

# Purchasing practices of companies with high material costs

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## Abstract

Increasing competitive pressures force companies to cut costs. Today, one of the major components of cost is the purchasing spend, which can go up to 70% of a firm's sales volume. Because of this high percentage of costs in total profits purchasing function has gained a significant attention in companies.

**Keywords:** Purchasing, Material consumption, GMRG 4 survey

## Introduction:

The ever increasing competitive pressures across the globe are forcing corporations to look internally and cut costs to survive the downturns through operational excellence. One of the major components of cost is the purchasing spend, which on an average accounts for 40–70% of a firm's sales volume (Saranga and Moser, 2010, 197). Because of this high percentage of costs in total profits purchasing function has gained a significant attention in companies (Das and Narasimham, 2000; Ellram, *et al.*, 2002). The role of today's purchasing function has therefore transformed from a mere clerical activity to a competence with the capability to structure, develop and manage the supply base in alignment with corporate objectives. (e.g. Pagell and Krause 2002; Zsidisin *et al.* 2005; Lawson *et al.* 2009; Narasimhan *et al.* 2010; Lee and Drake, 2010). It is not viewed as a function measured only through cutting costs on purchases but also on better quality of inputs and co-innovation with suppliers. But purchasing function is still a supporting function, that doesn't add value. That means that measuring the success of this indirect activity is very complicated (Nollet *et al.*, 2008). In this work it will be analyzed are the biggest companies largest material consumers and how do largest materials consumers differ from others.

Arabzad and Ghorbani (2011) state that organizations usually have to deal with a large number of products and a variety of suppliers and that complicates the research of the purchasing function. Not all buyer-supplier relationships are to be managed in the same way. Effective purchasing and supply management requires the selection of strategies that are appropriate for the prevailing circumstances. For a long time, the ABC-analysis was the only

tool for differentiating between important and less important purchases. The ABC-analysis however, does not provide strategic recommendations for the categories.

Ellegaard and Koch (2012) on grounds of their research provide purchasing initiatives. Their research was done on construction industry but these initiatives can apply to any purchasing.

*Table 1. Purchasing initiatives*

| Topic  | Purchasing initiative   |
|--|---|
| 1. Spend consolidation—long term supplier agreements | Consolidates spend with preferred suppliers to realize volume discounts in return for increased supplier turnover—PMs forced to use suppliers |
| 2. Joint total cost (TC) reduction                   | Agrees with suppliers to work jointly on TC reduction initiatives—making it profitable for suppliers to serve C1                              |
| 3. Quality management                                | Chooses suppliers that deliver high quality and initiates joint quality management to avoid later quality costs                               |
| 4. Joint value engineering (VE)                      | Initiates VE processes with suppliers to achieve savings from design optimizations  |
| 5. Supplier performance evaluation                   | Develops evaluation method and initiates supplier performance feed-back meetings to improve supplier performance                              |
| 6. Direct material sourcing                          | Buys directly from material suppliers instead of letting contractors buy—wants the material margin  |
| 7. Open book price optimization                      | Applies price pressure on contractors   |
| 8. Process costs agreement                           | Promises contractors low costs of delivering their contract work on site—in return for the low prices   |

*Source: Ellegaard and Koch (2012, 152)*

Thrulogachantar and Zailani (2011) also argue the financial impact of the purchasing function on overall performance, and the fact that not all purchases are equal. They propose the following model of supply strategies on manufacturing performance. The four purchasing strategies they name are: negotiation, collaboration with suppliers, effect cost management and management of the supplier base. The better these strategies are used on different purchases the better end result will be obtained.

