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What drives the dividend decisions in BRICS countries?

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Abstract

Research background: We examine the dividend payout policies across companies listed on the main stock exchanges in Brazil, Russia, India, China, and South Africa (BRICS). Unlike the highly developed capital markets, the literature regarding dividend policy on BRICS' stock exchanges is scarce.

Purpose of the article: The purpose of this paper is threefold: verification of the existence of dividend smoothing pattern; selection of the significant drivers that affect both dividend levels and dividend smoothing; examination of differences between dividend policy of cross- and single-listed companies.

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Methods: Based on a dataset of 564 companies that paid dividends for at least 11 consecutive years in the period of 1995–2015, we apply a GMM two-step estimator to assess the speed of dividend adjustment (SOA) coefficient. Further we employ the linear panel regression to indicate the individual and market determinants of the dividend levels and SOAs. In the latter case, we base on time series of the SOAs obtained from the rolling estimation technique. Finally, we conduct separate estimations for cross-listed companies.

Findings & value added: We confirm a moderate level of dividend smoothing within BRICS countries. Among the firm-level characteristics affecting the SOA the most important are: ownership dispersion, age and size of a firm, retained earnings, leverage, long term debt, asset tangibility, liquidity risk ratio, and issuing the depositary receipts (DR). Two relevant market factors are found: market capitalisation and turnover in relation to GDP. Similar characteristics have a significant impact on dividends' levels in the entire sample, whereas in the subsample of cross-listed companies fewer variables are significant. Our paper is the first comprehensive attempt to investigate the dividend policy and determinants of dividend smoothing among BRICS countries.

Introduction

Dividend policy is one of the most intriguing topics that has attracted attention in the financial research for decades. Along with empirical studies, competing theoretical frameworks have been proposed, which largely depart from the fundamental dividend irrelevance hypothesis proposed by Miller and Modigliani (1961). Moreover, the significance of dividend decisions also from the managerial perspective was highlighted by Lintner (1956). Although some authors perceive Lintner's original work to be rather simple in terms of statistical methods and used dataset (Booth & Zhou, 2017), this framework has been widely employed in empirics of dividends.

In this paper we apply the original Lintner's approach and examine the dividend payout policies across a broad sample of 564 companies listed on the main stock exchanges with the place of residence in the BRICS countries. On the contrary to the highly developed capital markets, the literature regarding dividend policy on BRICS' stock exchanges is not sufficient. Thus, we examine companies listed on Johannesburg Stock Exchange in South Africa (JSE); B3 stock exchange in Brazil; the Shanghai Stock Exchange in China (SSE); the National Stock Exchange in India (NSE); and the Moscow Exchange (MOEX) in the Russian Federation. This group of countries exhibits several characteristics which make them unique underlying dataset to examine dividend behavior.

In recent decades BRICS countries have experienced strong growth rates in comparison to more mature markets. This obviously shapes the higher share of the BRICS in the global economy and increases expectations of the stronger political voice of these countries (European Parliament 2012; Radulescu *et al.*, 2014). Moreover, BRICS countries also pursued the development of their stock markets and to some extent joined the process

of international financial integration, which also brought some negative outcomes considering the influence of the recent financial crisis on the market capitalisation. Along with the process of international financial integration companies from BRICS countries relatively often use the opportunities of cross-listing on foreign stock markets. Indeed, depositary receipts (DR) programs organized for BRICS companies comprise to 20 percent share in all active and inactive DR schemes (Citi Global DR Directory)¹. Cross-listed companies are particularly interesting in terms of dividend policy drivers, as they must meet the expectations of home and foreign investors regarding both company's performance and dividend decisions. Finally, although dividend policy along with dividend smoothing drivers have been studied in numerous empirical studies, the results on the emerging stock markets exhibit a great deal of heterogeneity. Basing on the Fernau and Hirsch (2019) comprehensive summary of studies one can easily notice that the majority of studies quoted in the discussed paper was focused on one country. In several papers, a group of countries was analysed, i.e. 28 countries in Rahman (2002), 14 EU countries in Bremberger *et al.*, (2013), Sub-Saharan African countries in Arko *et al.* (2014), 16 emerging countries in Boțoc and Pirtea (2014), 44 countries in Shinozaki and Uchida (2014), 6 countries (including Brazil from BRICS countries) in Benavides *et al.* (2016) and more recently stock exchanges from 7 Asian countries in Nowak *et al.* (2021). More importantly, to the authors' knowledge, dividend smoothing behavior has not been analysed for the BRICS countries in one study.

In this paper, we have three research tasks. The first task is to investigate whether companies from BRICS countries pursue dividend smoothing policy. Thus, based on a unique panel dataset, we estimate the speed of dividend adjustment coefficient (SOA) using a GMM two-step estimator. As a result, we obtain a joint SOA coefficient for BRICS countries. The second task of the paper is to examine dividend smoothing determinants with two classes of factors: company and stock market ratios. We argue that dividend decisions are driven by the extent of the market development. Including market factors also solves the problem of underlying stock exchanges heterogeneity. Within the second task, we want to examine which drivers affect both dividend' and speed of adjustment levels. Thus, we begin with calculating individual SOA coefficients and use them to discover the determinants that influence the speed of dividend adjustment. Then we continue with the extension of Lintner's equation and explore whether the same explanatory factors affect the dividend levels. Finally, the third

¹ Own calculation based on <https://depositaryreceipts.citi.com>.

research task is to investigate whether cross-listed companies from BRICS countries conduct different dividend policy in comparison to single-listed firms. Therefore, we divide our research sample and conduct separate calculations for sub-sample of companies that issued depositary receipts.

This study contributes to the literature in two ways. Our paper is the first comprehensive attempt to investigate the dividend policy and determinants of dividend smoothing among BRICS countries. Second, we fill the gap in the existing literature by focusing on cross-listed companies domiciled in BRICS. To the best of authors' knowledge, depositary receipts issuers from BRICS countries have not been examined in terms of dividend smoothing. Finally, our research contributes to the deeper understanding of the dividend policy on emerging stock markets since we put emphasis not only on dividend smoothing determinants, but also dividend levels drivers.

The rest of the paper is organized as follows. Following this introduction, in section 2 the concise literature review regarding determinants of dividend policy along with dividend smoothing on the emerging markets is presented. Brief characteristics of the BRICS stock markets is given in section three, while empirical approach and discussion of obtained results are presented in section four and five.

Literature review

Determinants of dividend policy and smoothing

From an emerging market perspective there is lack of consensus on the pattern of both dividend payout and dividend smoothing, as well as its determinants. However, in general it is agreed that companies from emerging economies tend to adjust dividends faster than companies from developed markets (Al-Najjar, 2009; Shinozaki & Uchida, 2014).

The suitability of Lintner's model itself in emerging markets is still under debate and appears to vary between countries. For example, Benzinho (2004) and Tran and Nguyen (2014) concluded that Lintner's stable dividend policy has been followed by Portugal and Vietnamese companies, respectively. Similar results were obtained by Al-Ajmi and Abo Hussain (2011) for Saudi Arabia and by Al-Yahyaee *et al.* (2010) for Oman. However, several studies indicated that Lintner's model does not fit developing markets (Wolmarans, 2003; Al-Yahyaee *et al.*, 2011).

The determinants of dividend policy and dividend smoothing in emerging markets are usually similar to each other, as well as similar to determinants of policy and smoothing in developed markets. However, the direc-

tion of the relationship differs in some cases, and this may be explained by cultural differences (Javakhadze *et al.*, 2014), law standards and tax regimes (Chemmanur *et al.*, 2010; Boulton *et al.*, 2012), or ownership structure (Aivazian *et al.*, 2003).

It is widely acknowledged and expected by the agency theory that larger and older companies tend to pay more dividends on average (Labhane, 2017; Forti *et al.*, 2015; Brawn & Šević, 2018; Al-Najjar, 2009) and are more likely to pay dividends (Al-Najjar & Kilincarslan, 2017). The age of the company can be also perceived as a proxy of its market strength and organisational development. Companies that have survived market competition over a longer period of time are able to consolidate products and processes (Forti *et al.*, 2015) which makes them also more cash-abundant. Moreover, the studies of Leary and Michaely (2011), Jeong (2013) and Javakhadze *et al.* (2014) confirmed the positive relationship between age and dividend smoothing. Thus, not only do older companies pay higher dividends, they also smooth them to a larger extent.

