Competitive Pressure Systems Mapping in the Brazilian Truck Market

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Abstract

The automotive business in Brazil achieved 10% of the industry revenue and 6% of the formal employment by 2008. The commercial vehicle segment concentrated so far eight truck makers that experienced their best market figures in 2008, the economy crisis in 2009, and an extraordinary recovery in 2010. Government tax reduction programs as well as special financing incentives were undoubtedly decisive to re-stimulate the business during the crisis. Positive Brazilian perspectives with the boom in the agricultural, oil and gas, mining and infrastructure activities plus the coming sports events call the attention of new players that are quickly implementing different business strategies to become part of the game. New emission regulations starting from 2012 also bring uncertainties, challenges and opportunities. With the growing globalization and market concentration it's critical for any industry understand and minimize the forces of competitive pressures. The main goal of this paper, therefore, is to contribute to the academy with an alternative approach of strategic and behavioral analysis of rivalry and competition different than the five forces model of Porter. Ford, Iveco, MAN, Mercedes-Benz, Scania and Volvo were assessed from 2008 to 2010 within three main performance indicators – unit sales, gross revenues and operating profits – supporting the elaboration of the competitive pressure systems mapping model of D'aveni, including a hypothetical future scenario with a new entrant and the potential impacts in the system. Main findings and results portray the asymmetrical strategic behavior of competitors and the temporary dynamic stability in the Brazilian truck industry.

Keywords: competitive pressure systems mapping; market commonality; strategy; competitive dynamics; rivalry; automotive industry; trucks.

1 Introduction

The automotive business in Brazil is vital for the nation with 10% of the industry revenue and 6% of the formal employment (ABDI, 2008). Within this industry, eight truck makers run their plants in five different Brazilian states, supplying the truck market with light, medium and heavy commercial vehicles (ANFAVEA, 2010). With the economic crisis in 2009 the Brazilian truck market decreased the sales performance by 26.1% below 2008, but recovered in 2010 with 43.5% of growth in national registrations and 56.9% higher volumes in the total production figures. Government tax reduction programs as well as special financing incentives were undoubtedly decisive to re-stimulate the business during the crisis. Although the exportation increased in 2010 the importation figures also have grown, especially in the heavy segment with new entrants, representing 2.5% of the total market sales. Positive Brazilian market perspectives in the agriculture, mining, and oil and gas sectors as well as in the infrastructure activities added to the coming international sports events in the country, i.e. FIFA World Cup and the Olympic Games, had all called the attention of new players that have already started to implement different business strategies like direct importations, global strategic alliances and the erection plan of new production plants. New emission regulations valid from 2012 on also bring uncertainties, challenges and opportunities. With the growing globalization in competition it's critical for the Brazilian truck makers understand and minimize the competitive pressures coming from their existing competitors as well as the new entrants.

Nowadays, the majority of the companies adapt passively and gradually according to the main course of actions from the market. They adjust the pace of their own actions in order to catch up with the development of the industry trends they're following. However, the most import insights around strategy

rarely come from the projection of new trends. In the contrary, they rise from speculations of how the new trends can change the value for the customers and how it will impact in the company's business (KIM; MAUBORGNE, 2005).

In a given industry the competitive movements from one competitor can cause deep effects in the other players and create a mutual dependency. Even when the competition is concentrated or well balanced, in which the competitors are relatively equal in terms of size and apparent resources, there might occur periods of instability when one or more competitors decide to fight back using all available resources (PORTER, 2004).

For Besanko (2004), the market structure refers to the number and to the distribution of companies in this market. For Porter (2004), the foreign competitors must be treated in the same way as the local competitors for the market structural analysis. One common indicator is the coefficient of concentration index of N competitors. The nature of a market (concentrated or not concentrated) usually allows a quick and reasonably precise evaluation of the probable nature of competition. Other common index used in the industry is the Herfindahl Index (BESANKO, 2004).

For D'aveni (2002) the competitiveness within the industry is traditionally measured by the antitrust specialists following the same basic indices. For Besanko (2004), the companies may go through a continuum of price fluctuations, varying from the perfect competition on one hand, to the monopoly on the other hand. Tied to each extreme there is a variation interval of the Herfindahl indices, which is typical of each kind of competition.

Table 1: Truck makers figures, Concentration and Herfindahl Indices.

