

THE INFLUENCE OF OWNERSHIP CONCENTRATION AND EXPORT IN A PERFORMANCE FACTOR OF PUBLICLY TRADED COMPANIES OF B3.

A INFLUÊNCIA DA CONCENTRAÇÃO ACIONÁRIA E DA EXPORTAÇÃO EM UM FATOR DE DESEMPENHO DAS EMPRESAS DE CAPITAL ABERTO DA B3

LA INFLUENCIA DE LA CONCENTRACIÓN Y EXPORTACIÓN DE ACCIONISTAS EN UN FACTOR DE RENDIMIENTO DE LAS COMPAÑÍAS DE CAPITAL ABIERTA DE LA B3

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Editor Científico: José Edson Lara
Organização Comitê Científico
Double Blind Review pelo SEER/OJS
Recebido em 02.12.2019
Aprovado em 07.05.2020



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Resumo

Objetivo: Verificar a relação que a concentração acionária aliada a exportação enquanto estratégia de internacionalização com o fator de desempenho desenvolvido por este trabalho nas empresas de capital aberto

Metodologia/abordagem: Para a verificação da relação entre o nível de desempenho e a exportação foram criados três modelos que se diferenciam pelo acréscimo da exportação quadrática e cúbica no intuito de verificar o comportamento da exportação. Para isso, foi edificada as três equações através das regressões, que compila as métricas do modelo quantitativo descrito.

Originalidade/Relevância: Este trabalho se propõe a criar um fator que mensure o desempenho, diferenciando-se dos demais trabalhos que buscam somente utilizar indicadores contábeis como métricas de desempenho, uma vez que pode ser este um dificultador que faz com que se encontre diversos resultados sobre a mesma problemática.

Principais resultados: Foi encontrada relação significativa e positiva entre a interação exportação-concentração, ou seja, quanto maior a exportação aliada a uma maior concentração, maior o desempenho. A exportação se relaciona em formato de U com o fator de desempenho, ou seja, inicia-se impactando negativamente no desempenho, mas após certo ponto, a exportação determina positivamente o desempenho.

Contribuições teóricas/metodológicas: Referente a variável concentração acionária, utilizou-se a concentração do maior acionista (CONC) e para a variável de exportação foi considerado a porcentagem de receita adquirida por meio de clientes no exterior (EXP) e os seus (EXP²) e (EXP³). E como variáveis de controle estão crescimento, tamanho, Risco, Tangibilidade e Payout conforme aplicado por Pereira (2013) e Carvalhal-da-Silva e Leal (2006) com o objetivo de minimizar o erro estocástico.

Contribuições sociais/para a gestão: Contribuir com conhecimentos práticos e teóricos sobre mercado de capitais na sociedade. Pretende-se orientar gestores na tomada de decisões minimizando conflitos entre acionistas e administradores.

Palavras-chave: Concentração; Desempenho; Exportação; Internacionalização.

Abstract

Objective: To verify the relationship that the share concentration combined with export as an internationalization strategy with the performance factor developed by this work in public companies

Methodology / approach: To verify the relationship between the level of performance and the export, three models were created that differ by the increase of the quadratic and cubic export in order to verify the export behavior. For that, the three equations were built through the regressions, which compiles the metrics of the described quantitative model.

Originality / Relevance: This work proposes to create a factor that measures performance, differentiating itself from other works that seek only to use accounting indicators as performance metrics, since this may be a hindrance that makes that several results are found on the same issue.

Main results: A significant and positive relationship was found between the export-concentration interaction, that is, the greater the export combined with the greater concentration, the greater the performance. The export is U-shaped with the performance, that is, it starts with a negative impact on performance, but after a certain point, exports positively determine performance.

Theoretical / methodological contributions: Regarding the share concentration variable, the concentration of the largest shareholder (CONC) was used and for the export variable, the percentage of revenue acquired through customers abroad (EXP) and yours (EXP²) and (EXP³). And as control variables are growth, size, risk, tangibility and payout as applied by Pereira (2013) and Carvalho-da-Silva and Leal (2006) in order to minimize stochastic error.