Another important factor is company's profitability, which is often captured by the return on asset (ROA) or return on equity (ROE) ratios. The positive relationship between dividend level and profitability has become a stylised fact, as only profitable companies can afford to pay dividends over longer periods. However, the link between profitability and smoothing is less obvious. As profitable companies become fuelled with cash, they also engage more in dividend smoothing, as predicted by the agency costs theory. Paying out dividends reduces the risk of overinvestment. Nonetheless, the information asymmetry theory predicts that companies exhibiting lower profit ratios will engage in dividend smoothing. This prediction was supported by Shinozaki and Uchida (2014) results, which confirmed the negative relationship between dividend smoothing and profitability.

It is also clear that companies with larger growth opportunities are less likely to pay dividends, as they need cash for investment. In an empirical setting these growth opportunities are generally proxied either by the assets (Boțoc & Pirtea, 2014) or sales growth rates (Shahnaz Mahdzan *et al.*, 2016) as well as market-to-book ratios (Leary & Michaely, 2011; Javakhadze *et al.*, 2014). Forti *et al.* (2015) suggested that companies with higher market-to-book ratios (higher growth opportunities) pay higher dividends on average. However, Javakhadze *et al.* (2014) and Leary and Michaely (2011) argued that lower market-to-book ratios (lower growth opportunities) coexist with stronger dividend smoothing patterns. Finally, Fama and French (2001) referred to the concept of the company's life cycle and analysed the maturity of companies proxied by profitability, growth opportunities, and size. As mature companies become larger and more prof-

itable, their growth opportunities shrink which makes them more prone to pay dividends.

Several studies suggest that liquidity and financial leverage ratios can play a significant role in dividend policy. While Al-Najjar (2009) argues that there is no relationship between dividends and liquidity, Forti *et al.* (2015) and Boțoc and Pirtea (2014) suggest that liquidity is positively related to dividend payouts. Moreover, companies with greater debt should exhibit lower dividends. This stems from the fact that engaging in a debt contract lowers the amount of available cash and reduces the propensity to pay dividends as it is expected by the agency theory. Additionally, along with debt contract companies become closely monitored by capital lenders. The results of previous studies are mixed. Ramachandran and Packkrisamy (2010) confirmed a negative relationship between dividend payout and long term-debt for the whole sample of companies, however the results among the selected industries varied significantly. Interestingly, the results obtained by Boțoc and Pirtea (2014) suggest the positive relationship between dividends and company's leverage, while Shinozaki and Uchida (2014) found leverage to be statistically insignificant in the dividend smoothing regression. The contradictory outcomes may be related to the different debt types or market characteristics. Booth *et al.* (2001) proved that companies from emerging economies are exhibiting generally lower debt ratios, including long-term debt, in comparison to companies originating in highly developed arm's length markets. As the Aivazian *et al.* (2006) study suggests, companies with market debt are more willing to pursue smoothed dividend policy, whereas, Lam *et al.* (2012) and Hoang and Hoxha (2019) confirmed that companies with higher debt ratios pay lower dividends.

Few studies examined the asset tangibility ratios and company's risk. The negative relationship of the former variables has been confirmed in Al-Najjar (2009) and Aivazian *et al.* (2003) studies among developing countries. Tangible assets enable investors to make company valuations and reduce the information asymmetry, but at the same time reduce the short-term assets which could be used as a collateral for bank lending. Asset tangibility was examined by Javakhadze *et al.* (2014) in terms of smoothing. The authors revealed that the more tangible the assets of the company, the higher the speed of adjustment. However, it is worth mentioning that the results of previous studies are inconsistent in this respect (Leary & Michaely, 2011). Chay and Suh (2009) suggested that dividend policy is dependent on the risk that company faces. This determinant is relevant in terms of dividend smoothing as well. Leary and Michaely (2011) argued that riskier companies, smooth dividends to a smaller extent than less risky ones.

Although listing on foreign markets is an important issue from the profit-sharing perspective, the literature regarding depositary receipts is concentrated on the market reactions (Foerster & Karolyi, 1993, 1999; Miller, 1999) and cross-listing drivers (Karolyi, 1998). Thus, only in few studies did the authors examine the impact of the cross-listing on dividend policy. Errunza and Miller (2000) argued that depositary receipts programmes exemplify the financial liberalisation processes. The authors confirmed the cost of capital lowering in the aftermath of the American depositary receipts (ADR) issues. Moreover, they also observed a decrease in the dividend per share growth rate, but this effect was statistically insignificant. Aggarwal *et al.* (2012) found support that higher dividend increases are more common for those cross-listed companies that experience higher information asymmetry, while Perretti *et al.* (2013) confirmed the significance of the size, growth, and retained earnings/book value ratio in explaining the propensity to pay dividends by companies that issued ADRs. Perretti *et al.* (2013) also revealed that the contradictory recession in the home market significantly increases the likelihood of dividend decrease. Moreover, Lam *et al.* (2012) confirmed for Chinese companies, that those entities that are cross-listed pay lower cash dividends than companies with state ownership. This latter outcome is in line with Cheng *et al.* (2021) study, which confirmed that cross-listed companies from China pay lower and more stable dividends than their single-listed counterparts. Cheng *et al.* (2021) employed also Lintner's model and obtained lower SOA coefficient (0.41) for cross-listed companies than for non-cross-listed (0.53).

Much of the literature focuses on the role of the ownership structure. Several studies suggest that state-owned enterprises smooth dividends more than private-owned enterprises (Bremberger *et al.*, 2013; Gugler, 2003). Moreover, Gonzalez *et al.* (2017) argued that in the case of Latin American markets, companies with more concentrated ownership structures are more likely to pay dividends, which stays in contrast to the research on the UK companies (Khan, 2006). In the latter study, more concentrated ownership led to lowering of dividends. Bodnaruk and Östberg (2013) suggested that dividend payout is positively correlated with shareholder base: the more shareholders a company has, the more dividends it pays. In the case of dividend smoothing, the relationship seems to be opposite: the more concentrated the ownership is, the faster the adjustment of the dividend is (Chemmanur *et al.*, 2010; Jeong, 2013). Finally, Grinstein and Michaely (2005) argued that dividend payout is higher if institutional investors are among the shareholders. From a dividend smoothing perspective, the relationship was investigated by Leary and Michaely (2011) and Al-Najjar (2009). Those authors found the relationship to be positive, in that the speed of

dividend adjustment is lower if institutional investors are present in the ownership structure of the company. Nevertheless, Fernau and Hirsch (2019) unambiguously stated on the basis of meta regression analysis that the dividend smoothing coefficients differ significantly depending on the inclusion of ownership as a determinant of dividend smoothing effects. Consequently, the authors argued that researchers should undoubtedly take into account ownership characteristics when estimating dividend smoothing. The omission of ownership features due to, for example, data limitations, will result in necessity of solving the problem of omitted variable bias.

In some papers, the authors examined the influence of the stock market maturity on the dividend policy. Twu (2012) confirmed the negative impact of the market development on the dividend payouts, whereas Rangvid *et al.* (2014) confirmed weaker dividend smoothing in less developed markets. The liquidity and dividends factors are also considered to be important in the literature on the attractiveness of stock exchanges. As Lo (2013) indicated, supporting high liquidity is a fundamental responsibility of stock exchanges, as it allows investors for immediate transaction completion.

Dividend policy in BRICS countries — findings from previous research

Although there are no publications considering dividend policy in all BRICS countries together, there are however several studies related to companies from specific BRICS countries (see Table 1). For instance, Pandey and Bhat (2007) positively verified the validity of Lintner's model for Indian companies. Additionally, the authors confirmed the relevance of the monetary policy restrictiveness in explaining downward changes in dividend payouts.

The positive relationship between dividends and earnings, also expressed by Lintner's equation, was investigated by Kumar (2006) for Indian companies in the period 1994–2000. Moreover, in the selected papers the authors concentrated on the financial sector. Sura *et al.* (2006) confirmed that Indian banks follow target payout policy, while Pal and Goyal (2007) proved the relevance of the lagged dividends in explaining dividend decisions. In a more recent study of Indian banks, Sudhakar and Saroja (2010) argued that dividends from the last year, as well as current depreciation and net profit, determine the current dividend level among Indian banks. Besides the banking industry, there are also other sectors analysed in India. For example, Devaki and Kamalaveni (2012) examined hotels and found out that institutional investors have greater influence, than other groups of shareholders, on dividend decisions. Furthermore, the Kaur Bawa and Kaur

(2012) study revealed that Lintner's model is the most appropriate for explaining the dividend behaviour of small and medium enterprises in the Indian manufacturing sector. Ramachandran and Packkirisamy (2010) analysed the effect of capital structure and proved that an increase in debt financing negatively affects company's dividend policy.

