What drives dividend smoothing? A meta regression analysis of the Lintner model

Erik Fernau[a,] Stefan Hirsch[a]

[a] University of Mannheim, Finance Area, L 9, 1-2, 68161 Mannheim, Germany; tel. +49 621 181 1526; fax +49 621 181 1518; e-mail: fernau@uni-mannheim.de

[b] ETH Zurich, AECP Group, 8092, Zurich, Switzerland; tel. +41 44 632 52 27; e-mail: stehirsch@ethz.ch

January 2017

What drives dividend smoothing? A meta regression analysis of the Lintner model

January 2017

ABSTRACT

Dividend smoothing is one of the most robust findings reported in the empirical corporate finance literature. Although there is consensus about the presence of dividend smoothing, its degree varies widely across studies investigating different time periods, countries, or industries (e.g. banking vs. non-banking). We perform a meta-regression analysis to investigate the heterogeneity in dividend smoothing effects reported in the underlying literature. Using a set of 123 empirical studies, we find evidence for various determinants of differences in dividend smoothing across studies. Among the set of control variables, firm size (negative) and debt (positive) yield significant effects on dividend smoothing. We further find evidence that dividend smoothing is lower in the US than in any other country. Moreover, heterogeneous results are the consequence of the application of a wide set of econometric techniques. Our study offers a nuanced view on the different smoothing effects reported in the literature and provides helpful hints for future research on this important topic.

JEL Classification: C83, G32, G35

Keywords: Meta regression analysis, dividend smoothing, speed of adjustment, Lintner model

1. Introduction

The analysis of firms` cash disbursal to shareholders is a fundamental field of study within financial economics. Conducting a survey of 28 companies in the US, Lintner (1956) drew two key conclusions about corporate payout policy: (1) Firms strongly base their current dividend on the previous dividend. ("dividend smoothing"). (2) Firms have a long-term target payout ratio and partially adjust their dividend towards it. Due to the emergence of stock repurchases as an alternative payout channel (Grullon and Michaely, 2002) many authors (e.g. Andres et al., 2015; Brav et al., 2005; DeAngelo et al., 2008; Skinner, 2008) argue that the assumption of a long-term payout ratio solely based on dividends has lost some of its significance. Dividend smoothing, though, remains one of the most robust findings in the empirical corporate finance literature even 60 years after Lintner's (1956) pioneering study (Leary and Roberts, 2011). This may explain why the Lintner model is still the most widely used empirical model of dividend payouts. Whereas the existence of dividend smoothing is a robust finding in empirical studies subsequent to Lintners study, the degree of dividend smoothing varies widely across the large number of empirical studies. Factors such as the considered time period (Brav et al., 2005), the investigated country (Chemmanur et al, 2010) or the consideration of firm characteristics affecting dividend payouts (Leary and Roberts, 2011) are potential drivers of the heterogeneous dividend smoothing findings. However, the literature lacks a detailed understanding about the drivers of the heterogeneous results. The diverse empirical findings as well as contradicting theoretical assumptions on dividend payout policies, smoothing effects and the respective drivers indicate the need for a quantitative overview of previous findings.

We use a meta regression analysis (MRA) framework based on the MRA guidelines of Stanley et al. (2013) to provide a summarizing picture of this core topic of empirical corporate finance literature. MRA refers to a meta-study where regression analysis is performed on previous regression results on a specific research topic (Stanley and Jarrell, 1989). MRA hence is an approach to assess and summarize existing empirical results on a specific economic phenomenon taking into account factors related to the underlying study design, such as the analyzed region, country, time period or the employed econometric technique, that drive heterogeneity in results (Nelson and Kennedy, 2009). The usefulness of MRA to evaluate existing empirical research has been widely discussed (e.g. Stanley 2001). According to Stanley (2001) there is consensus that the MRA framework offers significant advantages compared to classical meta-analysis approaches such as narrative literature reviews. Initiated by Card and Kruegers (1995) seminal analysis of the relationship between minimum wages on employment MRA has been applied to a wide range of economic research areas[1] (e.g. Jarrell and Stanley, 1990; Longhi et al., 2005; Card et al., 2010; Bakucs et al., 2014; Oczkowski and Doucouliagos, 2014; Valickova et al., 2015; Wang and Shailer, 2015; Demena and van Bergeijk, 2016).

Different empirical results may either reflect sampling errors or bias, mistakes in the analysis, (Trotman and Wood 1991) or reveal true differences in the population that are reflected by the analyzed sample (Wang and Shailer 2015). Meta regression analysis (MRA) enables to identify those issues, thus providing a quantitative overview across previous findings that allows to identify `true` smoothing effects as well as the tendency to preferably report statistically significant results. Moreover, MRA provides a setting to identify important study characteristics such as analyzed country, time span or population as well as employed data sets and econometric estimators that drive heterogeneity in reported results (Hirsch, 2017).

[1] The application of MRA has its roots in natural science (e.g. DerSimonian and Laird, 1986)

Our meta analysis comprises 123 different empirical studies on dividend smoothing. We thereby surpass the amount of studies considered in other meta studies by far. In addition, we track all the refinements that have been made to Lintner's (1956) study with respect to their model specification as well as the study design characteristics. In particular, we consider a large set of potential drivers for the heterogeneity in dividend smoothing results such as the analyzed time span or country, the econometric technique used, or the consideration of firm-specific characteristics. This allows us to draw a detailed picture on the reasons for the heterogeneous results found in the prior literature. Thus, our MRA allows to draw a detailed picture on smoothing effects for different populations or study design characteristics. This enables us to reassess previous studies and can provide helpful hints for future research on this important topic.

We find that the estimated dividend smoothing effects are severely affected by study design characteristics. The consideration of firm characteristics plays an important role in explaining heterogeneous dividend smoothing effects across countries. Whereas studies controlling for firm size finds significant higher dividend smoothing, the consideration of leverage among the set of control variables leads to significant lower dividend smoothing coefficients. Moreover, our results suggests that there is evidence for country effects in dividend smoothing. Studies focusing on the US find a lower degree of dividend smoothing compared to studies investigating the UK, other EU, or developing countries. Differences in dividend smoothing are also driven by the choice of the econometric technique. Our results indicates that the use of the GMM estimation technique avoids an upward bias in the estimation of dividend smoothing effects

Our study adds to the literature in several important ways: (1) We assess whether previous results on dividend smoothing are affected by publication bias, i.e. a tendency to favor significant results and insignificant ones (Stanley, 2005). (2) We summarize smoothing effects and derive a proxy for the 'true' effect after potential publication bias. (3) We assess the modifications that have been made relative to Lintner's study and identify the study characteristics (e.g. analyzed country, time period, industry, applied estimator) that impact reported smoothing effects.

The remainder of this paper proceeds as follows. Section 2 reviews the theoretical and empirical literature on dividend payout policies with a particular focus on the Lintner model. In Section 3, we present the design of our MRA and some descriptive statistics. Section 4 presents the results of our MRA, and section 5 concludes.

2. Literature on the Lintner model

Based on his survey evidence Lintner (1956) captures the idea of dividend smoothing and the existence of a long-term target payout based on the following model:

$$\Delta D_{i,t} = \alpha_i + \lambda_i(D_{i,t}^{*} - D_{i,t-1}) + u_{i,}t \qquad (1)$$

$$D_{i,t}^{*} = r_i P_{i,t} \qquad (2)$$

where $\Delta D_{i,t}$ corresponds to the change in dividend payments relative to the dividend payments in the previous period ($D_{i,t-1}$), $D_{i,t}^{*}$ is the target dividend payment assumed to the be equal to a fraction r_i of current after tax-earnings $P_{i,t}$, λ reflects the speed of adjustment towards the target payment, α_i is the constant, and $u_{i,t}$ an error term. A coefficient $0 \leq \lambda_i \leq 1$ indicates that firms adjust their dividends partially towards the target in a given period. Lintner also assumes a positive constant reflecting managers' reluctance to cut dividends. Inserting (2) into (1) and rearranging yields the following equation:

$$D_{i,t} = a_i + \lambda_i r_i Ei_{,t} + (1-\lambda_i)D_{i,t-1} + u_{i,t} \qquad (3)$$

If we set $\lambda_i r_i = b_i$ and $1-\lambda_i = d_i$ and follow the common assumption of a constant speed of adjustment and target payout ratio across firms (Andres et al., 2009; Andres et al., 2015; Fama, 1974; Skinner, 2008) , we end up with the following equation, which we refer to as the "classic Lintner model":

$$D_{i,t} = a_i + bE_{i,t} + dD_{i,t-1} + u_{i,t} \quad (4)$$

Lintner (1956) tests this model using sample of 28 US companies for the sample period 1947-1953 using OLS as estimation method. He finds a speed of adjustment of about 1/3. In accordance with Lintner's prediction, early studies such as the study by Fama and Babiak (1968) and Watts (1973) finds a speed of adjustment as close to 1/3 and the constant as small but positive.

Today, equation 4 is still the most widely used regression model in empirical studies dealing with Lintner-type partial adjustment approaches. However, the findings for the estimated dividend smoothing parameters are as diverse as the differences of the study design of subsequent studies using Lintner-type partial adjustment models. These studies differ with respect to the time span, the investigated country, potential modifications of equation (4) or the econometric technique i.a.

Following Lintner (1956) researchers started to adjust the classical model to incorporate theoretical considerations as well as empirical phenomena more properly. Fama and Babiak (1968) argue that target dividend payments are still based on a fixed ratio of current earnings. However, they assume that earnings are determined by the following process:

$$E_{i,t}=(1+\delta_i)E_{i,t-1} + v_{i,t} \quad (5)$$

with $v_{i,t}$ representing a serially uncorrelated error term. They further assume that dividends are not fully adjusted to the expected change in earnings ($(1+\delta_i)E_{i,t-1}$) and partially adjusted to the earnings surprise.

Using the assumptions and rearranging of equation (4) yields the following equation, which we refer to as the "modified Lintner model''[2]:

$$D_{i,t} = a_i + bEi_{,t} + dD_{i,t-1} + fE_{i,t-1} + u_{i,t} \quad (6)$$

Lintners (1956) findings are based on accounting profits. An important strand of the literature though relates dividend payments to the mitigation of free-cash-flow problems (e.g. Allen et al., 2000; Easterbrook, 1984; Jensen, 1986). For this reason many authors rely on cash-flows instead of or in addition to accounting profits in modelling dividend payouts (e.g. Andres et al., 2009; Renneboog and Szilagyi, 2015).

