The Effect of Sales Planning Practices on Manufacturing Strategy. An International Comparative Study.

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Proper competitive strategy is the means of survival and development for manufacturing companies. In this vein, the producers should perceive a manufacturing strategy as the issue of crucial importance for their market position. It describes the use of manufacturing as a competitive weapon, as opposed to a function that is passive with respect to its competitive environment.
Manufacturing companies differ in the way they meet the demand for their products. Some deliver products to their clients from finished goods inventories as their production anticipates customers' orders; others, however, manufacture only in response to customers' orders. In this connection the emphasis of manufacturing strategies is now more to competition in terms of time and customization. Time competition requires an emphasis on time which should not be wasted and is supported by fewer and faster activities being performed. On the other hand, customization means performing some activities according to the unique requirements of an individual customer. Competition in terms of time and customization is reflected in one of the most popular classification of manufacturing strategy, namely: make-to-stock (MTO), assembly-to-order (ATO), make-to-order (MTO) and engineer-to-order (ETO). The application of the strategy may determine the extent the producers use forecasting techniques, combine environmental and market data into forecasting process and prepare forecasts for specific purposes.
The goal of the paper is to make a cross-national comparison of the effect of forecasting practices on different types of manufacturing strategies applied in 343 producers from Europe, Asia and Africa. In order to achieve an empirical aim a necessary methodology and statistical analyses have been employed. In the result of the analysis multiple regression models have been developed for specific manufacturing strategies of producers from different countries worldwide. It enabled to make cross-national comparisons of the contribution to variance in manufacturing strategy.

1. MANUFACTURING STRATEGIES IN THE COMPANY

Customer requirements and their implications determine an operations strategy in manufacturing enterprises. Manufacturing companies differ in the way they meet their demand. Some deliver products to their clients from finished goods inventories as their production anticipates customers' orders; others, however, manufacture only in response to customers' orders. Those two situations are connected to different transactional standards of customer service, namely the customer's sensitivity to product availability and delivering unique products adjusted to the individual customer's requirements. In this connection the emphasis is now more and more to competition in terms of time and customization. Time competition requires an emphasis on time which should not be wasted and is supported by fewer and faster activities being performed[1]. On the other hand, customization means performing some activities according to the unique requirements of an individual customer[2]. Competition in

[1] Stalk, G., *Time – the next source of competitive advantage*, Harvard Business Review, July-August 1988

[2] Wikner, J., Rudberg, M., *Integrating production and engineering perspectives on the customer orderdecoupling point*, International Journal of Operations & Production Management Vol. 25 No. 7, 2005, pp. 623-641

terms of time and customization is reflected in the most popular classification of manufacturing types, namely: make-to-stock (MTO), 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[3][4][5].

Competition in terms of time requires adopting make-to-stock strategy in order to meet immediately customer's order from inventory. On the other hand, creating unique products is only possible if the customer can influence its properties which means that the product to some extent is engineered-to-order, made-to-order or at least assembly-to-order. Consequently, to customize products, some production-related activities are influenced by customer requirements, whereas others are not[6].

The adopted manufacturing strategy may determine the extent the companies apply pull and push concepts in practice. Assembly to order and make to stock strategies are more connected to push concept where the activities are forecast driven, initiated by prior plans and forecasts. The engineer and make to order strategies are more involved in performing a pull concept where the prevailing activities are order-driven which means they are originated by the real customers' market demand. The relationships between a specific manufacturing strategy and pull/push concepts are illustrated in Figure 1.

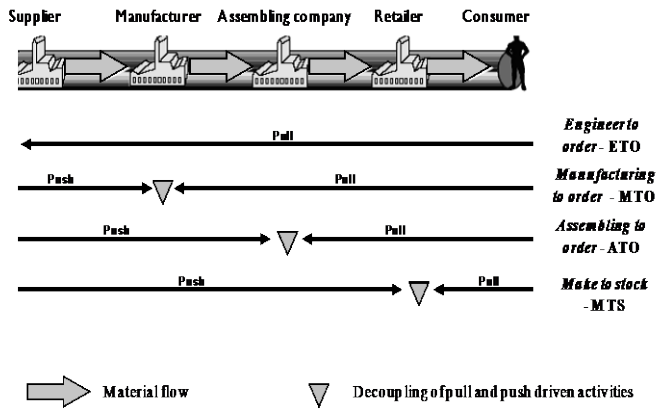

Figure 1. The extent of application of pull/push concepts determined by a specific manufacturing strategy Adopted from: S. Hoekstra, J. Romme: Integrated logistics structures: Developing Customer Oriented Goods Flow, McGraw-Hill 1999, London.

