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Designing an Analytical Model for Determining Price Reasonableness in Contract Management: A Case Study of an ICT Company

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Abstract
Discovering the fair and reasonable price, is one of the critical subjects in purchasing process, especially in imperfect markets, in which, market mechanism cannot be applied to judge about proposed price. To cover this gap, in this paper, an analytical model for analyzing the price in non-competitive markets, has been developed and step by step procedure in order to decide about proposed price, is presented. For this reason, all factors affecting the price, have been collected and divided in "Market condition", "Internal characteristics" and "Nature of product" categories. In next stage, effect of each factor on cost items has been clarified and accordingly, it becomes explicit that how these factors can be used to analyze the cost items and discover the reasonable price. Finally, the proposed model has been applied in a governmental agency in ICT industry.
Keywords: Fair and reasonable price, Contract pricing, Cost and price analysis, Purchasing.

1. Introduction

Complex competition in today's turbulent environments, directly influences on all organizational processes, including purchasing one, in which, making a tradeoff between quality and price of purchased goods, is a critical task. In these conditions, the need to develop a comprehensive and systematic approach to determine the fair and reasonable price will be one of the important and also difficult decisions in this process, especially for companies who are faced with large number of goods and limited suppliers. In these situations, market mechanism is not effectively applicable (IT procurement policy manual, 2012) to judge about proposed price. Despite the importance of this subject, studies show that companies commonly don't use effective analytical model to judge about the realism of offered price and generally rely on some tools such as historical data based on their last purchases (Woo, 2004). As an instance, United States Government Accountability Office (GAO), expressed that they are not sure that their processes and tools for determining the fair and reasonable price, is adequate (GAO, 2005). On the other hand, analyzing the supplier's price and discovering the fair price in not simple on its own, which can be studied from two dimensions. At first, the various factors involved in this decision, such as quality, order quantity, governmental laws, change in raw materials price, energy price and etc., that identifying and analyzing of these factors and their impacts on price, is difficult. Secondly, the effect of each factor on the supplier's offered price is quite dynamic and is not simply predictable.

Therefore, organizations and especially governmental agencies will need a proper control mechanism to make a correct judgment about the goods price and "discover" the fair and reasonable price in their purchasing process. For this reason, some studies have been performed in this context. Results of these researches commonly have led to set some guidelines, policies and recommendations, such as Federal Acquisition Regulation (FAR) principles that contains a set of contract cost principles and procedures (FAR,2013). But, analytical and systematic approaches in this subject, have rarely been used, which was the main motivation for conducting this research.

The rest of the paper is organized as follows. In the first section, the literature review will be presented. In section 2, analysis of existing methods for determining fair and reasonable price have been addressed. In section 3, developed model, have been explained and in next section, results of case study are provided. Finally, contents are summarized along with some future research areas.

2. Literature review

Literature study in price setting shows that this topic can be studied both from the "buyer" and "seller" perspectives. From the seller perspective, pricing can target different goals, such as organizations survive, income maximization, and improve market share, which is done by the supplier (seller). On the other hand, the price subject from the buyer's perspective, means the process of discovering fair and reasonable price. In this vision, the buyer want to make a good judgment about seller's price in purchasing process. The important point in this scope, is that neither of these two approaches are not independent from each other. To clarify it more, appropriate decision about the price of particular good or service, can be made just when seller knows the possible response of their customers in various pricing strategies. Therefore, beside the classic parameters which have influence the good or service price, such as cost of raw materials or financial cost of suppliers, "customer's behavior", also has more importance, which results in new generation of marketing, named "neuromarketing (Fugate, 2007).

From another viewpoint, during the purchasing process in order to reach the fair and reasonable price (scope of this paper), byer should be aware of the vendor's pricing strategies and methods. In another word, buyer should know in various circumstances, how do seller make decision and which variables, in which structure, make up the price?

Accordingly, for discovering fair price, both standpoints should be regarded. As can be seen in next part, studies show that one of the gaps in the literature is the shortage of systemic approach that considers both these outlooks.

