



Proceedings of GLOGIFT 09
November 12 – 14, 2009
National Institute of Industrial Engineering
Mumbai, India

RELATION BETWEEN CONTRACT MANUFACTURING POSITIONS AND FLEXIBILITY LEVELS OF READY WEAR ENTERPRISES

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ABSTRACT

Flexibility is indispensable in ready wear enterprises since people's consumption trends change and vary, competitors require making difference and new things with increase on the same product, new products need to be transmitted to market due to always changing fashion movements, products per year and number of seasons increase, standard product markets are increasingly distributed and the necessity to present different products is available in the scope of these segments. In recent times performance of ready wear enterprises mostly depends on activities which will be done, to respond variations and ambiguities quickly. Contract manufacturing takes an important place between activities which ready wear enterprises apply to respond variable demands.

Contract manufacturing employment relations mean taking over the production of one or a few parts in the production process, on demand of a firm for other firm, and cause to appear new production networks. These production relations provide share of risks, change in type and amount of product, and also decrease in generally costs and especially labour costs. Taking the reasons of contract manufacturing relations into consideration, definitions of different contract types have been matter of subjects in lots of researches.

As demands increase in periods, firms, which have more works over the capacity of production, give similar their own works to other firms, and so here capacity subcontracting makes possible to meet so great order. Works which require expertise, are given to experienced firms as contract and so the subcontracting provides to develop relations with different firms on different expertise fields to the product. Demand subcontracting which is third type of contract relation, occurs with small firms' demands, and some firms prefer doing this contract work for other firm since this one both decreases the necessity of enterprise capital and clears away the necessity of searching market. Naturally reasons of these three contract

manufacturing relations differ from each other but the most important reasons can be said to lower price of employers and to decrease the necessity of capital. For this reason, labour focused works are given as contract and these works are done in a cheap way. But decrease in the necessity of capital is the secondary item, and some works, require special tool and machines, are done as contract. The first principle of specializing contract relations are to provide savings from capital and not to employ skillful labour work in unnecessary positions (Eraydin, 2000).

Researchers show that ready wear sector occurs as multi-focused contract relations in Turkey. Just as these researches put forward that contract relations are not available in confection industry and the rate for independently productive firms is only 7.9 %. This value explains most of the firms produce with other firms together.

Hereby this study deals with relation between contract manufacturing positions and flexibility levels of ready wear enterprises. In determination of flexibility levels in ready wear enterprises performance indicators are used in terms of product flexibility, volume flexibility, machine flexibility, material flexibility and process flexibility. These performance indicators are numbers of product and model produced in the enterprise at the same time, product change times, the least and the most amount of production batches, easily adaptation to different demands, transition periods to the production of new products, calibration levels of machines mentioned in production system to the product change, average numbers of procedures on a machine and etc. Research data are supplied from 85 ready wear enterprises (small and medium enterprises) which have employers over 50 and work in Turkey. Data are evaluated with statistical operations, the relation between between contract manufacturing positions and product flexibility, volume flexibility, machine flexibility, material flexibility, process flexibility of ready wear enterprises is studied.

In conclusion, flexibility performance levels of enterprises are presented to contract manufacturing positions of ready wear enterprises in Turkey. So this study is concluded that flexibility performance of enterprises which make contract manufacturing is higher than flexibility performance of others not making contract manufacturing.

Key words: *ready wear sector, contract manufacturing, flexibility*

1. INTRODUCTION

Today pleasures and needs of consumers always change, lanscape and structure of market are determined by consumers, creating new products forms the basis of today's competition. Producibile lot variety is so much that carries the concept of flexibility on agenda. Replying and conforming to the changes in enviromental factors depend on dynamic structure of organization and flexibility of production process. As flexible structure increases in enterprises, consumer wishes and behaviors are quickly replied, target mass or market is kept and so becomes larger (Gönen ve Çelik, 2009).

Enterprises lead to their basic abilities, benefit from other enterprises for other activities, constitute several organizations and create a synergy in global competition environment and so they keep their existence in this environment. Contract production is defined as using capacity of plants which do not belong to the producer in meeting of needs. Hereby, the most important reason is not to have any capacity in order to meet the needs or to make production in less cost (Durak, 2005).