Trucks by Company	2010	2009	2008		
	Jan-Dec	Jan-Dec	Jan-Dec	Percent Variation	
Units	A	B	C	A/B	B/C
Trucks	171.040	114.286	126.777	49,7%	-9,9%
Anfavea Members	170.802	113.593	125.589	50,4%	-9,6%
Market share / Trucks	99,9%	99,4%	99,1%	0,5%	0,3%
Agrale	746	555	822	34,4%	-32,5%
	0,4%	0,5%	0,6%	-10,2%	-25,1%
Ford	29.627	21.497	21.902	37,8%	-1,8%
	17,3%	18,8%	17,3%	-7,9%	8,9%
International	100	0	0	0,0%	0,0%
	0,1%	0,0%	0,0%	0,0%	0,0%
Iveco	13.539	7.810	10.043	73,4%	-22,2%
	7,9%	6,8%	7,9%	15,8%	-13,7%
MAN (Volkswagen Trucks and Buses)	48.649	34.341	37.112	41,7%	-7,5%
	28,4%	30,0%	29,3%	-5,3%	2,6%
Mercedes-Benz (MBB)	46.505	32.332	37.565	43,8%	-13,9%
	27,2%	28,3%	29,6%	-3,9%	-4,5%
Scania	15.411	8.327	8.010	85,1%	4,0%
	9,0%	7,3%	6,3%	23,7%	15,3%
Volvo	16.224	8.730	10.134	85,8%	-13,9%
	9,5%	7,6%	8,0%	24,2%	-4,4%
Other Companies	239	694	1.189	-65,6%	-41,6%
	0,1%	0,6%	0,9%	-77,0%	-35,3%
Concentration Index (Multinationals)	99,4%	98,9%	98,4%	0,5%	0,5%
Herfindahl Index	0,21	0,22	0,22	-6,0%	0,7%

Source: Elaborated by the authors with data from ANFAVEA, 2010.

The Herfindahl index in the Brazilian truck market situates from 2008 to 2010 in the oligopoly interval from 0.2 to 0.6. Yet, according to Besanko (2004), while in an oligopoly, the intensity of the price competition can vary from light to extremely aggressive depending on the rivalry among the competitors. Nevertheless, those variations are solely suggestions and should not be taken as an absolute truth. Besanko (2004) affirms that "it's essential to evaluate the circumstances that round the competitive interaction of the companies to take conclusion around the intensity of the prices competition instead of trusting either the Herfindahl index only or other concentration indicators". Nonetheless, it's important to note that this research doesn't aim to go deeper into the types of competition, which theory is richly and more elaborately assessed by the author.

For Keegan (2005), rivalry refers to the overall actions that the companies undertake in the industry in order to improve their positions and take advantage ones on the top of the others. For the author, "when the rivalry pushes the companies forward toward innovation or cost reduction, it might be a positive force. On the other hand, when it pushes the prices and, consequently the profitability backward, it creates instability and negatively influences the industry attractiveness". Furthermore, the competitive dynamics shows that in some industries the global players have practically excluded the local players from the game (KEEGAN, 2005). As a matter of fact, the Brazilian truck market is massively represented by global players according to Table 1.

Therefore, the main goal of this paper is to contribute to the academy with an alternative approach of strategic and behavioral analysis of rivalry and competition different than the five forces model of Porter, by using the competitive pressure systems mapping model of D'aveni.

2 Literature Review

Typically, the strategists see the competitive pressures as something based on the five forces of Porter: bargaining power of customers, bargaining power of suppliers, threat of new entrants, threat of substitute products, and competitive rivalry within an industry. However, the recent researches of multimarket contacts indicate that the competitive pressure system dynamics is much more complex than the success factors that influence the intensity of rivalry among the five forces of Porter. Furthermore, the overall vision of the pressure systems allows an industry to take decisions more pro-actively and intelligently. The result can lead not only to superior knowledge, but also to the employment of the competitive strategy based on the pressures mapping and more coherently. The main purpose of mapping the pressures is not to analyze the current tactics and techniques of industry competition, such as the war of prices, marketing, and technological innovation. Instead, it's most useful to assess, who in the industry has got the potential and the stimulus to exert or to avoid future competitive pressures, to form strategic alliances, to identify potential acquisitions or opportunities to enter in new markets and, consequently, the ability to establish a new dynamic stability and direction in the industry. Though, it's not an easy task to determine which are the main borders and competitors in an industry. The starting point is to identify all the existing competitors and the markets they overlap with the focus company being assessed, i.e. the company that intends to create the map, also including the rivals that exert pressure towards the focus company's rivals. The more two companies overlap, the higher is the pressure. Also, the pressure is measured by two distinct factors: the importance of the market to the company, i.e., the overall sales in the market, and the degree of penetration of the rivals measured by the size of their incursion, i.e., their market share (D'AVENI, 2002). Therefore the competitive pressures can be expressed by:

Pressure = (Importance of Market) x (Size of Incursion)

Once all the pressures from each rival are measured, then they should be represented in a numeric scale in which the sum of pressures is equal to 1. The competitive pressures may also be mapped by symbols in which the companies are represented by circles, the formal (or tacit) alliances are expressed by connecting lines between the circles, and the pressures are indicated by arrows that display their direction. The thicker is the arrow, the higher is the pressure. Once the pressure mapping is drawn, then it requires interpretation. In this phase, it is useful to start the analysis of the strategic behavior from the market leaders down to their competitors (D'AVENI, 2002). Furthermore, the pressure systems must be continuously assessed due to the dynamic behavior of the industry, the rivalry, and the market so that the pressure mapping might be compared to a picture expressing the very single moment of a certain market in such a way that the sequenced and chronological overlapping of several maps might also create a live animation of competition dynamics over time, such as a film. This methodology might create a broadened vision and understanding of how the market evolves and the competitive pressure system behaves among the existing competitors and new entrants over the years (PEREIRA *et al*, 2004 *apud* SCARANELLO & CARVALHO, 2005).

