Business cycles and dividend payments: A study in the Brazilian market

Ciclos econômicos e pagamentos de dividendos: Um estudo no mercado brasileiro

Renato Henrique Gurgel Mota and Angelica Maria Constantino de Moura

Federal University of Rio Grande do Norte, Natal, RN, Brazil

Authors' notes

Renato Henrique Gurgel Mota is now an associate professor in the Department of Accounting Sciences at the Federal University of Rio Grande do Norte; Angelica Maria Constantino de Moura is now an accounting analyst at Alesat Combustíveis S.A.

Correspondence concerning this article should be addressed to Renato Henrique Gurgel Mota, Avenida Senador Salgado Filho, 3000, Lagoa Nova, Natal, Rio Grande do Norte, Brazil, ZIP code 59078-900. Email: renato.mota@ufrn.br

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Abstract

Purpose: To analyze the behavior of the dividend distribution of publicly traded Brazilian companies according to the effects of the business cycles, comparing the stages of recovery, expansion, recession, and contraction (Schumpeter, 1935) with the stages of expansion and recession according to the National Bureau of Economic Research (NBER).

Originality/value: According to Schumpeter (1935), classifying the stages of the business cycle presents greater details to the NBER method because the four stages show different characteristics that are not observed when only the two stages of the NBER model are used.

Design/methodology/approach: Information was collected from 243 publicly traded companies listed on the Brazilian Stock Exchange between 1997 and 2021 to achieve the research objective. Data were obtained from the Refinitiv database, using panel data regression models with random effects to analyze two hypotheses defined in this study. The hypotheses state that the behavior of the relationship between the payment of dividends and the stages of the NBER's bearish (high) business cycles is different from the recession and contraction stages (recovery and expansion), according to Schumpeter.

Findings: The results indicated the non-rejection of the hypotheses, reinforcing the importance of the analysis of the four stages of the business cycles and complementary form by investors, analysts, managers, and other users when analyzing the payment of dividends by publicly held companies at the different levels of economic activity in the country.

Keywords: dividends, payout, economic crises, business cycles, GDP variation

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Resumo

Objetivo: Analisar o comportamento da distribuição de dividendos das empresas brasileiras de capital aberto de acordo com os efeitos dos ciclos econômicos, comparando as fases de recuperação, expansão, recessão e contração (Schumpeter, 1935) com as fases de expansão e recessão conforme o National Bureau of Economic Research (NBER).

Originalidade/valor: O método de classificação das fases dos ciclos econômicos de acordo com Schumpeter (1935) apresenta maiores detalhes em relação ao método NBER. As quatro fases apresentam características diferentes e não são observadas quando usadas apenas as duas fases do modelo do NBER.

***Design*/metodologia/abordagem:** Para atingir o objetivo da pesquisa, foram coletadas informações de 243 empresas de capital aberto listadas na Bolsa de Valores Brasileira entre os anos 1997 e 2021. Os dados foram obtidos na base de dados da Refinitiv, e utilizaram-se os modelos de regressão de dados em painel com efeitos aleatórios para analisar duas hipóteses definidas neste estudo. As hipóteses afirmam que o comportamento da relação entre o pagamento de dividendos e as fases dos ciclos econômicos de baixa (alta) do NBER é diferente em relação às fases de recessão e contração (recuperação e expansão) conforme Schumpeter.

Resultados: Os resultados indicaram não rejeição das hipóteses, reforçando a importância da análise das quatro fases dos ciclos econômicos e de forma complementar por investidores, analistas, gestores e demais usuários ao analisar o pagamento de dividendos por companhias abertas nos diferentes níveis de atividade econômica do país.

Palavras-chave: dividendos, payout, crises econômicas, ciclos econômicos, variação do PIB

INTRODUCTION

In recent decades, several studies have dealt with dividend policy, such as the studies by Lintner (1956), Gordon (1963), and Miller and Modigliani (1961) on the relevance and irrelevance of dividend payments to the company (Ambrozini, 2011). According to Bhattacharya (1979), the distribution of dividends plays an essential role in the market, being used by managers as a positive or negative signal of the company's cash flow (Novis & Saito, 2003; Vancin & Procianoy, 2016a; Santos & Galvão, 2015).

Moreiras et al. (2012) present dividends to reduce informational asymmetry and avoid agency conflict between managers and shareholders since the dividend policy decreases the cash flow available by the entity and transmits private information to shareholders. The dividend policy, according to Loss and Sarlo Neto (2006), can be understood as an instrument of the legal protection of the capital market, acting at the level of confidence of investors, defining whether they will want their return in dividends or as a reinvestment for the entity, generating a future capital gain.

Economic aspects can also impact corporate finances and, consequently, dividends paid. According to Schumpeter (1935), crises are elements, or regular, if not necessary, components of a wave-like movement that alternates between stages of prosperity and depression, which have permeated economic life since the beginning of the capitalist era. These economic stages can be modified by external factors that cause crises and the process of innovation in the economic market: wars, revolutions, natural catastrophes, institutional changes (such as changes in trade, policies, banking, and monetary legislation), crop variations as well as weather conditions or diseases, changes in gold production, for example. Therefore, the periods of crisis arise during the stages of recession and contraction, preceding the stages of prosperity and expansion, causing changes in the economic environment, thus generating changes in the cash flow of the entities and, consequently, in the distribution of their dividends.

The classification of the business cycle into two stages, according to the National Bureau of Economic Research (NBER), segregates a cycle into two periods: recession and expansion (Knoop, 2010). In comparison, Schumpeter (1935) classifies business cycles into four stages: recovery, expansion, recession, and depression, thus allowing a more detailed analysis of the period of economic growth by segregating this stage into recovery and expansion and the stage of decline of economic activity into recession and contraction.

