

## Purchasing portfolio usage and purchasing sophistication

***Citation for published version (APA):***

Gelderman, C. J., & Weele, van, A. J. (2005). *Purchasing portfolio usage and purchasing sophistication*. (Managementwetenschappen : working papers on Management; Vol. GR05-03). Open Universiteit Nederland.

***Document status and date:***

Published: 01/01/2005

***Document Version:***

Publisher's PDF, also known as Version of Record (includes final page, issue and volume numbers)

***Please check the document version of this publication:***

- A submitted manuscript is the version of the article upon submission and before peer-review. There can be important differences between the submitted version and the official published version of record. People interested in the research are advised to contact the author for the final version of the publication, or visit the DOI to the publisher's website.
- The final author version and the galley proof are versions of the publication after peer review.
- The final published version features the final layout of the paper including the volume, issue and page numbers.

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# Purchasing portfolio usage and purchasing sophistication

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# Purchasing portfolio usage and purchasing sophistication

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Submission date: 31 January 2005

## Abstract/summary

Purchasing portfolio models have caused considerable controversy in literature. Many advantages and disadvantages have been put forward, revealing a strong disagreement on the merits of portfolio models. This study addresses the question whether or not the use of purchasing portfolio models should be considered as a sign of purchasing sophistication. Using data from a broad sample of industries, it was found that purchasing sophistication is a two-dimensional construct: purchasing's professionalism and purchasing's position within companies. After controlling for firm size, the position and the professionalism of purchasing were both positively related to the greater use of the purchasing portfolio. Findings indicate that portfolio usage indeed is a sign of purchasing sophistication.

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## 1. Introduction

It is generally agreed that purchasing has evolved from a clerical buying function into a strategic business function that contributes to the competitive position of companies (Carter and Narasimhan, 1996; Ellram and Carr, 1994). Empirical evidence indicates that firms can indeed obtain competitive advantage by managing supplier relations (e.g. Chen et al., 2004; Mol, 2002; Dyer, 1996). Obviously, differentiation is needed in managing supplier relationships, not all suppliers are to be dealt with in the same way. The need for differentiated supplier relationships requires some sort of classification (Lilliecreutz and Ydreskog, 1999). Since portfolio models provide differentiated strategic actions for heterogeneous categories of objects or subjects (Turnbull, 1990), a purchasing portfolio approach could be expected to be characteristic for a sophisticated, strategic purchasing function.

In a seminal paper Kraljic (1983) introduced a comprehensive purchasing portfolio approach, including a matrix that classifies a firm's purchased items into four categories on the basis of their profit impact and supply risk. Some authors have introduced similar models, although there are more similarities than differences in comparison to the original Kraljic matrix (see Elliott-Shircore and Steele, 1985; Lilliecreutz and Ydreskog, 1997; Olsen and Ellram, 1997; Van Weele, 2002). The Kraljic matrix has become the standard in the field of purchasing portfolio models (Gelderman, 2003; Lamming and Harrison, 2001). Moreover, it has become the dominant approach to what the profession regards as 'operational professionalism' (Cox, 1997).

However, in contrast with a growing acceptance and usage, purchasing portfolio models have become the target of severe criticism. Some argue that the complexity of business decisions does not allow for simple recommendations. How could one deduce strategies from a portfolio analysis that is based on just two basic dimensions (Heege, 1981; Dubois and Pederson, 2002)? By simplifying the issue of buyer-supplier relationships, portfolio models fail to capture vital aspects, such as the context of networks (Dubois and Pederson, 2002), the interdependencies between products (Ritter, 2000), and the concern for sustainable competitive advantage through interfirm relationships (Wagner and Johnson, 2004). Some find the Kraljic approach counterproductive, providing recommendations either to exploit power (Olsen and Ellram, 1997), or to avoid risk associated with the supplier exercising power (Dubois and Pedersen, 2002). From a completely different perspective, Cox (1997) sharply condemns the purchasing portfolio approach. Its major weakness is that the methodology "does not provide us with any pro-active thinking about what can or should be done to change the existing reality of power" In addition, measurement issues have been raised, criticizing portfolio models. In general, decisions based on portfolio models are proven to be sensitive to the choice of dimensions, factors and weights (Day, 1986). How is one to know whether or not the most appropriate variables are being used (Nellore and Söderquist, 2000)? Homburg (1995) and Heege (1981) call attention to the demarcation problem, measuring the key variables. Any classification is rather arbitrary, if one is not clear what the exact distinction is between 'a high' and 'a low' supply risk. Others point at the disregard for the supplier's side in the Kraljic matrix (Homburg, 1995; Kamann, 2000).

