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International diversification strategies and their effects on the performance of companies listed on B3

Aloisio Pereira Júnior[1], Vinícius Pereira[2],

Universidade Federal de Uberlândia, Uberlândia - MG, Brazil.

[1]aloisio@iftm.edu.br

[2] viniciuss56@ufu.br

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Abstract

Objective: The research seeks to verify whether cash moderated by environmental contingencies (munificence and dynamism) mediates the relation between international diversification and the operational performance of Brazilian exporting companies listed on B3.

Method: The Brazilian exporting companies listed on B3 were analyzed from 2010 to 2020 and multivariate analyses were performed with panel data with fixed and dynamic effects, in the case, using the System-GMM method, through mediation model proposed by Muller, Judd Yzerbyt (2005).

Results: The results indicate that cash, moderated by the instability and growth of the sector, mediate the relation between international diversification and the performance of the exporting companies in the sample. The indirect effect of international diversification on performance is better through greater liquidity of exporting companies in a less unstable and munificent environment. The findings suggest that the managers of exporting companies should analyze the cash reserves in the expansion of the business to the foreign market, taking into account the task environment in which the company operates.

Contributions: The present study brings contributions to the theory by expanding the studies of the effects of international diversification on the companies' performance, suggesting that liquidity has a strategic value in the expansion of business to the foreign market. Empirically, it brings important practical implications on the decision-making process of constitution and liquidity management, by showing that managers of exporting companies ought to analyze the costs and benefits of liquidity and observe the instability and growth of the sector to improve the companies' performance.

Keywords: International Diversification; Cash; Environmental Contingencies; Performance.

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Introduction

The relation between international diversification and organizational performance has been extensively studied in the international business literature, although the findings have shown mixed and, therefore, inconclusive results (Bausch & Krist, 2007; Kirca et al., 2011; Marano, Arregle, Hitt, Spadafora, Essen, 2016).

In light of those controversial discoveries, it is important to analyze the relation between international diversification and performance by verifying additional factors that underlie that relation. Verbeke and Forootan (2012) defend the study of the effect of international diversification on performance under the perspective of mediation, with the addition of other contextual or procedural conditions that may mediate the direct relation between international diversification and performance.

In the present study, cash and environmental contingencies are considered a mechanism that may mediate the direct relation between international diversification and performance. Therefore, we propose the addition of the cash variable, moderated by environmental contingencies, in the analysis of the effects of international diversification on the companies' performance. For that purpose, we analyze the direct effect of international diversification on performance, the effect of international diversification on cash and, consequently, the effect of moderated cash by environmental contingencies on performance.

The studies on the effects of cash retention on company performance have generated contrary conclusions (Almeida, Campello, Cunha, Weisbach, 2004; Fresard, 2010; Nason & Patel, 2016; Rocca & Cambrea, 2018; Rocca, Stagliano, Rocca, Cariola, Skatova, 2019; Aslam, Kalim, Fizza, 2019; Doan, 2020). The opposite results may be due to the different features of companies or their institutional contexts (Doan, 2020), with the environment being one of the main sources of contingencies faced by a company (García-Sánchez, Martínez-Ferrero, Garcia- Benau, 2018).

In accordance with the contingency theory, the organization has a particular configuration of contingencies arising from its own context and the organization's efficacy is related to the conformity between its internal characteristics and external contingencies (Wang & Singh, 2014). According to Jung, Foege and Nuesch (2020), the combination of resources and the organizational task environment (environmental contingencies) influence the company's performance.

Jung et al. (2020) investigated how the dimensions of the organizational task environment, dynamism, complexity and munificence, influence the strategic value of cash, understood as a versatile resource that facilitates the strategic adjustment between the company and the environment. The authors discovered that dynamism and complexity strengthened the relation between cash and performance, and munificence attenuated the relation.

However, those authors did not analyze the moderation between cash and environmental contingencies, adding it as a contextual condition that may mediate the direct relation between international diversification and company performance, then there is that gap in the literature on international finance and business. According to the Resource-Based View (RBV) theory, the company may diversify internationally to acquire resources to contribute to its growth.

Hence, in the present study, it is considered that international diversification allows the company to increase its sales and, consequently, its cash, which may be used in a dynamic and munificent environment, influencing the company's performance.

Therefore, the objective is to verify whether the relation between international diversification and the performance of Brazilian exporting companies listed on B3 is mediated by the moderation between cash and environmental contingencies. The influence of environmental contingencies in emerging economies may be greater than in developed economies, since the fragility of their institutions may generate uncertainty and a random environment (Puffer, Mccarthy, Boisot, 2010), which justifies this research in Brazil, an emerging country, with great political, economic and institutional uncertainties (Miranda, Pimentel, Bezerra, 2018).

The analysis covered the period from 2010 to 2020 because of the availability of the companies' export revenue data. In order to test the hypotheses, multivariate linear regressions were performed with panel data with fixed and dynamic effects, in this case, using the System-GMM method. The results indicate that cash, moderated by instability (dynamism) and sector growth (munificence), mediates the relation between international diversification and the performance of the exporting companies in the sample.

The present study brings contributions to the theory by expanding the studies of the effects of international diversification on the companies' performance, suggesting that liquidity has a strategic value in the expansion of business to the foreign market and that it may be considered, in a context of instability and growth of the sector, a variable that mediates the relation between international diversification and performance.

