Further Evidence on Debt-Equity Choice

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Abstract

Using a large sample of 5,365 European firms, we document the driving factors of debt-equity choices. Adjustments to a target debt level play a modest role except when debt exceeds an upper barrier, a result that underlines the importance of debt capacity. Preference for internal financing, leverage deficit prior to equity issues, as well as a high level of slack of firms seeking to reduce equity constitute further evidence in favor of pecking order models. It is also found that managers try to time the market by issuing shares when returns are high, but that there is a link between financing and investment activities as predicted by agency models.

Keywords: dynamic capital structure, debt-equity choice, tradeoff models, pecking order models.

JEL classification: G32

Executive summary

Debt equity choices are a main concern for financial executives, but capital structure is still puzzling academics. At first glance, the existence of a target debt ratio is an appealing concept to understand capital structure. If there are pros and cons associated with debt finance, financial policy consists in finding the optimal leverage ratio that equalizes marginal costs and benefits. Debt tax shield, financial distress and agency conflicts are significant constituents of these costs and benefits. Such a basic trade off view has been challenged both on theoretical and empirical grounds.

Focusing on information asymmetries, pecking order models do not result in an optimal debt ratio due to the varying impact of asymmetric information on the value of internal and external finance. As a result, firms should prefer internal financing over external financing and debt issues over equity issues.

Financial decisions are dynamic in nature and capital structure models have to account for this. Dynamic patterns have been included through the speed of adjustment in trade off models and non constant levels of asymmetric information in pecking order models. Such refinements increase the complexity of the empirical test design. For example, dynamic panel data analysis allows the speed of adjustment to be estimated but implies that a target leverage ratio exists.

Debt equity choice tests do not require that a priori assumptions concerning financial policy be made and allow the dominant forces acting on capital structure to be identified. This is because such choices encompass both financing and payout activities, and because rational managers will only modify capital structure when benefits exceed costs. Past debt equity choice studies highlight the economic role played by important pieces of the puzzle: adjustment to a target leverage ratio -the cornerstone of dynamic trade off models-, operating performance and market performance.

We document debt equity choice using a large sample of more than 5,000 European firms over the period 1989-2000. We test pecking order and trade off models through time-series analysis of leverage ratios around these events and through cross-sectional analysis of firm specific determinants of these choices. We provide evidence that neither of these models in their most commonly accepted forms offer an acceptable description of the real world. We conclude that the financing process is complex and dynamic.

We document significant deviations from the target leverage ratio. This suggests that the speed of adjustment (if any) is slow. In addition we show that the leverage ratio has only

an upper barrier beyond which it has to be actively reduced in particular through debt reduction. This behavior of European firms is consistent with pecking order models that include debt capacity concerns. Evidence of a lower leverage boundary is inconclusive. This result contradicts predictions of dynamic tradeoff models, which are models with two barriers.

We find that operating performance affects debt equity choices. There is a strong preference for internal over external financing, in particular for internal over debt financing even though there are second order benefits of debt financing for profitable firms. Firms that reduce their equity, through share repurchases or significant increases in dividends, are not concerned with debt capacity problems. They may even react to an excess in debt capacity, a behavior in line with pecking order models.

Finally, we show that market performance affects debt equity choices in two ways. First managers try to take advantage of favorable market fluctuations, i.e. they issue equity when stock prices are low and repurchase shares when stock prices are high. Even when this timing effect is controlled for we find a significant impact of market performance on debt equity choices. Further tests show that these effects are rooted in agency conflicts and interactions between the financing and investment activities. When companies have profitable investment projects, a convergence of interests between managers and shareholders favors either equity financing or the quest for financial flexibility through leverage reduction. In the opposite case, debt financing and equity reduction are used for their disciplinary power on managers.

Further evidence on debt-equity choice

1 Introduction

Since the seminal article by Modigliani and Miller (1958) showing that any change in capital structure is neutral with respect to the value of the firm, the topic of capital structure has been the focus of many publications. These studies investigate optimal financial policies by adding various imperfections to the standard framework of Modigliani and Miller. Two types of models currently prevail in the literature: (1) tradeoff models that define optimal financial policy as an adjustment process towards a target debt ratio and (2) pecking order models in which optimal financial policy depends on the ability to generate internal financing and on market conditions. In the latter models, the target debt ratio is secondary.

The existence of a target debt ratio is an appealing concept. If markets are imperfect, there must be pros and cons associated with using debt. Financial policy therefore consists in an optimization process under constraints. Firms increase (decrease) their debt ratio when it is lower (higher) than the optimal leverage ratio. Traditional tradeoff models balance tax benefits of debt (Modigliani and Miller, 1963; Miller and Scholes, 1978) against financial distress costs (Stiglitz, 1972; Titman, 1984). Positive agency models also involve a tradeoff between reducing agency costs of managerial discretion (Jensen and Meckling, 1976; Jensen, 1986) and agency costs of debt (Jensen and Meckling, 1976; Myers, 1977; Stulz 1990). Dynamic tradeoff models (Fischer et al., 1989; Leland, 1998; Ju et al., 2002) allow deviations between the observed leverage ratio and the target ratio. Thus, optimal financial policy consists in making adjustments when costs caused by disequilibrium (costs of deviation) exceed transaction costs (adjustment costs).

An analysis of information asymmetries between managers and external investors leads Myers and Majluf (1984) and Myers (1984) to develop the pecking order model. Adverse selection risk premia required by external investors create biases in investment choice. If existing shareholders are passive, managers can cut informational costs by modifying the financial policy. They will favor financing sources that are least subject to information asymmetries. More specifically, firms prefer internal financing over external

financing, and debt issues[1] over equity issues. Lucas and Mc Donald (1990) formally integrate equity issues into a pecking order framework. Firms issue stocks during windows of opportunities arising when the release of valuable information has corrected previous undervaluation or when positive Net Present Value (NPV) projects become available during periods of overvaluation. Another feature of pecking order models is that managers seek to accumulate financial slack. This excess cash provides flexibility and therefore allows firms to avoid information asymmetry costs. Slack also reduces financial distress costs which occur at high debt levels. Because of such costs, there exists a maximum debt ratio, the debt capacity (Myers and Majluf, 1984).

Empirically, much emphasis has been placed on analyzing the determinants of the (observed) leverage ratio. Titman and Wessels (1988) contribute to formulating and testing assumptions as identified by financial theory. Rajan and Zingales (1995) for the G7 countries and Booth et al. (2001) for ten developing countries test the theoretical and empirical lessons learnt from U.S. studies. Results are found to be robust with respect to economic cycles and institutional environments. The positive impact of firm size and of the tangibility ratio on observed debt ratios is interpreted as being favorable to the tradeoff models, whereas the negative impact of profitability as being favorable to pecking order models. Growth options and asset misvaluation issues lead to mixed interpretations of the positive impact of the market-to-book ratio (MTB). Using estimators suited to dynamic panel data analysis, Miguel and Pindado (2001) find that Spanish firms rapidly adjust to their target leverage ratio. In contrast, adjustment has been found to be slow for Swiss companies (Gaud et al., 2004). Overall, no dominant model emerges from these studies.

An empirical alternative is to study debt-equity choice. Motivations that govern corporate financial policy are analyzed by focusing on significant external changes of capital structure. For example, Marsh (1982) and MacKie-Mason (1990) find a higher probability of issuing equity rather than debt when the observed debt ratio exceeds the target debt ratio. Market performance is also found to positively impact this probability.

Financial policy is dynamic in nature and therefore cross-sectional regression analyses of the determinants of leverage ratio have limited relevance as they are static. In a dynamic framework, observed leverage ratios are affected both by events that cause deviations from the target leverage ratio and by those that alter the target. Dynamic panel data estimators

[1] Unless an explicit distinction is made, 'issues (reductions) of debt' comprises issues (repayments) of bonds and bank loans (repayments of loans).

enable endogenous target leverage ratios and the adjustment speed within the sample to be estimated. These econometric models, however, make the *a priori* assumption that a target leverage ratio exists. Such an assumption is not relevant in a pecking order framework[2]. In contrast, debt-equity choice tests do not require that *a priori* assumptions concerning financial policy be made. As these tests focus on changes, they are dynamic in nature. They are also sufficiently flexible to be run with unbalanced panel data. Finally, debt-equity choices allow the dominant forces acting on capital structure to be identified. This is because such choices encompass both financing and payout activities, and because rational managers will only modify capital structure when benefits exceed costs.

