Internationalization and its possible impact on subjective and objective performance: Evidence from Brazilian TNCs

Jase R. Ramsey, Livia L. Barakat and
Sherban L. Cretoiu[*]

Brazilian transnational corporations (TNCs) have increased foreign direct investment nearly every year since 2001. This paper assesses Brazilian TNCs' transnationality index and the relationship with both objective and subjective foreign performance. An empirical study was conducted of 41 Brazilian TNCs' international activities in 2008 and 2009. The results demonstrate that an increase in the degree of internationalization is associated with better foreign performance. This relationship is stronger for the objective performance dimension than the subjective dimension. Furthermore, UNCTAD's transnationality index is more reliable in this context than an alternative construct that includes other internationalization measures.

1. Introduction

Internationalization has long been discussed in the strategic management literature as a way of diversifying the business and creating value (Dunning, 2000; Johanson and Vahlne, 1977). Transnational corporations (TNCs) engage in foreign direct investment (FDI) in pursuit of superior performance (Sharma, 1998). But TNC strategies differ in terms of entry mode (Kogut and Singh, 1988), location (Goerzen and Beamish, 2003), centralization (Davidson, 1984) and ownership (Hennart and Reddy, 1997). The array of international strategy choices available to the firm results in differing levels of internationalization. In order to better understand what these levels mean to the organization, scholars have attempted to establish a reliable measure of the degree of internationalization.

* Jase R. Ramsey (corresponding author) is Assistant Professor of International Business and Management at the University of Alabama. Contact, tel: 1.205.348.6615; e.mail: Jase@cba.ua.edu Livia L. Barakat is Assistant Professor at Fundação Dom Cabral, Brazil. Sherban L. Cretoiu is Professor at Fundação Dom Cabral, Brazil.

Many different ways of measuring internationalization exist. Some measures rely on a single-variable based on foreign sales (Geringer, Beamish and daCosta, 1989). Others propose a multidimensional measure including *inter alia* FDI, employment and geographic dispersion (Ietto-Gillies, 1998, 2009; Sullivan, 1994; UNCTAD, 1995). Although the choice of an "ideal" measure seems to depend upon context (Ietto-Gillies, 1998), it is nevertheless important to assess the internationalization level of firms in order to understand the patterns and effects of global strategies on firm performance. For example Brazilian TNCs have been increasing their investment abroad since 2001, with consequent performance improvements (Loncan and Nique, 2010). But since the recession of 2008, many Brazilian firms have begun to question whether further internationalization is the most prudent use of their capital (Ramsey et al., 2010).

The purpose of this paper is to contribute to our knowledge in three areas. First, whether firm performance is related to the degree of internationalization of a firm. Second, whether some measures of internationalization are better suited to assessment of the relationship between performance and internationalization. Third, whether the relationship between internationalization and performance is better explained by subjective or objective measures of performance.

We first discuss alternative ways of measuring the degree of internationalization. We then address how the degree of internationalization is related to firm performance. Finally, we discuss whether the degree of internationalization is more closely related to subjective or objective measures of performance. In doing so, we propose and test two models in which internationalization has a positive relationship with both foreign objective and subjective performance.

2.   Internationalization

2.1   Degree of internationalization

An important element in the study of the degree of internationalization is the level of measurement (Ietto-Gillies, 2009). In principle, internationalization can be measured at national, industry or firm level. We chose the firm level because the objective of this paper

understanding how the degree of internationalization affects a firm's foreign performance.

Internationalization refers to a firm's engagement in FDI and development of foreign business units. The classical determinants of FDI are: (1) ownership advantages that may be explored overseas; (2) location advantages offered by other countries; and (3) internalization advantages by integrating intermediate product markets (Dunning, 2000). Therefore, internationalization via FDI is an alternative to international outsourcing and a means to create value for the firm. Levels of international commitment vary widely across industries and organisational cultures. The process of internationalization typically involves multinational enterprises gradually increasing involvement in foreign markets, often starting with a basic sales office and ending up producing abroad in more advanced stages (Johanson and Vahlne, 1977). As such, firms are committed to foreign markets to varying degrees, depending on their particular stage of internationalisation and according to individual strategic plans.

In spite of this complexity, researchers need a credible means to quantify the degree of internationalization. The first attempts to quantify internationalization used a single-variable approach, based on foreign sales (Collins, 1990; Geringer, et al., 1989; Grant, 1987) or the ratio of foreign assets to total assets (Ramaswamy, 1993). Despite ease of calculation, single-item usually underperform multi-item scales in terms of predictive ability. Multi-item scales reduce measurement errors, resulting in increased reliability and construct validity. Moreover, single-item scales can be ignore the multi-dimension nature of a firm's international presence, which extends beyond a mere financial perspective (Churchill Jr, 1979). Psychic dispersion, a manager's international experience, the intensity level of internationalization and the geographical extensiveness of the international activities may also be important (Ietto-Gillies, 1998).

