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THE RELATIONSHIPS BETWEEN POSTPONEMENT STRATEGIES AND MANUFACTURING PERFORMANCE IN SUPPLY CHAINS. AN INDUSTRIAL PERSPECTIVE

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ABSTRACT. The postponement strategy is one of the most popular concepts, widely implemented in contemporary supply chains. Generally, the postponement strategy means delaying supply chain activities purposefully, until the customers' order is received. There is a diverse degree of a delay which is mostly determined by appropriate locations of material decoupling points in a flow of products among parties in a supply chain.

Although the in-depth empirical studies have been conducted on postponement strategy, there is still a dearth of research concerning effects of different types of postponement on supply chain performance.

The paper investigates the relationships between postponement strategies and different measures of manufacturing performance in supply chains operating in several industries worldwide. In order to realize an empirical goal of the research the statistical analyses have been carried out. The conclusions of the study and directions of future research have been formulated on the basis of the obtained results.

Key words: manufacturing performance, supply chains, material decoupling points.

INTRODUCTION

The supply chain, which in the last few years has been a subject of intense research both in theoretical and practical frameworks, is currently one of the most dynamically developing concepts [Kisperska-Moron and Swierczek 2009]. On the basis of the literature review Mentzer et al. [2001a] quote more than 100 definitions of the notion 'supply chain', which concentrate and regard its many different aspects. For the purpose of this paper the supply chain is defined as "a set of three or more companies directly linked by one or more of the upstream and downstream flows of products, services, finances and information from a source to a customer"[Mentzer 2001b].

One of the most important links of supply chains are manufacturers who developed many supply chain strategies to address the problems of product proliferation and meeting exact customers' needs. Among many other strategies aiming at perfect customer service and balanced asset utilization, postponement has been identified as important characteristics of modern and competitive supply chains. Implementation of postponement may require quite significant reconfiguration of the supply chain and all companies being its links have to participate in that effort [van Hoek 1999].

Although the concept of postponement has recently been a subject of intense studies, it still faces many challenges and requires further empirical validation. One of the areas, which determines the progress in a research, is the assessment of postponement as a valuable tool enhancing the

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performance of supply chain. In the opinion of van Hoek many newer variations of postponement need further development and explanation prior to being validated in terms of performance issues [van Hoek 2001]. It may be concluded, there is a dearth of research concerning an impact of postponement strategies on supply chain performance.

The aim of the study is to investigate the relationships between postponement strategies and manufacturing performance of supply chains operating in different industries. In order to accomplish the goal, a paper was structured into several sections.

Following the introduction, the issues concerning the application of postponement strategies in supply chains have been discussed. Then, the theoretical foundation of measuring of manufacturing performance has been presented. In the empirical part of the paper a methodological framework has been developed. Next, the empirical findings obtained from the statistical analyses have been presented and discussed in a relation to the research questions. Finally, the conclusions from the results of research have been drawn and the implications for the further empirical studies are indicated.