In studies conducted in the Brazilian stock market, Decourt and Procianoy (2012) identified that companies, despite periods of crisis, continue

increasing dividend payments, meaning that these payments constitute a protection to shareholders because, even if stock prices fall, investors continue to earn good dividends. In a similar analysis, Leite et al. (2020) separately studied the period of prosperity (2010–2013) and crisis (2014–2016) concerning the payment of dividends. They found that companies paid more dividends, on average, in periods of crisis, even suffering a loss of performance during this period (Leite et al., 2020). In a study with companies listed in Brazil, Bolsa, and Balcão (B3) on the behavior of dividends in periods of recession and expansion in the period from 1995 to 2016, Martucheli et al. (2021) identified higher levels of dividend payment in the recession stage than in the expansion period.

In international markets, this scenario is also controversial. For example, Bliss et al. (2015) identified that companies decrease dividend payments during crises to build cash reserves and preserve their investments, considering the period of the crisis generated by the COVID-19 pandemic.

The studies mentioned above analyzed the distribution of dividends using specific periods or the classification of two stages according to the NBER. However, the analysis of the four stages of the cycles, according to Schumpeter (1935), may bring new implications on the subject, so the following research problem arises: What is the dividend payment behavior of publicly traded Brazilian companies during the stages of economic cycles as measured by Schumpeter and the NBER?

To answer the problem of the study, we defined the following objective: to analyze the dividend distribution behavior of publicly traded Brazilian companies according to the effects of the business cycles, comparing the stages defined by Schumpeter (1935) to the NBER model.

The study of business cycles is critical because, due to the competitive market and recessionary economic cycles, entities have started to place in their financial analyses the figure of economic crises, as they can influence the change of business strategies, thus contributing to the market (investors) who will have more information about the dividend's behavior in different stages of business cycles (Leite et al., 2020).

The present study seeks to contribute to the literature by comparing the four stages of the business cycles proposed by Schumpeter (1935) to the one proposed by the NBER. This last model is considered insufficient to investigate dividend payments, as it does not identify minor oscillations such as recovery and contraction (Paulo & Mota, 2019).

This research uses a sample of publicly held companies from 1997 to 2021. This broader temporal space stands out from previous studies. In this

period, Brazil experienced recessions of which the following stand out: the global financial crisis of 2007–2008, the crisis of 2014 caused by the economic policy of Dilma Rousseff's government and the devaluation of commodities, and the crisis of 2020 with the coronavirus pandemic (Comitê de Datação de Ciclos Econômicos [Codace], 2023). Despite all this period of crises, studies that relate stages of cycles and dividends remain scarce in the literature.

The payment of dividends is a form of protection to shareholders, acting as a sign of the expected cash flows of companies in an environment of imperfect information. Therefore, dividends can control the performance of management, preventing investments in projects with low returns, thus justifying the importance of this study by launching new knowledge about the dividend payment behavior according to the stages of the business cycles (Bhattacharya, 1979; Jensen, 1986; La Porta et al., 2000; Fonteles et al., 2012; Martins et al., 2021).

LITERATURE REVIEW

Dividend policy

Academic discussions about dividend theory began in the last century, with Lintner (1956) explaining the reluctance of managers to change dividend policies for fear of having to reverse this decision in the future. The study found that the change in dividends does not follow the same proportion as the change in profits. Managers prefer to keep dividends constant (Dividend Persistence Theory) even if they do not follow proportionally the increase in profits (Ambrozini, 2011).

Years later, Miller and Modigliani (1961) presented a theory contrary to that of Lintner (1956), stating that dividends are irrelevant to the value creation of an entity since distributing dividends or reinvesting profits in the company would have the same effect because by reinvesting the gains in the entity, it will consequently generate an appreciation of its shares in the future, and thus increase the gain of investors (Martins et al., 2021).

In 1963, Myron Gordon demonstrated his contrary view to the Dividends Irrelevance Theory, in which he treated shareholders as individuals who make not-so-rational decisions since, in a situation of uncertainty, they prefer to receive dividends than to expect a particular appreciation of the entity's capital by having the profit reinvested in it (Ambrozini, 2011).

Another critical aspect of dividends is related to informational asymmetry. It is more common for managers to know more than external investors

about the actual state of the company's current earnings (Miller & Rock, 1985), so there will be a conflict of interest explained by the Agency Theory, in which the payment of dividends assumes an important reducing role, decreasing resources under the control of managers so that the portion of the profit obtained by the company is distributed to its owners (Miller & Rock, 1985; Martins et al., 2021). It is possible to highlight that economic fluctuations will also imply in the results of the firms, therefore, in the payment of dividends by the managers, thus changing the volume of resources under their control.

Free cash flow as a dividend return causes the entity to be "well regarded" by the capital market, valuing the share price and satisfying shareholders (Bhattacharya, 1979; Jensen, 1986). In this scenario, a model arises in which the payment of dividends acts as a signal of the expected cash flows of companies in an environment of imperfect information (Bhattacharya, 1979). Signaling theory is used here to explain the behavior of managers who maintain the level of dividend payment even in periods of crisis, signaling to the market their financial capacity to support the reduction of economic activity.

In addition to economic factors, legislative and tax rules influence the distribution of profits to shareholders. In Brazil, there are two forms: the distribution of dividends, which is not taxed, and the Interest on Equity Capital (Juros Sobre Capital Próprio [JSCP]), which generates taxation to the shareholder and tax benefit to the entity (Decourt & Procianoy, 2012).

In addition, Brazil has weak legal protection for minority shareholders, forcing companies to pay dividends, being regulated by Law no. 6,404/1976, which deals with the joint-stock company (sociedades por ações), establishing the figure of mandatory dividends (La Porta et al., 2000; Vancin & Procianoy, 2016b). In Brazil, Law no. 6,404/1976 determines the distribution of half of the adjusted net income when there is an omission in The Bylaws and at least 25% when there is a subsequent change on this issue. In the case of publicly held companies after the enactment of Law no. 6,404/ 1976, the fixing of the mandatory minimum dividend is free.