Several studies on debt-equity choice have appeared recently, but they all focus on samples of U.S. firms (Jung et al., 1996; Hovakimian et al., 2001; Hovakimian, 2004; Hovakimian et al., 2004). These studies highlight the economic role played by three important pieces of the puzzle: Adjustment to a target leverage ratio, operating performance, and market performance. As compared with prior studies, these analyses are based on larger samples and consider a wider array of events that are better defined. Tests of the adjustment to a target leverage ratio are crucial as adjustment is the cornerstone of dynamic tradeoff models. Also, an examination of the impact of performance should highlight whether it is a significant determinant of the target leverage ratio and/or of deviations from this target. This test may also lead to the conclusion that the impact of performance on debt-equity choice stems from other factors than the adjustment to the target leverage ratio as implied by pecking order models.

This article claims a number of contributions to this literature. First, we test whether capital structure models and U.S. evidence are portable to the European market. To date, there is very limited quantitative empirical evidence on non-U.S. debt-equity choice[3]. For this purpose, we construct a sample of 5,365 European firms for the period 1989-2000. Even though the European market is in a consolidation phase, there still exists considerable institutional and cultural diversity. Thus, strong economic forces would be at work if results were found to be significant in spite of these institutional differences. This article also contributes to the literature by incorporating significant dividend increases in the range of

[2] Shyam-Sunder and Myers (1999) point to the poor performance of a dynamic tradeoff model compared to a simple pecking order model to explain changes in debt ratios over time.

[3] Bancel and Mittoo (2002) analyze capital structure choice of European firms, but they conduct a survey rather than a quantitative study.

payout choices. We maintain that there is no reason to exclude dividend increases while including other forms of payouts such as debt reductions or share repurchases[4]. Finally, we introduce linear restriction tests on MTB levels to gain better insight on the issue of market performance and, more specifically, of investment prospects. Using interacted variables, we test the agency hypothesis by examining changes in sign on MTB for firms having different investment prospects.

Our results indicate that neither a simple pecking order model nor a simple tradeoff model is sufficient in understanding financial policy. We conclude that the financing process is complex and dynamic. In terms of debt ratios, we find that firms only constrain themselves to an upper barrier. As implied by the role of debt capacity in pecking order models, firms refuse to exceed a maximum debt level and prefer to repay debt rather than exceeding this limit. Evidence of a lower leverage boundary is inconclusive. This result contradicts predictions of dynamic tradeoff models, which are models with two barriers.

Operating and market performance affect debt-equity choice. Firms prefer internal financing to debt issues, although the latter provide second order benefits. In contrast to Hovakimian et al. (2004), we do not find that unprofitable firms seeking outside financing prefer to issue equity. But we find that profitable firms do try to reduce their equity. As profitable firms do not have debt capacity concerns, they may react to the excessive costs of slack as suggested by pecking order models. Two distinct effects are embedded in market performance results. Empirical evidence shows that managers are trying to time the market, but also that financing and investment activities interact. In particular, debt does not represent a suitable form of financing for firms with profitable investment projects. Instead, such firms issue equity or, if they can, repay debt to maintain financial flexibility. In contrast, debt disciplines managers when there is a lack of profitable projects. Firms with no positive NPV projects prefer debt issues and reductions of equity, either by share repurchases or by dividend increases.

The remainder of the article is organized as follows. In section 2, we provide a review of the literature on the determinants of debt-equity choice. The method and hypotheses are discussed in section 3, while our data are presented in section 4. Results are discussed in

[4] For the U.S. market, Grullon and Michaelly (2002) indicate a propensity to substitute dividend payments by share repurchases. Significant share repurchases are scarce in our sample because of restrictive legislation in continental Europe during the period under review.

section 5, while section 6 deals with their sensitivity. Finally, section 7 contains some concluding remarks.

2 Literature review

In this section, we provide a review of the main determinants of debt-equity choice: Target debt ratio, observed debt ratio, operating performance, and market performance.

2.1 Target debt ratio and observed debt ratio

Two cases suggest a capital structure transaction under dynamic tradeoff models. First, a change in the target level and thus of its limits puts the effective leverage outside the new limits. Second, the deviation from the target suffers an increase such that the costs of deviation exceed those of adjustment. In both cases, adjustment creates value and should be priced by the market. Event studies on debt-equity choice, however, show abnormal positive (negative) price reactions to increases (decreases) in the leverage ratio (Masulis, 1980; Jung et al., 1996). These unilateral reactions underline the importance of agency and informational issues.

The target debt ratio is of secondary importance in pecking order models. Nevertheless, effective leverage affects choice of capital structure due to debt capacity. Highly levered firms can either choose to issue equity or to forgo investment rather than issue debt. Operating at levels close to debt capacity is expensive because of high bankruptcy costs (Myers and Majluf, 1984).

In debt-equity choice studies, tests of adjustment to a target leverage ratio yield mixed results. Under tradeoff models, the choice is made in order to reduce positive or negative deviations from the target leverage. Marsh (1982), Jalilvand and Harris (1984) and MacKie-Mason (1990) show a higher probability of issuing equity rather than debt when observed leverage exceeds target leverage. In Hovakimian et al. (2001), the difference between observed and target leverage does not have any power in explaining the amounts issued, but does affect the amounts repurchased. After cleaning the sample of overlapping transactions, Hovakimian (2004) finds that this difference neither affects share issues, nor share repurchases and debt issues. His results only confirm the adjustment hypothesis for debt reductions. Note that these studies use a variety of procedures to proxy for the target. Initially, historical statistics of leverage ratios were used. Hovakimian et al. (2001) substitute these broad and static proxies with regression-based estimates. Hovakimian (2004), however, does

not observe any change in his results whether he uses regression-based estimates or industry levels statistics.

2.2 Operating performance

Internal financing and part of the slack are rooted in operating performance. Under pecking order models, operating performance generates cheap financing that is preferable to debt. High and stable operating performance reduces the probability of bankruptcy and underinvestment, increases the probability of overinvestment and enables to benefit from debt tax shields. Operating performance thus has a positive impact on the leverage ratio in tradeoff models. High (low) profitability is a source of passive and negative (positive) deviation in dynamic tradeoff models.

Empirically, straightforward regressions of the leverage ratio on a set of potential determinants show a negative impact of profitability on leverage (Titman and Wessel, 1988; Rajan and Zingales, 1995; Booth et al., 2001). These regression findings, however, do not allow to discriminate between dynamic tradeoff and pecking order models. When firms are likely to be close to their target, profitability is found to have no impact on observed leverage (Hovakimian et al., 2004). With dynamic estimates, the sign of the profitability variable changes when it is lagged (Gaud et al., 2004). These results are in line with dynamic tradeoff models.

Studies of debt-equity choice sharpen this conclusion. Hovakimian et al. (2001) and Hovakimian et al. (2004) show that profitability increases the probability of choosing the external transaction leading to the highest level of leverage. Hovakimian (2004) does not observe this effect for issues. Hovakimian et al. (2004) use simultaneous issues of debt and equity to test the presence of specific impacts on a particular type of issue. Profitability specifically reduces the probability of equity issues, but has no impact on debt issues. They conclude, on the one hand, that unprofitable firms are likely to positively deviate from their target and will therefore issue equity rather than debt. On the other hand, profitable firms do not offset their negative deviation as they prefer internal financing, which is available.