APPLICATION OF THE POSTPONEMENT STRATEGIES IN A SUPPLY CHAIN

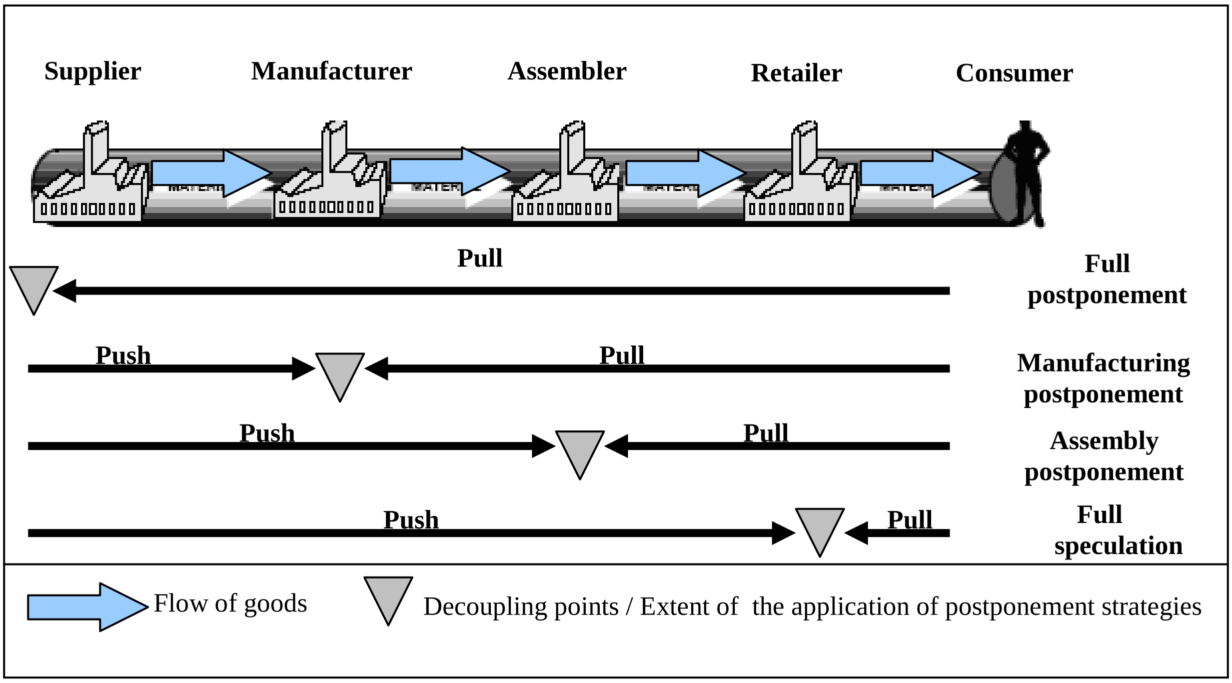
The concept of postponement has a long history not only in academic literature [Alderson 1950, Bucklin 1965] but also of practical application [e.g. Brewer and Rosenzweig 1961, Cox and Goodman 1956]. Over the years researchers changed their views concerning postponement understood once mainly as a strategy that changes the differentiation of goods according to their form, identity and inventory location to as late as possible. Nowadays postponement is considered as an organizational concept whereby some of the activities in the supply chain are not performed until customer orders are received [van Hoek 2001]. During that evolution of the concept authors were proposing different types of postponement relating it to the degree of delay when the final product reaches its shape, form or place [Yeung et al. 2007]. One can easily notice the overwhelming diversity of postponement practices and underlying complexity of the issues connected to it, both on a company and supply chain level.

The extent of application of the postponement strategy may decrease or increase gradually in the supply chains being determined by an appropriate location of material decoupling point. In the opinion of Hoekstra and Romme "the decoupling point is the point that indicates how deeply the customer order penetrates into the goods flow"[Hoekstra and Romme 1992]. The material decoupling point is a buffer between upstream and downstream partners in the supply chain. This enables them to be protected from fluctuating consumer buying behavior and therefore establishing smoother upstream dynamics, while downstream consumer demand is still met via a product pull from the buffer stock [Mason-Jones and Towill 1999]. On the left side of material decoupling point the activities are forecast driven, initiated by a push strategy, according to plans and forecasts. On the right side of material decoupling point the activities are order-driven which means they are originated by a pull strategy, according to customers' market demand.

The extent of postponement in a supply chain can be indicated by the location of material decoupling points, which are reflected in the most popular classification of manufacturing types, namely: make-to-stock (MTS), assembly-to-order (ATO), make-to-order (MTO) and engineer-to-order (ETO).

In make-to-stock manufacturing products are standardized but not necessarily allocated to specific locations; the demand is anticipated to be stable or readily forecasted at an aggregate level. In assemble-to-order system products can be customized within a range of possibilities, usually based upon a standard platform. Make-to-order is characterized by raw materials and components, which are common but can be configured into a wide variety of products. In the last manufacturing system engineer-to-order products are specially designed from engineering specifications. While the products might use some standard components, at least some of the components or arrangements of components have been specifically designed by the customer or the customer working with the producer[Naylor et al. 1999, Goldsby and Garcia-Dastugue 2003, Bozarth and Chapman 1999].

Adapting a view of Yang and Burns [2003] those four stages can determine the extent of application of postponement strategies in a supply chain: make-to-stock MTS is typical for full speculation strategy, assembly-to-order ATO refers to assembly postponement, make-to-order MTO is linked to manufacturing postponement and engineer-to-order ETO corresponds to full postponement. Those points develop a continuum indicating different extent of application of the postponement strategies in supply chains - Fig.1. Therefore, the location of material decupling point is often perceived as a primary tool to indicate an extent of the application of postponement strategies in the supply chains.