A further refinement relative to Lintners study concerns an econometric issue. The classic Lintner model as well as similar Lintner-type adjustment models include the lagged dependent variable among the set of independent variables. In this case, the use of OLS yields upward biased coefficient estimates of the lagged dependent variable (Hsiao, 1986). The Within-Group estimator, in turn, which has been used by many authors in subsequent studies leads to a downward biased coefficient of the lagged dependent variable. (Nickell, 1981) A growing number of studies (e.g. Andres et al., 2015; Naceur et al., 2006; Pindado et al., 2012) rely on Arellano and Bond's (1991) GMM-in.differences or Arellano and Bover's (1995)/Blundell and Bond's (1998) GMM-in-systems estimators. These estimators yield unbiased coefficient estimates of the lagged dependent variable (Baltagi 2008).

The substantial rise in the volume of stock repurchases marks a major challenge for the concept of a long-term dividend payout. In recent studies, Skinner (2008), Brav et al. (2005), and Leary and Roberts

[2] Other authors (e.g. Dharan, 1988; Hines, 1996; Theobald, 1978) include further lagged of either the earnings or the dividend parameter in the equation. As their estimation still rely on the two key variables dividends and earnings, we also refer to these models as "modified Lintner model''.

(2011) report evidence questioning that firms base their payout on a target dividend ratio. Whereas stock repurchases gained in importance from 1980 onwards, they emerged as an alternative payout method at the end of the 1990s in several European countries.[3] The availability of a different payout method suggest that firms might use stock repurchases to disburse temporary earnings (Jagannathan et al, 2000) leading to higher dividend smoothing. Andres et al. (2015), Brav et al. (2005), and Choe (1990) find evidence in line with this prediction. In addition to the time period, institutional differences across countries might be another reason for heterogeneous results in dividend smoothing. Andres et al. (2009), McDonald et al. (1975), and Short et al. (2002) find speed of adjustment coefficients that are different from the US analyzing a sample of German, French, and UK firms, respectively. Chemmanur et al. (2010) compare the dividend policies of firms in the US and Hong Kong and relate the finding of a more flexible dividend payout in Hong Kong to differences in the equity ownership and tax regime across the two countries.

As the tax status of investors as well as their equity ownership might also differ within countries, Chemmanur et al.'s (2010) finding can also be interpreted as consistent with different firm characteristics as drivers for the heterogeneity in dividend smoothing. Leary and Roberts (2011) provide a thorough overview of potential firm-specific determinants of dividend smoothing. As we show in our meta-analysis, firm size, ownership structure as well as leverage are among the most commonly used firm characteristics that have been used as control variables in Lintner-type partial adjustment models. Finally, most studies have excluded financial firms from their analysis due to different regulatory requirements of these firms. However, the evidence of De Angelo et al. (2004) suggests substantial differences in

[3] The basis for stock repurchases in the EU is the Second Council Directive of December, 13th, 1976 (77/91/EEC). However, as the the single EU countries still had to translate the directive in national law, the volume in stock repurchases did not reach meaningful levels in any European country before the end of the 1990s.

payout policies across industries making industry sectors a potential driver of heterogeneity in smoothing effects as well. In the subsequent meta analysis we aim to shed light on the significance of these potential factors in explaining the heterogeneity of dividend smoothing effects across studies.

3. Meta regression data & descriptive statistics

In section 3.1. we describe how we identify the studies included in our MRA. Subsequently, we provide some descriptive statistics with respect to study design characteristics.

3.1 SAMPLE SELECTION

First we performed a literature search based on the MRA guidelines of Stanley et al. (2013) to identify all potentially relevant unpublished and published empirical studies on dividend smoothing. We performed an initial search with all reasonable combinations of the following key terms: “Dividends”, “payouts”, “Lintner model”, “dividend smoothing”,” target payout”, and “speed of adjustment”. . The following databases have been employed for the literature search: Econstor, google scholar, SSRN, Jstor, Wiley, Business Source Premier EBSCOhost, NBER, Econ papers. We moreover checked the references lists of those studies by means of snowballing techniques to identify studies that have not been detected by the initial key term search (Longhi et al., 2005). This resulted in an initial set of 407 published and unpublished tudies. We then checked whether those studies are based on an empirical estimation of Lintner`s model; We exluded studies which are an earlier version of a subsequently published paper as well as studies that fail to report standard errors with the regression results as the availability of the latter is crucial for the estimation of publication bias. As regards working papers, those are only included if no other published version exists. However, whenever two versions exist we compared the working paper version to the published version and extracted unpublished results from the working paper which have been excluded from the published version. This enables to detect publication bias that arises if editors encourage authors to drop insignificant results. This resulted in a final sample of 123 studies that report 1137 coefficients. Many studies report several coefficients which are the result of estimations for subsamples or estimations based on different econometric approaches . Examples are Persson (2013) who reports coefficients for different industry sectors, Al-attar (2015) reporting results for different size class subsamples or Foerster and Sapp (2006) who split their sample into three different time frames.

Some reported results had to be excluded from our analysis as they cannot be captured by the MRA as they only appear in a single study. Examples for exclusion of results are: Gugler (2003) as this study reports results for different ownership structures that cannot be controlled for by the MRA. Moreover, in this study no results are reported for the whole sample of firms independent of ownership structure. The same holds for the Korkeamaki et al. (2010) where results are presented for firms that pay only ordinary dividends. Results of Javakhadze et al. (2014) need to be excluded as speed of adjustment is reported for 24 countries in table but without any further information i.e. standard error or profit measure and respective coefficient. In this study speed of adjustment coefficients are used as dependent variables in subsequent regressions implying that the main focus is not on the Lintner model anyway. Athari et al. (2016) reports results for islamic vs. conventional banks where the MRA cannot distinguish between those groups. Other examples of exclusion due to unfeasibility to control for in the MRA can be found in Benhamouda (2007). From Persson (2013) we exclude results for samples where firms are grouped into different market caps (small, mid, large). From Al-attar et al. (2015) we exclude results for different subsamples related to high/poor quality earners and high/low gearing as well as high growth/low growth. Kim and Jeon (2015) analyze separate samples for domestically operating Korean firms and multinationals` foreign subsidiaries operating in Korea. Results for the latter (tables 3 and 6) are excluded from our MRA study. From Ameer (2007) we exclude results that are for subsamples related to high and low growth firms. Finally, results that are generated by applying Lintner`s model to time series of single firms (e.g. Aggarwal and Pasricha, 2011; Michaely and Roberts 2011, Table 3) are not included as most of the times se`s are not reported. Moreover, results of this approach are not comparable to results based on (pooled data) with panel estimators (Hirsch 2017). From Shinozaki and Uchida (2015) we exclude results related to different ownership structure of firms. (Desai, Foley and Hines (2002) is excluded because only dividend payments by majority owned affiliates to parents or by parents to shareholders are considered. We also exclude results for models where only D_{t-n} with n>1 has been used as an independent variable (e.g. Dereeper and Turki 2012).

Table 1 in the appendix provides a chronological overview of the final set of 123 included studies on dividend smoothing.

[Insert Table 1 about here]

3.2 DESCRIPTIVE STATISTICS

Table 2 summarizes the variables included in the MRA. It can be observed that the mean adjustment coefficient across included studies is 0.461 indicating the presence of a mediocre degree of dividend adjustment. The included explanatory variables control for the underlying design of studies. Table 2 reveals that 48.6% of the studies focus on a mean year of the analyzed sample after 1998 We split our sample in studies focusing on a mean year of 1998 or prior to and studies focusing on a later period as a large number of countries included in our dataset exhibits meaningful levels of stock repurchases as an additional payout channel from the end of the 1990s onwards. The average time series dimension of the analyzed panel is 13.6 years. Along these lines, Baltagi (2008) shows that OLS is particularly biased for short time series dimension. Nevertheless, only 17% of the 1137 coefficients have been generated using a GMM estimator while the remainder has either been estimated by OLS (54.2%), the fixed effects (within) estimator (15.1%) or by means of other methods (13.7%). It will hence be interesting to assess whether the length of the analyzed time series impacts on reported estimates as this would strengthen the argument to employ GMM. As regards extensions of the classical Lintner model specified by (4) it can be observed that 39.6% of reported coefficients are generated on the classical version while the remainder of coefficients has been estimated based on extensions that include further explanatory variables such as firm size, debt, or ownership. Finally, the lower panel of Table 2 indicates that the literature on dividend smoothing has also focused on industry differences.

[Insert Table 2 about here]

4. Meta regression analysis

We first provide a descriptive analysis of reported estimates that allows by means of a funnel plot to derive preliminary hints regarding the presence of publication bias. Moreover, a proxy for the `true` smoothing value is derived. Section 4.2 then describes the MRA framework used with a focus on econometric issues that need to be considered. Finally, section 4.3 presents and discusses the MRA results.

4.1 DESCRIPTIVE ANALYSIS OF THE 'TRUE'-EFFECT AND PUBLICATION BIAS

Before estimating MRA models we conduct a preliminary analysis of the "true" adjustment coefficient and of publication bias.

A first impression on whether the underlying literature is affected by publication bias can be derived by means of a funnel plot. Publication bias is the consequence of a favor for statistically significant results by authors or journal editors. Stanley (2005; 2008) suggest that the degree of this bias can be proxied by the correlation of estimates and their standard errors. A strong indication for publication bias would hence be an average t-statistic larger than two prevailing across analyzed estimates. To graphically illustrate this relationship Stanley and Doucouliagos (2010) propose to plot estimated coefficients against their precision, where precision is measured by the inverse of coefficients' standard errors (Oczkowski and Doucouliagos, 2014; Zigraiova and Havranek, 2015). If the underlying literature is not affected by publication bias estimated adjustment coefficients with high standard errors in the lower part of the plot shall be characterized by high variation around the "true" adjustment coefficient, while estimates with low standard errors in the upper part of the plot should be characterized by low variation around the "true" value. Thus, without publication bias the plot should take the form of a symmetric inverted funnel. In turn, skewness of the funnel is a hint for publication bias. In order to construct the funnel plot we follow Stanley (2005) and first derive a proxy for the true adjustment coefficient by averaging the top 10% of most precisely estimated adjustment coefficients leading to a value of 0.405. This indicates that true adjustment speed based on this methodology is slightly higher than suggested by Lintner (1956). We then plot estimated coefficients and their precision around this "true" value. The resulting funnel plot is shown in Figure 1. Skewness in either direction cannot be detected and the plot takes the form of an inverted symmetrical funnel. This implies that given the assumption of a single underlying "true" effect of 0.405 publication bias is not present.

