

Marketing

Pricing strategies and levels and their impact on corporate profitability

*Estratégias e níveis de preços e seus impactos sobre a lucratividade das empresas**Estrategias y niveles de precios y su impacto en la rentabilidad de las empresas*Deonir De Toni ^{a,*}, Gabriel Sperandio Milan ^b, Evandro Busata Saciloto ^b, Fabiano Larentis ^a^a Universidade Caxias do Sul, Bento Gonçalves, RS, Brazil^b Universidade Caxias do Sul, Caxias do Sul, RS, Brazil

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Abstract

Price policy definition is one of the most important decisions in management as it affects corporate profitability and market competitiveness. Despite the importance that prices take in organizations, it appears that this element has not received proper attention by many academics and marketers since it represents, according to estimates, less than 2% of the papers on leading journals in the field. Thus, the aim of this study was to propose and test a theoretical model showing the impacts of pricing policy on corporate profitability. To this end, 150 companies in the metal-mechanic sector situated in the Northeast of Rio Grande do Sul State, Brazil were studied, integrating customer value-based pricing strategies, competition-based pricing strategies and cost-based pricing strategies with price levels (high and low) and performance with respect to profitability. The results indicate that the profitability of the surveyed companies is positively affected by value-based pricing strategy and high price levels while it is negatively affected by low price levels. Such findings indicate that pricing policies influence the profitability of organizations and therefore, a more strategic look at the pricing process may constitute one aspect that cannot be overlooked by managers.

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Keywords: Prices; Pricing; Pricing policy; Price strategies; Business performance

Resumo

A definição da política de preços é uma das mais importantes decisões no âmbito da gestão, pois afeta a lucratividade das empresas e sua competitividade no mercado. Apesar da importância que o preço assume nas organizações, parece que tal elemento não tem recebido a devida atenção de muitos acadêmicos e profissionais de marketing, por representar menos de 2% dos artigos das principais revistas da área, segundo estimativas. Desta forma, o objetivo deste estudo foi o de propor e testar um modelo teórico que indique os impactos da política de preços sobre a lucratividade das empresas. Para tanto, foram estudadas 150 empresas do polo metal-mecânico situadas na região Nordeste do Estado do Rio Grande do Sul, Brasil, integrando-se as estratégias de preços baseadas em valor para o cliente, na concorrência e em custos com os níveis (altos e baixos) de preços praticados e o seu desempenho no que se refere à lucratividade. Os resultados indicam que a lucratividade das empresas estudadas é afetada positivamente pela estratégia de preços baseada em valor e níveis altos de preço e negativamente pelos níveis baixos de preço. Tais achados sinalizam que as políticas de preços são impactantes na lucratividade das organizações e que, portanto, um olhar mais estratégico para o processo de formação de preços constitui um aspecto que não pode ser negligenciado pelos gestores.

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Palavras-chave: Preços; Precificação; Política de preços; Estratégias de preço; Desempenho das empresas

* Corresponding author at: Alameda João Dal Sasso, 800, CEP 95700-000, Bento Gonçalves, RS, Brazil.

E-mail: dtoni2@ucs.br (D. De Toni).

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Resumen

La definición de la política de precios es una de las decisiones más importantes en la gestión, ya que afecta a la rentabilidad de las empresas y su competitividad en el mercado. A pesar de la importancia que el precio tiene en las organizaciones, parece que este elemento no ha recibido la debida atención de muchos académicos y profesionales de marketing, dado que el tema aparece en menos del 2% de los artículos de las principales revistas del área, según estimaciones. El objetivo en este estudio es proponer y poner a prueba un modelo teórico que indique los impactos de la política de precios en la rentabilidad de las empresas. Para ello, se han estudiado 150 empresas del parque industrial metalmecánico ubicado en la región nordeste del estado de Rio Grande do Sul, Brasil, y se han integrado las estrategias de fijación de precios con base en el valor para el cliente, en la competencia y en los costos con los niveles de precios (altos y bajos) y su desempeño con respecto a la rentabilidad. Los resultados indican que la rentabilidad de las empresas es afectada positivamente por la estrategia de precios basada en el valor y niveles de precios altos, y negativamente por los niveles de precios bajos. Los hallazgos indican que las políticas de precios producen efectos en la rentabilidad de las organizaciones y que, por lo tanto, una mirada más estratégica al proceso de fijación de precios constituye un aspecto que los administradores no pueden dejar de tener en cuenta.

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Palabras clave: Precios; Fijación de precios; Política de precios; Estrategias de precios; Desempeño de las empresas

Introduction

Price is one of the most flexible elements of the marketing mix, which interferes directly and in a short term over the profitability and cost effectiveness of a company (Simon, Bilstein, & Luby, 2008). Despite the importance a price has on the performance of businesses, it seems that such element has not received the proper attention by many academics and marketing professionals (Avlonitis & Indounas, 2006). Typically, in marketing, the main focus is placed on the development of new products, distribution channels and communication strategies, and according to Lancioni (2005) this could lead to precipitated pricing decisions without properly evaluating market and cost factors. Thus, pricing is treated as the simplest strategy within marketing, perhaps because many companies determine their prices based on intuition and the manager's market experience (Simon, 1992). In addition, only few managers strategically think about pricing while proactively administrating their prices in order to create favorable conditions that lead to profits (Nagle & Holden, 2003). Considering this, Liozu and Hinterhuber (2012) highlight the need for more research regarding the pricing preferences and practices because, according to the authors, less than 2% of all published articles in marketing journals are focused on pricing.

Strategic pricing requires a stronger relationship between marketing and the other sectors of a company. In order to enhance companies' economic and financial performance, the pricing policies should be defined by their internal capacities and on the basic systematical understanding of needs and wishes of their customers, in addition to market conditions such as, economic conditions and degree of competition (Besanko, Dranove, Shanley, & Schaefer, 2012; De Toni & Mazzon, 2013b). In this context, this study's objective was to propose and test a theoretical model that indicates the impacts of pricing policies on company's profit. On this regard, the theoretical assumptions consider as pricing policies the definitions that comprise the pricing strategies and the price levels used by companies in their respective markets.

In this study, the considered pricing strategies are based on Nagle and Holden (2003) studies, namely value-based, competition-based and cost-based pricing strategies; whereas the pricing levels are classified as high and low prices (Urdan & Osaku, 2005). Besides identifying the direct effects of these elements over profitability, this research also analyzed the impacts of moderating effects considering some independent variables on the business profitability (dependent variable).

It is important to mention that this study was performed on 150 metal-mechanic companies situated in the Northeast of Rio Grande do Sul State, Brazil, also call region of Serra Gaúcha, along with the people responsible for their companies' pricing process. By using a hierarchical regression analysis, we were able to test the main model and the interaction models against our proposed hypothesis, which will be presented throughout this project.