There are also several studies dedicated to dividend policy on the Brazilian market. The findings of Forti *et al.* (2015) suggest that firm size, profitability, market value, liquidity, and profit growth correlate with a firm's greater propensity to pay out dividends. More recently Benavides *et al.* (2016) examined the Brazilian market along with other five Latin America countries (Argentina, Chile, Colombia, Mexico, and Peru). Their main conclusion concerning dividend smoothing in Brazil highlights the importance of the rule of law. Brazil, together with Argentina and Chile, was found to have higher scores on rule of law compliance in comparison to Colombia, Mexico and Peru. Thus, Brazilian companies tend to smooth dividends more.

Wang *et al.* (2011) found that the presence of the state in the ownership structure in China increases companies' likelihood of paying dividends. The authors supported that current dividends per share (DPS_t) ratio is a positive function of state ownership, along with DPS_{t-1} , current earnings and company's size. In general, their findings confirmed that the average actual payout ratio for Chinese companies is situated between the payout ratios for emerging and developed markets. Moreover, Cheng *et al.* (2021) study revealed moderate level of dividend smoothing among Chinese companies and confirmed that free cash-flow, ROE, and size are positively, whereas higher growth opportunities and financial leverage are negatively related to dividend levels paid by Chinese companies. Finally, Cheng *et al.* (2021) noted that larger and more cash abundant companies with higher ownership concentration exhibit higher variability of dividends. On the contrary market-to-book ratio and leverage are negatively related to dividends variability.

BRICS stock exchanges — general overview

Analysis presented in this paper encompasses companies listed on five stock exchanges: the Johannesburg Stock Exchange in South Africa (JSE), the Brazilian stock exchange (B3²), the Shanghai Stock Exchange in China

² Since July 3, 2017 known as B3 S.A. – Brasil, Bolsa, Balcão (BM&FBovespa SA. CVM approves B3's Corporate Name and the Merger of Cetip. Last Modified June 19, 2017. http://www.bmfbovespa.com.br/en_us/news/b3s-corporate-name-and-the-merger-of-cetip.htm (accessed 18 Mar 2019).

(SSE), the National Stock Exchange in India (NSE), and the Moscow Exchange (MOEX) in the Russian Federation. The length of the period of functioning, as well as the economic and legal environment in which these exchanges operate, determines the level of their development. Taking into consideration the size and liquidity of a market, it is clear that the selected group of stock exchanges is varied. Regarding the number of listed companies, NSE is an undisputed leader with 1,794 issuers quoted at the end of 2015. In the second place there is SSE with 1,081 listed companies, while JSE and B3 list 382 and 359 companies, respectively. The Russian stock exchange is the smallest in the selected group, quoting 254 companies in December 2015 (The World Bank, 2017).

Considering capitalization in the US dollars, the biggest stock exchange was the SSE. As of the end of 2015, SSE capitalization amounted to 4,549 billion USD, whereas NSE amounted to 1,485 billion USD. However, taking into account capitalization in GDP terms, the results are quite different. Throughout the analysed period, this indicator was the highest at JSE (since 2006 it has exceeded 200% every year with the maximum level at 256.50% in 2014) (The World Bank, 2017). It should also be mentioned that on the examined stock markets (except JSE) the highest capitalization to GDP rate occurred in 2007. By 2015, none of the stock exchanges has reached the 2007 value of this indicator. The biggest drop occurred in Brazil (from 77.06% to 27.20%) and in Russia (from 100.83% to 28.80%) (The World Bank, 2017). In terms of market liquidity, which can be measured using different indicators based on the market turnover, such as the value of traded stocks about the GDP, SSE is distinguished from the analysed markets, as the value of trading to GDP exceeded 355% in 2015. This ratio was equal to 75% for JSE, 37% for NSE, 23% for B3 and only 8% for MOEX (The World Bank, 2017).

One of the microeconomic factors determining the development of the stock market is corporate governance codes. The analysed stock exchanges differ in terms of the date of issue of corporate governance practices, the scope of those requirements, and the rules of their implementation and application. In the case of three stock exchanges — Brazilian (first corporate governance code imposed in 1999), Russian (first code implemented in 2002) and South African (first code implemented in 1994) — the corporate governance codes include voluntary recommendations for listed companies and the disclosure requirements for adoption of such practices are through ‘comply or explain’ reporting mechanisms. The exception is the Indian

CVM approves B3's Corporate Name and the Merger of Cetip. Last Modified June 19, 2017. http://www.bmfbovespa.com.br/en_us/news/b3s-corporate-name-and-the-merger-of-cetip.htm (accessed 18 Mar 2019).

stock exchange, which has no corporate governance code. However, good corporate practices are enforced through company law, regulation, or stock exchange listing requirements with a mixed character of binding (voluntary and obligatory). The only market with a strictly binding corporate governance code is the SSE. The code was developed jointly by the China Securities Regulatory Commission and the State Economic and Trade Commission in 2002. Companies infringing corporate governance regulations are subject to administrative, civil, and criminal liability (Xing, 2003; Yang *et al.*, 2011).

In conclusion, in the analysed period, the most developed stock exchange regarding listed companies is the NSE in India. However, regarding capitalization and liquidity, the best results were achieved by SSE. The Russian MOEX is by far the least liquid and the smallest regarding both capitalization measures and number of listed companies. It also recorded the biggest market collapse as a result of the 2008 financial crisis. In terms of macroeconomic factors, the strongest influence on the Russian capital market (including the stock exchange) had the level of oil prices and the exchange rate of the ruble against major foreign currencies. These two factors slowed market recovery after the 2008 crisis (Abramov & Radygin, 2016). Hammoudeh *et al.* (2013) revealed that, among the BRICS countries, Brazil is the most susceptible to economic and financial risks, Russia and China are very sensitive to political risks, and India is most affected by higher oil prices. The confirmation of greater influence of political risk on the Moscow Exchange has been observed since 2014, when economic and financial sanctions were imposed by Western European countries and the United States on Russia over its role in the Ukraine crisis. As a consequence, some foreign investors decided to withdraw their money from the MOEX and non-resident investments dropped from \$86 billion in 2013 to \$50 billion in 2015 (Reuters, 2018). Furthermore, most listed Russian companies are still controlled by either the state or a founding oligarch, which affects their free float. A very good example is the MOEX itself. The Central Bank of Russia (CBR), which controls the MOEX, owned 30% of its stake, while two other Russian state banks had an additional 18.4%. In 2014, the CBR sold a 12% stake in the MOEX, aiming to set an example for other issuers and thus improve the free float. After this transaction, the MOEX free float increased above 50% for the first time (Mellow, 2014).

The above analysis of stock exchanges of the BRICS countries confirms their diversity in terms of capital market development indicators. Partly these differences result from the duration of the functioning of these exchanges. However, their contemporary level of development is determined primarily by macroeconomic and political-legal factors.

Research methodology

We begin the analysis for the entire research sample using the following specification based on Lintner's (1956) original work, but designed for panel data:

$$D_{it} = \gamma_0 + \gamma_1 D_{it-1} + \alpha E_{it} + \omega_j + \pi_t + \varepsilon_{it}, \quad (1)$$

where D_{it} is the level of dividends for firm i in year t and E_{it} is firm i 's earnings in year t . γ_0, γ_1 and α are the parameters. The speed of dividend adjustment (SOA) coefficient, which reflects the adjustment of dividends based on the company's target payout ratio, is estimated as $(1 - \gamma_1)$ from Equation (1). Also, ω_j and π_t denote unobserved country-specific and year-specific effects, respectively. ε_{it} is assumed to have an IID $(0; \sigma_{\varepsilon_{it}}^2)$ distribution.

Unlike the studies of Fama and Babiak (1968), Brav *et al.* (2005) and Larkin *et al.* (2017), we follow the approach of Boțoc and Pirtea (2014) and Ha *et al.* (2017) and divide both dividends and earnings by firm i 's total assets. Thus, in Equation (1) we employ cross-sectionally comparable ratios.