To begin, a definition from fair and reasonable price should be provided. According to FAR (Federal Acquisition Regulation), "a cost is reasonable, if in its nature and amount, it does not exceed that which would be incurred by a prudent person in the conduct of competitive business" (FAR Cost Principles Guide, 2013, p: 3). Based on this definition, in following, main researches in this field will be investigated and analyzed.

One of the interesting studies in this area has been done by Lamm &Vose (Lamm and Vose, 1988). Based on their research, identifying the pricing strategies used by sellers, is the key element to recognize the fair and reasonable price. They believe that with some evidences, seller pricing strategies can be found by byer. Then, they presented a set of key variables that determine the pricing strategy of the seller and the conditions under which, pricing strategy is chosen. Knowing how to allocate the variables and integrating them in the buying process, is a critical need, however, is challenging. In this way, the researchers have discussed four pricing strategies that more important than others. These strategies are (Lamm and Vose, 1988):

- Cost-Plus (Penetration) Pricing
- Demand (Skimming) Pricing
- Rule-of-Thumb (Myopic) Pricing
- Buy-in (Foot-in-the-Door) Pricing

They believe that each of these strategies is adopted with considering the factors which can be divided into two categories: internal and external factors.

Internal factors are those which are associated with the internal conditions of the seller that include theses main factors (Lamm and Vose, 1988):

1. Seller's internal characteristics
2. Management orientation
3. Accounting and costing methods

External factors are those that commonly are out of control, and are forced from environment. External factors are (Lamm and Vose, 1988):

1. Nature of the product
2. Market characteristics
3. Buyer's control variables

Then, researchers have discussed the effect of these factors on pricing strategy. Figure 1, shows the analysis structure has been derived from Lamm &Vose research. Based on this article, byer, for price analyzing, should recognize the suppliers pricing strategy and for this reason, effective internal and external variable that influence the seller's pricing strategy, should be recognized.

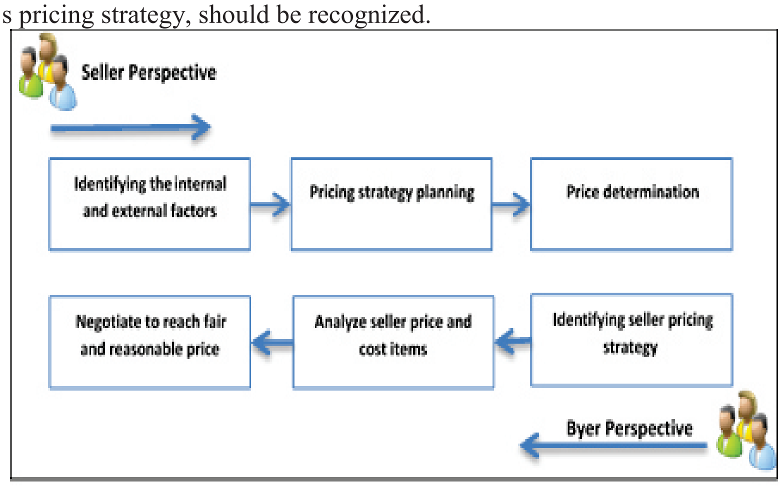

Figure 1. Price analyzing from two perspective: seller and byer

Another exciting research which is done on this scope, was conducted by Russell (Russell, 2002). Russell, in his survey, has mentioned that an important step in the price analyzing process, is knowing pricing theories.

According to him, at first, the buyer must know his status in transaction with the seller. For this reason, he introduced six type of markets. In each section, price setting is various, due to difference in their market specifications. (Figure 2).