Theoretical background

Pricing strategies

According to Monroe (2003), price decisions are one of the most important decisions of management because it affects profitability and the companies' return along with their market competitiveness. Thus, the task of developing and defining prices is complex and challenging, because the managers involved in this process must understand how their customers perceive the prices, how to develop the perceived value, what are the intrinsic and relevant costs to comply with this necessity, as well as consider the pricing objectives of the company and their competitive position in the market (De Toni & Mazzon, 2013a,b; Hinterhuber & Liozu, 2014; Monroe, 2003).

In this way, Nagle and Hogan (2007) argue that companies which do not manage their prices lose control over them, impairing their profitability and cost effectiveness mainly due to the customers will on paying a determinate price, which

not only does it depend on the perceived value, but also depends on the prices set by the leading competitors. Consequently, mistaken or inexistent pricing policies could lead buyers to increase the volume of information while allowing them to augment their bargaining power thus forcing price reductions and discounts. The difference between conventional price setting and strategic pricing consists on setting prices by reacting to the market conditions or managing them proactively, being their sole purpose to exert the most profitable pricing by generating more value for customers without the obligation of increasing the business' sales volume (Nagle & Holden, 2003)

Logically, there is not a unique way for defining prices. Before setting a price, the company must decide what is going to be the strategy for the product in addition to what will be the proposed objectives, since the clearer these decisions, the easier it will be to establish prices (Hinterhuber & Liozu, 2013).

According to Hinterhuber (2008), prices have a high impact on companies' profitability, and pricing strategies vary considerably between sectors and market situations. Nonetheless, researchers mostly agree that pricing strategies can be categorized in three big groups: cost-based pricing, competition-based pricing and customer value-based pricing (Nagle & Holden, 2003).

Nagle and Holden (2003) argue that there must be a balanced consideration of information, perception and intrinsic behavior of the 3C's of this process (Cost, Competition and Customers) as a way to reach the optimal price. The management of such information is a crucial factor for the success of the pricing definition strategy and the price settlement. In some cases, these practices have also been designated as pricing methods (Avlonitis, Indounas, & Gounaris, 2005).

Customer value-based pricing strategy

Value establishment can be defined as the offer of benefits of equal or superior value to the sacrifices incurred by the purchaser for a product and/or service. Within the possible sacrifices, there is the financial sacrifice, which is translated by the price to be charged or actually paid by the buyer (Juran & De Feo, 2010; Porter, 1986; Zeithaml, 1988). Besides, the process of value settlement includes the transformation of the results from the organizational strategy on programs aimed to extract and deliver value to the company's customers. In addition, it identifies the benefits and costs (or sacrifices) of products and experiences resulting from the relationship between the customers and the organization. The superior value proposal represents an offer for the customers which increases the value or solves a problem in a better way than those offered by similar competitors (Payne & Frow, 2014).

Perceived value-based pricing is a pricing practice in which the managers take decisions based on the perception of benefits from the item being offered to the customer and how these benefits are perceived and weighted by the customers in relationship to the price they pay (Ingenbleek, Frambach, & Verhallen, 2010). Therefore, as a cultural orientation of businesses, value-based pricing is derived from a set of routine philosophies

and organizational strategies that a specific company could use in order to focus on customer satisfaction and, as a result, increases their profitability (Cressman, 2012). Because of this, Liozu (2013) highlights that using prices based on customer's perception of value is a more modern pricing approach, although sometimes it incites a profound organizational change on the established organizational structure, the current corporate structure or the pre-existing processes and systems.

In this sense, Ingenbleek, Debruyne, Frambach, and Verhallen (2003) affirm that perceived value-based pricing, along with pricing practices that refer to the use of information about costs and competitors' prices, are intimately related to the product's performance, the service and the business as a whole. These authors demonstrated that the usage of value-based pricing is a key pricing practice for obtaining larger returns and for creating some kind of comparative advantage for the companies offers. This was demonstrated in a study conducted by Füreder, Maier, and Yaramova (2014), on medium-sized companies in Austria which used with higher frequency the perceived value-based pricing strategy. These authors identified that these companies had larger contribution margins, between 11–30%, against 0–10% of those companies that did not use this same strategy. Thus, the approach of a value-based pricing strategy is considered superior to other approaches in relationship to the results obtained by other companies (Hinterhuber, 2004; Ingenbleek et al., 2003; Liozu & Hinterhuber, 2013). Therefore, we propose the following research hypothesis:

H1a. Adopting a value-based pricing strategy has a direct and positive impact on profit margin.

The constant changes in the market, influenced by technological advances and by increasing change in the customers' expectations, are leading organizations to constantly search for new products in order to continue being profitable and competitive (Boehe, Milan, & De Toni, 2009; Cooper, 2000).

The innovation and development of new products are ways of adding value to the products or services while differentiating them from their competitors, thus providing better results. Therefore, in order for a business to maintain itself as competitive and profitable in the market, the development of new products (DNP), and the innovation of their products and processes are fundamental factors for an organization's performance (Cooper & Kleinschmidt, 1987). Thus, a new product that grants value to the customer, due to its quality, cost reduction or innovation constitutes a competitive advantage contributing to a better performance of the organization.

In a study developed by Milan, De Toni, Larentis, and Gava (2013) about pricing and expenditure strategies, the authors identified that the factor that mostly influences an organization's performance is related to the achievement of their objectives by the development of new products. In other words, businesses that achieved their sales, market participation and profit margins objectives exhibited a better organizational performance. Therefore, it is identified that the success of many organizations is linked to the development of new products (DNP) that add customer value (Cooper, 2000). It is observed that a company

which adopts a constant innovative strategy, mainly on the products released on the market, can add more value to the customer and, consequently, obtain better profitability (Boehe et al., 2009; De Toni, Milan, and Reginato, 2011). Considering this, we formulated the following research hypothesis:

H1b. Level of development of new products (DNP) moderates the relationship between customer value-based pricing strategy and profit margin, and such relationship is stronger in those companies which launch more products into the market.

Competition-based pricing strategy

Competition-based pricing uses as key information the competitors' price levels, as well as behavior expectations, observed in real competitors and/or potential primary sources to determine adequate pricing levels to be practiced by the company (Liozu & Hinterhuber, 2012). The main advantage of this approach is considering the actual pricing situation of the competitors, and its main disadvantage is that the demand related aspects are not considered. Furthermore, a strong competitive focus among the competitors can increase the risk of starting a price war among competitors in the market (Heil & Helsen, 2001).

