BUYING BUNDLES: THE EFFECTS OF BUNDLE ATTRIBUTES ON THE VALUE OF BUNDLING

Merijn Linthorst, Jan Telgen and Fredo Schotanus*

ABSTRACT. We consider the situation in which a buyer has to find the optimal degree of bundling for buying goods and services. From a review of the literature we develop attributes associated with bundling. Each of these attributes has an effect on the value of a bundle. Combined, the attributes determine the value of a bundle. We describe how the various attributes of a bundle contribute to the value of a bundle given the context of the buying situation. Based on interviews, a further analysis of bundle attributes and their effects on the bundle value is provided. The results of this analysis can be used to assist in finding the optimal degree of bundling.

INTRODUCTION OF THE TOPIC

When a buyer has to purchase a set of products and/or services he searches for the optimal way to buy on the market. One of the decisions the buyer has to make is whether he bundles the products and/or services or buys them in separate lots. For example, buying various products and services needed for a construction project separately is an alternative to buying a complete project. This is an important decision as it can have a large effect on cost components such as the purchasing price and operation costs.

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* *Merijn M. Linthorst, M.Sc., Jan Telgen, Ph.D. and Fredo Schotanus, Ph.D. are a Ph.D. student, NEVI Professor of Purchasing Management, and Assistant Professor, respectively at the University of Twente, Enschede, the Netherlands. Mr. Linthorst's research interests are bundling and splitting decisions in purchasing. Telgen's teaching and research interests are the interface between public sector purchasing management and operations research. Schotanus' research interests are cooperative purchasing and supplier selection.*

The bundling decision involves, as observed in our exploratory empirical results, a large number of attributes (i.e., dimensions), such as the purchasing volume and the risk of bankruptcy or non-delivery. These multi-dimensional decision problems are often underestimated and are typically based on intuition (Grove and Meehl, 1996): often buyers immediately move on to selecting the right supplier for the products or services.

A good understanding on what attributes play a role in bundling decisions can help buyers to make better founded decisions about the degree of bundling. Unfortunately, current research offers little guidance on important attributes for bundling decisions. It is therefore our research objective to improve the understanding on bundle composition. Specifically, we present a framework for making bundling decisions and we elaborate on the concept of bundle attributes. These bundle attributes contribute to the value of a bundle and can be used as a basis for a well-informed bundling decision. We discuss the attributes and their effects on the value of a bundle based on a number of practical bundling decisions reviewed with purchasers.

LITERATURE ON BUNDLING

Purchasers have considered bundle options for centuries, though little academic discussions seem to be devoted to the decision problem (Schoenherr and Mabert, 2008). Most of the bundling literature has been written from a seller's perspective in either a marketing or economics literature. In the next two subsections, we discuss the buyer's and seller's perspectives in more detail.

Bundling From a Seller's Perspective

From a seller's perspective, marketing literature on bundling has examined the firm's promoting and pricing of bundles (e.g. Ansari, Siddarth, and Weinberg, 1996; Ben-Akiva and Gershenfeld, 1998), consumer evaluation of bundles (e.g. Johnson, Herrmann, and Bauer, 1999; Soman and Gourville, 2001), and the optimality of bundling, by modeling the various marketing options for a marketeer (e.g. Bakos and Brynjolfsson, 2000; Wilson et al., 1990). Economics literature has mainly focused on bundling as an entry deterrence mechanism (e.g. Nalebuff, 2004; Carlton and Waldman, 2002), bundling and efficiency (e.g. Fang and Norman, 2003), and bundling as a profit-maximizing

mechanism (e.g. Armstrong, 1999; Avery and Hendershott, 2000). Stremersch and Tellis (2002) state, in their examination of the literature on bundling from a seller's perspective, that there is no integrative framework that explains what an optimal bundle is, given various factors that have an effect on an optimal bundle. Also, they state that the literature is ambiguous about definitions for bundling, key conditions for optimal bundling and legality of bundling. This makes it even more difficult to develop a framework for making optimal bundling decisions from a buyer's perspective.

Bundling from a Buyer's Perspective

The body of literature on bundling from a buyer's perspective is much smaller than that from the seller's perspective. Only a few topics in bundling have been covered from a buyer's perspective. The study of Mabert and Schoeherr (2001) showed that choosing the right bundle structure significantly influences the buyer's perceived performance of the bundle. This importance of the bundle structure was later confirmed by Beall et al. (2003). This stresses the importance of the decision on the correct bundle structure.