Source: Hoekstra, Romme, 1999

Fig. 1. Potential locations of material decoupling points indicating the extent of application of postponement strategies in the supply chains
Rys. 1. Potencjalne lokalizacje materiałowych punktów rozdziału wskazujące na zakres stosowania strategii odraczania w łańcuchach dostaw

PERFORMANCE MEASURES OF MANUFACTURING PRACTICES

A large number of different types of performance measures have been used to characterize systems, particularly production, distribution, and inventory systems. Such a large number of available performance measures makes their selection difficult. Generally, performance measurement research focuses on analyzing performance measurement systems that are already in use, categorizing performance measures and then studying the measures within a category [Beamon 1999]. The measurement is recognized to be a vital issue for identifying the problems, improving and increasing productivity. To achieve this, it is necessary to establish appropriate metrics for measurement purposes.

One of the most important measures is manufacturing performance. Hayes and Wheelwright [1984] claim that manufacturing is considered to be an important element of firm's endeavor to improve company performance. Measuring manufacturing practices has been based on the assumption that given performance level is a result of certain management processes and it is an outgoing point for further analysis of competitive factors contributing or limiting constant improvements in that field. Defining proper measures is a key step in the whole process, especially because these measures may vary depending on the conditions and circumstances in a particular country or even industry sector.

Very often the measurement of the manufacturing process may be more accurate by measuring the result of the activity, i.e. business performance. There are several different opinions on what exact aspects of purchasing performance should and could be measured [Kisperska-Moron and Swierczek 2007].

Many researches have studied and identified variation in manufacturing processes that reduce product quality and increase the overall costs of operation. Subsequently, several indices were presented to assess the efficiency of manufacturing process. Maull [1992] argues that the value of the products/items affects the volume by value of the items being phased-out, and, thus, the potential scrap costs. The average scrap rate in phase-in/out is a very good measure of manufacturing process efficiency. The scrap rates belong to a group of indices, which assesses the internal failure costs of manufacturing. It reflects the failures in achieving the specified quality [Bamford and Land 2006]. General manufacturing scrap embraces the following manufacturing process characteristics: materials supply scrap level, manufacturing scrap level and final product scrap level. They are used to assess the performance manufacturing efficiency. Materials supply scrap level describes the percentage of a materials supply batch that is scrapped, manufacturing scrap level concerns the percentage of a manufacturing batch that is scrapped [Wanstrom and Jonsson 2006] and final product scrap level indicates the percentage of a final distribution product that is scrapped.

The other performance dimension often linked to the manufacturing efficiency is productivity [Chew 1988] which is seen as one of the most vital factors affecting a manufacturing company's competitiveness [Steenhuis and de Bruijn 2006]. Productivity is the ratio of actual output to input over a period of time. Inputs might include transforming and transformed resources, such as staff and equipment. Outputs are goods and services [Slack et al. 2001, Tangen 2005].

In its simplest form, labor productivity could be defined as the hours of work divided by the units of work accomplished [Thomas 1994]. Another productivity dimension which have been studied for several decades is the productivity of manufacturing facilities. It is a metric used for measuring and analyzing the productivity of individual production equipment in a factory. Equipment productivity metric assess an internal efficiency and it is a measure of the value added in a manufacturing process by an equipment [Johnson and Lesshammer 1999].

Beamon [1999] enumerates different measures, namely: flexibility, resource and output. Flexibility is a firm's ability to respond changes in products, delivery times, volume and mix. Therefore, it may include new product flexibility, delivery flexibility, volume flexibility. Resource measures are concerned with the efficiency in using the resources in manufacturing process. It includes costs of using several resources, inventory levels in a supply chain, and return on investments. Output measures include customer satisfaction in terms of on-time deliveries, order fill rate, response time, sales quantities, and profit [Gunasekaran et al. 2001].

Another important group includes time-based performance measures. Generally they reflect the companies' ability to reduce lead times relative to manufacturing a product [Jayaram et al. 2000].

METHODOLOGY

Sample characteristics and data collection

The sample was compiled from surveys of manufacturing firms and consisted originally of 861 manufacturers. As a result of initial data analysis, screening and elimination of observations with missing values 305 companies remained as a subject of further analysis. The respondents were mainly small and medium-sized companies. Those groups embraced mainly manufacturers from USA (28 %), Fiji (19%), China and Shanghai (19%), Poland (12%), Hungary (11%) and others.

The majority of the surveyed companies operate in electronic and other electrical equipment industry (38%), followed by industrial and commercial machinery equipment (19%), fabricated metal products (13%), food industry (12%), chemicals (7%), primary metal products and stone, clay, glass, concrete products - each industry constitutes 5% of the sample. The sample breakdowns were graphically illustrated in Figures 2 and 3.