Social / management contributions: Contribute practical and theoretical knowledge about the capital market in society. It is intended to guide managers in decision making by minimizing conflicts between shareholders and managers.

Keywords: Concentration; Performance; Export; Internationalization.

Resumen

Objetivo: Verificar la relación entre la concentración de acciones y la exportación como estrategia de internacionalización con el factor de desempeño desarrollado por este trabajo en empresas públicas.

Metodología / enfoque: Para verificar la relación entre el nivel de rendimiento y la exportación, se crearon tres modelos que difieren por el aumento de la exportación cuadrática y cúbica para verificar el comportamiento de la exportación. Para eso, las tres ecuaciones se construyeron a través de las regresiones, que compilan las métricas del modelo cuantitativo descrito.

Originalidad / Relevancia: Este trabajo propone crear un factor que mida el desempeño, diferenciándose de otros trabajos que solo buscan usar indicadores contables como indicadores de desempeño, ya que esto puede ser un obstáculo que que se encuentran varios resultados sobre el mismo tema.

Resultados principales: Se encontró una relación significativa y positiva entre la interacción exportación-concentración, es decir, cuanto mayor es la exportación combinada con la mayor concentración, mayor es el rendimiento. es decir, comienza con un impacto negativo en el desempeño, pero después de cierto punto, las exportaciones determinan positivamente el desempeño.

Contribuciones teóricas / metodológicas: con respecto a la variable de concentración de acciones, se utilizó la concentración del mayor accionista (CONC) y para la variable de exportación, el porcentaje de ingresos adquiridos a través de clientes en el extranjero (EXP) y tuyo (EXP²) y (EXP³). Y como las variables de control son el crecimiento, el tamaño, el riesgo,

la tangibilidad y el pago según lo aplicado por Pereira (2013) y Carvalhal-da-Silva y Leal (2006) para minimizar el error estocástico.

Contribuciones sociales / de gestión: Contribuir con conocimientos prácticos y teóricos sobre el mercado de capitales en la sociedad. Su objetivo es guiar a los gerentes en la toma de decisiones al minimizar los conflictos entre accionistas y gerentes.

Palabras clave: concentración; Actuación; Exportar; Internacionalización

1. Introduction

Multinational companies have generated social impact by providing growth to emerging countries, as the Ministry of Industry, Foreign and Services Trade (MDIC, 2018) Brazil has increased its representation on the world stage, as Brazilian exports have had a 17 growth 5% in 2017, a figure above the world average of 10.6% and after five long years of falls.

The study of how these multinational companies operate and generate value is also growing positively in the academic environment at the expense of their relevance to the market. A quick search on Google Scholar database with the keywords "multinational" and "multinationals", showed that in the last year 2017 to June 2018, there were 6,740 and 14,800 respectively publications on the subject.

Issues so far discussed quite as performance and concentration are now being evaluated in an international context performance. It is as shown in some studies, such as the Bhaumik, Driffield & Pal (2010) which investigates how property concentrations of emerging organizations can impact on internationalization and find that family businesses and have high concentration (own feature emerging markets such as Brazil) have lower chances of investing abroad.

According to Zahra (2003), often family businesses that have concentration and active participation of members in management, have greater caution on the internationalization decisions, even if it is to maximize performance. However, Jensen and Meckling (1976), say that the concentration of decision-making can also be positive for the valuation of companies, as it increases the control of the directors.

There are also studies that seek to relate the performance and export, as Sousa's work, Martinez-Lopez & Coelho (2008) which meant that exports positively affect the performance of organizations and collaborate with the growth of countries. In a complementary way, Pinheiro (1987) to compare Brazilian and Korean companies, finds that the export expansion allows economies of scale, incentive to increase productivity and to promote access to different technologies that exist in their home countries.