Despite all these theoretical problems and objections, there is limited empirical evidence on the usefulness of purchasing portfolio models (e.g. Carter, 1997; Lilliecreutz and Ydreskog, 1999; Gelderman and Van Weele, 2002; Wagner and Johnson, 2004). Based on an (inductive) case study approach, Wagner and Johnson (2004) found that managers anticipated positive outcomes from planning activities related to supplier portfolios. In an explorative study Gelderman and Van Weele (2003) concluded that experienced practitioners have found a reply to the critique of the Kraljic approach. The main point of that study was that experienced portfolio users reflect on the results of portfolio analysis and consider in-depth discussions within cross functional teams as the most important benefit of any purchasing portfolio analysis. These tentative conclusions however, are based on a small number of explorative case studies. Therefore, it remains unclear whether purchasing portfolio usage should be considered as a sign of a mature and sophisticated purchasing function or as sign of poor operational pragmatism. This contrast leads to the scope and aim of this study: by using survey data we will test whether or not purchasing portfolio usage is positively associated with purchasing sophistication.

The organization of the paper is as follows. First, a brief introduction to purchasing portfolio models is presented, following by a review of the pros and cons of such models. Next, the characteristics of purchasing sophistication are discussed. This is followed by a description of the design of a survey among purchasing professionals of Dutch manufacturing companies. Finally, the results are discussed and implications are presented.

## 2. Theoretical background

### 2.1 Purchasing portfolio models

Kraljic (1983) introduced the first comprehensive *portfolio approach* for the use in purchasing and supply management. Some twenty years ago he advised managers to guard their firms against disastrous supply interruptions and to cope with changing economics and new technologies. His message was that 'purchasing must become supply management'. In this context Kraljic (1983) developed a convenient portfolio approach for the determination of a comprehensive strategy for supply.

Kraljic's approach includes the construction of a portfolio matrix that classifies purchased products and services on the basis of two dimensions: profit impact and supply risk ('low' and 'high'). The result is a 2x2 matrix and a classification in four categories: bottleneck, non-critical, leverage and strategic items, see figure 1. Each of the four categories requires a distinctive approach towards suppliers. Leverage items allow the buying company to exploit its full purchasing power, for instance through tendering, target pricing and product substitution. Routine items are of low value, are ordered frequently and therefore cause high transaction costs. Therefore, strategies are aimed at reducing transaction cost through category management en e-procurement solutions. Bottleneck items cause significant problems and risks which should be handled by volume insurance, vendor control, security of inventories and backup plans. Strategic items require a more collaborative strategy between both buyer and seller. The general idea of Kraljic's model is to minimize supply risk and make the most of buying power. Each of the four quadrants allows for differentiated supplier strategies based upon the position of a product in the portfolio.

In the course of time portfolio models have entered many textbooks on purchasing and supply management (e.g. Monczka et al., 2005; Baily et al., 2004; Burt et al., 2003; Van Weele, 2002).

The Kraljic matrix inspired many practitioners and researchers to gain a deeper understanding of the possibilities of a portfolio approach for purchasing purposes (e.g. Wagner and Johnson, 2004; Gelderman and Van Weele, 2002 and 2003; Caniels and Gelderman, 2005; Nellore and Söderquist, 2000). Other scholars have introduced variations on the original Kraljic matrix (e.g. Elliot-Shircore and Steele, 1985; Syson, 1992; Hadelor and Evans, 1994; Olsen and Ellram, 1997; Van Weele, 2002). However, the proposed matrices are very similar to the Kraljic matrix, the models employ practically the same dimensions, the same categories and the same recommendations, see appendix A. It is fair to conclude that the Kraljic matrix has become the standard in the field of purchasing portfolio models (Gelderman, 2003; Lamming and Harrison, 2001).

