

THE SELECTED DECISION DETERMINANTS OF THE FULL POSTPONEMENT STRATEGY IN POLISH MANUFACTURING COMPANIES. AN EXPLORATORY SURVEY

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Abstract: *The postponement strategy has been discussed in literature for over five decades. However, the intensity of studies and conducted research on this issue has risen dramatically over last 10 years. The postponement concept can be perceived as one of a supply chain strategy for a product customization. The paper depicts the results of a primary survey conducted among companies in Poland. The objective of the research was to explore and describe the product-related variables of crucial importance connected to the postponement strategies (specifically to the full postponement) in Polish firms. The results of the research will be then used for a further extended survey dealing with the conditions and factors which determine employing the different postponement strategies in the supply chains in Poland.*

Key words: *postponement strategies, full postponement, product-related decision determinants*

1. INTRODUCTION

One of the most important tiers in the supply chain is a producer, which is often a focal company, linking suppliers and customers. It is also a fundamental link when selecting and implementing a full postponement concept, which is one of the postponement strategies. The postponement strategies range from providing highly customized products, which have high uncertainty (full postponement strategy) through to providing a standard product with low demand uncertainty (full speculation strategy).

The full postponement strategy represents the highest level of postponement application. Both logistics and manufacturing operations are customer order initiated [1]. In other words: final processing and manufacturing activities are postponed until customer orders have been received and are performed from central locations in the supply chain to include customer and country specific characteristics in the finished product based on final manufacturing frequently followed by direct shipment to retailers and customers [2]. Apart from manufacturing and distribution a multitude of other activities can also be postponed: in fact postponement can be applied along the entire supply chain [3].

In spite of the theoretical approach which suggests studying the postponement concept from the perspective of the whole supply chain, the presented study is limited to one, particular segment of the chain - a manufacturer. The main purpose of the study is to conduct an exploratory survey to deliver results in a descriptive form. These results derived from a primary research highlight the postponement areas and variables of crucial importance, which should be considered in future in-depth studies in Polish companies.

2. APPLICATION OF THE FULL POSTPONEMENT STRATEGY IN THE SUPPLY CHAIN

The decision about implementing the postponement strategy across a supply chain generally depends on the external conditions of an environment. In the opinion of R. Mason-Jones *et al.* for most companies postponement is determined by a combination of three categories: product type, consumer demand and supply chain approach [2, 4, 5]. Figure 1 illustrates the most meaningful categories which determine developing of the appropriate postponement strategy.

Figure 1 shows three categories of decision determinants. Each category comprises subsequently a number of factors determining application of the postponement strategy, regardless of the particular attributes of markets and operating conditions in each industry. In the opinion of J.D. Pagh *et al.* the product on each stage of its life cycle can determine an appropriate postponement strategy. The product in the first two stages (introduction and growth) requires concentration on the customer service; on the contrary in two final stages of a product life cycle (maturation and decline) an orientation on cost reduction [1] would be more preferable.

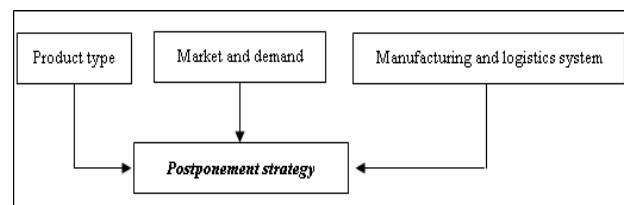


Fig. 1. Three groups of decision determinants of the appropriate postponement strategy.

Another important product-related factor, strongly influencing the choice of postponement strategy is the product design. For a highly customized product, some degree of postponement will presumably be beneficial [1].

Second category determining application of the postponement concept is the market nature and the demand. This category is perceived to be the most important as the needs and requirements of the customers very strongly influence on the market's position of a company. There are many elements connected with a customer services that determine the application of postponement strategy, such as: the relative delivery time and the relative frequency.