For D'aveni (2002), the organizations need to seek for superior position in the industry as much as possible and avoid intolerable pressures as much as needed, but it's more valuable to gain superior strategic influence with the evolution of the system. For Bingham (2011), the strategies associated with the five forces of Porter, which constructs stability and a fortress around an attractive market, can provide on one hand a long-term competitive advantage, although on the other hand it only remains valuable until the terrain shifts and the strategic position is eroded. Nevertheless, for Stambaugh (2011), in the recent inter-firm dynamics researches, the act of being competitively aggressive is part of the game to sustain market position and relative performance so that competitors carefully and continuously monitor and analyze their rivals, and are motivated to improve their performance by attacking those firms.

Yet, in the past researches, Chen (1996) issued for the first time the concept of Market Commonality by establishing a fundamental theory of competitor analysis and inter-firm rivalry. Hsu (2006), believes that Chen's previous definition of Market Commonality is mixed with the concept of Competitive Pressures of D'aveni (2002). If taking the principle that *Pbi / Pi* represents the relative advantage of company *b* in market *i* and *Pai / Pa* represents the importance of market *i* to company *a*, then *Pai / Pa x Pbi / Pi* represents the competitive pressure from company *b* to company *a* in market *i*. With the adaptation of the mathematical model of Hsu and Chen (2006) to the Competitive Pressures of D'aveni (2002), and, if pressure is equal to *Importance of Market x Size of Incursion* , then pressure is equal to *Pai / Pa x Pbi / Pi*. Therefore, Market Commonality *Mab* is represented by the sum of pressures from company *b* to company *a* in all of the I markets they overlap (HSU; CHEN, 2006).

State of the art researches around competitive dynamics and aggressiveness have also disclosed that in vigorously competitive industries, the more successful are the competitive attacks, the faster and stronger are the competitive responses (Derfus *et al*, 2008 apud Stambaugh, Yu & Dubinsky, 2011). Also, if markets are characterized by intensive competitive conditions or threatened by highly substitute products, an aggressive competitive retaliation might be expected. The study of competitive history of inter-firm dynamics may provide strategic guidelines for market entrants. Similarly, the study of market entrants may also provide insights and directions for formulating defensive strategies (KARAKAYA; YANNOPOULOS, 2010). Although all the concepts are closely connected it's important to emphasize that the goal of this paper is neither to research multimarket overlaps nor aggressiveness or defensive competitive strategies, but to focus on the competitive pressures mapping approach in the Brazilian truck market.

Hypothesis

For Porter (2004), the majority of well succeeded global strategies were based on the acknowledgment of the five forces of market competition. D'aveni (2002) disagrees with the five forces of Porter affirming that "Unfortunately, managers almost always lack objective measurements and useful pictures of the pressure patterns they face". Moreover, D'aveni (2002) emphasizes that "none of these factors explicitly accounts for the complexities presented by recent multimarket contact research nor for the variety of pressure patterns that comprise and influence intraindustry rivalry". For D'aveni (2002), the competitive pressures are asymmetric, meaning that the pressure from company *a* towards company *b* is not necessarily equal to the pressure from company *b* towards company *a* because the overlap of contacts between the rivals may differ in the importance of market, which depends on the company's customer portfolio. Taking into consideration all the possible overlap combinations that may exist among several rivals, there aren't two pressure systems exactly alike. Porter (2004) also understands that the differences in strategy might not affect the rivalry in the industry with the same level of importance, and that the competitive rivalry process is not symmetric. In this aspect, both authors have a common understanding concerning about the asymmetrical behavior between two rivals. Thus, would it be possible to conclude that the same theory applies in the Brazilian truck market?

Also, for D'aveni (2002), the pressure systems can never be frozen. The maximum that can be achieved is a temporary dynamic stability that might be affected by internal destabilizing actions or external frictions. Competitiveness in the Brazilian truck market might also display such behavior? Also, could other indicators than unit sales be effective to analyze the Brazilian truck market dynamics?

Hypothesis 1: the pressures between two competitors "a" and "b" in market "i" are asymmetrical.

Hypothesis 2: beyond unit sales, other performance indicators like gross revenues and operating profits give a different strategic perspective around the competitive pressures.

Taking into consideration the recent market contact researches from Segismundo and Laurindo (2006) and the specialized automotive magazine Autodata, it looks like there aren't significant barriers for new entrants in the Brazilian truck market.

Hypothesis 3: by employing competitive pressure systems mapping either a new entrant or an existing rival might gain superior awareness by visualizing the future hypothetical competitive dynamics in the market.