In addition, according Pinheiro (1987) emerging countries while forcing to produce products in order to replace imports made, in general, to raise the level of inefficiency and poor performance when compared to Asian companies that adopt a posture more internationalized, so is encouraged exports and imports in order to generate greater performance for s domestic firms.

Another current study investigates whether there is a relationship between performance and concentration, such as Demsetz & Lehn (1985) said that there was no significant relationship between ownership concentration and performance, as the authors note, many variables can impact the concentration, so such variable would be endogenous and could not explain the performance. As the study of Rogers, Dami, Ribeiro and Sousa (2008) who investigated the companies listed on the B3 in the period between 1997 and 2001 and found that ownership structure does not influence the financial performance of firms.

However, studies such as the Yabei & Izumida (2008) that to investigate companies listed on the Tokyo Stock Exchange from 1980 to 2005, found that for a developed country like Japan, met significant effect U-shaped between concentration property and corporate performance.

Faced with several studies conducted on the subject performance and concentration, such as Demsetz & Lehn (1985), Carvalhal-da-Silva & Leal (2005), Rogers et al. (2008) and Yabei & Izumida (2008), it is perceived that there is no consensus on the impact the merger may have on performance. The same is true when assessing the relationship between performance and degree of internationalization in which for more than 30 years of research with mixed results (Contractor, Kundu, & Hsu, 2003).

In this context, this paper aims to create, based on the literature, a factor that measures performance, differentiating themselves from other papers who seek to use only financial indicators such as performance metrics, since it can be this an impediment that makes that is found different results on the same question.

For this, from the Rosa studies (2017), the author created by means of a factor analysis, the variables that, according to literature are important to assess the competitiveness of a company. In his bibliometric research, Rosa (2017) found nine variables that could theoretically measure the competitive performance, which are "retained earnings to total assets; Operating earnings per share; Return on Capital; Return on Assets (ROA); Return on Equity (ROE); Return on Invested Capital; Operating return on Shares; Market capitalization / Book Value; and Gross Margin "(Rose, 2017, p. 94).

After the factor analysis, the author found only 4 variables that were grouped into a single factor and showed satisfactory commonalities, which were: Return on assets (ROA), return on equity

(ROE), return on capital employed and return on the capital. Some authors like Kupfer (1992) which states that a competitive performance can also be measured by market share (Market Share).

In order to obtain a single factor that measures performance, this paper has proposed creating a single factor involving the variables found by Rose (2017) and Market Share shown by Kupfer (1992) to understand whether this measure could improve the models applied to the moment.

As shown above, with the advancement of world trade, it is appropriate to analyze the concentration of ownership for being a strong Brazilian feature (Pinto & Leal, 2013) combined with export and market expansion strategy, so that they understand possible relationships between these features with business performance in order to contribute to the gym to suggest a new performance factor to be tested, in addition, contribute in a practical way by subsidizing investors with information about the characteristics of public companies that can impact on their performance.

Considering the discussed context, this article has the following research problem: What is the relationship between ownership concentration and export in a performance factor of the companies listed on the B3?

Thus, the article aims to investigate the relationship that ownership concentration combined with export as internationalization strategy with the performance factor developed by this work in public companies.

Because of CFC Resolution 1,156 / 2009, Brazilian financial statements have been adequate international standards from 2010, therefore, the analyzed period is 2010-2017.

This study, in addition to this introduction, has four sections, and the second section it is the theoretical basis. The third section refers to the methodology adopted. The fourth section presents the results and analysis, and finally, the fifth section is intended for the final considerations.

2. Theoretical foundation

2.1 Performance and export

The reasons for an organization to decide to internalize can be varied, among them stands out the expansion and performance in other markets, combating competition and mitigation costs (Milan, Eckert, Mello & Giovanella, 2013). However, internationalization also brings attention points to be accompanied as they may increase the agency costs of the company, such as: (1) the risk due to conflict of interest and (2) the risk of information asymmetry (Muller, 2008).

According to Smaniotto, & Paiva Vieira (2012), when an organization has multinational operations, it is essential to draw its structure thinking on maximizing competitiveness and return.