[Insert Figure 1 about here]

Testing whether the standard error impacts significantly is known as the funnel asymmetry test (FAT). The models where the standard error is introduced in a linear way show a strong relationship between the standard error and the estimated coefficients hence pointing towards publication bias. The models which introduce the standard error in a squared way –which is supposed to be the more precise measure as publication bias will be less severe for estimates with low standard errors- do not point towards publication bias.

However, the disadvantage of using funnel plots is that a single “true” effect is assumed for different regions, sectors, time periods, or estimation technique. Hence, possible publication bias within country or industry subsamples of reported adjustment coefficients cannot be detected with this method (Hirsch, 2017; Doucouliagos et al., 2005; Stanley 2005, 2008). In the following we therefore conduct MRA which provides a more objective analysis than funnel plots.

4.2 META REGRESSION MODEL

While the funnel analysis performed in 4.1. can provide first indications regarding the `true` effect and publication bias its main disadvantage lies in the assumption that there is only a single ‘true’ effect. However, it is reasonable to assume that a broader range of heterogeneous `true` effects exit for different sub populations defined by study focus on different countries, firm size, or industries. Moreover, it is likely that `true` effects vary over time. In addition the shape of the funnel can also be driven by applied estimation techniques (Hirsch 2017).

We therefore perform several MRA`s based on different estimation strategies. Compared to funnel graphs MRA enables to more precisely analyze possible publication bias as it can account for different subgroups in the sample (e.g. defined by time, countries, or industries) which might be affected by publication bias in a heterogeneous way. MRA also allows to account for heterogeneity in reported results driven by the underlying study design (Doucouliagos et al., 2005; Stanley 2005, 2008).

Following Stanley (2005, 2008) we implement several specifications of the following model:

$$\hat{y}_j = \beta_0 + \beta_1 se(\hat{y}_j) + \sum_n \beta_n x_{nj} + \varepsilon_j \qquad (7).$$

where the dependent variable reflects the j=1,…., 1137 identified speed of adjustment coefficients λ The standard error of each estimated coefficient ($se(\hat{y}_j)$) is included as independent variable together with a vector $\boldsymbol{x}$ of those variables reported in Table 2 that relate to structural characteristics of the underlying studies. The respective coefficients (β_n) therefore capture the variance in reported smoothing coefficients caused by those characteristics. Finally, ε_j is an i.i.d. error term.

The inclusion of the standard error of estimated coefficients as an independent variable provides the base to test for publication bias. If publication bias prevails across the analyzed literature a significant correlation between estimated coefficients and their standard errors, which ensures a sufficient level of statistical significance, should prevail (Oczkowski and Doucouliagos, 2014). Thus, authors will likely prefer those results where the quotient of estimated coefficient and its standard error is approximately around two implying significance at the 5%-level. In contrast if publication bias is not present estimated coefficients are distributed randomly around the `true` value and there should be no significant correlation with standard errors. The impact of publication bias is therefore reflected by $\hat{\beta}_1$ of equation (7) and testing $H_0 : \hat{\beta}_1 = 0$ can be considered as a test for the presence of publication bias. As rejecting H_0 points towards skewness of the funnel graph (Figure 1) it is also known as the funnel asymmetry test (FAT) Stanley (2005; 2008).

Stanley and Doucouliagos (2012) suggest to also consider modified specifications of (7) where the standard error is introduced non-linearly as this allows for a more flexible relationship between coefficients and standard errors over the domain of dividend smoothing estimates. We therefore also consider the following specification (8):

$$\hat{y}_j = \beta_0 + \beta_2 se(\hat{y}_j)^2 + \sum_n \beta_n x_{nj} + \varepsilon_j \tag{8}$$

where $H_1 : \hat{\beta}_2 = 0$ now serves as publication bias test.

Finally, the intercept $\hat{\beta}_0$ reflects the mean value of dividend smoothing corrected for publication bias given that the impact of all study design characteristics included in $\boldsymbol{x}$ is set to zero. The presence of a \`true\` dividend smoothing effect can hence be tested by $H_2 : \hat{\beta}_0 = 0$ and rejecting this hypothesis points toward the existence of an effect. According to Stanley (2005; 2008) the test of a non-significant MRA intercept is also known as precision effect test (PET).

To summarize the MRA allows to identify the following three issues: (i) publication bias through the impact of standard errors; (ii) the impact of study characteristics on variance in reported coefficients; and (iii) the existence of a \`true\` effect of dividend smoothing.

4.3 ECONOMETRIC IMPLEMENTATION

As suggested by the MRA guidelines of Stanley et al. (2013) we estimate MRA equations (aa) and (bb) by means of several econometric approaches. This is necessary to account for several econometric problems caused by the fact that the dependent variable of (7) and (8) is composed of estimated regression coefficients. These regression coefficients are derived by means of separate empirical studies implying heterogeneous variances of the coefficients and heteroscedasticity in the error terms of (7) and (8) (Nelson and Kennedy, 2009). We therefore use weighted least squares (WLS) estimation with the reciprocal of coefficients` standard errors as weights. As Stanley (2005) as well as Oczkowski and Doucouliagos (2014) point out $1/se(\hat{\lambda}_j)^2$ can serve as an adequate weight as it captures the heterogeneous variances of the coefficients and thus generates heteroscedasticity corrected standard errors of (7) and (8).

Another econometric issue arises from the fact that some of the studies included in our meta analysis provide more than one estimate. This implies that the meta data is composed of clusters of estimates with similar error structures. Nelson and Kennedy (2009) point out that such within-cluster error correlation leads to biases in the error terms of (7) and (8). To correct the standard errors of (7) and (8) for within study-cluster correlation we follow Oczkowski and Doucouliagos (2014) and employ several techniques to derive unbiased standard errors. In particular we first estimate (7) and (8) using WLS with heteroscedasticity robust standard errors as our base model. We then correct for correlation among errors of estimates from the same study by estimating (7) and (8) as WLS models with cluster robust and bootstrapped clustered standard errors.

To check the robustness of the WLS results in accordance with Stanley et al. (2013) and Oczkowski and Doucouliagos (2014) we also estimate (7) and (8) by means of panel estimators. However, although panel estimators such as fixed and random effects are suitable to capture the clustered (i.e. panel) structure of our data it is known that WLS is the more reasonable approach to estimate MRA models (Hirsch, 2017). E.g. Stanley and Doucouliagos (2013) demonstrate that WLS outperforms the random- and fixed effects estimator especially when the meta-data is affected by publication bias. Moreover, the fixed and random effects estimator are based on a set of adverse assumptions (e.g. Baltagi 2008). First, coefficient clusters in our sample are of considerably different size with a large number of clusters that contain a single observation only[4]. However, Nelson and Kennedy (2009) point out that employing the fixed effects estimator to such panels is disadvantageous. Second, application of the fixed effects estimator leads to inefficient estimates of (7) and (8) as study/author specific fixed effects significantly decrease the degrees of freedom (Baltagi, 2008; Nelson and Kennedy, 2009).[i] Third, to generate unbiased coefficients of (7) and (8) the random effects estimator requires zero correlation between the random effect and the explanatory variables (i.e. the standard errors as well as the variables in $\boldsymbol{x}$) (Baltagi, 2008; Stanley and Doucouliagos, 2013). Due to these disadvantages and the predominance of WLS in MRA models we consider the WLS estimations of (7) and (8) as our main results while the fixed and random effects results shall serve as robustness checks.

4.4 META REGRESSION RESULTS

Similar to Hirsch (2017) to get a first impression of publication bias we first estimate equations (7) and (8) without including the set of explanatory variables **x**. The results are reported in Table 2. The constant of each model indicates mean speed of adjustment corrected for publication bias. It can be observed that this value is significant between 0.597 and 0.605 and thus higher than the average of the 10% most precise measures derived as the proxy for true persistence above. The test if the constant has a significant impact i.e. the PET test (Stanley 2005, 2008) indicates for all specifications the presence of a significant smoothing effect.

---

[4] We observe 15 studies that report just one coefficient. The maximum number of coefficients that a single study reports amounts to 59. The average number of coefficients reported in the respective study is 9.244. A standard deviation of 10.507shows that the coefficient clusters in our sample are of considerably different size.

[Insert Table 3 about here]

As regards the FAT test the models where the standard error is introduced in a linear way show a strong relationship between the standard error and the estimated coefficients hence pointing towards publication bias. However, the models which introduce the standard error in a squared way –which is supposed to be the more precise measure as publication bias will be less severe for estimates with low standard errors- do not point towards publication bias.

[Insert Table 4 about here]

As already noted, a possible publication bias within country, industry or other study design characteristics related can only be detected by controlling for these factors in a multivariate meta regression model. Moreover, this analysis enable us to identify the study characteristics with an impact on estimated dividend smoothing effects.

Table 4 reports the results of various specifications of the multivariate regression models. (7) and (8) indicate that once we control for differences in study design characteristics, there is no evidence in favour of a publication bias. In contrast to our univariate analysis, the standard error is not statistically significant, whereas specification (8) that checks for a publication bias by means of the squared standard error confirms the insignificant results from the univariate analysis. This result is robust to the correction of standard errors for within study clusters in (9) and (10), to the use of bootstrapped clustered standard errors in (11) and (12) and the use of random fixed effects in (13) and (14).Thus, overall our results do not hind towards a publication bias.

The multivariate meta regression analysis reveals several important findings with respect to the factors affecting the results in reported dividend smoothing coefficients. Several studies (e.g. Andres et al., 2015; Brav et al., 2005; Choe, 1990) find evidence that the degree of dividend smoothing has increased in recent years possibly due to the emergence of stock repurchases as an additional way to disburse temporary earnings. The sign of the coefficient of the variable capturing whether the mean sample period is 1998 supports this explanation. However, the coefficient is statistically insignificant in 7 out of 8 specifications. Thus there have to be other reasons for the high degree of dividend smoothing that has been documented in many empirical studies. Our results suggests, that the consideration of firm characteristics might play an important role in this aspect. Whereas studies controlling for firm size finds significant higher dividend smoothing, the consideration of leverage among the set of control variables leads to significant lower dividend smoothing coefficients. This result is robust across all eight specifications in Table 4. Studies controlling for other firm characteristics than size. Leverage, or ownership also find lower speed of adjustment coefficients.