3 Research Methodology

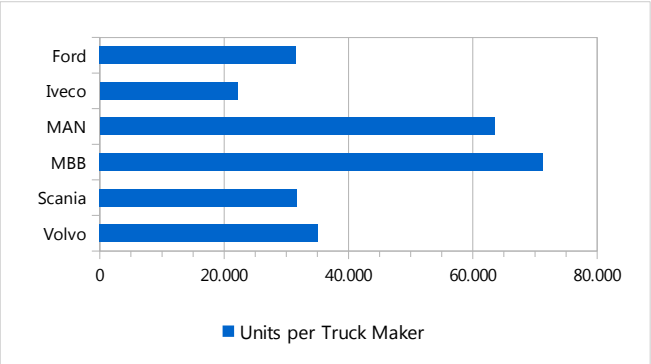
Competitive Pressure Systems Mapping from D'aveni (2002) was chosen as the academic model to analyze and measure rivalry and competition in the Brazilian truck market. Ford, Iveco, MAN, Mercedes-Benz (MBB), Scania and Volvo were assessed in two market segments – semi-heavy and heavy trucks – from 2008 to 2010 within three main performance indicators: unit sales, gross revenues and operating profits.

Data collection, population and sampling

This research is based on four main data groups. Firstly, Brazilian truck makers overall unit sales data was collected from Anfavea – Associação Nacional de Veículos Automotores. Secondly, the number of truck registrations per maker and per model was collected from Fenabrave – Federação Nacional da Indústria de Veículos Automotores. The third step focused on the data collection of truck prices made available in the specialized web magazine O Carreteiro. The fourth step concerned about the data collection of the average operating margins of the truck makers available – only for subscribed users – in the report *The World's Truck Manufacturers 13th edition* from AutomotiveWorld.com. However, as the report focuses only on the European truck makers, the data of Ford Motor Company was collected from the finance portal Wikinvest.com. Data from imported trucks was not collected neither assessed in this research.

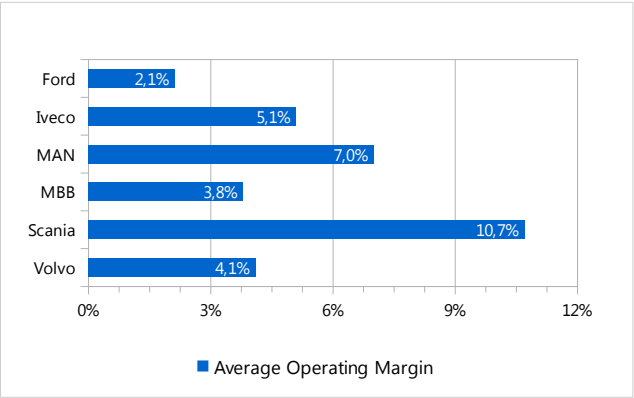
4 Results

Initially, the total unit sales data of commercial vehicles in the semi-heavy and heavy truck segments was collected from 2008 to 2010 according to Graphic 1.



Graphic 1: Total unit sales in Brazil from 2008 to 2010 in the semi-heavy and heavy truck segments. Source: Elaborated by the authors with data from Anfavea, 2010.

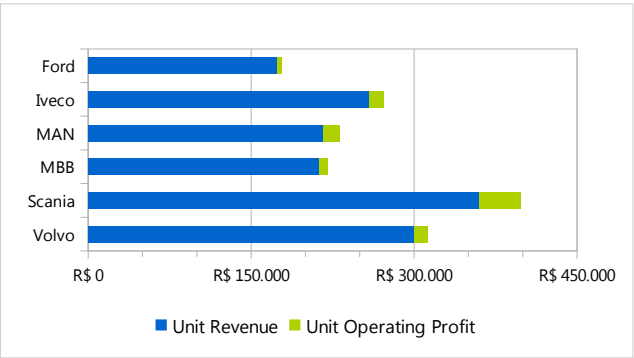
The data collection of operating margins of each truck maker was one of the most difficult tasks of this research. As none of the competitors make their profit margins available in the Brazilian truck market, then the data regards to global operations and represent the average results from 2005 to 2009 according to Graphic 2. There was also another limitation concerning about unavailable operating margin data from Ford trucks so that the overall Ford Motor Company global margins were used. For Storey (2010), operating margins from 5-7% probably are the most timid goal that a truck maker can establish. Moreover, in a dynamically perceived business like the truck industry, the ability of a company to sustain the profitability over the cyclic periods of demand is a clear signal that it managed to achieve the correct driving fundamentals of its business.