In order to practically apply a manufacturing strategy, it is necessary to possess specific input data being a basis for decision making process. Decisions may be either made on the basis of the accurate and valuable data, typical for pull concept or plans and forecasts, common for a push approach. Regarding a mutual relationship between a type of manufacturing strategy and input data in a decision making process, one can identify three inextricably linked regulation mechanisms illustrated in Figure 2, namely:

- Purely order driven manufacturing activities;
- Manufacturing activities initiated on the basis of forecasts enriched with real sales data;
- Purely forecast driven manufacturing activities.

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

[4] Goldsby, T.J., Garcia-Dastugue, S., *The Manufacturing Flow Management Process*, International Journal of Logistics Management, Vol. 14, No.2, 2003, pp. 33-52

[5] Bozarth, C., Chapman, S., *A contingency view of time-based competition for manufacturers*", International Journal of Operations and Production Management, Vol. 16, No. 6, 1996, pp. 56-67

[6] Wikner, J., Rudberg, M., *Integrating production and engineering perspectives on the customer orderdecoupling point*, International Journal of Operations & Production Management Vol. 25 No. 7, 2005, pp. 623-641

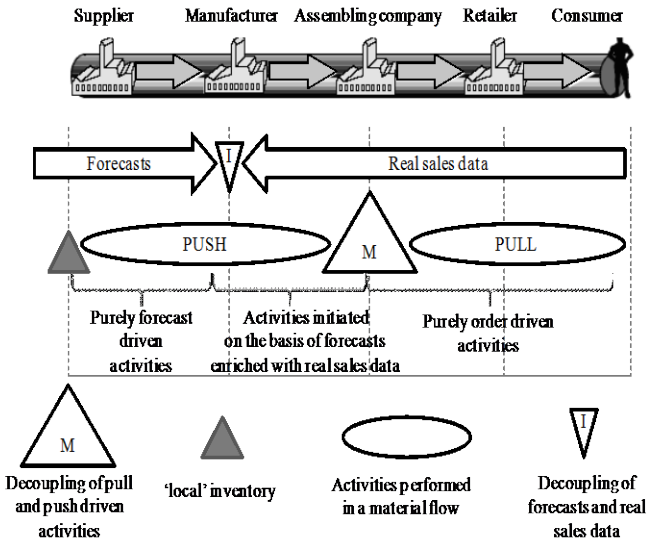

Figure 2. An exemplary relationship between a manufacturing strategy (i.e. assembly to order) and input data in a decision making process

Adapted from: M. Soltysik, A. Swierczek: Podstawy zarządzania łańcuchami dostaw. AE, Katowice, 2009. [eng. M. Soltysik, A. Swierczek: Fundamentals of Supply Chain Management, AE, Katowice, 2009]

As depicted in Figure 2, a purely order manufacturing activities are performed on the basis of actual customer orders. The companies performing those activities are located on the right side from the point decoupling the pull and push driven activities.

They have an access to the real market data obtained from incoming customer orders or points of sales. It allows those companies to employ a purely pull approach increasing a responsiveness and enabling a significant cost reduction of performed manufacturing operations.

The combination of the pull and push approaches is reflected in a second manufacturing regulation mechanism. The manufacturing activities are initiated on the basis of forecasts however, the companies have still an access to the real customer data. This suggests that market information is not used for a decision making process, and demand data can only be used for an improvement of forecasts in order to enhance the operating capabilities to deliver a higher service level. The other prerequisite for employing a push concept is a lack of proper information and data unavailability in time for a quick reaction in performing manufacturing activities in line with a pull approach.