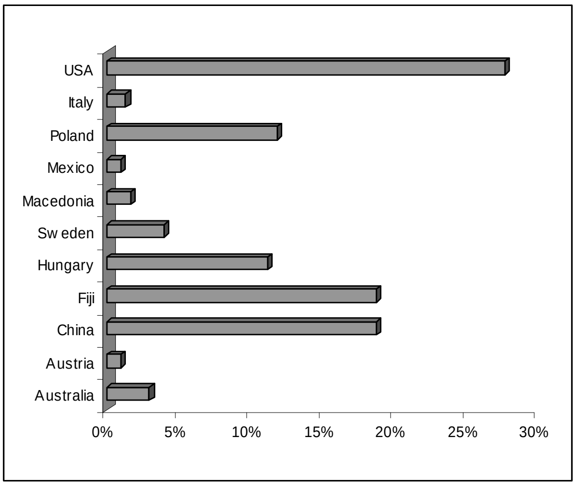


Fig. 2. The sample breakdown by country of origin
Rys. 2. Struktura próby badawczej ze względu na kraj pochodzenia

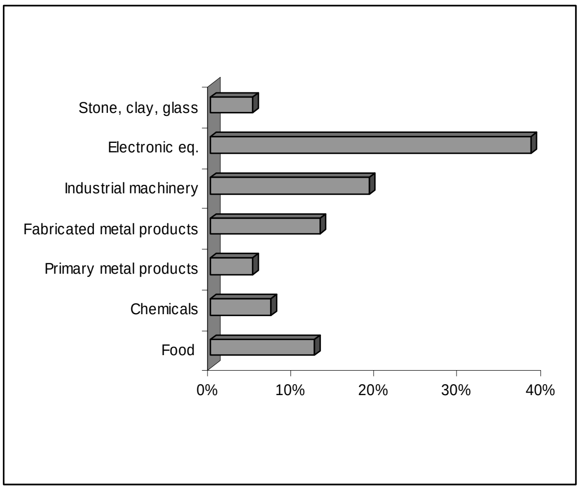


Fig. 3. The sample breakdown by industry type
Rys. 3. Struktura próby badawczej ze względu na rodzaj przemysłu

The main research instrument used for this study was a questionnaire developed by the Global Manufacturing Research Group consisting of several sections examining manufacturing practices. There is no single meta-theory for guiding a development of GMRG survey. Instead, many aspects of general manufacturing practices were a subject of investigation. Data collected within a fourth release of a survey has been gathered between 2006 and 2008 by researchers from several countries in Europe, North America, Asia, and Africa. The survey was a random sample of firms in a given geographical area [Vestag and Whybark 2005]. For the purpose of the research presented in this paper only a portion of selected variables has been used. Originally 31 (27 independent and 4 dependent) variables were a subject of initial analysis.

Research questions and methods

The aim of the study is to explore the relationships between postponement strategies and manufacturing performance of supply chains in different industries. In order to realize an empirical aim of the study, two research questions were raised, namely:

RQ1: What are the significant indices of manufacturing performance in investigated supply chains?

RQ2: Which aspects of manufacturing performance should be considered while implementing the postponement strategies in supply chains operating in different industries worldwide?

In order to answer the research questions a two-step statistical analysis was employed. The first step was the reduction of the 27 independent variables through Exploratory Factor Analysis EFA. Those variables reflected multidimensional indices of manufacturing performance. In order to perform the factor analysis a Principal Component Analysis (PCA) with Varimax Rotation was employed. The analysis was conducted on standardized variables.

In the result of EFA an anti-image correlation matrix has been obtained. Its inspection has led to the elimination of 4 variables whose a measure of individual sampling adequacy is below a nominal cut off point of 0.5. Additionaly, in the result of factor analysis 7 variables were excluded as they indicated factor loadings below a nominal cut-off point of 0.65. Finally, the factor analysis which was carried out on 15 items, revealed the following structure of constructs:

Factor 1: Cost and flexibility (direct manufacturing costs, total product costs, flexibility to change output volume, flexibility to change product mix),

Factor 2: Product's characteristics (product features, product performance, perceived overall product quality),

Factor 3: Manufacturing productivity (labor productivity, equipment productivity),

Factor 4: Internal failures of manufacturing process (rejects of incoming material, rejects during processing - scrap rate, rejects at final inspection),

Factor 5: Manufacturing time performance (manufacturing throughput time, set-up time in the production elapsed time, processing time in the production elapsed time).