There is a three-step theory that explains the behavior of the export firms. This theory refers basically about the idea of having maturity stages, where the first stage it is early internationalization, so it is a stage where costs outweigh the benefits. The second stage refers to the moment when the benefits outweigh the incremental costs, thus, it provides a positive effect on firm performance, and finally there is the third stage in which there is an excessive internationalization, and the costs again outweigh the gains (Contractor et al., 2003)

Objectively, studies of Contractor et al. (2003), argue that multinationality and performance variables initially have negative relationship, followed by a positive stage and finally, again a negative relationship. However much that does not get positive results to start the internationalization strategy, it is clear that long-term, such a strategy can provide growth for organizations and benefits such as: (1) external knowledge, (2) access to inputs lower cost, (3) Exploration of specific assets, (4) increased bargaining power for the scale of operation, (5) Scale (6) Geographic diversification and finally, (7) international experience.

The measurement of internationalization can be done through various indicators, however, is not a single direction in research regarding the methods and procedures for this purpose (Sullivan, 1994). This study will adopt the export strategy as a means of territorial expansion since this is one of the first options that companies adopt when deciding to internationalize, because it has a lower degree of risk (Jeannet & Hennessey, 1995).

Longevity, the expansion of organizations and economic development is dependent on a better understanding of the determinants that influence performance, and export is one of them (Sousa et al., 2008).

2.2 Performance and ownership concentration

The ownership concentration can lead to agency problems by briefly two reasons: (1) involved in an organization may have different goals and objectives and (2) Stakeholders have different degrees of information involving organizations (Gillan & Starks, 2003).

As Shleifer & Vishny (1997), when the concentration is low, the majority tend to increase shareholder value by choosing strategies that aim to profit maximization. However, according Morck, Wolfenzon and Bernard (2005), when the concentration is high, there may be the fact that controllers seek to supply own and not necessarily what is best for the minority shareholders.

According to Carvalhal-da-Silva & Leal (2006) value and performance relate negatively with owning concentration, corroborating the results of Smith (1998), which the author investigated 278 Brazilian companies to verify a possible relationship between concentration property and performance, and concluded that the variables are related negatively. Already in research Dami, Rogers & Ribeiro (2007), the performance and voting ownership structure do not relate significantly.

2.3 Performance, ownership concentration and export

With exposed to date, it appears that the internationalization strategy is a way to maximize value, market and develop the company's performance (Liu & Buck, 2007), moreover, following the good governance practices, it is possible mitigate agency conflicts and facilitate the export decisions, so good governance can have positive impact on the export strategies of companies in emerging economies (Lu, Xu, & Liu, 2009)

Also according to Lu, Xu & Liu (2009), the company has moderate level of concentration and controlled agency conflicts, it becomes easier to adopt maximizing strategies of value and firms can export to seek long-term growth and expand its market share. However, if the concentration reaches a threshold level, can occur in the state to influence the drivers and thereby divert the international strategic focus for a national, whatever the export represents a potential growth.

Through this, and after all the studies presented where it is inferred different positions on the individual relationship of the variables with the performance, the hypothesis appears to be tested in this study: Hypothesis H1: There is a positive relationship between the interaction export-focus on performance factor.

3. Methodology

3.1. Search classification and sample selection

Research is quantitative, since this type of study is known by measurement, so as to collect the use of these data occurs by means of statistics (Richardson, 1999). In addition, the research can be classified as being descriptive, because as Gil (1999), this kind of work seeks to characterize a phenomenon or verifying relationships between variables. In this sense, this article seeks to understand the relationship between ownership concentration, export and a performance factor;

To develop this study, data were collected on Economatica database, except for the export variable, which was manually collected in the reference forms provided by the Brazilian Securities Commission (CVM) in item 7.6.

The survey sample was made up of all the listed companies, non-financial and active, or even companies that have closed capital within the period, they were considered to not bias the sample order, since the dependent variable is performance factor one, therefore, need to portray the reality of the market in the period.