Therefore, the measurement of internationalization has expanded beyond single measures and financial criteria. Multi-variable measures have emerged as a means to control for measurement error and to address the different aspects of the internationalization process (Dorrenbacher, 2000). Lu and Beamish (2004) for instance,

assess internationalization using two variables: the number of overseas subsidiaries and the number of countries these subsidiaries inhabit.

One such multi-variable measure was developed by UNCTAD for its *World Investment Report* (UNCTAD, 1995). It combines three ratios: foreign sales to total sales, foreign assets to total assets, and foreign employment to total employment. The "transnationality index" averages the three dimensions in order to balance different types of internationalization across various industries. Tuselmann et al. (2008) used it to assess the importance of industry internationalization in shaping the strength and nature of the country-of-origin influence in employee relations of United States subsidiaries. While relatively few studies have used the transnationality index, some scholars have used its elements to develop alternative indices (Outreville, 2008; Ruzzier, Antoncic and Hisrich, 2007). Furthermore, UNCTAD's transnationality index has been adopted by several business schools around the world in order to compare companies across countries (see UNCTAD's annual *World Investment Report* for the largest TNCs worldwide).

Due to the multi-variable nature of the transnationality index as well as its approach of using other than purely financial measures, we have selected it as the primary measure for the degree of internationalization. Furthermore, we have selected Brazil as the country to sample for this study because it is the largest economy in Latin America as well as the greatest source of FDI from the region.

One prior study showed that the more internationalized the Brazilian company (in terms of foreign sales over total sales), the better its performance (returns on assets) (Loncan and Nique, 2010). But the study only sampled five companies and used a single indicator for each concept. The contribution of our study is to extend this research by exploring the relationship by surveying a larger sample, testing multi-dimensional constructs and adding subjective measures of performance.

2.2   Internationalization and firm performance

A number of prior studies have discussed the effects of internationalization on firm performance. The general argument is that TNCs increase their return on foreign investment by focusing on global strategic planning, risk management and their unique advantages

(Dymsza, 1984). The underlying assumption is that international firms develop firm-specific advantages that lead to superior returns (Bouquet, Morrison and Birkinshaw, 2009). Firms establish these advantages by altering their strategy. For example, management centralization (Davidson, 1984), entry mode (Sharma, 1998), portfolio size (Goerzen and Beamish, 2003) and cultural distance (Park and Ungson, 1997) are all strategic decisions involved in international operations that have been shown to affect foreign performance.

Relatively little research has sought to understanding the effect of the degree of internationalization on performance.[1] It is commonly assumed that as firms increase their degree of internationalization, they will increase their knowledge of doing business abroad, resulting in superior performance. A mechanism for increased knowledge is an increase in employees abroad. Furthermore, the more resources that the firm allocates abroad, the more it will be committed to improving foreign performance. If a firm has a large percentage of its assets abroad, then it will be more inclined to focus on foreign performance. Finally, companies that invest a large amount of time and capital abroad are likely to increase foreign sales and consequently firm performance.

3. Performance measurement

In a review of export studies, Sousa (2004) found that there are approximately 50 different measures of foreign performance, but only a few are frequently utilized. How a firm measures overall foreign performance may affect how satisfied it is with its foreign subsidiaries. For example, executives may be more or less satisfied with performance depending on how it compares to expectations (Oliver, 1997) or competitors (Shoham, 1998).

A distinction can be drawn between objective and subjective measures of performance. Objective measures are indicators mainly based on values ascertained from profit and loss statements (e.g. earnings before interest and taxes (EBIT)) or ratios calculated with absolute values (e.g. return on sales (ROS)). On the other hand, subjective measures are indicators based on attitudes towards performance such as perceived success and satisfaction with foreign performance.

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[1] See Lu and Beamish (2004) as a notable exception.

3.1   Objective measures of performance

Objective indicators are represented as numbers or percentages directly found in financial statements, balance sheets or market/sales reports. Recent studies have used a combination of these variables (e.g. Andersson, Forsgren and Pedersen, 2001). Lel and Miller (2008), for instance, employ measures such as stock price, stock returns and EBIT to assess performance of international cross-listed companies. Taggart and Taggart (1999) also use sales based measures such as market share and growth of exports to show the link between exchange-rate stability and performance. Other authors measure performance by return on assets (Miller and Eden, 2006), return on sales (Makino and Isobe, 2003) and return on equity (Bouquet, Morrison and Birkinshaw, 2009). Bouquet, et al. (2009) found that the amount of time and effort in activities, communications and discussions concerning the global marketplace was correlated with firm performance.

Therefore, we hypothesize that:

H1: The TNC's degree of internationalization is positively correlated to its objective foreign performance.

3.2   Subjective measures of performance

Despite numerous ways to objectively measure foreign performance, difficulties in obtaining and dealing with company accounts remain a point of contention within the literature for three main reasons.