Terpend *et al.* (2011) name several models by which purchasing functions (1) categorize items that will be purchased, (2) select suppliers and (3) select the type of relationship with the selected supplier. However, taking into account the strategic influence of purchasing Terpend *et al.* (2011, 75) propose a different purchasing conduct. First the company must decide on the strategic impact of the purchase, take into account the market for this purchase, and finally choose adequate strategy to approach the supplier. Each of these steps will yield a different outcome on operations and consequently on profits. By cluster analysis they found four types of purchases: Strategic purchase, Captive Buyer Purchase (also a strategic purchase but here the seller has a better bargaining power), Noncritical purchase and Adversarial purchase.

Coisins *et al.* (2006) divided their sample of 151 UK firms into four categories (Strategic, Celebrity, Undeveloped, Capable) depending on the role the purchasing function's in the company. Specifically they considered the strategic nature of purchasing in terms are purchasing representatives present at strategic meetings, how is the purchasing function coordinated with other functions, and skills of personnel in the purchasing department. In this

work different aspects of purchasing will be considered, namely, how companies with highest material costs manage their purchasing function and it will not be entered into types of purchases even though it is highly important.

## **Literature review**

Typically, surveys pay a lot of attention to what can be regarded as operational purchasing activities; paying invoices within agreed payment terms, providing feedback to suppliers, communication, etc. (Rozemeijer et al., 2002). Ramsay and Croom (2008) spent a big part of the paper on reiterating the message that Purchasing encompasses both strategic and non-strategic activities, and that the term 'operational' is mainly being used as a negative term (Rozemeijer, 2008).

Based on a sample of 221 manufacturing firms, Chena et al. (2004) argue that strategic purchasing can create sustainable competitive advantage by enabling firms to: (a) foster close working relationships with a limited number of suppliers; (b) promote open communication among supply-chain partners; and (c) develop long-term strategic relationships orientated to achieve mutual gains. The more firms concentrate on these strategic relationships, the more operational purchasing becomes a strategic enabler. To illustrate this point one could look at the so-called supplier satisfaction surveys that a number of companies that are regarded as highly advanced in their purchasing and supply management practices (e.g. Honda, Atlas Copco, Nokia, IKEA, IBM, BP) use to improve their relationships with key suppliers (Rozemeijer, 2008).

The quest for global efficiency and effectiveness has led to increased centralization and coordination of the purchasing function (Faes et al., 2000). More and more the question prevails how to get organized at a corporate level to capture potential purchasing synergies (Rozemeijer, 2000). Dimitri et al. (2006) suggest that centralization appears as a clear trend in public procurement as well. Purchasing centralization creates purchasing synergy benefits, which, according to Trautmann et al. (2009a), can be divided into three main categories: economies of scale, economies of information and learning, and economies of process. Some cost estimates of the savings achieved though centralized purchasing have been presented in the literature. According to Nollet and Beaulieu (2005) there is a general agreement that purchasing groups generate savings of between 10% and 15%, while some products can generate even larger savings. Centralization has its negative effects also. McCue and Pitzer (2000) argue that the centralized purchasing system inevitably results in conflicts between the central purchasing department and the line departments it is established to serve. This means that potential improvements in negotiated contract costs may never translate into actual reduced costs if the organization cannot motivate employees to comply. Kulp et al. (2006) estimated that about 20–30% of unrealized savings are due to noncompliance to contracts. In this work it will be analyzed to what extent are high material usage companies organized and to what extent are they centralized.

Purchasing practices also differ by countries. Literature identifies three factors associated with strategic sourcing: (1) Professionalism: purchasing skills, knowledge, and professionalism; (2) Status: purchasing status within the organization; and (3) Supply Management: purchasing

sophistication in managing external relationships. General differences exist between countries in terms of professionalism and status, but not in terms of the degree to which supply management techniques are practiced. Purchasing skills, knowledge, and professionalism may be the most important current and future critical success factor for strategic purchasing. Recruiting, training, educating, and professionalizing these “strategically-oriented” employees may help purchasing professionals become integrated more efficiently and effectively in their organizations and with other firms in the supply chain. Purchasing professionals must be given the authority and support. In order for an organization to achieve a sustainable competitive advantage it must “constantly assess the relative utility of a range of collaborative and competitive external—and internal—contractual relationships”. Odgen *et al.* (2007), researched professionalism, status and supply management in Belgium, Canada, France, Germany, Hungary, the United Kingdom, and the United States. They find higher professionalism in USA and Canada, highest status in Belgium and France, while for Supply management there were no statistically significant differences between countries. In this work it will be analyzed to what extent are purchasing functions in companies given the right status and authority.