Moreover, our results shows, that in line with the predictions, the use of the econometric technique has an impact on estimated dividend smoothing coefficients. The GMM dummy is positive relative to the base case of OLS as estimation technique across all specifications. This indicates a severe downward bias in estimated speed of adjustment coefficients of studies using OLS as estimation technique. Dividend smoothing is particularly well-documented for firms in the US. However, our results based on a large set of studies covering a large number of different countries suggests, that dividend smoothing is by no means restricted to the US. In fact, the negative coefficients estimates of all groups of countries relative to the base case of studies investigating firms in the US and across all specifications indicates that the degree of dividend smoothing is significantly lower in the US compared to a group of other countries.

5. Conclusion

We shed light on the reasons for these heterogeneous results by means of a meta regression analysis (MRA) framework based on the MRA guidelines of Stanley et al. (2013). Covering a large set of 123 empirical studies across different sample periods, investigated countries, and several other differences in study design characteristics, we do not find evidence for a publication bias and confirm the existence of dividend smoothing.

We find that the emergence of stock repurchases as an additional payout channel in recent years cannot explain the large differences in reported dividend smoothing coefficients across empirical studies. We find a large number of other factors that explain the heterogenous findings for dividend smoothing:.our results suggests that the consideration of firm characteristics among the set of control variables as well as country effects are important in explaining different degrees of dividend smoothing. Studies focusing on the US find a lower degree of dividend smoothing compared to studies investigating the UK, other EU, or developing countries. Differences in dividend smoothing are also driven by the choice of the econometric technique. Our results also indicates that the use of the GMM estimation technique avoids an upward bias in the estimation of dividend smoothing effects.

The results of our MRA provides a summarizing picture of the large amount on literature on dividend smoothing. Our study is important in reevaluating the results reported in previous studies and in providing guidance for the study design of future studies on dividend smoothing.

References

Abdullah, N. M. H., Ahmad, Z., Roslan, S. (2012). The Influence of Ownership Structure on the Firms Dividend Policy Based Lintner Model. International Review of Business Research Papers 8(6): 71-88.

Adelegan, O. (2003). An Empirical Analysis of the Relationship between Cash Flow and Dividend Changes in Nigeria. R&D Management 15(1): 35-49.

Ahmad, H. , Javid, A. (2010). The Ownership Structure and Dividend Payout Policy in Pakistan (Evidence from Karachi stock Exchange 100 Index). International Journal of Business Management Economics and Information Technology 1(1): 58-69.

Ahmed, H. and Javid, A.Y. (2008). Dynamics and determinants of dividend policy in Pakistan (evidence from Karachi stock exchange non-financial listed firms). MPRA Paper No. 37342.

Ahmed, H., Javid, A. Y. (2009). Dynamics and Determinants of Dividend Policy in Pakistan (Evidence from Karachi Stock Exchange Non-Financial Listed Firms). International Research Journal of Finance and Economics 25(3): 148-171.

Aivazian, V.A., Booth, L. and Cleary, S. (2006). Dividend Smoothing and Debt Ratings. Journal of Financial and Quantitative Analysis 41(2): 439-453.

Al-Ajmi, J. (2010). Modelling the dividend policy of banks in Gulf Cooperation Council countries. Applied Economics Letters 17(14): 1423-1428.

Al-attar A.M., Al-Shattarat, H.K., Yusuf, A.N. (2015). The effects of contextual factors on disaggregated earnings in explaining dividend changes in Jordanian firms. International Journal of Commerce and Management 25(2): 218-239.

Allen, F., Bernardo, A., Welch, I. (2000). A theory of dividends based on tax clientele. Journal of Finance 55(6): 2499-2536.

Al-Malkawi, H-A., Bhatt, M. I., Magableh, S. (2014). On the dividend smoothing, signaling and the global financial crisis. Economic Modelling 42(): 159-165.

Al-Najjar, B. (2009). Dividend behaviour and smoothing new evidence from Jordanian panel data. Studies in Economics and Finance 26(3): 182-197.

Al-Najjar, B., Belghitar, Y. (2012). The information content of cash flows. Economic Issues 17(2): 57-70.

Al-Yahyaee, K.H. Pham, T.M., Walter, T.S. (2010). Dividend stability in a unique environment. Managerial Finance 36(10): 903-916.

Al-Yahyaee, K.H., Pham, T.M., Walter, T.S. (2006). Dividend Policy in the Absence of Taxes. Working Paper School of Banking and Finance, University of New South Wales.

Al-Yahyaee, K.H., Pham, T.M., Walter, T.S. (2011). Dividend smoothing when firms distribute most of their earnings as dividends, Applied Financial Economics 21(16): 1175-1183.

Alzahrani, M. and Lasfer, M. (2009). The Impact of Taxation on Dividends: A Cross-Country Analysis. Working paper King Fahd University of Petroleum & Minerals, Dhahran.

Ameer, R. (2007). Dividend Payout of the Property Firms in Malaysia. Pacific Rim Property Research Journal 13(4): 451-472.

Ameer, R. (2008). Product market competition, regulation and dividend payout policy of Malaysian Banks. Journal of Financial Regulation and Compliance 16(4): 318-334.

Anastassiou, T.A. (2007). A dividend function for Greek manufacturing. Managerial Finance 33(5): 344-347.

Andres, C,, Betzer, A., Goergen, M., Renneboog, L. (2009). Dividend policy of German firms: A panel data analysis of partial adjustment models. Journal of Empirical Finance 16(2): 175-187.

Andres, C., Betzer, A., van den Bongard, I., Goergen, M. (2014). Dividend Policy, Corporate Control and the Tax Status of the Controlling Shareholder. Working Paper Schumpeter School of Business and Economics, Bergische Universität Wuppertal.

Andres, C., Doumet, M., Fernau, E., Theissen, E. (2015): The Lintner model revisited: Dividends versus total payouts. Journal of Banking and Finance 55: 56-69.

Apedzan, E., Kighir, N., Haji, O., Norhayati, M. (2015). Corporate cash flow and dividends smoothing: a panel data analysis at Bursa Malaysia. Journal of Financial Reporting and Accounting 13(1): 2-19.

Arko, A.C., Abor, J., Adjasi, C.K.D., Amidu, M. (2014). What influence dividend decisions of firms in Sub-Saharan African? Journal of Accounting in Emerging Economies 4(1): 57-78

Athari, S.A., Adaoglu, C., Bektas, E. (2016). Investor protection and dividend policy: The case of Islamic and conventional banks. Emerging Markets Review 27: 100-117.

Baba, N., Ueno, Y. (2008). Are stock repurchases more flexible than dividends? The case of Japanese firms. Applied Financial Economics Letters 4(5): 315-318.

Baiyao, Z. (2011). Dividend Policy in Mainland China and USA. Bachelor thesis Hong Kong Baptist University.

Baker, H.K., Chang, B., Dutta, S., Saadi,S. (2013). Canadian corporate payout policy. International Journal of Managerial Finance 9(3): 164-184

Bakucs, Z., Falkowski, J. and Fertö, I. (2014) Does Market Structure Influence Price Transmission in the Agro-food Sector? A Meta-analysis Perspective. *Journal of Agricultural Economics* 65(1): 1-25.

Baltagi, B.H. (2008) *Econometric Analysis of Panel Data*. Chichester, UK: John Wiley & Sons.

Banks, S., Cheffins, B., Goergen, M. (2009). Dividends and politics. European Journal of Political Economy 25(2): 208-224.

Benavides, J., Berggrun, L., Perafan, H. (2016). Dividend payout policies: Evidence from Latin Americs. Finance Research Letters 17(): 197-210.

Benhamouda, Z. (2007). UK corporate share repurchases: an empirical analysis of corporate motives and payout policies, Durham theses, Durham University. Available at Durham E-Theses Online: http://etheses.dur.ac.uk/2137/.

Bodla, B. S., Pal, K., Sura, J. S. (2007). Examining Application of Lintner's Dividend Model in Indian Banking Industry. ICFAI Journal of Bank Management 6(4): 40-59.

Boţoc, C., Pirtea, M. (2014). Dividend Payout-Policy Drivers: Evidence from Emerging Countries. Emerging Markets Finance and Trade 50(4): 95-112.

Brav, A., Graham, J. R., Harvey, C. R., Michaely, R. (2005). Payout policy in the 21st century. Journal of Financial Economics 77(3): 483-527.

Bremberger, F., Cambini, C., Gugler, K., Rondi, L. (2013). Dividend Policy in Regulated Firms. Working Paper WU Vienna University of Economics and Business.

Bremberger, F., Cambini, C., Gugler, K., Rondi, L. (2014). Dividend Smoothing and Payout in Regulated Network Industries: Evidence from the EU. Working paper. Politecnico di Torino, Wirtschaftsuniversität Wien

Bremberger, F., Cambini, C., Gugler, K., Rondi, L. (2016). DIVIDEND POLICY IN REGULATED NETWORK INDUSTRIES: EVIDENCE FROM THE EU. Economic Inquiry 54(1): 408–432.

Brittain, J.A. (1964). The Tax Structure and Corporate Dividend Policy. The American Economic Review 54(3): 272-287.

Card, D. and Krueger, A.B. (1995) Time-Series Minimum-Wage Studies: A Meta-Analysis. *The American Economic Review* 85(2): 238-243

Card, D., Kluve, J. and Weber, A. (2010) Active Labour Market Policy Evaluations: A Meta- Analysis. *The Economic Journal* 120: 452-477.

Chan, K.F., Powell, J.G., Shi, J., Smith, T. (2016). Dividend persistence and dividend behavior. Accounting and Finance: doi: 10.1111/acfi.12208.

Chemmanur, T.J., He, J., Hu, G., Liu, Y.H. 2010. Is dividend smoothing universal? New insights from a comparative study of dividend policies in Hong Kong and the U.S: Journal of Corporate Finance 16, 413-430.

Chen, X., Sinha, A. K. (2016). Large Shareholders and Dividends: Game Theoretic Analysis of Shareholder Power. Working paper. California State Univerisity, Bradley University.

Choe, H. (1990). Intertemporal and Cross-sectional Variation of Corporate Dividend Policy. Ph.D. Dissertation. University of Chicago.

Dai, Q. (2007). Influence of a Tax Reform on Dividend Clienteles. Working paper. Binghamton University.

