Tridimensional Supply Evaluation Matrix: A Supplier Management Instrument

Autoria: Carla Hollerweger, Rafael Teixeira

Propósito Central do Trabalho
Supplier management is becoming an important topic in supply chain literature, as the ability of offering competitive products is also relying on suppliers’ capabilities. On the other hand, one of the greatest challenges faced by organizations is to diagnose in advance suppliers that stand risk and are priorities for development and management processes. Supply chain literature itself points out the necessity of building an effective supplier management program, helping companies to avoid supplying risks but, until now, little has been studied on the topic. And even more, most of the models presented in current literature evaluate aspects related to purchasing has never been empirically validated. With that in mind, this research aims at building a matrix to classify and evaluate suppliers, considering three dimensions: supply complexity, impact on company results, and supply dependence. The matrix was built based on Kraljic’s purchasing model, who aimed to classify purchased products based in two dimensions: complexity of supply market and profit impact of the buyer company. However it would be important to consider Kraljic’s matrix not only as a purchase management model, but also a supplier management tool, yet this is not possible, as only a very limited number of factors have been considered. Important factors such as supply complexity, impact on results and supplier/buyer dependence should be taken in account for a comprehensive supply management instrument.

Marco Teórico
The supplier development process does not apply only to efforts in developing new partners. This process also aims to increase performance and improve processes of current suppliers, so the needs of the buyer company are fulfilled more effectively. Supplier development processes is part of the supply management process, and these activities can vary from specific efforts up to complex efforts, comprehending actions like formal evaluations, feedback, trainings, performance reports, or even capital investments. Supply management process should consider that suppliers tend to attend the buyer firm differently and to behave differently when facing the needs of the buyer company, depending on variables such as size, organizational culture, IT tools available, product relevance and complexity, etc. Many companies still fail to identify problems related to their suppliers beforehand. Based on this, a supplier management tool becomes an important instrument for companies to identify suppliers that may present risks to the business, and establish action plans for supplier development. They are also important tools to organize and classify information and suppliers for a better management, serving as indicators that help the buyer firm in dealing with different suppliers and making decisions. To help buyer firms better manage a great number of suppliers and products, Kraljic (1983) has developed a matrix to classify different products to develop appropriate purchasing strategies. However Kraljic’s purchasing model aims to classify inputs, not suppliers. Even if, as a result, the author aims to create action plans for suppliers based on the results presented in his study, the matrix does not classify and analyze suppliers directly. Many companies purchase two or more products from a single supplier, so if the buyer firm classifies products individually in the matrix, the action plans may not be appropriate or comprehensive enough. Moreover, the matrices do not consider some other important factors for supply management. On top of that, it is important to understand the supplier’s market, so it is possible to comprehend if the supplier is practicing appropriate prices, or if there are more competitive suppliers in the market, and to analyze the supplier’s market more efficiently, it is necessary to consider Porter’s five competitive forces: (1) bargaining power of suppliers, (2) bargaining power of buyers, (3) threat of substitute
suppliers, (4) rivalry among competitors, and (5) threat of new entrants. Furthermore, Kraljic has not considered criteria such as delivery and quality to analyze the importance of the purchase, although criteria such as cost, quality and delivery are essential for development and evaluation of any supplier. Another important aspect is supply dependence, which is also important to avoid that any company becomes too dependent of another.

Método de investigação se pertinente
Our sample frame was based on companies with more than one hundred employees. To select these medium and big size companies, we used two databases of companies. One database classifies the 500 biggest companies of Brazil. The other one classifies the most important companies in terms of revenues in the state of Rio Grande do Sul, in Brazil. We compiled these two database and built a new database composed of 780 companies. We made a draft with 42 questions to apply as a pilot test to five professors and two purchasing professionals and we also pre-tested the measurement instrument with 22 companies in order to check if the obtained results were consistent. The first pilot study entailed discussions with two purchasing professionals and five professors from a graduate program in management. Several issues were discussed, such as clarity of the questionnaire items, relevance of the items, appropriate terms and jargons commonly used for surveys, and some other issues for further improvement of the items. We also pre-tested the instrument with 22 companies, aiming to enhance readability and clarity of the items, as well as enhancing the questions content validity. A 5-point Likert scale with end points of “strongly disagree” and “strongly agree” was used to measure the items. The respondents were defined as one purchasing executive of each company, who were instructed to answer the survey items based on the most important supplier of the company. The main supplier was selected by the purchasing executive based on the dollar amount and the criticality of the purchased material. We collected data from purchasing executives employed by firms of different industries: metallurgic (47%) automotive (27%), consumer goods (14%), chemical and petrochemical (7%) and textiles (5%). The final questionnaire has 35 items and from Dec 1st, 2012 to Dec 20th, 2012, we invited the purchasing executives of the companies listed on the database to answer the questionnaire. A total number of 182 responses answered the questions, resulting in a response rate of 24%. Two questionnaires were completed for less than 90%, so they were considered as invalid, as missing data impedes their use in further analysis. Thus, the effective response rate was 23%.

