



## Degree of Internationalization and performance: Evidence from emerging Brazilian multinational firms

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*Grado de Internacionalización y desempeño: evidencia de empresas multinacionales brasileñas*

*Grau de Internacionalização e desempenho: evidência de empresas multinacionais brasileiras*

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*This paper analyses the relationship between degree of internationalization, as measured by Foreign Sales over Total Sales, and Accounting and Market performance for five Brazilian emerging multinational firms. Results indicates that a higher degree of internationalization of sales is associated to positive returns in terms of ROA and Tobin's Q. Moreover, the firms competing in more added-value sectors exhibited the highest marginal returns over foreign sales.*

*La presente investigación analizo la relación entre el grado de internacionalización, medido por las ventas internacionales sobre ventas totales, y el desempeño financiero y de mercado para cinco empresas multinacionales brasileñas. Los resultados indican que mayores grados de internacionalización de las ventas se asocian a retornos positivos en terminos de ROA (retorno sobre los activos) y Tobin's Q (desempeño de mercado). Las empresas compitiendo en sectores de más alto valor agregado presentaron retornos marginales mayores sobre sus ventas internacionales.*

*A presente pesquisa analisou a relação entre o grau de internacionalização, medido pelo total de vendas internacionais sobre vendas totais, e a performance contábil e de mercado para cinco multinacionais brasileiras. Os resultados indicam que um maior grau de internacionalização das vendas está associado a retornos positivos em termos de ROA (retorno sobre ativos) e Tobin's Q (performance de mercado). Adicionalmente, empresas competindo em setores de valor agregado mais alto apresentaram maiores retornos marginais sobre suas vendas internacionais.*

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## 1. Background

The fast growth of the globalization process and international competition has been pressuring firms to seek foreign markets. By becoming multinational companies, firms are able to exploit their competitive advantages, and to develop new ones. (Porter 1990, Ca-teora & Graham 2001). However, the decision to operate in international markets should be done in comparison to the profit possibilities in the domestic market. That means, the degree of internationalization should grow when the marginal returns earned in foreign markets outperforms the marginal returns earned in the domestic market. It suggests there should be an optimum degree of internationalization. (Li 2007).

Despite the consolidation of globalization, and the growing number of multinational companies, research in the International Business field is still inconclusive regarding the relationship between internationalization and performance. Besides many hypotheses were tested, the results found were contradictory sometimes. There are evidences of the relationship between internationalization and performance as being both positive, negative and even inexistent (Sullivan 1994a, Li 2007, Kotabe, Srinivasan e Aulakh 2002, Denis, Denis e Yost 2002). It reinforces the need for more research on this subject.

Moreover, the majority of papers written studied the internationalization of firms located in developed economies, mainly USA, Sweden, Germany and Japan. (Lu & Beamish 2004, Delios & Beamish 1999, Agmon & Lessard 1977). On the other hand, emerging economies as the BRIC countries are becoming strong players in the global market, mainly after the financial crisis that hit the whole economy in the last three years. This paper brings a new perspective over the theme: the internationalization of emerging Brazilian multinational companies.

### KEY WORDS

Globalization,  
International  
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### PALABRAS CLAVE

Globalización,  
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### PALAVRAS- CHAVE

Globalização,  
Comércio  
internacional,  
Multinacionais

## 2. Literature Review

Many studies addressed the question whether a higher degree of internationalization should be reflected in higher economic performance in the firm level. Since Vernon (1971), hundreds of papers were written, many of them bringing valuable contributions. This paper will not review every paper written on the subject. For practical purposes, we build on the research conducted by Li (2007), which has reviewed the many papers that analyzed the relationship between internationalization and performance.

### JEL CODES

F230; L190

The major findings are summarized as follows:

- *Positive relationship*: Higher levels of internationalization are associated with positive returns. Firms deploy their intangible assets to explore market imperfections in foreign countries.
- *Negative relationship*: Higher levels of internationalization are associated with negative returns, mainly when internationalization is done by Greenfield project. This contradictory finding can be explained by Agency Theory, as managers may invest in international projects that destroy value, to be able to capture cash flows from owners.
- *Inexistent Relationship*: Internationalization and performance are not correlated.
- *S-Curve Hypothesis*: Internationalization produces positive returns up to a certain level of investment in international operations. Further from that point, there is an escalation of managerial costs, and the marginal product of internationalization becomes negative. There is a dynamic interplay between costs and benefits of internationalization, so the resulting relationship with performance is a cyclical S-curve.
- *Inverted U-Curve*: Based on the incremental model developed by Uppsala school, this theory postulates that internationalization starts on geographic adjacent countries, where the business environment is more familiar to firms, and returns are prone to be positive. When entering in more complex markets, firms begin to face managerial difficulties that end up compromising returns. Eventually the marginal cost of international expansion will exceed the marginal benefits. The relationship between internationalization and performance would take an inverted U curve.