The number of 5 factors was determined according to the analysis of the percentage of variance explained and the Kaiser criterion [Aczel 1993]. KMO coefficient score indicating a suitability of the sample for factor analysis in a space of 15 variables is 0.715 which in the opinion of Kaiser, is a middling result [Bryman and Cramer 1999], but sufficient for larger samples, such as 305 companies. Bartlett's test of sphericity demonstrated sufficiently high value for the extracted factors at $p <= 0.000$ (Approx. chi-square 1638.9, df = 120). This result proves that the difference between correlation matrix of the components and identity matrix is significant.

In the second stage of the analysis multiple regression analysis was developed. It enabled to make a cross-industrial comparisons of the contribution to variance.

Four items were selected as dependent variables based on their relevance as indicators of the extent of postponement in a supply chain. They defined a percent of manufacturing orders falling into four categories: engineer-to-order (full postponement), make-to-order (manufacturing postponement), assembly-to-order (assembly postponement) and make-to-stock (full speculation).

Multiple regression models were developed for each of the five factors with the four dependent variables. The primary reason for using multiple regression was to generate values of adjusted R^2 (with the values above .05) for comparison of the strength of relationship and the strength of contribution of variance. Only variables with observed p-values of less than 0.05 were kept in developed models. Although, initially seven industries were a subject of the analysis, three of them indicated no significant associations among postponement strategies and manufacturing performance factors. Therefore, only four out of seven industries were then employed for the further analysis.

RESULTS OF THE ANALYSIS

The obtained results of the regression analysis allow to notice some significant relationships between the dependent variables reflecting the types of postponement strategies and the independent factors.

There are many significant associations between postponement strategies and cost/ flexibility factor. Full postponement strategy is related with cost and flexibility dimensions in food industry and chemical products. This factor is also important for manufacturing postponement in food industry and assembly postponement in stone, clay, glass and concrete products. The obtained results seem to be rather logical, as the greater extent of postponement triggers the higher level of costs and raises flexibility. It should be noted that the flexibility of changing output volume and product mix contribute to the higher level of product's customization. The observations made by Ahlstrom and Westbrook [1999] suggest that the negatives associatied with product customization have most to do with increased cost. One reason why this occurs may be that the production system incurs a premium cost for the increased flexibility because the manufacturing has not evolved into a full customization, but continues also to produce batches of standard products. This also confirms the previous research showing that in many industries postponement is considered to be a supply chain strategy for mass customization [Feitzinger and Lee 1997, Kotha 1995, Lampel and Mintzberg 1996]. The obtained results of this study suggest that essentially those industries are food and chemical sectors. It is also interesting to indicate that in a primary metal industry greater extent of postponement has no significant association with cost and flexibility factor. This may be partially caused by not a large extent of application of postponement in a primary metal sector.

There are three significant associations between postponement strategies and another performance factor - product's characteristics. The quality attributes of products seem to be particularly important for food industry and stone, clay, glass, concrete products. However, it is interesting to observe that this performance factor is significantly associated both with manufacturing postponement and full speculation strategies. It may suggest that in a food industry manufacturing postponement affects the product's characteristics as the manufacturing technology determines the quality of groceries. Very similar explanation may be addressed to stone, clay, glass, concrete products. The manufacturing performance in terms of qualitative characteristics of products is depended on the technology of manufacturing process. Presumably that is the major reason why manufacturing postponement has relationships with the product's characteristics. The strong association is also observed between full speculation strategy and product's characteristics in a food industry. It should be noted that the groceries are very sensitive products whose qualitative parameters affect people's health and sometimes even life. Therefore, it is important to keep the standards not only during manufacturing of food, but also meet certain criteria of quality during storage and transportation of groceries in a distribution process. This may partially explain the link between full speculation strategy and product's characteristics. The other products, such as stone, clay, glass, concrete are not so sensitive, and for example, may be exposed to unfavorable weather conditions (sun, high temperatures, rain, snow etc.) and, in general, they will not lose their original parameters of quality.

The other manufacturing performance measures indicating the failures in achieving the specified quality are scrap rates. The results suggest that a full postponement is significantly associated with an internal failure of manufacturing process in food industry, chemicals/allied products and primary metal industry.

On the other hand, manufacturing postponement is significantly linked to this performance factor in a chemical sector and stone, clay, glass, concrete products. It is interesting to observe that the significant associations are found with only two postponement strategies in all examined industries.

