Faster or Better? Operations Capabilities Development as a Competitive Weapon

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Abstract
This research aims to contribute to the debate about tradeoffs on Operations Strategy. The results, drawn from a multiple case study, provide evidences that tradeoffs might occur in the selection of the strategic choices. Leading firms are developing higher flexibility and on-time delivery capabilities as a response to competitive pressures.

Keywords: operational capabilities, tradeoffs, local manufacturing system.

Introduction
There is an open debate in the literature of operations strategy: after all, it is possible for a firm to compete in multiple competitive priorities simultaneously or achieve strength on multiple operational capabilities without sacrificing performance of any of them? Rosenzweig and Easton (2010) sought to answer this question by means of a meta-analytic study, concluding that, on average, empirical studies analyzed do not report the existence of tradeoffs. The way capabilities are acquired and the nature of the relationship between the operational capabilities of the quality, flexibility, cost and delivery (Boyer and Lewis 2002, Rosenzweig and Roth 2004), as well as the relationship of causality on the strategic initiatives that precede them (Flynn and Flynn 2004) has been a central theme in operations strategy.

One of the conjectures presented by Rosenzweig and Easton (2010) is that the tradeoffs faced by managers are not directly related to the dimensions of quality, flexibility, cost and delivery performance. The authors suggest that tradeoffs would occur, in fact, in the selection of strategic choices and associated initiatives. The first choices influence the future strategic choices, limiting the possible alternatives for the development of capabilities (Hayes and Pisano1996). With these conjectures, Rosenzweig and Easton (2010) amplify the prospects for future research and reinforce the call of Boyer and Pagell (2000) for deeper studies that allow a better understanding about the dynamics of development of operational capabilities by using case study methodology (Rosenzweig and Easton 2010, p. 137).

This article seeks to answer this call examining how a group of companies develops their operational capabilities and seeks to identify if the conjecture proposed by Rosenzweig and Easton (2010) occurs. It was chosen a group of firms belonging to the same industry, same size, same location, pursuing similar business strategies and facing the same competitive pressures.

Thus, it is possible to isolate some contingent factors that normally affect the analysis of the data, and allows verifying which strategic initiatives enable or inhibit the development of operational capabilities.

The choice fell on a Brazilian traditional footwear manufacturing system, composed mostly by small and micro firms and just over a dozen midsize firms, which sell all their production on the domestic market, not participating in global production chains. These firms present a low degree of automation, with features of handcrafted production and exploit a market niche known as fast fashion: consumers demand for new models in a virtually uninterrupted manner. This choice also seeks to fill another gap pointed to the literature: empirical studies on operational capabilities usually analyze large companies with global operations, leaving doubts whether small and mid-sized companies face similar contingencies (Christiansen et al. 2003, Corbett 2008). About three years ago, the studied firms have been facing growing competition in their target market by major footwear manufacturers, mainly large companies, with a high degree of automation and advanced technology of production. These larger companies, traditional exporters, have turned their interests to domestic market for three main reasons: first, the sharp drop in exports due to the financial crisis that has shaken the American and European market in 2008; second, the unfavorable exchange rate for exporters, reducing their competitiveness against other footwear manufacturers countries (Brazilian Association of Footwear Industry- ABICALÇADOS, 2010); third, the increasing attractiveness of the internal market, as a result of the recent increase in per-capita income of the Brazilian population (FGV 2010).

Empirical studies conducted by Ward et al.(1995) and Ward and Duray (2000) explored the relationship between increased competition and operations strategy, showing that firms respond to increased competition with the development of certain operational capabilities. Thus, analyzing how the footwear firms are facing an increase competition through the theoretical model of operations strategy proposed by Hayes and Wheelwright (1984), built on the concepts launched by Skinner (1969), may allow answering the following research questions:

-What are the competitive priorities chosen to face increase competition?

-What are the operational capabilities present in the studied firms?

-How operational capabilities are developed? There is evidence of tradeoffs?

-What initiatives (associated with the strategic choices) seem to favor or inhibit the development of the aimed capabilities?

This article seeks to contribute in a limited, but important element of the theoretical model of operations strategy by shedding light over the dynamic process of the development of operational capabilities pursued by firms facing a higher competition. The methodological strategy is the study of multiple cases for allowing a deeper and more detailed analysis of the initiatives adopted by the firms and their possible consequences.