Business cycles

NBER economists classify business cycles into two periods: recession and expansion, with recession defined as two or more consecutive quarters of negative gross domestic product (GDP) growth, while expansion implies two or more successive quarters of positive GDP growth. During this cycle, the peak of an expansion dates to the beginning of a recession, in which the

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economic peak occurs when the level of GDP reaches its maximum before it begins to decline, and the trough of a recession is the moment when GDP falls to its lowest level before it starts to rise again (Knoop, 2010).

Periods of economic growth are closely associated with financial crises. In such a way that prosperity causes depression, and depression causes prosperity, new ventures arise in times of crisis. Consequently, according to this theory, during periods of crisis, entrepreneurs have a greater capacity for initiative, with the support of the discoveries of scientists and inventors, creating opportunities capable of generating investments, growth, and employment, thus causing the "rebalancing" of the economy, since this impulse creates new waves of growth (Schumpeter, 1997).

Regarding the payment of dividends in times of crisis, Bliss et al. (2015) state that during the recession stage, the entities need to recover and thus be able to grow again; therefore, they carry out spending restraints, preserving a more significant portion of their cash flow, reducing the distribution of dividends. However, Decourt and Procianoy (2012) identified that even in periods of crisis, dividend distributions continue to grow, and a possible explanation for this event is the high levels of payout (dividend payments) of companies, which are considered a form of protection by shareholders during periods of economic instability. However, a high payout can impact the entity's growth, as it distributes its resources by paying dividends, reducing the options available for investment (Decourt & Procianoy, 2012).

Lindén et al. (2023) examined whether the ownership structure of Finland's public firms influenced dividend payments during the COVID crisis. The results indicate a significant relationship between shareholder concentration and higher dividend pay changes. In addition, the study showed that managers are reluctant to reduce dividends even in times of crisis.

Analyzing the firms of the G7, Ntantamis and Zhou (2022) found different results among the countries of the Group. For example, the United Kingdom, Germany, France, and Italy broadly reduced dividends, while companies in the United States and Canada made more share buybacks to reduce cash payments.

Leite et al. (2020) observed in a sample of 64 Brazilian companies between 2010 and 2016 the determining factors of the payment of dividends during the stages of prosperity and crisis. The study found that entities in periods of economic turbulence experience a performance loss. However, they do not decrease the levels of dividend payments during recessionary periods (Leite et al., 2020).

Martucheli et al. (2021) identified the dividend distribution behavior of Brazilian companies listed on the B3 stock market during periods of recession

and expansion of the Brazilian economy, using a sample of 987 companies over 22 years (1996–2016). As a result, it has been observed that entities pay more dividends in periods of recession than in periods of economic expansion, signaling to the market that it is doing well financially.

Previous studies on the subject were based on segregating cycles into two stages. However, according to Schumpeter (1935), cycles are a wave movement composed of the stages of expansion, recession, depression, and recovery, in which economic growth occurs in the first two stages, while decline occurs in the last two stages. According to Kuznets (1940), one of Schumpeter's followers, innovation causes an imbalance in the economy, causing each stage to present different characteristics: 1. the expansion stage is characterized by an increase in economic activity (GDP), with a fall in unemployment and rising prices, companies are constantly growing their production and investing in new opportunities; after the expansion stage; 2. in recession, there is a decline in economic activity, the unemployment rate rises again, and the prices of goods and services fall; when economic activity continues to decline; 3. the contraction stage sets in, characterized by increasingly worse indicators for GDP, employment, consumption, investment, production, personal income, and profits; and 4. the recovery stage, marks the end of these cycles of reduced economic activity, GDP grows again, increasing the number of hires, increasing production and prices begin to rise more moderately until they enter equilibrium again.

As seen earlier, the classification of the four stages of the business cycle produces more information regarding the period of prosperity and decline of economic activity than the classification of the NBER, and the characteristics of these stages are distinct. In this context, the recession stage, according to the NBER, unifies the characteristics of contraction and recession explained by Schumpeter (1935), and the decline of the economy in this last stage cited is much more substantial than the previous one, leading to this study establishing the following hypothesis:

- H1: The dividend payment in the recession stage measured according to the NBER metric differs from the recession and contraction stages measured according to Schumpeter.

In line with the previous discussion, the expansion stage measured according to the NBER comprises the expansion and recovery stages according to Schumpeter (1935). Therefore, it has different characteristics, and the expansion is marked by a more substantial growth than that observed in the recovery. Thus, the following hypothesis is presented:

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- H2: The dividend payment in the expansion stage measured according to the NBER metric differs from the expansion and recovery stages measured according to Schumpeter.

METHODOLOGY

Data description

The research sample comprises companies listed on the Brazilian stock exchange from 1997 to 2021. This period covers the publication of Decree no. 2,673 of July 16, 1998, which deals with the payment of dividends or JSCP by federal state-owned companies, in addition to understanding the main crises of the Brazilian market: the effect of the devaluation of the Real (1999), the real estate crisis (2008), the great Brazilian recession (2014–2016) and the crisis caused by the pandemic (2019–2020). The data used in this study were obtained through the Refinitiv platform. The initial sample of the research is composed of 6,576 observations, excluding duplicate values (61), companies with negative revenue (6), zero value (166), and missing data (4,337), totaling a final sample of 2,006 observations. Table 1 describes the sample distributed by the companies' operating sectors.

Table 1

Description of the sample by sector

Sector	Companies	%	Observations	%
Energy	5	2.06	51	2.54
Communication services	8	3.29	60	2.99
Financials	8	3.29	74	3.69
Information technology	11	4.53	59	2.94
Health care	15	6.17	85	4.24
Consumer staples	18	7.41	180	8.97
Real estate	20	8.23	125	6.23
Materials	23	9.47	228	11.37
Utilities	32	13.17	393	19.59

(continues)

Table 1 (conclusion)

Description of the sample by sector

Sector	Companies	%	Observations	%
Industrials	44	18.11	328	16.35
Consumer discretionary	59	24.28	423	21.09
Total	243	100	2,006	100

The firms were classified by sector according to the global industry classification standard (gics). the companies are distributed among 11 sectors, of which durable consumer goods (59), industry (44), and public services (32) have the largest number of companies/observations in the sample. The sectors with the lowest participation are financial (8), communication services (8), and energy (5), the latter being composed of companies producing oil, gas, and biofuels.