Quayle (2002) found that purchasing within the smaller firms receives little attention. The analysis of purchasing activity of small firms has identified that just 19% have a purchasing function. There appears to be a lack of awareness that effective purchasing may positively affect profitability. This work will show the differences in purchasing by sizes of companies as well.

## Methodology

This survey research is based on Global Manufacturing Research Group (GMRG) data. The data is from the fourth round (GMRG 4.0) taking place in 2009. This research group dates back to 1986. Detailed description of the project can be found in (Whybark, 1997). In this fourth round, 1493 filled questionnaires, from 25 countries are collected which is a respectable simple size for analysis of plant operational issues (Whybark *et al.* 2009). Each country decides which modules it will collect and therefore in this analysis only countries that collected the purchasing module are analyzed. In that sample are 620 companies.

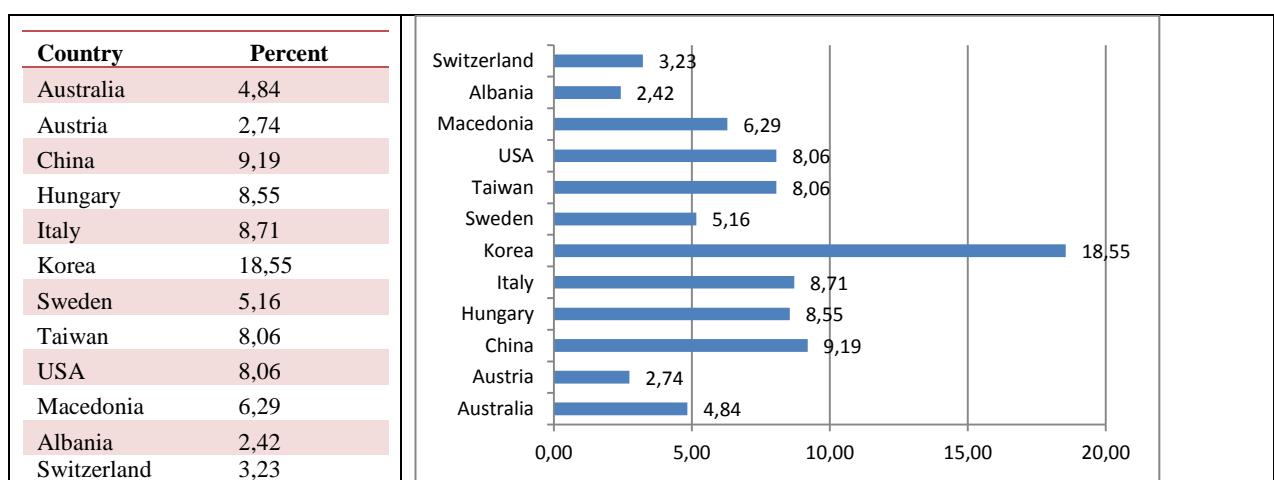


Figure 1: Countries in the GMRG 4.0 (2009) survey

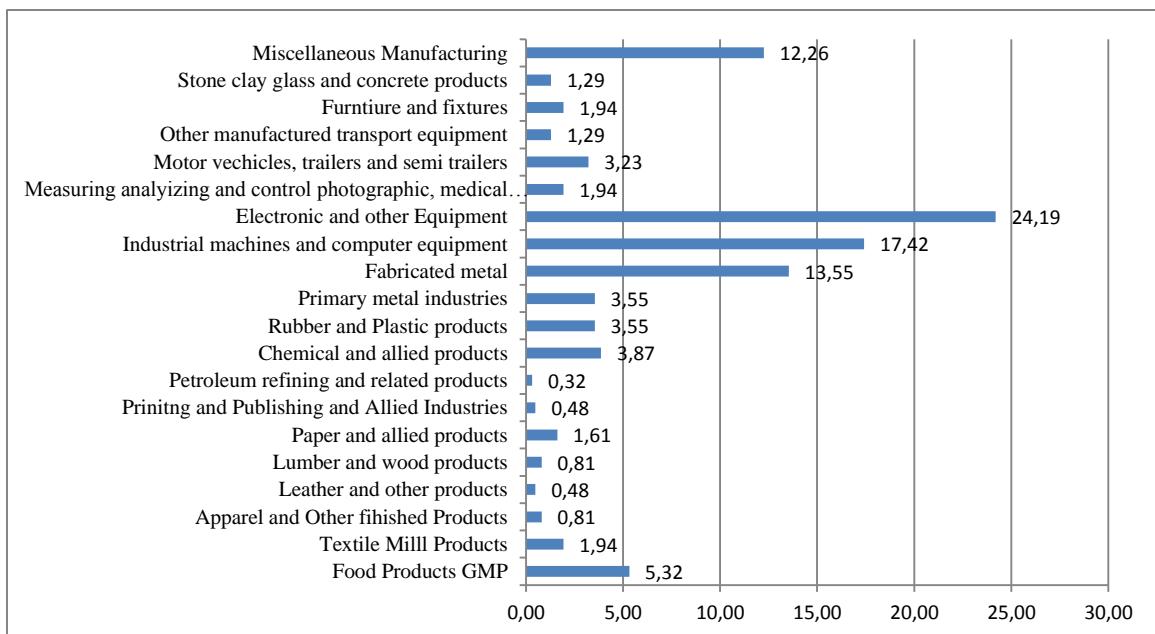


Figure 2: Distribution of the sample by industry

In the literature research there were no articles that compared material usage by industries. Papers usually deal with one or few industries. Here it is found that four industries dominate in material consumption (electronic, machines, metal and miscellaneous industries). This is an important contribution of this paper mostly enabled by a large data set.