The research empirically contributes by examining the strategic adjustment of the company's cash in the scope of international diversification, considering the company's environmental contingencies, with important practical implications on the decision-making process of constitution and liquidity management. It brings advances by showing that managers of exporting companies should analyze the costs and benefits of liquidity, by observing the instability and growth of the sector to improve the performance of companies.

2. Theoretical Reference and hypotheses

2.1 International diversification and performance

The study of the effect of international diversification on company performance has been a central theme in international business literature as business strategies are increasingly global (Marano et al., 2016). Nevertheless, according to recent meta-analyses and literature review articles, the vast body of research which studies that relation has generated mixed results (Bausch & Krist, 2007; Kirca et al., 2011; Marano et al., 2016) for both operational and market performance.

Previous studies have shown a positive linear relation (Nachum, 2004; Bany-Ariffin, Matemilola, Wahid, Abdullah, 2016; Song & Lee, 2020), negative (Chen & Tan, 2012; Singla & George, 2013; Vithessonthi & Racela, 2016), U-shaped curves (Contractor, Kumar, Kundu, 2007), inverted-U relation (Elango, 2006) and others have

recorded S-curves (Lu & Beamish, 2004; Chiang & Yu, 2005; Kumar & Singh, 2008). In research carried out in Brazil, Teruel, Pereira and Maestri (2013) found a U-shaped relation between international diversification and performance.

The mixed results of empirical research have led scholars to question the theoretical foundations that examine the direct relation between international diversification and performance in isolation from other contextual or procedural conditions (Verbeke & Forootan, 2012; Buckley & Tian, 2016). More recent researches have studied the role of company's specific resources or assets in the process of international diversification and its indirect effect on performance, by investigating from the perspective of mediation how international diversification helps the companies develop specific assets that improve competitiveness and profitability (Buckley & Tian, 2016; Tashman, Marano, Babin, 2019).

Therefore, for the purpose of analyze the mediation proposed in this research, we consider that in the first stage the degree of international diversification has a negative relation with performance and in the second stage, with the increase in the degree of diversification, that relation passes to be positive, raising the following hypothesis regarding the direct relation between international diversification and performance:

H1: The degree of international diversification has a U-shaped effect on companies' performance.

2.2 The relation between international diversification and cash retention

The RBV defend certain resources may provide growth and competitive advantage for companies (Penrose, 1959; Wernerfelt, 1984; Barney, 1991). For Penrose (1959), versatile resources, understood as those that offer an infinity of possibilities of services in the firm's productive activities, contribute to its growth, in other words, profitability. Furthermore, according to Barney (1991), resources must be valuable, rare, irreplaceable and inimitable (VRIN) to provide a competitive advantage for companies.

Even though cash does not meet the four features of resources that offer competitive advantage (Barney, 1991), for Jung et al. (2020) the cash is a versatile and, consequently, valuable asset that offers a competitive advantage to the company. Resources are valuable when they allow the company generate or implement strategies that improve its efficiency and efficacy (Barney, 1991).

The finance literature has already provided several theories and evidence frameworks regarding the benefits and costs of liquidity (Jung et al., 2020). Keynes says (1936) companies keep cash to support their normal and certain transactions, keep as a precaution, in case of contingency situations, and for reasons of speculation, with the aim to take advantage of emerging opportunities.

According to Myers and Majluf (1984), the company maintains financial slack so that it can be used to finance investments when raising funds through debt and shares is expensive. For the transaction cost theory, companies hold higher levels of cash to reduce transaction costs to raise funds and do not liquidate assets to make payments (Opler, Pinkowitz, Stulz, Williamson, 1999; Mun & Jang, 2015).

The benefits generated by maintaining cash allow companies to avoid the cost of liquidating assets and raising funds, to take advantage of growth opportunities, in addition to mitigating the likelihood of financial problems, which would lead them to face high financing costs, but also decline of profitable investment projects (Jamil, Anwar, Afzaal, Tariq, Asif, 2016).

In contrast to that positive view, liquidity is also associated with agency problems, in other words, to the opportunity costs for the shareholder. From this perspective, cash reserves may trigger opportunistic behavior among managers who, in a discretionary way, use cash for their own interest, maximizing their personal utility (Jensen, 1986), rather than generating shareholder wealth by being reinvested in business opportunities.

The number of companies that accumulate cash reserves to support business growth and development processes is increasing (Rocca & Cambrea, 2018). Pinkowitz, Stulz and Williamson (2016) show a tendency to increase the liquidity of companies around the world, including multinationals, but despite that, the cash retention policy of those companies has been little explored in the literature (Fernandes & Gonenc, 2016).

Previous studies have shown that internationally diversified companies retain more cash than their domestic counterparts (Ramírez & Tadesse, 2009; Chiang & Wang, 2011; Gu, 2017; Wu, Yang, Zhou, 2017; Pereira Júnior; Pereira; Penedo, 2021) and that international diversification increases the propensity of companies save money during economic crises (Benkraiem, Lakhal, Zopounidis, 2020). Researches also show that international diversification is a determinant of cash reserves (Chiang & Wang, 2011; Arata, Sheng and Lora, 2015), which has a positive effect on cash retention (Pinkowitz et al., 2016) and that export activities increase the need for liquid assets by extending the operating cycle of companies (Ramírez & Tadesse, 2009).