The purely forecast driven mechanism denotes that the companies, located on the left side from the point decupling the pull and push driven activities, do not receive direct demand information from points-of-sales or customer orders. It makes them difficult to respond to the real market expectations. Therefore, the links originate the activities according to prior plans and forecasts, and their ability to fulfill customer demand in a proper way ensuring a desired customer service depends on the quality and reliability of predicted future sales and, more general, undertaken sales planning practices. The latter ones are here an ingredient of a crucial significance for efficiency of decision making process.

It ought to be indicated that the forecast activities play an important role for an application of a purely push approach and may also be combined with a real customer data improving plans of sales. In this vein, a sales planning process enables to implement a desired manufacturing strategy. In order to investigate a role of sales planning practices in a specific manufacturing strategy, the considerations should not be limited to the production process itself. Contrary, the scope of the analysis ought to be extended on the input and output flows, whose organization is most often subordinated to the particular type of production process. It is a consequence of employing a holistic approach to the physical flow of raw materials (as an input batch to a production process), semi finished goods in a manufacturing and assembly, and commodities (in the distribution process to the customers). As depicted in Figure 2, there may be a diverse contribution of sales planning practices and their characteristics in a particular manufacturing strategy regarding country-specific perspective. Therefore, it seems to be interesting to investigate a cross national contribution of selected sales planning practices to apply a specific manufacturing strategy.

2. THE CHARACTERISTICS OF SELECTED SALES PLANNING PRACTICES PERFORMED IN MANUFACTURING FIRMS

Manufacturing strategy depends on the demand. The demand determines which strategy might be applied. When the demand is stable and its varia-

bility is low, the make-to-stock strategy (MTO) seems to be the most appropriate to use. In other case, more proper is to implement other strategies such as: assembly-to-order (ATO), make-to-order (MTO) or engineer-to-order (ETO). A valuable demand management process can enable a company to be more proactive to anticipated demand, and more reactive to unanticipated demand[7].

Sales planning is embedded in a wider concept of demand management. Demand management strives to manage all the activities associated with discovering markets, planning products or services for those markets and then fulfilling the customer's needs. It is an integrated process across the manufacturing supply chains. When the demand management process is implemented within the structure of the organizations more appropriate term for that process is sales planning.

Hardly ever, the volume of sales is the same as volume of demand, but sales is recorded in a software and the demand is not. Sales are the activities involved in selling products or services in return or exchange for money or other compensation. This is an act of completion of commercial activity. The term demand signifies the ability or the willingness to buy products by the customers.

Sales planning consists of several elements inextricably linked, namely: input data and forecasting.

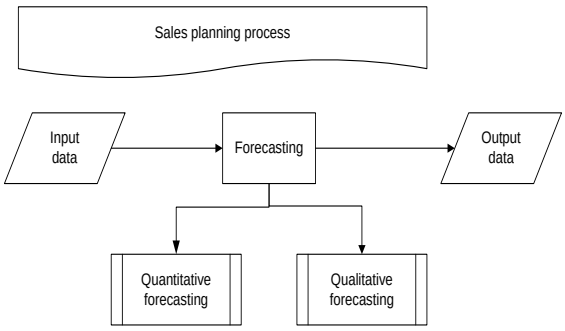

Figure 3. Sales planning process

Input data are: marketing and sales input, statistical analysis, business plan and strategy and product/brand management[8].

Figure 4. Sources of information for sale planning process

Source: Olivier Wight Companies, Olivier Wight ABCD Checklist for operational Excellence, John Wiley & Sons, USA 2001

The data used in forecasting process should be divided into two groups: internal and external data. Acting in an integrated environment, it is possible to get forecast burdened small forecast error. Than the control over the forecasting process wouldn't be lost.