2.3 Market performance

Investment prospects and misvaluation of assets are two distinct driving forces on capital structure policy that can be proxied by market performance. Conflicts of interests

between stakeholders prompt firms with positive NPV projects to prefer equity issues. Agency costs of debt (Myers, 1977; Jensen and Meckling, 1976) increase in line with the ratio of investment projects over assets in place, while profitable projects reduce agency costs of managerial discretion (Jung et al., 1996). When there is a lack of positive NPV projects, the convergence between the managerial objective to finance growth by equity issues and the criterion of shareholder value maximization vanishes. The cash that remains once all profitable projects have been undertaken gives rise to the free cash flow issue (Jensen, 1986). In this context, managers prefer to repay debt, unlike shareholders. When managers reduce the leverage ratio against the interests of shareholders, however, they also increase the probability of a hostile takeover. Managers might therefore constrain themselves to issue debt (Zweibel, 1996) or to increase equity payouts. As dividend cuts are extremely costly (Bernatzi et al., 1997), dividends are 'sticky'. Dividend increases are therefore a stronger commitment to distribute future cash flows than are share repurchases.

Jung et al. (1996) note that agency concerns do not exclude adverse selection problems on risky securities. They find that equity issues are a worse event for firms lacking valuable investment projects than for firms with positive NPV projects. Lang and Litzenberger (1989) find that the positive (negative) reaction to an increase (decrease) in dividends is stronger for firms subject to overinvestment (i.e. when the Tobin's Q ratio is less than 1).

The effect of market performance on capital structure may also derive from the managers' belief that securities are mispriced by the market, which may lead to implement market timing strategies. Slow assimilation of information, segmentation of markets, various degrees of information asymmetry across firms or time periods are some possible explanations for mispricing. Around 59% of European managers surveyed by Bancel and Mittoo (2002) recognize that issuing shares after a rise in stock price is important or very important. Studies of long-term performance (Loughran and Ritter, 1995; Speiss and Affleck-Graves, 1995; Ikenberry et al., 1995) tend to conclude that market timing is a successful strategy on average as returns are abnormally low (high) after equity issues (repurchases). Baker and Wurgler (2002) show that equity issues are preceded by a surge in stock price and that these transactions have lasting consequences on the leverage ratios. They suggest that observed debt ratios can be explained by successive market timing attempts by managers who are not concerned about offsetting the resulting impacts on debt levels. Korajczyk and Levy (2003) show that financially unconstrained firms are able to deviate from their target leverage ratio to take advantage of favorable market conditions. Introducing regression analysis to identify determinants of the choice between equity issues and simultaneous debt and equity

issues, Hovakimian et al. (2004) control for market timing. They observe that the impact of MTB on leverage remains negative, which leads them to favor the tradeoff hypothesis. As return loses it significance when market timing is possible whatever the capital structure choice, they also conclude that managers attempt to time the market.

3 Method

Before a detailed discussion of method and hypotheses, it is necessary to define debt-equity choices.

3.1 Types of events

Studies of debt-equity choice focus on significant financing and payout transactions. Hovakimian (2004) shows that some transactions have specific determinants and therefore a clear definition of event types is necessary. With one exception, we use the traditional 5% cut-off criterion of book value of assets at the beginning of the year to identify debt-equity choices[5]. For dividends, we use a 7% cut-off because they are 'sticky' and because we want to identify significant dividend increases. In addition, a minimum of two years of data surrounding an event is required. We use consolidated financial statements which make it possible to analyze private and public external financing. Such data are particularly well suited for the European market where bank financing and private equity is likely to play an important role.

There are five basic transactions: Two pure financing transactions – equity issues and debt issues – and three pure payout transactions – share repurchases, dividend increases and debt reductions. Other transactions simultaneously affect the amount of debt and equity. These include (1) simultaneous debt and share issues, (2) simultaneous debt reductions and share repurchases, and (3) simultaneous dividend increases and debt reductions. These events are either pure financing or pure payout transactions[6]. We consider not operating as a choice

[5] Changes in equity capital are defined, in Thomson items, based on the cash flow statement as [tf.SaleOfComAndPfdStkCFStmt - tf.PurchOfComAndPfdStkCFStmt - tf.CashDividendsCFStmt], whereas changes in debts are defined, based on the balance sheet, as the difference over two periods between [tf.STDebtAndCurPortLTDebt + tf.TotalLTDebt].

[6] In this paper, we do not deal with mixed debt-equity choices such as equity issues and debt reductions or debt issues and share repurchases. We only seek to observe specific effects on equity and debt.

and report a 'No transactions' event that includes firms that have not been active in capital markets for two consecutive years.

3.2 Event studies

Time-series analysis of changes in the leverage ratio around the date of a debt-equity choice allows to test the main assumption of dynamic tradeoff models, i.e. adjustment to a target. For each type of transaction and on a long-term basis, such analysis focuses on major changes in the leverage ratio and its target. Our method is similar to that used in Lie (2001), Grullon et al. (2002), and Hovakimian (2004). As we use book data, time periods are annual. In addition to mean values, median values are also used in this type of study because of possible asymmetry in financial data. We study changes in leverage ratios and deviations from the target over a window of seven years. Variations for three sub-periods [-3, -1], [-1, 1] and [-1, 3] are also presented. Ranking tests for median values and Student tests for mean values are reported to assess the significance of changes in leverage and target deviations.

If firms adjust toward a target leverage ratio, then equity issues and debt reductions are a response to excessive positive deviations from the target. In contrast, debt issues, dividend increases and share repurchases are responses to out-of-the-range negative deviations. With equity issues, for example, the positive deviation of the observed leverage ratio from its target should be at a maximum before the issue. Equity issuers should also reduce the leverage ratio so that it durably lies within the limits. Changes in the observed leverage ratio also provide information on the adjustment mechanism. If firms issue equity to respond to excessive positive deviations from the target, the *ex ante* leverage ratios should be greater than the *ex post* levels.

3.3 LOGIT regressions

We use LOGIT regressions to test the determinants of debt-equity choices in a multivariate setting. Such regressions allow a cross-sectional test of the explanatory power of our variables on the probability of debt-equity choices. The estimated model has the following general form:

$$P(y_{it} = 1) = \frac{e^{\beta' X_{it}}}{1 + e^{\beta' X_{it}}} + \varepsilon_{it} \qquad (1)$$

with

$P(y_{it} = 1)$	:	Probability that firm *i* operates externally in year *t* rather than chooses an alternative transaction type.
X_{it}	:	Vector of explanatory variables.
ε_{it}	:	Stochastic error term.

If dynamic tradeoff models were to hold, then firms should decide to interact with capital markets to reduce excessive over (under) leverage. As long as deviation costs from the target are less than adjustment costs, there is no sound reason to actively alter the capital structure. Consequently, the pre-transaction observed leverage ratio should increase (decrease) the probability of choosing a transaction that reduces (increases) the leverage ratio. On the contrary, the target leverage ratio should reduce (increase) this probability. Firms that do not interact with financial markets do stay within their limits; therefore the above mentioned behaviors should be observed when firms choose between an external transaction and no transaction at all. In all other cases, no conclusion can be reached regarding adjustment as a dominant force. Indeed, in the regressions of choice between different types of external transactions, firms have already chosen either to payout or to finance part of their assets. The decision to carry out a transaction may be mainly motivated by other factors such as financing needs or a market opportunity, even though the observed signs on adjustment variables are as expected. We can thus only conclude that firms minimize deviations from targets from these regressions pertaining to external choice[7].

Tradeoff models predict that high profitability should lead to the selection of transactions that increase debt ratios. Profitability should therefore positively (negatively) impact on the probability of either issuing debt or repurchasing shares or that of increasing dividends (the probability of issuing equity or that of reducing debt), as opposed to not carrying out an external transaction. Profitability should also increase the probability of issuing debt rather than equity, and decrease that of reducing debt rather than either

[7] Hovakimian (2004) refers to this weak hypothesis concerning the role of target ratios as the debt-equity choice hypothesis.

repurchasing shares or increasing dividends. For profitable firms, we would expect a specific positive effect of profitability on the probability of debt issuance as it enables more tax shield, has limited effect on the probability of bankruptcy and also corrects mechanical negative deviation from the target leverage. In contrast, we do not expect a specific negative impact of profitability on equity issues. If unprofitable firms in search of external financing use the equity channel, they act in the interests of creditors and managers, but not in that of shareholders.

Under pecking order models, firms prefer internal financing as long as information asymmetry remains the main source of cost. To assess this preference, we introduce in our regressions a variable to proxy for existing slack. External financing is not necessary if slack is sufficient to cover financing needs. Consequently, slack should have a negative impact on the probability of choosing external financing. As pecking order models always emphasize preference for internal financing over debt financing, the specific impact of existing slack on debt issues should be negative once the decision to obtain external financing has been made. In contrast, one might observe a specific positive effect of existing slack on equity issuance as available cash gives an option to delay equity issues until they become a cheap source of financing.