First, financial statements are usually confidential and restricted to internal control (Woodcock, Beamish and Makino, 1994). Even publicly traded companies are not obliged in most countries (including Brazil) to publish results of foreign operations separately from consolidated statements. Lack of objective information is thus responsible for greatly reducing response rates in empirical work on international business performance (Wall et al., 2004).

Second, objective measures are not easily comparable because companies from different industries and sizes may have different results (e.g. foreign profit), but not necessarily outperform each other.

For instance, a foreign firm operating in a very large foreign market (e.g. China) might appear to outperform a firm operating in a relatively small foreign market (e.g. Uruguay). Is firm A which sells $9,000,000 of socks in China outperforming firm B selling $8,000,000 of socks in Uruguay? One could argue that firm B is dominating the market in Uruguay and firm A is barely getting into the market in China. One way researchers have avoided this issue is by using ratios such as return on assets or by assessing performance subjectively.

A third reason why objective measures may be problematic is due to timing. For instance, many emerging markets companies are more focused on long-term objectives such as learning and obtaining market share than on short term sales and profits (Pangarkar and Klein, 2004). In such cases even though profits may seem marginal, the firm can be satisfied because it did not expect a quick return.

According to Wall et al. (2004), using subjective measures is a cost-efficient choice because evaluations may be collected in simple questionnaires. Additionally, executives are more amenable to evaluating performance on a Likert scale than reporting confidential information (Sousa, 2004). Moreover, subjective measures provide a broader assessment of the results of internationalisation as well as a useful comparison between expectations and perceived success. Furthermore, a study of international joint ventures in the United States provided empirical evidence that subjective measures are adequate for assessing firms' performance (Geringer and Herbert, 1991). Thus, scholars have been increasingly applying subjective measures as a complement to objective measures and also a solution to recurrent issues with objective indicators (Al-Khalifa and Peterson, 2004; Brouthers, Brouthers and Werner, 2008; Nielsen, 2007).

In general, we expect that subjective measures of performance would also reflect the degree of internationalization. One might even argue that subjective measures would be more closely correlated with the transnationality index because it can overcome the aforementioned problems with objective measures. Specifically, managers are more willing to give subjective results than hard numbers and both the size of the operation and how long it has been operating can both be taken into account when the manager responds to subjective measures.

Therefore, we hypothesize that:

H2: The TNC's degree of internationalization is positively correlated to its subjective foreign performance.

4.   Data and Methodology

In this section we present the methods and procedures used to formulate our questionnaire, to collect the data and to validate the scales constructed.

4.1   Data collection

A set of 71 Brazilian groups that entered foreign markets via FDI were contacted to participate in the survey. The potential response pool included publicly traded companies listed on the Bovespa (São Paulo Stock Exchange) and private limited companies (Ltda.). While 71 groups may be considered relatively small for an empirical study, this number is very close to the entire population of large Brazilian multinational groups.[2]

International managers were asked to fill out a three page questionnaire regarding their international activities in 2008 and 2009. Forty four companies replied, of which 41 were valid (57.7 per cent response rate). The three response that were not valid were from firms that only exported or could not provide the required financial data. All variables in this study were obtained from the questionnaire. Companies' financial department provided information on objective performance as well as total and foreign revenues and assets to compose the internationalization measure; human resource departments provided the number of total and foreign employees; and international managers answered the questions regarding subjective performance, number of countries and year when the first international subsidiary was established. An effort was made to verify the data from secondary sources to improve validity. Note that we considered groups instead of individual businesses since decision making is often centralized in the holding company. Therefore, the data are based on the groups' consolidated numbers and locations.

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[2]   The questionnaire (in Portuguese) is available from the authors on request.

4.2 Sample profile

From the 41 groups that participated in the study, 90 per cent are privately owned as opposed to state-owned. Respondent firms belong to various industries: manufacturing (51 per cent), services (44 per cent) and natural resources (5 per cent) (see the Appendix for a complete listing of companies and industries). Additionally, companies entered foreign markets relatively recently foreign markets: 20 per cent opened the first international subsidiary before 1980; 10 per cent between 1981 and 1990; 29 per cent started between 1991 and 2000; and 32 per cent after 2001 (9 per cent did not provide this information).

4.3 Measurement

The proposed model has three variable constructs: *degree of internationalization* as the predictor of both foreign *objective performance* and *subjective performance.*

Data from 2008 and 2009 was averaged since firms may have different performances depending on the year. Therefore, using the average avoids spikes in the results due to year effects (e.g. 2008 and the financial crisis), providing a more accurate and stable assessment of performance (Maijoor and Vanstraelen, 2006; Slaper and Krause, 2010).