In addition, export data were collected as follows, if the company claimed not to export on your form reference, has been assigned a zero value, however, if the form was not available or if the document claimed that exports, however, not inform the percentage to be lower than 5%, the data remained blank for not presenting a position to say.

3.2. Description of variables

A summary of the variables can be seen in Figure 1, with the acronyms, measurement, sources and studies base. For the dependent variable performance, we used the ROA variables, ROE, ROIC, return on capital and market share as demonstrated previously in association function of the theories of Rosa (2017) and Kupfer (1992), for, through the use of factor analysis technique, to obtain a single factor that measures the performance (WDES) companies.

Variable acronym	Method of calculation	Source	Study Base
Dependent variable - Performance			
DES	Factorial of variables ROA, ROE, ROIC, return on capital and Market Share	Economatica	Suitable Rose (2017) and Kupfer (1992)
Independent variables			
EXP	Percentage of revenues from overseas	Reference Form Item 7.6 - Material revenues from abroad	Sullivan (1994)
EXP2	Percentages derived from overseas revenues squared	Reference Form Item 7.6 - Material revenues from abroad	
exp3	Percentages derived from foreign income cubed	Reference Form Item 7.6 - Material revenues from abroad	
CONC	% The largest shareholder	Economatica	Adapted from Lameira & Ness (2011)
Control variables			
CRES	Revenue current year - revenue prior year / revenue last year	Economatica	Carvalho-da-Silva & Leal (2006)

TAM	log of total assets	Economática	Carvalho-da-Silva & Leal (2006)
RISK	Log EBIT standard deviation of the last five years	Economática	Pereira (2013)
TANG	Fixed Assets / Total Assets	Economática	Pereira (2013)
PAY	Dividend paid / Net Income	Economática	Pereira (2013)
Interaction variables			
EXPCONC	X EXP CONC	Economática	

Figure 1: Study Variables

Source: Authors

Regarding the variable ownership concentration, we used the concentration of the largest shareholder (CONC) and for export variable was considered the percentage of revenue acquired by overseas customers (EXP) and its (EXP²) and (EXP³). And as control variables are growth, size, risk, and Tangibility Payout as applied by Pereira (2013) and Carvalho-da-Silva & Leal (2006) in order to minimize the stochastic error. This study controlled results per year, from 2010 to 2017, obtaining eight years, but 7 dummy variables of type and sector, 19 sectors turned into 18 dummy.

The reporting period is from 2010 to 2017 due to CFC Resolution 1,156 / 2009, which made it mandatory that Brazilian financial statements to conform to international standards from 2010.

To investigate the meeting of the influence of the variables on the performance factor, regression will be used with panel data, which according to Hsiao (1986) is a technique that allows control of heterogeneity and the use of a greater amount of observations, increasing the degree of freedom and reducing the collinearity.

3.3. Models and methods

The aim of this study is to analyze whether there is relationship between the concentration together with by exporting internationalization strategy in performance level companies. To check the relationship between performance level and exports were created three models that differ by adding the quadratic and cubic export in order to verify the export behavior.

To this, it was built three equations, which compiles the metrics described quantitative model, as can be seen below.

$$DES_i = \beta_0 + \beta_1 EXP_i + \beta_2 CRES_i + \beta_3 TAM_i + \beta_4 RISK_i + \beta_5 TANG_i + \beta_6 PAY_i + \beta_7 CONC_i + \beta_8 EXPCONC_i + \epsilon_i$$

(Model 1)

$$DES_i = \beta_0 + \beta_1 EXP_i + \beta_2 EXP^2_i + \beta_3 CRES_i + \beta_4 TAM_i + \beta_5 RISK_i + \beta_6 TANG_i + \beta_7 PAY_i + \beta_8 CONC_i + \beta_9 EXPCONC_i + \epsilon_i$$