Limited empirical evidence is available on the specific impact of operating performance on debt or equity payouts. As tradeoff and agency models predict a positive effect of operating performance on the debt ratio, profitable firms should prefer equity reductions to debt reductions. Under pecking order models, profitable firms aim to stockpile debt capacity and slack. At high debt levels, firms should therefore prefer debt reductions over either 'No transactions' or equity reductions. The latter should be avoided when debt capacity is a concern or when slack is not too costly. Determinants of slack capacity are not well identified. When information is asymmetric, Shyam-Sunders and Myers (1999) argue that firms exceeding this maximum level prefer to repurchase debt rather than equity due to the positive price effect on stocks.

Concerning market performance, traditional regressions do not discriminate between the agency and the market timing hypotheses. For example, both hypotheses predict a positive impact of market performance on the probability of issuing equity versus debt or versus 'No transactions'. Firms with profitable investment projects avoid debt financing under an agency framework, while market timing suggests that abnormal positive returns lead to the issuing of stocks. To discriminate between the two hypotheses, Hovakimian et al. (2004) introduce simultaneous debt and equity issues in their set of debt-equity choices. If managers are faced

with the decision between issuing simultaneously debt and equity or only equity, they can try to time the market in both cases. As a result, a negative effect of market performance can be unequivocally attributed to the investment prospect (agency) hypothesis. Furthermore, this hypothesis implies that the quality of investment projects affects financing choices. The disciplinary role of debt should be of greater value to firms with mediocre investment opportunities, while convergence of interests between managers and shareholders as well as agency costs of debt should enhance the value of equity issues for firms with profitable projects. We introduce an interacted variable between the MTB ratio and a dummy variable equal to 1 for firms with a MTB less than 1 to test changes in sign between these two types of firms.

4 Data

The sample is obtained from the Thomson Financial® database. It includes listed companies in member countries of the European Union (EU) and the European Free Trade Association (EFTA)[8]. Data have been deflated and have been converted to constant Euros using 2000 as base year[9]. Financial institutions and companies whose total book value does not exceed €5 million are excluded from the sample. After trimming[10], our sample comprises 20,661 firm-year observations for 5,365 firms over the 1989-2000 period. Table 1 contains descriptive statistics for our main variables.

The leverage ratio (DTAM) is proxied by the ratio of total financial debt over total market value of assets[11]. To proxy for the target leverage ratio (TDTAM), we use yearly

[8] In total, firms from 17 different countries are represented: Germany, Austria, Belgium, Denmark, Spain, Finland, France, Greece, Ireland, Italy, Luxembourg, Norway, Netherlands, Portugal, United Kingdom, Sweden and Switzerland.

[9] For firms whose accounts are in non euro-zone currencies, 01.01.2001 is used as the conversion base date.

[10] In order to minimize the impact of outliers, the sample is trimmed applying a method similar to that in Kremp et al. (1999). Observations outside the interval defined by the third quartile plus five times the interquartile range and the first quartile less five times the interquartile range for return, profitability, interest coverage ratio, net margin ratio and net cash-flow margin ratio are excluded. The ratio of depreciation and amortization to total assets is trimmed upward only.

[11] (tf.STDebtAndCurPortLTDebt + tf.TotalLTDebt) / (tf.TotalLiabilities + tf.YrEndMarketCap).

industry leverage, where industry is identified using the three-digit SIC codes. Hovakimian (2004) finds that the same conclusions can be drawn whether industry leverages or regression-based targets are used[12]. Firms that reduce debt are highly levered prior to the transaction, which suggests that beyond a given leverage ratio, firms seek to reduce debt. Such firms have very high leverage ratios (27.3% mean value and 24.6% median value), whether they are compared to their target ratio (19.2% and 15.6%) or to firms with 'No transactions' (13.8% and 10.0%). In contrast, firms that reduce equity have very low debt levels. The median leverage ratio is 5.5% for share repurchases and 0.3% for dividend increases, compared to industry levels of 12.4% and 10.8%, respectively. For debt issuers, the differential between observed and industry leverage is also negative, but much less significant (14.4% against 16.1% in median values). It is more surprising to observe that equity issuers have lower leverage ratios than their peers (11.8% against 14.0% in median values). As a result, issues widen existing differentials. Observed differentials before payouts are substantial. Under dynamic tradeoff models, such significant deviations from targets and our observation that equity issuers are underlevered firms imply large optimal financing areas and thus weak adjustment pressures. Substantial negative differentials between the observed leverage for firms with 'No transactions' (10.0% median value) and the target ratio (14.5% median value) also support this point.

We use two variables to measure operating performance. Profitability before tax, interest and depreciation (ROA[13]) is measured over the year of the transaction and the preceding year. This variable is designed to proxy a firms' ability to generate cash flow. The second variable is the mean ratio of cash and cash equivalents to total assets (CASH[14]) over the year of the transaction and the preceding year. This variable is designed to proxy for accumulation of existing slack. Firms with 'No transactions' have high operating performance levels (median ROA of 29.3% and median CASH of 9.7%). Therefore, their negative deviation from the target leverage might be mechanical. These firms have a better operating performance than debt and equity issuers. Their operating performance is considerably lower, however, than firms that reduce equity. Debt issuers have only slightly lower median ROAs than firms with 'No transactions' (29.2%), and lower median CASH (6.1%). The opposite

[12] We deal with the sensitivity of results to the use of regression-based targets and book leverage ratio in section 6.

[13] tf.EarningsBeforeIntTaxesAndDepr / tf.TotalAssets.

[14] tf.CashAndSTInvestments / tf.TotalAssets.

holds for equity issuers. The median level of CASH (9.6%) is closer to that of firms with 'No transactions', whereas the ROA (28.5%) is less similar.

The operating performance of firms that payout assets is very high, especially for those that increase dividends (60.8% median ROA and 23.0% median CASH). For share repurchasers, the median ROA is 38.5% and the median CASH 14.4%. This suggests that profitable firms increase their leverage. However, such firms have low pre-transaction debt levels and have accumulated substantial amounts of slack, which has possibly become too costly. Debt repurchasers are closer to firms with 'No transactions', with a median ROA of 29.5% and a median CASH of 6.5%. Firms that simultaneously issue debt and equity are profitable companies (30.2% median ROA), but they have already invested part of their internal financing (7.1% median CASH). Firms that simultaneously payout debt and equity are also profitable, but have higher levels of CASH (median value of 12.4% and 8.0%, respectively).

Descriptive statistics of market return (RETURN[15]) differ considerably depending on whether firms reduce equity or issue shares. For example, firms that repurchase shares have a negative median return (-8.9%), while firms that increase dividends have a moderate median return (2.1%). In contrast, firms that issue equity (even simultaneously with debt) have a very high median return (36.6% and 39.3%, respectively). MTBs[16] are much closer. All firms that carry out equity transactions have high median MTBs (1.456 for equity issues, 1.388 for share repurchases, and 2.384 for dividend increases). These MTBs are large compared either to those of firms having no transactions (1.207), or to those of firms that carry out debt transactions (1.309 for debt issues and 1.149 for debt reductions). These various return profiles suggest that firms try to time the market by issuing equities when stock prices are abnormally high and by repurchasing shares when prices are abnormally low. With respect to variations in MTB, these may show that firms with positive NPV projects seek to avoid unnecessary high debt pressures by issuing equity. This explanation does not seem to hold for payout transactions as firms with valuable projects appear to reduce equity. Clearly, the significance of this result needs to be checked in a multivariate setting; such analysis is the main focus of section 5.

[15] (tf.YrEndMarketCap– lagged tf.YrEndMarketCap) / lagged tf.YrEndMarketCap.

[16] (tf.YrEndMarketCap + tf.TotalLiabilities) / tf.TotalAssets.