The sample includes companies that historically pay more dividends, such as the Financial and Electric Power sectors (included in Public Services) and companies in the Real Estate and Consumer Goods sectors, which usually pay less than average (Galvão et al., 2018).

Classification of business cycles
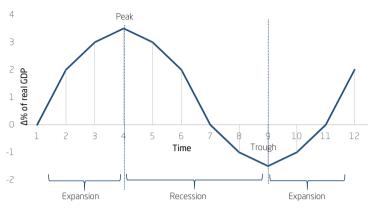
This study aims to verify the behavior of dividends in Brazilian companies using the classification methodology of cycles according to NBER and Schumpeter (1935), called only Schumpeter below.

Model NBER

The stages of the business cycles of the NBER model were classified considering the actual variation of GDP to the same period of the previous year, as shown in Figure 1.

Figure 1

Stages of a business cycle according to the NBER

Source: Adapted from Paulo and Mota (2019).

The peaks and troughs of the business cycles were defined according to Claessens et al. (2012), in which a complete economic cycle is composed of two stages: the recession stage (from the peak to the valley) and the expansion stage (from the valley to the next peak). Specifically, a peak in a quarterly series occurs at time t if:

$$y_t = \left[(y_t - y_{t-2}) > 0, (y_t - y_{t-1}) > 0\right] \text{ and } \left[(y_{t+2} - y_t) < 0, (y_{t+1} - y_t) < 0\right] \tag{1}$$

Similarly, the trough of a quarterly series occurs at time t if:

$$y_t = \left[(y_t - y_{t-2}) < 0, (y_t - y_{t-1}) < 0\right] \text{ and } \left[(y_{t+2} - y_t) > 0, (y_{t+1} - y_t) > 0\right] \tag{2}$$

Schumpeter's model

We used the quarterly variations of real GDP over the sample period to calculate the economic fluctuations according to Schumpeter. Its average was considered the equilibrium trend that Schumpeter mentioned (1935), segregating the stages of expansion and recession from the stages of contraction and recovery, thus having the model of business cycles with four stages (Paulo & Mota, 2019). Figure 2 demonstrates this classification of cycles.

Figure 2

Stages of a business cycle–Schumpeter model

Source: Paulo and Mota (2019).

The financial data of the companies were collected annually, using the stages of the last quarters of each fiscal year to represent the level of economic activity of that period, according to Paulo and Mota (2019).

Econometric models

To observe the behavior of dividend payments according to the two models of business cycles (NBER and Schumpeter), we used panel data regression models, which, according to Fávero and Belfiore (2017), are helpful to study the behavior of a phenomenon (dependent variable) in the presence of grouped data, with repeated measures, based on the studies of Forti et al. (2015) and Vancin and Procianoy (2016b).

To compare the models of the NBER and Schumpeter business cycles, we estimated regressions as described in equations 3 to 5 used to test H1 and equations 6 to 8 for H2.

To test the differences between the stages of low GDP, in this case, the recession stage by the NBER as the stages of recession and contraction according to Schumpeter, about dividend payments, we analyzed the data that relate payout with dummies variables representing the business cycles measured according to the NBER and Schumpeter. Initially, the variables were tested individually with the control variables (Equation 3). Right after, the two variables of the bearish cycle, recession and contraction, are included in the model, according to Schumpeter (Equation 4). Finally, one of the high

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cycles is because there is no reference to choose which stage should be omitted or not in the case of analyzing the effects of all stages in the same regression (Equation 5). The equations are described below:

$$Payout_{it} = \beta 0_{it} + \beta 1_{it}\, STAGE\_low\_NBER_t + \beta 2_{it}\, Control_{it} + \varepsilon_{it} \qquad (3)$$

$$Payout_{it} = \beta 0_{it} + \beta 1_{it}\, STAGES\_low\_S_t + \beta 2_{it}\, Control_{it} + \varepsilon_{it} \qquad (4)$$

$$Payout_{it} = \beta 0_{it} + \beta 1_{it}\, STAGES\_low\_S_t + \\ \beta 2_{it}\, STAGE\_High\_S_t + \beta 3_{it}\, Control_{it} + \varepsilon_{it} \qquad (5)$$

To analyze the relationship between payout and the stages of the GDP high cycles, a strategy like that described for the low stages was used, according to the equations below:

$$Payout_{it} = \beta 0_{it} + \beta 1_{it}\, STAGE\_High\_NBER_t + \beta 2_{it}\, Control_{it} + \varepsilon_{it} \qquad (6)$$

$$Payout_{it} = \beta 0_{it} + \beta 1_{it}\, STAGES\_High\_S_t + \beta 2_{it}\, Control_{it} + \varepsilon_{it} \qquad (7)$$

$$Payout_{it} = \beta 0_{it} + \beta 1_{it}\, STAGES\_High\_S_t + \\ \beta 2_{it}\, STAGE\_Low\_S_t + \beta 3_{it}\, Control_{it} + \varepsilon_{it} \qquad (8)$$

According to Schumpeter, in the models described above, *STAGES_High_S* represents the variables of the recovery and expansion stages, and *STAGES_low_S$_t$* represents the recession and contraction stages. The description of the variables is shown in Table 2.