Darling, P.G. (1957). The Influence of Expectations and Liquidity on Dividend Policy. Journal of Political Economy 65(3): 209-224.

DeAngelo, H., De Angelo, L., Skinner, D. (2004). Are dividends disappearing? Dividend concentration and the consolidation of earnings. Journal of Financial Economics 72(3): 425-456.

DeAngelo, H., De Angelo, L., Skinner, D. (2008). Corporate Payout Policy. Foundations and Trends in Finance 3(2-3): 95-287.

DeAngelo, H., DeAngelo, L. (2000). Controlling stockholders and the disciplinary role of corporate payout policy - a study of the Times Mirror company. Journal of Financial Economics 56(2): 153-207.

Demena, B.A. and van Bergeijl, P.A.G. (2016) A Meta-Analysis of FDI and Productivity Spillovers in Developing Countries. Journal of Economic Surveys DOI: 10.1111/joes.12146

DerSimonian, R. and Laird, N. (1986) Meta-analysis in clinical trials. *Controlled Clinical Trials* 7(3): 177-188.

Desai, M. A., Foley, C. F., Hines Jr., J. R. (2001). Repatriation Taxes and Dividend Distortions. National Tax Journal 54(4): 829-851.

Desai, M.A., Jin, L. (2011). Insitutional tax clienteles and payout policy. Journal of Financial Economics 100(1): 68-84.

Devaki, S., Kamalaveni, D. (2012). Shareholding patterns and dividend payout: An empirical analysis in Indian corporate hotels. Intenational Journal of Multidisciplinary Research 2(1): 48-63.

Dharan, B. G. (1988). The Association between Corporate Dividends and Current Cost Disclosure. Journal of Business Finance & Accounting 15(2): 215-230.

Dorsman, A.B., van Montfort, K., Vink, I. (1999). An adjusted Lintner-model for the Netherlands. SERIE RESEARCH MEMORANDA faculteit der Economische Wetenschappen en Econometrie, wije Universiteit Amsterdam.

Doucouliagos, H., Laroche, P. and Stanley, T.D. (2005) Publication Bias in Union-Productivity Research? *Relations industrielles / Industrial Relations* 60(2): 320-347.

Easterbrook. F. H. (1984). Two Agency-Cost Explanations of Dividends. American Economic Review 74(4): 650-659.

Esteban, J. M. D, Pérez, O. L. d. F. (2001). Dividend Policy of European Banks. Working paper. Universidad de Burgos.

Fama, E. F. (1974). The Empirical Relationships between the Dividend and Investment Decisions of Firms. American Economic Review 64(3): 304-318.

Fama, E. F., French, K. (2002). Testing Trade-Off and Pecking Order Predictions About Dividends and Debt. Review of Financial Studies 15(1): 1-33.

Fama, E.F., Babiak, H. (1968). Dividend Policy: An Empirical Analysis. Journal of the American Statistical Association 63(324): 1132-1161.

Feldstein, M. S. (1970). Corporate Taxation and Dividend Behaviour. Review of Economic Studies 37(1): 57-72.

Foerster, S.R., Sapp, S.G. (2006). The changing role of dividends: a firm-level study from the nineteenth to the twenty-first Century. Canadian Journal of Economics 39 (4): 1316-1344.

Garrett, I., Priestley, R. (2000). Dividend Behavior and Dividend Signaling. Journal of Financial and Quantitative Analysis 35(2): 173-189.

Geiler, P., Renneboog, L. (2015). Taxes, earnings payout, and payout channel choice. Journal of International Financial Markets, Institutions & Money 37(): 178-203.

Goergen, M., Renneboog, L., Silva, L. C. de (2004). Dividend policy of German firms. A dynamic panel data analysis of partial adjustment models. Working paper. Cardiff University, Oxford Economic Research Associates, Tilburg University.

Goncharov, I., Triest, S. v. (2011). Do fair value adjustments influence dividend policy?. Accounting and Business Research 41(1): 51-68.

Grullon, G., Michaely, R. (2002). Dividends, Share Repurchases, and the Substitution Hypothesis. Journal of Finance 57(4): 1649-1684.

Gugler, K. (2003) Corporate governance, dividend payout policy, and the interrelation between dividends, R&D, and capital investment. Journal of Banking and Finance 27: 1297-1321

Gugler, K., Yurtoglu, B. B. (2003). Corporate governance and dividend payout policy in Germany. European Economic Review 47(4): 731-758.

Gunathilaka, C. (2014). What Drives the Payout Policy? Evidence from Sri Lanka: A Dynamic Panel Data Analysis. Wayamba Journal of Management 3(2): 1-16.

Haddad, A. E., Al Shattarat, W. K., Al-Hamadeen, R. M. (2008). Partial-Adjustment-Models of Dividend Policy Behaviour for Industrial Jordanian Firms. Corporate Ownership & Control 5(4): 356-372.

Haleem, F., Javid, A. Y. (2011). Modeling Dividend Behavior in Pakistan. Information Management and Business Review 3(6): 289-301.

Harrington, S.E. (1981). Stock Life Insurer Shareholder Dividend Policy and Holding Company Affiliation. The Journal of Risk and Insurance 48(4): 550-576.

Hayunga, D. K., Stephens, C. P. (2009). Dividend behaviour of US equity REITs. Journal of Property

Hines Jr, J. R., Desai, M. H., Foley, C. F. (2007). Dividend Policy Inside the Multinational Firm. Financial Management 36(1): 5-26.

Hines, J. R. Jr. (1996). Dividends and Profits - Some Unsubtle Foreign Influences. Journal of Finance 51(2): 661-689.

Hsiao, C. (1986). Analysis of Panel Data. Cambridge University Press, Cambridge.

Hussain, J. (2011). Corporate dividends decisions: evidence from Saudi Arabia. Journal of Risk Finance 12(1): 41-56.

Hutagalung, S., Yahya, M.H., Kamarudin, F., Osman, Z. (2013). The Dividend Payout Policy – A Study on Malaysian Financial Institutions. Pertanika J. Soc. Sci. & Hum. 21(S): 127-148.

Jarrell, S.B. and Stanley, T.D. (1990) A Meta-Analysis of the Union-Nonunion Wage Gap. *Industrial & Labor Relations Review* 44: 54-67.

Jensen, M. C. (1986). Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers. American Economic Review 76(2): 323-329.

Kamat, M. S., Kamt, M. M. (2012). An Application of Partial Adjustment Equation in Determining Payout Behavior using an Extended Instrumental Variable Approach. Working paper. VVM's Shree Damodar College, Goa University.

Kamat, M.S., Kamat, M.M. (2013). Economic reforms, determinants and stability of dividends in a dynamic setting. Journal of Asia Business Studies 7(1): 5 – 30.

Kanoja, S., Bhatia, B. S. (2013). Dividend Decisions and Payout Policy: An Empirical Analysis of Listed Indian Companies. Working paper. University of Delhi.

Kao, C., Wu, C. (1994). Tests of Dividend Signaling Using the Marsh-Merton Model: A Generalized Friction Approach. Journal of Business 67(1): 45-68.

Karathanassis, G. A., Chrysanthopoulou, E. Ch. (2005). The relationship Between Ownership Structure and Corporate Dividend Policy – Evidence from the Athens Stock Exchange. Working paper. Athens University of Economics and Business.

KAUR BAWA, S., KAUR, P. (2012). EMPIRICAL VALIDITY OF DIVIDEND POLICY MODELS IN THE INDIAN MANUFACTURING MSMEs. International Journal of Multidisciplinary Management Studies 2(1): 18-39.

Kim, J., Jeon, Y. (2015). Dividend Policy and Corporate Social Responsibility: A Comparative Analysis of Multinational Enterprise Subsidiaries and Domestic Firms in Korea. Emerging Markets Finance and Trade 51(2): 306-319.

Kinfe, T. (2011). Determinants of Dividend payout: An Empirical Study on Bank Industry in Ethiopia. Master thesis Addis Ababa University School of Business and Public Administration Department of Accounting and Finance School of Graduate Studies.

Korkeamaki, T., Liljeblom, E., Pasternack, D. (2010). Tax reform and payout policy: Do shareholder clienteles or payout policy adjust?. Journal of Corporate Finance 16(4): 572-587.

Kumar, J. (2003). Ownership Structure and Dividend Payout Policy in India. Working paper. Indira Gandhi Institute of Development Research.

Kumar, R. and Kumar Jha, P. (2012). DETERMINANTS OF CORPORATE DIVIDEND POLICY IN INDIA - A STUDY OF LISTED IT COMPANIES AT BSE. Working paper Faculty of Management Studies, BHU.

Leary, M. T., Michaely, R. (2011). Determinants of Dividend Smoothing: Empirical Evidence. Review of Financial Studies 24(10): 3197-3249.

Lee, C. F., Wu, C., Djarraya, M. (1987). A further empirical investigation of the dividend adjustment process. Journal of Econometrics 35(2-3): 267-285.

Lintner, J. (1956. Distribution of incomes of corporations among dividends, retained earnings, and taxes. American Economic Review 46(2): 97-113.

Longhi, S., Nijkamp, P. and Poot, J. (2005) A Meta-Analysis Assessment of the Effect of Immigartion on Wages. *Journal of Economic Surveys* 19(3): 451-477

Mande, V. (1994). Earnings Response Coefficients and Dividend Policy Parameters. Accounting and Business Research 24(94): 148-156.

McDonald, J.G., Jacquillat, B., Nussenbaum, M. (1975). DIVIDEND, INVESTMENT AND FINANCING DECISIONS: EMPIRICAL EVIDENCE ON FRENCH FIRMS. Journal of Financial and Quantitative Analysis: 741-755.

McDonald, R. and Soderstrom, N. (1986). DIVIDEND AND SHARE CHANGES:IS THERE A FINANCING HIERARCHY? NBER WORKING PAPER SERIEs. Working Paper No. 2029.

Michaely, R., Roberts, M. R. (2012). Corporate Dividend Policies: Lessons from Private Firms. Review of Financial Studies 25(3): 711-746.

Mohsin, H.M., Ashraf, M.S. (2011). Monetary policy restriction and dividend behavior of Pakistani firms: an empirical analysis. MPRA Paper No. 34052.

Mollah, Sabur A. (2009). Testing Partial Adjustment Dividend Behavioral Models in Emerging Markets: Evidence from Pre and Post Market Reforms in Bangladesh. Global Journal of Business Research 3(1): 1-14.

