ^{firm} by 0.167 on average.³¹⁸ A comparable increase of 0.125, one standard deviation in the tax variable, increases the firms' dividend yield by 3.96% of the sample mean. Accordingly, one standard deviation in θ^{firm} increases the likelihood to pay dividends by 3.44% and the likelihood to initiate dividend payments by 15.98%. The economic influence of taxes on share repurchases is even higher, with relative effects of 13.09%, 6.99% and 6.62% for *Repyield*, *Reppaid* and *Repinit*, respectively.

The coefficients of our firm-level control variables in the regressions on the dividend yield *Divyield* and the share repurchase yield *Repyield* correspond to findings of prior literature. The coefficients for *Income* are positive, in line with the notion that managers use payouts to signal profitability. However, the coefficient is not significant in the regression on *Divyield*. The coefficients on *Closely* and *Lev* are negative and mostly statistically significant, indicating the diminishing need for dividends as a tool to reduce agency costs in the presence of external financing, strong shareholders and inside ownership. Finally, the coefficients on *Trend* and *Q* are negative and highly significant, in line with high growth firms rather retaining their earnings to finance their investments. On the country-level, *Log GDP* is negative and significant in the regressions on *Divyield* and *Repyield*, while *Log Index* is negatively significant in the dividend regression

³¹⁸ Table 4.3 shows that the mean value of θ^{firm} rose from 0.833 to 1.0 after the reform.

but positively significant in the repurchase regression. While some controls like *Income*, *Closely* and *Lev* show consistent signs through all our payout measures, others like *Trend*, *Q*, *Log GDP* and *Log Index* change signs. This could be an indication of a differential, more complex role of growth prospects and the macroeconomic environment in the choice to distribute or initiate distributions.

Table 4.10 provides the results using the average relative tax variable θ^{avg} . The results are very similar. All coefficients of the tax variable are positive and highly significant in the dividend regressions, while negative and highly significant in the share repurchase regressions. The economic significance is comparable, but even a little higher than in our regressions using θ^{firm} .

To test our second hypothesis, we use variations of our previous regression equation. The question whether firms switch payouts to the channel that relatively benefitted from the reform, is tested with a combination of *Relativediv* and one of the relative tax variables θ^{firm} and θ^{avg} . We test whether firms raise their overall payouts when the aggregate tax burden on distributions declines with a combination of *Totalpayout* and one of the combined tax variables Σ^{firm} and Σ^{avg} . Specifically, we test the following regression equations:

$$\begin{aligned} Payout_{i,t} = & \alpha_0 + \alpha_i + \beta_1 Income_{i,t-1} + \beta_2 Tax_{(i),t} + \beta_3 Marketcap_{i,t-1} \\ & + \beta_4 Trend_{i,t-1} + \beta_5 Closely_{i,t-1} + \beta_6 Lev_{i,t-1} + \beta_7 Q_{i,t-1} \\ & + \beta_8 LogGDP_t + \beta_9 LogIndex_t + \varepsilon_{i,t}, \end{aligned}$$

where $Payout_{i,t}$ stands for either *Relativediv* or *Totalpayout* for firm i in year t and $Tax_{(i),t}$ stands for either $\theta_{i,t}^{firm}$ or θ_t^{avg} in the regressions on *Relativediv* and

Table 4.10: Taxes and the use of payout channels: θ^{avg}

This table shows the results of fixed effects panel regressions of the average relative tax variable on six measures of payout activity. *Divyield* stands for Cash Dividends Paid scaled by Market Capitalization. *Divpaid* is a dummy variable that equals 1 if a firm paid out a dividend and *Divinit* is a dummy variable that equals 1 if a firm has initiated dividend payments or raised its dividend by at least 20%. *Repyield*, *Reppaid* and *Repinit* are defined accordingly. *Income* denotes Pre-tax Income and is scaled by Total Assets. θ^{avg} is the average relative tax variable. *Trend* is the relative change between Market Price - Year End in $t - 1$ and t , *Closely* denotes Closely Held Shares, *Lev* stands for Total Debt divided by Total Assets and *Q* stands for Tobin's Q. *Log GDP* and *Log Index* represent the natural logarithms of the gross domestic product and the broad stock index, respectively. The index $t - 1$ indicates a variable that is lagged by one year. One star, two stars and three stars denote significance at the 10%, 5% and the 1% level, respectively. Robust standard errors are given in parentheses.