(Model 2)

$$DES_i = \beta_0 + \beta_1 EXP_i + \beta_2 EXP^2_i + \beta_3 EXP^3_i + \beta_4 CRES_i + \beta_5 TAM_i + \beta_6 RISK_i + \beta_7 TANG_i + \beta_8 PAY_i + \beta_9 CONC_i + \beta_{10} EXPCONC_i + \epsilon_i$$

(Model 3)

In:

DES_i = Performance Level;

β_0 = is the intercept;

$\beta_1 EXP_i$ = comprises exports company;

$\beta_2 EXP^2_i$ = comprises exports company squared;

$\beta_3 EXP^3_i$ = comprises exports now to the hub;

$\beta_4 CRES_i$ = company growth comprising

$\beta_5 TAM_i$ = company size comprises

$\beta_6 RISK_i$ = comprises the risk of bankruptcy

$\beta_7 TANG_i$ = comprises Company leverage

$\beta_8 PAY_i$ = comprises Company Payout

$\beta_9 CONC_i$ = comprises company ownership concentration

$\beta_{10} EXPCONC_i$ = comprises the interaction export company and concentration

ϵ_i = is the model error term

It was held the box plot for all variables to check for outliers at the base, and it was found that, except for the variable concentration, the other had extreme values, so the variables were winsorizadas to treat the problem.

A common problem in regression models is multicollinearity, which according to Gujarati (2006) there are basically two types, the perfect occurs when the variables, constants, not all are equal to zero together and less than perfect when variables are related to each other. For this, the VIF test was performed to verify that the sample has or not this problem, and as can be seen in Table 5, the test showed the value of 1.95 in average and no value above 10, so the test It showed that there is no multicollinearity problems.

In addition, tests were conducted to identify the most appropriate model for regression with panel data, that is, if would be pooled model, random or fixed effects. To this end, Breusch- Pagan

tests were performed (H0 = Pooled and H1 = Random), Chow (H0 = Pooled and H1 = fixed) and Hausman (H0 = Random and H1 = Solid), and according to the results presented in table 5, it appears that the most appropriate model for this sample is fixed effects.

Another problem that can arise in regression models is the autocorrelation and heteroscedasticity, for this the tests were performed Woodridge and Wald respectively, and what we found is that there are no such problems in the variables in this study since the tests had a significance below 0.05%, so we accepted the H0 hypothesis of no autocorrelation or heteroskedasticity.

4. Data analysis

4.1. Descriptive analysis of the data

Figure 2 presents the descriptive analysis of the study data, with features such as mean, standard deviation, maximum and minimum. As can be seen in Table 2, the average export was 6%, and the maximum was of companies that had 100% of its revenues from abroad.

The performance factor averaged 0.01, with the maximum score of 1.14. It is also worth noting that the average equity concentration averaged 50%, reaching 100% ownership concentration, thereby enhancing Marques statement, Guimarães and Peixoto (2015) in Brazil, companies have a strong concentration of control in a shareholder or control group.

Variables	Comments	Average	Standard Deviation	Min	Max
Companies	4,896	307	177	1	612
Sector	4,896	10	5	1	19
Year	4,896	2014	2	2010	2017
EXP	3,564	00:06	00:17	00:00	1:00
EXP2	3,564	00:03	00:13	0	1
exp3	3,564	00:02	00:11	0	
CONC	1,655	00:50	00:28	00:00	1:00
WDES	2,436	00:01	00:26	-0.19	1:14
WEXPCONC	4,896	00:00	00:02	00:00	00:09
WTAM	2,969	9:04	1:26	4.89	10.82
WCRES	2,514	00:02	00:32	-0.79	1:02
WRISK	3,250	7.74	0.93	5	9:39
WTANG	2,969	00:23	00:24	0	0.82
WPAY	2,781	-0.34	0.69	-3.27	0.73

Figure 2: Study Description

Note Variables: EXP - Export; EXP2 - Export squared; Exp3 - Export to the hub; WDES - Performance Factor; CONC - level of ownership concentration, WTAM - Company Size; WCRES - Growth of the company; WRISK - bankruptcy risk; WTANG - Tangibility; WPAY - Payout of the company; WEXPCONC - Interaction between export and ownership concentration.