To measure the *degree of internationalization*, we applied the UNCTAD methodology, which considers three indices: foreign sales over total sales, foreign assets over total assets and foreign employees over total employees. The indices achieved good reliability (Cronbach's alpha = .87). As discussed above, using a multidimensional index balances the different ways of internationalizing since we have groups from different industries. In general, companies from the services sector have a large number of employees abroad but a relatively low amount of assets. On the other hand, companies from the manufacturing sector can accumulate high revenues abroad without necessarily having a large workforce. Because aggregating various items into a construct may limit the interpretation of results (Bergkvist and Rossiter, 2007), we also present an analysis of the effects of each index on performance measures separately.

Furthermore, we added two additional variables that have been used to measure the degree of internationalization (Ietto-Gillies, 1998; Sullivan, 1994). The number of countries and international experience were added to the construct in order to compare two competing rubrics. The first variable was measured by the number of countries that firms had FDI in 2009 (Sundaram and Black, 1992). The second variable, international experience, is based on the organizational learning perspective (e.g., Hennart and Reddy, 1997) and measured by the number of years since the first international subsidiary was established.

Foreign *objective performance* was measured with three indicators. The first was the EBITDA index, which is the proportion of foreign EBITDA to total EBITDA. The second measure was foreign return on sales (ROS), which is calculated by the ratio of foreign profit (EBITDA) to foreign sales. ROS is commonly employed to assess firm's operational efficiency and has been applied in the literature (Daniels and Bracker, 1989; Geringer, et al., 1989). The third measure was foreign return on assets (ROA), which is calculated by the ratio of foreign profit (EBITDA) to foreign assets. This indicator has also been used in the literature as a measure of investment efficiency (Loncan and Nique, 2010; Rugman and Oh, 2010). Using indices instead of the absolute numbers allows us to assess relative foreign performance and compare companies from different industries and sizes. The construct, however, showed low reliability, with Cronbach's Alpha of 0.41. Nevertheless, we decided to proceed with the tests in order to keep a minimum of three indicators per construct.

Four indicators were used to measure *subjective performance* (Al-Khalifa and Peterson, 2004). According to this approach, firms assess performance based on four elements: sales, sales growth, profit and market share. Thus, firms were asked to rate its satisfaction with each of these measures of performance on a five-point Likert scale. The dimensions proved to be unidimensional by factorial analysis and reliable (Cronbach's Alpha = 0.82). See table 1 for a summary of the variables and their components.

4.4   Methodology

Before testing the models, several analyses were employed in order to assure data consistency. First, missing data were replaced by

Table 1. Variables, components, year and source of data

Variables	Components	Year of data	Source of data
Revenues index	Foreign sales/Total sales	Avg of 2008 and 2009	Financial department
Assets index	Foreign sales/Total sales	Avg of 2008 and 2009	Financial department
Employees index	Foreign employees/Total employees	Avg of 2008 and 2009	HR department
UNCTAD index*	Avg of revenues, assets and employees index	Avg of 2008 and 2009	Financial department
EBITDA index	Foreign EBITDA/Total EBITDA	Avg of 2008 and 2009	Financial department
Foreign return on sales (ROS)	Foreign EBITDA/Foreign sales	Avg of 2008 and 2009	Financial department
Foreign return on assets (ROA)	Foreign EBITDA/Foreign assets	Avg of 2008 and 2009	Financial department
Satisfaction with sales	5-point Likert scale ratings on sales	Avg of 2008 and 2009	International department
Satisfaction with sales growth	5-point Likert scale ratings on sales growth	Avg of 2008 and 2009	International department
Satisfaction with profit	5-point Likert scale ratings on profit	Avg of 2008 and 2009	International department
Satisfaction with market share	5-point Likert scale ratings on market share	Avg of 2008 and 2009	International department
Foreign countries	The number of countries the firm had FDI in 2009		International department
International experience	Number of years since the first intl. subsidiary was established		International department

Note: The source for all data is a respondent from each company. Where ever possible, secondary sources were used to verify responses (ie., total revenues).

* Index Proposed in the *World Investment Report, 1995*.

regression estimates since excluding cases would reduce the sample and statistical power. The method considers the relationship among variables and avoids losing variance, which is common when replacing variables by means (Hairet al., 2005). Furthermore, we employed the Mahalanobis distance D^2 to identify multivariate outliers (Tabachnick and Fidell, 2001). Three firms may be considered outliers in this study, but since large differences in terms of the degree of internationalization and performance are expected in a sample of TNCs from different sizes and industries, discrepancies in this case are not seen as harmful. Additionally, we conducted an exploratory factor analysis (Kline, 2005) with all variables in the models and found that factor loadings are

concentrated in the expected dimensions. The solution showed three factors (transnationality index, subjective and objective performance) that accounted for 69.4 per cent of the total variance explained. Each construct proved to be unidimensional in a separate exploratory factor analysis. Finally, we assessed constructs' reliability using the Cronbach's Alpha, as shown above.

In order to test the proposed model, we used Structural Equation Modelling and AMOS software. The procedure involves simultaneously testing relationships between one or more independent variables and one or more dependent variables. Thus, the method combines exploratory factor analysis with multiple regression analysis (Tabachnick and Fidell, 2001). The moderating variables were mean centred to avoid multicollinearity issues (Cohen et al., 2003).