Variable	Divyield	Divpaid	Divinit	Repyield	Reppaid	Repinit
Income $_{t-1}$	0.0000 (0.0000)	0.0023** (0.0010)	0.0025*** (0.0010)	0.0002*** (0.0001)	0.0049*** (0.0015)	0.0033*** (0.0013)
θ^{avg}	0.0037** (0.0017)	0.1408*** (0.0343)	0.1141*** (0.0325)	-0.0172*** (0.0016)	-0.2705*** (0.0335)	-0.1810*** (0.0247)
Trend $_{t-1}$	-0.0007*** (0.0001)	0.0034** (0.0016)	0.0202*** (0.0020)	-0.0009*** (0.0001)	-0.0126*** (0.0026)	0.0097*** (0.0025)
Closely $_{t-1}$	-0.0009 (0.0006)	-0.0425*** (0.0143)	-0.0066 (0.0121)	-0.0023** (0.0010)	-0.0686*** (0.0184)	-0.0465*** (0.0153)
Lev $_{t-1}$	-0.0002** (0.0001)	-0.0232*** (0.0041)	-0.0197*** (0.0032)	-0.0019*** (0.0003)	-0.0402*** (0.0057)	-0.0341*** (0.0048)
Q $_{t-1}$	-0.0001*** (0.0000)	0.0006* (0.0004)	0.0013*** (0.0003)	-0.0001*** (0.0000)	-0.0006 (0.0005)	-0.0008* (0.0005)
Log GDP	-0.0063*** (0.0017)	-0.0990*** (0.0371)	0.1527*** (0.0322)	-0.0129*** (0.0021)	0.0905** (0.0422)	-0.1160*** (0.0307)
Log Index	-0.0022*** (0.0005)	0.1016*** (0.0115)	0.0284** (0.0134)	0.0160*** (0.0011)	0.1501*** (0.0178)	0.1804*** (0.0161)
Constant	0.1153*** (0.0251)	1.3606** (0.5705)	-2.5783*** (0.4852)	0.1625*** (0.0326)	-1.4864** (0.6514)	1.4305*** (0.4692)
Observations	38,550	38,550	38,550	38,550	38,550	38,550
Adjusted R ²	0.681	0.781	0.151	0.235	0.413	0.0795
F-statistic	31.07	19.36	28.72	40.57	27.91	29.80
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

for $\Sigma_{i,t}^{firm}$ or Σ_t^{avg} in the regressions on *Totalpayout*. Notice that by definition, neither *Totalpayout*, the sum of dividends distributed and shares repurchased, nor *Relativediv* the relative amount of payouts carried out in the form of a dividend, are scaled like our other variables. In order to consistently account for size effects in these regressions as well, we have added the variable *Marketcap* as an additional control variable. Further, for easier interpretation and in order to put *Totalpayout* in the same dimensions as our other variables, we use the

variable's natural logarithm *Log Totalpayout* in our regressions. Notice that *Log Totalpayout* and *Relativediv* are not defined for firms that have neither distributed dividends nor repurchased shares. This reduces our sample size to 20,055 observations. Table 4.11 presents the results of the panel regressions.

Table 4.11: Tax influences on payout policy

This table shows the results of fixed effects panel regressions of the relative and combined tax variables on two measures of payout policy. *Relativediv* is defined as the amount of payouts carried out in the form of a dividend divided by the sum of all payouts. *Log Totalpayout* is the natural logarithm of the sum of dividends distributed and shares repurchased. *Income* denotes Pre-tax Income and is scaled by Total Assets. θ^{firm} is the firm-specific relative tax variable, Σ^{firm} is the combined firm-specific tax variable. θ^{avg} is the average relative tax variable and Σ^{avg} is the combined tax variable of an average firm in our sample. *Marketcap* stands for the Market Capitalization of a firm, *Trend* is the relative change between Market Price - Year End in $t - 1$ and t , *Closely* denotes Closely Held Shares, *Lev* stands for Total Debt divided by Total Assets and *Q* stands for Tobin's Q. *Log GDP* and *Log Index* represent the natural logarithms of the gross domestic product and the broad stock index, respectively. The index $t - 1$ indicates a variable that is lagged by one year. One star, two stars and three stars denote significance at the 10%, 5% and the 1% level, respectively. Robust standard errors are given in parentheses.