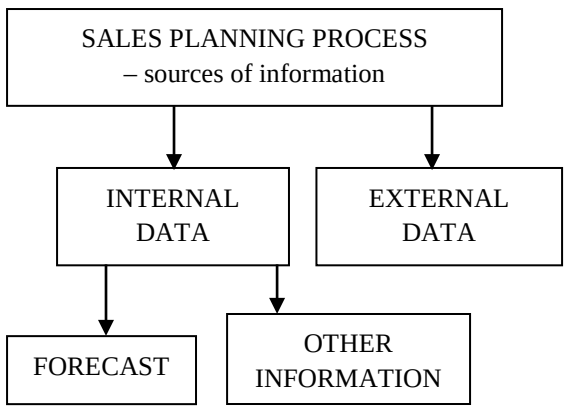

Figure 5. Sources of information used in forecast process

[7] Croxton, K.L., Lambert, D.M., Garcia-Dastugue, S. and Rogers, D.S., *The Demand Management Process*, The International Journal of Logistics Management, Vol. 13, No. 2, 2002, pp. 51-66

[8] Crum, C. and Palmatier, G.E., *Demand management best practices: process, principles, and collaboration*, Integrated Business Management Series, J.ROSS Publishing, USA 2003

Internal data which is needed in the planning process is mainly the results of sales forecast and other information necessary to determine the company sales capabilities. Two main methods of sales forecast can be identified[9]:

1. quantitative forecasting,
2. qualitative forecasting.

Classification of forecasting methods into those two categories is based on the availability of historical time series data.

Quantitative forecasting methods are used when the historical data on variables of interest are available - these methods are based on an analysis of historical data concerning the time series of the specific variable of interest and possibly other related time series. Quantitative forecasting can be categorized into two types of models. The first type, causal models, uses independent variables instead of (or as well as) time in order to generate a forecast. The second type, time series models, creates a demand profile with time as the independent variable[10].

Qualitative forecasting techniques generally employ the judgment of experts in the appropriate field to generate forecasts. A key advantage of these procedures is that they can be applied in situations where historical data are simply not available.
Three important qualitative forecasting methods are: the Delphi technique, scenario writing, the subject approach and historical analogy with examples[11].

A special group of qualitative methods used in forecasting is market research. This technique is used when historical data are not available and there are no similar products which can serve as an analogy model, for example for completely new, innovative products introduced into the market. New product forecasting should not rely solely on internal sources and company personnel judgment. If possible, external sources both in terms of data and judgment should be canvassed, especially data and judgment from current and potential customer[12] . Three different types of testing may occur with customers throughout the new product development[13]:

1. concept testing,
2. product use testing,
3. market testing.

A different groups of methods is forecasting the market. When the company intends to enter to the new market, market research is needed. Assessing market potential involves observing and quantifying relationships among different social and economic factors that affect purchasing behaviors. Analysts at the industry level look for causal factors that, when linked together, explain changes (upward or downward) in demand for a given set of products or services. This may be done on the local level, the national level, or even the international level.

The information received in the sales planning process is then used for different purposes. The demand plan helps manufacturers in planning production and managing inventory. In consequence, they can satisfy customer orders, keep buffers lower and hence decrease tied-up capital. The requirements of different departments in an organization have been summarized in Table 1.

[9] Mentzer, J.T., Moon, M.M. *Sales Forecasting Management. A Demand Management Approach*, SAGE Publications, London 2005
[10] Ibd.
[11] Ibd.
[12] Kahn, K.B. *New product forecasting. An applied approach.*, M.E. Sharpe, Inc. USA 2006
[13] Ibd.

Table 1. Forecasting requirements of various management functions.

	Needs	Level	Horizon	Interval	Form
Marketing	Annual plans (updated monthly or quarterly) for new and existing products or product changes, promotional efforts, channel placement, and pricing	Product or product line	Annual	Monthly or quarterly	Dollars
Sales	Setting goals for the sales force and motivating sales people to exceed those goals	Territory and/or customer	1-2 years	Monthly or quarterly	Dollars
Finance / Accounting	Projecting cost and profit levels and capital needs	Corporate, division, product line	1-3 years	Monthly or quarterly	Dollars
Production / purchasing long-term	Planning the development of plant and equipment	SKU*	1-3 years	Monthly or quarterly	Units
Production / Purchasing short-term	Planning specific production runs	SKU*	1-6 months	Daily, weekly, monthly	Units
Logistics long-term	Planning the development of storage facilities and transportation equipment	SKUL**	Monthly to several years	Monthly	Units/ Weight/ Volume
Logistics short-term	Specific decisions of what products to move to what locations and when	SKUL**	Daily, weekly, monthly	Daily, weekly, monthly	Units/ Weight/ Volume