In estimating the parameters in Equation (1), we use a GMM two-step estimator (Blundell & Bond, 1998), with the finite-sample correction for variance (Windmeijer, 2005). For the post-estimation checks, we conduct the Arellano-Bond test for zero autocorrelation in first-differenced errors and the Hansen-Sargan test of overidentifying restrictions.

We continue the analysis by calculating the SOA coefficients for individual companies. However, instead of calculating only one SOA value for each firm we use the rolling estimation technique in order to obtain a time series of the SOA coefficient (Larkin *et al.*, 2017). In doing so, we employ the dividend partial adjustment model proposed by Fama and Babiak (1968):

$$\Delta D_{it} = \alpha_i + \beta_{1i} D_{it-1} + \beta_{2i} E_{it} + \varepsilon_{it}, \quad (2)$$

where D_{it} is the target level of dividends for firm i in year t ; E_{it} is firm i 's earnings in year t ; α_i, β_{1i} and β_{2i} are the parameters and ε_{it} is the error term. In Equation (2) the SOA coefficient is estimated as $-\beta_{1i}$. Low values of the SOA coefficient indicate that the managers are strongly attached to the previous levels of dividend payment and they are willing to smooth dividends. We use the OLS method with the robust Newey-West standard errors.

Having estimated the time-series of the SOA coefficient for each company, we employ the linear panel regression to find out the determinants of the SOA according to the following equation:

$$SOA_{it} = \gamma_0 + \sum_{l=1}^k \alpha_{ilt} F_{ilt} + \sum_{m=1}^n \beta_{jmt} G_{jmt} + \omega_j + \pi_t + \varepsilon_{it}, \quad (3)$$

where SOA_{it} is the SOA coefficient estimated for the i^{th} company in year t based on the rolling regression and Equation (2); F_{ilt} are the firm-level determinants affecting the SOA; $l = 1, 2, \dots, 12$; G_{jmt} are the country-level determinants; $j = 1, 2$; $\gamma_0, \alpha_{ilt}, \beta_{jmt}$ are the parameters; ω_j and π_t denote unobserved country-specific and year-specific effects; ε_{it} is the error term with IID $(0; \sigma_{\varepsilon_{it}}^2)$ distribution. All the SOA's determinants (with the exception of *liquidity risk proxy*) are calculated as the rolling median estimates over the analysed period. In order to decide whether the random or fixed effect model should be used, we employed the Hausman test.

We expanded the research to indicate the determinants of the dividends' levels paid by BRICS companies and employed another panel regression, namely:

$$D_{it} = \gamma_0 + \gamma_1 D_{it-1} + \alpha E_{it} + \sum_{p=1}^s \alpha_{ipt} F_{ipt} + \sum_{m=1}^n \beta_{jmt} G_{jmt} + \omega_j + \pi_t + \varepsilon_{it} \quad (4)$$

where D_{it} and E_{it} are the same values as used in Equations (1) and (2); F_{ipt} are the firm-level determinants affecting the dividend levels; $p = 1, 2, \dots, 11$; G_{jmt} are the country-level determinants; $j = 1, 2$; $\gamma_0, \alpha_{ipt}, \beta_{jmt}$ are the parameters; ω_j, π_t are the effects as in Equation (3); $\varepsilon_{it} \sim \text{IID}(0; \sigma_{\varepsilon_{it}}^2)$. The dividend determinants are computed as the rolling medians as in Equation (3) to achieve comparability of results and remove the outlying values in the dataset. We used the same country-level characteristics as in Equation (3) and almost identical firm-level factors (the exception being the payout ratio). Since we again used the dynamic panel data model, we re-employed a GMM two-step estimator (Blundell & Bond, 1998) with a finite-sample correction (Windmeijer, 2005) for variance.

Following the existing literature on dividend policy, and to ensure the highest comparability of results between dividend and speed of dividend adjustment regressions, we employed individual and market level determinants. The employed variables are explained in Table 2 along with expected signs of their coefficients. In the case of dividend regression (Equation 4) we started with Lintner's equation, and henceforth the lagged dividend (D_{it-1}) and earnings (E_{it}) ratios became naturally control variables. In

the case of the SOA determinants regression (Equation 3), we employed the payout ratio (*payout*) and free float ratio (*free_float*). In the latter case, we want to capture the level of the diffused ownership. The higher the free float ratio is the less closely the company is held and has a lower share of strategic investors in ownership structure. We also argue that change in control variables is justified due to the use of dividends and earnings ratios for the estimation of the rolling SOA coefficients.

In line with previous studies, we examined the length of the company's coverage in Eikon in years (*age*), the size of the company (*size*), and retained earnings (*fin_slack*) as factors relating to a company's maturity together with variables proxying a company's growth opportunities: asset growth (*growth*) and market-to-book ratio (*MB*). We capture financial risk by leverage (*leverage*) and liquidity risk dummy (*l.risk proxy*). Additionally, we investigate the asset tangibility and long-term debt ratio (*LT debt*). In the latter case, we assume that companies with higher values of debt ratios were more mature and recognised by capital lenders, which can lead to lower information asymmetry and might induce dividend payments. On the other hand, debts are tying managers' hands and might negatively affect dividend payouts.

To identify companies that exhibited depositary receipts in their capital structure, we manually collected information from Eikon Refinitiv LSEG group³ and Citi Global DR Directory. For the first database, we checked whether the companies issued depositary receipts. For the second data source, we confirmed this information and enriched it with the issue date and the type of DR. Thus, finally we collected data for the sponsored issues. We argue that only in the case of the intended issue of DR can we expect changes in the corporate decisions, along with dividend behaviour.

Among the country-level factors that reflect the quantitative development level of the examined stock markets, we checked for the market capitalisation (*m_cap*) and stock market turnover ratio significance (*m_turnov*), respectively.

The sample

Research sample comprised companies listed on BRICS stock exchanges as described in the previous section. The initial list of 3,912 companies was retrieved from the stock exchanges in mid-2016. Following the standard approach in the literature, we restricted our sample to non-financial and

³ The data were obtained from the Refinitiv, a part of LSEG business based on a cooperation agreement with the University of Gdańsk, Poland.

non-insurance companies which were domiciled in the countries of our choice. It amounted research sample to 3,104 companies. Information on the type of industry, the history of dividends and other variables was collected manually from Eikon. As we concentrated on the determinants of regular dividend policy, we restricted the sample to companies that not only exhibited an uninterrupted path of cash dividends for a considerably long period, but also had no missing financial data. Since we decided to employ the rolling regression to estimate the speed of dividend adjustment coefficients and assumed that the minimum 6-year timespan of those values would be acceptable for further calculations, we ultimately included companies with at least an 11-year time series of consecutive data in the research sample. Removing entities with gaps in dividend and financial time series limited the final research sample to 564 firms that do not operate in the financial sector.

Results and discussion

In Table 3, we present the results of estimation Lintner's model using Equation (1). Panel A refers to the whole research sample of 546 firms. Panel B refers to the subsample of 123 companies that issued depositary receipts in the period of analysis.

Models (1)–(3) differ concerning the controlled country and time effects. The results of the post-estimation tests confirm a significant serial correlation of the residuals of the 1st order (which is expected in the dynamic setting⁴) and no serial correlation of residuals of the 2nd order. Moreover, the result of the Sargan-Hansen test implies that the models are correctly specified, since all instruments chosen for GMM estimation are valid. Additionally, according to the results of estimation summarized in Table 3, both the lagged dividends and current earnings have a statistically significant positive impact on dividend levels. However, the influence of current earnings is weaker than that of former dividends in all specifications. Besides, the estimated values of the γ_1 parameter are considerably higher for the whole sample (panel A) comparing to the subsample of DR issuers (panel B). The estimated speed of adjustment coefficient $1 - \gamma_1$ ranges from 0.4207 (model 2A) to 0.6025 (model 1B). The obtained results are stable across all specifications and imply the importance of the lagged dividends in explaining the current level of dividends, which confirms the

⁴ The results obtained for DR issuers subsample should be considered only at the 10% significance level.

relevance of Lintner's model for the companies listed in BRICS countries. Moreover, the levels of SOA indicate a considerably stronger dividend smoothing behaviour in the whole research sample among BRICS countries and a rather moderate one in reference to the DR issuers subsample.