Finally, we introduce two other control variables that appear in debt-equity choice studies. Following Hovakimian et al. (2004), we control for the size of transactions (SIZE[17]) in external debt-equity choice regressions. Like Hovakimian et al. (2001) and Hovakimian et al. (2004), we also introduce a dummy variable to control for earnings per share dilution (dEPdil[18]).

5 Results

5.1 Target leverage ratio

The results of event studies are reported in Table 2. The adjustment hypothesis is not validated for all types of external transactions. Firms do not actively change the amount of their equity to adjust their leverage ratio. There is some supporting evidence of adjustment, however, for debt transactions.

Equity issues are not decided to offset an excess leverage, while results are inconclusive for debt issues. The target leverage deviation (DEV_DTAM, defined as DTAM minus TDTAM) does not reach a maximum prior to equity issues. Equity issuers have a track record of leverage lower than the target (-2.0% mean value and -3.3% median value in t-1; variations of leverage and of its deviations not significant over [-3, -1]). As expected, debt issuers are underlevered prior to the transaction (-0.9% mean value and -2.2% median value in t-1), and the difference becomes larger (the absolute value of the negative deviation increases over [-3, -1] by a mean value of 0.4% and a median value of 0.3%). In addition, debt issuers significantly and durably increase their leverage levels (6.5% mean value and 5.3% median value over [-1, 3]). As a result, the post-transaction leverage ratio is significantly larger than the pre-transaction leverage. Although consistent with the target adjustment hypothesis, debt issues have a long lasting effect (in t+3, the positive deviation still has a mean value of 3.8% and a median value of 2.1%, in addition the deviation increases

[17] Ratio of the net amount of the transaction divided by total assets at beginning of the year.

[18] dEPdil is equal to 1 when the cost of after-tax debt exceeds the ratio of net profits to market value of equity capital. Where BN/V=tf.NetIncome/tfYrEndMarketCap; the estimated cost of debt over [t-1, t] is tf.InterestExpenseonDebt/tf.TotalDebt and the estimated tax rate over [t-1, t] is tf.IncomeTaxes/(tf.NetIncome+tf.IncomeTaxes).

over [-1, 3] by a 5.7% mean value and a 4.8% median value), which implies low deviation costs as compared to adjustment costs.

Concerning payout transactions, we reject the adjustment hypothesis for equity and accept it for debt. Firms that increase dividends or repurchase shares have low pre-transaction debt ratios[19] and the negative deviation from their target debt level increases in magnitude before the transaction (for share repurchases, DEV_DTAM has a -5.1% mean value and a -6.4% median value in t-3; the absolute deviation increases by a 2.1% mean value and a 1.6% median value over [-3, -1]). Once again, these results highlight that adjustment costs are high in comparison to deviation costs. In addition, the equity payout transactions have almost no effect on the size of the deviation (the negative deviation in t+1 still has a 6.3% mean value and a 7.5% median value for share repurchases). After these equity transactions, the negative deviation from the target slowly diminishes (for dividend increases, the negative deviation falls by a 3.6% mean value and a 2.6% median value over [-1, 3]). Nevertheless, it remains difficult to accept the adjustment hypothesis. With regard to debt reductions, the positive deviation before the transaction is high (7.2% mean value and 5.5% median value in t-1). Debt ratios reach a peak just before debt reductions (the deviation increases by a 2.3% mean value and a 1.8% median value over [-3, -1]). Leverage levels are durably lower after debt reductions (-8.1% mean value and -8.0% median value over [-1, 3]) and the positive deviation is offset (the positive deviation falls by a 6.1% mean value and a 5.9% median value over [-1, 3]). The firms are then durably close to their target (the deviation is not significant on average and has a -1.4% median value in t+3).

The event study results also show the changes in the leverage ratio for firms with 'No transactions'. This ratio is found to be stable over the seven-year window (i.e. changes in leverage are not economically significant), but firms durably maintain a negative deviation from the target. Assuming that targets are properly proxied by industry levels[20], this result shows that internal financing is a factor of negative mechanical deviation from the target. The downward deviation is found to be durable (it ranges from -4.2% to -3.4% in mean value, and from -6.0% to -5.0% in median value).

[19] Firms that pay dividends have lower debt ratios than those that repurchase shares. For example, in t-1, the average debt ratio is 3.1% versus 9.2%.

[20] In the sensitivity analysis in section 6, we study whether results are different when other target proxies are used.

Overall, regressions in Table 3 have high pseudos-R^2s and classificatory ability. Pseudos-R^2s range from a high of 0.6706 to a low of 0.0991. Consistent with the findings in Hovakimian et al. (2001), the models are better suited to payout transactions than to financing transactions.

The results of all 'Transactions versus No transactions' regressions reject the target adjustment hypothesis, with the exception of the 'Debt reductions versus No transactions' regression. These results are in line with the above findings. In the multivariate regression setting, the choice to reduce debt is positively (negatively) affected by $DTAM_{it-1}$ (TDTAM). The reverse impact is not found for equity payouts. As highlighted by event study results, equity issuers are underlevered, and it is not surprising therefore that the observed signs in the regressions are not as expected under a tradeoff. While the event study results do not reject the hypothesis that adjustment is slow for debt issuers, cross-sectional regressions do as $DTAM_{it-1}$ enters with a positive sign in the regression 'Debt issues versus No transactions'. Results confirm, however, that firms try to minimize target deviations once they have decided to actively change their capital structure. $DTAM_{it-1}$ (TDTAM) negatively (positively) affects the decision to issue debt rather than equity, while signs are reverse in the regressions pertaining to debt reductions versus either share repurchases or dividend increases.

In summary, our results show that firms suffer little from being durably away from the target leverage ratio, except when they have to reduce debt because the debt ratio is too high. They highlight the existence of a constraining upper barrier to leverage, but adjustment pressures appear to be very soft when firms negatively deviate from the target leverage. Thus, financial distress costs and agency costs between shareholders and bondholders play an important role. This type of financing behavior does not reject a pecking order hypothesis that includes debt capacity. Nevertheless, European firms try to minimize deviations from the target leverage when they decide to actively change the capital structure, a result in line with Hovakimian (2004) for a sample of U.S. firms. These conclusions on the role of adjustment to the target leverage suggest that other factors significantly affect financial policies.

5.2 Operating performance

When financing transactions are considered, we observe that ROA has a positive impact on the probability of issuing debt rather than equity, in conformity with tradeoff models. ROA is insignificant in the 'Debt issues versus Debt issues and Equity issues' regression, although it has a positive impact on the probability of choosing to issue

simultaneously debt and equity rather than to issue equity only. It has therefore a specific positive impact on debt issues. Thus, debt financing has specific advantages as disciplinary strength and/or tax shield for profitable firms, a finding that is consistent with the tradeoff hypothesis.

Our results on operating performance tell more than a simple static tradeoff story, however. As we can see for decisions to raise external funds, the consistently negative coefficients on ROA and CASH imply that firms prefer internal over external financing. Inclusion of simultaneous issues in the regressions reveals a specific negative impact of CASH on debt issues. The coefficient for CASH is negative in the 'Debt issues versus Equity issues' and 'Debt issues and Equity issues versus Equity issues' regressions, but not in the 'Debt issues versus Debt issues and Equity issues' regression. Consequently, preference for internal financing over debt financing is confirmed. There is no specific impact of operating performance on equity issues. Slack might add enough value here to offset external financing aversion. As it enables to seize investment opportunities (Baskin, 1987), slack may also provide financing flexibility by giving managers the possibility to time the equity market. These results are in contrast to those in Hovakimian et al. (2004). These authors do not include CASH in their regressions and find a specific effect of ROA on equity issues. They argue that, on the one hand, unprofitable firms are likely to positively deviate from their target and will therefore issue equity rather than debt and, on the other hand, profitable firms do not offset their negative deviation as they prefer internal financing which is available. Our results also highlight that benefits of debt are of second-order importance for profitable firms due to their preference for internal financing over debt. Unlike Hovakimian et al. (2004), we do not observe that equity issuers operate when their profitability is low. Such a behavior would have been surprising because shareholders would have suffered a loss in their wealth.