Table 2
Description of the regression variables

Panel A. Independent variable			
Variable	Definition of the indicator	Expected signal	Sources
Payout	Payment of JSCP and Dividendsit Net incomeit (TR. F.DivPayoutRatioPct)	-	Forti et al. (2015), Vancin and Procianoy (2016a), and Martucheli et al. (2021)

(continues)

Table 2 (continuation)

Description of the regression variables

Panel B. Variables of interest			
Variable	Definition of the indicator	Expected signal	Sources
N_Recession	Economic recession, according to the NBER. The dummy variable is 1 for the cycle stage and zero for the other stages.	- or +	
N_Expansion	Economic expansion, according to the NBER. The variable dummy is 1 for the stage of the cycle and zero for the other stages.	- or +	
S_Recession	Economic recession, according to Schumpeter. The dummy variable is 1 for the cycle stage and zero for the other stages.	- or +	Paulo and Mota (2019)
S_Expansion	Economic expansion, according to Schumpeter. The dummy variable is 1 for the cycle stage and zero for the other stages.	- or +	
S_Contraction	Economic contraction, according to Schumpeter. The dummy variable is 1 for the cycle stage and zero for the other stages.	- or +	
S_Recovery	Economic recovery, according to Schumpeter. The dummy variable is 1 for the cycle stage and zero for the other stages.	- or +	
Panel C. Control variables			
Size	Natural logarithm of the total assets of the enterprise i in the period t (TR. F.TotAssets)	+	Forti et al. (2015)
Growth (growth opportunity)	Revenue Oper. Net.it – Rec. Oper. Net. IT-1 Revenue Oper. Net.it-1 (TR. InvtrRevenue)	-	Galvão et al. (2018)

(continues)

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Table 2 (conclusion)

Description of the regression variables

Panel C. Control variables			
Variable	Definition of the indicator	Expected signal	Sources
LEV (financial leverage)	Total debtit Total assetsit (TR. F.DebtTot/ TR. F.TotAssets)	-	Al-Gharaibeh et al. (2013), Esqueda (2016), Chu (2018), and Martucheli et al. (2021)
Free cash flow per share (FCF)	It is the total operating cash flow after removing taxes, financial expenses, and expenditures on assets over one year. (TR. F. LeveredFOCFPerShr)	+	Al-Gharaibeh et al. (2013)
Price to book (PtB)	Price valueit Book valueit (TR. InvtrPricetoBook)	+	Kulchania (2016) and Forti et al. (2015)
COVID-19	The dummy variable is 1 for 2020 and 2021 and zero for the other stages.	-	Lindén et al. (2023) and Ntantamis and Zhou (2022)

Regarding the control variables, Al-Gharaibeh et al. (2013) and Martucheli et al. (2021) showed that companies with higher assets have a greater distribution of dividends, while more indebted companies distribute fewer dividends since they use their profits to pay their debts (Chu, 2018; Martucheli et al., 2021). As for the variable growth opportunity, a contrary movement is expected compared to dividend yields because companies with higher growth opportunities tend to retain more profits to invest in projects and consequently have lower levels of dividend payments, so a negative sign is expected between the payout and growth opportunity variables (Esqueda, 2016).

Dividend payments are positively related to free cash flows, as companies with high uncertainty in cash flows tend to decrease dividend payouts and increase share buybacks (Kulchania, 2016). Therefore, companies that run cash surpluses prefer to make dividend payments, reducing managerial discretionary funds and agency problems between managers and shareholders (Jensen, 1986; Al-Gharaibeh et al., 2013).

As for the relationship between the variables market to book and Payout, Lintner (1956) identified the payment of premiums in the value of the shares

of dividend-paying companies (Forti et al., 2015). Therefore, the market is expected to increase the pricing of entities that present a better present and future cash flow for shareholders, increasing their market to book (Forti et al., 2015).

FINDINGS

Descriptive analysis

The sample's descriptive statistics are presented in Table 3, segregated into a general sample in Panel A, and in the stages of recession and expansion according to the NBER (Panel B and C).

Table 3

Description of the general sample and segregated by stage according to the NBER method

Panel A. Sample description—General					
Variables	N.	Mean	Standard deviation	Min.	Max.
Payout	2006	0.6694	1.5173	0.0169	13.8509
Size	2006	22.2662	1.5695	18.7372	26.1917
Growth	2006	0.1835	0.3057	-0.4313	1.7799
Leverage	2006	0.2788	0.1579	0.0022	0.6822
FCF	2006	-0.7940	12.0142	-98.9515	23.5329
PtB	2006	1.9995	2.5088	0.0404	16.2618
Panel B. Description of the sample according to NBER method—Expansion stage					
Payout	930	0.7643	1.7926	0.0169	13.8509
Size	930	22.3172	1.5832	18.7372	26.1917
Growth	930	0.1418	0.3034	-0.4313	1.7799
Lev	930	0.2738	0.1578	0.0022	0.6822
FCF	930	-0.0641	10.0281	-98.9515	23.5329
PtB	930	2.2637	2.7967	0.0404	16.2618

(continues)

Table 3 (conclusion)

Description of the general sample and segregated by stage according to the NBER method

Panel C. Description of the sample according to the NBER method—Recession stage					
Variables	N.	Mean	Standard deviation	Min.	Max.
Payout	1.076	0.5875	1.2257	0.0169	13.8509
Size	1.076	22.2222	1.5569	18.7372	26.1917
Growth	1.076	0.2196	0.3033	-0.4313	1.7799
Leverage	1.076	0.2830	0.1580	0.0022	0.6822
FCF	1.076	-1.4248	13.4704	-98.9515	23.5329
PtB	1.076	1.7711	2.2062	0.0404	16.2618

When observing the mean of the variable Payout Panels A and B, we noted that the expansion period (0.7643) of the NBER model presents a higher level of dividend payment when compared to the recession stage (0.5875), that is, on average, in periods of expansion the companies pay more dividends to their net income than in the recession period, in line with the findings of Leite et al. (2020). We highlight the results of growth opportunities that present a higher average in the recession stage than in the expansion stage (0.2196 and 0.1418), indicating that in this stage, there are greater positive variations in net operating revenue; the variable FCF presents a more negative value in the recession stage, indicating that this period is marked by less financial slack and the variable PtB that is also lower in the recession stage, indicating a decrease in the indicator probably caused by the reduction in the price of the shares in this period.

Table 4 shows the description of the data according to Schumpeter, dividing the stages of the business cycles into four.