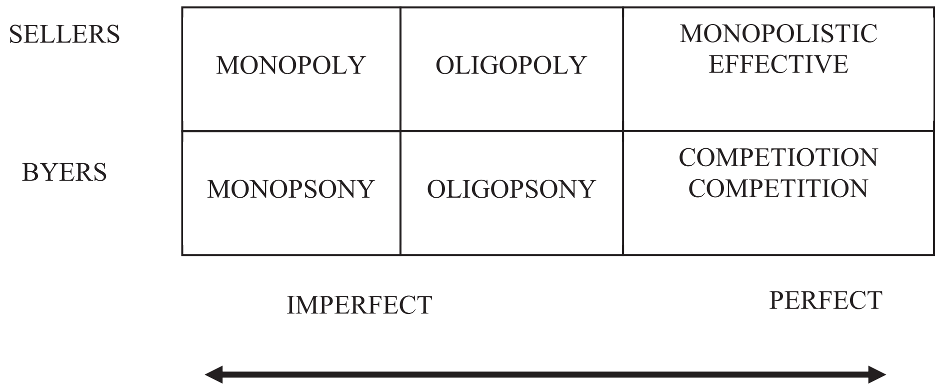

Figure 2: Market categorizing based on market condition and supply and amount of demand (Russell, 2002)

In table 1, characteristics of these markets have been explained.

Table 1: Market categories (Russell, 2002)

Description	Market
This market contains too buyers and sellers that none of them do not set the price. Products are homogeneous and interchangeable, and no obstacle in the way buyers and sellers to enter the market or leaving it there.	Perfect Market
In this market, only one seller sets the price. His dominance in the market, until he can produce exclusive products and is not a serious candidate in the market, can be continued.	Monopoly
This condition occurs when there are few sellers and many buyers. In this market, retailers, using advertising and differentiation through quality, can take price control.	Oligopoly
In this situation, we can see a large number of buyers and sellers, each of which can freely enter and exit the market. Compared to perfect competition, in this market, buyers have more power to determine the price in contrast with sellers.	Monopolistic competition
Here, there are fewer sellers than the complete market. However, neither the buyer nor the seller cannot come to dominate the market.	Effective competition
This position is similar to oligopoly, with the difference that there are many sellers and few buyers. The ability to control prices by the seller in this market is limited.	Oliogopsony
In this situation, there are many sellers and only one buyer. Examples of this type of markets can be seen in military organizations. As an instance, US Department of Defense (DOD) purchases from this contract style.	Monopsony

As can be seen in the above table, the subject of fair and reasonable price, especially when the market is in imperfect competitive conditions, could be controversial. It means that, as we move toward a monopoly, the number of sellers will be decreased and accordingly, their ability to control and change the price, will be increased. On the other hands, when the number of buyers decreases, buyer has stronger power to set the price. In each situation, the offered price is challenged by the other side of the transaction, which results in bargaining. In this condition, through negotiation, each of them try to reach a fair and reasonable price, whereas, in perfect markets, price will be determined based on market mechanism (supply and demand tradeoff, not with buyer or seller's position in the market).

After that, Russell in order to find the fair and reasonable price, introduces some factors that shape the price. These factors are the characteristics of a product that can affect the price of the products. He derived these factors from winger's model (Wenger et al., 1990). These factors are:

1. Change
2. Complexity
3. Customization
4. Maintainability
5. Homogeneity
6. Consumption
7. Unit Cost
8. Documentation
9. Item Attention

10. Sources of Supply
11. Criticality
12. Stability

Then, he proposed a structure for weighting the factors that determine importance of each factor on price. In this structure, each factor is classified in a spectrum from simple to complex. After that, he introduced his analytic structure based on these weighted factors. From his perspective, the cost analyst should look at the various dimensions of the building blocks of a good price and compare these results to identify the mismatches.

For example, supposed that supplier stated that product "A", is a human oriented. It means that a significant share in this product cost, is the cost of manpower. In this situation, if the seller due to change in salary laws, raises the final price of this good, the higher price can be justified and acceptable. But if he stated that the reason for price increasing is related to "investment on new machines", this claim will not easily be accepted. Because the logical relationship between the cost of labor and the nature of product (human based) is not found and more accurate judgment on this claim, requires more detailed study and providing documentary evidences by supplier.