The first step was to verify convergent validity. This procedure consisted of testing the significance of the variables' factor loadings (confirmatory factorial analysis) in a model that assumes constructs covary and not causally affect each other (Kline, 2005)8}dc
. Subsequently, discriminant validity was achieved once correlations among pairs of constructs were less than unity, and correlations among variables were larger than correlations among traits (Bagozzi, Youjae and Phillips, 1991). Finally, nomological validity was verified by testing the predicting power of exogenous constructs on endogenous constructs. This procedure involves fixing variances at unity in order to assess the path coefficients (Anderson and Gerbing, 1982). Furthermore, we discuss models' fit and compare the two different models (Marsh, Balla and McDonald, 1988).

5.   Results

5.1   Descriptive analysis

This section presents descriptive statistics and a correlation analysis of the variables in this study. The following table shows means, standard deviations and bivariate correlations between the variables.

An examination of the correlation matrix reveals a number of findings regarding the degree of internationalization and performance variables. For instance, the assets index seems to correlate with the greatest number of potential performance variables (e.g. four out

Table 2. Correlation matrix

	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11
1. Revenues index	0.19	0.20											
2. Assets index	0.16	0.16	0.67**										
3. Employees index	0.16	0.18	0.67**	0.74**									
4. EBITDA index	0.14	0.13	0.71**	0.46**	0.60**								
5. Foreign return on sales (ROS)	0.06	0.16	0.16	0.26	0.25	0.19							
6. Foreign return on assets (ROA)	0.05	0.22	0.09	-0.02	-0.07	0.17	0.24						
7. Satisfaction with sales	3.21	0.71	0.13	0.43**	0.41**	0.15	0.12	-0.02					
8. Satisfaction with sales growth	3.18	0.83	-0.06	0.03	-0.10	-0.06	-0.15	-0.02	0.62**				
9. Satisfaction with profits	2.92	0.58	0.15	0.31*	0.31	0.20	0.02	0.07	0.65**	0.49**			
10. Satisfaction with market share	3.16	0.72	0.35*	0.43**	0.45**	0.42**	0.18	0.08	0.56**	0.41**	0.54**		
11. International experience	18.27	10.42	0.07	0.00	-0.14	-0.12	0.08	-0.01	-0.07	0.34**	-0.03	0.15	
12. Number of countries	9.21	5.15	0.26	0.42**	0.21	0.03	0.48**	-0.19	-0.02	-0.03	-0.10	0.06	0.32*

OBS: ***Beta is significant at 0.1% level; **Beta is significant at 1% level; *Beta is significant at 5% level; †Beta is significant at 10% level.

of seven or 57 per cent) This suggests that companies possessing a high percentage of its assets abroad may perform better in various dimensions (profit, sales, market share, etc). The revenues index is positively correlated only with satisfaction with market share. The employee index is positively correlated the EBITDA index, satisfaction with sales and market share. In summary, at least one of the three components of the UNCTAD index was correlated with a performance measure with the exception of ROS, ROA and satisfaction with sales growth.

The number of countries variable is only correlated to ROS, and the amount of international experience is only correlated with satisfaction with sales growth. These results seem to suggest that the components of the UNCTAD index correlate more positively with the performance measures than the two alternative options.

The correlation matrix also shows that all subjective performance measures positively correlate with each other. The highest correlation is between satisfaction with profits and satisfaction with sales. However, only one item of subjective performance (satisfaction with market share) is positively correlated with an item of objective performance (EBITDA index). This is possibly explained by the fact that the subjective construct is measuring the satisfaction with different aspects of performance as compared with the ones in the objective performance construct.

It is interesting to note that international experience is positively associated with satisfaction with sales growth, suggesting that firms operating longer in international markets are better able to obtain incremental sales. Finally, companies operating in many countries seem to have a better ROS.

5.2   Structural Equation Modeling

Two models were tested in order to compare scales and to find the better fitting structure. The first model used the three indices from UNCTAD (ratios of revenues, assets and employees) as the degree of internationalization measure. The second model added the number of countries and international experience to the transnationality index.