In ready wear sector; flexibility in production becomes indispensable due to rapidly changing fashion, increasing financial competition environment and also changing consumer demands in recent times. Performance of ready wear enterprises becomes depending on some activities to reply changes and undeterministic situations on the high level rapidly. Contract production takes over an important place between these activities with a view to replying changing demands for ready wear enterprises.

In global process of industrial society, some information is included about producing goods to the demands and preferences of consumers in cheap way, how to use new technologies in the production of goods and service. Enterprises lead to contract production due to the problems on the subject of cheap production to the demands and preference of consumers.

Nowadays it is common that independent enterprises from each other lead to their basic abilities, they prepare a joint project with other enterprises or continue long-term relations with them. Reasons of mentioned contract production are to obtain partially or totally cost optimization of consumer orders, to benefit from technological opportunities from other enterprises, to achieve high quality on working expert enterprises or to deliver orders over production capacity of enterprise on time (Güner, 2003). Also difficulty in finding abroad market with a new mark, limitness related with marketing, easiness of contract production to the sale, fail in competition power, rapid market changes and guarantee on certain orders cause enterprises to have contract production made. On this point, contract production means collectiveness of dealers with a good organization (Özlen at al., 2004).

The study analyzes flexibility levels of ready wear enterprises to the positions of having contract production made for small and medium sized industry development organization (KOSGEB) which has 50 employees and over producing ready wear in Turkey and lastly presents the effect of contract production on various flexible types.

2. MATERIAL AND METHOD

Search model has also been used in this research. The basis of the research has been formed in medium and large ready wear enterprises working in Turkey. These are examples of 85 ready wear enterprises (medium and large enterprises) having over and 50 employees and have been selected with random method.

In accumulation of search data, a questionnaire form has been used after developing by researchers. This form includes flexibility performance indicators to find and measure flexibility levels of ready wear enterprises. Performance indicators used in finding flexibility levels of ready wear enterprises in research are levels of providing enough flexibility, numbers of product types, numbers of models, process of product change, less cost of new product and positions of transferring to new product rapidly, positions of meeting demands in small and large amounts, positions of working in profit on different lot amounts.

Data obtained from questionnaires are analyzed to the positions of having contract production made for ready wear enterprises and presented on bilateral tables.

3. FLEXIBILITY LEVELS TO THE POSITIONS OF HAVING CONTRACT PRODUCTION MADE FOR READY WEAR ENTERPRISES

Table 1 shows positions of having contract production made for ready wear enterprises.

Table 1: Distribution of Positions of Having Contract Production Made for Ready Wear Enterprises

Positions of Having Contract Production Made	Medium and Large Enterprises	
	f	%
Every time	50	58,8
sometimes	14	16,5
Anytime	21	24,7
TOTAL	85	100,0

n: 85

Working in Turkey, 58,8 % of ready wear productive enterprises have contract production made and 16,5 % have sometimes contract production made in research. 24,7 % of them do not have contract production made. Looking at table 1, it is said that a large rate such as 76% of ready wear enterprises makes contract production in Turkey every time or in need.

Table 2 explains positions of having enough flexibility to the contract production for ready wear enterprises in research.

Table 2: Distribution in Levels of Providing Enough Flexibility to The Positions of Having Contract Production Made for Ready Wear Enterprises

Positions of Having Contract Production Made	Position of Providing Flexibility							
	Every time		Sometimes		Any time		Total	
	f	%	f	%	f	%	f	%
Every time	30	35,3	21	24,7	-	0	51	60
Sometimes	7	8,2	5	5,9	1	1,2	13	15,3
Any time	12	14,1	9	10,6	-	0	21	24,7
TOTAL	49	57,6	35	41,3	1	1,2	85	100

n: 85

Looking at table 2, it is clear that 35,5% of ready wear enterprises having contract production made, working in Turkey provide enough flexibility, 24,7% of them provide partial flexibility. Only 1,2% say “any time” to the question “Do you provide enough flexibility in production?”. Flexibility in production is a concept related with

conforming rapidly and efficiently to changes on market for production system (Zerenler and İraz, 2006). Generally, examining table 2, most of the medium and large ready wear enterprises see themselves enough flexible in Turkey. According to this result, it can be said that ready wear enterprises working in Turkey especially comply with changes in fashion and consumer exceptions.