With regard to payout transactions, results for CASH and ROA are in line with tradeoff models. The observed signs could also be consistent with excess slack that has become too costly. Estimated coefficients for ROA and CASH enter with a positive sign in the regressions 'Dividend increases versus No transactions', 'Share repurchases versus No transactions' and with a negative sign in 'Debt reductions versus Share repurchases' and 'Debt reductions versus Dividend increases'. In line with tradeoff models, profitable firms try to raise debt levels, but the pecking order hypothesis cannot be rejected on the ground that profitable firms have to preserve their debt capacity. Firms that choose to reduce their equity are firms with low leverage ratios and with high levels of slack. They may therefore not have

debt capacity problems, but on the contrary they may be concerned with slack that is too costly.

In the 'Debt reductions versus No transactions' regression, the estimated coefficient on ROA has a positive sign and that on CASH a negative sign. Firms that reduce debt need to use their internal financing for debt service. Only high profitability firms manage to repay a significant fraction of their debt, thus reducing the positive deviation from the target leverage. The negative impact of CASH can be explained by the burden of existing debt which limits accumulation of slack. No conclusion about specific effects can be drawn as we only observe a specific positive effect of ROA on dividend increases. The absence of any other impact could be a result of the limited size of the sub-samples.

5.3 Market performance

As far as financing transactions are concerned, we observe a dependence between investment and financing activities, which is consistent with the agency hypothesis. The estimated coefficients on RETURN and MTB_{it-1} have a negative sign in the 'Debt issues versus Equity issues' regression. In addition, the sum of the estimated coefficient for MTB_{it-1} and for $d1(MTB_{it-1})$ points to a change in sign[21] for firms with a low MTB. This is confirmed in regressions pertaining to simultaneous issues of debt and equity for which we observe a specific negative impact of MTB_{it-1} on equity (debt) issues for low (high) MTB firms. We find a negative sign for the estimated coefficients on RETURN and MTB_{it-1} in the 'Debt issues and Equity issues versus Equity issues' regression. Such coefficients cannot be due to a market timing strategy. Firms that have to choose between the above two alternatives have already decided to issue equity, and thus timing is irrelevant. In short, firms with mediocre investment projects avoid to issue equity due to lack of convergence between manager and shareholder interests, whereas firms with sound investment opportunities avoid to raise the debt level to limit the agency costs of debt. We find additionally that RETURN has a positive impact on equity issues in the 'Debt issues versus Equity issues' and 'Debt issues versus Debt issues and Equity issues' regressions. Therefore, it is not possible to reject the hypothesis that managers implement market timing strategies.

[21] For each change in sign between the estimated MTB_{it-1} coefficients and the sum of the MTB_{it-1} and $d1(MTB_{it-1})$ coefficients, we carry out a linear restriction test to reject the null hypothesis. It is rejected at the 5% level for all reported cases.

Similar conclusions can be drawn from payout regressions. In line with agency models, RETURN and MTB_{it-1} have a positive impact in the regressions 'Debt reductions versus No transactions', 'Debt reductions versus Share repurchases' and 'Debt reductions versus Dividend increases'. In these regressions, we observe a change in sign for low MTB firms. These results suggest that firms with profitable projects are searching for financial flexibility by decreasing the debt burden. In a multivariate setting, the role of MTB thus differs from that suggested by descriptive statistics of equity payouts. We also observe a specific negative impact of MTB_{it-1} on dividend increases and share repurchases, but an insignificant impact of RETURN. A possible explanation is that firms lacking profitable projects pay out their free cash flow while maintaining debt capital for its disciplinary role. For debt reductions, our results show a positive impact of MTB_{it-1} with a change in sign for low MTB firms. There is no specific effect in the 'Debt reductions and Share repurchases versus Share repurchases' regression, but caution should be exercised before concluding that a sole timing effect is at work in payouts given the small sample size.

6 Sensitivity to leverage ratio proxies

The purpose of this section is to check whether the previous conclusions remain unchanged when other leverage ratio proxies are used. First, we rerun the event study tests and the logit regressions using book leverage[22], which is commonly used in capital structure studies. We also estimate target leverage using the outputs of the regressions of capital structure determinants as in Hovakimian et al. (2001). Following Hovakimian (2004), we use several more or less comprehensive sets of explanatory variables. The variables included in these sets are frequently used in the literature (Rajan and Zingales, 1995; Booth et al., 2001). The first target is estimated by using the following eight variables: industry leverage ratio, asset tangibility ratio, logarithm of sales, depreciation and amortization to total assets ratio and industry means for MTB, RETURN, ROA and CASH. We add year dummy variables to take into account the time effect. The second target is estimated with the above mentioned eight variables and time dummies, but in this case MTB, RETURN, ROA and CASH are firm-year observations. Finally, a third target is estimated with a more restrictive specification that only includes industry leverage ratio, asset tangibility ratio, MTB, depreciation and amortization to total assets ratio and time dummy variables. All regressions are run using a

[22] (tf.STDebtAndCurPortLTDebt + tf.TotalLTDebt) / tf.TotalAssets.

fixed effects panel data estimator to control for the heterogeneity among firms. Target estimations are truncated to lie within 0 and 1.

Overall, conclusions concerning the event studies remain unchanged, although some differences in the results can be observed. In particular, when the book debt ratio is used, equity issuers are less underlevered prior to the transaction and the leverage ratio significantly increases over [-3, -1]. In spite of these results, we cannot conclude that equity issuers are overlevered as implied by the target adjustment hypothesis. For debt issuers, the mean deviation from the target is insignificant when we use book leverage in t-3, t-2 and t-1. When the second regression-based target is used, dividend increases and share repurchases usually have no effect on changes in deviations. These results do not alter our conclusion that leverage only has an upper barrier.

As far as the LOGIT analysis is concerned, the target adjustment hypothesis cannot be rejected in a few specifications for equity issues and for share repurchases. When book leverage and regression-based targets are used, the expected signs are observed in the 'Equity issues versus No transactions' regression. The expected signs are also observed in the 'Share repurchases versus No transactions' regression when regression-based targets are used. But then, even a weak adjustment hypothesis is not confirmed for dividend increases. In short, these results are insufficient to accept a two-barrier adjustment hypothesis.

Conclusions on operating performance do not appear to be in question either. We find, like Hovakimian et al. (2004), a positive impact of ROA in the 'Debt issues versus Equity issues and Debt issues' regression. Nevertheless, the impact is only significant at the 10% level when the second regression-based target estimation is used with book leverage.

As far as market performance is concerned, coefficients on RETURN and MTB_{it-1} do not change for all financing choices, whatever proxy of leverage and target are used. For payout choices, some coefficients are no longer significant under some specifications, in particular when book leverage is used. For example, when book leverage and regression-based targets are used, we do not observe any significant change in sign for low MTB firms in the 'Debt reductions versus Share repurchases' regression. There is no positive MTB_{it-1} effect with a change in sign for low MTB firms in the 'Share repurchases versus No transactions' regression. In both regressions, the estimated coefficient on RETURN remains positive, with two exceptions when market leverage is used. Then, we observe a positive impact of MTB_{it-1} and a change in sign. In all cases, at least one proxy of market performance has a positive impact on debt reduction, supporting the hypothesis that firms with profitable projects try to reduce debt to maintain flexibility. With book leverage, however, we find a positive impact of

RETURN and a negative impact of MTB_{it-1} without any change in sign in the 'Debt reductions versus Dividend increases' regression. In addition, we find no impact of MTB_{it-1} in the regressions which consider simultaneously debt reductions and equity reductions, either through dividend increases or share repurchases.

Note that the impact of market performance on share repurchases may not be solely attributed to firms repurchasing shares when stock prices are low. In this regard, when the first and third regression-based targets are used, as well as for all book leverage regressions, we observe a significant positive impact of RETURN in the 'Debt reductions and Share repurchases versus Share repurchases' regression.

7 Conclusion

In this paper, we document debt-equity choice using a sample of more than 5,000 European firms over the period 1989-2000. We test pecking order and tradeoff models through time-series analysis of leverage ratios around these events and through cross-sectional analysis of firm specific determinants of these choices. By focusing on possible adjustment to a target debt ratio and on the role played by operating performance and market performance in debt-equity choices, we provide evidence that neither of these models in their most commonly accepted forms offer an acceptable description of the real world.