RBV's perspective, with international diversification companies may explore markets in different countries, by enabling access to a set of previously restricted resources, as well as providing opportunities for the creation of new resources (Bausch & Krist, 2007; Yuan, Qian, Pangarkar, 2016). Thus, it is suggested that as companies increase international diversification, they increase their cash reserves, then we propose the following hypothesis:

H2: International diversification has a positive relation with companies' cash.

2.3 The relation between international diversification and performance with a mediating effect on cash moderated by environmental contingencies

From a theoretical point of view, the relation between liquidity and performance is established in the literature, although the results are mixed, displaying a positive linear relation (Almeida et al., 2004; Fresard, 2010; Forti, Peixoto, Freitas, 2011; Rocca & Cambrea, 2018; Rocca et al., 2019; Doan, 2020; Pereira Júnior et al., 2021), negative linear (Aslam et al., 2019) and inverted-U-shaped (Nason & Patel, 2016).

In the Brazilian context, Forti et al. (2011) found a positive linear relation between cash retention and operating performance and concluded that the retention of large volumes of cash may

be considered a viable competitive strategy for companies, with positive effects on performance. Pereira Júnior et al. (2021) have analyzed Brazilian exporting and domestic companies listed on the B3 and also found a positive linear relation between cash retention and performance.

Rocca et al. (2019) suggest the need to investigate the role of moderating factors inherent to the company's institutional context, which are capable of increasing rather than reducing the value of liquidity in companies' performance. Those authors verified that poorer institutional contexts in which companies are inserted moderate the basic relation between cash and performance.

The cash may be a beneficial resource for the company to adapt in the context in which it operates (Almeida et al., 2004; Deb, David, O'brien, 2017; Rocca et al., 2019). According to Kim and Bettis (2014) cash is the most flexible and versatile resource that companies may have, since it can be converted at any time for any purpose, by representing a latent ability to carry out a broader set of strategic actions. Furthermore, it has the potential to provide a competitive advantage and protect the company from environmental turmoil, improving performance by facilitating adaptation to complex environments (Deb et al., 2017).

From a contingency perspective, the organization's efficacy is related to the conformity between its internal features and external contingencies (Wang & Singh, 2014), with the environment being one of the main sources of contingencies faced by a company (García-Sánchez et al., 2018). The organizational performance depends on the fit between the organizational structure, processes and environment (Drazin, Van de Ven, 1985).

Therefore, the way company combines its resources with the external environment influences its performance (Drazin et al., 1985; Wang & Singh, 2014; Jung et al., 2020). Then, we suggest, the integration of the Contingency theory with the RBV in its Penrosean logic (1959) in the study of the effects of external environmental contingencies and liquidity on the companies' performance.

For Jung et al. (2020) liquidity has value for companies that operate under certain contingencies that require flexibility and adaptation. The companies need to strategically adjust to environmental contingencies to adapt, which means match corporate resources with environmental contingencies that affect their performance.

Dess and Beard (1984) classify the task environment of companies in three dimensions: dynamism, complexity and munificence. Dynamism is related to the rate of change, instability and unpredictability of the environment, complexity refers to the degree of heterogeneity of the environment and munificence to the level of resources present in the environment that support the growth of companies.

Jung et al. (2020) demonstrated that the environmental dimensions proposed by Dess and Beard (1984) moderate the relation between cash and performance. By advancing the study on the strategic value of liquidity in the company's adaptation process to environmental contingencies, the present research investigates whether the relation between international diversification and accounting performance is mediated by moderated cash by dynamism and munificence.

In a dynamic environment, that is, unstable and unpredictable, liquidity works as security protection to mitigate the negative effects of unexpected and performance-damaging events (Jung et al., 2020), that is, the greater the liquidity in a dynamic environment, the better business performance.

On the other hand, in an environment of greater instability, liquidity may generate negative effects on performance, it suggests that companies with greater cash reserves refrain from acting in the face of instability in the sector, which makes the company complacent, which reduces the strategic value of the liquidity (Nason & Patel, 2016; Jung et al., 2020).

In a more munificent environment, the relation between cash and performance does not generate positive effects, by leading to a decrease in the importance of the adaptive nature of cash (Jung et al., 2020), it implies that companies that operate in more generous environments need less liquidity for better performance.

Thus, it is believed, when companies diversify internationally they increase their revenues with the expansion of sales in the foreign market (Fernandes & Gonenc, 2016), by enabling the increase of their cash reserves, whose environmental contingencies moderate their relation with the performance. Then, the following hypotheses arise:

H3: The cash moderated by environmental contingencies mediates the relation between international diversification and companies' performance.
H3a: The cash moderated by environmental dynamism mediates the relation between international diversification and companies' performance.
H3b: The cash moderated by environmental munificence mediates the relation between international diversification and companies' performance.

Currently, in an incipient way, researches have emerged that is analyzing the financial effects of COVID 19 at the company level, for example, Zimon and Tarighi (2021) analyzed the relation between working capital management policies and the performance during COVID 19 for Polish small and medium-sized companies, nonetheless they did not find significant influence of COVID 19 on the relation between working capital and performance components. Ahmad, Bashir and Waqas (2022) identified that the effect of working capital management on the performance of Chinese companies was more evident in the COVID 19 period compared to the 2008 subprime crisis period.

Otherwise, Shen, Fu, Pan, Yu and Chen (2020) explored the relation between COVID 19 and the financial performance of Chinese companies and found out that COVID 19 harmed the performance of the companies in the sample. Hu and Zhang (2021) discovered that the adverse effects of COVID-19 on firm performance are less pronounced in countries with better healthcare systems, more advanced financial systems and better institutions.