Table 3: Distribution in Numbers of Product Type to The Positions of Having Contract Production Mad Efor Ready Wear Enterprises

Distribution of Having Contract Production Made	Number of Product Type									
	1-3 type		3-5 type		5-8 type		over8		Total	
	f	%	f	%	f	%	f	%	f	%
Every time	12	14,1	10	11,8	11	12,9	17	20	50	58,8
Sometimes	6	7,1	8	9,4		0		0	14	16,5
Any time	11	12,9	3	3,5	3	3,5	4	4,7	21	24,6
TOTAL	29	34,1	21	24,7	14	16,4	21	24,70	85	100

n: 85

Looking table 3, 20 % of ready wear enterprises working in Turkey have over 8 product types, 12,9% of them have product types between 5-8, 11,8% have product types between 3-5 and 14,1% have product types between 1-3. It is understood from table 3 that enterprises having contract production made show most changes. Enterprises having contract production made in need and enterprises not having contract production made focus on product types between 1-3 and 3-5. As 12,9% of enterprises not having contract production made have product types between 1-3, 4,7% of them have over 8. Recently flexibility in product types becomes indispensable due to some reasons such as increasing product types and decreasing order amounts in ready wear sector. Benefiting from data, it can be said that enterprises not having contract production made limit product type, enterprises having that production made have more types and so competition is achieved in ready wear sector.

Table 4: Distrubution in Numbers of Models to The Positions of Having Contract Production Made for Ready Wear Enterprises

Positions of Having Contract Production Made	Numbers of Model									
	model 1-3		model 3-5		model 5-8		over 8		Toplam	
	f	%	f	%	f	%	f	%	f	%
Every time	13	15,3	12	14,1	8	9,4	19	22,4	52	61,2
Sometimes	5	5,9	3	3,5	5	5,9	1	1,2	14	16,5
Any time	5	5,9	4	4,7	4	4,7	6	7,1	19	22,3
TOTAL	23	27,1	19	22,3	17	20	26	30,6	85	100

n: 85

Table 4 shows distribution in numbers of models to the positions of having contract production made for ready wear enterprises in research. Looking at table 4, enterprises having contract production made which work over 8 model, are 22,4% and those not having contract production made are 7,1%. Also, 15,3% of enterprises having contract production made work on model between 1-3, 14,1% work on model between 3-5 and 9,4% of them work on model between 5-8. Product type and model type mean different things in ready wear sector. Model type includes different constructions in the same product group. Model variety can be generally increased without needing different and new machine and equipment. If an enterprise plans its production aimed at a product group, it supplies its equipment to this product group, and also it produces in different product groups, it can be explained successful on the high level in terms of flexibility.

Table 5: Distribution in Change Process of Product to The Positions of Having Contract Production Made for Ready Wear Enterprises

Positions of Having Contract Production Made	Change Process of Product											
	Every day		2-5 days		6-9 days		10-14 days		Over 15 days		Total	
	f	%	f	%	f	%	f	%	f	%	f	%
Every time	9	10,6	24	28,3	8	9,4	5	5,9	6	7,1	52	61,3
Sometimes	-	0	8	9,4	2	2,4	1	1,2	3	3,5	14	16,5
Any time	4	4,7	3	3,5	6	7,1	2	2,4	4	4,7	19	22,4
TOTAL	13	15,3	35	41,2	16	18,9	8	9,5	13	15,3	85	100

n: 85

Distribution in change process of product to the positions of having contract production made for ready wear enterprises is given at table 5. Looking at table 5, 10,6% of enterprises having contract production made change products every day,

28,3% of them change products between 2-5 days, and 7,1% change products over 15 days. 9,4% of enterprises having contract production made in need change products between 2-5 days but any does not say it changes products every day in this way. 7,1 % of enterprises not having contract production made say that they change their products between 6-9 days. Order amounts affected from market conditions directly have effect in production. Especially ready wear enterprises must be organized to adapt easily quick changes on market. Concluding from table 5, enterprises having contract production made are suitable for short-term changes and 28,3%of enterprises change their products between 2-5 days.