Variable	Relativediv	Log Totalpayout	Relativediv	Log Totalpayout
$Income_{t-1}$	-0.0017 (0.0293)	0.3331 (0.2102)	-0.0001 (0.0290)	0.3312 (0.2098)
θ^{firm}	0.1745*** (0.0272)			
Σ^{firm}		-0.6375*** (0.1752)		
θ^{avg}			0.2554*** (0.0290)	
Σ^{avg}				-0.8377*** (0.1900)
$Marketcap_{t-1}$	-0.0000*** (0.0000)	0.0000*** (0.0000)	-0.0000*** (0.0000)	0.0000*** (0.0000)
$Trend_{t-1}$	0.0015 (0.0051)	0.0534** (0.0258)	0.0022 (0.0051)	0.0522** (0.0258)
$Closely_{t-1}$	-0.0118 (0.0240)	-0.6168*** (0.1100)	0.0268 (0.0227)	-0.5263*** (0.1077)
Lev_{t-1}	0.1610*** (0.0449)	-1.5292*** (0.2664)	0.1638*** (0.0448)	-1.5337*** (0.2662)
Q_{t-1}	0.0025* (0.0013)	-0.0020 (0.0058)	0.0024* (0.0013)	-0.0023 (0.0058)
Log GDP	0.0619* (0.0364)	0.3605** (0.1805)	0.1025*** (0.0378)	0.2540 (0.1871)
Log Index	-0.1308*** (0.0181)	1.1390*** (0.0788)	-0.1485*** (0.0184)	1.1907*** (0.0813)
Constant	-0.0620 (0.5693)	-0.5139 (2.8538)	-0.7206 (0.5933)	1.0770 (2.9420)
Observations	20,055	20,055	20,055	20,055
Adjusted R ²	0.672	0.854	0.673	0.854
F-statistic	13.59	58.59	17.54	59.09
Prob > F	0.0000	0.0000	0.0000	0.0000

The coefficients of our two relative tax variables θ^{firm} and θ^{avg} are both positive and statistically significant at the 1% level in our regressions on *Relativediv*. These results show that managers indeed increase the relative amount distributed via the payout channel that benefitted more by a reform. Again, these results are economically significant. An increase of 0.125, one standard deviation in θ^{firm} , increases the share of distributions paid via dividends by 4.21%. For θ^{avg} , the effect is even higher, with a relative increase of 5.01%. In the regressions on *Log Totalpayout*, the coefficients on Σ^{firm} and Σ^{avg} are both negative and highly significant. If a reform reduces the aggregate tax burden on dividends and capital gains, like the JGTRRA 2003 in the U.S. did, firms increase their overall payouts in reaction to the reform. Because the dependent variable is in logarithms, the economic interpretation is straight forward. If the aggregate tax burden increases by one standard deviation, 0.110 for Σ^{firm} and 0.096 for Σ^{avg} , firms reduce their total payouts by 7.01% and 8.04%, respectively. These results are in line with our second hypothesis. Although managers do alter the composition of their payouts towards the more tax-beneficial alternative, they do not simply switch payouts from one channel to the other, but instead increase overall payouts, indicating a complementary relation between dividends and share repurchases.

4.4.4 Balancing out the U.S. dominance in the sample

We have already provided some backup for the robustness of the tax effects by estimating our regressions with eight alternative measures for payouts and four alternative tax variables. However, one serious concern we have not addressed

so far emerges directly from the composition of our sample. When reviewing table 4.5, it becomes apparent that 90.1% of the firms in our sample come from the U.S., while only 7.7% are from Germany and 2.2% are from Switzerland. In fact, of the 38,550 observations in our final sample, 34,755 come from the U.S. while 2,581 are from Germany and 1,214 are of Swiss origin. This is simply due to the fact that we have chosen to include the whole WorldScope population for each of the three countries, with the U.S. being the largest economy by far. Legitimately, concerned readers may ask the question whether we have really reassessed the impact of the JGTRRA 2003 in a multi-country setting or merely provide yet another U.S. study with some noise introduced by German and Swiss observations. To address these concerns, we follow three alternative approaches to balance out the U.S. dominance in the sample.