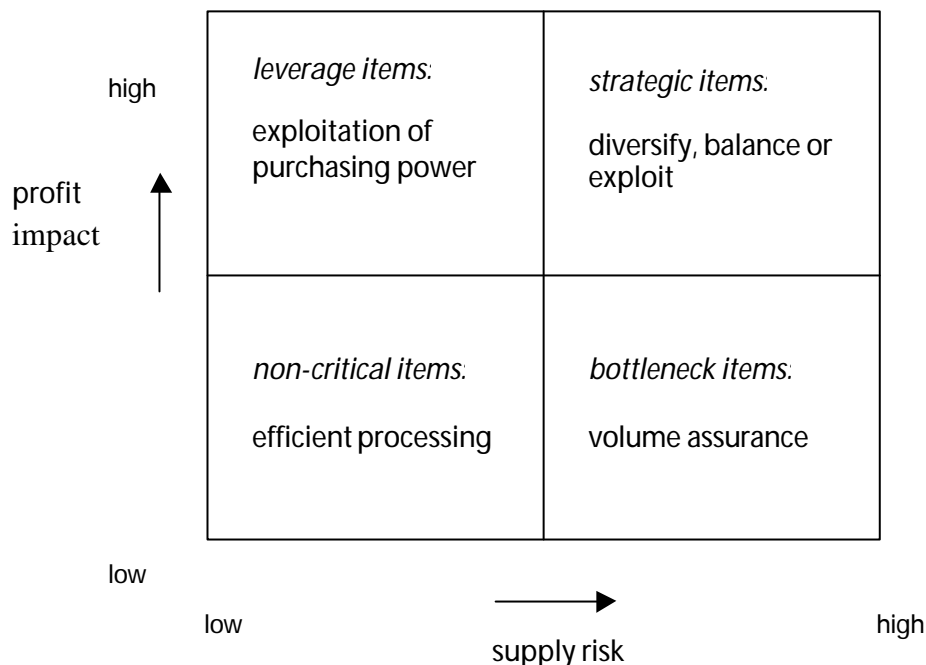


Figure 1: The Kraljic matrix: categories and recommendations  
Source: modified from Kraljic (1983)

## 2.2 Criticism and support

Organizations usually have to deal with a large number of products and a variety of suppliers, to be treated in different ways. For long, the *ABC-analysis* (or Pareto-analysis) was the only tool for differentiating between important and less important purchases. However, the ABC-analysis concentrates on the financial value of items, ignoring the cost of poor quality, performance risk, social risk and other components (Hartmann et al., 2001). Moreover, ABC analysis does not provide strategic recommendations for the categories, it merely provides information on the concentration of purchase spend.

The introduction of the Kraljic portfolio approach has been described as “a major breakthrough in the development of professional purchasing”, representing “the most important single diagnostic and prescriptive tool available to purchasing and supply management” (Syson, 1992). Kraljic (1983) made a reasonable case for the usefulness of the portfolio approach by describing the experiences of four large industrial companies. Other case studies indicated that a purchasing portfolio model is a powerful tool for:

- coordinating the sourcing patterns of fairly autonomous strategic business units within companies, resulting in leverage and synergy (Carter, 1997; Gelderman and Van Weele, 2002)
- differentiating the overall purchasing strategy, with different strategies for different supplier groups (Lilliecreutz and Ydreskog, 1999)
- discussing, visualizing and illustrating the possibilities of the development of differentiated purchasing strategies (Gelderman and Van Weele, 2002)
- configuring and managing supplier relationships, considering various interdependencies and trade-offs among relationships (Wagner and Johnson, 2004).