Table 6: Distribution in Positions of Transferring to The New Products Rapidly and Less Cost of These Products to The Positions of Having Contract Production Made for Ready Wear Enterprises

Positions of Having Contract Production Made	Transferring to the New Product Rapidly							
	Every time		Sometimes		Any time		TOTAL	
	f	%	f	%	f	%	f	%
Every time	23	27	23	27	3	3,5	49	57,5
Sometimes	7	8,2	5	5,9	2	2,4	14	16,5
Any time	6	7,1	6	7,1	10	11,8	22	26
TOTAL	36	42,3	34	40	15	17,7	85	100

n: 85

Distribution in positions of transferring to the new products rapidly and less cost of these products to the positions of having contract production made for ready wear enterprises are dealt at table 6. Looking at table 6, 27% of enterprises having contract production made transfer to the production of new products rapidly and less costly and 27% of them partially transfer to it. 11,8% of enterprises not having contract production made do not transfer to this so production and also 3,5% of these do not transfer. In recent times product type increases to obtain for consumers due to developed technology. Especially the most important success indicator in flexibility of product type is to be less costly and rapidly. In case enterprises achive this one, they will be only successful in product flexibility. It is understood from table 6 that contract production supplies to transferring to new product easily for enterprises.

Table 7: Distribution in Positions of Meeting Demands in Small Amounts to the Positions of Having Contract Production Made for Ready Wear Enterprises

Positions of Having Contract Production Made	Position of Meeting Demand in Small Amounts							
	Every time		Sometimes		Any time		TOTAL	
	f	%	f	%	f	%	f	%
Every time	30	35,3	14	16,5	5	5,9	49	57,7
Sometimes	8	9,4	7	8,2	-	0	15	17,6
Any time	6	7,1	5	5,9	10	11,8	21	24,8
TOTAL	44	60	26	30,6	15	17,7	85	100

n: 85

Distribution in positions of meeting demands in small amounts to the positions of having contract production made for ready wear enterprises is given at table 7. 35,3% of enterprises having contract production made meet demands in small amounts, 16,5% of them partially meet and 5,9% do not meet demands. 5,9% of enterprises having contract production made do not meet in small amounts and also the rate as 11,8% enterprises not having contract production made do not meet these demands. Nowadays amounts in production lots decrease as product type increases in ready wear trade. Replying to production lots in small amounts will supply competition advantage. Benefiting from table 7, it can be said that enterprises having contract production made meet demands in small amounts more.

Table 8: Distribution in Positions of Meeting Demands in Large Amounts to The Positions of Having Contract Production Made for Ready Wear Enterprises

Positions of Having Contract Production Made	Position of Meeting Demand in Large Amounts							
	Every time		Sometimes		Any time		TOTAL	
	F	%	f	%	f	%	f	%
Every time	33	38,9	13	15,3	2	2,4	38	56,6
Sometimes	10	11,8	4	4,7	2	2,4	16	18,9
Any time	4	4,7	6	7,1	11	12,9	21	24,7
TOTAL	47	55,4	23	27,1	12	17,7	85	100

n: 85

Distribution in positions of meeting demands in large amounts to the positions of having contract production made for ready wear enterprises is given at table 8. 38,9% of enterprises having contract production made meet demands in large amounts. This rate is 4,7% for enterprises not having contract production made. For enterprises not meeting demands in large amounts, the rate in enterprises having contract production

made is 2,4% but the rate in enterprises not having contract production made is 12,9%. Less production costs and delivering orders on time form the basis of contract production. Looking at the conclusions of table 8, enterprises having contract production made reply to the orders in large amounts more easily.

Table 9: Distribution in Positions of Working in Profit on Different Lot Amounts to The Positions of Having Contract Production Made for Ready Wear Enterprises

Positions of Having Contract Production Made	Position of Working in Profit on Different Lot Amounts							
	Every time		Sometimes		Any time		TOTAL	
	f	%	f	%	f	%	f	%
Every time	17	20	30	35,3	3	3,5	50	58,8
Sometimes	9	10,6	4	4,7	1	1,2	14	16,5
Any time	3	3,5	5	5,9	15	15,3	21	24,7
TOTAL	29	34,1	39	45,9	17	20	85	100

n: 85

Distribution in positions of working in profit on different lot amounts to the positions of having contract production made for ready wear enterprises is given at table 9. Looking at table 9, percent of working in profit on different amounts is 20% for enterprises having contract production made, this rate is 3,5% for enterprises not having contract production made. 35,3% of enterprises having contract production made partially work in profit. 15,3% of enterprises which do not work in profit on different lot amounts, do not have contract production made, this rate is 3,5% for enterprises having contract production made. It is important to keep working in profit for enterprises as they supply flexibility to meet small and large production demands. Concluding from table 9, it can be said that enterprises having contract production made work in more profit on different lot amounts.