First, we re-estimate all our regressions using weights. Each U.S. observation enters the regression weighed with a factor of $1/34,755$, each German observation weighed with $1/2,581$ and each Swiss observation weighed with $1/1,214$. This puts the influence of the three countries on the regression results on par. Second, we create a subsample using propensity score matching to reduce the number of U.S. observations. In particular, we match 2,581 of the U.S. observations to the German observations and keep all 1,214 observations from Switzerland, generating a reduced sample of 6,367 observations. As matching criteria, we use total dividends paid for our dividend regressions, total shares repurchased for our repurchase regressions and the sum of distributions for our regressions on *Log Totalpayout* and *Relativediv*. Our third approach is similar to the second,

albeit the firms are now not matched but randomly chosen. Specifically, we separate the German sample into payers and non-payers, using *Divpaid* for our dividend regressions, *Reppaid* for our repurchase regressions and an equivalent dummy indicating if the sum of dividends distributed and shares repurchased is positive, for the regressions on *Log Totalpayout* and *Relativediv*. In a second step, for each German payer (non-payer), we have randomly chosen one payer (non-payer) from the U.S. while keeping all Swiss observations, again yielding a reduced sample of 6,367 observations. Employing these three strategies, we have re-estimated our regressions using exactly the same setup as in the respective previous paragraphs. This leads to a total of 48 new regressions in which the U.S. dominance is alleviated in different ways. Of course, a thorough discussion of the results is not possible here due to spatial limitations. Instead, table 4.12 provides an overview over the coefficients of the tax variables only, our main variables of interest.

The coefficients of θ^{firm} and θ^{avg} in the regressions on *Divyield*, *Divpaid* and *Divinit* are all positive and in almost all cases highly statistically significant while the coefficients are negative and significant in the regressions on *Repyield* and *Repinit*. All of these results are in line with our first hypothesis. Notably, in all but one of the regressions on *Reppaid*, the coefficients show the predicted sign but are not statistically significant. This casts some doubt on the robustness of our previous results concerning *Reppaid*. The coefficients of θ^{firm} and θ^{avg} in the regressions on *Relativediv* are all positive and mostly statistically significant.

Table 4.12: Balancing out the U.S. dominance in the sample

This table shows the coefficients of the tax variables in re-estimations of our original regressions using three different approaches to balance out the U.S. dominance in our original sample. *Divyield* stands for Cash Dividends Paid scaled by Market Capitalization. *Divpaid* is a dummy variable that equals 1 if a firm paid out a dividend and *Divinit* is a dummy variable that equals 1 if a firm has initiated dividend payments or raised its dividend by at least 20%. *Repyield*, *Reppaid* and *Repinitt* are defined accordingly. *Log Totalpayout* is the natural logarithm of the sum of dividends distributed and shares repurchased. *Relativediv* is defined as the amount of payouts carried out in the form of a dividend divided by the sum of all payouts. Tax^{firm} stands for θ^{firm} in the regressions on *Divyield*, *Divpaid*, *Divinit*, *Repyield*, *Reppaid*, *Repinitt* and *Relativediv* and for Σ^{firm} in the regressions on *Log Totalpayout*. Tax^{avg} stands for θ^{avg} in the regressions on *Divyield*, *Divpaid*, *Divinit*, *Repyield*, *Reppaid*, *Repinitt* and *Relativediv* and for Σ^{avg} in the regressions on *Log Totalpayout*. Panel A shows the results of weighted regressions of the original sample of 38,550 observations. Panel B shows the results of regressions of a reduced sample of 6,376 observations with firms selected using propensity score matching. Panel C shows the results of regressions of a reduced sample of 6,376 observations with firms selected randomly.

Panel A: Weighted Regressions

Variable	Divyield	Divpaid	Divinit	Repyield	Reppaid	Repinitt	Rel.div	LogTotalp.
Tax^{firm}	0.0076*** (0.0026)	0.1307*** (0.0490)	0.1110** (0.0444)	-0.0044*** (0.0015)	-0.0143 (0.0337)	-0.0607** (0.0285)	0.0365 (0.0293)	-0.4827** (0.2138)
Tax^{avg}	0.0080*** (0.0025)	0.1451*** (0.0464)	0.0991* (0.0507)	-0.0062*** (0.0017)	-0.0419 (0.0376)	-0.0904*** (0.0313)	0.0607** (0.0305)	-0.5211** (0.2037)