Figure 1. Model 1 – UNCTAD's transnationality index and objective and subjective performance
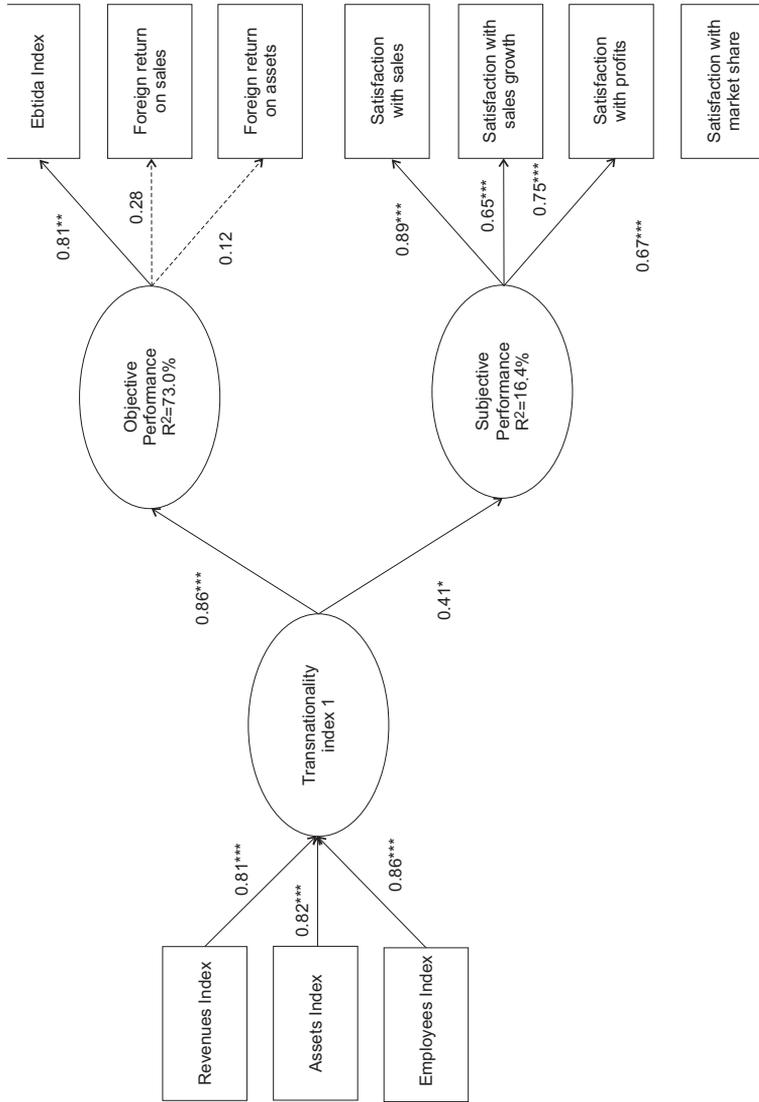
Performance measures remained equal in both models. Results of model 1 are shown in the next figure:

Convergent validity was achieved for most of the variables in model 1. The three UNCTAD indices are significant ($p < 0.001$) and have high factor loadings (> 0.80). Additionally, all variables of subjective performance measure are significant ($p < 0.001$). Yet, satisfaction with sales and satisfaction with profits reflect subjective performance more than sales growth and market share. While the positive signs for ROS and ROA indicate that the transnationality index has a positive effect, only the EBITDA index is significant ($p < .01$). This suggests that the transnationality index is closely tied to the relative amount of foreign profits.

While both paths from the transnationality index to objective ($p < 0.001$) and subjective ($p < 0.05$) performance were significant (confirming H1 and H2), the impact was greater on objective performance than subjective performance. This finding points to the importance of internationalization on firm's results and at the same time challenges our initial notion that subjective measures would be more correlated with the transnationality index because they can overcome the problems of objective measures. The transnationality index explains 73.0 per cent of the variance for objective performance (R^2) and 16.4 per cent for subjective performance.

Model 1 achieved good measures of fit according to the standards recommended in the SEM literature (Tabachnick and Fidell, 2001). The goodness of fit (GFI) was 0.81 and the adjusted goodness of fit (AGFI) was 0.68. Both these measures indicate that the data fits the model well. Taking into account the degree of parsimony, the PGFI index was 0.49. This shows that there might be too many parameters to be estimated, especially considering a small sample such as this. Furthermore, residual based fit indices such as RMR and RMSEA were 0.11 and 0.13 respectively. It is important to note that the RMSEA is not completely adequate for small samples and thus should be interpreted with caution (Hu and Bentler, 1999).

Two variables were added to the transnationality index in order to test an alternative measure of internationalization: number