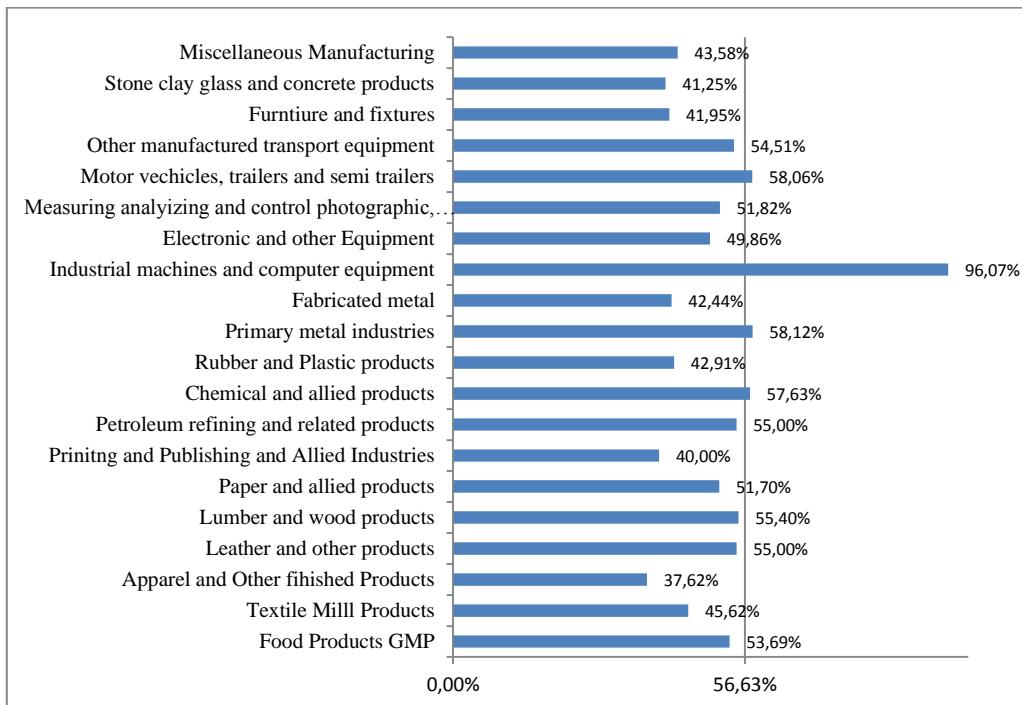


Figure 3. Manufacturing costs as a percentage of total costs by industries

The average spending on materials as a percentage of total costs are 56,63%. It can be clearly seen that material spending is really substantial and should be explored to see how to achieve

better quality if it is not possible to reduce costs. The next question was what do companies purchase and it turned out that material spending is only 54,78% of total purchasing spending.

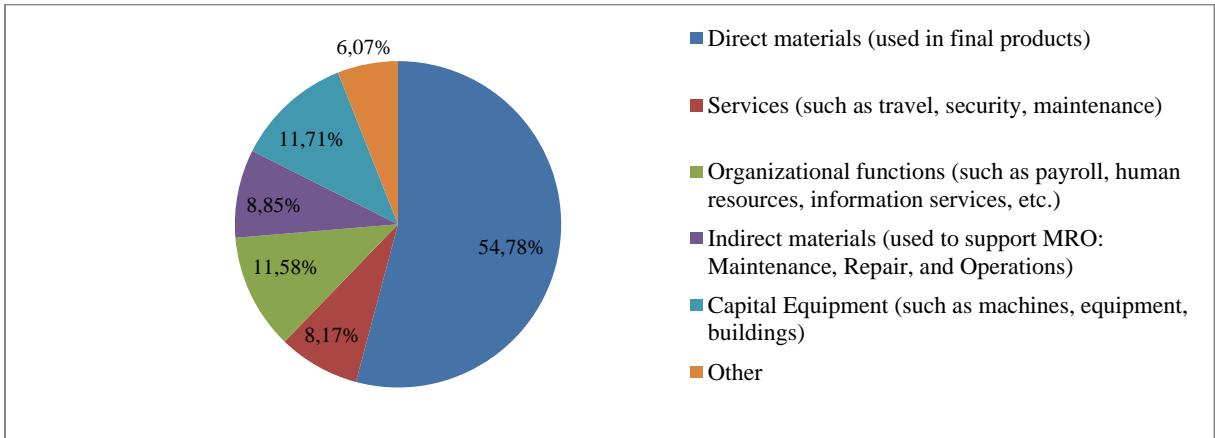


Figure 4: Breakdown of purchasing

Service, payroll and capital equipment do not necessarily count for materials that are purchased for manufacturing, but since it turned out that purchasing function does this other purchases as well it was taken into consideration.

Next it was analyzed how much of total costs for material are distributed by size of the company in terms of number of employees.

Table 2: Material spending as a percentage of total spending by size of the company

| No. employee   | % total manufacturing costs for material |
|----------------|--|
| < 50           | 48,09%                                   |
| > 50 and < 250 | 58,06%                                   |
| > 250          | 56,19%                                   |

Contrary to usual belief it is the middle size companies that have highest percentage on material spending, and the differences are statistically important. The result of the analysis is presented in Table 3.