Panel B: Propensity Score Matching

Variable	Divyield	Divpaid	Divinit	Repyield	Reppaid	Repinitt	Rel.div	LogTotalp.
Tax^{firm}	0.0093*** (0.0025)	0.1451*** (0.0436)	0.1493*** (0.0466)	-0.0084*** (0.0025)	-0.0035 (0.0314)	-0.0784** (0.0372)	0.0537* (0.0289)	-0.5141*** (0.1828)
Tax^{avg}	0.0090*** (0.0024)	0.1614*** (0.0425)	0.1198** (0.0512)	-0.0085*** (0.0021)	-0.0259 (0.0354)	-0.0919*** (0.0344)	0.0768*** (0.0281)	-0.5083*** (0.1820)

Panel C: Random Sample

Variable	Divyield	Divpaid	Divinit	Repyield	Reppaid	Repinitt	Rel.div	LogTotalp.
Tax^{firm}	0.0084** (0.0034)	0.1422** (0.0619)	0.1101* (0.0595)	-0.0039** (0.0019)	0.0100 (0.0456)	-0.0598 (0.0409)	0.0351 (0.0366)	-0.4496* (0.2427)
Tax^{avg}	0.0078*** (0.0030)	0.1512*** (0.0547)	0.0946 (0.0628)	-0.0052*** (0.0019)	-0.0309 (0.0454)	-0.0865** (0.0381)	0.0628* (0.0352)	-0.4712** (0.2180)

Finally, the coefficients of Σ^{firm} and Σ^{avg} in the regressions on *Log Totalpayout* are all negative and statistically significant. These results are in line with our second hypothesis. All in all, we see the evidence presented in table 4.12 as a strong indicator that our previous findings also hold in a more balanced international setting and are not simply the outcome of a sample selection with heavy emphasis on firms from the U.S.

4.5 Conclusion

We provide empirical evidence that firms react to payout tax reductions, even when the presence of large-scale, economy-wide influences on payout policy is considered. A beneficial tax reform increases the amount distributed, the likelihood to distribute and the likelihood to initiate payouts through the respective payout channel. However, even as firms increase their use of the relatively tax advantaged payout channel, they also increase overall payouts in reaction to a cut in the aggregate tax burden. This hints at a rather complementary relation between dividends and share repurchases in our sample. Our results are statistically and economically significant and robust to manifold definitions of the dependent and independent variables as well as to different compositions of the underlying sample. The results indicate that reforms of payout taxes can be used as an effective tool to influence corporate payout behavior and thereby, to some extent, affect the performance of the economy as a whole. With respect to the Jobs and Growth Tax Relief Reconciliation Act of 2003 in the U.S., our analysis shows that the reform achieved its goal of eliminating distortive lock-in effects by

increasing the overall level of payouts in the economy.

In contrast to most prior literature on the payout impact of the JGTRRA 2003, we do not employ a single-country setting with uniform tax variables, but instead analyze a multi-country dataset with two almost simultaneous but contrary tax reforms in the U.S. and Germany, and with Switzerland as a non-reform country. We have analyzed the payout policy of all 18,475 U.S., German and Swiss companies included in the WorldScope database from the year 1998 to 2009. While the JGTRRA 2003 increased the relative advantageousness of dividends, the German tax reform of 2002 significantly reduced the former tax advantage of dividends. Taxation in Switzerland has not changed significantly during our observation period and serves as a benchmark. Further, we introduce firm-specific tax variables into our analysis by employing elaborate models of the tax systems effective in the countries analyzed in our study. We consider taxation on the corporate and the shareholder level and account for different types of investors with different tax preferences in the shareholder structure of a firm. By analyzing countries with contrary tax reforms and employing firm-specific tax variables with greatly increased cross-sectional variation, we are able to effectively separate tax effects from other overall trends in payout behavior, like changes in the macroeconomic environment and changes in investor sentiment.

The empirical evidence presented in this paper contributes to previous results on the impact of the JGTRRA tax reform of 2003 in the U.S. in particular, and about the influence of tax reforms on payout behavior in general. With respect to dividends, many U.S. studies show a positive reaction of dividend

payouts to the 2003 tax cuts, while others have problems to find evidence for a tax influence. One possible explanation for these nonuniform results is that single-country studies oftentimes have difficulties in isolating tax effects from other large scale, economy wide effects on corporate payout. In fact, there are reports of an ongoing negative trend in dividend payouts over the last decades in the literature, possibly superimposing existing tax effects. Our results show that, even when accounting for an overall negative trend like this, there still remains a strong tax effect on the payout decision of corporate managers. Concerning prior studies, it is possible that the actual effect of the JGTRRA 2003 on payouts is even stronger than reported in many single-country studies on the tax reform.