The remainder of paper is divided into five sections, included this introduction. The second section presents the theoretical framework chosen for the data analysis. The third section describes the methodological aspects, and the fourth section presents the data analysis. The last section offers a discussion of the results, followed by the conclusions and limitations of the study.

Theoretical Framework

The conceptual basis of the theoretical framework of operations strategy developed by Hayes and Wheelwright (1984), from the classic article published by Skinner (1969), "Manufacturing-

missing link in corporate strategy", has been shown to be robust despite the deep changes that have occurred in the industrial competition in recent decades (Hayes and Pisano, 1996). The essence of the model proposed by Hayes and Wheelwright (1984) obeys logic of alignment between business strategy and operations strategy as schematized in Figure 1. The result of this alignment is the development of operational capabilities that meet the firm's competition strategy, implicit in the choice of competitive priorities (Hayes and Wheelwright, 1984).

Answering the questions of research of this article allows exploring the theoretical framework offered in operations strategy using different approaches.

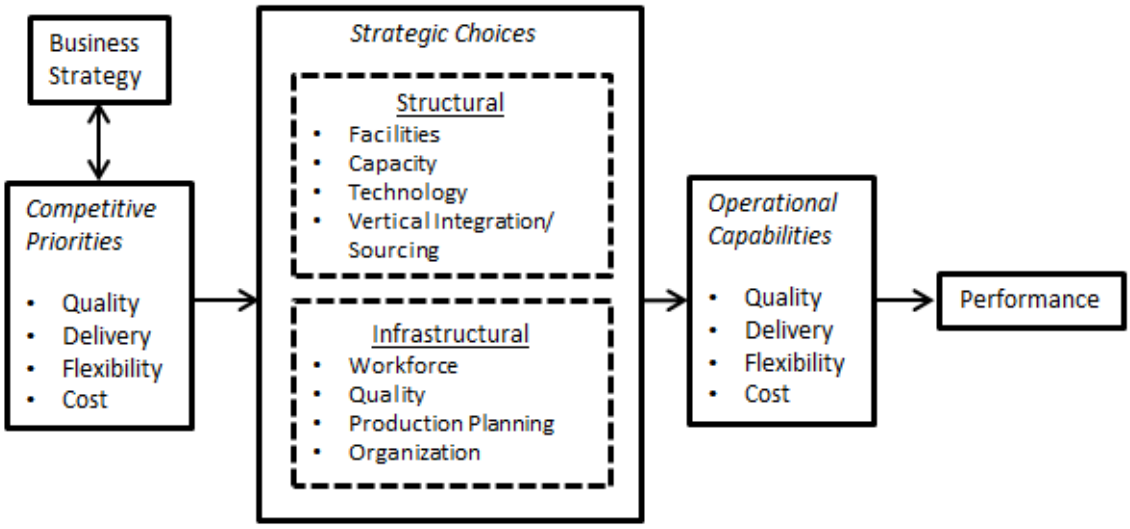


Figure 1 – Simplified Model of Manufacturing Strategy
Source: based on Hayes and Wheelwright (1984) and Rosenzweig and Easton (2010)

The first question "What are the competitive priorities chosen to face the competition?" refers to competitive priorities that represent the planned or intentional success factors, which should be consistent with the business strategy. Competitive priorities show what the firm wants to emphasize more ahead, whether in terms of future improvements, both in terms of reach or maintain competitive advantage in some of the dimensions of quality, delivery, cost and flexibility (Boyer and Lewis 2002). The concept of order winners and order qualifiers criteria proposed by Hill (1989) was used in the firms' interviews because it leads to a necessary competitive criteria prioritization. The order qualifiers would be those deemed necessary to compete in the market. Already the order winners would be those criteria – cost, delivery performance, quality or flexibility- more valued by the buyer and who decide the purchase.

The second question "what are the operational capabilities present in the studied firms?" allows exploring the extensive literature on operational capabilities and their dimensions. In this study, the operational capabilities studied will be those actually carried out by companies, such as flexibility, quality, delivery performance and cost efficiency and their dimensions.