Portfolio approaches can be used to improve the allocation of scarce resources (Olsen and Ellram, 1997). A portfolio model provides a framework to understand and to focus a company's supply strategy (Hadelor and Evans, 1994). Portfolio usage has been associated with the level of purchasing sophistication of companies. A portfolio approach can make the difference between an unfocused, ineffective purchasing organization and a focused, effective one (Hadelor and Evans, 1994), especially for those companies which have never thought systematically about their procurement expenditure (Cox, 1997). The utilization of the purchasing methodology may lift the purchasing activity out of the tactical, fire fighting mode into a strategic role (Elliott-Shircore and Steele, 1995), it convinces top management of the effective role that purchasing can play in contributing to a company's profit and success (Carter, 1997).

However, purchasing portfolio models have been severely criticized too. There are doubts and questions with respect to the following measurement issues:

- the selection of variables: ‘how could one know whether the most appropriate variables are being used?’ (Nellore and Söderquist, 2000)
- the supplier's side: ‘why is the supplier's side disregarded in most portfolio models?’ (Kamann, 2000; Homburg, 1995)
- the operationalization of dimensions: ‘what is exactly meant by profit impact and supply risk?’ (Ramsay, 1996)
- the measurement of variables: ‘how should the weighting of factors take place?’ (Olsen and Ellram, 1997)
- the lines of demarcation: ‘what is the exact difference between a ‘high’ and a ‘low’ supply risk?’ (Homburg, 1995)
- the simplicity of recommendations: ‘how could one deduce strategies from an analysis that is based on just two dimensions?’ (Dubois and Pedersen, 2002).

Other criticism is related to more fundamental issues and objections of principle. Portfolio models have a tendency to result in strategies that are independent of each other (Coate, 1983). They do not depict the *interdependencies* between two or more items in a matrix (Olsen and Ellram, 1997), instead they concentrate on separate products (Ritter, 2000). Because portfolio models are limited to analysing products in a dyadic context, they fail to capture all the aspects which are considered vital for buyer-supplier relationships from a *network perspective* (Dubois and Pedersen, 2002). In with the foregoing, some are averse to recommendations either to exploit power (Olsen and Ellram, 1997), or to avoid risk associated with the interdependence of companies within an industrial network (Dubois and Pederson, 2002). From a different perspective, Cox (1997) condemns the portfolio methodology, because it does not provide any *proactive thinking* about what can be done to change the existing reality of power in the various supply chains in which companies are involved.

It should be noticed that arguments in favour of portfolio models have been reported in (a limited number of) case studies, while the counter-arguments can be found in conceptual studies. The critique of portfolio models, however, does not include the experience of practitioners. Gelderman and Van Weele (2003) reported that experienced users have found a reply to the critique of portfolio models, stressing that there is no simple, standardized blue print for the application of portfolio models: it requires critical thinking and sophistication of the purchasing function. This proposition, however, is not substantiated by quantitative empirical evidence.

### *2.3 Purchasing sophistication*

Purchasing sophistication (or maturity) can be viewed as a key characteristic of the purchasing function. The sophistication level of the function determines the extent to which the purchasing function will be included in the strategic management decision making process (Pearson and Gritzmacher, 2002). In this study *purchasing sophistication* is defined as the level of professionalism of the purchasing function (c.f. Rozemeijer et al., 2003). The concept has been derived from different purchasing stage- or development models (e.g. Reck and Long, 1988; Keough, 1993; Van Weele, 2002). Various characteristics of the purchasing function can be expected to determine its level of sophistication and maturity. In this study the following characteristics have been used for the development of a purchasing sophistication -construct: (1) reporting level of the purchasing function, (2) the contribution to the competitive position of the company, (3) an orientation on collaborative supplier relationships, (4) the skills to participate in cross functional teams, (5) skills for developing purchasing and supplier strategies, and (6) a focus on clerical and administrative duties. These characteristics can provide an indication of the level of sophistication of the purchasing function. Appendix B includes the list of questions, relating to the purchasing sophistication.