The results suggest that this factor plays specifically important role for a larger extent of application of postponement. The observed tendencies may indicate that the internal failures in manufacturing are particularly important when the activities are customized and initiated by a real customer demand. In a full postponement strategy the whole flow of products is pull-driven from the supplies of raw materials, through processing and distribution of final products. This may partially explain the importance of failures of manufacturing process in a full postponement strategy as each supply of raw material, processing and sale of product is based on real market data and has to be checked thoroughly at all stages of the product flow. The smaller extent of the application of postponement strategy may not have a significant relationships with the failures of manufacturing process as the products are producted and delivered on mass scale and it may be assumed that the potential irregularities of that performance factor are rather common and do not cause overwhelming disruptions in operations.

The last performance measure indicating significant associations with postponement strategies is manufacturing time. The relationships with manufacturing time are found in all industries only for two types of postponement strategies, namely manufacturing and assembly postponement.

In chemical and primary metal industries time performance seems to be particularly important for manufacturing postponement. On the other hand, an assembly postponement strategy is significantly associated with manufacturing time performance in food, chemical and stone, clay, glass and concrete sectors. It may prove that manufacturing as well as assembly postponement can be perceived as time-sensitive strategies which have to deal with the compression of logistics time flow of products from production through distribution in the examined industries. This may also suggest that the consumers want to purchase customized products but, at the same time, they also do not like an idea to wait too long for individualized products offered by supply chains. In fact, a location of material decoupling points typical for manufacturing and assembly strategies enable the companies to produce and deliver commodity according to high time standards imposed by consumers. This is consistent with the research conducted by Yang et al. [2004] who claim that typically the implementation of postponement might lead to increasing cycle time. In order to reach a consistency between manufacturing, assembly postponement and time compression some companies decide to apply just-in-time or quick response strategies and use tools enabling to reduce lead time [van Hoek 2001, Aviv and Federgruen 2001].

An interesting issue is that both full postponement and full speculation strategies do not indicate any significant associations with manufacturing time performance. It may suggest that in a full postponement consumers are not sensitive to time reduction, especially when purchasing extremely luxury products. Full postponement strategy is implemented when customers are participating in the process of engineering the product meeting exact, very refined customers' needs. In that situation the consumers or final users of products are aware they have to wait for a product, even if they have to spend a huge amount of money for the product. On the other hand, speculation strategy is not associated with time performance as the reduction of cycles is not an issue of critical importance. In a full speculation strategy the supply chains should ensure the products' availability. It means that the consumers are not willing to wait for product at all and want to purchase a desired product at once while shopping. This situation mostly concerns fast moving goods. For this reason there are no significant associations between full postponement and full speculation strategies, and manufacturing time performance in any of the examined industries. As in both strategies time performance is not important, their associations with that performance factor is very weak or not significant.

It should be noted that one performance measure, namely manufacturing productivity has no significant associations with any type of postponement strategies. It may suggest that postponement strategies do not influence manufacturing productivity in the examined industries.

The purpose of the paper was to investigate relationships between postponement strategies and manufacturing performance in supply chains operating in several industries worldwide.

Answering the research question no. 1 (What are the significant indices of manufacturing performance in investigated supply chains?) the study indicated five groups of indicators measuring different dimensions of manufacturing performance in supply chains. The measures concern basic dimensions of manufacturing practices in investigated supply chains, namely cost, flexibility, product's characteristics, manufacturing productivity, internal failures of manufacturing process, manufacturing time performance.

Answering the research question no. 2 (Which aspects of manufacturing performance should be considered while implementing the postponement strategies in supply chains operating in different industries worldwide??) the study shows that there are several significant associations between different types of postponement strategies and manufacturing performance measures in supply chains operating in several industries worldwide. The supply chains in the examined industries (food and kindred products, chemicals and allied products, primary metal industry, stone, clay, glass, concrete products) report different relationships between postponement strategies and manufacturing performance. It is definitely conditioned upon a number of factors connected to the technological issues, complexity of manufacturing process, types of products and general conditions of their storage, transport and packing, consumer demand, adopted organization of supply chain etc.

The general comparison of industries in terms of the relationships between postponement and manufacturing performance in supply chains shows that the examined types of postponement strategies indicate the associations with the measures of manufacturing performance to a different extent. The study reveals that there are different levels of postponement in supply chains operating in examined industries (some strategy may even not exist). On the other hand, some types of postponement are not linked with manufacturing performance which may suggest they do not contribute to an overall efficiency of supply chains.

FUTURE DIRECTIONS OF FURTHER RESEARCH

This empirical study, apart from providing some insights into the relationships between postponement strategies and manufacturing performance of supply chains operating in several industries, also highlights some areas of future research. An important element is the investigation of the impact of postponement strategies on the levels of supply chain performance, including, apart from manufacturing, also other functional areas of supply chains. The other issues requiring in-depth studies are differences in relationships among postponement strategies and supply chain performance between countries. Next detailed issue which needs to be investigated is building a general, empirical model showing the significant relationships between postponement strategies and supply chain performance.