The obtained level of dividend smoothing in the BRICS countries in our study is lower from results obtained for highly-developed stock markets (i.a. Michaely & Leary, 2011; Chemmanur *et al.*, 2010). Indeed, Michaely and Leary (2011) indicate that dividend smoothing is prevalent among US companies, with median SOA levels lower than 0.1 for the years 1998–2007. Direct comparison of our result suggest that companies listed in BRICS countries are maintaining SOA levels similar to US companies in 1950-ties. Our result suggests, that companies in less developed economies from our study are still operating in less stable external conditions, or that pursuing more smoothed dividend policy is not inevitable to attract investors.

The SOA level for BRICS countries is nevertheless similar to the results obtained by Benavides *et al.* (2016) for Brazil (SOA coefficient between 0.24 and 0.37) and significantly lower that values obtained by Pandey and Bhat (2007) for India (SOA between 0.69–0.79) and Kaur Bawa and Kaur (2012) also for Indian stock exchanges (SOA 0.898). The discrepancies in results are undoubtedly due to the differences in study design characteristics (Fernau & Hirsch, 2019).

The obtained results of the SOA for the DR-subsample indicate that cross-listed do not follow highly smoothed dividend policy prevalent on the more mature, foreign stock exchanges. Higher level of the SOA for the cross-listed firms' subsample stays in contrast with Cheng *et al.* (2021) study for Chinese companies. We believe that that difference in the SOA levels is related to, first more heterogeneous research sample in our study, and second to divergent definitions of dependent variable in Lintner's equation. Indeed, we employ dividends-to-assets ratio to mitigate the companies size effect, whereas Cheng *et al.* (2021) applied dividends per share (DPS).

Turning to the discovery of the speed of dividend adjustment coefficient drivers, we employed the rolling regression to estimate the time series of the individual SOAs for each company (Equation 2). Consequently, we analysed the firm-level and market-level factors affecting dividend smoothing, as described in Table 3. In Table 4, we report the results of the estimation of linear panel dynamic regression (Equation 3), reflecting the influence of the selected factors on the SOA coefficient. In all 27 specifications (including 14 specifications for panel A and 13 specifications for panel B) we took into account two control variables: the *payout* and the *free_float*.

The first specification (model (1) in panels A and B) covers only control variables, whereas in models (2) to (12) we interchangeably include one of the potential SOA factors. Model (14) in panel A and model (13) in panel B include only those determinants that turned out to be statistically significant at the significance level $\alpha = 0.05$. Starting with the control variables, we ascertained that the *free_float* was statistically significant at a significance level of $\alpha = 0.05$ in twelve specifications in panel A and in all thirteen specifications in panel B. This variable was also significant at a level of $\alpha = 0.1$ in specification (14) in panel A. The impact of the free float ratio on the SOA coefficient was negative, which means that an increase of the free float ratio leads to a decrease of the SOA coefficient and, accordingly an increase in dividend smoothing. This finding can be referred to the Cheng *et al.* (2021) study, in which companies with higher ownership concentration exhibited higher variability of dividends captured by standard deviation of dividends' measures. The second control variable, the payout ratio, was statistically significant in the case of panel A in twelve specification, including six at $\alpha = 0.05$ and six at $\alpha = 0.10$. However, in panel B the *payout* was significant only in the last specification (13). The sign of the *payout* was also negative, which suggests that companies with higher payouts tend to smooth dividends to a larger extent. This result is in line with the agency theory predictions and is comparable with the results of Javakhadze *et al.* (2014).

Moving on to the individual determinants of the SOA, we discovered that the coefficient estimates of *age* were statistically significant and negative in panels A and B. This means that older companies are more eager to smooth their dividends, which is in line with results obtained by Leary and Michaely (2011) and Javakhadze *et al.* (2014). We also found that the *size* of a company had a statistically significant negative impact on the SOA (Jeong, 2013; Javakhadze *et al.*, 2014). The negative and significant impact of *size* was confirmed by the results of estimation of model (14) in panel A. Similar influence of *age* was acknowledged by model (13) in panel B. The estimated coefficients of *leverage* and *LT debt* ratios turned out to be statistically significant and negative in both panels. This implies that companies with higher leverage ratios and long-term debt engage more in dividend smoothing, which is in line with Aivazian *et al.* (2006) and Cheng *et al.* (2021) findings.

The variables reflecting risk, asset tangibility, and retained earnings (*fin_slack*) were statistically significant with positive signs of estimates coefficients (panel A). Thus, the higher-risk companies, as well as those with excess cash and higher levels of tangible assets, were less engaged in dividend smoothing. It is important to note that the three mentioned varia-

bles stayed significant in the combined specification (Model 14). The positive sign of *fin_slack* coefficient is inconsistent with the predictions of agency theory. The results obtained for the whole research sample were confirmed for the DR issuers in the case of *asset_tang* and *fin_slack* variables. The estimates coefficient of *l.risk proxy* variable was insignificant in the DR subsample. Moreover, the DR binary variable was statistically significant with a positive sign of the coefficient. The depositary receipt issuers tended to smooth dividends to a lesser extent in comparison to the other companies. Such an effect was confirmed by model (14) including all significant variables. Both the *growth* and *MB* remained statistically insignificant in association with the SOA coefficient, both in the case of the whole sample and in the smaller subsample.

Overall, our findings confirm that older, larger companies with an increased level of leverage and long-term debt, as well as higher levels of percentage of shares outstanding are more willing to smooth dividends. On the contrary, the companies at risk of losing liquidity, with higher levels of tangible assets and retained earnings, as well as those issuing DR, have less willingness to smooth their dividend. Interestingly, the foregoing results were mostly confirmed for the subsample of DR issuers. Generally, for the majority of the coefficient estimates of the SOA determinants the obtained signs are in line with the results of previous studies and our expectations (Javakhadze *et al.*, 2014; Boțoc & Pirtea, 2014; Aivazian *et al.*, 2006).

Turning to the market level determinants, we found that market capitalisation (in relation to GDP) has a positive influence on the level of the SOA coefficient (model (11) in panel A and panel B), whereas the market turnover (model (12) in panel B) showed the opposite. We argue that the market turnover is a proper approximation of the stock market development, while investors prefer to enter deep and more liquid markets. More importantly, liquidity on the emerging stock markets comes from large companies which, as we note above, engage more in dividend smoothing. Higher emerging market capitalisation, which stems from the higher number of smaller and younger companies IPOs, does not assure favourable liquidity levels for investors. In contrary to previous study of Nowak *et al.* (2020) for the companies listed in Asian-Tigers countries, we obtained significant coefficients of those main market variables.

It is essential to mention that, probably due to the relatively small size of the DR issuers subsample, we had numerous problems with the selection of appropriate instruments in equation (4) (see the results of the Hansen test in Table 4, panel B).

Continuing our research in order to detect the drivers of dividend levels, we employed the dynamic panel model estimation (Equation 4). The results

are described in Table 5. As in the case of selecting the SOA determinants, we considered two control variables, eleven firm-based factors, and two market-based determinants. In panel A (including 564 companies) we summarized sixteen specifications. In thirteen models the individual drivers were considered interchangeably, one by one, whereas in three combined specifications (models (14)–(16)) we included all the significant factors. These models differed with respect to controlled effects (country or/and time specific). In panel B (encompassing 123 firms issuing DR receipts) we conducted estimations based on thirteen specifications. In twelve models the individual drivers were considered interchangeably, whereas the last model (13) included all the significant factors. Unsurprisingly, we discovered a significant positive impact of the lagged values of dividends and current earnings in all the specifications estimated based on the whole sample. The control variables were also significant in the majority of models in panel B (except specification (1)). The *age* variable was significant in panel A and partially significant⁵ in panel B, but the sign of its coefficient was changing which means that the results should be interpreted with caution. This result stays in contrast with many previous studies (i.a. Forti *et al.*, 2015; Al-Najjar, 2009), which confirmed that older companies have larger payouts.

The variable reflecting the size of a company remained statistically significant in both panels with negative impact on the dividend level. We obtained almost the same estimates coefficient of the *leverage* in the case of panel A (in panel B the *leverage* variable was not significant). Variables reflecting long term debt ratio (*LT debt*) and growth of the assets (*growth*) of the company were statistically significant and negatively associated with the dividend levels in both panels. Importantly, both the variables were also significant in combined specifications (14) (15) and (16) in panel A. The *growth* variable was also significant in specification (14) in panel B with the same negative sign. The proxy for liquidity risk (*l.risk proxy*) was significant only in the case of panel A, whereas four other factors (*free_float*, *MB*, *asset_tang*, and *fin_slack*) remained statistically insignificant for both panels. The DR dummy did not reveal a significant impact on the dividend level (panel A).