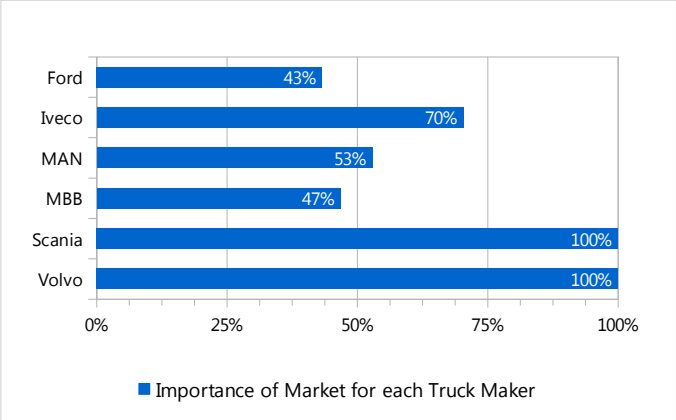
Graphic 2: Global average operating margins from 2005 to 2009. Source: Elaborated by the authors with data from AutomotiveWorld.com and Wikinvest.com, 2010.

The next phase was divided into five steps: the first one was to build the tables with the best-seller ranking of truck registrations by segmentation from 2008 to 2010. Then, the prices for new vehicles were obtained from price tables of each maker and, for the old vehicles, i.e., 2008 and 2009, the price tables were available in the web magazine O Carreteiro, built by a specialized price research company named Molicar. The third step focused on the calculation of the weighted average unit price per maker, achieved by the sum of the product of unit prices per model and the amount of registrations per model, divided by the total unit sales per maker. In the fourth step, the estimate annual gross revenue per maker was calculated by the product of the weighted average unit price per maker and the total unit sales.

In the last step, the total gross revenue of the period was obtained by the sum of the annual gross revenues. Then, the unit revenue was calculated by the total gross revenue divided by the total unit sales per maker in the period. Finally, the annual operating profit was calculated by the product of the annual gross revenue and the average operating margin of each maker. Then, the operating profit per unit was achieved by the total operating profit divided by the total unit sales in the period. The results are displayed in Graphic 3. The importance of market was calculated by the annual unit sales of each truck maker in the semi-heavy and heavy segments divided by their annual unit sales in the Brazilian truck market. The average importance of market, illustrated by graphic 4, was calculated for the period from 2008 to 2010.



Graphic 3: Revenue and operating profit per unit from 2008 to 2010. Source: Elaborated by the authors.



Graphic 4: Importance of Market from 2008 to 2010. Source: Elaborated by the authors with data from Anfavea, 2010.

Calculation of Pressures

Six competitors – Ford, Iveco, MAN, MBB, Scania and Volvo – were assessed according to the mixed models of D'aveni (2002) and Hsu (2006) presented in the Literature Review. From those models, the importance of market was treated as the non-random variable and the size of incursion as the random variable. Also, as the unit sales indicator, i.e., market share, is typically expressed in percentage, then the gross revenues and the operating profits were also converted from Brazilian Real (R$) into a percentage scale.

Symbolic Pressure Mapping

Once all the pressures from each rival were measured, then they were represented in a numeric scale in which the sum of pressures was equal to 1. Table 2 represents the competitive pressures mapping in the Brazilian truck market in 2008.

Table 2: Competitive Pressures Mapping in 2008.

			(a) Ford	(b) Iveco	(c) MAN	(d) MBB	(e) Scania	(f) Volvo
Ford	Ma(x)	(1)	**-**	**0,07**	**0,39**	**0,38**	**0,04**	**0,12**
		(2)	-	-15,7%	7,5%	-2,2%	-10,6%	-5,4%
		(3)	-	-16,4%	33,3%	-28,1%	20,0%	-29,0%
Iveco	Mb(x)		**0,09**	**-**	**0,25**	**0,30**	**0,18**	**0,18**
			-23,2%	-	-1,7%	-13,2%	20,7%	14,6%
			-54,2%	-	27,2%	-32,9%	58,0%	-36,0%
MAN	Mc(x)		**0,22**	**0,11**	**-**	**0,41**	**0,10**	**0,16**
			-4,7%	-4,2%	-	-1,0%	9,9%	5,4%
			-39,4%	5,5%	-	0,2%	80,0%	-9,1%
MBB	Md(x)		**0,20**	**0,12**	**0,39**	**-**	**0,12**	**0,17**
			-7,2%	-9,5%	5,9%	-	1,8%	0,3%
			-55,6%	-24,3%	36,2%	-	32,8%	-35,0%
Scania	Me(x)		**0,05**	**0,18**	**0,24**	**0,31**	**-**	**0,22**
			-27,7%	7,2%	0,2%	-13,2%	-	18,5%
			-56,1%	5,4%	44,7%	-21,5%	-	-15,3%
Volvo	Mf(x)		**0,11**	**0,13**	**0,28**	**0,31**	**0,17**	**-**
			-19,5%	7,1%	1,2%	-10,0%	24,8%	-
			-54,6%	-25,3%	27,8%	-32,8%	48,1%	-

Mx(x) = Competitive Pressure from (x) over x

(1) Market share
(2) Gross Revenue
(3) Operating Profit

Source: Elaborated by the authors.