Simultaneously, Russell has used 4 methods in order to determine the validity of proposed costs. These methods are (Russell, 2002):

1. Percentage method
2. Dollar Build up method
3. Cost estimation relationship method
4. Market employment method

To evaluate the price analyzing and fair price discovering, he argues that if a supplier's price is fair, each method will result in same outcome, without any inconsistency. Otherwise, if the results of these methods will show a conflict, it should be deeply be investigated. Hence, he conducts each method separately and finally compares the results in order to find possible contradiction. If all the results are consistent, the seller claims can be accepted.

As mentioned before, other related researches on discovering fair and reasonable price, have focused on some techniques for analyzing offered price. These technics can be divided in 3 categories as follows (Russell. 2002, Shounder and Atkin, 2005; FDA Staff Manual Guides, 2011; Contract Audit Guide Framework, 2010, NOAA Acquisition Process Guide Evaluation Module, 2011):

• Primary technics

Focus of these technics is on comparison of the offered prices with price of similar products.

"Primary comparisons are the most conclusive. They may be accompanied with lower tier comparisons if necessary.

1. Comparison of proposed prices responding to the solicitation.
2. Comparison with competitive published price lists published market prices of commodities, similar indexes, and discount or refund arrangements"(Russel,2002).

Primary comparison is operative when access to prices are possible in the market and reachable through priced catalogs, or some related laws and regulations.

• Secondary technics

These methods, compare the previous price of products or similar item and commonly are used, when needed information for primary comparison is not accessible. According to Russel, these technics can be included these types (Russell, 2002):

1. "Comparison of proposed prices to historical prices of same or similar items: such comparison would be valid only if the contracting officer is able to determine that the historical prices also were rational. Historical prices should be adjusted for time, quantity, or even seasonal differences.
2. Comparison of proposed prices to market pricing data of same or similar items.
3. Application of cost estimating relationships and other rough index estimates, such as dollars per pound or per horsepower.
4. Comparison of proposed prices with Independent Government Estimates (IGE)".

• Auxiliary technics

These technics cannot be used independently and should be applied as supplement of other methods (including primary or secondary price analysis techniques) to confirm them.

According to Russel, this technics can be include these types (Russell, 2002):

1. "Value analysis" requires the buyer to isolate the reasons for differences in prices quoted for similar products.
2. "Visual analysis" involves inspection of the item or drawing in an attempt to estimate its value".

In addition to main related researches which are discussed above, some similar researches in this area can be seen in literature which are applied in various fields such as healthcare or energy sectors (Hughes et al., 2003; Leslie, 2014).

In continue, above mentioned researches have been analyzed and based on the research gap, the proposed model have been presented.

3. Gap analysis

According to literature review, despite the importance of determining fair and reasonable price, there is no comprehensive model with systematic approach to provide reliable information for decision-makers. Although mentioned techniques can be regarded as useful tools for interpreting suggested supplier's price, but finally the buyers can't understand in what circumstances, what parameters make up the price. Therefore, reviewing the literature on determine fair and reasonable price, presents some points which are necessary to be considered for designing model .These points are:

1. The fair and reasonable price determination has two separate sides. One of them is analytical side and another is related to negotiation skills. Therefore, determining the fair and reasonable price, is not exactly possible. Hence, besides the analytical models and price analysis techniques, human skills such as negotiation should be considered to improve the efficiency of this process. Hence, the ideal model provides a framework for analyzing the price and cost items and highlight the inconsistencies, not the fair price calculation.
2. Survey on concepts, tools and techniques in this subject, indicates that price analysis should provide 3 categories of information. Seller strategies, market condition and nature of products. Although some researchers such as Russell, considered the market theory and product characteristics, but reasonable relationship between these factors and price analysis has not been presented. For example, Russell introduced 12 characteristics that affect the complexity of each product and consequently on their prices. But he didn't present any framework to show how analyzer can use these factors to judge a bout price. Similarly, Lamm &Vose introduced seller pricing strategies and condition that result to take these strategies, but they have not clarified explicit relationship between the pricing strategy and fair price determination process.