Liozu, Boland, Hinterhuber, and Perelli (2011) conducted a research mapping the pricing processes of companies which based their prices on competitors and they found that managers use their knowledge and experiences to define prices, as well as models of costs, contribution margin goals, and well-structured profit goals. In addition, these companies were strongly considering the prices of their main competitors while adding a price reward by always sharing the decision based on the manager's intuition, which is not a scientific method to define prices.

In this sense, competition-based pricing strategies are very dangerous because the company does not effectively have clear cost or profit information from its competitor who, in some instances, may be working with very low margins (Nagle & Holden, 2003). In some situations, the competitor developed a more efficient production process, thus the costs would not be equivalent, even because of the scale gains. Therefore, by following this strategy, the company is at risk of operating with minimal margins or even having negative profits. Pricing reduction strategies based on competition, in which companies may seek to increase the volume of sales, can also encourage the competitors to lower their prices while contributing to a predatory competition and a price war, resulting in reduced profit margins and smaller companies' profitability (Diamantopoulos, 2005).

Besides, in highly competitive markets, the price information from competitors becomes obsolete very quickly (Ingenbleek et al., 2010). In this case, it is necessary to manage the capacity that competitors have to react to the pricing strategy defined by the company, while noting that in competitive markets this can increase the risk of starting a price war and decreasing profit margins (Simon et al., 2008). Therefore, we present the following research hypothesis:

H2. Adopting a competition-based pricing strategy has a direct and negative impact on profit margin.

Cost-based pricing strategy

Cost-based pricing is the most simple and popular method for setting prices. Historically, it is the most common pricing strategy because it carries a sense of financial prudence (Simon et al., 2008). This involves adding a profit margin on costs, such as adding a standard percentage contribution margin to the products and services. First, the sales level (revenue) is determined, and then the unit and total costs are calculated, followed by checking the company's profit objectives and finally establishing the prices. Thus, for the professionals involved in this process, it is necessary to show to customers enough value on products and commercialized services in order to justify the prices charged by the company (Urdañ, 2005).

According to a study by Guilding, Drury, and Tayles (2005) in 187 companies in the United Kingdom and in 90 companies in Australia, three factors that can interfere with a cost-based strategy were identified: (i) intensity of competition: in a highly competitive market, the intensity of competition may result in a loss of contribution and profit margins due to the pressure to equal their prices to the competition, which turns costs in a highly relevant element since it provides the limits of prices to be charged; (ii) company size: larger companies have a greater capacity of influencing prices, because they have the propensity to act as a guide for the price ranges prevailing in the market, even because they frequently have scale gains; and (iii) type of industries: manufacturing industries have higher expenses due to their high investments on physical facilities and on resources used in manufacturing processes, which makes it difficult to accurately define the individual costs of products and potentially force an increase on the total cost.

Similarly, a study of 84 companies performed by Milan et al. (2013) showed that in these companies there is a greater focus on price setting based on costs. Thus, this strategy encourages companies to use better expenditure techniques.

In addition, Liozu et al. (2011) conducted a study on fifteen small and medium-size American companies by interviewing forty-four of their managers. In such study, they addressed the three main pricing strategies: customer value-based pricing (in four companies), cost-based pricing (in six companies) and competition-based pricing (in five companies). They identified that the majority of the companies basing their prices on costs developed advanced cost models, all of which used contribution and profit margin goals in order to set their prices. In this matter, the following research hypothesis is proposed:

H3a. Adopting a cost-based pricing strategy has a direct and positive impact on profit margin.

Based on the innovation economy, it can be inferred that a higher level of competition in the market encourages companies to innovate; therefore, they do their best to increase their performance. Companies that interact more with the foreign market either by importing or exporting have a stronger concern with the company's cost than those that do not have foreign activities (Milan et al., 2013). Starting from this premise, it is assumed that companies that look for a cost-based pricing strategy are always searching for alternatives for cost reduction.

Among these alternatives, the import of raw materials and supplies has emerged as a strategy for cost reduction and, consequently, for the improvement of the profit margins (Boeche et al., 2009). Hence, it is assumed that the relationship between the cost-based pricing strategy and the profit margin could be stronger at the companies that operate with imported raw materials and supplies. Considering this, the following research hypothesis emerges:

H3b. Import of raw materials and supplies moderates the relationship between cost-based pricing strategy and profit margin, and this relationship would be stronger for companies that import.

Price levels

According to Hinterhuber (2004), the impact of price levels on profitability is high, which means that even the impact of small increases of price on profits and corporate profitability by far exceeds the impact of other leverages in managing best results. In his study, it was possible to detected that a 5% increase in average sales prices may increase the earnings before interest and taxes (EBIT) by 22%, on average, compared to a 12% increase on the sales volume and a 10% cost reduction of sold goods, respectively. In other words, of all the elements available to managers, the price is what has the larger impact on corporate results, reflecting on representative gains (Kohlia & Surib, 2011). Evidence of this nature suggests that managers should abandon the rationale of having a greater market share and an

increased business volume (sales, revenues) in favor of a vision more focused to profits (Simon et al., 2008). The results indicate that companies that practice a higher price against the price of their competitors obtain greater profits, which probably is related to superior customer value. This justifies the charge of higher prices and, as a result, enhances the business performance.

As reported in a study developed by Milan et al. (2013), market penetration-based pricing strategies, meaning the practice of lower or smaller prices, presented a significant and negative relationship with the business performance of the companies investigated. Such fact could be explained by its relationships to offering lower prices than the competition. Therefore, low prices are more strongly associated with lower profits and vice versa (Simon et al., 2008). Thus, we propose the following research hypotheses:

H4. Adopting high price levels has a direct and positive impact on profit margin.

H5. Adopting low price levels has a direct and negative impact on profit margin.

To facilitate comprehension, Fig. 1 shows the proposed theoretical framework which indicates the main effects between the constructs and the tested interaction (moderation) effects along with the proposed research hypotheses.