Although it is not the object of this research, in a complementary way, we pursued to verify the effects of COVID 19 on the results presented in section 4. We included the models the dummy variable for COVID, by considering the 2020 year (COVID = 1, if the year is 2020 and not COVID = 0, for the other years) and following the procedure adopted by Ahmad et al. (2022). It

is noteworthy that the results of all models did not show statistical significance for the COVID period and its interactions with cash and international diversification.

The Figure 1 presents the conceptual model of the effect of international diversification on performance mediated by moderation between cash and environmental contingencies.

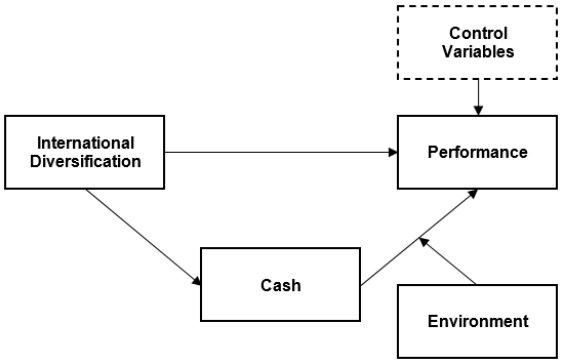

Figure 1 - International diversification and performance: a conceptual model. **Source:** Prepared by the authors (2021)

3. Methods

3.1 Data and sample

The initial sample composed by 384 Brazilian companies listed on B3 was based on accounting data collected from the Economática database between 2010 and 2020 years. That period was demarcated by the availability of data on export earnings in reference forms 7.6 disclosed on the B3 website.

There were excluded 126 companies from section K, divisions 64 to 66 of the National Registry of Economic Activities – NREA version 2.0, which perform financial, insurance and related services activities, by resulting in 258 companies. Since we investigated companies with available export data, the final sample consisted of 75 exporting companies from 10 sectors: agriculture, extractive industry, manufacturing industry, electricity and gas, trade and preparation of motor vehicles, transport and storage, food, information and communication, real estate construction and leasing.

We identified the company's economic activity by consulting the NREA of the main activity informed in the National Register of Legal Entities – NRLE in the Federal Revenue database. For the calculation of organizational task environment variables (dynamism and munificence), the companies were grouped by sector at the 2-digit level of the NRLE version 2.0.

3.2 Study variables

The variables are from the balance sheets and consolidated income statements, and the year end. Table 1 lists the variables used in this study.

Table 1 - Variables of the international diversification study

Variable	Initials	Definition	Database	Authors
Dependent				
Operational performance	ROA	Operating income before interest divided by total assets.	Economática	Nachum (2004); Oh (2010); Forti et al. (2011); Chen and Tan (2012); Jung et al. (2020); Pereira Júnior et al. (2021)
Independent				
Degree of Internationalization	EXP	Export revenue divided by total revenue.	B3 - Reference Form 7.6	Chen and Tan (2012); Oh (2010)
Mediator				
Cash retention	CASH	Cash and cash equivalents divided by total assets.	Economática	Jung et al. (2020)
Moderator				
Dynamism	INST	Instability to	Economática	Jung et al. (2020)
	CAP	Capacity b		
Munificence	GRO	The ratio of the current year's average sector sales value divided by the previous year's average sales value		
Control				
Investment	INV	Capital expenditure divided by total assets	Economática	Jung et al. (2020)
Sales Growth	SGR	Natural logarithm of the ratio between sales (t) and sales (t-1)		Jung et al. (2020)
Cash Flow	CFL	Operating income before depreciation, less total income tax, less the annual change in deferred taxes, less gross interest expense on total debt, less the amount of dividends and divided by total assets		Jung et al. (2020)
Leverage	LEV	Total debt divided by total assets		Jung et al. (2020)
Firm Size	SIZE	Natural logarithm of total assets		Rocca and Cambrea (2018); Rocca et al. (2019)
Absorbed Slack (NWC)	NWC	Net Working Capital divided by total assets		Jung et al. (2020)
Absorbed Slack (SG&A)	SGA	Administrative and sales expenses divided by sales		Jung et al. (2020)

a Volatility of the sector's sales during the previous five years. Sector sales were regressed by five years about time. Standard errors were extracted from the regression coefficients related to time dummies, by dividing the standard error by the industry average sales and by calculating the logarithm to account for the asymmetry.

b First, environmental capacity was calculated as the time coefficient of the regressions of sector sales over time, divided by the average value of sector sales. As natural logarithms of sector sales were used as the dependent variable, the antilog of the regression slope coefficient was calculated to obtain the final proxy for environmental capacity.

Source: Prepared by the authors (2021)

All variables were winsorized at 1% to deal with the influence of outliers. Interaction variables were standardized to reduce multicollinearity. The variance inflation factors (VIFs) ranged between 1.66 and 1.73, below the critical limits of multicollinearity. The Breusch Pagan, Chow and Hausman tests were run to estimate the most suitable model for data regression. The Wald test showed that the models exhibited heteroscedasticity problems and the Wooldridge test showed that there is the presence of first-order autocorrelation. The regressions were run considering heteroscedasticity robust standard errors and clustered at the company level. The effect of time and sector was addressed through dummies of time and sector.