The third and fourth research questions involve the idea of development process: "How operational capabilities are developed? There is evidence of tradeoffs?" and "What initiatives (associated with strategic choices) seem to favor or inhibit the development of the aimed capabilities?" This process follows the logical order shown in Figure 1: once elected, the competitive priorities should guide the decisions or strategic choices as, for example, the number, size and location of the manufacturing facilities, production planning and control, or

even the type of relationship to be developed with suppliers and customers (Noble 1995, Skinner 1969). It is by means of these structural choices (bricks-and-mortar) and infrastructure (policies and procedures), usually implemented through programs such as TQM-Total Quality Management and JIT-Just-in-Time, firms may acquire and maintain their operational capabilities (Boyer and McDermot 1999, Hayes and Wheelwright1984, Ward et al. 2007). Therefore, operational capabilities represent the firm's ability to compete on dimensions of quality, delivery performance, flexibility and cost relative to its direct competitors in the target markets. In short, their real competitive force (Rosenzweig and Roth 2004).

The third research question also addresses the issue of the simultaneous (or not) development of operational capabilities: "Is there evidence of tradeoffs?" As mentioned earlier, despite the several empirical studies that have sought to observe the nature of the relationship that exists between the capabilities, the debate follows open (Rosenzweig and Easton 2010). This debate involves basically three perspectives: the tradeoffs model initially proposed by Skinner (1969), the cumulative model (Ferdows and DeMeyers 1990, Flynn and Flynn 2004, Noble 1995), and the integrative model (Hayes and Pisano 1996; Rosenzweig and Roth 2004, Schmenner and Swink 1998).

The cumulative model was initially suggested by Ferdows and De Meyers (1990), which presented empirical evidence that the operational capabilities are cumulative and appears to follow a sequence of construction: from a solid foundation in quality, delivery performance develops, followed by cost efficiency and flexibility. Research conducted by Safizadeh et al. (2000) and Flynn and Flynn (2004) suggest that certain contingencies, such as type of process (job shop, batch, continuous flow), geographic region and industry may influence the sequence of development of capabilities.

The integrative model does not see conflict between the two models presented previously. Schmener and Swink (1998) integrated conceptually the two models using the Theory of Performance Frontier, whose concept can be summarized as follows: it is the maximum performance that can be achieved by a manufacturing unit given a set of operational resources. According to the authors, the firm presents slack when it does not use all of its operational resources. In other words, there are operational inefficiencies. In this condition, there are enough resources for the simultaneous development of competences, even if at different speeds (Hayes and Pisano 1996). However, if operational inefficiencies are eliminated, either by any means, the firm gradually approaches its performance frontier. In this position, the marginal increase in operational efficiency is less than the investment necessary to achieve it. In this condition, the authors suggest that tradeoffs occurs (Schmener and Swink 1998).

Methodological Aspects

The nature of the research questions of this study refers directly to the case study methodology. The challenge of studying how firms develop the operational capabilities in depth requires some care to minimize the risk of spurious relationships between variables. Stuart et al. (2002) alert researchers in operations management on the need to consider the possible effects of industry, size, manufacturing process, among others, in establishing criteria for sampling. Thus, the study of firms belonging to the same industry, exposed to similar forces of competitive environment, with similar manufacturing processes, allows a more detailed analysis of the similarities and differences between them, isolating key factors that could confuse the relationship between certain activities and events or cause-and-effect relationships. On the other hand, imposes limits on the generalization of the findings (Ward et al. 1995).

Choice of cases and sample data collection

Data collection was divided into two stages: the first fulfilled the goal of providing subsidies on the footwear production system and the definition of the sample of firms to be studied. The second step was the case study itself in six firms. In the first phase fifteen professionals belonging to support institutions present in the region, with deep knowledge of historical, social and competitive context of the footwear industry being studied were interviewed. They helped to choose the firms sample based on the following criteria: the firm should be considered a successful one, to present a minimum production rate of 1.000 pairs/day and have a production manager in charge. From an initial list of fifteen firms, six of them accepted to participate in the study. Two additional firms were invited, in accordance with the mentioned criteria, to test the appropriateness of the questionnaire regarding the approach and language used.