From what has been discussed, it seems that existing models have were limiter in some techniques, and systematic model to analyze price by means of effective parameters, has not existed. Accordingly, in next stage, proposed model to compensate this shortage, has been presented.

4. Proposed model

Based on requirements which are explained in last section, an analytical framework to fill this gap, is presented in this part which can be schematically seen in figure 3.

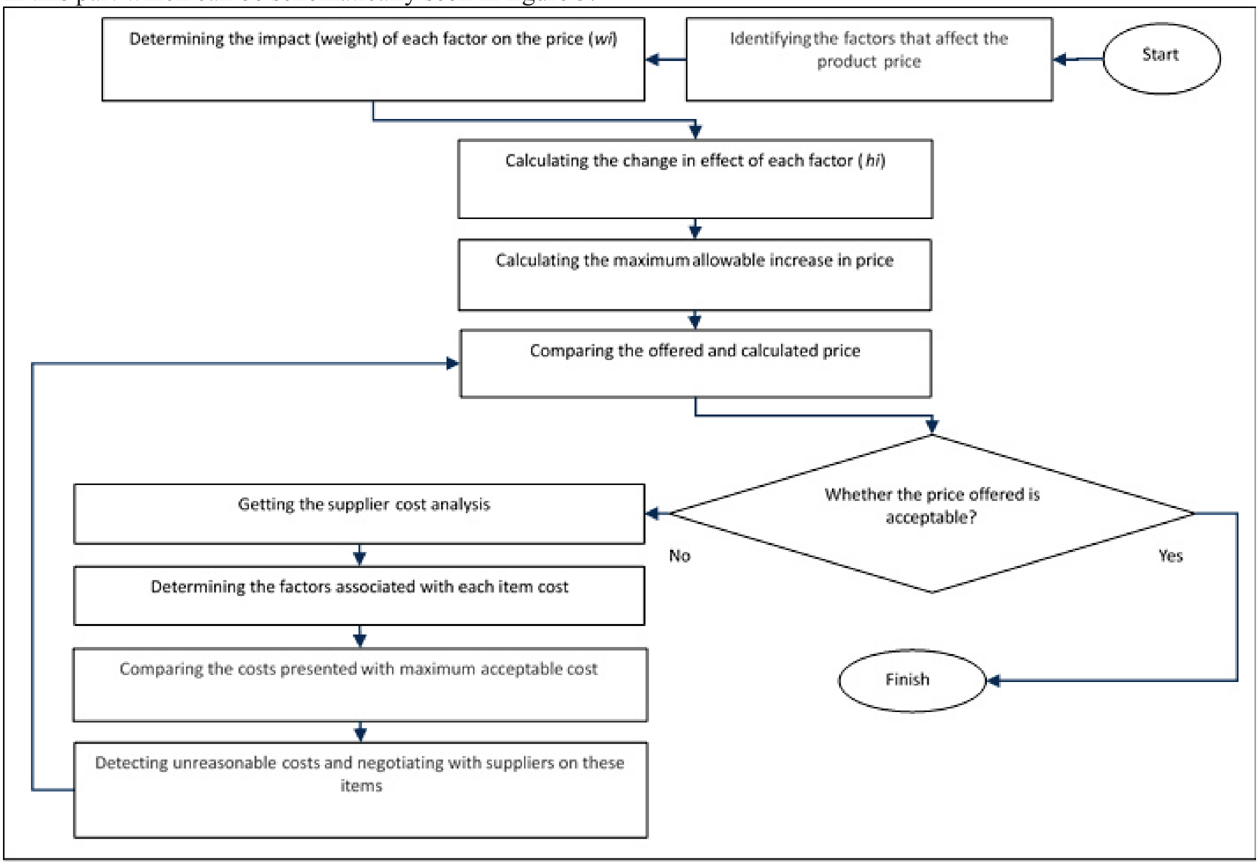

Figure 3: Proposed model for evaluating price reasonableness

4.1 Identifying factors that affect the product price

As mentioned in the previous section, several factors have different impacts on the suppliers pricing strategy that buyer firstly should recognize them. According to literature, these factors can divided in three categories as shown in figure 4.