Figure 2. Model 2 – Alternative transnationality index and objective and subjective performance
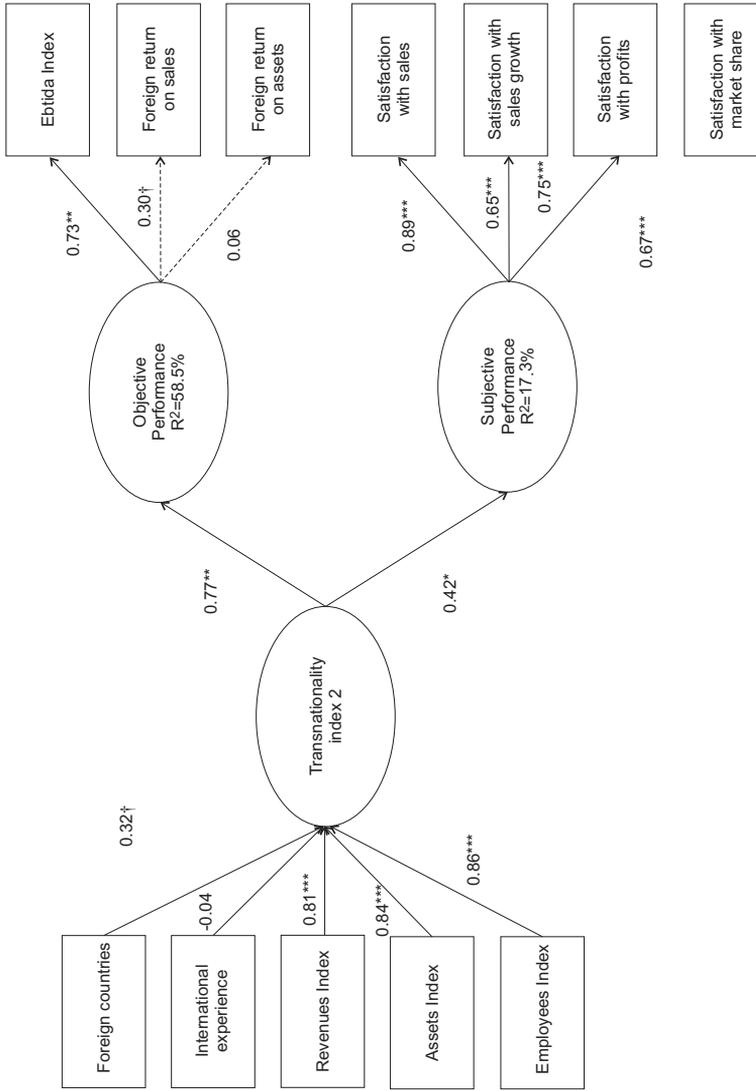
OBS: ***Beta is significant at 0.1% level; **Beta is significant at 1% level; *Beta is significant at 5% level; †Beta is significant at 10% level.

of countries and international experience. The results of model 2 are shown in the next figure.

Figure 2 illustrates that the number of countries is significant (p = .05), though it has a much lower loading than the UNCTAD variables. On the other hand, international experience does not appear ($p >$ .10) to be an indicator of transnationality when controlling for the number of countries and the revenue, asset and employee indices. Low loadings on the two additional measures have reduced the reliability of the five-variable construct to an alpha level of 0.26, effectively invalidating this scale. This result provides evidence that, in this context, UNCTAD's transnationality index is a better measure for the degree of internationalization than the five-variable construct tested. Thus, adding other indicators such as number of countries and international experience does not add internal consistency or explanatory power to the transnationality index.

Furthermore, when the two other internationalization variables were added in model 2, the five-variable transnationality index showed a lower impact on both performance constructs compared to model 1. It may be inferred that companies in international markets for long periods and in many countries do not necessarily perform better than those with less experience or fewer countries, whereas companies that have a more intense presence in terms of revenues, assets and employees abroad tend to be more satisfied and to have a greater ratio for profits abroad.

Regarding the model fit, model 2 is inferior to model 1 in all measures. The goodness of fit (GFI) was 0.66, the adjusted goodness of fit (AGFI) was 0.52 and the PGFI was 0.46. Model 2 also showed poor fitting measures on residual based indices such as RMR (0.20) and RMSEA (0.18).

In order to assess the reliability of the constructs, defined as the proportion of true variance relative to total variance (Tabachnick and Fidell, 2001), we calculated the composite reliability (CR) and the average variance extracted (AVE). The following table compares the quality of the scales used in each model:

All of the constructs show higher values of CR and AEV in model 1 than model 2, indicating that the combined scales are more reliable in the first model. Except for objective performance, all constructs in both models show composite reliability superior to 0.70 (Hair, et al., 2005). The average extracted variance for the transnationality index in model 1 and subjective performance in both models show values above the limit of 0.50.

Table 3. Composite reliability and average extracted variance of model 1 and model 2

	CC	AVE
Model 1 (UNCTAD index)		
Transnationality index	0.87	0.69
Objective performance	0.40	0.25
Subjective performance	0.83	0.56
Model 2		
(UNCTAD index + number of countries + international experience)		
Transnationality index	0.73	0.44
Objective performance	0.33	0.21
Subjective performance	0.83	0.56

6.   Discussion

The purpose of this study was to test two different measures of internationalization and to determine whether the degree of internationalization is related to both objective and subjective performance. The first task was accomplished with a test of whether adding additional measures of internationalization to the three-variable UNCTAD transnationality index improved reliability of the measure and its association with performance measures. The second task was operationalized by contrasting both types of performance measures in order to assess if they were related in the same degree to the transnationality index.

From a survey with 41 Brazilian multinational groups and information over two years of international activities, we were able to propose and test a model using Structural Equation Modelling. The three indicators of UNCTAD (foreign revenues/total revenues, foreign assets/total assets and foreign employees/total employees) are more

effective in predicting the degree of internationalization in this context than adding other measures such as the number of countries and international experience. International experience was not found to be a significant indicator of the degree of internationalization. This finding is consistent with the sample profile, in which the most internationalized company, JBS-Friboi (food industry), established the first international subsidiary only five years ago. Thus, a lack of international experience it not necessarily detrimental to the firm's degree of internationalization.