#### *Reporting level*

Purchasing's position within the organizational structure can be assessed through the organization chart which indicates the reporting level of the purchasing function. Stage- or development models for the purchasing function most commonly point out that in the early stages of development, purchasing reports rather low in the organizational hierarchy (Rozemeijer, 2002). The relative power position of the purchasing position will be indicated by independent reporting to top management (Pearson and Gritzmacher, 1990). Thus, a highly sophisticated purchasing function would report directly to top management, whereas a firm with a low level of sophistication would have a lengthy reporting chain.

#### *Contribution to competitive position*

The purchasing can vary in its contribution to the firm (Reck and Long, 1988). A nonstrategic purchasing function's contribution to the long-term or strategic goals of the firm may be insignificant, which implies that purchasing is not an important activity in the firm (Carr and Pearson, 2002). However, purchasing can assume a pivotal strategic, evolving from an obscure buying function into a strategic business partner (Ellram and Carr, 1994). Chen et al. (2004) found empirical evidence that purchasing can engender sustainable competitive advantage by enabling firms to foster close working relationships with suppliers, to promote open communication among supply chain partners and to develop long-term strategic relationship orientation to achieve mutual gains. Therefore, a sophisticated purchasing function, in contrast to an immature function, will be considered as an important resource for the firm (c.f. Keough, 1993).

#### *Orientation on collaboration*

In the nineties there is support for the idea of shifting from a traditional antagonistic approach towards a more collaborative approach of suppliers (Matthyssens and Van den Bulte, 1994). Partnerships sourcing is said to be superior to adversarial competition, because it leads to long-term collaboration based on trust (MacBeth and Ferguson, 1994). Adversarial relationships between buyers and suppliers will be common in unsophisticated purchasing functions (Pearson and Gritzmacher, 1990). A sophisticated purchasing function should have an orientation towards collaborative relationships with suppliers.

#### *Cross-functional teams*

In a highly sophisticated purchasing function the purchasing professionals will have the skills to effectively participate in cross-functional teams. Trent and Monczka (1994) stipulated that a cross-functional sourcing team consists of personnel from at least three functions brought together to complete a purchasing or materials management assignment. They argued that cross-functional teams offer many opportunities to achieve competitive advantage in key performance areas. The study of Ellram and Pearson (1993) confirmed the notion of increased emphasis on team responsibility for the purchasing function. Team participation should foster improved communication, awareness, and integration of the purchasing function with other functional groups in the firm. Giuniperio and Vogt (1997) found higher levels of team participation in purchasing when the function had a strategic orientation. Johnson et al. (2002) too found that purchasing's strategic role was positively related to the greater usage of (internal) cross-functional team usage. Thus, the skills to participate in cross-functional teams are likely to be associated with the purchasing sophistication of companies.

#### *Developing strategies*

Purchasers need different skills depending on whether the function is task-oriented or strategic (Freeman and Cavinato, 1990). There is a broad consensus that companies need a variety of relationships, each providing its different benefits, where no general 'best' type of relationship exists (e.g. Young and Wilkinson, 1997; Gadde and Snehota, 2000). Professional purchasers must have a variety of skills for making effective decisions (Pearson and Gritzmacher, 2002), they are expected to possess the skills necessary to plan, evaluate,

implement, and control purchasing and supplier strategies (Carr and Smeltzer, 1997). More specific, purchasing personnel in companies with a sophisticated purchasing will have the skills to develop differentiated purchasing and supplier strategies.

#### *Clerical activities*

A purchasing department of low sophistication will be viewed primarily as a clerical function with little decision-making power (Pearson and Gritzmacher, 1990). In an immature purchasing function, purchasing will be evaluated on the clerical tasks it performs such as number of orders processed (Reck and Long, 1988). Within manufacturing companies, the purchasing function then typically will be seen as a part of the umbrella of materials management. It will be not the responsibility of purchasing to question those needs, forge long term relationships with suppliers, or to understand the needs of the end customer (Ellram, 1998). Many companies have progressed from a clerical function back in the 1960's to a strategic function nowadays, while others have not made such moves (Quayle, 2002). Buyers in a non-sophisticated purchasing function will be solving day-to-day problems with suppliers and spending their time mainly on clerical and administrative tasks.