When comparing the stages according to Schumpeter, we noticed that the average dividend payments decrease in the stages of recession and contraction (0.6120 and 0.5646), returning to increase in the recovery and expansion stages (0.6498 and 0.9063). In addition, it shows that this behavior is also different between the high and low stages of GDP, which is one of the justifications for analyzing the economic stages segregated into four instead of two. Another highlight is the FCF variable, with the highest negative average in the recession stage (-2.3280), indicating a decrease in the company's cash generation and improvement of this situation only in the recovery (0.8564).

Table 4

Description of the sample segregated by stage according to Schumpeter's model

Panel A. Description of the sample according to Schumpeter—Recovery stage					
Variables	N.	Mean	Standard deviation	Min.	Max.
Payout	515	0.6498	1.3758	0.0169	13.8509
Size	515	22.4605	1.5839	18.7372	26.1917
Growth	515	0.1035	0.2449	-0.4313	1.7799
Leverage	515	0.2838	0.1617	0.0022	0.6822
FCF	515	0.8564	5.2367	-98.9515	23.5329
PtB	515	2.4559	2.9020	0.0404	16.2618
Panel B. Description of the sample according to Schumpeter—Expansion stage					
Payout	415	0.9063	2.1964	0.0169	13.8509
Size	415	22.1392	1.5661	18.7372	26.1917
Growth	415	0.1893	0.3578	-0.4313	1.7799
Leverage	415	0.2615	0.1521	0.0022	0.6822
FCF	415	-1.2065	13.7568	-98.9515	23.5329
PtB	415	2.0252	2.6442	0.0404	16.2618
Panel C. Description of the sample according to Schumpeter—Recession stage					
Payout	518	0.6120	1.2965	0.0169	13.8509
Size	518	22.0811	1.4949	18.7372	26.1917
Growth	518	0.1844	0.2630	-0.4313	1.7799
Leverage	518	0.2820	0.1507	0.0022	0.6822
FCF	518	-2.3280	16.0427	-98.9515	23.5329
PtB	518	1.6516	1.9266	0.0404	16.2618
Panel D. Description of the sample according to Schumpeter—Contraction stage					
Payout	558	0.5646	1.1567	0.0169	13.8509
Size	558	22.3532	1.6027	18.7372	26.1917
Growth	558	0.2523	0.3333	-0.4313	1.7799
Leverage	558	0.2840	0.1646	0.0022	0.6822
FCF	558	-0.5863	10.4809	-98.9515	23.5329
PtB	558	1.8821	2.4336	0.0404	16.2618

Continuing the descriptive analysis, Table 5 presents the Spearman correlation matrix of the study variables.

Table 5

Spearman's correlation matrix

Panel A. Part 1						
Variables	Payout	S_EXP.	S_REC.	S_CONT.	S_RECOV.	N_EXP.
Payout	1					
S_EXP.	0.0561**	1				
S_REC.	0.0152	-0.3013***	1			
S_CONTR.	-0.0582***	-0.317***	-0.3663***	1		
S_RECOV.	-0.0075	-0.3002***	-0.3468***	-0.3648***	1	
N_EXP.	0.0390*	0.5494***	-0.5485***	-0.5771***	0.6322***	1
N_REC.	-0.0390*	-0.5494***	0.5485***	0.5771***	-0.6322***	-1
Size	0.0809***	-0.0485**	-0.0747***	0.0362	0.0827***	0.0331
Growth	-0.1147***	-0.0219	0.0505**	0.1741***	-0.2090***	-0.2008***
Leverage	0.012	-0.0543**	0.0216	0.0113	0.0171	-0.0291
FCF	0.1565***	-0.0007	-0.1101**	-0.0238	0.1354***	0.1180***
PtB	0.0807***	-0.0109	-0.0725**	-0.0498**	0.1338***	0.1083***
Panel B. Continued						
Variables	N_REC.	Size	Growth	Leverage	FCF	PtB
N_REC.	1					
Size	-0.0331	1				
Growth	0.2008***	-0.0242	1			
Leverage	0.0291	0.2758***	0.0104	1		
FCF	-0.1180***	0.1080***	-0.1783***	-0.1072	1	
PtB	-0.1083***	0.0258	0.1466***	0.1094*	0.0066	1

Through panel A, the payout variable presents a positive correlation between the independent variables size, financial leverage, cash flow, and market-to-book. As we expected, the stage variables are strongly correlated with them since they are only dummies representing periods of the business

cycles. When analyzing the relationship between the stages of the business cycles and payout, in the NBER model, a positive relationship is perceived between the expansion stage and a negative relationship in the recession stage, indicating that companies pay more (less) dividends in these stages, respectively. However, according to Schumpeter, recovery has a negative sign for payout and a positive sign for expansion when observing the stages of GDP growth. We also observed different signs for low GDP behavior, with a negative sign for contraction and a positive sign for recession, further reinforcing the justification of this study when the importance of segregating the stages of the business cycles into four. This analysis will be further explored in the next section.

Analysis of dividend payments in the stages of business cycles

We used unbalanced panel data regressions to test hypotheses 1 and 2 of this study. After performing the Breusch-Pagan, Hausman, and Chow F tests to verify which model best fits the research data, whether pooled, random, or fixed effects, we opted for the model with random effects for all models of the study. The Jarque-Bera normality tests indicated that the data were not standard; however, due to the large sample size, this assumption was relaxed according to the central limit theory (Wooldridge, 2014). The Wooldridge test indicated the absence of autocorrelation, and the Wald test showed heteroscedasticity in the data, so the models were estimated using White's correction. The VIF test for multicollinearity resulted in an average of 1.27, indicating the absence of multicollinearity.

Table 6 presents the results of the regressions according to equations 3 to 5, used to test the first hypothesis.