In the case of market level determinants, we found a significant positive impact of market capitalisation on the dividend level (models (11) and (15) in panel A; model (11) in panel B⁶). This outcome stays in contrast with Twu (2012) findings, which revealed lower propensity to pay dividends and

⁵ ‘Partially’ means in only one specification, namely (13).

⁶ In this case, only at 10% significance level.

lower dividends' levels in more developed stock markets. However, although we admit that BRICS countries have experienced a strong development in the recent decades, they are still not considered as highly matured markets. However, the market turnover was negatively associated with the dividend levels in the entire sample (models (12) and (15) in panel A) and was insignificant in the DR issuers subsample (panel B). This result sheds light on the relevance of stock market development on dividend payouts, however, we must admit that such a definition of market turnover was not examined in previous studies.

Overall, we primarily noticed that the lagged dividends had a substantially greater positive impact on the level of dividend than the current profits. Besides, we have identified the following factors:

1. With a negative impact on the dividend level: size of a company, leverage (only in the entire research sample), long term debt (LT debt) and growth;
2. With a positive impact on the level of the dividend: liquidity risk proxy (only in the entire sample).

The above findings can be interpreted as follows: larger companies, with higher levels of leverage and long-term debt and also recording higher asset growth, pay higher dividends. In turn, those more at risk of losing liquidity, pay smaller dividends. The research did not reveal any significant relationship between the level of free float ratio, the market-to-book ratio, asset tangibility, DR dummy, and financial slack ratios and the level of the dividends.

Moving on the market-oriented determinants, the market capitalization was positively related to dividend levels whereas turnover ratio — negatively, however, the results for market-based determinants were significantly on for the entire research sample.

One can easily notice that in the case of dividend levels determinants investigation results are more vague comparing to dividend smoothing outcomes. First, more factors turned out to be statistically insignificant (free float, MB ratio, asset tangibility, financial slack in both samples, DR dummy in the whole sample, and also age, leverage liquidity risk proxy, market capitalisation and turnover ratio in the DR issuers subsample). Second, the sign of market capitalisation and liquidity risk proxy coefficients (both positive in the whole sample) as well as the size and growth ratio coefficients (negative in both samples) are contrary to results existing already in the literature. Notwithstanding, we received the correct sign in the case of LT debt (negative) and market capitalisation (positive in the case of the whole sample).

Conclusions

This study contributes to the relatively limited research on the dividend policy and the phenomenon of dividend smoothing in emerging market countries (one of the latest thorough review of literature in this field can be found in Fernau & Hirsch, 2019). The analysis is based on a sample of 564 companies from the non-financial and non-insurance sectors listed on the main stock markets in the BRICS countries in 1995–2015. Moreover, the research discussed herein, does not concentrate solely on the analysis of the level of dividend smoothing and its drivers, but additionally focuses on indicating characteristics affecting the level of dividend payment. This second part of the study covers the extension of the first-order autoregressive model, the so-called partial-adjustment model of dividend payout, with potential factors affecting the level of dividend payment. In order to explain the sources of dividend smoothing and dividend levels themselves, a set of individual factors related to the company and market-oriented factors were analysed. Special attention was given to companies that issued depository receipts (DR) during the period of analysis. For such companies (there were in sample 123) separate calculations and estimations were conducted. Finally, it is worth emphasizing that this is the first study of this type carried out for all BRICS countries at the same time.

The research results show that the speed of dividend adjustment coefficient in the entire sample was estimated at about 0.45. These findings confirm the moderate level of smoothing in the BRICS countries. Considering the subsample of companies issuing DR, the level of the speed of dividend adjustment coefficient was of 0.6. This implies that cross-listed companies from BRICS countries adjust their dividends faster to the current earnings in comparison to single-listed firms.

Moreover, the research indicated significant firm-based and market-based factors responsible for the level of the speed of dividend adjustment ratio (SOA). These are: free float ratio, age, and size of a company, leverage, long-term debt, liquidity risk proxy, asset tangibility, financial slack, and DR dummy, stock market capitalization and stock market turnover.

Finally, we have also found that size, leverage, long-term debt, growth and liquidity risk proxy are important factors of dividend levels, together with the lagged dividend.

Among the shortcomings and limitations of our study we can include the small sample of the cross-listed companies (DR issuers). The limited number of such companies considered in the research was probably the main reason of ambiguous results obtained during the attempt to discover the dividend levels determinants. The other shortcoming is related to defin-

ing cross-listing — we implemented it simply as a dummy variable taking the value of 1 in the case of firms listed on the depositary receipts market in the period of analysis. However, we could assume the different definitions of cross-listing — i.e., as a share of turnover on the foreign stock market in the entire turnover of the firm, or as a share of foreign stakeholders in the whole ownership of a particular company. Furthermore, concerning the ownership it is pertinent to note that the proxy for the ownership variable considered in our study should be also enumerated among the limitations of the study — because of the lack of the data, we simply estimated it as a free-float, thus, it does not fully reflect the changes of the companies' ownership. Moreover, we took into account only two market-based factors — namely, capitalisation and turnover, expressed as the share of GDP. We expect that it would be beneficial for the paper to comprise the other market variables, reflecting i.e. the volatility or risk, and, even more interestingly, to include some institutional variables, i.e. the corporate governance codes. However, in the case of those latter drivers, because of their low variability, employing them in the panel regression could not be efficient. Presumably, they would coincide with the country effects. Other limitations are related to the method of estimation — we could apply the two-step method of indicating the SOAs, proposed by Leary and Michaely (2011) and employed by Larkin *et al.* (2017), or, more intriguingly, apply the two-equation Heckman's self-selection model in order to estimate the target dividend payout ratios (Kowerski & Bielak, 2018; Cheng *et al.*, 2021).

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Annex

Table 1. Selected studies on dividend policy drivers in BRICS countries

Author(s), year	Sample characteristic	Depending variable and model/method*	SOA	Significant variables
Pandey & Bhat (2007)	571 companies, manufacturing industry, India, 1989-1997	<i>D</i> in levels; Lintner's model with extension/ GMM	0.79-0.69	Lagged dividends(+), current earnings(+), dummy reflecting restrictive monetary policy multiplied by lagged dividends(+/-) depending on specification
Kumar (2006)	2575 listed companies, manufacturing industry, India, 1994-2000	ΔDPS and <i>D/A</i> ; full adjustment model, Lintner's model, Waud's model, earning trend model, Aivazian et al. (2003a) model/ OLS, FE	-	Earnings(+), lagged dividends(+/-) depending on specification, past investment opportunities(+), debt equity(-), institutional ownership(+/-), corporate ownership(+/-)
Sura et al. (2006)	33 listed banks, India, 1996-2006	<i>D</i> in levels; Lintner's model, Britain model/ OLS	0.15 – 1.50; an average of 0.49	Current earnings(+), lagged dividend(+), cash flow(+), depreciation(+/-) depending on year, capital expenditure (+/-) depending on year
Ramachandran & Paekkirisamy (2010)	73 listed companies, seven industries, India, 1996-2007	<i>DP</i> ; Britain's model/ OLS	-	Lagged dividend payout ratio, net income, total distributable earnings, cash flow, size, capital expenditure. Signs differ depending on subsamples based on industry and firms' size
Wang et al. (2011)	4864 firm-years, China, 1998-2008	<i>DP</i> ; Lintner's model with extension/ logit model	-	Current earnings(+), lagged dividend(+), state ownership(-), leverage(-), natural log of total assets(+/-) depending on year
Devaki & Kamalaveni (2012)	25 companies, hotel industry, India, 2001-2006	<i>D/A</i> ; full adjustment model, Lintner's model, Waud's model, earning trend model, Jitendra Mahakud's model based on Aivazian et al. (2003a) model/ FE	-	Lagged dividend(+), earnings(+), debt-equity ratio(+), sales(+), size(+), age(+), institutional shareholding(+)
Kaur Bawa & Kaur (2012)	106 micro, SME, manufacturing industry, India, 2006-2010	<i>D</i> in levels; Lintner's model, Britain's model, Darling's model, Dobrovolsky's model/ OLS, FE, RE	0.898	Current year profit(+), previous year profit (+), depreciation(+), change in sales(+), lagged dividends(+), current year cash flows(+)