### 3. Data collection

#### 3.1 Response

The survey procedures included a pilot study aimed at enhancing the reliability and validity of the questionnaire. The final questionnaire has been administered to 1,153 members of the Dutch Association of Purchasing Management (NEVI). All members are employed by manufacturing companies. We specifically targeted these purchasing professionals, because of their insights into the development of the purchasing function and the possible usage of a portfolio approach in their companies. A total number of 248 responses were received, of which 10 were invalid. The effective response rate is therefore 20.6 percent (238/1,153).

Job title	Frequency	Percent
Director Purchasing	70	29
Purchasing Manager	79	33
Senior Buyer	23	10
Purchasing Assistant	37	16
Manager of Logistics	10	4
Supply Chain Manager	4	2
Other	15	6
Total	238	100

Table 1: Job title of respondents

Table 1 presents the respondent profile. Based on their job titles, the respondents can be considered as being well informed about the purchasing operation in their companies. Industries represented included metal products industry (21 percent), electro technical industry (19 percent), chemical industry (14 percent), machine industry (13 percent), wood, furniture or paper industry (7 percent), metal basic industry (4 percent), means of transport industry (4 percent), and a small number of other industries. The distribution of the sample with respect to sales, is provided in table 2. The average ratio of purchases to sales was 54.2 percent ,

Annual sales (Euros)	Frequency	Percentage
Under 5 million	8	3.4
5 to 10 million	30	12.8
10 to 25 million	57	24.3
25 to 100 million	71	30.2
100 to 500 million	48	20.4
Over 500 million	21	8.9
Total	235	100

Table 2: Respondents' sales

The potential for non-response bias was tested using the procedure recommended by Armstrong and Overton (1977) in which the data is classified into a first category of returned questionnaires (first-wave, early respondents) and a second category of returned questionnaires (second-wave, late respondents). To



establish the presence of non-response bias, first-wave respondents were compared with second-wave respondents on relevant variables. All tests indicated that no statistical significant differences were found between the first wave and the second wave of respondents. Based upon the assumption that late respondents are similar to non respondents, it is concluded that the study does not suffer from non-response bias.

### 3.2 Purchasing sophistication construct

To determine the level of purchasing sophistication, respondents were asked to rate the purchasing function in their company on 6 different characteristics, using a five-point Likert scale (1=completely disagree to 5=completely agree). The results indicate that on average portfolio users score higher on the purchasing sophistication items, see appendix C.

Explanatory factor analysis was used to identify a possible underlying factor structure. The results of the factor analysis (principal components analysis with varimax rotation) are provided in table 3. The analysis indicates that purchasing sophistication is a two-dimensional construct. The first factor can be named *purchasing position*, referring to the internal position and status of the purchasing function in companies. The position of purchasing can be deduced from its contribution to the company's competitive position and its direct relationship with top management. The second factor can be labelled *purchasing professionalism*, since the professionalism of purchasing is reflected by the skills of purchasers and their (negative) orientation towards and engagement in inferior clerical activities. With the exception of 'orientation on collaboration', all items had at least one factor loading that exceeded the recommended level of 0.50 (Hair et al., 1998). Only 'orientation on collaboration' cross-loaded on both factors. Therefore, this characteristic has been removed from further analysis.

Items	Factor 1:	Factor 2:
	"purchasing position"	"purchasing professionalism"
Reporting to top management	0.848	0.078
Contribution to competitive position	0.807	0.163
Orientation on collaboration	0.368	0.257
Skills for cross functional teams	0.203	0.833
Skills for developing strategies	0.106	0.841
Orientation on clerical duties	- 0.018	- 0.656

Table 3: Results of purchasing sophistication factor analysis (factor loadings)

A reliability analysis has been performed in order to ensure the internal consistency of the indicators that constitute each construct. Cronbach's alpha was 0.60 and 0.71 for the first and second factors, respectively, indicating an acceptable internal consistency and reliability of the constructs.