In the second stage of the study were interviewed the main manager and the production manager of the six firms studied. The interviews were semi-structured and recorded by the respondent's permission. A visit to the factory, guided by the production manager, then was held in order to clarify, complete and on-the-spot check the content of the information given during the interviews. After analyzing the data, about two months after the interviews, each production manager was contacted for an interview feedback, with the purpose of validation of individual findings, significantly enriching the initial findings.

Reduction and data coding

The reduction of the data collected from the cases is an integral part of the analysis process and consists of select and summarize the contents of the recordings, the field notes and the various documents provided by the interviewees. Then reduced texts were encoded using the theoretical framework and research questions as a source of primary codes, following strategy suggested by Miles and Huberman (1994). To facilitate the comparison between the cases were established rules which allowed classifying the firms studied. Thus, ordinal scales were created which allowed classifying the variables of interest according to the intensity (high, medium, and low) observed in each firm. The rules established by Sousa and Voss (2001, p. 392) for the creation of ordinal scales were suitable for the present study and comply with recommendations of Bussab and Morettin (2002, p. 14) about the restrictions on the use of measures of position in ordinal scales.

Data Analysis

Sample of firms

The profile of the firms sample was similar regarding the age and average productivity. All the six firms are mid-sized. According a confidentiality agreement, the firms were identified with the letters A, B, C, D, E and F.

Competitive Priorities

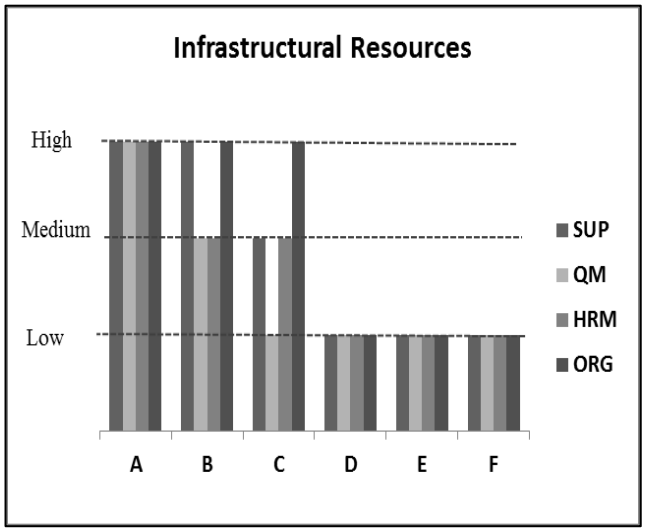
The managers have not shown difficulties in identifying their competitive priorities. In short, the current qualifiers criteria seem to be quality and cost and the order winners are flexibility and on time delivery, using the nomenclature created by Hill (1989).The entry of Asian footwear in the domestic market and, more recently, increased competition with domestic larger companies, increased the levels of clients ' requirement for all competitive criteria.

Structural decisions

All respondents recognized the importance of being installed in a local manufacturing system and take advantage of local external economies. The most important factor is the provision of skilled labor that allows them to achieve high levels of flexibility in all dimensions of interest to the industry. All plants showed similar layout, with differences only in the degree of organization, age and size of the premises. All firms are using systems of planning, programming and production control. The use of CAD-CAM systems was observed in all cases, usually providing good integration between new product development and production teams.

Infrastructure decisions

The infrastructure resources, unlike the observed structural resources, showed important differences among the studied firms. Findings are summarized in the Figure 2.



SUP	Long Term Relationship with Suppliers
QM	Quality Management Practices
HRM	Human Resources Management Practices
ORG	Production Manager Autonomy

Figure 2 – Comparison of infrastructure resources among the firms

A first evidence emerges from the Figure 2: there are two distinct groups of firms according the observed infrastructure resources: firms A, B and C appear to have developed more infrastructure resources when compared to the firms D, E and F. Additionally, long term relationship with suppliers (SUP) and Organization (ORG)- which in this study was considered as the perceived degree of autonomy of the production manager – are the best differentiators among the two groups of firms. The production managers of the firms D, E and F have reported low power to influence strategic and operational decisions, despite seeming experienced professionals in the industry, especially regarding the need to implement initiatives in the production or to provide adequate training to employees.