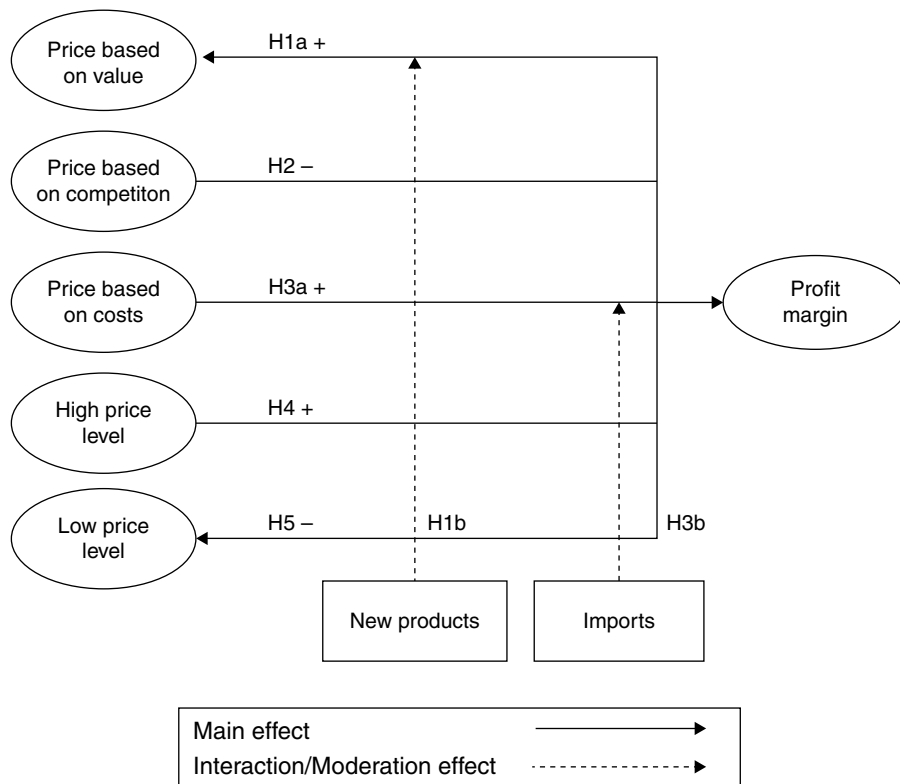


Fig. 1. Proposed theoretical framework and research hypotheses.

Source: Elaborated by the authors (2015).

Research method

Target population, sample and data collection procedures

The target population, for study purposes, according to SIMECS (Trade Union of Metallurgical, Mechanical and Electric Material Industries of Caxias do Sul) represented approximately 2600 companies totaling around 45 thousand jobs divided among the metal-mechanic, automotive and electronics sectors. However, service-providing companies were excluded, as, for example, surface metal treatment firms such as galvanizing, painting or those that manufacture products developed by others, which generally hire smaller firms to produce components that eventually would be added to the final product of the other company. It may be cited, as an example, companies linked to the molding sector and some milling companies. After defining these criteria, we reached to a target company population that have their own products and fit the objectives of this study, totaling 730 companies.

The data collection process occurred by a structured survey which was validated through a pre-test (Malhotra, Birks, & Wills, 2012). The questionnaires were electronically sent to companies. With the objective to formalize the request to participate in the research, we sent along an explanatory text which requested that the questionnaire would be directed to the person responsible of defining the prices of the company or to someone who acted directly in the pricing process. With this approach, we sought to direct the research instrument to a responsible person in the company who had greater control and relative experience in the analyzed context.

The data collection was performed between June and August of 2014. In order to increase the return of respondents, we sent follow-up messages via e-mail in order to raise awareness of the potential respondents. As for the larger companies on the list, we made telephone calls reinforcing the research relevance and the importance of obtaining the manager's perception. At the end of the process, 157 questionnaires were obtained (valid cases), having a 21.5% return

Data analysis process

According to Hair, Black, Babin, Anderson, and Tatham (2009), the Analysis of Variance (ANOVA) allows the researcher to conclude that there are statistical differences at some point between the groups' means. In this regard, considering the need for post hoc analysis, we opted to conduct the Tukey HSD test, which is more accurate, because it generates confidence intervals with lower amplitude facilitating the control of type I error rate (Field, 2013).

The data were also analyzed by hierarchical regression (OLS), which resulted in four models. The first one with only two control variables; the second one with the control variables and the independent variables; and the third and fourth models with the control variables, independent variables and the interaction effects between the control and independent variables. It is important to note that when interaction effects are calculated, it is

recommended to standardize the independent variables (Jaccard & Turrisi, 2003; Osborne, 2014).

For this reason, the transformation of independent variables were performed on Z-scores. Moreover, we checked the premises of multiple regression analysis. With regard to normal data on the remaining sample of 150 cases (after eliminating the missing values and uni- and multivariate outliers), we tested the assumed univariate normality (from the data skewness and kurtosis). The univariate normality condition was met in all model variables, in which the data asymmetry was between -2.117 and 1.625 , with an mean value of -0.326 . In relation of the amplitude of kurtosis, it lies at -1.318 and 7.837 , with a mean value of -0.194 .

The homoscedasticity condition was analyzed based on the Box's *M* test and the Levene's test (Hair et al., 2009). The results of Levene's test indicate the non-metric variables (market time, number of employees and revenues) which showed some visible heteroscedasticity problem. The results indicate that the variable 11 (total cost of the product) and variable 40 (number of active customers) show heteroscedasticity patterns, which should be observed with caution. However, by having a theoretical support (Urdan, 2005) we decided to retain these two variables in the regression analysis.

The linearity condition was evaluated based on a standardized residuals plot (Hair et al., 2009). Through verification of scatter plots, it was found that the variables from the studied model show linear relationships. Finally, the multicollinearity was analyzed by the tolerance test, having identified that they all showed acceptable levels while situating the tolerance levels between 0.46 and 0.85 with a variance inflation factor (VIF) between 1.05 and 2.17, which indicates that the multicollinearity is not a problem in relation to the selected variables (Hair et al., 2009).

Operationalization of constructs and respective variables

The research questionnaire was composed of 40 variables, grouped in dimensions, according to the theoretical model proposed. It used a Likert scale of seven points, where the ends were represented from 1 (totally disregarded/strongly disagree/low performance) to 7 (fully considered/strongly agree/high performance).

Pricing strategies

From the scale adapted from Urdan and Osaku (2005), we used 15 questions (variables) related to the aspects considered or not in the price defining process for the main products of the researched companies. In this part of the survey, we obtained three factors after the removal of variables V7: "Sales systems (marketing), advertising and distribution of competitors", V14: "Sales volume (income) necessary for the achievement of a break-even point", and V15: "Investments on new products". These variables were eliminated because their factor loadings were below 0.5. The variance explained by these three factors was 63.75%. The KMO test was 0.790 and Bartlett's test of sphericity showed Chi-square of 696.517 and significance ($p < 0.001$) displaying proper levels (Malhotra et al., 2012).

Table 1
Price definition.

Factor	Variables	Factor loadings	% variance	Cronbach's alpha	Mean	Standard deviation
F1: Competition-based prices	V09	0.847	33.22	0.826	5.14	1.13
	V05	0.798				
	V08	0.775				
	V06	0.755				
F2: Customer value-based prices	V10	0.619	18.63	0.853	5.76	0.962
	V01	0.855				
	V04	0.850				
	V02	0.809				
F3: Cost-based prices	V03	0.740	11.90	0.591	6.24	0.750
	V11	0.766				
	V13	0.716				
	V12	0.711				

Source: Survey data (2015).