3.3 Analytical technique

The data analysis was performed using multiple linear regression with panel data. For the moderate mediation test, the model proposed by Muller, Judd and Yzerbyt (2005) was used, which adopts the classic approach described by Baron and Kenny (1986), according to the following models:

$$Y = \beta_1 + \beta_2 X + \beta_3 X^2 + \beta_4 Mo + \beta_5 XMo + \varepsilon_1 \quad (1)$$

$$Me = \beta_{11} + \beta_{12} X + \beta_{13} Mo + \beta_{14} XMo + \varepsilon_2 \quad (2)$$

$$Y = \beta_{21} + \beta_{22} X + \beta_{23} X^2 + \beta_{24} Mo + \beta_{25} XMo + \beta_{26} Me + \beta_{27} MeMo + \varepsilon_3 \quad (3)$$

According to Muller et al. (2005), moderate mediation implies that the indirect effect between treatment (X) and outcome (Y) depends on the moderator (Mo). That is, in the case of this research, in equation (3) the partial effect of Me on Y depends on the moderator (β27 ≠ 0, and in equation (2) the effect of X on Me [β12] is different from zero). Not necessarily the residual effect of the treatment (X), that is, β22 and β23 need to be statistically significant to establish moderate mediation.

Once is necessary to demonstrate the moderate mediation in a sample of data, the prototypical case in equation (1) leads to the expectation that β2 and β3 are significantly different from zero, while β5 is not. In addition, one or both of the following patterns must exist: either β12 and β27 must have statistical significance or both β14 and β26.

According to the prototypical case, equation (1) displays the relation between the degree of internationalization (EXP), moderated by environmental contingencies, and performance (ROA). The equation (2) shows the relation between the degree of internationalization (EXP), moderated by environmental contingencies, and the mediating variable cash (CASH). Finally, the equation (3) demonstrates the mediating role of cash (CASH) moderated by environmental contingencies in the relation between the degree of internationalization (EXP) and performance (ROA).

The moderated mediation analyzed in this research is not suitable for the bootstrapping approach with data resampling as performed by Buckley (2016), as the parameters of the models of his research were estimated with stacked data.

4. Discussion of results

The Table 2 shows the descriptive statistics of the study variables with the treatment of outliers, by relating the averages, standard deviations and correlations.

Table 2 – Means, standard deviations and correlations

	Med.	DP	ROA	EXP	EXP2	CAI	INST	CAP
ROA	0,52	15,3	1					
EXP	0,26	0,23	-0,20*	1				
EXP2	0,12	0,19	-0,21*	0,94*	1			
CAI	0,08	0,08	0,17*	0,09*	0,11*	1		
INST	-1,64	0,29	-0,03	0,05	0,09*	-0,01	1	
CAP	1,00	0,01	0,15*	0,02	0,04	0,03	0,34*	1
CRE	1,02	0,18	0,05*	0,05	0,04	0,01	0,26*	0,45*
INV	0,05	0,05	0,08*	0,11*	0,13*	-0,01	0,06*	0,15*
VEN	0,01	0,33	0,23*	0,01	0,01	0,09*	0,03	0,20*
FLC	0,12	0,13	-0,35*	-0,00	0,02	-0,01	0,03	-0,03
END	0,33	0,27	-0,33*	0,10*	0,12*	-0,07*	0,01	-0,06*
TAM	6,37	0,82	0,24*	0,43*	0,39*	0,07*	-0,14*	0,01
CGL	0,26	0,35	-0,38*	-0,11*	-0,09*	-0,02	-0,01	-0,10*
DAV	0,29	0,56	-0,32*	-0,23*	-0,23*	0,06*	0,03	-0,07*
	CRE	INV	VEN	FLC	END	TAM	CGL	DAV
CRE	1							
INV	0,10*	1						
VEN	0,32*	0,15*	1					
FLC	-0,01	0,12*	-0,04*	1				
END	-0,01	0,06*	-0,06*	0,08*	1			
TAM	0,02	0,04*	0,07*	-0,23*	-0,10*	1		
CGL	-0,05*	-0,15*	-0,08*	0,34*	0,31*	-0,37*	1	
DAV	-0,04*	0,05*	-0,23*	0,23*	0,21*	-0,26*	0,31*	1

Note. Variables: ROA – Operational performance; EXP – Export Degree; CASH – Cash retention; INST – Instability; CAP – Capacity; GRO – Growth; INV – Investment; SGR - Sales Growth; CFL – Cash Flow; LEV – Leverage; SIZE – Size; NWC – Absorbed slack (NWC); SGA – Absorbed slack (SG&A).
*Statistical significance ($p<0.05$). Source: Prepared by the author (2021)

It may be verified in Table 2 that the variables included in the interactions, the predictor variable (CASH) and the moderating variables (INST, CAP and GRO) showed low correlation, by indicating that those variables are independent (Gardner et al., 2017). The results in which moderate mediation was found are shown in Tables 3 and 4. The Table 3 presents the results related to dynamism, measured by the instability of the sector of the companies in the sample.