Table 1 shows the correlation matrix of the variables in this study to verify the possible associations between them. It is observed that in general, the variables have a weak association

between them, which is a good indication of the absence of autocorrelation, except for the variables quadratic and cubic export because it is the same database.

The association of EXP variables EXP2, exp3, WEXPCONC, WTAM, WRISK and WTANG were positive regarding WDES interest variable, indicating that the higher the export, the size, the risk of bankruptcy, tangibility and allied export the concentration, the higher the performance, however, it is noted that these relationships are demonstrated weak, since the correlation can be introduced from -1 to 1, that is most strongly associated avariáveis size and risk of failure.

Table 1
Correlation of the variables

	WDES	EXP	EXP2	EXP3	CONC	WEXPCONC	WTAM	WCRES	WRISK	WTANG	WPAY
WDES	1										
EXP	0.0672*	1									
EXP2	0.0809*	0.9417*	1								
EXP3	0.0917*	0.8573*	0.9774*	1							
CONC	-0.0565*	-0.0921*	-0.0702*	-0.0525	1						
WEXPCONC	0.0626*	0.5141*	0.4241*	0.3525*	0.0076	1					
WTAM	0.4170*	0.0793*	0.0892*	0.0899*	-0.2434	0.0960*	1				
WCRES	0.0132	0.0317	0.0259	0.0207	-0.0327	0.0275	0.1528*	1			
WRISK	0.3982*	0.0377	0.0461*	0.0506*	-0.1312*	0.0764*	0.8220*	-0.0062	1		
WTANG	0.1318*	0.0083	0.0164	0.0171	-0.0127	-0.0303	0.1654*	0.0312	0.0925*	1	
WPAY	-0.0996*	-0.0736*	-0.0977*	-0.1114*	0.0338	-0.0598*	-0.1788*	0.0166	-0.1216*	0.0244	1

Note Variables: EXP - Export; EXP2 - Export squared; Exp3 - Export to the hub; WDES - Performance Factor; CONC - level of ownership concentration, WTAM - Company Size; WCRES - Growth of the company; WRISK - bankruptcy risk; WTANG - Tangibility; WPAY - Payout of the company; WEXPCONC - Interaction between export and ownership concentration.

Already the CONC and WPAY variables showed a negative association with WDES, suggesting that the higher the concentration and the payout, the lower the level of performance, however, these associations also showed weak.

4.2. Analysis of results

With the analysis of the correlation matrix was performed, starts the analysis of models 1, 2 and 3 as described in the methodology.

Model 1 tests the relationship of linear export (EXP), concentration (CONC) and other variables with the performance level (WDES). By analyzing the model 1 in Figure 3, it is observed that the export level determines negatively and significantly the level of performance constructed in this study, namely, shows that the higher the export linear point of view, the lower the performance level.

The variable interaction between export and concentration (WEXPCONC) positively determines the performance, the higher the export ally the concentration, the higher the performance, however, only the concentration alone showed no significant relationship with the variable of interest.

In addition, the control variables size (WTAM) and growth (WCRES) proved to be positively and significantly related to the level of performance, so the larger the company and the growth of it, the higher the level of performance.

Variables	Model 1	Model 2	Model 3
EXP	-0.0812 *	-0.3412 **	-0.6857
EXP2		0.2678 **	1.1166
exp3			-0.5711
CONC	-0.0287	-0.0360	-0.0390 *
WEXPCONC	0.3730 **	0.7952 **	1.0796 *
WTAM	0.1129 ***	0.1143 ***	0.1140 ***
WCRES	0.0274 ***	0.0277 ***	0.0285 ***
WRISK	0.0074	0.0080	0.0076
WTANG	0.0219	0.0221	0.0194
WPAY	-0.0021	-0.0024	-0.0027
Comments	969	969	969
VIF	1.95	1.95	1.95
Breusch- Pagan	1642.50 ***	1649.24 ***	1614.65 ***
Chow	7:36 ***	7:15 ***	6.83 ***
Hausman	204.18 ***	94.78 ***	185.14 ***
Woodridge	44 004 ***	45 782 ***	47 316 ***
Wald	1.5E + 34 ***	1.4e + 37 ***	1.7e + 34 ***
Controlled by year	Yes	Yes	Yes
Controlled by sector	Yes	Yes	Yes