For each factor formed, a new variable was created from the mean of each variable that integrates this factor. Thus, Factor 1 was named **F1: Competition-based Prices**, which was formed from the variables V9: “Reaction of our competitors to our company’s prices”, V5: “Price of our competitor’s products”, V8: “Current pricing strategy of our competitors”, V6: “Degree of competition in the market”, and V10: “Competitive advantages of competitors in the market”. The second factor was named **F2: Customer Value-based Prices**, which was formed from the variables V1: “Advantages that the product offers to the customer”, V4: “Perceived value of the product by the customers (benefits versus costs)”, V2: “Balance between the advantages of the product and its possible price”, and V3: “Advantages that the product offers in comparison to the competitors’ products”. Finally, the third factor was named **F3: Cost-based Prices**, composed by the variables V11: “Total cost of the product”, V13: “Profit margin percentage set by the company in relation to the price of the product”, and V12: “Variable costs of the product”. Table 1 summarizes the results obtained.

According to Table 1, which includes data from Factor Analysis, it is possible to observe that the surveyed companies tend to consider the costs as the main approach during their product’s price settlement process, since the mean registered for F3: Cost-based Prices was of 6.24. The factor F2: Customer Value-based Prices remained as the second option with a mean of 5.76, and the factor F3: Competition-based Prices was considered as the third option with an mean of 5.14. It is important to point out that the three strategic approaches presented means higher than 5 in a 7-point scale, suggesting that companies tend to consider the three approaches during the price definition process of their products. It is observed that the Cronbach’s Alpha for factor F3 (Cost-based Prices) stood at 0.591, near the border zone of 0.60. Even with a low confidence index we decided to leave this construct in our analysis, firstly, because it has a theoretical base that supports it (Nagle & Holden, 2003) and, secondly, because the values from 0.60 to 0.70 are considered the lower limit of acceptability by Hair et al. (2009).

Price levels: defining factors and variables

For Hamilton and Chernev (2010), price level perception is generally expressed in monetary levels and scales, as, for example, high prices versus low prices. Nevertheless, there are also many other factors that may not be directly linked to the prices such as, location, credibility, company’s reputation, comparison with its competitors and others. Thus, using an adapted scale of Urdan and Osaku (2005), a Factor Analysis was performed in which two factors were defined:

- F1: Low prices**, grouping variables V21: “We define low price to leverage sales volume and to reduce costs through accumulated experience”, V22: “We always try to have a price lower than our competitors’ prices in the market”, and V29: “Our prices are low in the market due to the inferior quality of our products in relation to competitors”;
- F2: High prices**, composed by the variables V23: “We offer our products at a higher price on the most important sectors of the market and a lower price by means of discounts in less important sectors”, V26: “For products that have complementary or optional items (such as accessories, parts, and services), we put a lower profit margin on the basic product (central) and a higher profit margin on complementary items (premium price)”, V30: “We offer product sets (a set of various products) at a total price that allows customers to save money, instead of purchasing the products individually (separately)”, V19: “We define a high price initially and then we reduce it systematically over time”, and V25: “Our customers see the prices of our products as a high quality indicator”.

According to the data of Factor Analysis, the two factors obtained a 59.6% of explained variance, very close to the limit recommended by Hair et al. (2009), which suggests sufficient factors to attend an explained variance percentage, generally of 60% or more. KMO test resulted in 0.772 and the Bartlett’s sphericity test resulted in a Chi-square of 369.63 with $p < 0.001$ significance level. These tests showed adequate levels as well as the Cronbach’s Alpha for both factors. With these factors, new

Table 2
Price levels.

Factor	Variables	Factor loadings	% variance	Cronbach's alpha	Mean	Standard deviation
F1: Low prices	V21	0.871	40.09	0.824	2.83	1.51
	V22	0.870				
	V29	0.776				
F2: High prices	V23	0.761	19.49	0.720	4.11	1.23
	V26	0.712				
	V30	0.644				
	V19	0.617				
	V25	0.567				

Source: Survey data (2015).

variables were generated from the mean of the variables that formed each factor, so it is possible to notice that the surveyed companies tend to agree more (mean = 4.11) on a high price strategy and to disagree on a low price strategy (mean = 2.83). Table 2 below summarizes these results.

The fact that companies agree more on the higher price practice and agree less on the lower price practice may be linked to the market characteristics in which these companies operate. Thus, for the respondents, defining a higher price practice may signal a better quality and, consequently, it leads to better profit margins for the company. This may be seen when analyzing, singly, V29 variable: “Our prices are low in the market due to the inferior quality of our products. . .”, since their mean was 2.08, and 132 of the analyzed companies, by means of the interviewed managers, disagree with this affirmation. This number of companies corresponds to 86.3% of the sample and, among them, 80 totally disagree, which represents 52% of the analyzed sample.

Business performance

Regarding the business performance, an analysis based on the profit margin reported by the companies was implemented. This variable was also used in the study developed by Milan et al. (2013), which was built based on the scales proposed by Ingenbleek et al. (2003). The results indicate that the surveyed companies' average net profit is between 5% and 10%, and that 25 companies (16.4% of the sample) showed a profitability above 15%.

Finally, we used two control variables. One of them was the number of newly released products in the past 2 years (these variables were transformed into a logarithmic scale due to their large dispersion), and the other was if the company imported or not, measured from a binary variable (0 = it does not import, and 1 = it imports).

Results

In this section, we present the main research results in relation to the sample characterization and to the analysis coming from the data collected.

Sample description and variance analysis

Of the 150 surveyed companies on the metal-mechanic industry of Serra Gaúcha region, situated in the northeast of Rio

Grande do Sul State, 54.9% of them belong to the metal-mechanic sector, 23.5% belong to the automotive sector and the remaining 21.6% belong to the electronics sector. They have a mean of 21 years of experience in the market and, according to our findings, 39.6% of the companies have 20 years of experience while 40% of them are on the range with 10–20 years of experience. The remaining 22.2% have up to 10 years of experience in the market.

When talking about the number of employees, 35.3% of the companies have up to 19 employees, 37.9% have from 20 to 100 employees, and the remaining 26.9% have more than 100 employees. About their revenue, according to the BNDES guidelines (Brazilian Development Bank), 24.2% of the companies have an annual gross revenue of 2.4 million (for that reason they are considered microenterprises), 34.0% have an annual revenue of up to 16 million (considered small enterprises), 25.5% have an annual revenue of up to 90 million (being characterized as medium-sized enterprises), and, lastly, 16.4% of the companies have an annual revenue above 90 million (being characterized as medium-large or large enterprises).