Table 3 – Results of the fixed effects analysis for the moderated mediation model - Dynamism (instability)

Dependent	Dynamism (instability)			
	Cash	ROA	ROA	ROA
	Model 1	Model 2	Model 3	Model 4
Controls				
Investment	-0,14	10,3	23,3**	26,5**
Sales Growth	0,01	5,18***	4,69***	4,41***
Cash flow	0,02	-13,2	-24,4	-24,9
Leverage	-0,02	-10,5	-14.8***	-14,4***
Size	0,02	8,41	-5,92	-6,63
NWC	0,07**	1,42	4,07	2,74
SGA	-0,09**	-20,6**	-22,2***	-21,3***
Explanatory				
Export	0,08**	-6,4***	-4,9***	-5,06***
Export2		2,36**	1,30**	1,18*
Cash				15,4***
Instability	0,00		-0,43	-0,58
Interactions				
Export*Instability	-0,01		0,04	0,18
Cash*Instability				-0,88*
_cons	-0,07	-47,1	50,7	54.0*
VIF	1,69	1,73	1,69	1,68
Model	Fixo	Fixo	Fixo	Fixo
N	635	650	637	635
Adjusted R^2	0,10	0,22	0,30	0,31

Note. Coefficient = beta coefficient or regressor parameter.
*, **, *** = p < 0.10, p < 0.05, p < 0.01, respectively.
Source: Prepared by the authors (2021)

The Table 4 presents the results related to environmental munificence for the analysis of the proposed moderate mediation model, in which munificence is measured by the growth of the sector of the companies in the sample.

Table 4 – Results of the fixed effects analysis for the moderated mediation model - Munificence (growth)

Dependent	Munificence (growth)			
	Cash	ROA	ROA	ROA
	Model 1	Model 2	Model 3	Model 4
Controls				
Investment	-0,15	10,3	23,0**	25,6**
Sales Growth	0,01	5,18***	4,27**	3,90**
Cash flow	0,02	-13,2	-24,4	-25,5
Leverage	-0,02	-10,5	-14,7***	-14,4***
Size	0,02	8,41	-6,00	-6,59
NWC	0,06**	1,42	4,16	3,11
SGA	-0,08**	-20,6**	-22,6***	-21,4***
Explanatory				
Export	0,07*	-6,4***	-4,9***	-4,9***
Export2		2,36**	1,30**	1,18**
Cash				14,5***
Growth	-0,01		0,95	1,11
Interactions				
Export*Growth	0,01**		0,02	0,12
Cash*Growth				-1,28***
_cons	-0,08	-47,1	50,9*	53,6*
VIF	1,71	1,73	1,68	1,66
Model	Fixo	Fixo	Fixo	Fixo
N	635	650	637	635
Adjusted R^2	0,11	0,22	0,30	0,31

Note. Coefficient = beta coefficient or regressor parameter.
*, **, *** = p < 0.10, p < 0.05, p < 0.01, respectively.
Source: Prepared by the authors (2021)

In Tables 3 and 4, the results of model 2 indicate that the degree of internationalization (exports) has a statistically significant U-shaped relation with the companies' performance (β = -6.4, p. < 0.01; β = 2,36, p. < 0.05), according to Contractor et al. (2007) and Teruel et al. (2013). Those results support H1, which implies that in the first stage the relation is negative, but that in the second stage the increase in exports starts to have a positive relation with performance.

The regression of the degree of internationalization in relation to cash retention was performed to test hypothesis H2. In Table 3, model 1, the coefficient for the degree of internationalization was statistically significant and positive (β = 0.08, p. < 0.05). In Table 4, model 1, the coefficient for the degree of internationalization was statistically significant and positive (β = 0.07, p. < 0.10). Those results indicate that the degree of internationalization is positively associated with cash retention, which results support H2. Those findings are in line with the results found by Pinkowitz et al. (2016) and Benkraiem et al. (2020).

For verification purposes of the existence of moderate mediation about the sample data, the prototypical case leads to the expectation that β2 and β3 are significantly different from zero, while β5 is not. Also, both β12 and β27 must be statistically significant.

Thus, the Table 3 shows that in model 3, the prototypical case leads to the expectation that β2 (β = -4.9, p. < 0.01) and β3 (β = 1.30, p. < 0.05) are significantly different from zero, while β5 (β= 0.04) is not. Also, both β12 (β = 0.08, p. < 0.05) and β27 (β = -0.88, p. < 0.10), in models 1 and 4, are statistically significant. Consequently, those results support H3a. The results confirm that cash retention moderated by dynamism (instability) partially mediates the relation between the degree of internationalization and performance.

According to Table 3, model 4, the indirect effect of international diversification on performance will be better through greater liquidity in a less unstable environment, since the relation of the interaction between cash and instability was statistically significant and negative (β = -0, 88, p. < 0.10).

The Table 4 shows that in model 3, the prototypical case leads to the expectation that β2 (β = -4.9, p. < 0.01) and β3 (β = 1.30, p. < 0, 05) are significantly different from zero, while β5 (β = 0.02) is not. Furthermore, both β12 (β = 0.07, p. < 0.10) and β27 (β = -1.28, p. < 0.01), in models 1 and 4, are statistically significant. Hence, those results support H3b. The results confirm that cash retention moderated by munificence (growth) partially mediates the relation between the degree of internationalization and performance.

It is possible to observe in Table 4, model 4, that the indirect effect of international diversification on performance will be better through greater liquidity in a less munificent environment, since the relation of the interaction between cash and growth was statistically significant and negative (β = -1.28, p. < 0.01).

The results of the moderations presented in Tables 3 and 4, model 4, show that a higher level of instability decreases the strategic value of liquidity, but for the less munificent environment, the low growth of the sector increases its strategic value. That is also indicated in the graphs of Figure 2 if instability is high and industry growth is low.