Table 1. Continued

Author(s), year	Sample characteristic	Dependent variable and model/method*	SOA	Significant variables
Forti et al. (2015)	300 listed companies, various industries Brazil, 1995-2011	D/A and D/E; modified Lintner's model/ GMM and Tobit model	-	Firm size(+), ROA(+), market to book ratio(+), liquidity(+), growth rate of assets(-), beta coefficient(-), profit growth(+), leverage(-), corporate governance(-), risk(-), information asymmetry(-), age(+), majority shareholder(+)
Benavides et al. (2016)	666 listed companies, Argentina, Brazil, Chile, Colombia, Mexico, Peru, 1995-2013	D/A; Lintner's model with extensions/ OLS	For Brazil: from 0.24 to 0.37	Interactions of earnings with profitability(+), past indebtedness(-), investment opportunities(-), leverage(-), proxy for the earned over contributed capital ratio(-), natural log of total assets(+/-) depending on specification

*GMM – the generalized method of moments; OLS – ordinary least squares; FE – fixed effects model; RE – random effects model; D – dividends; D/A dividends scaled by assets; D/E – dividends scaled by earnings (payout); DPS – dividend per share; ΔDPS – change in dividend per share; DP – dividend payout; SME – small and medium sized companies.

Table 2. Dividend policy determinants — variable definition and expected sign

Factor	Definition	Dependent variable and expected sign		Type of variables
		D_{it}	SOA_{it}	
D_{it-1}^a	lagged dividend scaled by total assets	+	n/a	control variables
E_{it}^a	earnings scaled by total assets	+	n/a	
payout ^b	yearly cash dividends divided by earnings	n/a	–	
free_float ^b	free floating common shares expressed as a percentage of shares outstanding	+	–	
age	number of years in Eikon database	+	–	company level determinants
size	natural logarithm of total assets in thous. of USD	+	–	
leverage	total assets divided by the common shareholders' equity	–	+	
l. risk proxy	dummy equal to 1 if the quick ratio ^c value falls below 1; 0 otherwise	–	+	
LT debt	long term debt divided by total capital	–/+	–/+	
MB	market to book value ratio	+	+	
growth	yearly asset growth ratio	+	+	
asset_tang	the sum of total net property, plant and equipment scaled by total assets	+	+	
fin_slack	retained earnings scaled by total assets	+	+	
DR	dummy equal to 1 if the company is listed on the depositary receipts market (only sponsored issues); 0 otherwise	–	+	
m_cap	market capitalisation in GDP terms	–	–	market level determinants
m_turnov	market turnover in GDP terms	–	+	

Notes: ^a – control variable in the dividend regression (Equation 4); ^b – control variable in the speed of dividend adjustment regression (Equation 3), ^c – quick ratio calculated as of total current assets minus total inventory divided by total current liabilities; n/a – not applicable. The underlying data before its transformation comes from: 1) Eikon (D_{it} , E_{it} , payout, age, size, leverage, l. risk proxy, LT debt, MB, growth, asset_tang, fin_slack); 2) World Development Indicators (World Bank) and World Federation of Exchanges, WFE (m_cap, m_turnov); 3) Citibank Depository Services and Eikon Refinitiv, LSEG group (DR); 4) Eikon and company's annual reports (free_float).

Table 3. Estimation results for partial-adjustment models of dividend payout

Variable	Panel A		Panel B		
	Models				
	(1A)	(2A)	(3A)	(1B)	(2B)
$D_{i,t-1}$	0.5433	0.5793	0.5696	0.3975	0.4324
	[0.000]	[0.000]	[0.000]	[0.011]	[0.003]
$E_{i,t}$	0.0961	0.0907	0.0917	0.1238	0.1229
	[0.000]	[0.000]	[0.000]	[0.027]	[0.028]
Intercept	0.0150	0.5626	0.4910	0.0176	0.0057
	[0.000]	[0.000]	[0.001]	[0.001]	[0.036]
SOA coefficient	0.4567	0.4207	0.4506	0.6025	0.5676
Country effects	Yes	No	Yes	Yes	No
Year effects	No	Yes	Yes	No	No
# Obs. no.	7143	7143	7143	1644	1644
# Firm no.	564	564	564	123	123
F	115.47	126.96	118.18	44.90	21.85
[p-value]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Arellano-Bond					
1 st order autocorr.	-2.73	-2.85	-2.83	-1.71	-1.75
[p-value]	[0.006]	[0.004]	[0.005]	[0.088]	[0.079]
2 nd order autocorr.	0.58	0.63	0.62	-0.62	-0.56
[p-value]	[0.560]	[0.530]	[0.538]	[0.533]	[0.577]
Sargan-Hansen					
Overid. restrictions	9.39	11.16	10.85	11.81	11.20
[p-value]	[0.226]	[0.132]	[0.145]	[0.107]	[0.130]
No. of instruments	11	11	12	11	10
Instruments for first-differenced equations	$E_{i,t-1}$, $E_{i,t-2}$, $D_{i,t-2}$	$E_{i,t-1}$, $E_{i,t-2}$, $D_{i,t-2}$	$E_{i,t-1}$, $E_{i,t-2}$, $D_{i,t-2}$	$E_{i,t-1}$, $E_{i,t-2}$, $D_{i,t-2}$	$E_{i,t-1}$, $E_{i,t-2}$, $D_{i,t-2}$
Instruments for level equations	$\Delta D_{i,t-1}$ country dummies	$\Delta D_{i,t-1}$ year dummies	$\Delta D_{i,t-1}$ country & year dummies	$\Delta D_{i,t-1}$ country dummies	$\Delta D_{i,t-1}$

Explanations: P-values are given in brackets.

Table 4. Dividend smoothing determinants

Panel A. Whole research sample, 546 firms														
Dependent variable: the SOA coefficient														
Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
intercept	1.1124 [0.001]	-1.5198 [0.113]	1.9166 [0.000]	1.1860 [0.000]	1.0810 [0.001]	1.2441 [0.000]	1.1678 [0.000]	1.1266 [0.001]	1.0012 [0.000]	1.0658 [0.000]	0.9781 [0.003]	1.0482 [0.000]	1.0901 [0.001]	1.557 [0.000]
payout	-0.1197 [0.070]	-0.1237 [0.060]	-0.1449 [0.028]	-0.1248 [0.058]	-0.1198 [0.069]	-0.0504 [0.332]	-0.0493 [0.350]	-0.1295 [0.052]	-0.1404 [0.033]	-0.1177 [0.074]	-0.1318 [0.046]	-0.1429 [0.029]	-0.1296 [0.050]	-0.1909 [0.004]
free_float	-0.0015 [0.0015]	-0.0016 [0.0014]	-0.0014 [0.020]	-0.0015 [0.022]	-0.0014 [0.031]	-0.0013 [0.005]	-0.0013 [0.005]	-0.0016 [0.015]	-0.0016 [0.010]	-0.0015 [0.016]	-0.0019 [0.003]	-0.0009 [0.119]	-0.0016 [0.013]	-0.0012 [0.053]
age		-1.5233 [0.003]												
size			-0.0726 [0.000]											-0.0565 [0.001]
leverage				-0.0295 [0.031]										
l. risk proxy LT debt					0.0750 [0.014]	-0.1530 [0.014]								0.0683 [0.026]
MB							0.0077 [0.063]							
growth								-0.1051 [0.295]						
asset_ tang									0.3806 [0.001]					0.3332 [0.005]
fin_slack										0.2932 [0.019]				0.3122 [0.010]
m_cap											0.3914 [0.001]			
m_turnov												-0.1899 [0.000]		-0.1351 [0.001]
DR													0.1741 [0.020]	0.1690 [0.021]