The graphical representation of pressures was based on the symbology taken from the academic model of D'aveni (2002), also available from other recent researches (SCARANELLO; CARVALHO, 2005). (JANSEN; ROTONDARO; JANSEN, 2005), (SEGISMUNDO; LAURINDO, 2006). The chosen focus company in the symbolic mapping was MAN, which has been the commercial vehicle leader in the overall Brazilian truck market for eight consecutive years according to Renavam – Registro Nacional de Veículos Automotores. The rivalry among the competitors, symbolically represented by the graphical elements, i.e., circles and arrows in the map, allows visual and better perception around competitor's relative size illustrated either

by bigger or smaller circles and the magnitude of the pressures they exert over they rivals illustrated either by thicker or thinner arrows. The predominant arrow color in the map highlights the highest pressure exerted among the three performance indicators assessed, i.e., market share, gross revenue or operating profit. Figure 1 illustrates the competitive pressure mapping in 2008.

Moreover, when two direct comparisons are assessed following the methodology of competitive pressures mapping, it becomes evident that sizes and pressures are not necessarily symmetric. Eventually, there might be coincident symmetry, but in general, the asymmetric behavior of pressures validates *hypothesis 1*. One clear example from the picture taken in 2008 is the asymmetric behavior between MAN and MBB. According to Table 2, Mcd > Mdc when it comes to market share (blue arrow). This behavior indicates that the main strategy of MBB in 2008 was to consolidate their sales presence in the Brazilian truck market in the semi-heavy and heavy segments by pressuring MAN predominantly in volumes. On the other hand, for MAN, it was more important to keep their customer portfolio because this strategy would represent a more aggressive gross revenue and consequently a safe operating profitability (green arrow) ahead of their rival, forcing MBB to continue competing for volumes instead of pricing, once MBB operating profit (green arrow) is acknowledgedly inferior, and a price increase policy (yellow arrow) would contribute directly for loss of customer portfolio (blue arrow).

In the transition of 2008 to 2009, an unforeseen external destabilizing action was noted: the world economy crisis reached the country and turned on the red light to the Brazilian truck market. When both competitive pressure maps were compared, it was clear that 2009, year of crisis and recession in the global scenario, thrust fierce competition among the rivals towards the sustainability of gross revenue and operating profit. With the truck demand lowered, most of the competitors focused on internal improvements in their quality, costs and productivity, but obviously also reduced their investment levels and were forced to adjust the manpower. The battle for profit sustainability was clearly perceptible due to the majority of green arrow pressures. Against the tide, MBB instinctively pressured most of their rivals with market share (blue arrows), but with the cyclic truck demand in 2009 that might not be the best competitive strategy. Figure 2 illustrates the competitive pressures in 2009.

Furthermore, competitive pressures between two rivals may asymmetrically vary for higher or for lower depending on the indicator being assessed. For instance, MBB exerted high pressure over a MAN concerning about market share (blue arrow) in 2008. Nevertheless, the pressure over MAN shrunk due to weaker gross revenues (yellow Arrow), probably affected by a mistaken market positioning, and went down even further in profitability due to inferior operating profits (green arrow). By comparing two different pictures represented by 2008 and 2009 competitive pressure maps it becomes visually perceptible that, beyond unit sales, other performance indicators like gross revenues and operating profit may also give a different strategic perspective and overview around the competitive pressures over the time validating *hypothesis 2*.

Threat of New Entrants

Recent researches around the weak barriers to entry in the Brazilian truck market indicate that new players have been working vigorously (RUNOFF, R. & ROMERO, V., 2011). Navistar heavy truck 9800i is one clear example of this strategic movement. The new player NC^2 (a joint venture between Navistar and Caterpillar) is also preparing to launch a new model in the semi-heavy segment: DuraStar. In order to visualize the impacts of the threat of new entrants in an established market a hypothetical future scenario was created from 2010's pressure mapping by assigning to Navistar flat 9% of market share, gross revenues and operating profitability. The same figures were proportionally reduced in one third from the top three best sellers. Taking into consideration that a new player can successfully affect the market leaders or the smaller existing players, it can also provoke changes in the pressure system behavior when compared to a previous picture. Furthermore, it’s perceptible in the hypothetical map that MBB continues to pressure the rivals with the clear goal of sustaining their market position, which unleashes immediate response from the competitors, including the new player.