Table 6

Relationship between payout and business cycles (low economic stages by NBER and Schumpeter)

Dependent	Eq. 3a	Eq. 3b	Eq. 3c	Eq. 4	Eq. 5a	Eq. 5b
	Payout	Payout	Payout	Payout	Payout	Payout
N_Recession	-0.112*					
	(-1.780)					
S_Recession		-0.110		-0.139*	-0.036	-0.243**
		(-1.551)		(-1.805)	(-0.437)	(-2.044)

(continues)

Table 6 (continuation)

Relationship between payout and business cycles (low economic stages by NBER and Schumpeter)

Dependent	Eq. 3a	Eq. 3b	Eq. 3c	Eq. 4	Eq. 5a	Eq. 5b
	Payout	Payout	Payout	Payout	Payout	Payout
S_Contraction			-0.041	-0.086	0.001	-0.207*
			(-0.601)	(-1.165)	(0.007)	(-1.872)
S_Expansion					0.208	
					(1.551)	
S_Recovery						-0.208
						(-1.551)
Size	-0.015	-0.015	-0.014	-0.015	-0.012	-0.012
	(-0.537)	(-0.541)	(-0.501)	(-0.547)	(-0.437)	(-0.437)
Growth	-0.225***	-0.244***	-0.241***	-0.228***	-0.257***	-0.257***
	(-2.760)	(-3.082)	(-2.922)	(-2.779)	(-3.058)	(-3.058)
Leverage	-0.385	-0.394	-0.401	-0.385	-0.374	-0.374
	(-1.192)	(-1.228)	(-1.243)	(-1.190)	(-1.166)	(-1.166)
FCF	0.001	0.001	0.001	0.001	0.001	0.001
	(0.448)	(0.421)	(0.506)	(0.422)	(0.507)	(0.507)
PtB	0.046	0.048*	0.049	0.047	0.047	0.047
	(1.590)	(1.657)	(1.638)	(1.591)	(1.614)	(1.614)
COVID-19	-0.266***	-0.302***	-0.256***	-0.282***	-0.229***	-0.229***
	(-4.420)	(-4.221)	(-4.044)	(-4.028)	(-4.014)	(-4.014)
Constant	1.567**	1.524**	1.486**	1.555**	1.280*	1.548**
	-2.241	-2.157	-2.151	-2.208	-1.769	-2.193
Observations	2.006	2.006	2.006	2.006	2.006	2.006
Companies	243	243	243	243	243	243
Adj. R-sq within	0.0147	0.0149	0.0133	0.0152	0.0165	0.0165
Adj. R-sq between	0.1256	0.1248	0.1241	0.1257	0.1327	0.1327

(continues)

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Table 6 (conclusion)

Relationship between payout and business cycles (low economic stages by NBER and Schumpeter)

Dependent	Eq. 3a	Eq. 3b	Eq. 3c	Eq. 4	Eq. 5a	Eq. 5b
	Payout	Payout	Payout	Payout	Payout	Payout
Adj. R-sq overall	0.0349	0.0345	0.0337	0.0351	0.037	0.037
F-test	0.0098	0.0088	0.008	0.0123	0.0118	0.0118
Sector control	yes	yes	yes	yes	yes	yes

Note. Robust Z-statistic in parentheses. Sig. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

According to Table 6, the variable N_Recession, which represents the low stage of GDP according to the NBER, presented a negative and significant relationship with payout only at the level of 10% (-0.112), and this relationship loses its significance when the stages of low GDP according to Schumpeter are analyzed, represented by variables S_Recession (-0.110) and S_Contraction (-0.041), separately, as seen in equations 3b and 3c. When analyzing the bearish stages together (Equation 4), only the variable S_Recession is significant, indicating that in the recession stage, the dividend payment is 13.9% lower than in the other stages. The variable S_Contraction is significant only at the level of 10% when analyzed according to Equation 5b, indicating that this characteristic of reduction in the payment of dividends is more robust in the recession. These findings highlight the importance of analyzing the stages of the cycles according to Schumpeter. Therefore, we cannot reject H1.

This reduction in dividend payments in recessionary periods may reflect cash retention managers' decisions to mitigate the adverse financial effects of this period (Ntantamis & Zhou, 2022).

In line with studies conducted in other countries, this research showed reduced shareholder remuneration during an economic downturn (Bliss et al., 2015; Ntantamis & Zhou, 2022). However, this research presented results contrary to those conducted in Brazil previously (Decourt & Procianoy, 2012; Leite et al., 2020; Martucheli et al., 2021). This divergence can be explained by analyzing the stages of the cycles or by a larger time frame instead of specific periods of crisis.

Of the control variables, growth presented statistical significance with a negative sign in all regressions, indicating that the firms that are considered investment opportunities, that is, those with more significant variation in

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the annual operating result, distribute a lower percentage of profit in the same direction as those found in Galvão et al. (2018). The coefficients of the pandemic variable vary between the models, presenting values between -0.229 and -0.302, indicating that shareholder compensation is lower by 22.9% to 30.2% compared to the other stages in the pandemic period, corroborating Ntantamis and Zhou (2022).

Table 7 presents the results of the regressions according to equations 6 to 8, used to test the second hypothesis.

Table 7

Relationship between payout and business cycles (boom stages of the economy by NBER and Schumpeter)

Dependent	Eq. 6a	Eq. 6b	Eq. 6c	Eq. 7	Eq. 8a	Eq. 8b
	Payout	Payout	Payout	Payout	Payout	Payout
N_Expansion	0.112*					
	(1.780)					
S_Expansion		0.222**		0.227**	0.207*	0.243**
		(1.996)		(2.099)	(1.872)	(2.044)
S_Recovery			-0.042	0.016	-0.001	0.036
			(-0.514)	(0.205)	(-0.007)	(0.437)
S_Recession				-0.036		
				(-0.449)		
S_Contraction						0.036
						(0.449)
Size	-0.015	-0.012	-0.013	-0.012	-0.012	-0.012
	(-0.537)	(-0.422)	(-0.473)	(-0.429)	(-0.437)	(-0.437)
Growth	-0.225***	-0.258***	-0.259***	-0.255***	-0.257***	-0.257***
	(-2.760)	(-3.237)	(-3.104)	(-3.063)	(-3.058)	(-3.058)
Leverage	-0.385	-0.375	-0.406	-0.374	-0.374	-0.374
	(-1.192)	(-1.180)	(-1.259)	(-1.167)	(-1.166)	(-1.166)
FCF	0.001	0.001	0.001	0.001	0.001	0.001
	(0.448)	(0.530)	(0.528)	(0.526)	(0.507)	(0.507)