Table 3. Results of the ANOVA test for differences between means of the groups

| Direct materials (used in final products) | Mean   | N   | Std. Deviation | Std. Error of Mean | F    | Sig.  |
|---|--------|-----|----------------|--------------------|------|-------|
| < 50                                      | 48,09% | 152 | 0,22           | 0,02               | 9,04 | 0,000 |
| > 50 and < 250                            | 58,06% | 218 | 0,24           | 0,02               | 9,12 | 0,003 |
| > 250                                     | 56,19% | 216 | 0,22           | 0,02               | 8,96 | 0,003 |
| Total                                     | 54,78% | 586 | 0,23           | 0,01               |      |       |

It is believed that if there is large consumption of material centralization would benefit the company. However the highest centralization is in big companies.

Table 4: Level of centralization of the purchasing function

| No. employees  | What percent of your active supplier base is managed by central purchasing? |
|----------------|---|
| < 50           | 5,2   |
| > 50 and < 250 | 10,9  |
| > 250          | 17,4  |

Small companies use centralization to a lesser extent which is in accordance with other researches. The reasons for centralization are shown in Table 5.

Table 5: Reasons for centralization varies by size of company

| No. employees | long term relationships | Common items used | Volume leverage | Items are standardized | IT enabled centralization |
|---------------|-------------------------|-------------------|-----------------|------------------------|---------------------------|
| < 50          | 4,80                    | 4,86              | <b>4,96</b>     | 4,36                   | 3,42                      |
| > 50, < 250   | 4,65                    | 4,61              | <b>5,14</b>     | 4,20                   | 4,04                      |
| > 250         | 5,08                    | 5,26              | <b>5,71</b>     | 4,77                   | 4,80                      |
| Total         | 4,85                    | 4,92              | 5,31            | 4,46                   | 4,18                      |

From Table 5. it can be seen that to all sizes of the firms the main reason for centralization is volume leverage, that is discounts on quantities purchased.

Since current literature shows clearly that purchasing function, even though only a supportive function has an important role in strategy execution, it is clear that it must not be evaluated solely on purchasing savings. Therefore it was analyzed by which factors the purchasing function is evaluated.

Table 6: How is the purchasing function evaluated?

| Factors                                 | < 50        | > 50, < 250 | > 250       | Low consumption | Medium | High material consumption |
|---|-------------|-------------|-------------|-----------------|--------|---------------------------|
| Monetary savings                        | 4,76        | 5,05        | <b>5,57</b> | 4,83            | 5,23   | 5,38                      |
| Total Cost of Ownership                 | 4,85        | 4,78        | 5,37        | 4,90            | 5,01   | 5,11                      |
| Purchased material quality              | <b>5,51</b> | <b>5,43</b> | <b>5,63</b> | 5,55            | 5,57   | 5,47                      |
| Delivery timeliness/speed               | <b>5,38</b> | <b>5,27</b> | 5,44        | 5,44            | 5,37   | 5,29                      |
| Avoiding stock outs/production stoppage | <b>5,39</b> | <b>5,15</b> | <b>5,56</b> | 5,28            | 5,32   | 5,46                      |
| Supporting new product design           | 3,91        | 3,91        | 4,55        | 4,15            | 4,23   | 4,08                      |
| Inventory turnover of direct materials  | 3,80        | 4,29        | 4,82        | 4,04            | 4,43   | 4,57                      |
| Avoiding price increases                | 4,41        | 4,57        | 4,89        | 4,56            | 4,78   | 4,58                      |
| Manufacturing/operations' satisfaction  | 4,73        | 4,65        | 4,86        | 4,86            | 4,83   | 4,59                      |
| Benchmarking                            | 3,52        | 3,61        | 4,32        | 3,69            | 3,84   | 3,99                      |
| Evaluation of purchasing by suppliers   | 3,51        | 3,74        | 3,95        | 3,51            | 3,80   | 3,91                      |
| Supply base rationalization             | 3,65        | 4,09        | 4,47        | 3,82            | 4,20   | 4,27                      |
| Purchase price- compared to target cost | 4,77        | 4,91        | 5,28        | 4,75            | 5,00   | 5,23                      |
| Global Sourcing                         | 3,77        | 4,48        | 5,43        | 4,60            | 4,83   | 4,98                      |