* - product items which are produced

** - number of location where products are sold

Source: Dnyanesh N. Sarang, Mohammad Laxmidhar master's thesis: "Exploratory Investigation of Sales Forecasting Process and Sales Forecasting System. Case Study of Three Companies" Jönköping International Business School, Jönköping University in Sweden, December 2006

Because of those different forecasting requirements in a company, prepared forecasts are very often not accurate. Then integration during demand forecasting is needed.

3. METHODOLOGY

3.1.RESEARCH MODEL, SAMPLE AND DATA COLLECTION

On the basis of literature review a research model has been developed – figure 6. As depicted in the model, the independent (explanatory) variables are sales planning practices and their characteristics classified into four groups, namely: qualitative methods and data combined into foreacasting, major aims of forecasting process, data used in forecasting, quantitative forecasting models. The response variables are four manufacturing strategy types. based on literature review, it may be assumed that there are some significant differences concerning forecasting practices between countries.

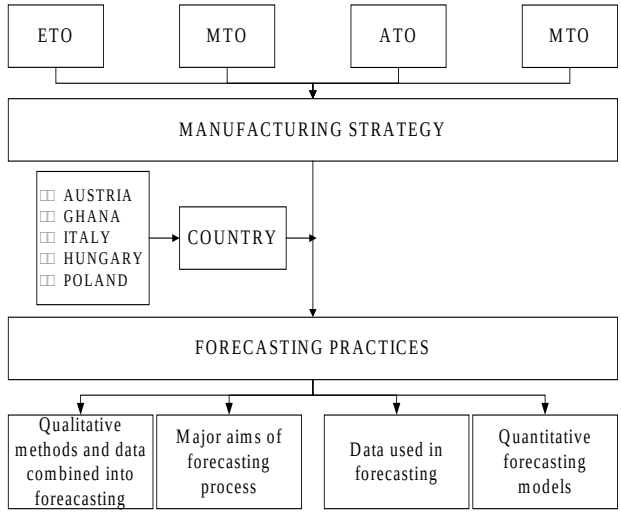

Figure 6. Conceptual model of cross-national effects of sales planning practices on manufacturing strategy

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 the development of GMRG survey. Instead, many aspects of general manufacturing practices were a subject of investigation. Data collected within the fourth release of the survey were gathered 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[14].

For the purpose of the research presented in this paper, a number of variables have been selected. Originally 17 (13 independent and 4 dependent variables) were a subject of initial analysis. The opinion items were gathered using 5-point Likert scale.

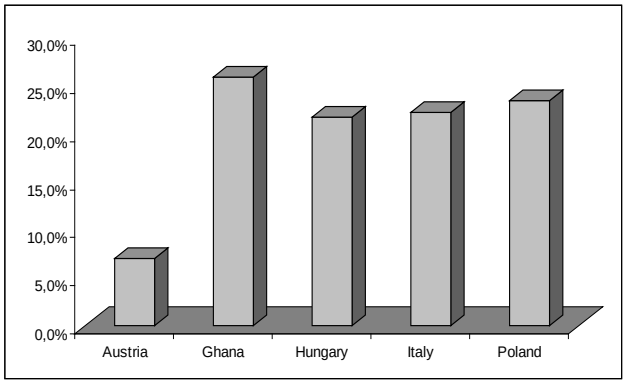

Figure 7. The sample breakdown by country of origin

In order to perform cross-national comparisons, the companies from five countries were chosen for further analysis. The sample was compiled from surveys of manufacturing firms and originally consisted of 343 manufacturers. As a result of initial data analysis, screening and elimination of observations with missing values, 244 companies remained as the subject of further analysis. The respondents were mainly small and medium-sized companies. This group included manufacturers from Ghana (25,8 %), Poland (23,4%), Italy (22,1%), Hungary (21,7%) and Austria (7,0%).