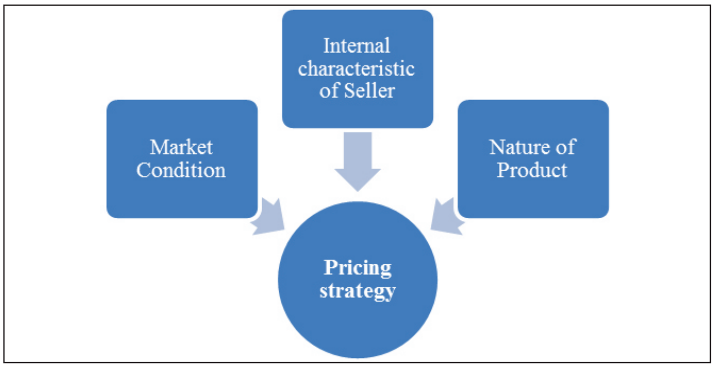

Figure 4: Factors affecting Pricing Strategy

Each of these categories, consists of some factors that will influence on some cost items and consequently on final price. In follow, according to literature review, these factors and cost items that may be affected from them, are collected.

Table 2: Factors from "Nature of products" category (Lamm and Vose, 1988; Afuah, 2003; Kaplan and cooper, 1998; Junny and Battle, 2008; Defense contract audit agency, 2005)

Factor	Description	Related Cost Items
Product's demand pattern	Demand is constant or variable?	• Set up Costs • Variable costs
Product's production history	Is it for first time that this product is produces or already has been produced?	• Variable costs • Design and R&D Costs • Depression
Products main required resources	Producing of this good is depend on machines or humans?	• Equipment and machinery Costs • Direct Labor costs
Production requirement	Required materials, machines, tools and facilities are special or general?	• Depression Costs • Material's Cost
Demand intensity	With increase in demand intensity, sellers probably suggest higher price than the price in normal situation.	• Profit
process standardization	Production processes are routine or variable?	• Variable costs
Product's specification	What is the acceptable level of quality, maintainability…?	• Material's Cost • R&D Cost • Direct Labor Cost • Depression
After sale requirement	What is the acceptable level of guaranty, warranty and similar services?	• Material's Cost • R&D Cost • Direct Labor Cost • Depression Costs

Table 3: Factors from “Internal characteristics of seller” category (Lamm and Vose, 1988; Afuah, 2003; Kaplan and cooper, 1998; Junny and Battle, 2008; Defense contract audit agency, 2005)

Factor	Description	Related Cost Items
Seller’s human resource situation	Number and expertise of sellers employees	• Direct Labor Cost
Human resource allocation	Human resource allocation in various units illustrates the importance of the various stages of production.	• Direct Labor Cost
Seller’s financial situation	The company's assets and debt will effect on hidden cost	• Profit
What is the firm's Activities Background	The production history is more likely to get costs such as the cost of brand is higher. However, because of its greater financial stability, they are more flexible in various methods of payment.	• Brands cost
Supplier’s business strategy	If a supplier's strategy is product development, design and R&D costs will be high, but if the suppliers follow market penetration or cost reduction strategy, consequently they will try to reduce their costs.	• R&D Costs
Relationship with other organizations, research institutes etc.	During partnership with unions and even competitors, some cost items such as R & D costs may decreases.	• R&D Costs
Quality systems	Does this supplier use the techniques of total quality management and continuous improvement?	• Production Costs • Depression
Investment structure	In what fields supplier has to invest?	• Depression • Variable Cost • R&D Structure
Payment Conditions	Payment conditions (Pay cash or installment) can influence price	• contract costs • Interest
Failed projects or plans	Suppliers may try to compensate their losses resulted from failed projects or plans, with increase in their goods or services price.	• Profit • Other costs
Active capacity supplier	If supplier’s capacity is full active or near maximum, suppliers proposed price for new products, probably is more. But if this parameter is low, supplier will try to offset fixed costs and is likely to accept orders with low profit.	• Profit
Financial stability	If the supplier's financial situation is stable, indicates a strong financial structure and good reputation in the market that is less need to manipulate the actual costs and expenses.	• Various Costs
Suppliers Performance	If the supplier’s performance is high, probably he will demand a high price for their products, due to the high cost of production inputs (material, equipment, human recourse…) which has been spent.	• Various cost
Production variety	To produce a variety of products, a variety of machines, facilities and equipment (such as new dies) and also manpower with different expertise may be needed.	• R&D Costs • Other Costs • *Direct Labor Cost*
Certificates	The cost that supplier spent to get certification (cost related to changes in processes and procedures, recruitment consultant, etc.) is included in the product’s price. On the other hand, the correct implementation of the standards, can lead to a significant improvement in some costs, especially in long term.	• Profit • Variable costs