However, the production manager (A) seems to enjoy an expressive freedom to introduce new manufacturing practices and Human Resources Management (HRM) practices. As a consequence, this is the firm that presented the highest resources in quality management (QM) and HRM. Firms B and C seem to invest less in HRM, especially in the "training" dimensions, "performance evaluation" and "recognition award", being, however, equivalent to A regarding the practice of "empowerment". Firm C presents QM less developed among the three best firms of the sample, due to the apparent low adherence to "quality practices".

The resignation of workers is carried out by most of the firms, due to the production seasonality and is perceived as a negative element in the business environment by the key informants. The firms A and B shows a layoffs rate inferior to5%, whilst the firm C informs around 10% and the firms D, E and F presents layoffs rate superior to30%. In general, firm A presented a better repertoire of initiatives associated with the infrastructure choices when compared to the sample analyzed, followed by the firms B and C.

Operational Capabilities

The evaluation of operational capabilities was based on observation of practices in the manufacturing environment, the records content, internal documents and perceptual information of production managers. The operational capabilities and their dimensions of interest were developed from information provided by production managers and have been further validated in the feedback meeting.

The quality capability (QUAL) was comprised by the performance, conformity and design dimensions. The flexibility capability (FLEX) encompasses the dimensions of quantity (number of new products per year), time (time-to-market of new products) and mix (number of different products produced by day). The delivery capability was represented by on-time delivery, the only delivery dimension of interest in the footwear industry. The cost capability (CST) was comprised by two dimensions: inventory reduction and operations cost reduction. All the six firms presented high FLEX in all dimensions of interest. Thus, the Figure 3 is shown without FLEX to allow a better visualization of the others operational capabilities.

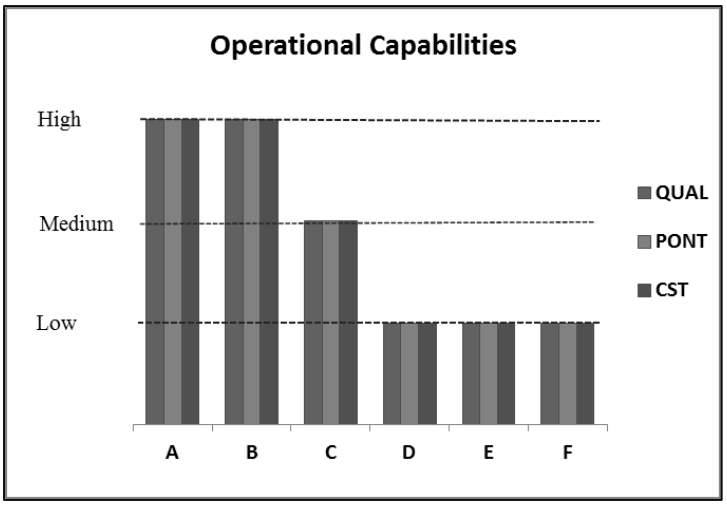


Figure 3 – Comparison of operational capabilities (without showing FLEX) among the firms

The first evidence observed in Figure 3 is the repetition of the pattern observed in Figure 2 (infrastructure): there are two distinct groups of companies. The first, comprised of firms A, B and C, demonstrates a superior development of capabilities when compared to firms in the second group (D, E and F). This finding is convergent with the theoretical model used (Figure 1), since the operational capabilities results from the implementation of adequate infrastructures resources (Hayes and Wheelwright 1984). Firms A and B show the best on-time delivery capability (PONT) development, indicating strategic alignment between their business strategy and the operations strategy. Finally, only firms A and B effectively developed cost capability (CST).

Discussion of the results and Conclusions

This study sheds light on the dynamics of the process of operational capabilities development, pointing out the major external and internal factors to the company that stimulate or inhibit their development. Competitive priorities of flexibility and on-time delivery were singled out as a response to increased hostility in the competitive scenario. Increase flexibility to even higher levels in the dimensions relevant to this industry (speed and variety in the introduction of new models, and production capacity of different models at the same time) was the path in pursuit of greater differentiation vis-à-vis the competition, converging with the empirical findings of Anand and Ward (2004), Ward et al. (1995) and Ward and Duray (2000). High flexibility is a capability observed in all companies, including those that other operational capabilities were not verified, evidence that its principal source is external to the firms in the sample studied, since they belong to a local manufacturing system, as already demonstrated by Piore and Sabel (1984) and Nassimbeni (2003). The internal sources of flexibility appear to be associated with the type of manufacturing process used (job shop) and the use of CADCAM technology, allowing a greater integration between the teams responsible for R&D, production and programming, consistent with the findings of De Menezes et al. (2010).