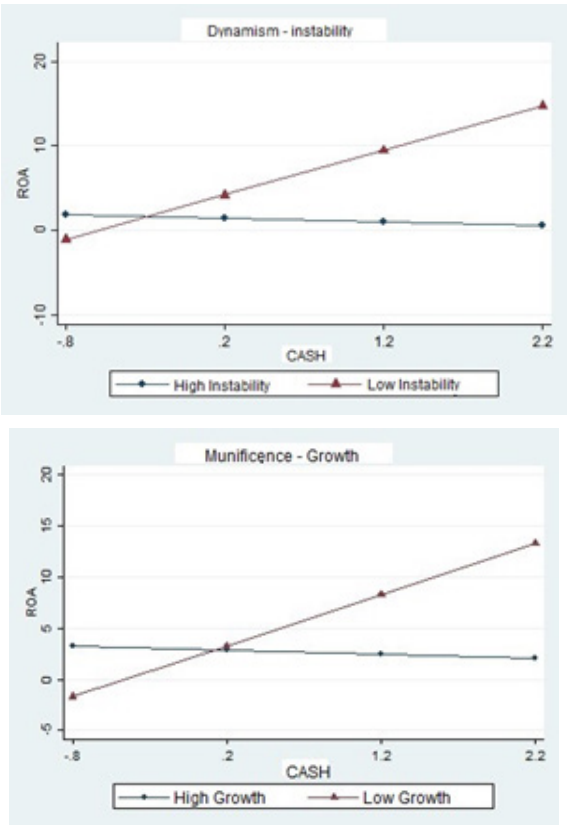

Figure 2 - Moderating effects of the company's task environment
Note. The plots were generated using the margins and marginsplot command in STATA. Each graph shows the company's performance (vertical axis), measured by ROA in relation to liquidity (horizontal axis). Limits apply to the rounded minimum and maximum amount of cash withholding (standardized). The 1st and 99th percentiles of the moderating variables were used as indications for a low and high environmental dimension.
Source: Prepared by the authors (2021).

The results suggest that exporting companies when expand their sales to the foreign market, maintain greater cash reserves, a versatile resource (Penrose, 1959) that may be used to adapt companies to external environmental contingencies (Jung et al., 2020). The instability and growth of the sector moderate the relation between cash and performance, making that relation weaker in environments of greater dynamism and munificence.

The cash reserves for exporting companies are beneficial in low munificence environments, as the results suggest that higher levels of liquidity in low-growth environments are associated with better performance, which is in line with the findings of Jung et al. (2020). That implies the assumption that cash in low munificence times helps companies create value (Fresard, 2010), develop new capabilities (Kim & Bettis, 2014) and ingress in new markets, while companies with little cash may suffer for not being able to diversify (Jung et al., 2020) and being penalized by the intensification of competition in ungenerous environments (Song & Lee, 2020).

From the perspective of RBV, exporting companies operating in less generous environments may expand to other markets to gain access to previously restricted resources (Bausch & Krist, 2007; Yuan et al., 2016), in the form of cash, using it strategically to support the low sector growth and improve performance.

In an environment of greater instability, the exporting companies performed better with lower levels of cash reserves, denoting that the possession of liquidity may generate negative effects on performance in dynamic environments. Those results suggest that exporting companies with greater cash reserves in dynamic environments refrain from acting in the face of sector instability, which makes the company complacent, with the view that investing money to improve the company's strategic position may be risky, decreasing the strategic value of liquidity (Nason & Patel, 2016; Jung et al., 2020).

Otherwise, the findings by Jung et al. (2020) display the North American context that cash assumes a strategic value for companies operating in a more dynamic environment. Those contrary results in relation to the ones found in the present research may be justified by the fact that exporting companies analyzed, in a Brazilian context of greater instability, preferred to adopt a more complacent strategic position. The Brazil, as an emerging country, may provide a more unstable environment for companies than the one faced by the North American companies.

In addition, the effect of cash retention on performance may be different for market-based measures compared to accounting-based measures (Nason & Patel, 2016), since the results found by Jung et al. (2020) for market performance have not been confirmed for operational performance.

4.1 Robustness test

Initially, we verify whether the sample data would be suitable for analysis using Multilevel Linear Regression (MLR), as that the data referring to the environment are at the sector level. Although, the intraclass correlation coefficient (ICC) that measures the variation of performance and companies' cash between sectors was below 0.05, which did not justify the use of RLM (Salah, 2018).

As there is a potential reverse causality between cash and performance, and potential endogeneity problems, the Generalized Method of Moments (GMM-System) by Arellano and Bover (1995) and Blundell and Bond (1998) was applied, by using a dynamic data estimate in panel (Roodman, 2009; Ullah, Akhtar & Zaefarian, 2018) to models 1, 3 and 4 of Tables 3 and 4. The tests were performed using the xtabond2 command in Stata. There were used as instruments the lagged explanatory variables (t-1 to t-4).

In the evaluation of the models estimated by the GMM-System, the following tests were performed: i) Hansen's J to test the validity of the instruments ($0.60 > p\text{-value} > 0.05$); ii) Arellano-Bond AR(2) to identify possible second-order autocorrelation problems ($p\text{-value} > 0.05$); iii) significance of the lagged dependent variable to justify the use of dynamic panel ($p\text{-value} < 0.05$).