REFERENCES

Aczel, A.D., 1993, Complete Business Statistics, Second Edition, Boston, Massachusetts.

Alderson W., 1950, Marketing efficiency and the principle of postponement, Cost and Profit Outlook 3, Spring.

Ahlstrom P., Westbrook R., 1999, Implications of mass customization for operations management: An exploratory survey, International Journal of Operations & Production Management, 19 (3), 262 - 275.

Aviv Y., Federgruen A., 2001, Design for postponement: a comprehensive characterization of its benefits under unknown demand distributors. Operations Research, 49 (4), 578-598.

Bamford, D.R., Land, N., 2006, The application and use of the PAF quality costing model within a footwear company, International Journal of Quality & Reliability Management, 23 (3), 265-278.

Beamon B.M, 1999, Measuring supply chain performance, International Journal of Operations & Production Management, 19 (3), 275 - 292.

Bozarth, C., Chapman, S., 1999, A contingency view of time-based competition for manufacturers, International Journal of Operations and Production Management, 16 (6), 56-67.

Brewer S.H., Rosenzweig J., 1961, Rhochrematics, California Management Review, 2:3, Spring, 52-71.

Bryman, A., Cramer, D., 1999, Quantitative Data Analysis with SPSS Release 8 for Windows. A Guide for Social Scientists, Routledge, London.

Bucklin P., 1965, A theory of distribution channel structure, CA:IBER Special Publication, Berkeley.

Chew, W., 1988, No-nonsense guide to measuring productivity, Harvard Business Review, 66 (1), 110-118.

Cox R., Goodman C.S., 1956, Marketing of House Building Materials, The Journal of Marketing, 21:1, July, 36-57.

Feitzinger E., Lee H. L. , 1997, Mass Customization at Hawlett-Packard: The power of postponement. Harvard Business Review, 16-121.

Goldsby, T.J., Garcia-Dastugue, S., 2003, The Manufacturing Flow Management Process, International Journal of Logistics Management, 14 (2), 33-52.

Gunasekaran A., Patel, C., Tirtiroglu, E., 2001, Performance Measures and Metrics in a Supply Chain Environment, International Journal of Operations & Production Management, 21 (1-2), 71-87.

Hayes, R. H. Wheelwright, S.C. ,1984, Restoring Our Competitive Edge: Competing through Manufacturing, Wiley, New York, NY.

Hoekstra, S., Romme, J., 1992, Integrated Logistics Structures: Developing Customer Oriented Goods Flow, Mc-Graw Hill, Maidenhead.

Jayaram J., Vickery S.K., Droge C., 2000, The effects of information system infrastructure and process improvements on supply-chain time performance, International Journal of Physical Distribution & Logistics Management. 30 (3/4), 314-330.

Johnson, P., Lesshammer, M., 1999, Evaluation and improvement of manufacturing performance measurement systems - the role of OEE, International Journal of Operations & Production Management, 19 (1), 55-77.

Kisperska-Moron, D., Swierczek, A., 2009, The agile capabilities of Polish companies in the supply chain: An empirical study, International Journal of Production Economics, 18, 217-224.

Kotha S., 1995, Mass Customization: implementing the emerging paradigm for competitive advantage. Strategic Management Journal, 16, 21-42.

Lampel J., Mintzberg H., 1996, Customizing Customization, Sloan Management Review, 38 (1), 21-30.

Mason-Jones, R., Towill, D.R., 1999, Using the Information Decoupling Point to Improve Supply Chain Performance, International Journal of Logistics Management, 10 (2), 13-26.

Maull, R., Hughes, D., Bennett, J., 1992, Role of the BOMs as a CAD/CAPM interface and the key importance of engineering change control, Computing & Control Engineering Journal, 3 (2), 63-70.

Mentzer, J.T., DeWitt, W., Kebbler, J.S., Min, S., Nix, N.W., Smith, C.D., 2001, Defining supply chain management, Journal of Business Logistics, 22 (2).

Mentzer, J.T. (ed.), 2001, Supply Chain Management, Sage Publications, Thousand Oaks California.

Naylor, J.B., Naim, M.M., Berry, D., 1999, Leagility: Integrating the Lean and Agile Manufacturing Paradigms in the Total Supply Chain, International Journal of Production Economics, 62, 107-118.

Slack, N., Chambers, S., Johnston, R., 2001, Operations Management, 3rd ed., Prentice-Hall, Harlow.