The relative delivery time refers to the average delivery time to customers, in proportion to the average manufacturing and delivery lead-time. The relative delivery frequency refers to the average delivery frequency to customers, in proportion to the average manufacturing and delivery cycle time. If the customers do not require a high relative delivering frequency and/or a short relative delivery time, it will likely be appropriate to employ some degree of postponement strategy [1].

The last category includes the constraints within the manufacturing and logistics processes. Two factors seem to be important to most supply chains: the extent that large economies of scale exist or special knowledge is needed in the manufacturing and/or logistics processes. If there are neither large economies of scale needed nor special knowledge, some degree of postponement will be appropriate.

The identified and described categories determine the implementation of the appropriate postponement strategy in the supply chains. These are general categories and factors influencing the extent and intensity of the postponement application in the supply chains. The in-depth analysis of the circumstances and conditions of employing the postponement strategy requires taking under the consideration many factors, specific for the particular sector.

3. RESEARCH METHODOLOGY FRAMEWORK

3.1. The classification of the research sample

The study is based on the results of a survey conducted in Poland in 2006. The source of data for the analysis was 57 manufacturing companies operating mainly in the Silesian Region, in the south of Poland.

Almost 23% of the examined companies produce metal products, group of 10.5% operate in industrial commercial machinery and computer equipment, sector of electronic and electrical components, stone, clay, glass and concrete products. More than 5% and less than 10% of the examined companies operate in the industry of textile mill products, lumber and wood products, analyzing and controlling instruments, food products.

The respondents were asked to answer questions, included in a detailed questionnaire consisting of a number of items, relevant to the postponement concept. The selection of the variables was based on the combination of support from recent literature and results of research.

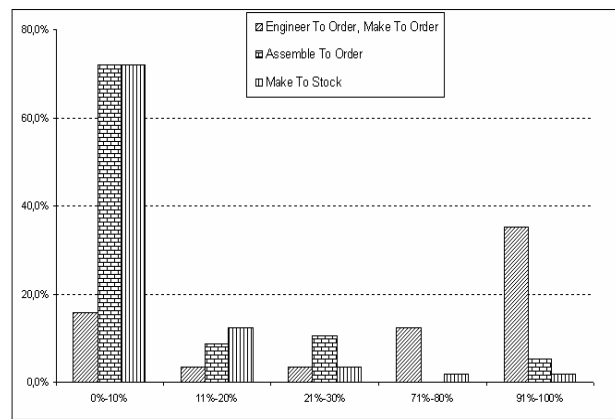


Fig. 2. Distribution of manufacturing orders by the type of postponement.

For the purpose of this research one variable was selected as a criterion for classifying the companies into three separate groups of firms according to the type of postponement strategy applied. The distribution of the research sample is rather clear-cut which means that in the result of a classification the research sample turned out to be well-clustered.

The general results of the classification show that 78.6% of the companies engineered to order or made to order at least 33% of incoming manufacturing orders. A group of 8.9% of the examined firms assembled to order and 12.5% of the cases made to stock at least 33% of orders. Figure 2 presents the detailed distribution of manufacturing orders falling into the particular categories: engineered to order and made to order, assembled to order and made to stock.

The analysis of Fig. 2 reveals that in 15% and in 12.3% of the examined companies from 0% to 10% and from 71% to 80% of manufacturing orders is engineered to order or made to order respectively. The volume from 91% to 100% of incoming orders in 35.1% of the analyzed companies is engineered to order or made to order. It may suggest that identified group of companies applied a full postponement strategy in their operating activity.

Less than 72% of the examined companies assembled to order or made to stock from 0% to 10% of the manufacturing orders. A group of 10.5% of the analyzed firms assembled to order and 23.3% of the sample made to stock from 21% to 30% and between 11% - 20% of the manufacturing orders respectively. The results of the research may indicate that two groups of the examined companies do not apply the manufacturing postponement and full speculation postponement strategies very often and in a wide volume of fulfilled manufacturing orders.