Table 4: Factors from "Market Condition" category (Lamm and Vose, 1988; Afuah, 2003; Kaplan and cooper, 1998; Junny and Battle, 2008; Defense contract audit agency, 2005)

Factor	Description	Related Cost Items
New entrants risks	New entrants can influence on market competitiveness and drive down prices.	• Profit
Supplier's Brand validity	What is the reputation of the brand?	• Profit
Similar goods or substitutes	With increasing in substitutes or similar products, more competitive prices likely to come down further.	• Profit
Changes in interest	If the bank rate goes up, the amount of installment loans that supplier received from buyer, will increase.	• Installment loans
Changes in import or export tariffs	If import tariffs have changed, the costs of raw materials also will change. Moreover change in export tariffs, can influence on the interest of the seller to export that brings impact on good's prices.	• Raw materials • Profit
Restrictive laws	Items price can be affected with governmental restrictive rules	• Profit • Variable costs
Number of raw material suppliers	The greater the number of suppliers of raw materials, leads to more competition and cost of raw materials falls.	• Raw materials
Number of competitors	The greater number of competitors, leads to more competition and likely price can be decreased.	• Profit

4.2 Determining the impact (weight) of each factor on the price (wi)

The factors were mentioned in the previous section, are the set of factors that affect the each product's price. However, in various conditions, effect of each factor on the price is various and therefore, it is necessary to determine the influence of these factors on the cost items (weight of each factor). Due to inherent differences of these factors, weighting of them should be taken through the appropriate resources. For example, providing information about the "Internal characteristics of seller" may be reached from purchasing experts and through site visit, whereas, information about the "Market Condition" and "nature of product", can be performed by market research groups.

4.3 Calculating the change in effect of each factor (hi)

Amount of changes in the level of each factors which have been weighted in the previous step, should be calculated in this stage. For instance, it is possible that one factor, has a significant impact on price (*wi*), but compare to previous purchase, didn't have a specific changes. Therefore this factor doesn't have any impact on price.

4.4 Calculating the maximum allowable increase in price (Δp)

Using the information obtained in the previous steps, the maximum acceptable price is calculated (formula 1).

$$\Delta p = (\%w_1 \times h_1) + (\%w_2 \times h_2) + (\%w_3 \times h_3) + \ldots$$

Formula 1: calculation of maximum level in price change

4.5 Comparison of offered and calculated price ($\Delta p std$ & $\Delta p Act$)

At this point, calculated maximum increase in price ($\Delta p std$) should be compared with maximum price which is offered by the supplier ($\Delta p Act$). The result of this comparison may be one of the following conditions:

- *Difference in prices is acceptable*

In this condition, supplier proposed price will be accepted and analyzing process can be stopped.

- Difference in prices is significant

In this condition, in order to identify the reasonable price, evaluating process is entered in new phase, which should be performed through steps 6 to 10.