Reasons for bundling by buyers are the benefits towards lowering the administrative costs, such as ordering costs (Looman, Ruffin and de Boer, 2002). Other authors mention benefits of bundling such as an increase of buying power (Ramsay, 2001; Schoenherr and Mabert, 2006) or an increase of economies of scale (Birou, Fawcett and Magnan, 1997). However, few studies have provided attributes that influence an appropriate bundling structure, or tried to construct a framework that can be used to determine an appropriate bundling structure. Perhaps Jap's (2002) suggestion of an optimal bundle structure in terms of number of items and purchasing spend comes closest. She poses that bundles should have a high number of items and a high spend. This should be weighted against the potential inability of suppliers to deliver and the loss of competition. The paper by Jap provides useful suggestions, but does not provide a framework or even a list of attributes.

Other research on bundling from a buyer's perspective focuses on bundles for reverse auctions. The achievement of price reductions by increasing the number of different bundles in the same bidding event has been reported by Carter et al (2004) and Hur et al. (2006). Changing the bundle composition for repeat auctions can also help to further reduce

the price (Arnold et al., 2005). Still, they do not study finding the right bundle composition itself.

This paper adds to the limited body of research on bundling from a buyer's perspective. Besides adding new reasons for bundling to the existing literature, we combine these reasons in a framework that can be used to determine an appropriate bundling structure.

CRITICAL ANALYSIS

The ambiguity in the literature on definitions of bundling, as stated by Stremersch and Tellis (2002) in the previous section, calls for a further critical analysis. Not clearly defining terms as bundling and bundling strategies would make it difficult to compare this study with the literature.

Bundling

Many different definitions of bundling have been proposed in the literature. For example, Adams and Yellen (1976) define bundling as "selling goods in packages". Guiltinan (1987) defines bundling as "the practice of marketing two or more products and/or services in a single package for a special price", and Salinger (1995) treats a pair of shoes as a bundle. These examples do not only show that definitions of bundling are fuzzy and not consistent (Stremersch and Tellis, 2002), they are also unclear about the distinction between product and bundle (see the definition of Sallinger) and domain of the use of bundling (see the definition of Guiltinan). We propose a definition for bundling from a buyer's perspective that tries to overcome the inconsistencies present in the literature.

We propose the definition of bundling as the buying of two or more undividable products in one package. We define the term 'undividable' in means as undividable for buyer's markets. We explain this term by a short example. Consider buying a bundle of electricity for two office buildings. According to the definition this will be a bundle of two products; you can find a supplier willing to deliver electricity for one of your office locations. Buying electricity for a part of an office building would be much harder, because no markets exist for supplying electricity to parts of office buildings. So the undividable product of the bundle is one office building. Considering this example will make it clear that

most of the purchasing transaction in practice do have some degree of bundling inherent to them. It is our purpose to contribute towards finding an optimal degree of bundling.

Bundle Strategies

Bundle strategies studied from a buyer's perspective have not been defined very clear. Examples of bundle strategies are described as increasing leverage by size and increasing the number of items in a bundle (Jap, 2002), bundling of part families (Smeltzer and Carr, 2003), and the bundling of items in the same commodity group (Beall et al., 2003). These strategy descriptions, although suitable in their specific context, are not generic in use. Based on interviews with purchasers we identify two generic bundling strategies.

1. Homogeneous bundling strategy: expanding your bundle homogeneously is done by adding more of the same products to those that you already have in your bundle. Every bundle has a dimension, called the degree of homogeneous bundling; the amount of exactly the same products in the bundle.

   > Example from the interviews: That is our default, we bundle the same products over our three locations, unless […] we have done that with catering and some IT hardware.

2. Heterogeneous bundling strategy: expanding your bundle heterogeneously is done by adding different products to those you already have in your bundle. Every bundle has a dimension, called the degree of heterogeneous bundling; the amount of different products in the bundle.

   > Example from the interviews: We had to build the hangars, the building for the restaurant and the platforms […] we saw that as one job.

With the definition of these two strategies we can classify every bundle, in their degree of bundling, both homogeneously and heterogeneously. Later in this paper we show that different bundling strategies also create different bundling effects.