3.2. Summary of the descriptive variables

To investigate the particular factors determining the application of the postponement strategies in Polish supply chains the variables included in the questionnaire have been grouped into a product characteristic category.

The specific product related variables were presented in Table 1.

Table 1

Product related variables determining selecting and employing an appropriate postponement strategy.

Category 1 Product characteristics

Variable 1	Number of product lines/product families
Variable 2	Percentage of sales from products that have been introduced in the last two years
Variable 3	Variety of competitive goals with different levels of relative importance
Variable 3a	The relative importance of cost reduction in a company
Variable 3b	The relative importance of quality delivered to customers
Variable 3c	The relative importance of product variety/volume
Variable 3d	The relative importance of new product design/innovation
Variable 4	Percentage of production (manufacturing) orders are in the following categories:
Variable 4a	% one of a kind
Variable 4b	% small batch
Variable 4c	% large batch

4. DATA ANALYSIS AND DISCUSSION

The category consisted of a number of variables concerning the product-related decision factors determining the possibilities of application of the full postponement strategy in Polish supply chains. The analysis of the respondents' answers is presented in Fig. 3.

The analysis of the Figure 3 reveals that companies which applied the full postponement strategy (the group of firms which engineer to order or make to order at least 61% of manufacturing orders) concentrate on manufacturing from 7 to 12 product lines or product families. It is limited number comparing to the analyzed companies which partly employ the full postponement strategy or do not employ it at all.

Figure 3 shows that the cost reduction has a low level of relative importance among companies which applied a full postponement strategy, especially in a group of organizations engineering or making to order all their products. On the contrary, the relative importance of quality delivered to the customers in the companies which implemented a full postponement strategy (the group of firms which engineer to order or make to order at least 61% of manufacturing orders) is significant. This group of companies assigned one third of points to this variable.

An interesting fact is, that two last variables illustrated in Fig. 3 reflect the lower level of importance across the whole sample of the analyzed companies. The relative importance of a product variety/ volume and a new product design/innovation is more significant for companies applying the full postponement strategy, which engineer or make to order at least 61% of products, but it still does not take a remarkable position in this group of firms.

The analysis of the next variables illustrated in Figure 4 reveals that in companies which engineer or make to order from 61% to 79% of manufacturing orders is observed the highest percentage of sales from products that have been introduced in the last two years.

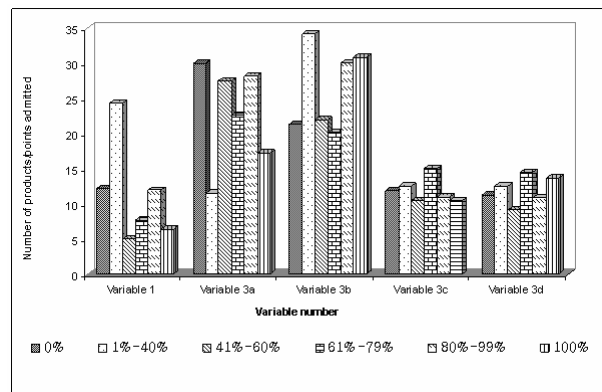


Fig. 3. The answers of respondents the selected variables of category *Product characteristics*.

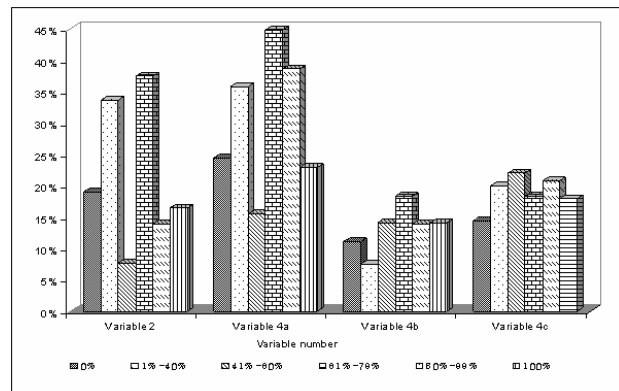


Fig. 4. The answers of respondents the selected variables of category *Product characteristics*.