In the questionnaire, we asked if the company carried commercial activity on foreign market and we found out that 39.9% of companies export, and these exports account for up to 10% of their annual revenue in 38 out of 60 exporting companies. For the remaining 22 companies, these exports account for more than 10% of their annual revenue. We also asked about their imports. Overall, 52.3% of the companies made purchases in the foreign market (imports), and the remaining 47.7% did not make purchases in the foreign market.

Regarding the launch of new products, 34.6% of companies declared that they had released up to three new products in the past 2 years, 28.8% launched between three and ten products, and 36.6% declared having launched more than ten products within this period. Regarding the profit margin of the companies, 2.7% stated that their profit margin was negative, while 55.3% reported having up to a 10% profit margin. The remaining 42% declared having a profit margin above 10%. The results are shown in Table 3.

From the ANOVA between the profit margin and the sector or branch of activity of the companies, revenue volume, number of employees, time in the market, number of new products launched, importing and exporting company, we identified some significant differences among the companies' profiles. Among these variables, we observed significant differences with regard

Table 3
Profit margins of the companies.

Net profit margin	Frequency	%
Negative net profit margin	4	2.7
From 0% to 5%	29	19.3
From 5.1% to 10%	54	36.0
From 10.1 to 15%	40	26.7
From 15.1% to 20%	14	9.3
Above 20%	9	6.0
Total	150	100

Source: Survey data (2015).

to the field of activities, revenues and the fact of importing or not.

It is evident that companies on the electrical and electronics industry have a higher profit margin (mean = 4.00) than those on the metal-mechanic industry (mean = 3.14; $p = 0.000$) and those on the automotive industry (mean = 3.14; $p = 0.042$). Two assumptions may emerge from this result, firstly due to the fact that companies in the electrical and electronics industry tend to define their prices based on customer value (mean = 6.14) more than the companies in the metal-mechanic industry (mean = 5.54; $p = 0.005$), and, secondly, because of the volume of new products launched, considering that the electrical and electronics industry launches more new products (more than ten products every 2 years) than the metal-mechanic industry (less than ten new products every 2 years, $p = 0.001$). Therefore, the facts that these companies are more proactive in the development of new products and add more value to their products, maybe justify why their profit margins are higher.

With regards to revenues, the companies with revenues above R\$ 2,400,000.00 have a profit margin higher than 10%, while the companies with revenues below this range display a profit margin below 10% ($p = 0.007$). This can also be justified by the fact that these companies adopted a more intense customer value-based pricing strategy (mean = 6.03 versus 5.50; $p = 0.000$) and that they launched more new products in their markets (more than ten products every 2 years, $p = 0.000$).

Regarding the release of new products, it was found that companies that launched more than ten products every 2 years displayed a higher profit margin (more than 10%) in comparison to those that launched less than ten products every 2 years ($p = 0.002$). According to Boehe et al. (2009), product innovation strategy, competitive intensity in the market, and functional integration among the various areas of the company influence significantly the development of new products (DNP) and the performance. Thus, market competitiveness and the organizational strategies geared to new products drive the companies to develop more products, improving the profit margin.

A significant difference in the profit margins of companies that import was also noticed. Companies that import show a superior profit margin (mean = 3.68) when compared to those that do not import (mean = 3.08, $p = 0.001$). The fact that these companies import indicates that they are trying to reduce their costs as well as they may be releasing more new products in relation to those that do not import ($p = 0.001$), maybe because they

search for innovations in the foreign market and try to launch them in the national market. In addition, the gains associated to the strategy of using imported raw materials and supplies may result in higher profit margins depending on the exchange rate appreciation. Similarly, the exchange rate appreciation increases the exposure to foreign competitors. Therefore, an innovation strategy allows important distinctions, leading to competitive advantages, can add more customer value and, consequently, the company can achieve better profits (Boehe et al., 2009; De Toni et al., 2011).

Pricing policies and their relationship with business performance

Based on the constructs of Pricing Strategies (customer value-based, competition-based and cost-based) and Price Levels in relation to the competition (higher or lower), it was identified that cost-based and competition-based pricing strategies did not show significant differences between their means with regard to the profit margins. On the other hand, customer value-based pricing strategies showed a significant difference ($p = 0.000$) between the means.

For example, 30 companies with a profit margin from 0% to 5% displayed a 5.13 mean in the usage of customer value-based pricing strategies, while 65 companies with a profit margin above 10% have a 6.15 mean when using this strategy. This indicates that the greater the usage of a value-based pricing strategy, the greater are the opportunities for the companies to increase their profit margin. Such evidence confirms the proposal that the usage of a customer value-based pricing strategy enables a better profitability for the companies (Nagle & Holden, 2003). Similarly, it suggests that companies with a high performance with regard to new product development (DNP) (more than ten products every 2 years) use more a customer value-based pricing strategy (mean High DNP = 6.03 versus mean Low DNP = 5.30, $p = 0.000$) than any other pricing strategies.

This fact could be related to the search for a better understanding of the market, thus better understanding the specific needs of the customers, who demand a more diversified line of products and a higher level of quality. Such results are similar to those of Boehe et al. (2009), who identified that companies which adopt innovation strategies or launch a large number of products into the market tend to have better performance. These results also complement the idea suggested by Cooper (2000) that companies with a differentiation strategy, with unique benefits and superior customer value tend to have a better performance in the market.

There are some important understandings that resulted from the ANOVA test between the profit margin and the price levels. First, regarding to low pricing practice, it was identified a decreasing result in relation to profit margins related to high pricing practice ($p = 0.000$). Thus, the greater the compliance on employing the low pricing practice, the lower the profit margins of the company. For example, the 85 companies that predominantly set low prices (mean = 3.22) showed margins below 10%. In contrast, the 65 companies that adopt such practice to a smaller extent (mean = 2.30) show profit margins above 10%.

Table 4
Correlations among the constructs.

Constructs	1	2	3	4	5	6
1 Business performance (net profit margin)	1					
2 High prices	0.471**	1				
3 Low prices	−0.453**	−0.362**	1			
4 Customer value-based prices	0.481**	0.401**	−0.425**	1		
5 Competition-based prices	0.075	0.205*	0.163*	0.287**	1	
6 Cost-based prices	0.116	0.153	−0.219**	0.294**	0.169*	1

Source: Survey data (2015).

Note: * Significant level of 10%; ** Significant level of 5%.

Obs.: all variables were standardized (mean = 0; standard deviation = 1).

The second finding is consistent with the first one, as there is an increasing and significant relationship between using high price practice and having a better profit margin. The greater the utilization of this practice, the greater the profit margin ($p = 0.000$). For example, 65 companies that practice high prices show a profit margin above 10%, while 85 companies that use such practice to a smaller extent show profit margins below 10% (mean High Price = 4.75 versus mean Low Price = 3.64, $p = 0.000$).