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

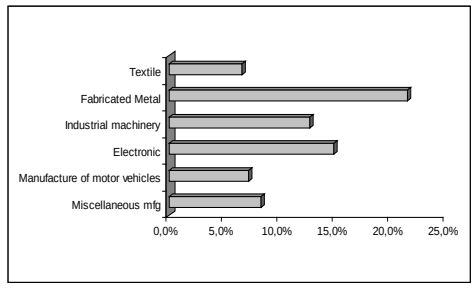

Figure 8. The sample breakdown by industry type

The majority of the surveyed companies operate in fabricated metal sector (21,5%), followed by electronic and other electrical equipment industry (14,9%) and industrial and commercial machinery equipment (12,7%), miscallaneus manufacturing (8,3%), manufacturing of motor vehicles sector (7,2%) and textile industry (6,6%). The sample breakdown was graphically presented in Figures 4 and 5.

3.2.RESEARCH PROBLEMS AND METHODS

The aim of the study is to make a cross-national comparison of the effect of sales planning practices on different types of manufacturing strategies applied in 343 producers from Europe, Asia and Africa. In order to realize the empirical aim of the study, two main research problems have been presented:

RP1: Identification of different groups of sales planning practices in examined companies,

RP2: Investigation of the contribution of sales planning practices in obtaining a specific type of manufacturing strategy in different countries worldwide.

In order to solve the research problems, a two-step statistical analysis was employed. The first step was the reduction of 13 independent variables through factor analysis. Those variables reflected multidimensional forecasting practices. In order to perform the factor analysis, a Principal Component Analysis (PCA) with Varimax Rotation was applied.

The measure of individual sampling adequacy for each of 13 variables in the anti-image correlation matrix was above a nominal cut off point of 0,5 Therefore, no variables was eliminated from the further analysis. All variables also

indicated relatively high factor loadings (better than 0,45).

Finally, the factor analysis which was carried out on 13 items, revealed the following structure of constructs (Table 2):

- Factor 1: qualitative methods and data combined into forecasting (use of qualitative models, management opinion, application of results from market research),
- Factor 2: major aims of forecasting process (sales and budget preparation, production resource planning, new product development, equipment/facilities planning),
- Factor 3: external data used in forecasting (economic conditions, customer's sales plans, supplier information, current order backlog),
- Factor 4: quantitative forecasting models (quantitative time series models, quantitative casual models).

Table 2. The Structure of the Constructs Obtained through the Factor Analysis

	Factors			
	1	2	3	4
The extent of use of quantitative time series models				0,748
The extent of use of quantitative casual models				0,733
The extent of use of qualitative models	0,703			
The extent of use of management opinion	0,772			
The extent of application of results from market research into forecasts	0,653			
The extent of application of economic conditions into forecasts			0,526	
The extent of application of customer's sales plans into forecasts			0,585	
The extent of application of supplier information into forecasts			0,767	
The extent of application of current order backlog into forecasts			0,599	
The extent a forecast is used in sales and budget preparation		0,479		
The extent a forecast is used in production resource planning		0,772		
The extent a forecast is used in new product development		0,596		
The extent a forecast is used in equipment/facilities planning		0,780		
Variance explained	16,434	16,673	14,509	14,122
Cumulative variance	16,434	33,107	47,616	61,737
Cronbach's Alpha	0,700	0,725	0,618	0,693

The number of factors was determined according to the analysis of the percentage of variance explained and the Kaiser criterion (Aczel, 1993). KMO coefficient score indicating the suitability of the sample for factor analysis in a space of 13 variables is 0,838 which is a very good result (Bryman and Cramer, 1999). Bartlett's test of sphericity demonstrated sufficiently high value for the extracted factors at p <= 0,000 (Approx. chi-square 1073,522, df = 78). The obtained structure of factor analysis explains 61,73 percent of variance.

The Cronbach's alpha coefficients were calculated to check the internal consistency of extracted factors. Alpha score of transformed variables in four instances is above the nominal cut-off point of 0.6. Considering the rule provided by George and Mallery, the obtained results of alpha coefficients suggest a relatively good internal consistency of those extracted constructs[15].