Mookerjee, R. (1992). An empirical investigation of corporate dividend pay-out behaviour in an emerging market Applied Financial Economics 2(4): 243-246.

Morgan, I., Saint-Pierre, J. (1978). Dividend and Investment Decisions of Canadian Firms. Canadian Journal of Economics 11(1): 20-37.

Naceur, S., Goaied , M., Belanes, A. (2006). On the Determinants and Dynamics of Dividend Policy. International Review of Finance 6(1-2): 1-23.

Naceur, S., Goaied , M., Belanes, A. (2016). A Re-examination of Dividend Policy: A Dynamic Panel Data Analysis. Working paper. ESSEC Tunis, IHEC Carthage.

Nakamura, A. (1985). Rational Expectations and the Firms Dividend Behavior. Review of Economics and Statistics 67(4): 606-615.

Nakamura, M. (1989). Asymmetry in the Dividend Behavior of US and Japanese Firms. MANAGERIAL AND DECISION ECONOMICS 10(4): 261-274.

Nelson, J.P. and Kennedy, P.E. (2009) The Use (and Abuse) of Meta-Analysis in Environmental and Natural Resource Economics: An Assessment. *Environmental and Resource Economics* 42(3): 345-377.

Oczkowski, E. and Doucouliagos, H. (2014) Wine Prices and Quality Ratings: a Meta-Regression Analysis. *American Journal of Agricultural Economics* 97(1): 103-121.

Omet, G. (2004). Dividend Policy Behaviour in the Jordanian Capital Market. INTERNATIONAL JOURNAL OF BUSINESS, 9(3): 287-300.

Pal, K, Goyal, P. (2007). Leading Determinants of Dividend Policy: A Case Study of the Indian Banking Industry. Decision 34 (2): 88-112.

Pan, M.-S. (2004). Aggregate Dividend Behavior and Permanent Earnings Hypothesis. Financial Review 36(): 23-38.

Pandey, I. M., Bhat, R. (2007). Dividend behavior of Indian companies under monetary policy. Managerial Finance 33(1): 14-25.

Pandey, I.M. (2003). CORPORATE DIVIDEND POLICY AND BEHAVIOUR: THE MALAYSIAN EVIDENCE. Asian Academy of Management Journal 8(1): 17–32.

Perez-Gonzalez, F. (2003). Large Shareholders and Dividends: Evidence from U.S. Tax Reforms. Working paper. Columbia University.

Persson, R. (2013): Dividend policy behavior: An analysis of firms listed at Stockholm Stock Exchange. Bachelor thesis Uppsala University, Department of Economics, EKONOMIKUM - Centre for Economic Sciences.

Pindado, J., Requejo, I., Torre, C. de la (2012). Do Family Firms Use Dividend Policy as a Governance Mechanism? Evidence from the Euro zone. Corporate Governance: An International Review 20(5): 413-431.

Powell, J.G., Shi, J., Smith, T. (2004). DIVIDEND PERSISTENCE AND RETURN PREDICTABILITY. Working Paper School of Finance and Applied Statistics, Faculty of Economics and Commerce, The Australian National University, Canberra.

Rahman, N. (2002). Ownership structure and dividend smoothing: cross-country evidence. Working Paper University of Chicago, Graduate School of Business

Raza, S. H., Zahaar, M., Hafeez, M. (2009). The Ownership Structure and Dividend Payout Policy in Pakistan: Evidence from. KSE-100 index non Financial Firms. Pakistan Journal of Education 26(1): 173-188.

Renneboog, L., Szilagyi, P. G. (2007). How Relevant is Dividend Policy under Low Shareholder Protection?. Working paper. Tilburg University.

Renneboog, L., Szilagyi, P. G. (2015). How Relevant is Dividend Policy under Low Shareholder Protection. Journal of International Financial Markets, Institutions and Money. Advance online publication. DOI: 10.1016/j.intfin.2015.01.006.

Renneboog, L., Trojanowski, G. (2007). Control structures and payout policy. Managerial Finance 27(3): 180-194.

Sembenelli, A. (1993). Signalling, Financial Hierarchy and Agency Theory as Explanations for Dividend Behavior: Evidence from Italian Firm Data. MANAGERIAL AND DECISION ECONOMICS 14(1): 37-45.

Shinozaki, S., Uchida, K. (2015). Ownership structure and dividend smoothing: International evidence. Working Paper Faculty of Economics, Kyushu University.

Short, H., Zhang, H., Keasey, K. (2002). The link between dividend policy and institutional ownership. Journal of Corporate Finance 8(2): 105-122.

Simegen, M. (2013). DETERMINANTS OF DIVIDEND POLICY OF BANKS IN ETHIOPIA. Master thesis ADDIS ABABA UNIVERSITY COLLEGE OF BUSINESS AND ECONOMICS DEPARTMENT OF ACCOUNTING AND FINANCE SCHOOL OF GRADUATE STUDIES.

Skinner, D. (2002). The evolving relation between earnings, dividends, and stock repurchases. Journal of Financial Economics 87(3): 582-609.

Stanley, T.D. (2001) Wheat from Chaff: Meta-Analysis as Quantitative Literature Review. *The Journal of Economic Perspectives* 15(3): 131-150.

Stanley, T.D. (2005) Beyond Publication Bias. *Journal of Economic Surveys* 19(3): 309-345.

Stanley, T.D. (2008) Meta-Regression Methods for Detecting and Estimating Empirical Effects in the Presence of Publication Selection. *Oxford Bulletin of Economics and Statistics* 70(1):103-127.

Stanley, T.D. and Doucouliagos, H. (2010) Picture This: A Simple Graph That Reveals Much Ado About Research. *Journal of Economic Surveys* 24(1): 170-191.

Stanley, T.D. and Doucouliagos, H. (2012) *Meta-regression Analysis in Economics and Business*. Oxford, UK: Routledge.

Stanley, T.D. and Doucouliagos, H. (2013) Better than Random: Weighted Least Squares Meta Regression Analysis University of Australia, School of Accounting, Economics and Finance, Economics Series Working Paper SWP 2013/2.

Stanley, T.D. and Jarrell, B. (1989) Meta-Regression Analysis: A Quantitative Method of Literature

Stanley, T.D., Doucouliagos, H., Giles, M., Heckemeyer, J.H., Johnston, R.J., Laroche, P., Nelson, J.P., Paldam, M., Poot, J., Pugh, G., Rosenberger, R.S. and Rost, K. (2013) Meta-Analysis of Economics Research Reporting Guidelines. *Journal of Economic Surveys* 27(2): 390-394.

Sudhahar, M. and Saroja, T. (2010). Determinants of Dividend Policy in Indian Banks: An Empirical Analysis. Journal of Bank Management, 9 (3): 63-75.

Sura, J.S., Pal, K., and Bodla, B.S. (2006). FACTORS INFLUENCING DIVIDEND POLICY DECISIONS IN BANKING SECTOR: AN INDIAN EVIDENCE. Amity Business Review 7(2): 64-75.

Theobald, M. (1978). Intertemporal Dividend Models - An Empirical Analysis Using Recent UK Data. Journal of Business Finance & Accounting 5(1): 123-135.

Tran, Q. T., Nguyen, T. T. H. (2014). Dividend Policy Behavior in Emerging Stock Markets: Evidence from Vietnamese Stock Market. International Journal of Financial Research 5(4): 85-89.

Trojanowski, G. (2004). Ownership structure and payout policy in the UK. Working paper. University of Exeter Business School.

Trotman, K.T. and Wood, R. (1991) A Meta-Analysis of Studies on Internal Control Judgements. *Journal of Accounting Research* 29(1): 180-192.

Turnovsky, S.J. (1967). The Allocation of Corporate Profits between Dividends and Retained Earnings. The Review of Economics and Statistics 49(4): 583-589.

Valickova, P., Havranek, T. and Horvath, R. (2015) Financial Development and Economic Growth: A Meta-Analysis. *Journal of Economic Surveys* 29(3): 506-526.

Vasiliou, D., Eriotis, N. (2002). The Determinants of Dividend policy: some Greek data. European Journal of Management and Public Policy 1(2): 46-56.

Wang, K. and Shailer, G. (2015) Ownership concentration and firm performance in emerging markets: a meta analysis. Journal of Economic Surveys 29(2), 199-229

Wang, X., Manry, D., Wandler, S. (2011). Economic Fluctuation and Dividend Policy in China. Journal of International Management Studies 6(2): 1-11.

Wang, X., Manry, D., Wandler, S. (2011). The impact of government ownership on dividend policy in China. Advances in Accounting, incorporating Advances in International Accounting 27(2): 366-372.

Watts, R. (1973). The Information Content of Dividends. Journal of Business 46(2): 191-211.

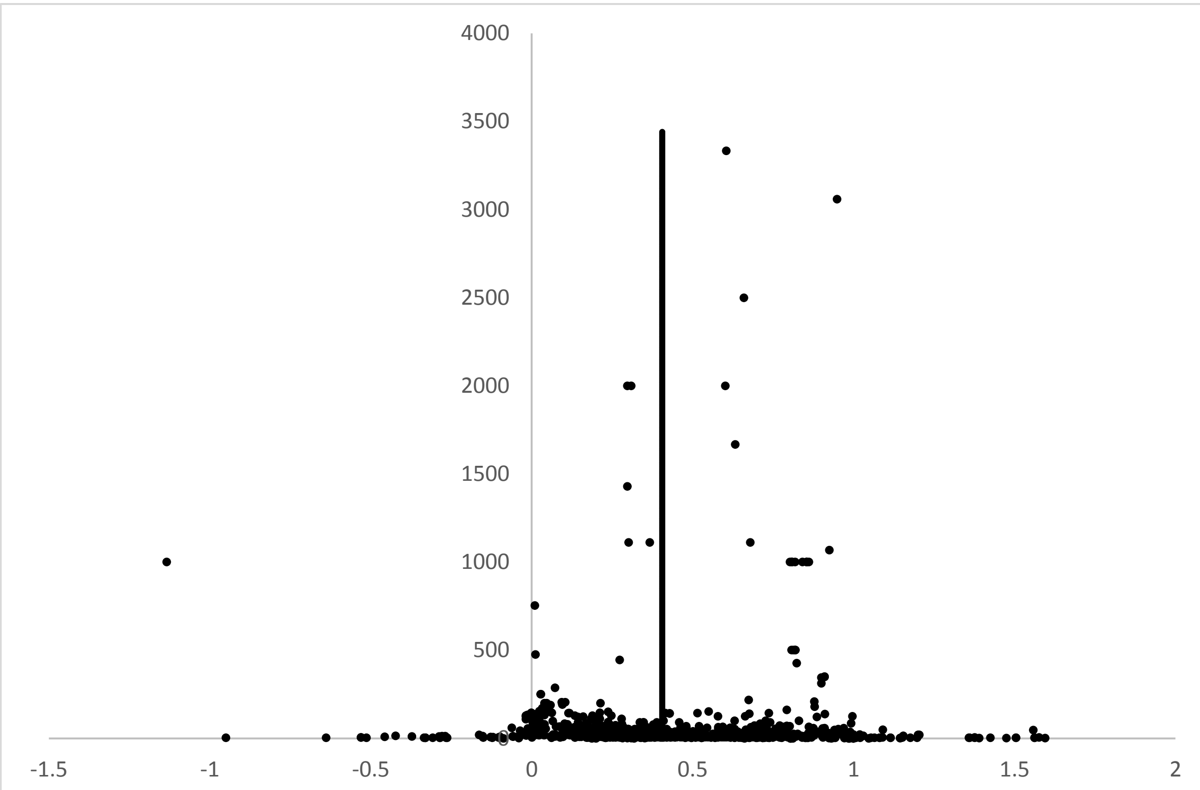
Younis, D. and Javid, A.Y. (2014). Market Imperfections and Dividend Policy Decisions of Manufacturing Sector of Pakistan. PIDE Working Papers 2014:99.