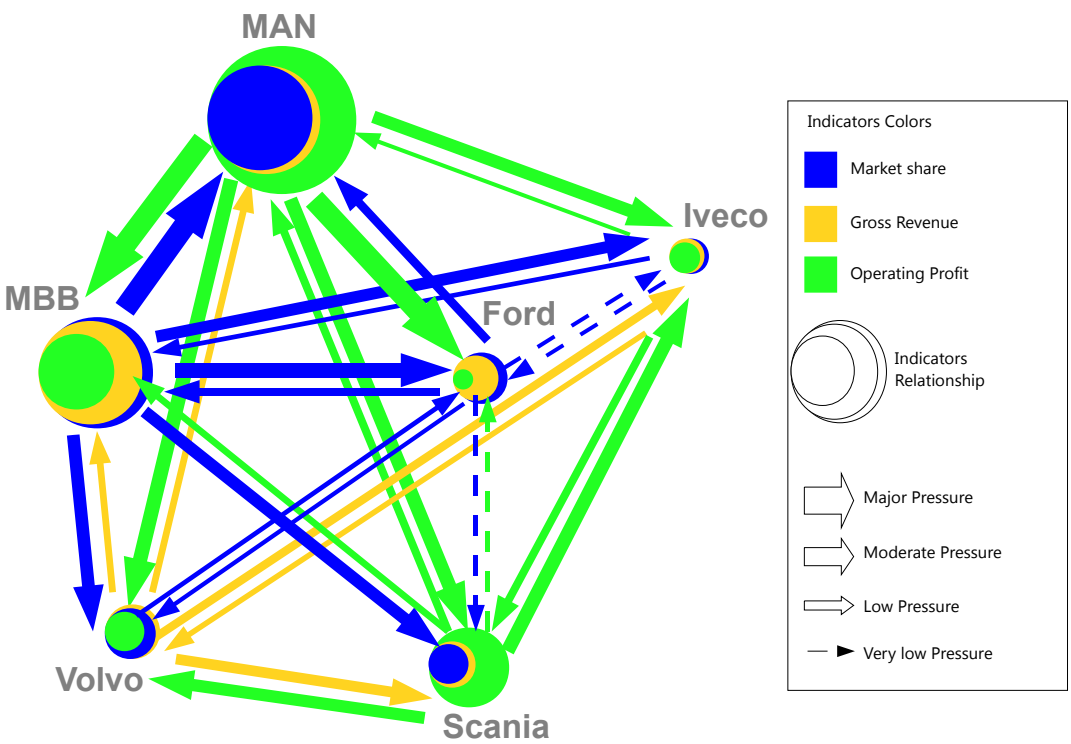


Figure 1: Competitive pressure mapping in the Brazilian truck market in 2008. Source: Elaborated by the authors.

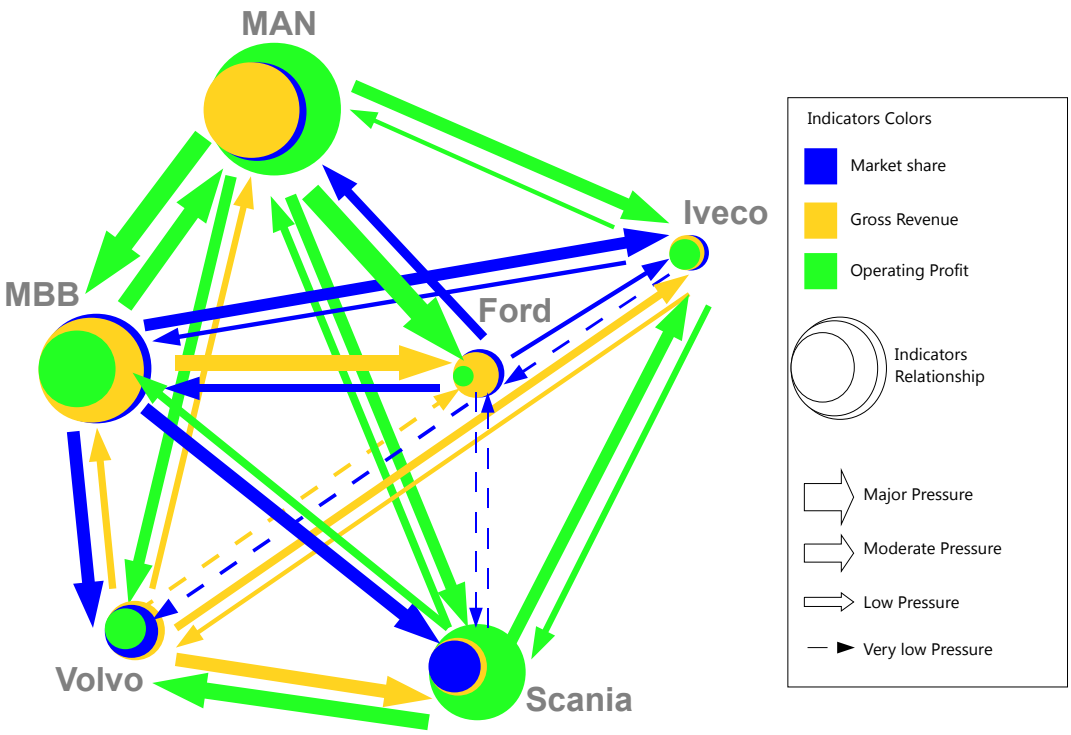


Figure 2: Competitive pressure mapping in the Brazilian truck market in 2009. Source: Elaborated by the authors.