The Model 3 did not meet the assumption of the significance of the lagged dependent variable, therefore it did not justify the use of a dynamic panel. The international diversification variables (EXP and EXP2), in statistical terms, could be considered exogenous,

Table 5 – Results of the analysis of fixed effects and GMM-System for the moderated mediation models

Dependent	Instability		Growth		Instability		Growth	
	(1) FE	(2) GMM	(3) FE	(4) GMM	(5) FE	(6) GMM	(7) FE	(8) GMM
	Cash	Cash	Cash	Cash	ROA	ROA	ROA	ROA
Cash (t-1)		0,25***		0,25***				
ROA (t-1)						-0,12*		-0,13*
Investment	-0,15	-0,05	-0,15	-0,04	26,5**	35,0**	26,3**	40,0
Sales Growth	0,01	-0,00	0,01	0,00	4,47***	8,64***	4,00**	8,10***
Cash flow	0,03	0,01	0,02	0,01	-25,1	-41,4**	-25,2	-37,9**
Leverage	-0,02	0,02	-0,02	0,02	-14,4***	-13,4***	-14,3***	-15,7***
Size	0,02	-0,02	0,02	-0,02	-6,81	0,60	-6,87	0,13
NWC	0,07**	-0,01	0,06**	-0,01	2,96	-8,57*	3,07	-9,68**
SGA	-0,08**	-0,05**	-0,08**	-0,05**	-20,9***	-9,8	-21,3***	-12,6*
Export	0,07*	0,09**	0,07*	0,10**	-4,97***	-6,65***	-4,98***	-6,94***
Export2					1,14*	2,78**	1,14*	2,54**
Cash					15,5***	47,2***	15,6***	40,5***
Instability	0,00	0,00			-0,41	-0,53		
Growth			-0,01	-0,03			1,24	2,22
_ cons	-0,10	0,24	-0,08	0,25	55,5*	0,25	55,2*	3,90
No	635	582	635	582	635	584	635	584
Adjusted R^2	0,10		0,10		0,30		0,30	
AR Test (2)		0,22		0,30		0,69		0,58
Hansen's J		0,25		0,22		0,47		0,59

Note. Coefficient = beta coefficient or regressor parameter.

*, **, *** = $p < 0.10$, $p < 0.05$, $p < 0.01$, respectively.

Source: Prepared by the author (2022)

since the endogeneity/exogeneity C test indicated a low correlation between those variables and the error (p-value > 0.05).

The Table 5 presents the results of the regressions of models 1 and 4 of Tables 3 and 4, following the procedure performed by Rocca and Cambrea (2018) and Rocca et al. (2019). The results of fixed effects models are reported in columns 1, 3, 5 and 7, while the results of models applying GMM-System are reported in columns 2, 4, 6 and 8.

The Hansen's J statistic confirms that the instruments used are valid. The AR(2) statistic shows the absence of second-order serial correlation problems and the lagged dependent variables presented statistical significance, which justifies the use of the dynamic panel.

Even using different lags of the dependent and explanatory variables as instruments, the previous results of the export-cash and cash-performance relation are confirmed by the GMM-system technique, which remains with the same sign and statistically significant, showing the robustness of the results verified by the estimator of fixed effect.

5. Final Considerations

The objective of this study was to verify whether the cash moderated by environmental contingencies mediates the relation between international diversification and the performance of Brazilian exporting companies listed on B3, which was achieved. We analyzed exporting companies covering the years 2010 to 2020. The statistical tests supported the study hypotheses, all of which were confirmed.

The results indicate that cash moderated by the sector's instability and growth mediates the relation between international diversification and performance. Those results suggest that the degree of internationalization is positively associated with cash retention and that higher cash levels in environments with low munificence and instability are associated with better performance.

Following a contingent perspective on the relation between cash and performance, and by suggesting that the cash value of exporting companies depends on contingencies, it is understood that cash reserves depend on a company's task environment, and may be a buffer for avoiding competitive pressures, by helping to align with the environment.

The present research echoes Penrose (1959) by showing that cash, in addition to mediating the relation between international diversification and performance, may provide a positive influence on performance depending on the environmental contingencies in which the company operates. When companies expand their business to the foreign market, they may increase liquidity and use the versatility of cash in a strategic way, especially in environments that are ungenerous in terms of resources.

According to the RBV theory and the contingent perspective, the present study contributes and adds to the international business literature the analysis of the cash retention of exporting companies as a mediating variable in the relation between international diversification and performance in a context of environmental dynamism and munificence, furthermore presents the strategic value of cash for the company's alignment depending on its task environment. From an empirical point of view, for managers of

exporting companies obtain better performance, we suggest that they analyze the costs and benefits of liquidity in expanding business to the foreign market, taking into account the task environment in which the company operates.

As a limitation of the research, it is pointed out that the results are limited to Brazilian companies listed on B3 and those which presented export operations, with the sample of limited generalization. Thereafter, the approach of environmental dynamism and munificence is restricted to the companies in the sample, since the variables of the companies' task environment were calculated based on the company's own data. We suggest for future studies test whether the results of this research are valid for unlisted companies, as well as for small and medium-sized companies.

We suggest for future research the study and identification of other resources that may provide growth and competitive advantage for companies, inserted in the analysis of the relation between international diversification and performance from the perspective of mediation. We also recommend the use of other international diversification proxies that denote other modes of entry into the foreign market, such as direct investment abroad, taking into account the task environment of the country of origin and destination of internationally diversifying companies.

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