Likewise, concerning the development of new products (DNP), the results indicate that companies that use high price levels develop more new products (mean High Price = 4.11 versus mean Low Price = 2.83, $p = 0.000$). For example, the 56 companies which developed more than ten products every 2 years use, with greater intensity, high pricing levels. The results reveal similarities to the studies by Simon et al. (2008) and Milan et al. (2013), which found that companies that use high prices tend to have a better performance than those that employ low prices.

When comparing pricing strategies with the performance and its relationship with the market share of the companies, it was observed that the companies which adopt high prices display a larger market share if compared to those which offer low prices (mean High Price = 4.11 versus mean Low Price = 2.83, $p = 0.000$). These results indicate that practicing low price levels not always it is possible to leverage larger market share or larger sales volume, because low prices may also suggest a smaller perceived level of quality (De Toni & Mazzon, 2013a; Zeithaml, 1988).

Impact of pricing policies on profit margin and its moderating factors

This stage of the study included an assessment through a multiple linear regression of the relationships between the set of metric explanatory variables, in this case represented by the factors linked to the pricing strategy and the charged price levels, which most influence the profitability of the analyzed companies. For the operationalization of the analysis, we used a stepwise multiple regression, which has as a main characteristic the individual assessment of each variable contribution before developing the equation. The independent variable with the greatest contribution is added first and the independent variables are selected for inclusion based on their incremental contribution over the variables already present in the equation (Hair et al., 2009).

Considering this, first of all, Table 4 presents the correlations among the constructs. We point out the correlations between business performance and high prices (0.471), business performance and customer value-based prices (0.481) and business performance and low prices (−0.453).

For testing the hypotheses, the data were analyzed by hierarchical regression, which shows that by adding one or more predictive variables to the existing regression equation it significantly increases the explanation of the variance of analysis criteria (Jaccard & Turrisi, 2003; Osborne, 2014). In addition, the effects of interaction or moderation are presented in order to test H1b and H3b hypotheses, which identify the presence of a dependent variable, independent variable(s), and a third variable seen as the moderator. Therefore, there is a moderating effect when the effect of the independent variable over the dependent variable differs as a function of the moderating variable (Jaccard & Turrisi, 2003; Osborne, 2014).

In the multiple regression analysis, we observed that all the four models tested were significant at the level $p < 0.01$, as shown in Table 5. Model 1, which includes only two control variables (number of new products launched and if the company imports or not), explains 7.9% (adjusted R -squared) of the total variance, suggesting how much the two variables influence profit margin. The results showed that the performance with new products and the fact that the company imports or not have a small participation on the company's profit margin. Besides, more than 92% of other factors may also influence company's profitability. Even though those items' participation in profitability is low, the results of the survey indicate, as seen in the variance tests, that companies which develop and launch more products and which import have a higher profit margin.

Model 2 includes the main effects between the dependent variable, the profit margin. It was noted that the explained variance is significantly greater ($R^2 = 35.7\%$; $\Delta F = 11.96$), meaning that the independent variables add explanatory value to the equation.

In model 3, it was added the interaction effect between the independent variable (customer value-based pricing strategy) and the control variable (development of new products–DNP). The results show that this model is also significant. Although the explained variance increased only 2.5%, this increase of the explained variance from 35.7% to 38.2% is significant ($\Delta F = 5.982$), which justifies the inclusion of these interaction effects. Finally, model 4, in which another interaction effect

Table 5
Hierarchical regression models (dependent variable: profit margin).

Constructs	Control variables Model 1	Main effect Model 2	Interaction effect Model 3	Interaction effect Model 4
New products development (NPD)	0.170**	0.052	−0.009	−0.006
Imports	0.216**	0.095	0.112	0.110
Customer value-based price strategy		0.238*	0.475*	0.489*
Competition-based price strategy		−0.014	−0.003	0.003
Cost-based price strategy		−0.044	−0.076	−0.155
High prices		0.259*	0.241*	0.236*
Low prices		−0.228*	−0.240*	−0.247
Customer value-based price strategy versus NPD			−0.287*	−0.291*
Cost-based price strategy versus imports				0.096
Constant	0.569*	0.606*	0.618*	0.618*
Adjusted R ²	0.079	0.326	0.348	0.347
R ²	0.092	0.357	0.382	0.386
ΔF		11.96*	5.982**	0.834

Source: Survey data (2015).

Note: * $p < 0.05$; ** $p < 0.01$ – standard coefficients.

was added (H3b), the interaction between the independent variable (cost-based pricing strategy) and the control variable (if the company imports or not), does not show a significant effect concerning model 3 ($R^2 = 38.6\%$; $\Delta F = 0.834$).

Based on the hierarchical regression analysis, it was possible to proceed to test the hypotheses of which the results are shown in Table 3. The first hypothesis (H1a) proposes that adopting a value-based pricing strategy is directly proportional to the profit margin of the company. Given that the positive coefficient (0.238 in model 2 and 0.475 in model 3) is significant at the $p < 0.01$ level, H1a can be accepted. However, H1b was not confirmed, since the results of the regression analysis showed contradictory results, because the moderation of the level of release of new products in relation to using the customer value-based pricing strategy significantly and negatively influences the profit margin. Anyways, as shown in model 1 in Table 5, the development of new products impacts significantly the companies' profit margin, but such strategy needs to be related to other organizational actions that lead to a better performance. H2 indicates that the competition-based pricing strategy did not significantly influence the profit margin of the companies analyzed (−0.014 in model 2 and −0.003 in model 3), thus rejecting H2. H3a indicates that the cost-based pricing

strategy positively influences profit margin. The results did not confirm this hypothesis within the surveyed samples (−0.044 in model 2 and −0.076 in model 3), therefore rejecting H3a. Likewise, H3b was not confirmed, because of the fact that the company imports did not show any moderation between the cost-based pricing strategy and the profit margin of the surveyed companies (0.096 in model 4). Not being able to confirm this hypothesis could also be related to the fact that in 2013–2014 there was a 15% decline in the import sector in Caxias do Sul, according to the Brazilian Ministry of Development, Industry and Foreign Trade (MDIC). The imports of raw material for this sector were approximately 3% (in R\$) of the gross revenue in 2014 (Brasil, 2016). Based on these data, we believe that imports could have barely interfered on the cost and the increase of the profit margins of the surveyed companies during this period.

H4 identifies that the companies which set high prices displayed a significant and positive impact on the profit margin, thus being confirmed (0.259 in model 2 and 0.241 in model 3). Likewise, H5 was confirmed because companies which set low prices displayed a significant negative impact on their profit margins (−0.228 in model 2 and −0.240 in model 3). Fig. 2 summarizes the inherent results of the tested hypotheses.