Significant deviations from the target leverage ratio are observed. This suggests that adjustment costs are high compared to deviation costs and therefore the speed of adjustment (if any) is slow. In addition, we show that the leverage ratio only has an upper barrier, beyond which it has to be actively reduced, in particular through debt reductions. This behavior of European firms is consistent with pecking order models that include debt capacity concerns.

Operating performance significantly affects debt-equity choice. We find that debt has specific second-order benefits for profitable firms, because it is both a disciplinary tool on the managers and a tax shield. Nevertheless, we also observe strong preference for internal financing over external financing and, in particular, over debt financing, as well as a mechanical negative impact of operating performance on debt level. Unlike Hovakimian et al. (2004), we do not find that low profitability firms needing external financing tend to favor equity issues. Such equity financing would be detrimental to shareholders. Finally, firms that reduce their equity are not concerned by debt capacity problems. On the contrary, they may react to high levels of slack that become too costly, a behavior in line with pecking order models.

We find that managers try to take advantage of favorable market fluctuations. As in Hovakimian et al. (2004), our results do not restrict the impact of market performance to this sole timing effect. Debt-equity choices remain affected by market performance even when market timing is controlled for. We believe that this residual effect is rooted in agency conflicts and acts as a proxy for interactions between financing and investment policies. We confirm this assertion by introducing a linear restriction test between firms with positive NPV projects and other firms. When companies have profitable investment projects, a convergence of interests between managers and shareholders favors equity financing. In the opposite case, debt financing is used for its disciplinary power. For payouts transactions, firms with profitable projects seek flexibility through leverage reduction, while the others increase leverage.

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Table 1: Descriptive statistics

This table presents descriptive statistics for the variables used in our estimations. The data are from the Thomson Financial® database and the sample contains 5,365 listed firms of member countries of the EU and EFTA which represent 20,661 firm-year observations over the period 1989-2000. DTAM is the ratio of total financial debt to total assets where total assets is the sum of the book value of debt plus the market value of equity at the end of the year. TDTAM is the DTAM of firms within the same three-digit SIC code and the same year. ROA is the ratio of EBITDA to total book assets measured over the period [t-1, t]. CASH is the mean value over [t-1, t] of the ratio of cash and cash equivalents to total book assets. RETURN is the ratio of the annual change in the market value of equity to the market value of equity at the beginning of the year. MTB_{it-1} is the ratio of the market value of assets (book value of assets plus market value of equity less book value of equity) to the book value of assets at the beginning of the year. dEPdil is a dummy variable to proxy for the dilution effect of equity transactions. It is equal to 1 when the cost of after-tax debt exceeds the ratio of net profits to market value of equity. SIZE is the ratio of the amount of the transaction to total book assets. med stands for median.

	Debt issues		Equity issues		Share repurchases		Dividend increases		Debt reductions		Debt and Equity issues		Debt and Shares repurchases		Dividend increases and Debt reductions		No transactions	
	mean	med	mean	med	mean	med	mean	med	mean	med	mean	med	mean	med	mean	med	mean	med
DTAM	0.172	0.144	0.151	0.118	0.092	0.055	0.031	0.003	0.273	0.246	0.149	0.118	0.201	0.172	0.126	0.081	0.138	0.100
TDTAM	0.194	0.161	0.171	0.140	0.167	0.124	0.147	0.108	0.192	0.156	0.182	0.148	0.173	0.133	0.163	0.105	0.175	0.145
ROA	0.296	0.292	0.271	0.285	0.414	0.385	0.618	0.608	0.292	0.295	0.303	0.302	0.325	0.338	0.645	0.635	0.304	0.293
CASH	0.089	0.061	0.136	0.096	0.189	0.144	0.256	0.230	0.095	0.065	0.104	0.071	0.145	0.124	0.122	0.080	0.133	0.097
RETURN	0.099	0.007	0.450	0.366	-0.060	-0.089	0.097	0.021	0.135	0.036	0.511	0.393	0.108	0.011	0.106	0.031	0.090	0.020
MTB_{it-1}	1.557	1.309	2.098	1.456	1.854	1.388	2.806	2.384	1.320	1.149	2.039	1.578	1.402	1.224	2.828	2.318	1.424	1.207
dEPdil	0.582	1.000	0.322	0.000	0.525	1.000	0.318	0.000	0.507	1.000	0.495	0.000	0.607	1.000	0.686	1.000	0.442	0.000
SIZE	0.146	0.095	0.249	0.155	0.142	0.126	0.116	0.094	0.121	0.102	0.592	0.409	0.227	0.195	0.206	0.184	0.028	0.025
N	5547	5547	645	645	99	99	538	538	3394	3394	740	740	28	28	51	51	9619	9619

Table 2: Event studies

*This table contains changes in leverage ratios and deviations from target ratios over a seven year window around transactions. The data are from the Thomson Financial® database and the sample contains 5,365 listed firms of member countries of the EU and EFTA which represent 20,661 firm-year observations over the period 1989-2000. DTAM is the ratio of total financial debt to total assets where the total assets is the sum of the book value of debt plus the market value of equity at the end of the year. DEV_DTAM is DTAM minus TDTAM. TDTAM is the DTAM of firms within the same three-digit SIC code and the same year. med is the symbol for median. t statistics are reported for mean deviations and variations. Ranking tests are reported for median deviations and variations. ***indicates significance at the 1% level.**indicates significance at the 5% level. *indicates significance at the 10% level.*

	t-3		t-2		t-1		t0		t1		t2		t3		[-3,-1]		[-1,1]		[-1,3]	
	mean	med	mean	med	mean	med	mean	med	mean	med	mean	med	mean	med	mean	med	mean	med	mean	med
Equity issues																				
DTAM	0.152	0.124	0.151	0.122	0.151	0.118	0.134	0.100	0.149	0.114	0.160	0.125	0.168	0.134	0.006	0.000	0.000	-0.002	0.009	-0.001
DEV_DTAM	-0.021***	-0.031***	-0.020***	-0.035***	-0.020***	-0.033***	-0.037***	-0.057***	-0.030***	-0.048***	-0.017***	-0.035***	-0.009	-0.036***	0.006	0.005	-0.006	-0.007	0.012**	0.009**
N	396		458		645		645		519		452		394		396		519		394	
Debt issues																				
DTAM	0.170	0.142	0.168	0.141	0.172	0.144	0.247	0.222	0.244	0.219	0.236	0.213	0.231	0.207	0.000	-0.001	0.078***	0.066***	0.065***	0.053***
DEV_DTAM	-0.008***	-0.019***	-0.012***	-0.023***	-0.009***	-0.022***	0.053***	0.036***	0.045***	0.028***	0.039***	0.023***	0.038***	0.021***	-0.004***	-0.003***	0.060***	0.050***	0.057***	0.048***
N	3684		4400		5547		5547		4000		3106		2507		3684		4000		2507	
Dividend increases																				
DTAM	0.042	0.007	0.040	0.006	0.031	0.003	0.033	0.003	0.046	0.006	0.049	0.007	0.053	0.008	-0.011***	0.000***	0.016***	0.000***	0.028***	0.000***
DEV_DTAM	-0.106***	-0.109***	-0.107***	-0.114***	-0.115***	-0.117***	-0.114***	-0.115***	-0.099***	-0.110***	-0.091***	-0.101***	-0.085***	-0.099***	-0.009***	0.000*	0.014***	0.009***	0.036***	0.026***
N	377		448		538		538		435		334		263		377		435		263	
Share repurchases																				
DTAM	0.108	0.079	0.101	0.079	0.092	0.055	0.103	0.071	0.102	0.061	0.114	0.092	0.135	0.120	-0.015**	-0.006***	0.017***	0.000**	0.075***	0.033***
DEV_DTAM	-0.051***	-0.064***	-0.056***	-0.075***	-0.072***	-0.088***	-0.064***	-0.078***	-0.063***	-0.075***	-0.042***	-0.060***	-0.028	-0.054*	-0.021***	-0.016***	0.012*	0.012*	0.062***	0.035***
N	82		91		99		99		69		43		30		82		69		30	
Debt reductions																				
DTAM	0.237	0.209	0.250	0.224	0.273	0.246	0.202	0.172	0.188	0.155	0.186	0.158	0.188	0.158	0.030***	0.025***	-0.076***	-0.074***	-0.081***	-0.080***
DEV_DTAM	0.042***	0.022***	0.052***	0.030***	0.072***	0.055***	0.010***	-0.006	-0.002	-0.016***	-0.001	-0.018***	0.003	-0.014**	0.023***	0.018***	-0.066***	-0.062***	-0.061***	-0.059***
N	2273		2638		3394		3394		2611		2219		1871		2273		2611		1871	
No transactions																				
DTAM	0.140	0.105	0.131	0.097	0.138	0.100	0.137	0.097	0.137	0.100	0.139	0.103	0.138	0.103	-0.007	-0.003	0.003***	0.000	0.002	-0.001
DEV_DTAM	-0.034***	-0.050***	-0.042***	-0.059***	-0.035***	-0.056***	-0.038***	-0.060***	-0.039***	-0.058***	-0.036***	-0.053***	-0.035***	-0.051***	-0.008***	-0.006***	0.001	0.000	0.006***	0.004***
N	6660		7297		9619		9619		7751		6589		5526		6660		7751		5526	