### 3.3 Control for size

Previous studies indicated that larger firms recognise the strategic importance of purchasing more than smaller firms did (e.g. Carr and Pearson, 1999). Mudambi et al. (2004) reported that most SME's do not try to engage in co-operative purchasing arrangements, while among the few that do try, many do not seem to do well. Quayle (2002) found a lack of awareness by SME's that effective purchasing may positively affect the profitability of organisations. Larger companies are more likely to deal with more products, more suppliers, and more complex purchasing situations and therefore need more advanced analytical tools to develop effective supplier strategies. Under those circumstances the employment of sophisticated tools will probably have more effect. Since this study included forms of various sizes, an attempt was made to control for firm's size. The variable 'firm size' was included as a control variable, measured on an ordinal scale: companies are either 'large companies' with more than 100 employees or 'small or medium sized enterprises' (SME's), in accordance with the definition of the Dutch Central Commission of Statistics (CBS). By sorting the sample according to firm size, the sample consists of 170 larger firms and 68 SME's.

#### 4. Empirical results

Since the dependent variable (portfolio usage) is measured as a dichotomous variable, logistic regression analysis has been used to explore the relationship between portfolio usage and the two purchasing sophistication factors: purchasing position and purchasing professionalism<sup>3</sup>.

The main results of the logistic regression are shown in table 4. The overall fit of the model can be assessed using the model chi square. In this case the chi square is statistically significant at  $P < 0.001$ . In other words, overall the model is predicting usage and non-usage significantly better than a model with only the constant included. The Nagelkerke R square was found to be 19.7%. The overall accuracy of the model is indicated by the predicted group membership which predicts to which of the two categories (users and non-users) a respondent is most likely to belong, based on the model. The correctly predicted group membership was 73.3%.

	B-Coefficient	Standard Error	Exp (B)
Purchasing position	0.358 *	0.178	1.430
Purchasing professionalism	0.662 *	0.189	1.938
Firm size	0.947 *	0.388	2.584
Constant	0.591 *	0.316	1.806
Nagelkerke R <sup>2</sup>		19.7%	
Overall chi square		23.690 *	
Correctly predicted group memberships		76.8%	

\* Significant at  $P < 0.05$

Table 4: Logistic regression for 'portfolio usage' (n=236)

The empirical results indicate that, after controlling for firm size, the position of the purchasing function is to be positively associated with portfolio usage. In case where purchasing has a better position within the company, a portfolio approach is more likely to be used. The same conclusion holds for the professionalism of the purchasing function. The purchasing portfolio is used more often by more professional purchasers than by their less professional colleagues. In other words, the usage of portfolio models increases significantly as purchasing's professionalism increases. In addition to the interpretation, the values of the coefficients Exp (B) indicate the contribution of the independent variables to the prediction of the outcome variable. The outcomes of the logistic regression indicate that the association with portfolio usage is stronger with purchasing professionalism than it is with purchasing position. As expected, firm size has a significant impact on portfolio usage. The odds that a larger company uses a portfolio model is almost 2.6 times higher than those of a SME.

#### 5. Conclusion and implications

The purchasing portfolio is often considered a valuable tool for developing differentiated purchasing and supplier strategies. However, portfolio models have been criticised, pointing at measurement problems, more fundamental issues and objections of principle. It appears that arguments in favour of portfolio models are derived from (qualitative) case studies, while counter-arguments are based on theoretical and conceptual studies. Based on a survey among purchasing professionals, this study provides evidence that purchasing portfolio usage should be associated with purchasing sophistication. Users contrast in a positive way with non-users of the portfolio, especially on their professionalism (skills) and their position within their companies.