THE VALUE OF BUNDLING

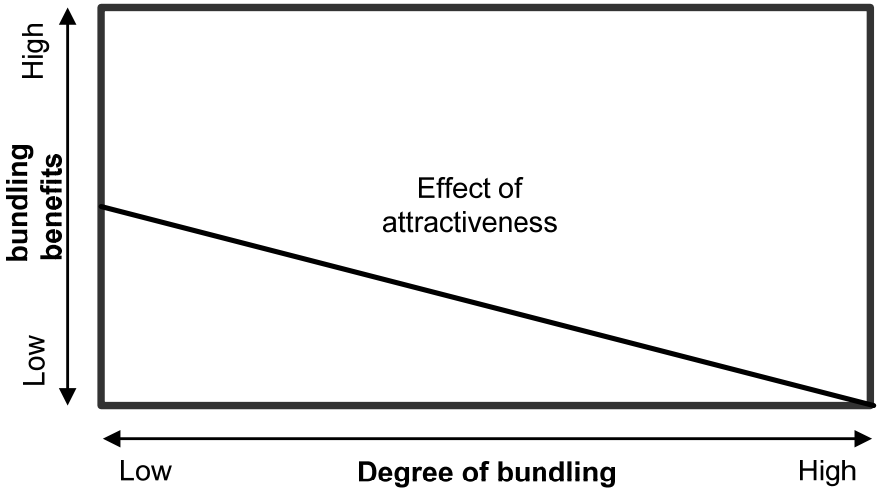
In their search for the optimal bundle structure, buyers assess various bundle options, which vary in bundling degree, either homo- and heterogeneously. Each of those bundle options has several bundle attributes, which can have favorable or not so favorable effects in the eyes of buyers.

We find a theoretical basis for these effects in transaction costs economics (TCE). According to this theory buyers seek to minimize their Total Cost of Supply (TCS). Homburg and Kuester (2001) distinguish three components of these total costs: (1) purchasing price, (2) operation costs, and (3) acquisition costs (Noordewier, John and Nevin, 1990). The purchasing price refers to direct product costs, for example the actual price charged by the supplier. This can be influenced by quantity discounts (Elmaghraby and Keskinocak 2003; Schotanus et al., 2007), competition (Jap, 2002), selection effects (Linthorst and Telgen, 2008), learning effects (Yelle, 1979), logistic effects (Lambooy et al., 2001), et cetera. The operation costs are the expenses from the primary business operations of the buyer, such as expenses for R&D, manufacturing and downtime costs, and costs for internal coordination (Gyrna, 1988). Acquisition costs are defined as the costs made in the process of buying the product. This can include contracting costs and relationship costs (Williamson, 1975).

The mentioned costs components of total costs of supply can be linked to different bundle attributes. For example, the bundle attribute volume (Looman et al., 2001) is different for each bundle option. More bundling often generates quantity discounts on the price, although in a decreasing manner. We call this the effect of the bundle attribute. In another example, the bundle attribute of attractiveness for suppliers (Jap, 2002) could have the effect of less competition and so higher prices paid with more bundling, due to constrained capacities or capabilities of the suppliers.

We can visualize these effects as a function of the bundling benefits versus the degree of bundling. In Figure 1, we show how such functions could look like.

FIGURE 1
The Effect of Attractiveness



A buyer faces the complex task to assess the various options in bundling. He looks at the attributes of the various options; he estimates their effects and the final trade-off. We call this trade-off between various effects of the bundle attributes the bundle value. With these definitions we can describe the bundle value in terms of the various effects of the bundle attributes.

Bundle value = effect (attribute 1) + effect (attribute 2) + effect (attribute …)

If we continue the example from the beginning of this section, the bundle value would be the summation of the bundling benefits of competition and the economies of scale. In Figure 2, we visualize how the function of bundle value could look like. The differences in the effects show us the existence of an optimal degree op bundling, at which the bundle value is at its maximum. It is this maximum value that purchasers want to achieve with their bundling strategies.