Future research could increase the universality of our findings by purposely searching for and analyzing different examples of contrary tax reforms around the world, possibly incorporating them into a larger, more international sample. Additionally, the inclusion of a more sophisticated macroeconomic model or of more precise ways to account for firms' shareholder structures may further sharpen our results.

Chapter 5

Conclusion

As defined in the introduction in chapter 1, the fundamental research question underlying this thesis is whether taxes exert influence on corporate distribution policy. To answer this question, we have empirically examined the payout reaction of corporations to multiple tax reforms in different countries.

Chapter 2 of this thesis has provided the theoretical foundation for the empirical analyses in the chapters 3 and 4. We have introduced the most important theories explaining corporate distribution policy and have shown that taxes are only one out of many influences on corporate payouts. Based on the results of chapter 2, we have added a set of control variables to all regressions in the later chapters in order to better isolate the influence of taxation from signalling effects, agency effects and the influence of growth.

In chapter 3 of this work, we have analyzed the full set of firms listed at the Frankfurt stock exchange from 1993 to 2009. During this time, the tax reduction act “Steuersenkungsgesetz” and the tax reform act of 2008 “Unternehmensteuerreformgesetz 2008” brought profound changes to the taxation of dividends and capital

gains in Germany. The German case is especially suited to investigate which of the two predominant theoretical models on the influence of taxes on corporate distribution policy holds. We have shown that, in accordance with the reduced tax advantageousness of dividends compared to capital gains introduced by the reform of 2002, German corporations have significantly reduced their dividend payouts, in line with the old view or traditional view of dividend taxation.

In chapter 4, we have extended our approach, analyzing the tax systems of the U.S., Germany and Switzerland from 1998 to 2009. With the German reform of 2002 and the Jobs and Growth Tax Relief Reconciliation Act of 2003 in the U.S., we examine two nearly simultaneous but contrary tax reforms. The analysis contributes to the literature by controlling for economy-wide influences on payout policy through its complex modeling of the shareholders' tax preferences in a multicountry setting. Using a sample comprising 18,475 firms from the three countries, we have shown that the results on tax effects in line with the old view found in chapter 3 hold in an international sample. Chapter 4 also answers the additional questions about the economic nature of the tax effect posed in the introductory chapter 1. We have found that decisionmakers do not avoid tax stimuli by merely substituting between dividends and share repurchases. Although firms do react to tax reforms by increasing their use of the tax favored payout channel, this is not to the detriment of their overall payouts.

Overall, we conclude that tax effects play an important role in firms' payout policy. Although chapter 2 of this thesis has shown that many financial managers do not view payout taxes as a prime determinant of their payout policy, we find

statistically and economically significant and robust tax influences throughout all of our empirical analyses. Pertaining to our main research questions, our results suggest that taxes do influence corporate distribution policy and that payout taxes can indeed be used as an effective tool for fiscal policy.

The results and conclusions presented in this thesis are subject to some limitations. One limitation regards the lack of precise data on the shareholder structure of the firms in our sample. Although we provide different ways to approximate the firms' shareholder structure, we are unable to model the exact tax preference structure of the firms analyzed. Due to the same reason, we can not draw conclusions about the influence of foreign shareholders on firms' payout policy, although they certainly represent an important investor group. Another limitation regards the payout measures used in our study. Our analyses do not discriminate between regular dividends and special dividends or between different forms of share repurchase programs. It is possible that the decision for each of these alternatives is driven by different factors. We also do not model mandatory payout requirements or the exact nature of the determinants underlying the process of utilization of corporate earnings.

The limitations presented above provide the natural starting point for a discussion of possible avenues for further research. The empirical analyses presented in this thesis will most certainly benefit from a more sophisticated modeling of the firms' shareholder structure or the payout measures. Further, the introduction of complex models of the tax systems of additional countries into our framework will benefit the econometric analysis and increase the general validity of the findings.

Finally, in the political context, the exercise of influence on payouts typically represents a rather intermediate step on the way to ultimate policy goals such as the control of unemployment or the gross domestic product. Thus, a direct analysis of the influence of precisely modeled payout taxation on firms' investment policy in an international sample may be a promising objective of future research.

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According to § 10 No. 7 of the Doctoral Studies' Guide Lines
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I hereby declare, that the

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