Figure 4 illustrates the next variables connected with the full postponement strategy.

It is assumed that these products are at stage of introduction or growth, as the results of the other research conducted (see: [6]) in 2005 show that the average life cycle of 84% of products manufactured in Poland is at least 5 years. The next three variables analyzed the percentage of production (manufacturing) orders are in three categories: one kind (highly customized, unique products), small batch (low level of produced quantities) and large batch (mass manufactured products).

The in-depth analysis of the interdependence between the extent of full postponement application and type of production by a volume is presented in Fig. 5.

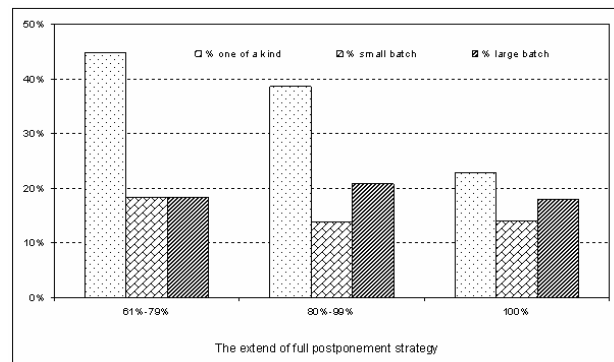


Fig. 5. The answers of respondents the selected variables of category *Product characteristics*.

It should be noted that there is a highest percentage of unique products manufactured in companies which employed a wide range of full postponement strategy. It is a dominating type of production across the sample of firms which engineer to order or make to order at least 61% of manufacturing orders.

At the same time, the percentage of manufacturing in small and large batches is relatively low and stable falling to the interval between 14% and 21% of all production orders.

The analyzed results confirm most of the fundamental product-related decision determinants which should be considered when identifying and selecting the full postponement strategy in Polish companies.

The employment of a full postponement strategy in Polish companies requires concentration on a limited number of manufactured products (from 7 to 12 product lines or product families) compared to the companies which do not implement the full postponement strategy.

The results obtained in a survey show that in a group of companies which employed a full postponement strategy, there is the highest percentage of sales coming from the products that are at the stage of introduction or growth. At the same time, the results reveal that a relative importance of the customer service (specifically quality delivered to the customers) in this group of companies is the most significant. The achieved results of research are coherent with the theory which states that the products in the stages of introduction and growth require concentration on customer service, hence a higher level of the postponement strategy. In parallel, the level of importance of the cost reduction is lower, as this variable is more preferable in companies which do not implement a full postponement strategy and products are in two final stages of a life cycle: maturation and decline.

On the basis of a survey conducted in Polish companies, two product-related variables cannot be confirmed. In a theory the product design and the product variety should be strongly taken under the consideration among companies which employed a full postponement strategy. The results show that neither a new product design/innovation nor a product variety/volume do not take remarkable positions in the opinion of companies, though it does not mean that these companies do not offer a wide range of product variety to the market customers. The analyzed companies may do it in practice, but their employers are not aware of its importance and subjectively do not consider it as the significant issue.

Last variable analyzed the level of a product customization by classifying the production orders into three subsequent groups: the percentage of unique products, the percentage of small and large batches. The results reveal that the highest percentage of manufacturing

orders in companies which employed a full postponement strategy falls into the group of product only one of its kind. The importance of production types by small and large batches is less significant in this sample of companies. These results are coherent with a theory which states that in case of a highly customized product, some degree of postponement will be profitable.

5. CONCLUSIONS

This study provides some insights into the possibilities and conditions of the implementation of full postponement strategy in Polish manufacturing companies. The results of a survey identify and explore some tendencies occurring in the analyzed companies from the perspective of postponement strategies. The obtained results are also the foundation of more profound studies connected with the concept of postponement in the context of Polish manufacturing companies, as the revealed results indicate the particular directions and the most important issues of the future research.

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