As mentioned before, the vast majority of studies analyzed multinational firms from developed countries. What would be the relationship between internationalization and performance for firms located in an emerging economy, like Brazil?

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### 3. Method

#### 3.1. Sample

To understand the effect of internationalization on performance, it is required to analyze how internationalization evolves over time. For that reason, the sampling process was done in ways to include multinationals that have been in foreign markets for some considerable period. The sampling was done by convenience. Six Brazilian multinationals were studied. These are very traditional companies, consolidated in the business market. Companies studied are:

Table 1. Sample

Company	Sector
Gerdau S.A	Steel
Sadia S.A	Food
Perdigão S.A	Food
Embraer S.A	Aircraft Manufacturing
Braskem S.A	Petrochemicals
Aracruz Celulose S.A	Paper & Cellulose

Data was collected from 2000 to 2007 on annual basis, extracted from Annual and Trimester reports. Since the Brazilian legislation does not force companies to display information regarding international operations on their statements, only public companies could be studied. These companies divulgate information about their international affairs as complementary information to investors.

### 3.2. Variables and analytic method

The main scale being used to measure the degree of internationalization was developed by Sullivan (1994). Internationalization is measured in three basic dimensions: Performance, Structure and Attitude. Performance describes the ratio of foreign sales over total sales (FSTS), Structure compares foreign assets with total assets (FATA), and Attitude refers to the psychic dispersion of international operations (PDIO), reflecting the diversity of markets where firms are operating. Only information to calculate FSTS could be obtained in the financial reports displayed by Brazilian companies. So internationalization was measured by foreign sales over total sales.

$$\text{FSTS} = \text{Foreign Sales (or Exports)} / \text{Total Sales}$$

Performance in internationalization-performance studies have been measured basically on three dimensions too: Accounting ratios (ROA, ROS), efficiency ratios (Operating Costs to Sales) and market ratios (Abnormal returns, Market-to-book, Tobin's). The variables calculated to measure performance were ROA (Return on Assets) for accounting performance and Tobin's Q for market performance:

$$\text{ROA} = \text{Net Income} / \text{Total Assets}$$

Tobin's Q was calculated following Chung and Pruitt (1994):

$$q = \frac{MVE + D}{TA}$$

**Where:**

MVE = Market value of equity;

D = Book value of debt (market value of debt is not easily obtained for Brazilian companies);

TA = Total Assets

The analytic method applied to understand the relationship between variables was Pearson Correlation and OLS regressions. Analyses were conducted in SPSS 16.0 software.

## 4. Results

### 4.1. Descriptive Statistics

The table below reports descriptive statistics for the sample:

Table 2. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
FSTS	48	,07	,98	,5726	,30389
TOBINS_Q	48	,38	1,76	1,0020	,34357
ROA	48	-,07	,15	,0668	,04610
Valid N (listwise)	48				

The average FSTS for the six companies between 2000 and 2007 was 0,57. That shows the fact that these companies are very export oriented, since their major sales revenues came from international markets. However, standard deviation is high, reflecting considerable differences between companies. Embraer and Aracruz sales in foreign markets are between 93% and 98%, depending on the year. Meanwhile, Braskem exported only 7% of its production in the year of 2000, but raised its exports over time, reaching 20% of FSTS in 2007. On average, the participation of foreign sales over total sales grew for all firms in the sample.

Average Tobin's Q is 1,0020. It reflects the low expectations put by investors in these companies, since the ratio is almost unitary. Companies are not overvalued. Tobin's Q also measures the replenishment cost of assets. Since the average ratio was 1, no conclusion can be drawn, because ratios below 1 usually suggests that it is cheaper to buy the company than

to start a similar business from the ground, meanwhile above 1 ratios tend to be associated with market overvaluation. Companies seem to be operating on an equilibrium frontier.

Embraer had the highest Q in the sample, reaching 1,76 in the year 2000. This result is consistent with financial theory, as Embraer is in a higher added-value business, when compared to the other companies in the sample. So investors should put more future expectations on that company.

Return on Assets (ROA) is low for the sample, accounting 0,068 (6,8%). It shows the somewhat inefficient deployment of firms' assets. It can be associated to the commodity characteristics of sample: besides Embraer, the rest of the firms analyzed are in commodity businesses.

The high standard deviation observed for the three variables must be highlighted: there is considerable heterogeneity between firms in the sample (Hair *et al.* 1998).