(continues)

Table 7 (conclusion)

Relationship between payout and business cycles (boom stages of the economy by NBER and Schumpeter)

Dependent	Eq. 6a	Eq. 6b	Eq. 6c	Eq. 7	Eq. 8a	Eq. 8b
	Payout	Payout	Payout	Payout	Payout	Payout
PtB	0.046	0.047*	0.050*	0.047	0.047	0.047
	(1.590)	(1.665)	(1.654)	(1.614)	(1.614)	(1.614)
COVID-19	-0.266***	-0.215***	-0.260***	-0.217***	-0.229***	-0.229***
	(-4.420)	(-4.385)	(-4.541)	(-4.368)	(-4.014)	(-4.014)
Constant	1.267*	1.180*	1.291*	1.181*	1.206*	1.170*
	(1.828)	(1.681)	(1.851)	(1.680)	(1.686)	(1.670)
Observations	2.006	2.006	2.006	2.006	2.006	2.006
Companies	243	243	243	243	243	243
Adj. R-sq within	0.014	0.0162	0.0134	0.0163	0.0165	0.0165
Adj. R-sq between	0.1256	0.1329	0.1247	0.1328	0.1327	0.1327
Adj. R-sq overall	0.0349	0.0369	0.0338	0.0369	0.037	0.037
F-test	0.0098	0.0098	0.0065	0.0089	0.0118	0.0118
Sector control	yes	yes	yes	yes	yes	yes

Note. Robust Z-statistic in parentheses. Sig. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

The results of Table 7 showed the variables N_Expansion and S_Expansion significant and with positive signs in all models tested, indicating that the payout is higher in these stages; however, the variable S_Recovery did not present statistical significance, that is, there are indications that in this stage there is no increase in the distribution of profits by the companies. Therefore, according to the results presented, it cannot be said that there is more dividend payment in the whole stage of high GDP since this is valid only for the expansion stage, according to Schumpeter. The coefficients of the variable S_Expansion range from 0.207 to 0.243, indicating a 20.7% to 24.3% higher payout in this stage than the others.

The higher payment of dividends in periods of prosperity is in line with the signaling theory, in which managers try to send positive signals to investors about the financial health of the firm, or even, concerning the asymmetry of information, there is a reduction in the number of financial resources under the control of the agent (Miller & Rock, 1985; Bhattacharya, 1979).

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Therefore, H2 of this study cannot be rejected. This outcome can be elucidated by the fact that these stages of GDP growth present differing characteristics when analyzed in more detail, as when using the four stages of the business cycles (Kuznets, 1940).
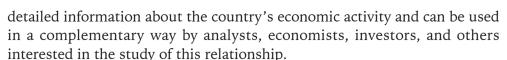
Therefore, according to the results presented, we related that there is a difference in the relationship between payout and the stages of the cycles of the NBER and Schumpeter models. According to Schumpeter, the classification of the cycles stages of the cycles can be used in a complementary way and even more informative when it is necessary to analyze stages of growth and fall of GDP.

FINAL CONSIDERATIONS

The present study aimed to analyze the behavior of the dividend distribution of Brazilian publicly traded companies according to the effects of business cycles, comparing the stages defined by Schumpeter (1935) to the NBER model. Thus, we collected from the Refinitiv database of 243 publicly held companies with shares traded on B3, totaling 2,006 observations, and analyzed the sample using a panel data regression with random effects.

This research analyzed the payment of dividends through the payout index as an analysis strategy. Two hypotheses were defined to better direct the discussions of the present research. The first hypothesis states that the dividend payment in the recession stage measured according to the NBER metric differs from the recession and contraction stages measured according to Schumpeter. According to the NBER, the results of the regressions used to test this hypothesis showed a negative and significant relationship only at 10% between the payout and the recession stage. In comparison, the variables of the stages of the business cycles, according to Schumpeter, presented a negative and significant relationship at the level of 5% for the recession when the recession and contraction stages were included in the model. That is, it was found that companies pay 13.9% to 24.3% less dividends in the recession stage compared to the others.

In addition, it was possible to observe that this reduction in the payment of dividends is even more significant in the contraction stage, corroborating the results of Lim (2016) that justify this reduction in the payment of dividends as an adjustment of the companies' cash flow in periods of economic downturn. Thus, the results indicated the non-rejection of H1 and that the classification of the cycles by the four stages can capture more

detailed information about the country's economic activity and can be used in a complementary way by analysts, economists, investors, and others interested in the study of this relationship.

This research defined a second hypothesis: the dividend payment in the expansion stage measured according to the NBER metric differs from the expansion and recovery stages measured according to Schumpeter. After the results of the tests of the second hypothesis, it was possible to verify that the relationship between payout and the expansion stage, according to the NBER, was significant and positive only at 10%. In comparison, only the expansion stage, according to Schumpeter, presented statistical significance lower than 5%; that is, there are indications that the firms pay around 20% more dividends in this stage to the others; it is not possible to say that this payment is higher in every stage of GDP growth that is included in the expansion stage according to the NBER. Therefore, H2 was not rejected.

The results align with the research conducted in the Brazilian stock market and studies conducted in other countries, bringing relevant results to the literature. It is worth mentioning the importance of this study, especially for investors with a strategy focused on good dividend-paying companies because, during expansion stages, companies tend to pay more dividends. In contrast, there are indications of lower dividend payments in the recession stage.

Given the results, we highlight the importance of investigating the behavior of dividend payments according to Schumpeter's model because the performance of dividends also varies according to minor oscillations such as recession and contraction.

As the limitation of the research, we mention the absence of a robustness test with lagged variables to mitigate endogeneity problems. This study also does not control the effects of adopting International Financial Reporting Standards (IFRS) on the financial statements of Brazilian firms. For future studies, we suggest controlling the entity's life cycle and observing how these companies behave according to each life cycle stage, for example.

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