Our results show that more internationalized firms perform better overseas. Firms with a higher degree of internationalization were found to be more satisfied with foreign sales, sales growth, profits and market share (the subjective measures). Additionally, internationalization leads to a higher proportion of foreign to total profits. On the other hand, foreign return on assets and foreign return on sales are not significantly impacted by the transnationality index.

Furthermore, the proportion of foreign employees to total employees was found to have a slightly stronger impact on the transnationality index than the other two measures (ratios of sales and assets). Additionally, although the degree of internationalization has a greater impact on objective performance compared to subjective performance, we can still infer that firms will be more satisfied with foreign performance as they increase foreign assets, revenues and employees. Thus, firms in initial stages of internationalization might have little of their performance accounted for by foreign activities and might have low satisfaction rates. As commitment to foreign markets increases, especially in terms of assets, revenues and employees, the percentage of foreign profits tends to increase.

Although we found an impact of the degree of internationalization as a whole on both objective and subjective performance, when analyzing the items separately we found that the assets index correlates with more performance variables than the employee index and the revenue index. Also, the number of countries is only correlated to ROS, and the amount of international experience is only correlated with satisfaction with sales growth. Therefore, companies with a high percentage of assets abroad may perform better on various dimensions (profit, sales, market share). These separate analyses also reinforce

that the components of the UNCTAD index correlate more positively with the performance measures than the two alternative options.

This study has important implications to both theory and practice. First, it shows that the UNCTAD transnationality index is more reliable in the context of Brazilian firms than some previously investigated measures of internationalization. Second, it provides empirical evidence that the greater the ratio of foreign to total revenues, assets and employees a TNC has across borders, the better its foreign performance. This partially answers the question of "Does more internationalization improve foreign performance?" Thus, firms may consider an internationalization strategy that aims to increase its degree of internationalization as a way to enhance foreign performance. More specifically, internationalization increases the EBITDA measure of objective performance and also all four of the executives' subjective measures of performance satisfaction.

Nevertheless, it is important to note several limitations of this study. The primary concern is the small sample size. Although 41 firms can be considered quite representative of Brazilian TNCs, the sample is still small for achieving good fit indices and explanatory power in Structural Equation Modelling. Additional studies that can obtain more companies would help verify the findings. Furthermore, we were only able to collect information over two years of international activities. Future studies with three or more years of data could test the model longitudinally, further improving the causality inherent in the proposed models. Also, since the study was built based on a survey with Brazilian TNCs, researchers should be cautious when generalizing to other countries. We thus suggest that this study be expanded to other countries as a way to attest the representativeness of the results. Finally, we did not control for the size and industry of the company. With a large and diverse sample, researchers could include these controls in the regressions.

Another consideration is the problem of endogeneity, in that we cannot assume that a higher degree of internationalization *causes* performance abroad. It is possible that in the long-term superior performance may affect the firms' ability to expand abroad. Measuring the variables at different time periods could help mitigate

this problem. While we attempted to justify our selection of variables and methodology, there are many other options for measuring the degree of internationalization to be explored (Ietto-Gillies, 2009). A final consideration is whether the three components of the UNCTAD index should have equal weights. Altering the weights and testing the model for fit may enhance the predictability of the model.

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Appendix. Companies and industries of sample

Company	Industry
JBS-Friboi	Food
Gerdau	Steel and metal
Ibope	Market Research
Metalfrio	Refrigerators
Odebrecht	Construction
Marfrig	Food
Vale	Mining
Sabó	Autoparts
Tigre	Building materials
Suzano Papel e Celulose	Pulp and paper
Artecola	Chemistry
Lupatech	Parts and equipment
Camargo Corrêa	Construction, cement, textiles and shoes
Ci&T Software	Software and IT services
Marcopolo	Vehicles and parts
Weg	Electrical machines and equipment
Stefanini IT Solutions	Software and IT services
Votorantim	Cement, metal, pulp and paper
América Latina Logística	Logistics
Tam	Airline
Embraer	Aeronotics
Natura	Hygiene and cosmetics
Petrobras	Oil and gas
Bematech	Retail equipment and technology
Alusa	Energy
Spoleto	Food
Andrade Gutierrez	Construction
Banco do Brasil	Financial Institution
Itaúsa	Software and IT services
Totvs	Software and IT services
DHB	Autoparts
Escolas Fisk	Language school
Ultrapar	Chemical products and fuel distribution
Politec	Software and IT services
Localiza	Rental car
Randon	Vehicles and parts
Cia Providência	Rubber and plastics
Brasil Foods	Food
Marisol	Clothing
Cemig	Energy
Eletrobrás	Energy