4. CONCLUSION

Increasingly changing market structure leads to variety in consumer wishes. This change requires flexibility in enterprise structure. Reaching change in developed world, providing best consumer happiness will be possible by producing the products on world prices and good quality, on the shortest period and on time. So rapidity and flexibility takes over in production. Replying to always changing demands for enterprises will be possible with flexibility in production. Nowadays enterprises experience some developments on having flexibility in production to meet demand fluctuations due to change in consumer needs. Flexibility is easy to define but a difficult concept to apply for production.

Contract production presents large contributions to the flexibility of production enterprises. Enterprises prefer this one due to solving problems, obtaining high quality making jobs by an expert, to prevent delays in deliver for orders over existent capacity of enterprise, not having problems such as changing production band on

orders in small amounts and not losing consumers. Furthermore, the most important reason is that costs are less to prefer contract production. History of contract production is given as a production type at very old times. But contract production increasingly have international character due to changing competition in world and its global effects.

Looking at the research conclusions, enterprises having contract production made have more advantages than enterprises not doing so in terms of flexibility. Enterprises having contract production made work on various products and models easily and transfer to the production of new products rapidly and less costly. Also working on different lot amounts sometimes becomes problem in enterprises not having contract production made. Enterprises having contract production made solve this problem more easily and work on different lot amounts and in profit.

There must be not only good producers but also good organizers to achieve in global competition for ready wear enterprises according to the research conclusions. Productions which are possible to produce in its environment for enterprise, must be produced there but productions which lead to problems to produce for their own enterprise, must be produced somewhere, benefiting from contract.

REFERENCES

1. Durak, İ., Küreselleşme Sürecinde Şebeke Organizasyonlar Ve Denizli Tekstil İşletmeleri Uygulaması (Network Organizations In Global Process And An Application In Denizli Textile Enterprises), Ankara Üniversitesi, Sosyal Bilimler Enstitüsü, İşletme Ana Bilim Dalı, Yayınlanmamış Doktora Tezi, Ankara, 2005.
2. Eraydın, A., Dış pazarlara eklenmeye çalışan konfeksiyon sanayinde üretimin örgütlenmesi ve emek süreçleri (Labour process and organization of production added into foreign markets in confection industry), ODTÜ Gelişme Dergisi, 27 (1-2), 91-117, 2000.
3. Gönen, S., Çelik, M., Esnek Üretim Sistemleri Uygulayan İşletmelerde Üretim Maliyetlerinin Değerlendirilmesi (Flexible Manufacturing Systems Production Cost Evaluation of Implementation of the Business), <http://eab.ege.edu.tr/pdf/4/C4-S1-2-%20M13.pdf>, 2009.
4. Güner, M., Analitik Hiyerarşi Yönteminin Fason İşletme Seçiminde Kullanılması (Using Analytical Hierarchy Method In Chose Of Contact Enterprise), Tekstil ve Konfeksiyon Dergisi, 4. sayı,2003.
5. Özlen, M., Erkip, N., Güllü, R. Kontrat Değerlendirme Modeli: Belli Ve Değişken Talep Ortamında Contact Üretim (A Model For Contract Evaluation: Subcontracting Under Dynamic Deterministic Demand Environment), YA/EM'2004 - Yöneylem Araştırması/Endüstri Mühendisliği - XXIV Ulusal Kongresi, 15-18 Haziran 2004, Gaziantep – Adana.
6. Zerenler, M., İraz, R., Kriz Dönemlerinde Ürün Ve Süreç Esnekliğinin İşletme Performansına Etkileri: Küçük Ve Orta Ölçekli Tekstil İşletmelerinde Bir Araştırma (Effects Of Product And Process Flexibility On Enterprise Performance In Crisis Periods: An Ampirical Study On Small And Medium Sized Enterprises) Selçuk Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, Sayı : 21, Yıl : 2006.