FIGURE 2
The Effect of Volume

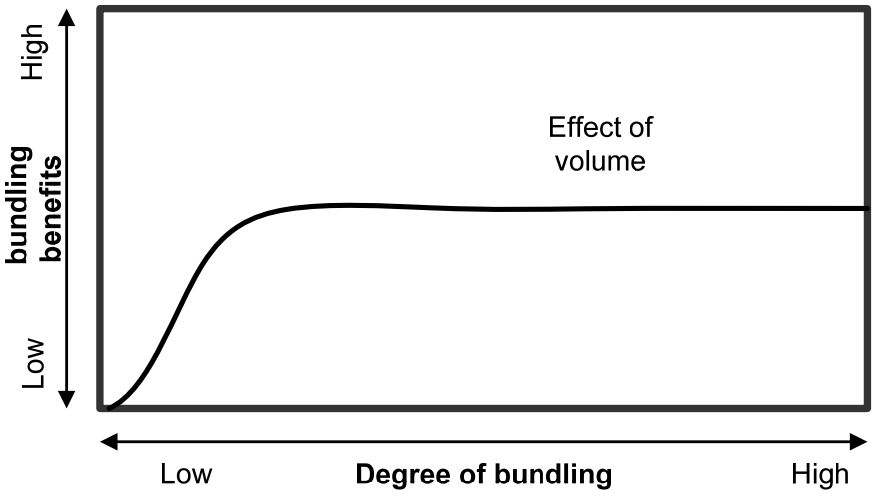
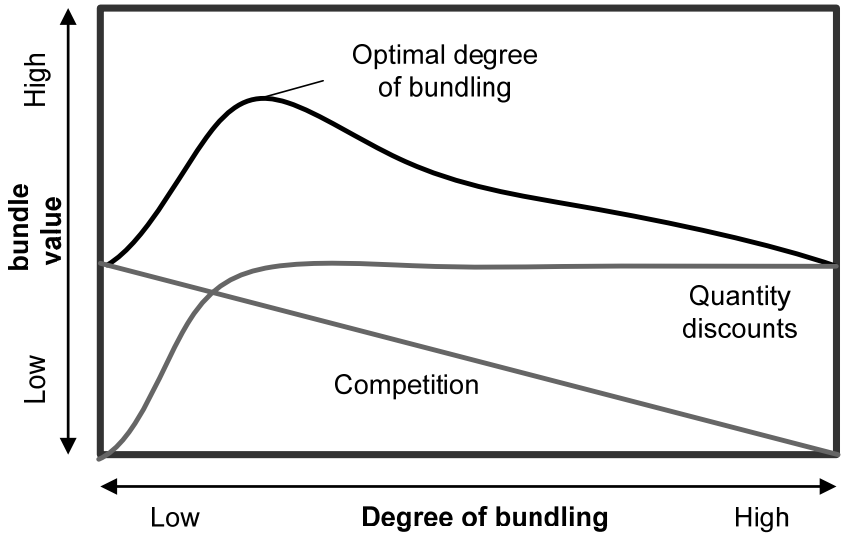


FIGURE 3
The Bundle Value



In the next section we will give an overview of all attributes and their effects on the bundle value.

RESULTS

In order to get a more thorough understanding about bundle attributes and their effects on the bundle value, seven exploratory interviews were conducted. These interviews were conducted with one or two experienced purchasers at the same time, for a total of 10 interviewees. In each of the interviews we discussed a number of cases on bundling. In total we discussed 23 cases with the interviewees. The interviewed purchasers were faced with the decision how to bundle in their daily activities. The purchasers were chosen to represent a variety of organizations. This included government departments, police departments, schools, energy providers and tobacco manufacturers.

In the interviews, the purchasers were asked if they could name the various bundled options they have had in various tenders and buying situations. Also they were asked if they could elaborate on the reasons for choosing one particular bundling option. In this way we accessed the vast experience of the purchasers on decision-making on bundling. The interviews were semi-structured to enable the interviewer to pursue interesting statements and elaborate on them during the interview. The interviews took one hour on average and were taped. From the descriptions and examples of the buyers we could form a list of bundle attributes which are linked to the various costs components of the total costs of supply. The list of attributes was created during the analyses of the tapes. In Table 1 we present the results.

To the attributes already mentioned in the literature such as attractiveness for suppliers (Jap, 2002), volume (Birou, Fawcett and Magnan, 1997), and purchasing effort (Looman, Ruffin and de Boer, 2002), we add the bundle attributes dependency, selection, outsourcing, specialization and physical separation. All the bundle attributes have effects on the value of the bundle through a cost component. In the decision about which degree of bundling to choose, purchasers have to combine all, or at least some of the cost components of the attributes into a specific bundle value curve. Only then they will be able to find the optimal degree of bundling for their buying situation.