Sorting the table by importance and by size reviled that to all sizes of the firms “Purchased material quality (conformance to specifications)” is the top priority. However, they are different by their second most important factor. To small companies avoiding stockouts is most important. To medium sized firms “Delivery timeliness/speed”, while for biggest companies “Monetary savings” are most important. To small companies delivery speed is on third place, while for medium and large firms the third important factor is avoiding stockouts. Kruskal Wallis test reviled that there is no statistical differences between these three sizes of companies for Purchased material quality (conformance to specifications) and Delivery timeliness/speed. Also no difference is found in “Evaluation of purchasing by suppliers” but this factor is not very important to any of the three sizes of companies. However when the test criteria was material consumption then there were substantial differences.

*Table 7. Differences in evaluation of the purchasing function by the level of material usage*

| Measures   | p     |
|--|-------|
| Monetary savings (Price reduction of purchased goods/services over prior periods.) | 0,012 |
| Inventory turnover of direct materials   | 0,030 |
| Supply base rationalization-increase/decrease                                      | 0,043 |
| Purchase price- compared to target cost  | 0,021 |

All these four measures are most important to companies with high usage of materials.

Finally it was analyzed is the purchasing function considered as a strategic function. Table 8 shows that the purchasing function is still not considered as important as it should be. The maximal grade was 7, and the numbers show that the strategic effect of purchasing still has to get more attention from the top management.

*Table 8: Strategic importance of the purchasing function by size of the company*

| No. employee   | To what degree does your procurement organization influence (have direct input) | To what degree does top management support the strategic importance of |
|----------------|---|--|
| < 50           | 4,22 (p=,000)   | 4,63 (p=,002)  |
| > 50 and < 250 | 4,22 (p=,000)   | 4,81 (p=,001)  |
| > 250          | 4,99 (p=,011)   | 5,20 (p=,460)  |
| Total          | 4,50  | 4,91   |

There is a statistically significant difference between all sizes of companies in terms of role of purchasing in strategy except for larger firms for the supporting of the top management. It means large firms consider purchasing function as strategically important, which is in accordance with the current literature.

Table 9: Strategic importance of the purchasing function by material consumption

| Level of materials consumption | To what degree does your procurement organization influence (have direct input) | To what degree does top management support the strategic importance of |
|--------------------------------|---|--|
| Low material consumption       | 4,22 (p=.057)   | 4,72 (p=.235)  |
| Medium                         | 4,50 (p=.009)   | 5,04 (p=.195)  |
| High material consumption      | 4,72 (p=.688)   | 4,94 (p=.274)  |
| Total                          | 4,50  | 4,91   |

There is no statistically significant difference between all three groups. As the company purchase more material it doesn't mean that the purchasing function becomes more strategically important, rather the size of the company determines the importance of purchasing.

## Conclusion

The main aim of the paper was to analyze do firms with higher material spending have different organization of purchasing than the lower consumers. Tests showed that it is the size (in terms of number of employees) and not material consumption that counts. Larger firms are more centralized and have more support by the top management, even though it was shown that highest material costs are in medium sized companies.

Evaluation of the purchasing function by size reviled that to all sizes of the firms "Purchased material quality (conformance to specifications)" is the top priority. However, they are different by their second most important factor. To small companies avoiding stock outs is most important. To medium sized firms "Delivery timeliness/speed", while for biggest companies "Monetary savings" are most important. To small companies delivery speed is on third place, while for medium and large firms the third important factor is avoiding stock outs.

However, if looked by material consumption different criteria for the evaluation of the purchasing function emerged. Those are Monetary savings (Price reduction of purchased goods/services over prior periods.), Inventory turnover of direct materials, Supply base rationalization-increase/decrease, Purchase price- compared to target cost.

The centralization of the purchasing function is highest in the larger companies, but to all sizes of companies the main reason for centralization is Volume leverage of price/cost.

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