The results of this study imply that top-managers, who find out that portfolio management has not (yet) been endorsed by their purchasing organisation, need to worry about its sophistication. These companies are probably lagging behind both in terms of professionalism and position of the purchasing organisation in the overall company hierarchy. The application of purchasing portfolio management seems to have prerequisites both in terms of professionalism that needs to be present and the exposure i.e. locus that the

<sup>3</sup> With logistic regression we can predict to which of two categories (here: users and non-users) a respondent is likely to belong, given certain other information (here: data on purchasing position, purchasing professionalism and company size). The analysis can be used to establish which variables are influential in predicting the correct category. Answers can be found to the question: which variables are appropriate for *predicting* whether a respondent will use a portfolio approach or not?

purchasing domain has within the overall company organisation. The application of purchasing portfolio techniques requires skills which go beyond traditional administrative competences. In addition, the purchasing purchasing needs to have a clear presence and position within the organisational hierarchy.

Future research could include an empirical study to the impact of a portfolio usage, in terms of performance measures that count to top management. Longitudinal studies in companies could provide information about the long-term impact and usefulness of a purchasing portfolio approach. Such research requires a complex design. The researcher should overcome the difficulties of attributing results to portfolio usage and of comparing the results from different companies, because several company-specific factors are likely to influence the impact of portfolio usage. In addition the personality of individual purchasers could be included as well, describing and explaining the use and effectiveness of the portfolio approach. This study attempted to provide new insights in the relationship purchasing sophistication and the usage of purchasing portfolio models. In this study, portfolio usage has been explained by purchasing sophistication (professionalism and position). One could wonder, however, whether or not the relationship is the other way around: the introduction of the purchasing portfolio in companies drives purchasing sophistication. Adopting a portfolio approach could work as a *catalyst for change* within the company. Portfolio models provide a practical framework for non-purchasing specialist, analysing and discussing purchasing issues within cross-functional teams. A portfolio project could put purchasing higher on the company's strategic agenda, clarifying the problems and possibilities of purchasing and supplier management. Further research could focus on the impact of portfolio usage on the sophistication of the purchasing function.

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**Appendix A**  
**Overview and comparison of purchasing portfolio models**

	Elliot-Shircore and Steele (1985)	Hadeler and Evans (1994)	Lilliecreutz and Ydreskog (1997)	Olsen and Ellram (1997)	Van Weele (2000)
name of the model	procurement positioning overview	supply strategy square	classification model	portfolio model	purchasing portfolio
matrix dimensions	profit/value potential	product's value potential	economic profile	strategic importance	profit impact
	supply vulnerability	complexity	complexity and risk profile	difficulty of managing	supply risk
categories	strategic critical tactical profit strategic security tactical acquisition	(not specified)	strategic leverage bottleneck non-critical	strategic leverage bottleneck non-critical	strategic leverage bottleneck non-critical
recommendations for:					
strategic items	manage suppliers	strategic partnerships		close relationship	partnership
leverage items	drive profit	global trading	(not specified, depending on the desired co-operation with the supplier)	leverage volume standardize and find substitutes standardize and consolidate	exploitation of power assurance of supply
bottleneck items	ensure supply	close relationship			
non-critical items	minimise attention	simple contracts			systems contracting

**Appendix B**

**Purchasing sophistication** (1=strongly disagree, 5=strongly agree)

1. Purchasing reports directly to top management.
2. Top management recognizes that purchasing contributes significantly to the competitive position of the company.
3. Purchasing is mainly aimed at collaboration with suppliers.
4. The skills of purchasing personnel are adequate for working in cross-functional teams.
5. The skills of purchasing personnel are adequate for developing purchasing and supplier strategies.
6. Purchasers are mainly engaged in clerical work and operational duties, dealing with day-to-day supplier problems.

**Appendix C**

**Means of the purchasing sophistication items**  
 (on a 5 point scale)

	overall sample means	user's mean score	non-user's mean score
Reporting to top management	3.94	4.03	3.66
Contribution to competitive position	3.72	3.83	3.42
Orientation on collaboration	3.60	3.63	3.48
Skills for cross functional teams	3.53	3.64	3.18
Skills for developing strategies	3.47	3.57	3.19
Orientation on clerical duties *	3.13	2.89	2.69
	n =	236	174
			62

\* recoded

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