Zameer,H., Rasool, S., Iqbal, S., Arshad, U. (2013). Determinants of Dividend Policy: A Case of Banking Sector in Pakistan. Middle-East Journal of Scientific Research 18(3): 410-424.

Zigraiova, D. and Havranek, T. (2015) Bank Competition and Financial Stability: Much Ado about Nothing. Journal of Economic Surveys. DOI: .10.111/joes.12131.

Appendix

Figure 1: **Funnel plot for the speed of dividend adjustment coefficients**



Note: The speed of adjustment is measured on the x-axis while the y-axis represents precision calculated as the inverse standard error. The vertical line at 0.405 indicates the "true" speed of adjustment calculated as the mean of the 10% most precise adjustment coefficients.

Table 1: **Overview of studies estimating speed of adjustment Lintner-type coefficients**

Authors	**Countries**	**Time span**	**No. of firms**	**No. of estimators**	**Method**
Darling (1957)	US	1921-1954	34	2	OLS
Brittain (1964)	US	1920-1960	41	4	OLS
Turnovsky (1967)	US	1948-1962	15	3	OLS
Fama & Babiak (1968)	US	1946-1964	19	8	OLS
Feldstein (1970)	UK	1953-1964	12	18	OLS & other method
Fama (1974)	US	1946-1968	23	3	OLS
Mcdonald & Nussenbaum (1975)	France	1967-1968	2	7	OLS
Theobald (1978)	US	1964-1975	12	6	Other method
Morgan & Saint-Pierre (1978)	Canada	1954-1972	19	6	OLS
Harrington (1981)	US	1950-1976	27	2	OLS
Nakamura (1985)	Japan	1964-1981	18	48	OLS
	US				
Mcdonald & Soderstrom (1986)	US	1965-1984	20	1	Fixed effects
Lee et al. (1987)	US	1962-1978	17	10	OLS & other method
Dharan (1988)	US	1981-1983	3	6	OLS
Nakamura (1989)	US	1960-1982	23	24	OLS
Mookerjee (1992)	India	1950-1981	32	8	Other method
Sembenelli (1993)	Italy	1962-1988	27	6	OLS & GMM
Kao & Wu (1994)	US	1965-1986	22	4	OLS & other method
Mande (1994)	US	1977-1986	10	1	OLS
Hines (1996)	US	1984-1989	6	5	OLS
Dorsman et al. (1999)	Netherlands	1986-1996	11	2	OLS
De Angelo & De Angelo (2000)	US	1958-1979	22	4	Other method
Garrett & Priestley (2000)	US	1876-1997	122	3	Other method

Esteban & Pérez (2001)	22 European countries	1991-1998	8	1	GMM
Desai et al. (2001)	US	1982-1997	16	24	OLS, Fixed effects, & other method
Short et al. (2002)	UK	1988-1992	5	3	OLS
Vasiliou & Eriotis (2002)	Greece	1996-2001	6	4	OLS & Fixed effects
Fama & French (2002)	US	1965-1999	35	3	Other method
Rahman (2002)	28 countries	1992-1999	8	59	OLS
Adelegan (2003)	Nigeria	1984-1997	14	6	OLS
Gugler & Yurtoglu (2003)	Germany	1992-1998	7	6	Fixed effects
Kumar (2003)	India	1994-2000	7	28	OLS & Fixed effects
Pandey (2003)	Malaysia	1993-2000	8	7	Fixed effects
Perez-Gonzalez (2003)	US	1980-1999	20	2	Fixed effects
Pan (2004)	US	1871-1993	123	4	GMM
Trojanowski (2004)	UK	1992-1998	7	16	GMM
Goergen et al. (2004)	Germany	1984-1993	10	24	OLS, Fixed effects, GMM, & other method
Powell et al. (2004)	US	1927-1996	70	2	OLS
Omet (2004)	Jordania	1985-1999	15	3	OLS, Fixed effects, & other method
Karathanassis & Chrysanthopoulou (2005)	Greece	1996-1998	3	32	Fixed effects & other method
Naceur et al. (2006)	Tunisia	1996-2002	7	24	OLS, Fixed effects, GMM, & other method
Al-Yahyaee et al. (2006)	Oman	1989-2004	16	2	Other method
Foerster & Sapp (2006)	Canada	1871-2003	133	4	OLS
Aivazian et al. (2006)	US	1981-1999	19	1	Fixed effects
Sura et al. (2006)	India	2003-2004	2	43	OLS
Pandey & Bhat (2007)	India	1989-1997	9	8	GMM
Renneboog & Trojanowski (2007)	UK	1992-1998	7	6	GMM
Dai (2007)	Norway	1989-1998	10	5	Other method
Hines et al. (2007)	US	1982-2002	21	29	OLS, Fixed effects, & other method
Bodla et al. (2007)	India	1996-2006	11	32	OLS
Renneboog & Szilagyi (2007)	Netherlands	1996-2004	9	8	GMM

Anastassiou (2007)	Greece	1958-.	.	1	OLS
Benhamouda (2007)	UK	2000-2004	5	20	OLS & Fixed effects
Ameer (2007)	Malaysia	1995-2005	11	3	OLS
Pal & Goyal (2007)	India	1997-1998	2	9	OLS
Ahmed & Javid (2008)	Pakistan	2001-2006	6	17	OLS, Fixed effects, GMM, & other method
Baba & Ueno (2008)	Japan	1990-2003	14	1	GMM
Haddad et al. (2008)	Jordania	1996-2002	7	6	OLS & GMM
Ameer (2008)	Malaysia	1995-2005	11	7	OLS
Ahmed & Javid (2009)	Pakistan	2001-2006	6	13	OLS, Fixed effects, GMM, & other method
Al-Najjar (2009)	Jordania	1994-2003	10	3	OLS, Fixed effects, & other method
Banks et al. (2009)	UK	1949-2002	54	10	OLS
Andres et al. (2009)	Germany	1984-2005	22	20	OLS, Fixed effects, & GMM
Hayunga & Stephens (2009)	UK	1992-2003	12	11	OLS & other method
Mollah (2009)	Bnagladesh	1988-2003	16	16	OLS
Alzahrani & Lasfer (2009)	24 OECD countries	2000-2007	8	12	Fixed effects & GMM
Raza et al. (2009)	Pakistan	2001-2006	6	1	OLS
Korkeamaki et al. (2010)	Finland	2003-2006	4	10	OLS, Fixed effects, & other method
Ahmed & Javid (2010)	Pakistan	2001-2006	6	1	Other method
Al-Ajmi (2010)	Qatar	1997-2006	10	14	OLS
Korkeamaki et al. (2010)	Finland	2003-2006	4	8	OLS & Fixed effects
Al-Yahyaee (2010)	Oman	1989-2004	16	1	Other method
Chemmanur et al. (2010)	Hong Kong	1984-2002	19	8	OLS
Chemmanur et al. (2010)	US	1984-2002	19	6	OLS
Sudhahar & Saroja (2010)	India	1997-2007	11	3	OLS
Wang et al. (2011)	China	1998-2008	11	2	OLS
Desai & Jin (2011)	US	1980-1997	18	4	OLS & Fixed effects
Haleem & Javid (2011)	Pakistan	2007-2009	3	32	OLS
Hussain (2011)	Saudia Arabia	1990-2006	17	9	Fixed effects & other method

Wang et al. (2011)	China	1998-2008	11	14	OLS & other method
Goncharov & Triest (2011)	Russia	2003-2006	4	7	OLS
Baiyao (2011)	US	1991-2007	17	2	OLS
Mohsin & Ashraf (2011)	Pakistan	2001-2009	9	3	Fixed effects & GMM & other method
Wang et al. (2011)	China	1998-2008	11	2	OLS
Al Yayaee et al. (2011)	Oman	1989-2004	16	1	Other method
Kinfe (2011)	Ethiopia	2006-2010	5	1	OLS
Al-Najjar & Belghitar (2012)	UK	1991-2007	17	8	Fixed effects & GMM & other method
Devaki & Kamalaveni (2012)	India	2001-2006	6	4	Fixed effects & other method
Abdullah et al. (2012)	Malaysia	2009-2010	2	1	OLS
Pindado et al. (2012)	9 EU countries	1996-2006	11	12	GMM
Michaely & Roberts (2012)	US	1993-2002	10	3	OLS
Kamat & Kamt (2012)	India	1971-2007	37	9	GMM
Kaur Bawa & Kaur (2012)	India	2006-2006	1	24	OLS & Fixed effects
Kumar & Kumar Jha (2012)	India	2007-2011	5	3	OLS
Hutagalung et al. (2013)	Malaysia	2001-2010	10	1	Fixed effects
Kanoja & Bhatia (2013)	India	2007-2012	6	5	OLS
Subhash et al. (2013)	India	1975-1992	18	3	GMM
Zameer et al. (2013)	Pakistan	2003-2009	7	1	OLS
Persso (2013)	Sweden	2005-2011	7	6	Fixed effects
Baker et al. (2013)	Canada	1988-1999	12	2	OLS
Bremberger et al. (2013)	14 EU countries	1986-2010	25	9	OLS, Fixed effects, & GMM
Simegn (2013)	Ethiopia	2002-2011	10	2	Fixed effects
Al-Malkawi et al. (2014)	Oman	2001-2010	10	2	Other method
Gunathilaka (2014)	Sri Lanka	2006-2010	5	7	GMM
Tran & Nguyen (2014)	Vietnam	2006-2011	6	2	Fixed effects
Boţoc & Pirtea (2014)	16 emerging countries	2003-2011	9	16	OLS & GMM