As a new player, it's expected from NC^2 to fight for market share and market consolidation, which is mostly perceptible against the competitors within the same market size – Ford and Iveco. Also, due to a superior product maturity, specially dedicated to the U.S market, NC^2 have the power to exert strategic price pressure over MAN, Scania and Volvo – perceived as premium brands – boosting the gross revenues and operating profits. Thus, if by employing competitive pressure systems mapping either a new entrant or an existing rival may gain early and superior awareness by visualizing the future hypothetical competitive dynamics in the market, then it validates *hypothesis 3*. Figure 3 illustrates a hypothetical competitive pressure mapping with NC^2 as a new entrant in the Brazilian truck market.

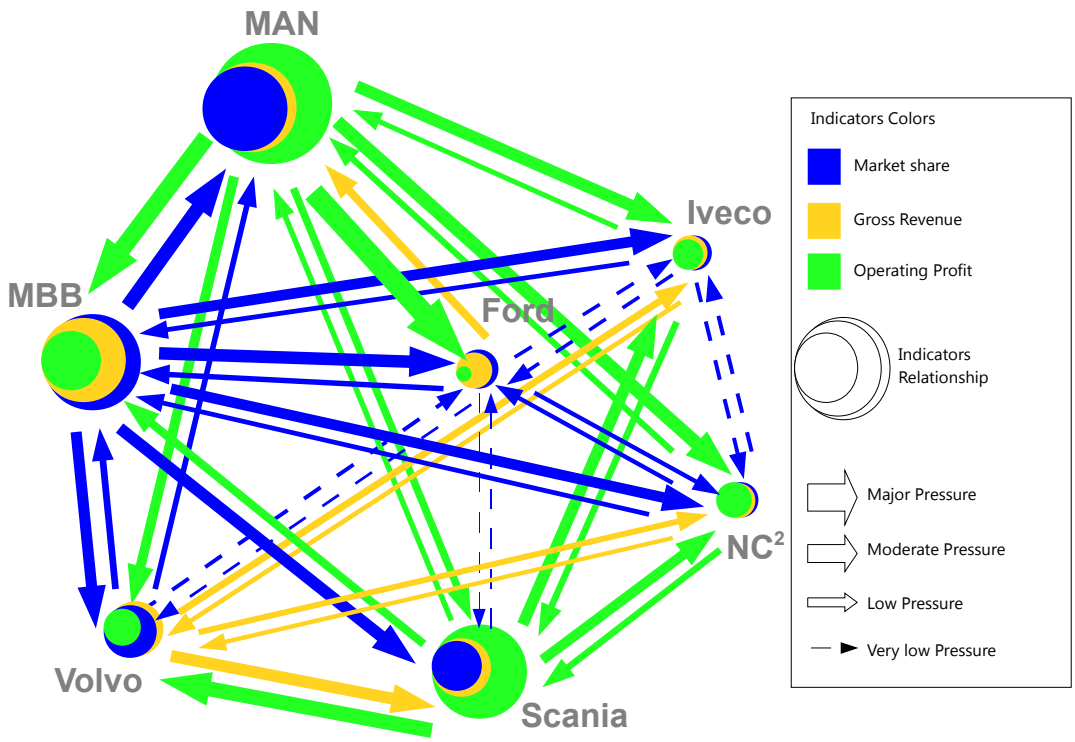


Figure 3: Hypothetical competitive pressure mapping in the Brazilian truck market. Source: Elaborated by the authors.

5 Final Considerations

Recent researches around the Brazilian truck market took into account the analysis of competitor's product portfolio, specification and technical differences as well as new market launches to interpret and present the competitive pressure results (SEGISMUNDO; LAURINDO, 2006). On the other hand, the utilization of more classic and generalist metrics in this research lead to a macroeconomic academic interpretation of the results and took the opportunity to contribute to the academy with an alternative approach of strategic and behavioral analysis of rivalry and competition different than the five forces model of Porter, by using the competitive pressure systems mapping model of D'aveni (2002). The interpretation of the competitive pressure mapping stimulates the formulation of several questions around the temporary dynamic stability of the pressure system, such as: a) is there a competitor or a dominant group of competitors exerting high pressures? b) the market leaders behave aggressively to each other or only to the smaller competitors? c) the chosen strategies are explicit, implicit or inconsistent? Also, regardless the industry, any given company is able to develop a new competitive and strategic mind-set by employing the competitive pressure mapping in order to answer two critical questions: a) if the current pattern of competitive pressures continue, which behavior or position the company should make explicit? b) how the company might create stability (or instability) around the current pressure system in order to predictably influence the results? With the competitive pressure mapping focused on the current situation of the market it may create vital answers to the dynamic stability well as the profitability (D'AVENI, 2002). Certainly, by choosing other performance indicators than only the market share, such as gross revenue and operating profit, directly influenced the interpretation and the analysis of the competitive pressure results. Despite the limitations and difficulties around the data collection of regional gross revenues and profitability, a suggestion of continuation of this research around strategy, rivalry and competition is the elaboration of the competitive pressure mapping either in the top emerging and BRICT countries or in the global truck market, but also including a new approach around state of the art competitive dynamics of inter-firm rivalry and multimarket contacts, such as defensive and aggressiveness strategies.

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