In the second stage of the analysis multiple regression models were developed. It enabled to make a cross-national comparison of the contribution to variance in manufacturing startegies. Only variables with observed p-values of less than 0.05 were kept in the model.

Multiple regression models were developed for each of the four response variables indicating specific manufacturing strategy. Response variables were defined as a percentage of manufacaturing orders falling into four categories: engineer-to-order, make-to-order, assembly-to-order and make-to-stock.

First, descriptive statistics was used to make a cross-national comparisons of applied manufacturing strategies in the examined companies operating in specific countries. Afterwards, the regression models were developed.

[15] George D., Mallery P., *SPSS for Windows step by step: A simple guide and reference*. 11.0 update 4th edition. Boston, Allyn and Bacon 2003

Data were analyzed seperately for companies in 5 countries.

4. RESULTS OF ANALYSIS

4.1.IDENTIFICATION OF MANUFACTURING STRATEGIES IN THE EXAMINES COMPANIES

Table 3 shows comparisons of the types of manufacturing strategies performed in the companies operating in five countries worldwide.

Table 3. Cross-national comparison of manufacturing strategies performed in examined countries (median scores)

Country of origin	Manufacturing strategies			
	ETO	MTO	ATO	MTO
Austria	0%	40%	0%	10%
Ghana	0%	20%	0%	20%
Hungary	3%	80%	0%	3%
Italy	0%	50%	3%	5%
Poland	5%	50%	0%	2%

The obtained results suggest that engineer to order and assembly to order strategies are not widely applied in investigated companies. The average share of orders initiated in accordance with the first strategy is 3 and 5 percent indicated by the companies from Hungary and Poland respectively. The latter strategy with a share of only 3 percent is reported by the companies from Italy.

The prevailing share of orders is made in line with the make to order and make to stock strategies. Roughly all contracts are made to order in Hungarian firms whereas half of them is made in the same fashion in Italian and Polish companies. Median score for make to order strategy in Austrian and Ghanan companies is 40 and 20 percent respectively. It is worth noting that the same share of 20 percent of orders is performed in line with a make to stock strategy in the companies from Ghana. Median score for the latter startegy reported by the companies from Austria is only 10 percent.

It may be highlighted that, judging on the types of manufacturing strategies applied in the examined companies, the sample is not diverse. The prevailing share of contracts with a final customer is made to order and made to stock. Futhermore, it is important to indicate that, as the minority of orders are originated with engineer and assemble to order strategies, the problem of data representativeness appears and one should be very cautious while drawing any conclusions based on the conducted analysis. Furthermore, as three significant models explaining assembly to order (ATO) strategy were demonstrated by the companies with a very low average number of orders falling to ATO category, the analysis of those three models has been dropped.

4.2.THE CONTRIBUTION OF SELECTED SALES PLANNING PRACTICES TO APPLY A SPECIFIC MANUFACTURING STRATEGY

The regression analysis for manufacturing strategy showed that each analyzed country, except for Hungary, has at least one model with significant independent variables and adjusted coefficients of determination (R^2 adjusted) ranging from 0,061 to 0,355. The strongest models, as measured by adjusted R^2, are reported by the companies operating in Austria and Poland. Table 3 demonstrates the results of regression analysis for five countries, namely Austria, Ghana, Italy and Poland.

Table 3. Comparison of regression models for manufacturing strategies in considered countries

* p-value < 0,05

** adj. R sq. significant at 0,05

Manufacturing strategy	Country	**Forecasting practices**	**Std. Coef.**	**p-value** *	**R square** **
MTO	Austria	major aims of forecasting process	-0,409	0,001	0,208
		quantitative forecasting models	0,249	0,035	
	Ghana	major aims of forecasting process	0,041	0,050	0,061
	Poland	qualitative methods and data combined into forecasting	0,225	0,050	0,210
		quantitative forecasting models	-0,370	0,002	
MTS	Austria	qualitative methods and data combined into forecasting	-0,253	0,021	0,355
		major aims of forecasting	0,265	0,024	

		process external data used in forecasting	-0,336	0,005	
	Italy	quantitative forecasting models	0,259	0,041	0,067
ETO	Austria	quantitative forecasting models	-0,378	0,002	0,143
	Poland	quantitative forecasting models	0,305	0,015	0,093