Steenhuis, H.-J. , de Bruijn, E. J., 2006, International shopfloor level productivity differences: an exploratory study, Journal of Manufacturing Technology Management. 17 (1), 42-55.

Tangen, S., 2005, Demystifying productivity and performance, International Journal of Productivity and Performance Management. 54 (1), 34-46.

Thomas, R.H., 1994, Effects of scheduled overtime on labor productivity, Journal of Construction Engineering and Management, 118 (1), 60-67.

van Hoek R., 1999, Postponement and the reconfiguration challenge for food supply chains, Supply Chain Management, 4 (1), 18-34.

van Hoek R., 2001, The rediscovery of postponement: a literature review and directions for research. Journal of Operations Management. 19 (2), 161-184.

Vestag, G., Whybark D.C., 2005, Inventory management: Is there a knock-on effect? International Journal of Production Economics. 93-94, 129-138.

Wanstrom, C., Jonsson, P., 2006, The impact of engineering changes on materials planning, Journal of Manufacturing Technology Management. 17 (5), 561-584.

Yeung J.H.Y., Seles W., Deming Z., Min Z., 2007, Postponement strategy from a supply chain perspective: cases from China, International Journal of Physical Distribution & Logistics Management, 37 (4), 333.

Yang B., Burns N.D., 2003, Implications of postponement for supply chain, International Journal of Production Research, 41 (9), 2075-90.

Yang B., Burns N.D., Backhouse C.J., 2004, Postponement: a review and an integrated framework. International Journal of Operations and Production Management. 24 (4), 468-487.

ZALEŻNOŚCI MIĘDZY STRATEGIAMI ODRACZANIA I WYNIKAMI DZIAŁALNOSCI PRODUKCYJNEJ W ŁAŃCUCHACH DOSTAW. UJĘCIE SEKTOROWE.

STRESZCZENIE. Strategia odraczania to jedna z najbardziej popularnych strategii, stosowana na szeroką skalę we współcześnie funkcjonujących łańcuchach dostaw. Polega ona na celowym opóźnianiu działań w łańcuchu dostaw aż do momentu otrzymania zamówienia od klienta. Różny stopień tego opóźnienia jest zależny głównie od lokalizacji materiałowych punktów rozdziału w przepływie produktów między ogniwami łańcucha dostaw. Pomimo wielu dogłębnych studiów empirycznych dotyczących strategii odraczania, nadal występuje niedostatek badań dotyczący wpływu różnych typów strategii odraczania na wyniki osiągane przez łańcuchy dostaw.
W pracy zaprezentowano zależności występujące między strategiami odraczania i różnymi wskaźnikami działalności produkcyjnej w łańcuchach dostaw funkcjonujących w kilku wybranych gałęziach przemysłu na całym świecie. W tym celu przeprowadzono analizy statystyczne. Na podstawie otrzymanych wyników sformułowano wnioski oraz wskazówki dotyczące kierunku przyszłych badań.

Słowa kluczowe: wyniki działalności produkcyjnej, łańcuchy dostaw, materiałowe punkty rozdziału.

DIE BEZIEHUNGEN ZWISCHEN VERSCHIEBUNG STRATEGIEN UND PRODUKTIONSLEISTUNG IN LIEFERKETTEN

ZUSAMMENFASSUNG. Die Verschiebung Strategie ist eine der populärsten Konzepte, die oft gegenwärtig innerhalb der Lieferketten implementiert ist. Es geht um absichtliche Verzögerung bestimmter Aktivitäten in der Lieferkette bis den Eingang der Kundenbestellung. Es gibt ein vielfältiges Grad der Verzögerung, die von der Entkopplung Punkte im Materialfluss zwischen verschiedenen Partner in der Lieferkette abhängig ist. Trotz vieler eingehender empirischer Untersuchungen über die Verschiebung Strategie, gibt es noch ein Mangel an Forschung über die Auswirkungen der verschiedenen Arten der Verschiebung auf die Leistung der Lieferkette.

Der Artikel präsentiert die Beziehungen zwischen den Verschiebung Strategien und verschiedene Indikatoren der Produktionsleistung in der Lieferkette von ausgewählten Branchen weltweit. Zur Erreichung des empirischen Ziel der Forschung wurden die statistischen Analysen durchgeführt. Die Schlussfolgerungen der Studie und Richtungen der künftigen Forschung wurden auf der Grundlage der erhaltenen Ergebnisse formuliert.

Codewörter: Produktionsleistung, Lieferkette, Entkopplung Punkte.

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