Table 4. Continued

Panel B. Depositary receipts issuers subsample, 123 firms														
Dependent variable: the SOA coefficient														
Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	
intercept	1.0194 [0.000]	1.1787 [0.000]	2.7000 [0.000]	1.1838 [0.000]	1.0139 [0.000]	1.7124 [0.000]	1.4298 [0.000]	1.0162 [0.000]	0.8075 [0.000]	1.2724 [0.000]	1.0488 [0.000]	1.1894 [0.000]	0.9862 [0.000]	
payout	0.0742 [0.430]	0.0851 [0.360]	-1.1094 [0.469]	0.0403 [0.667]	0.0660 [0.478]	-0.0088 [0.934]	-0.0352 [0.712]	0.0766 [0.435]	-0.1202 [0.427]	-0.1595 [0.299]	0.1094 [0.253]	0.0438 [0.641]	-0.3066 [0.045]	
free_float	-0.0037 [0.000]	-0.0039 [0.000]	-0.0045 [0.000]	-0.0015 [0.000]	-0.0037 [0.000]	-0.0032 [0.000]	-0.0041 [0.000]	-0.0037 [0.000]	-0.0037 [0.007]	-0.0037 [0.006]	-0.0032 [0.000]	-0.0040 [0.000]	-0.0035 [0.008]	
age		-0.0178 [0.000]											-0.0277 [0.000]	
size			-0.1075 [0.000]											
leverage				-0.0626 [0.000]									-0.0602 [0.024]	
l. risk proxy					0.0069 [0.888]								0.1259 [0.035]	
LT debt						-0.4696 [0.000]								
MB							0.0243 [0.054]						0.0770 [0.000]	
growth								-0.0141 [0.921]					-0.5275 [0.004]	
asset_tang									0.6654 [0.000]				0.5274 [0.006]	

Table 4. Continued

fin_slack										0.8828 [0.000]							0.7680 [0.001]
m_cap																	
m_turnov																	
F ² /Wald	26.85^b	41.11^b	6.82^a	41.96^b	27.62^a	68.19^b	52.04^b	26.75^b	6.77^a	2.83^a	31.10^b	-0.2726					
chi2 ^b	[0.000]	[0.000]	[0.000]	[0.000]	[0.004]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.001]					7.46^a
Hausman	1.71	3.04	12.66	3.01	7.42	6.83	4.40	2.47	12.25	9.50	5.78	38.27 ^a					40.53
	[0.424]	[0.386]	[0.005]	[0.389]	[0.060]	[0.078]	[0.221]	[0.481]	[0.007]	[0.023]	[0.123]	[0.633]					[0.000]
FE/RE	RE	RE	FE	RE	RE	RE	RE	RE	FE	FE	RE	RE					FE
Year	No	No	No	No	No	Yes	Yes	Yes	No	Yes	No	No					No
dummies																	
Country	No	No	No	No	No	Yes	No	No	-	-	No	No					-
dummies																	
R ² overall	0.0323	0.0441	0.0100	0.0449	0.0340	0.0646	0.0451	0.0324	0.0149	0.0180	0.0370	0.0409					0.0262
# Obs. no.	1207	1207	1207	1207	1191	1207	1199	1207	1207	1207	1207	1207					1183

Explanations: Statistics in bold are statistically significant at the significance level 0.05. P-values are given in brackets.

Table 5. Continued

# Instr no.	13	12	12	13	12	13	13	13	13	13	12	13	13	13	15	15
F	49.49	96.28	97.78	175.93	99.56	212.41	50.47	106.85	112.70	151.70	118.68	97.07	88.51	76.84	74.23	69.50
[p-value]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
AB 1 st ord	-3.37	-2.74	-2.68	-2.73	-2.84	-2.73	-3.42	-2.69	-2.73	-2.73	-2.77	-2.73	-2.82	-3.28	-3.27	-3.28
autocorr.	[0.001]	[0.006]	[0.007]	[0.000]	[0.004]	[0.000]	[0.001]	[0.007]	[0.006]	[0.006]	[0.006]	[0.006]	[0.005]	[0.001]	[0.001]	[0.001]
AB 2 nd ord	0.03	0.59	0.57	0.58	0.63	0.58	-0.23	0.55	0.56	0.59	0.60	0.58	0.69	-0.33	-0.33	-0.33
autocorr.	[0.980]	[0.556]	[0.571]	[0.559]	[0.530]	[0.560]	[0.818]	[0.584]	[0.573]	[0.558]	[0.549]	[0.560]	[0.492]	[0.742]	[0.740]	[0.743]
Hansen	13.30	9.93	8.82	9.94	11.27	9.75	16.85	9.45	10.09	10.10	10.44	9.80	9.67	11.46	10.39	11.78
over. restr.	[0.065]	[0.192]	[0.266]	[0.192]	[0.127]	[0.203]	[0.018]	[0.222]	[0.183]	[0.183]	[0.165]	[0.200]	[0.208]	[0.120]	[0.168]	[0.108]

Panel B. Depositary receipts issuers subsample, 123 firms

Dependent variable: the SOA coefficient

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Intercept	0.4012 [0.692]	0.5740 [0.442]	0.0383 [0.001]	0.0167 [0.019]	0.0179 [0.001]	-0.0408 [0.902]	0.0114 [0.136]	0.0192 [0.014]	0.0158 [0.022]	0.0174 [0.001]	0.0089 [0.153]	0.0132 [0.042]	0.0418 [0.001]
$D_{i,t-1}$	0.4075 [0.417]	0.3690 [0.044]	0.3667 [0.017]	0.3790 [0.019]	0.4215 [0.007]	0.3606 [0.039]	0.4774 [0.021]	0.3403 [0.066]	0.3723 [0.025]	0.3725 [0.029]	0.3713 [0.033]	0.3779 [0.027]	0.3273 [0.040]
$E_{i,t}$	0.0915 [0.530]	0.1565 [0.001]	0.1546 [0.024]	0.1543 [0.008]	0.1048 [0.096]	0.1625 [0.003]	0.1916 [0.094]	0.1581 [0.003]	0.1621 [0.006]	0.1460 [0.036]	0.1675 [0.004]	0.1631 [0.004]	0.1585 [0.008]
free_float	0.0000 [0.690]												
age		0.0004 [0.413]	-0.0014 [0.008]										-0.0014 [0.006]
size													
leverage				-0.0004 [0.537]									
lnrisk proxy					0.0024 [0.389]								
LT debt						-0.0227 [0.027]							
MB							-0.0008 [0.608]						
growth								-0.0235 [0.000]					-0.0246 [0.000]
asset_tang									-0.0022 [0.664]				
fin_slack										-0.0031 [0.687]			

Table 5. Continued

m_cap	0.0040 [0.095]											
m_turnov												
SOA	0.5925	0.631	0.6333	0.621	0.5785	0.6394	0.5226	0.6597	0.6277	0.6275	0.6287	0.0038
Country ef	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Year ef	Yes	Yes	No	No	No	Yes	No	No	No	No	No	No
# Obs. no.	1426	1634	1634	1934	1628	1634	1584	1634	1634	1632	1634	1634
# Instr. no.	13	13	12	12	12	12	12	12	12	12	12	13
F	21.15	26.99	38.18	43.22	31.39	46.38	27.97	36.53	36.07	38.93	39.86	36.24
AB 1 st ord	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
autocorr.	-1.15	-1.65	-1.65	-1.68	-1.71	-1.64	-2.76	-1.62	-1.67	-1.65	-1.67	-1.68
	[0.251]	[0.100]	[0.099]	[0.093]	[0.087]	[0.100]	[0.006]	[0.106]	[0.094]	[0.099]	[0.095]	[0.093]
AB 2 nd ord	0.27	-0.43	-0.46	-0.43	-0.68	-0.44	-0.51	-0.49	-0.41	-0.48	-0.40	-0.39
autocorr.	[0.789]	[0.671]	[0.643]	[0.666]	[0.494]	[0.660]	[0.607]	[0.627]	[0.680]	[0.629]	[0.693]	[0.696]
Hansen	18.45	14.53	12.20	12.08	11.57	10.67	21.88	14.17	12.79	12.49	13.82	13.25
over. restr.	[0.010]	[0.043]	[0.094]	[0.098]	[0.116]	[0.154]	[0.003]	[0.048]	[0.077]	[0.086]	[0.055]	[0.063]

Explanations: AB – the Arellano-Bond test of autocorrelation of error term; Hansen over. restr. – the Hansen test of overidentifying restrictions; instruments for first-differenced equations: $E_{i,t-1}$, $E_{i,t-2}$, $D_{i,t-2}$, $D_{i,t-1}$; levels of exogenous determinants; country dummies; year dummies; country & year dummies (if considered in the specification); p-values are given in brackets; statistics in bold are statistically significant at the significance level 0.05.