Bremberger et al. (2014)	13 EU countries	1986-2010	25	13	OLS, Fixed effects, & GMM
Arko et al. (2014)	Sub-Saharan African countries	1997-2007	11	9	OLS
Andres et al. (2014)	Germany	1984-2005	22	19	OLS & GMM
Younis & Javid (2014)	Pakistan	2003-2011	9	6	Fixed effects & other method
Geiler & Renneboog (2015)	UK	1997-2007	11	5	OLS & other method
Renneboog & Szilagyi (2015)	Netherlands	1996-2004	9	8	GMM
Andres et al. (2015)	Germany	1988-2008	21	3	OLS, Fixed effects, & GMM
Al-Attar et al. (2015)	Jordania	2006-2011	6	7	OLS
Kighir et al. (2015)	Malaysia	1999-2012	14	25	OLS, Fixed effects, & GMM
Kim & Jeon (2015)	Korea	2000-2010	11	8	OLS, Fixed effects, & other method
Shinozaki & Uchida (2015)	44 countries	2003-2013	11	1	Fixed effects
Benavides et al. (2016)	Argentina	1995-2013	19	45	OLS
	Brazil				
	Chile				
	Columbia				
	Mexico				
	Peru				
Ben Naceur et al. (2016)	Tunisia	1996-2002	7	14	OLS, Fixed effects, GMM, & other method
Athari et al. (2016)	7 Arabian countries	2003-2012	10	4	GMM
Chan et al. (2016)	US	1927-2013	87	2	OLS
Bremberger et al. (2016)	14 EU countries	1986-2010	25	11	OLS, Fixed effects, & GMM
Chen & Sinha (2016)	US	1996-2001	6	4	OLS

Table 2: Summary statistics of meta data

Variable label	Definition	Mean	Standard deviation
Dependent Variable			
SOA	Speed of dividend adjustment to target dividend payout ratio	0.461	0.330
Precision			
Standard error (se)	Standard error of the SOA coefficient	0.145	0.964
Study design characteristics			
Before 1998	The mean year of estimation period <1998 = 1, 0 otherwise	0.514	0.500
No. of years	Length of the analyzed time series dimension	13.609	13.308
Debt	Estimation controls for firm debt = 1, 0 otherwise	0.113	0.317
Ownership	Estimation controls for ownership = 1, 0 otherwise	0.176	0.381
Size	Estimation controls for firm size =1, 0 otherwise	0.143	0.350
Other	Estimation controls for other firm factors =1, 0 otherwise	0.421	0.494
Lintner classical	Estimation does not include additional variables =1, 0 otherwise	0.396	0.489
Earnings	The estimation uses an earnings measure =1, 0 if cash flow	0.878	0.328
OLS	The estimation is based on OLS =1, 0 otherwise	0.542	0.498
GMM	The estimation is based on GMM=1, 0 otherwise	0.170	0.375
Fixed effects	The estimation is based on fixed effects = 1, 0 otherwise	0.151	0.358
Other estimators	The estimation is based on other methods = 1, 0 otherwise	0.137	0.344
Service and Consumer Goods	Study analyzes service/consumer goods firms =1, 0 otherwise	0.014	0.118
Banks	Study analyzes banks =1, 0 otherwise	0.127	0.333
Industry firms	Study analyzes industry sector firms =1, 0 otherwise	0.054	0.225
Banks excluded	Study excludes banks =1, 0 otherwise	0.373	0.484
EU	Study focuses on the EU =1, 0 otherwise	0.188	0.391
Developing	Study focuses on developing countries =1, 0 otherwise	0.326	0.469
US	Study focuses on the US =1, 0 otherwise	0.140	0.347
UK	Study focuses on the UK =1, 0 otherwise	0.085	0.279

Table 3: WLS FAT-PET meta-regression analysis results

Variable	**Robust se** (1)	**Robust se** (2)	**Study cluster robust se** (3)	**Study cluster robust se** (4)	**Bootstrap se clustered by study** (5)	**Bootstrap se clustered by study** (6)
Constant	**0.605*** (0.070)**	**0.597*** (0.068)**	**0.605*** (0.092)**	**0.597*** (0.088)**	**0.605*** [0.000]**	**0.597*** [0.000]**
SE	**-6.821*** (2.612)**		**-6.821* (3.618)**		**-6.821* [0.062]**	
SE^2		-0.147 (0.134)		-0.147 (0.172)		-0.147 [0.672]
R^2	0.007	0.000	0.007	0.000	0.007	0.000
Adj. R^2	0.007	0.000	0.006	0.000	0.008	0.001

Notes: Dependent variable is the speed of adjustment coefficient; Standard errors in parentheses; p values in brackets; ***,**,* significance at the 1, 5, 10% level; Squared standard errors of adjustment coefficients are used as weights

Table 4: WLS estimation results models (7) and (8)

Variable	Robust se (7)	Robust se (8)	Cluster robust se by study (9)	Cluster robust se by study (10)	Bootstrap se clustered by study (11)	Bootstrap se clustered by study (12)	Weighted Random effects clustered by study (13)	Weighted Random effects clustered by study (14)
Constant	0.950***	0.948***	0.950***	0.948***	0.950***	0.948***	0.982***	0.980***
	(0.095)	(0.094)	(0.154)	(0.152)	[0.000]	[0.000]	(0.054)	(0.054)
se	1.193	-	1.193	-	1.193	-	0.694	
	(1.066)		(1.718)		[0.546]		(1.852)	
se^2	-	0.123	-	0.123	-	0.123	-	0.053
		(0.107)		(0.140)		[0.714]		(1.148)
Post 1998	-0.096	-0.091	-0.096	-0.091	-0.096	-0.091	-0.126	-0.123**
	(0.208)	(0.208)	(0.227)	(0.226)	[0.974]	[0.940]	(0.054)	(0.054)
No. of years	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.003	-0.003
	(0.005)	(0.005)	(0.009)	(0.009)	[0.886]	[0.842]	(0.003)	(0.003)
Debt	-0.722***	-0.745***	-0.722***	-0.745***	-0.722**	-0.745**	-0.757***	-0.765***
	(0.177)	(0.167)	(0.252)	(0.241)	[0.046]	[0.034]	(0.085)	(0.082)
Ownership	0.023	0.021	0.023	0.021	0.023	0.021	0.043	0.042
	(0.047)	(0.047)	(0.057)	(0.057)	[0.788]	[0.746]	(0.044)	(0.044)
Size	0.944***	0.956***	0.944***	0.956***	0.944***	0.956***	0.965***	0.970***
	(0.151)	(0.148)	(0.205)	(0.201)	[0.002]	[0.002]	(0.077)	(0.076)
Other	-0.262***	-0.251***	-0.262**	-0.251**	-0.262*	-0.251*	-0.244***	-0.241***
	(0.075)	(0.071)	(0.119)	(0.115)	[0.096]	[0.094]	(0.059)	(0.059)
Cash Flow	0.044	0.045	0.044***	0.045***	0.044***	0.045***	0.047***	0.047***
	(0.106)	(0.106)	(0.002)	(0.002)	[0.000]	[0.000]	(0.012)	(0.012)
GMM	0.534***	0.523***	0.534***	0.523***	0.534*	0.523*	0.583***	0.580***
	(0.181)	(0.178)	(0.190)	(0.186)	[0.052]	[0.056]	(0.059)	(0.058)
Fixed effects	-0.022	-0.017	-0.022	-0.017	-0.022	-0.017	-0.007	-0.004
	(0.087)	(0.088)	(0.100)	(0.100)	[0.862]	[0.886]	(0.057)	(0.057)
Other estimators	0.138	0.144	0.138	0.144	0.138	0.144	0.103	0.105
	(0.110)	(0.112)	(0.088)	(0.089)	[0.216]	[0.176]	(0.071)	(0.071)
Service & consumer goods	0.932***	0.965***	0.932***	0.965***	0.932***	0.965***	0.885	0.899*
	(0.234)	(0.227)	(0.243)	(0.233)	[0.008]	[0.008]	(0.542)	(0.541)
Banks	0.004	0.009	0.004	0.009	0.004	0.009	0.091	0.094
	(0.161)	(0.162)	(0.160)	(0.162)	[0.992]	[0.999]	(0.122)	(0.122)
Industry firms	0.274**	0.309**	0.274*	0.309*	0.274	0.309	0.341	0.357
	(0.139)	(0.152)	(0.159)	(0.170)	[0.176]	[0.138]	(0.359)	(0.357)
EU	-0.548***	-0.538***	-0.548***	-0.538***	-0.548***	-0.538***	-0.601***	-0.598***
	(0.107)	(0.106)	(0.110)	(0.107)	[0.002]	[0.002]	(0.063)	(0.063)
Developing	-0.858***	-0.852**	-0.858***	-0.852***	-0.858***	-0.852***	-0.883***	-0.882***
	(0.068)	(0.069)	(0.074)	(0.073)	[0.002]	[0.002]	(0.043)	(0.043)
UK	-0.830***	-0.825***	-0.830***	-0.825***	-0.830***	-0.825***	-0.926***	-0.925***
	(0.140)	(0.140)	(0.118)	(0.120)	[0.002]	[0.002]	(0.111)	(0.111)
Other countries	-0.742***	-0.734***	-0.742***	-0.734***	-0.742***	-0.734**	-0.746***	-0.744***
	(0.072)	(0.071)	(0.128)	(0.127)	[0.010]	[0.014]	(0.049)	(0.049)
F	75.78	64.57	1357.58	1197.30				
p(F)	0.000	0.000	0.000	0.000				
LR χ							3163.37	16908.39
p(χ)							0.000	0.000
R^2	0.796	0.796	0.796	0.796	0.796	0.796		
Adj. R^2	0.793	0.793	0.793	0.793	0.796	0.796		