#### 4.2. Correlations and OLS regressions: Aggregate analysis

The comparison between ROA and FSTS is showed in the graph below:

Graph 1: ROA and FSTS

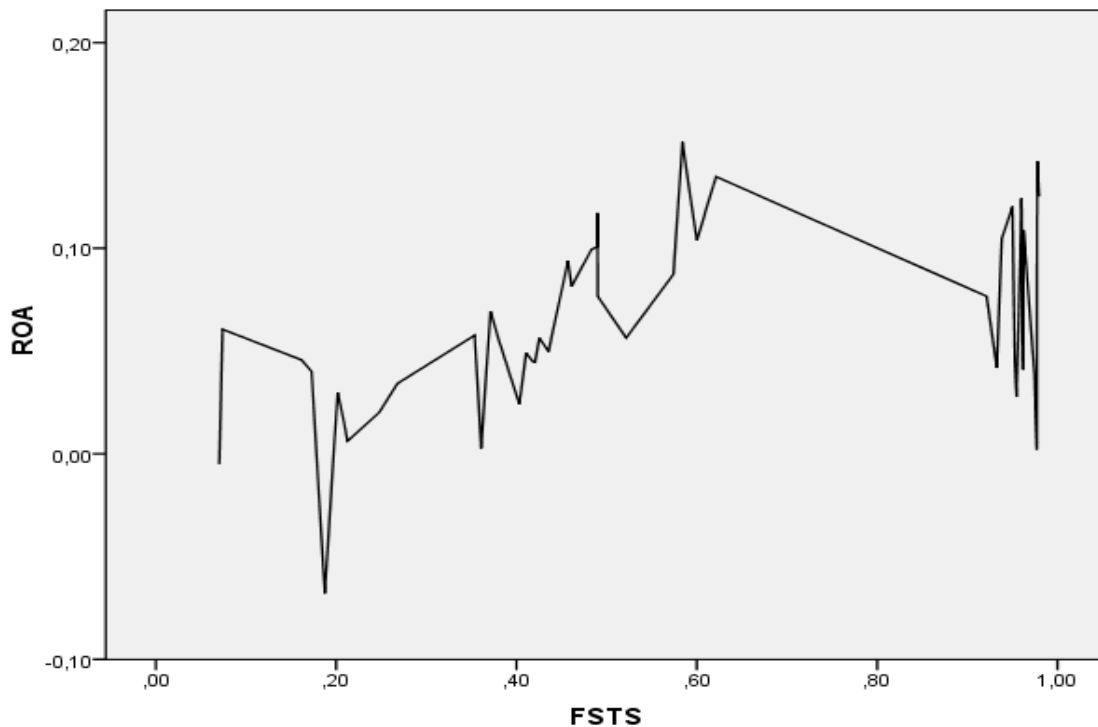


Table 3: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,492 <sup>a</sup>	,242	,226	,04056

a. Predictors: (Constant), FSTS

Table 4. ANOVA<sup>b</sup>

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	,024	1	,024	14,719	,000 <sup>a</sup>
	Residual	,076	46	,002		
	Total	,100	47			

a. Predictors: (Constant), FSTS

Table 4. ANOVA<sup>b</sup>

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	,024	1	,024	14,719	,000 <sup>a</sup>
	Residual	,076	46	,002		
	Total	,100	47			

b. Dependent Variable: ROA

The regression is statistically significant at 0,01 level. Adjusted R<sup>2</sup> is 0,226, what shows that the variables are positively correlated. Higher levels of foreign sales over total sales (FSTS) are associated to a better accounting performance, as measured by ROA, although the relationship is weak.

The following graph shows the relationship between Tobin's Q and FSTS:

Graph 2: Tobin's Q and FSTS

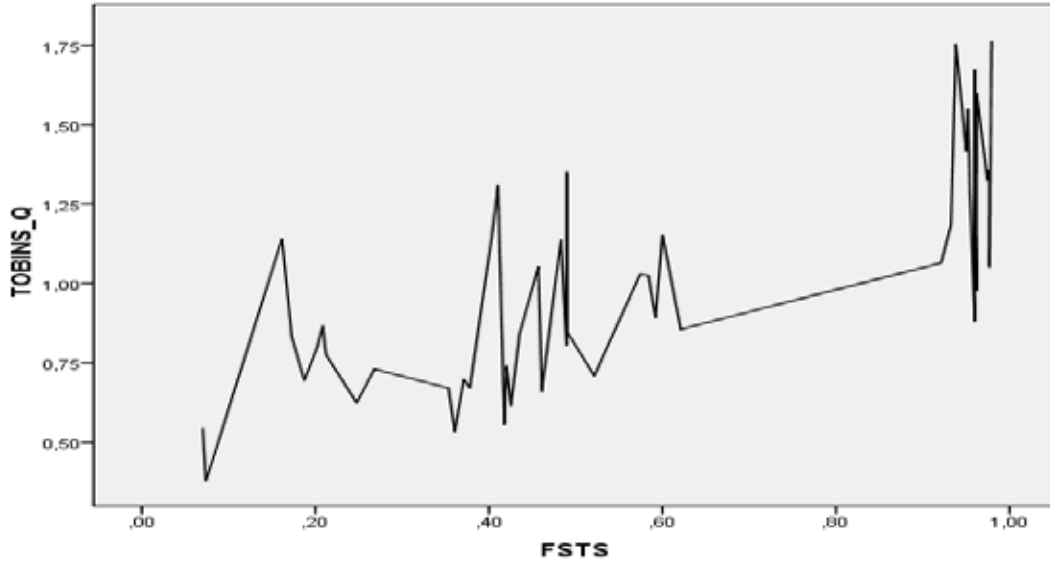


Table 5. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,735 <sup>a</sup>	,540	,530	,23558

a. Predictors: (Constant), FSTS

Table 6. ANOVA<sup>b</sup>

Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	2,995	1	2,995	53,965	,000 <sup>a</sup>
Residual	2,553	46	,055		
Total	5,548	47			

a. Predictors: (Constant), FSTS

b. Dependent Variable: TOBINS\_Q



The regression is also significant at 0,01 level, what supports the model. Adjusted  $R^2$  is 0,53, what can be considered satisfactory (Hair *et al.*, 1998). Higher degrees of foreign sales over total sales are associated to higher Tobin's Q ratios. It can be interpreted that as the FSTS rises, stock market reacts positively. It is possible that the Brazilian stock market investors are pricing internationalization of sales as an intangible asset, augmenting their expectations over firm's future cash flow generation.

#### 4.3. Firm level (Disaggregate) analysis

By differentiating ROA and Tobin's Q over FSTS we may assess the marginal product of FSTS, in other words, the marginal contribution of FSTS in terms of performance:

$$\frac{\partial ROA}{\partial FSTS} = b \quad \frac{\partial TOBINSQ}{\partial FSTS} = b$$

*Beta* is the marginal productivity of FSTS. By analyzing the relationship at firm level, the sample becomes smaller, and the coefficients are not statistically significant. However, the analysis is still interesting as it shows the differences that may exist in the contribution of internationalization to performance in different segments of business.

Table 7. Marginal productivity of FSTS, firm level analysis, 2000-2007

Company	$\frac{\partial ROA}{\partial FSTS} = b$	$\frac{\partial TOBINSQ}{\partial FSTS} = b$
Gerdau S.A	1,9	0,37
Sadia S.A	0,25	0,67
Perdigão S.A	0,38	-0,16
Embraer S.A	0,98	4,23
Braskem S.A	-0,21	0,16
Aracruz Celulose S.A	0,09	-10,8

In terms of ROA, the highest marginal return produced by international sales was observed for Gerdau. In terms of Tobin's Q Embraer had the highest marginal return (4,23).

The findings are interesting, because the firms that are profiting the most of their foreign sales are exactly the ones competing in less commoditized sectors. Embraer is in the highly competitive aircraft manufacturing market. Gerdau is a steel mill, present in many countries and selling 60% of its products outside of Brazil. It cannot be said that steel is not a commodity, but when compared to the products manufactures by the other firms in the sample

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(food, petrochemicals and cellulose), it has a higher added-value. This finding reinforces the argument that emerging countries should invest in more added-value industry sectors, and that firms from emerging countries must invest in R&D to add value to their products.

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## 5. Conclusions, Managerial Implications and Study Limitations

The results found in this study cannot be generalized to the whole of Brazilian business context, because sampling was not random, but done by convenience by the researchers. However, the findings may suggest support for the positive relationship between internationalization and performance hypothesis.

The regressions between FSTS and ROA and Tobin's Q were both significant. There is a positive relationship between FSTS and both performance variables. ROA is positively associated to higher levels of FSTS. For Tobin's Q the relationship was stronger, what suggests that stock market investors value internationalization as an intangible asset.

At firm level analysis, Embraer and Gerdau had better marginal products for their international sales efforts. This finding is interesting in the sense that both companies are involved in highly competitive and technology-intense sectors, in contrast to other firms in the sample that are competing in more commoditized sectors.

As managerial implications, the findings suggest that Brazilian firms should invest more in their internationalization process, since positive returns are associated to higher levels of foreign sales, both for accounting and market indicators. Another important implication is that firms should invest in technology and R&D, to add value to their products and earn higher marginal productivity for their exporting efforts. Actions to increase internationalization and added-value of products would enhance competitiveness at both firm and country level.

The study has several limitations. The sample is neither large nor fully representative of the Brazilian business environment. Due to the reduced sample, only simple analytical tools could be applied, such as OLS regressions and correlations. More robust studies should be done, with larger samples that would permit the utilization of more sophisticated statistics and econometric models, such as panel data and time series analysis.

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