There are three models predicting manufacturing to order strategy with an adj. R^2 ranging from 0,06 to 0,21 indicated by the companies from Austria, Ghana and Poland, two models explaining make to stock strategy with adj. R^2 of 0,35 and 0,06 reported by the firms from Austria and Italy respectively. Finally, there are two models predicting engineer to order strategy with adj. R^2 of .14 and 0,09 indicated by the companies from Austria and Poland respectively. It is also worth noting that the regression analysis developed for Hungarian companies showed models with no significant independent variable.

There are three significant models predicting make to order strategy demontrated by the companies from Austria, Ghana and Poland. Two response variables explain make to order strategy in Austrian companies, namely major aims of forecasting process and quantitative forecasting models. The negative value of a standardized regression coefficient for a first response variable in the model suggests that there is no specific aim of using forecasting techniques for a make to order strategy in the companies from Austria. On the contrary, this factor seems to be important in the companies originating from Ghana, which report that the enumareted goals guide the forecasting practices in a make to order strategy. It is the only significant factor demonstrated by this group of firms which affects make to order strategy. As the Ghanaian companies operate in an underdeveloped country they are not using sophisticated and advanced forecasting methods and techniques, and conducting a forecasting process still seems to be rather intuitive task, than deliberate and considered set of actions. However, the significance of the forecasting goals for make to order strategy reported by the firms from Ghana may confirm that the companies are aware of the role and importance of forecasting practices for applying a make to order strategy but still do not possess appropriate instruments for its practical implementation.

The positive value of a standardized regression coefficient for the use of quantitative forecasting models suggests that it contributes to a greater application of make to stock strategy in Austrian companies. This may prove that in orderly arranged set of actions in a forecasting process demonstrated by Austrian companies, the quantitative forecasting models are widely used for predicting future tendencies. It is contrary to the results reported by Polish companies which indicated negative value of a standardized regression coefficient for this factor with a make to order strategy. It suggests that the firms from Poland do not apply quantitative forecasting models for a make to order strategy, instead they are using qualitative methods and data combined into forecasting. Comparing the obtained results, it is worth noting that, as Austrian companies are more aware of the role of forecasting in their activity, they are likely to use the quantitative models in bulding a forecast for a make to order strategy. On the other hand, instead of applying a qunatitative approach, the Polish firms are more eager to use qualitative methods and data while forecasting for a make to order concept.

The results showed that there are two significant models predicting make to stock strategy demontrated by the companies from Austria and Italy.

5. CONCLUSIONS

The conducted analysis enabled to make a cross-national comparison of the effect of sales planning practices on different types of manufacturing strategies. The obtained results provide an adequate basis for solving two research problems.

The first research problem was the identification of different groups of sales planning practices in the examined companies. An empirical study revealed a four factoral stucture of sales planning practices peformed in manufacturing companies, namely qualitative methods and data combined into forecasting, major aims of forecasting process, external data used in forecasting and quantitative forecasting models.

The second research question dealt with the contribution of sales planning practices enabling to

obtain a specific type of manufacturing strategy in different countries worldwide. The analysis confirmed the observed associations are country specific. The companies in the examined countries (Ghana, Poland, Italy and Austria) report different contribution of sales planning practices to the specific manufacturing strategies. As the results indicated, differences are noticed among countries representing a diverse level of economic development and environmental conditions of operating for manufacturing companies. Regarding cross national perspective, the most aware of the contribution of sales planning practices are Austrian and Italian companies. They seem to use sales planning practices appropriately and reasonably adjusted for the specific manufacturing strategy. On the other hand, Polish companies use similar sales planning practices for the specific manufacturing strategies however most often they are used inversly and sometimes it is difficult to explain prerequisites for applying those forecasting practices

Finally, one should be aware that, apart from a country specific perspective, the effect of sales planning practices on manufacturing strategies is definitely conditioned upon a number of internal factors connected to the technological issues, complexity of manufacturing process, types of products and general conditions of their storage, transport and packing, consumer demand etc.

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