Resultados e contribuições do trabalho para a área
This research aimed to build an instrument for supply evaluation, classifying the suppliers in three dimensions: supply complexity, impact on results and supply dependence. We employed a confirmatory factor analysis (CFA) and the resulting fit measurements indexes suggest that the model has an adequate fit. Additionally, all constructs presented acceptable reliability and convergent validity, except for the sub-construct delivery, that presented measures below the threshold values, and for that reason, the entire sub-construct was discarded. Some measurement items did not contribute to the psychometric properties of our measurement instrument and thus were discarded as well. As a result, we created a reliable and valid instrument, which can be used in other studies and by other companies to evaluate and classify suppliers. The tridimensional matrix showed a concentration of suppliers in Quadrants 7 and 8 of the matrix. Quadrant 7 presented 44 suppliers, 24.7% of the respondents. Quadrant 8 has 81 suppliers, with 45.5%. While Quadrants 1, 2, 3, 4, 5 and 6 have 29.8% of the suppliers. This concentration can be explained by the fact that we analyzed the most important supplier of each company, so the supplier will present a high impact for the buyer company operations. All the constructs presented high levels for almost all buyer companies as follows: • Impact on Results: the subconstruct cost showed a high level on the dimension
impact on results: average of 4.13, considering a 5-point Likert scale, which means that the cost of the input has a high impact on the total amount purchased by the buyer company. The subconstruct quality has presented an average of 1.81, which may mean that the suppliers are not presenting many quality problems. • Supply Complexity: the subconstruct rivalry among competitors and substitute suppliers have shown an average of 2.73 and 2.76, respectively, which possibly means that there are not many alternative suppliers in the market or these suppliers do not offer good prices and quality. Bargaining power showed an average of 2.35, which demonstrate that the buyer companies have a good relationship and bargaining power with their main suppliers. • Supply Dependence: there is a high buyer dependence over the suppliers, the average was 3.85. The suppliers are not so dependent of the buyers, average of 2.50. As suppliers have different levels of supply complexity, impact on results and supply dependence, they need different supplier development strategies, so we characterize four different strategies based in the quadrants of the supply evaluation matrix presented herein: • Non-Critical Suppliers: it is important to establish closer and long-term relationships, the buyer company can work with a single-sourcing strategy, meaning that the buyer company may have just one supplier for the purchased input. • Leverage Suppliers: it is important to invest more time on supplier development programs to enhance the performance of the supplier in terms of quality and delivery, and to reduce the cost of the purchased inputs. • Bottleneck Suppliers: These suppliers may have a dominant power position, so the supply strategy is therefore focused on assurance of supply. As there are not many alternative suppliers or the substitution process is complex, the buyer company should try to improve the relationship with the supplier. • Critical Suppliers: The supply strategy is primarily focused on assurance of supply. Thus, it is important to have a contingency plan, in case of abnormal situations. Mutual trust and commitment that comes with the intensified relationship is also likely to reduce the supply risk. This matrix can help companies in the identification of supply problems before they occur, instead of working in a reactive way. In other words, the matrix enables buyer companies to detect which suppliers are more or less critical, establishing action plans to avoid supply unexpected bad situations or identifying the suppliers that are more likely to establish a long term relationship.

Referências bibliográficas
Kraljic, P. Purchasing Must Become Supply Management
Krause, D
Handfield, R.
Terpend, R.
Krause, D. R.
Caniëls, M. C. J.