Hi	Research Hypotheses	Results
H1a	Adopting a customer value-based pricing strategy has a direct and positive impact on profit margin.	Confirmed
H1b	Level of development of new products (DNP) moderates the relationship between customer value-based pricing strategy and profit margin, and such relationship is stronger in those companies which launch more products into the market.	Not confirmed
H2	Adopting a competition-based pricing strategy has a direct and negative impact on profit margin.	Not confirmed
H3a	Adopting a cost-based pricing strategy has a direct and positive impact on profit margin.	Not confirmed
H3b	Import of raw materials and supplies moderates the relationship between cost-based pricing strategy and profit margin, and this relationship would be stronger for companies that import.	Not confirmed
H4	Adopting high price levels has a direct and positive impact on profit margin.	Confirmed
H5	Adopting low price levels has a direct and negative impact on profit margin.	Confirmed

Fig. 2. Research hypotheses test results.

Source: Survey data (2015).

Concluding remarks

In order to have a better performance than their competitors, companies should establish a set of superior resources, such as, abilities, skills and knowledge, because the role of the price fixing capacity as a way of effectively improving the company's performance is vital (Dutta, Zbaracki, & Bergen, 2003; Liozu & Hinterhuber, 2013). Therefore, a more strategic approach to the companies' pricing process excels as a relevant element for the companies' better performance and for the construction of a possible source of competitive advantage (Hinterhuber & Liozu, 2014).

The profitability and cost effectiveness of the companies are highly attached to a pricing strategy that visualizes their internal capacities, skills and corporate advantages against their competitors while also considering their customer's needs or how much they are willing to pay. Setting lower prices could sacrifice profits because a greater sales volume may not compensate for a lower profit margin. Higher prices could also sacrifice profits because greater margins per unit may not compensate for a smaller sales volume (Simon et al., 2008).

Therefore, the results of our study indicate that companies which search for a customer value-based pricing strategy and which set high prices, logically within the market context in which they operate, tend to yield a greater profit margin than their competitors who may adopt a competition-based pricing strategy and set lower prices. Another important fact is that the most innovative companies, or those who launch a higher quantity of new products, and operate with imported raw materials and supplies also show a higher profit margin. This indicates that the higher the usage of value-based pricing strategies (in which the company adds more innovation launching new products), the greater are the possibilities of increasing the company's profit margin.

Such results may be identified on the hierarchical test from the hierarchical regression (see model 3 in Table 5), in which it is confirmed that a customer value-based pricing strategy, when added to the interaction effect of new products, significantly increases the explanation of the proposed model (Fig. 1), since the independent variables and the moderating variables explain the 34.8% variance.

Among this study's contributions, we can list mainly two. The first refers to the proposal of the theoretical model itself, in which it is identified that the strategies and price levels practiced have a significant impact on profit margin. Such theoretical proposal identifies that the price exerts a preponderant role on companies' profitability and that the interaction effects contribute to a better explanation of this model. The second contribution is related to the results of the survey, which show that the customer value-based pricing strategy and the setting of high prices enable a better profitability. This can be seen from the confirmation of hypotheses H1a, H4 and H5, which reinforces the power that a value-based pricing strategy and the high prices have in the profitability of organizations.

However, hypotheses H2 and H3a were not confirmed, which means that competition-based and cost-based pricing strategies did not significantly influence companies' profitability. It is

observed that the cost-based pricing strategy is the most used by the surveyed companies (mean value = 5.75, mean competition = 5.14, and mean costs = 6.24), which is also confirmed by other studies (Liozu et al., 2011). The small correlation between both strategies with the profit margin may be among the factors that may have contributed to the failure to confirm hypotheses H2 and H3a (Table 1). Likewise, the two proposed moderations were not confirmed to H1b, since the development of new products (DNP) moderates the relationship between the customer value strategy and the profit margins of the companies, but in a negative way, and to H3b, as the import of raw material and supplies does not moderate the relationship between the cost-based pricing strategy and profit margin. Nonetheless, this also needs to be seen as a caveat, since we did not ask in the survey the companies' percentage of import and how much imported items represent in their costs. Future studies can repeat these tests using this information to test again this moderation, because, according to Boehe et al. (2009), raw material and supplies imports may contribute to cost reduction and improvements of the organization's profit margins.

The failure to confirm the DNP and imports moderating variables indicate that a companies' profitability is a complex and multidimensional phenomenon and that there are numerous variables which can affect profitability. In addition, the companies working with low prices do not necessarily work with low costs, interfering negatively in their profitability.

It is worth mentioning that this may be related to a potential limitation in our study, since the profit margin of surveyed companies was measured by the respondent's perception (subjective metrics) and not by information directly collected from income statements (objective metrics). In addition, the fact that Brazilian companies obtain financial profits as compensation for weak operational results, since debts and taxes may also distort the results. We recommend, for future studies, using EBITDA instead of a profit margin.

Another aspect that undergoes the same effect is related to the price levels practiced by the DNP companies (high and low prices) since it is known that businesses also operate in intermediate levels or that they accompany the competitors' prices. Therefore, in future studies, the usage or not of intermediate price levels could be measured and the impact of these on the companies' performance could be verified.

In this study's case, we measured the performance by only one variable, the profit margin. Nevertheless, it is known that the performance of an organization can be measured by many other variables, such as fixed assets, customer satisfaction, cost effectiveness and others (Ingenbleek et al., 2003; Urdan & Osaku, 2005). In this manner, future studies could use different performance variables and check their different impacts associated to pricing strategies and price levels practiced (Hinterhuber & Liozu, 2014; Ingenbleek & Van Der Lans, 2013).

Within the presented results, it is possible to notice that smaller businesses, mainly those associated to the metal-mechanic industry, show a greater difficulty in relation to their performance. Therefore, further research about the maturity level of the pricing process of companies and the competitive environment within their markets could help explain the difference

on performance between companies. Moreover, further studies regarding the pricing processes of smaller businesses are appropriate because there may be an influence by larger companies with greater bargaining power, influencing the methods, the strategies and the pricing levels practiced by them.

Pricing strategies may be seen as a complex activity that requires a good understanding of the internal structure of the company, a good knowledge of the market, and a good knowledge of the diverse variables that comprise it and their interfaces (Milan et al., 2013). The price is considered one of the most impacting elements in companies' performance. The results found indicate the importance of maintaining the focus of the pricing on the current and potential customers and not only on competitors. Thereby, the differentiation whether from new products and/or services and the value delivered to customers provides a more effective way to practice best pricing strategies, which will have a positive impact on companies' profit and competitiveness (Davicik & Sharma, 2015).

Conflicts of interest

The authors declare no conflicts of interest.

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