The coefficients of the control variables by sector (industry) and years (year) were omitted from the table.
note: T statistic in parentheses. The asterisks *, ** and *** represent, respectively, statistically significant at the level of 10%, 5% and 1%.

Variables: EXP - Export; EXP2 - Export squared; Exp3 - Export to the hub; WDES - Performance Factor; CONC - level of ownership concentration, WTAM - Company Size; WCRES - Growth of the company; WRISK - bankruptcy risk; WTANG - Tangibility; WPAY - Payout of the company; WEXPCONC - Interaction between export and ownership concentration.

Figure 3: Results of panel regression models with fixed effect of the 1, 2 and 3

Model 2 of Table 4 tests the ratio of export squared (EXP2) to see if there is a concave relationship with performance (WDES), and also test the concentration (CONC) and other variables with the performance level (WDES). By analyzing the model 2 indicates that both the linear export level as the quadratic significantly determine the performance level, however, the EXP has a negative correlation as model 1 and EXP2 demonstrates a positive relationship thereby infers if the export relates variable U-shaped with the performance, ie, there is a limit percentage export makes this

relationship is no and after this limit, the export shall positively influence. The optimum found in this model was 63.7%, ie,

The control variables showed the same result as the model 1, ie, size, growth and interaction-export concentration determine positively and significantly the fact that performance.

Finally, the model 3 of Table 4, it adds up to the hub export variable (exp3) to see if there is a relationship in S format with the performance (WDES). It is observed that when inserting the cubic export the model, all export variables no longer have significance to the fact that performance (WDES), but, unlike the other two models, the variable concentration becomes significant performance-related negative (WDES), the higher the concentration, the lower the performance.

After the result of the model 3, it is inferred that the variable performance is better explained by the model 2, in other words, it appears that the performance is influenced with the export of U shape, which agrees with the study of Contractor et al. (2003) showing that exports may present an early stage where the costs outweigh the benefits, however, after a certain level of export, stage 2 begins on shows that gain become higher than the costs. In addition, the three models the interaction export-concentration was positive and significantly related to performance.

Specifically, in the model 2, which proved to be the most suitable to the study, it is found that the ratio exists in the interaction (WEXPCONC), however, not the case regarding when assessing the concentration individually, and thus it is understood that the concentration alone does not affect the performance factor corroborating the results of Demsetz & Lehn (1985), Dami, Rogers & Ribeiro (2007) and Rogers et al. (2008), however, when combined with the strategy of internationalization through exports, both variables positive impact on performance.

5. Final considerations

This study aimed to investigate whether ownership concentration combined with export relates to the performance factor built by this article of the companies listed on the B3 in the period 2010 to 2017. For this purpose, we used the regression with panel data to analyze the relationship between variables.

From this study, the following contributions were generated: (1) Accepts H1 it was found a significant positive relationship between the interaction exporting concentration, i.e. higher export combined with a higher concentration, the higher the performance (2) export relates in U shape with the performance factor, it starts impacting negatively on performance, but after a certain point, the export positively determines the performance. In this study, it was found that the inflection point is

63.7%, (3) Concentration by itself has no significant relationship with performance and (4) The larger the size and growth of the business, the greater the performance factor built for this study.

The interaction between the level of exports and level of ownership concentration with a positive impact on performance, shows that administrators must manage jointly these two factors, since their interaction provides a better performance.

As future work, it is suggested to measure the concentration of the sum of the top three to see if there may be different results in this variable relationship, and add other internationalization variables to consider other forms of foreign entry.

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