The search for a better performance in on-time delivery capability seems to be related to a greater integration within supply chain. In this study, the supply chain is represented by the suppliers of raw materials (leather, accessories, chemicals, and equipment), service providers (artisans subcontractors) and customers. The best example is offered by the firm A, who practices a partnership policy with the three links in its supply chain, demonstrating to have agile communication between them, with positive results in prioritization of service in times of heated demand and ensuring on-time delivering.

Quality practices are quite simple and look appropriate to the requirements and characteristics of the industry and target market. It is observed that firms with higher indices of layoffs are also those with weak evidence of investments in QM and HRM, and lack of development of operational capabilities (Firms D, E and F)). There are evidences that managers of these firms control the operational cost using simple accounting tools. As a result, they have been chosen suppliers by price, without any interest in a long term relationship building. Indeed, these managers believe that the dismissal of part of its annual quota of workers generates important savings. Stratman et al. (2004) demonstrate that the hidden costs in learning factors such as lower productivity and higher index of defects are not captured by the usual accounting tools. Additionally, there is also the risk of a future reduction in the supply of skilled labor, as other sectors of the local economy offer more stable working conditions. If this threat to materialize in the future, would affect the largest source of flexibility, since it is linked to the availability of skilled artisans.

Companies A and B present strong evidences of the development of the following competencies: flexibility, on-time delivery, quality and, in a less evident way, cost. Apparently, quality is not the driver of the development of the capabilities, as proposed by Ferdows and Meyers (1990). The local contingencies and the competitive scenario seem to indicate that the time factor is the main driver of the observed development of the capabilities, as suggested by Corbett and Wassenhove (1993, p. 112): "... time and quality are the two sides of the same coin, both can be powerful drivers of improvement programs". The need to be faster in the time-to-market of footwear new models and the need for timely delivery to the customer seems to have led to production managers' attention towards the adoption of programs of planning, programming and control of the most suitable production, as well as operational practices that

have resulted in reduced rework and intermediate inventories. Greater integration between the R&D and production sectors appear to confer greater speed in the new products development, as evidenced in firms A, B and C.

There is convergence in the literature of operations strategy that superior performance is strongly associated with a set of infrastructure practices that shape, over time, the emergence of operational capabilities (Flynn et al.1995, Maffei and Meredith 1995, Ward et al. 2007), mostly associated to HRM practices that are common to QM initiatives and JIT (Ahmad and Schroeder 2003), consistent with the findings of the present study.

The contribution to the development of the theory is small, but valuable: strengthens the conjecture launched by Rosenzweig and Easton (2010) that probably tradeoffs occur in selecting the strategic choices of infrastructure, and not in the process of development of operational capabilities. In other words, the restrictions for the simultaneous development of operational capabilities have their origin in the selection of policies and initiatives; once the appropriate policies and practices are adopted, operational capabilities appear to develop simultaneously.

The practical implications of this study are clear: the emphasis in a long-term relationship with suppliers, customers and service providers, added to the HRM practices can promote a breakthrough in the search for greater flexibility and on-time delivery, resulting in greater competitiveness and further improvement in the quality and reduced operating costs.

Although it has pursued a triangulation of data by seeking multiple sources of evidence, the collection and analysis of data was conducted by a single researcher. The participation of other researchers would result in an increase in the internal validity of the constructs. On the other hand, the protocol and methodology for data analysis resulted in a logical sequence of evidence observed in order to allow the complete reproduction of the study by a third researcher, providing consistency and reliability to the conclusions. Despite these precautions, the generalizability of the findings is limited to industry studied in this work, and also the locality, due to the weight that the local entrepreneurial culture seems to take place in the dynamics of strategic choices, as well as the characteristics of the niche market explored. Future research could test the findings of this study in other local manufacturing systems, or even test them using another theoretical lens on this particular universe of companies, as for example, the Resource-Based Theory.

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