Table 3: LOGIT regressions

*This table contains the results using the LOGIT estimator for debt-equity choice regressions. The data are from the Thomson Financial® database. The sample contains 5,365 listed firms of member countries of the EU and EFTA which represent 20,661 firm-year observations over the period 1989-2000. DTAM is the ratio of total financial debt to total assets where total assets is the sum of the book value of debt plus the market value of equity at the end of the year. TDTAM is the DTAM of firms within the same three-digit SIC code and the same year. ROA is the ratio of EBITDA to total book assets measured over the period [t-1, t]. CASH is the mean value over [t-1, t] of the ratio of cash and cash equivalents to total book assets. RETURN is the ratio of the annual change in the market value of equity to the market value of equity at the beginning of the year. MTB_{it-1} is the ratio of the market value of assets (book value of assets plus market value of equity less book value of equity) to the book value of assets at the beginning of the year. d1 is a dummy variable equal to 1 for firms with a MTB_{it-1} lower than one. dEPdil is a dummy variable to proxy for the dilution effect of equity transactions. It is equal to 1 when the after-tax cost of debt exceeds the ratio of net profits to market value of equity. SIZE is the ratio of the amount of the transaction to total book assets. Estimated coefficients for the country and year dummy variables are not reported. Standard deviations are reported in italics. *** indicates significance at the 1% level. ** indicates significance at the 5% level. * indicates significance at the 10% level. t1 is a t-statistic for the linear restriction test under the null hypothesis. Wald 1 is a test of the joint significance of time dummy variables. Wald 2 is a test of the joint significance of the country dummy variables. Wald 1 and 2 are asymptotically distributed as χ^2 under the null hypothesis of no relationship. Degrees of freedom are reported in brackets. % is the correct classification percentage of the model estimated with a 0.5 cut-off.*

	Debt issues versus Equity issues	Debt issues versus Debt issues and Equity issues	Debt issues and Equity issues versus Equity issues	Equity issues versus No transactions	Debt issues versus No transactions	Debt reductions versus Share repur--chases	Debt reductions versus Dividend increases	Debt reductions versus Debt reductions and Dividend increases	Debt reductions versus Debt reductions and Share repurchases	Debt reductions and Dividend increases versus Dividend increases	Debt reductions and Share repurchases versus Share repurchases	Share repur--chases versus No transactions	Dividends increases versus No transactions	Debt reductions versus No transactions
$DTAM_{it-1}$	-2.008	-1.489	-0.009	2.998	1.188	18.428	26.955	13.236	14.934	11.625	12.781	-1.319	-6.320	7.724
	*0.439***	*0.463***	*0.622*	*0.416***	*0.167***	*2.080***	*1.761***	*2.592***	*3.076***	*2.771***	*4.729***	*1.215*	*1.044***	*0.208***
TDTAM	3.127	1.706	1.578	0.077	3.230	-6.856	-3.050	-4.683	-4.948	-1.967	-9.367	2.062	0.668	-2.399
	*0.759***	*0.768***	*1.064*	*0.746*	*0.297***	*1.988***	*1.392***	*2.445**	*3.640*	*3.135*	*7.515*	*1.809*	*0.985*	*0.371****
ROA	1.230	0.437	1.112	-2.383	-1.299	-2.441	-4.519	-4.699	-0.483	-1.138	-4.897	4.166	6.181	0.936
	*0.269***	*0.327*	*0.345****	*0.258****	*0.134****	*0.758****	*0.456****	*0.780****	*1.180*	*1.100*	*2.904**	*0.717****	*0.320****	*0.157****
CASH	-2.456	-0.491	-3.138	-1.009	-3.831	-4.443	-4.748	0.785	-2.576	-8.859	-5.566	2.098	2.689	-1.086
	*0.418***	*0.529*	*0.685****	*0.403***	*0.201****	*1.044****	*0.667****	*1.702*	*1.818*	*1.933****	*3.178**	*0.717****	*0.352****	*0.230****
RETURN	-1.033	-0.769	-0.234	1.553	0.313	1.398	0.617	0.151	0.049	0.558	1.698	-1.438	-0.566	0.120
	*0.081****	*0.086****	*0.116***	*0.084****	*0.042****	*0.367****	*0.191****	*0.381*	*0.423*	*0.474*	*1.101*	*0.331****	*0.132****	*0.052***
MTB_{it-1}	-0.211	0.015	-0.321	0.483	0.369	0.431	0.182	0.275	1.350	0.324	0.126	-0.077	0.023	0.155
	*0.040****	*0.048*	*0.058****	*0.039****	*0.027****	*0.116****	*0.059****	*0.094****	*0.546***	*0.174**	*0.549*	*0.107*	*0.042*	*0.031****
d1(MTB_{it-1})	0.815	0.963	-0.058	-1.693	-0.777	-1.611	-0.792	0.190	-0.588	-2.787	-0.740	0.535	-0.302	-0.594
	*0.183****	*0.199****	*0.259*	*0.181****	*0.059****	*0.405****	*0.385***	*0.976*	*0.665*	*1.358***	*1.028*	*0.344*	*0.281*	*0.068****
dEPdil	0.834	0.463	0.508	-0.132	0.640	-0.192	-0.016	-0.375	-0.361	1.372	-0.047	0.110	-0.056	-0.041
	*0.103****	*0.108****	*0.142****	*0.101*	*0.040****	*0.282*	*0.193*	*0.392*	*0.465*	*0.493****	*0.799*	*0.231*	*0.127*	*0.049*
SIZE	-1.148	-5.155	4.314			-6.538	1.570	-14.914	-18.232	18.582	17.000			
	*0.215****	*0.222****	*0.337****			*2.379****	*1.535*	*2.262****	*2.674****	*2.919****	*4.763****			
N1	*5547*	*5547*	*740*	*645*	*5547*	*3394*	*3394*	*3394*	*3394*	*51*	*28*	*99*	*538*	*3394*
N2	*645*	*740*	*645*	*9619*	*9619*	*99*	*538*	*51*	*28*	*538*	*99*	*9619*	*9619*	*9619*
t1	51.1			259.1	443.4	33.9	14.5			7.7				118.4
Wald 1	120.7(11)	43.7(11)	26.4(11)	88.4(11)	155.1(11)	39.2(11)	34.8(11)	16.8(11)	10.3(7)	17.0(11)	4.1(7)	47.8(11)	51.0(11)	49.8(11)
Wald 2	124.9(14)	157.6(15)	21.31(14)	188.0(14)	237.0(16)	31.1(10)	33.0(14)	15.1(8)	16.8(4)	8.2(8)	0.5(4)	33.27 (10)	98.9(14)	218.8(16)
Pseudo-R^2	0.2099	0.3413	0.2269	0.2079	0.0991	0.4331	0.6705	0.4376	0.3519	0.5047	0.4342	0.1987	0.3670	0.1660
%	90.28%	90.70%	75.52%	93.90%	68.08%	97.74%	95.73%	98.72%	99.21%	93.55%	86.61%	98.98%	95.55%	76.16%

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