TABLE 1
Bundle Attributes and Their Effects

Bundle attribute and description	Example from the interviews	Effect of the bundle attribute on	
Attractiveness for suppliers			
The bundle is attractive enough to generate enough competition, as well as on the short as on the long term.	You can bundle, but not too much, the bundle must be interesting for small and large companies.	Price	Competition
Volume			
The volume of the bundle drives the supplier to offer discounts	With this size the bundle just had a nice volume that generated some discount benefits.		Quantity discounts
Subcontracting			
The supply of the components of the bundle is passed on to subcontractors.	Why don't we split it up, then the subcontractors can place bids […] they are cheaper.		Splitting effect
Physical separation			
The components of the bundle are supplied to different geographical locations.	Because the areas of the works were adjacent to each other, we could buy it as a bundle.		Logistics costs
Specialization			
The delivery of the components of the bundle is the core-business of the contracted suppliers.	If it doesn't belong to the core-business of the supplier, we split it off, that makes it commercial more interesting.	Price	Learning Effect
Integration			
The integration of the components of the bundle can create value.	When different components of the installation are highly dependent on each other that would be a reason for us to buy in a bundle.	Opera-tion costs	Internal coordination costs

TABLE 1 (Continued)

Bundle attribute and description	**Example from the interviews**	**Effect of the bundle attribute on**	
Risks			
The risk of bankruptcy or non-delivery of the components of the bundle.	…and if the contractor goes bankrupt, the project will be delayed […] with a main contractor that will not happen.		Downtime costs
Coordination			
The need of coordination between the components of the bundle by the buyer.	It is the policy here to leave the coordination to the suppliers […] we want to keep it as simple as possible here.	Acquisi-tion costs	Relationship costs
Purchasing effort			
The effort of buying the components in a bundle or separately.	If you are going to buy all the activities separately, you do not want to know how much time that is going to take.	Acquisi-tion costs	Contracting costs

Still there is the matter of which degree of bundling, homogenous or heterogeneous as described in the critical analysis, would be most appropriate. We propose that not all attributes of the bundle change the bundle value when a solely homogeneous or heterogeneous bundling strategy is pursued. From the data of the interviews, we discovered that the reasons for bundling mentioned, were linked with either a homogeneous or a heterogeneous strategy of bundling. As is shown in Table 2, quantity discounts are not considered as a reason for heterogeneous bundling. Splitting and learning effects and internal coordination costs are not considered as a reason for homogeneous bundling. Although it says nothing about the correctness of the considerations of the buyers, it gives an indication of the perceived importance of these cost components when pursuing different bundle strategies.

The conclusion of these analyses is that we can visualize components of bundle value. In addition, we can point out differences in these

TABLE 2
The Influence of Bundle Strategy on Bundle Value

Effects	Mentioned as a reason for:	
	homogeneous bundling	heterogeneous bundling
Competition	✓	✓
Quantity discounts	✓	
Splitting effect		✓
Logistics costs	✓	✓
Learning effect		✓
Internal coordination costs		✓
Downtime costs	✓	✓
Relationship costs	✓	✓
Contracting costs	✓	✓

components when pursuing homogeneous or heterogeneous bundling strategies. From a practical point view an assessment of bundle attributes makes it easier for a practitioner to find the right degree of bundling.

DISCUSSION AND FURTHER RESEARCH

This paper has explored the various attributes of bundles from a buyer's perspective. We add to literature by presenting an overview of attributes and their effects on the value of bundling. We also propose a framework which simplifies bundling decisions for purchasers. However, this article has several limitations that further research could address.

First, the list of attributes has been generated from the experiences of many purchasers and we tried to find as many attributes as possible, but we do not claim having found every bundle attribute. To make the list more complete, further research could focus on finding more attributes of bundles that are relevant in the bundling decisions, by more extensive empirical and literature research. Second, when changing the degree of bundling, it is not yet clear how the effects of the bundle attributes change. In this paper we propose some examples how the curves of the effects could look like, but we only do this with the purpose of clarifying the concept. Further research could focus on the question how these effects influence the bundling value. For example, the effects of the

bundle attribute subcontracting on bundling (Linthorst and Telgen, 2008). Finally, we plan to further investigate how an optimal degree of bundling can be determined.

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