4.6 Getting the supplier cost analysis

If difference between calculated and offered price is significant, it is necessary to study and analyze the cost of each item to discover inconsistencies. Therefore, production cost of chosen products are obtained and analyzed. To clarify it more, an analyzing structure is presented in Fig 5.

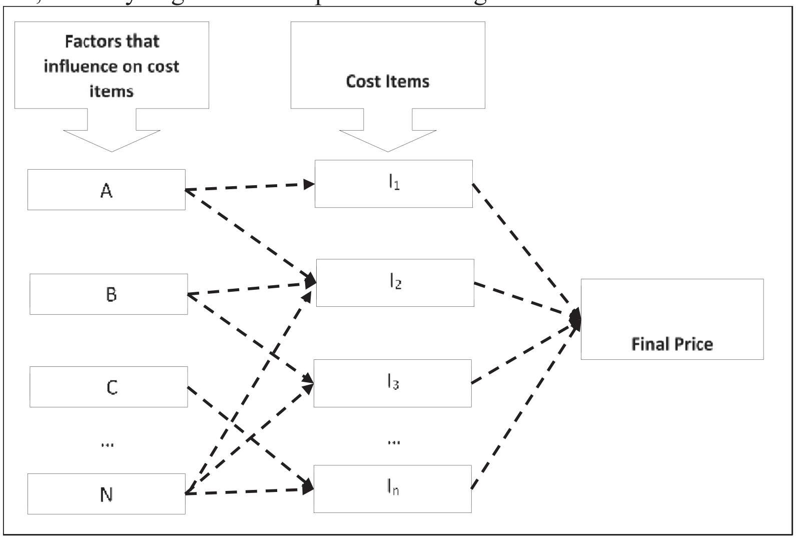

Figure 5: Structure for analyzing cost items

In this structure, relationships between factors, cost items and final price, have been shown. According to this structure, for analyzing the cost items, related factors should be recognized which previously were presented in tables 2, 3 and 4, in third column (related cost items). With these relationships, maximum changes in the cost of each item and offered cost are compared, and analyzer can recognize that which items are reasonable and which ones needs more discussion and detail information. In this process, purchase officer try to know more information about reasons of unacceptable costs. With this information, he/she modifies his judgment about maximum level of unfair costs or also he/she can persuade supplier to revise these costs. This loop will continue to obtain an acceptable price.

In the next part, this model applied to a real case in a governmental agency in ICT industry.

5. Case study

In order to represent the capability of proposed model, it is applied to a real case in a governmental agency which produce some ICT equipment. In this section, after the brief introduction of this company and their challenge in the fair price determination subject, applied procedure is explained.

5.1Company background

This company is one of the large company in ICT industry with great amount of purchasing items. Despite the high volume of demand for parts and equipment which was commonly provided from single-source firms, this company only relied on cost lists to judge about price reasonableness.Although, based on several experiences, they could set some rules and procedures with their suppliers, but deciding about supplier's price, completely was subjective, unstructured and based on personal opinion.

5.2 Case description and results

To put our model in practice, one of the company's purchased party, has been chosen and designed model presented in figure 3, step by step has been followed.

At first, by means of one questionnaire, affecting factors have been recognized and prioritized, by means of purchsing and market anlyse staffs. According to this survey, 10 affecting factors have been selected. These factors were 1-require intensity, 2-active supplier capacity, 3-new entrants risk, 4-similar goods or substitutes, 5- product demand, 6-product processes, 7-products main resources, 8- production variety, 9-changes in import or export tariffs and 10- number of raw material suppliers. These 10 factors, influence on 5 cost items including profit, variable costs, equipment and machinery costs, R&D costs and raw materials.

In following, acceptable change in each factor, has been determined by purchasing committee members, where they agreed that just 5% difference between standard and actual cost will be accepted.

After that, $\Delta pAct$ was calculated and accordingly, final decision about price reasonableness has been made which is shown in table5.

Table 5: Calculation of "Standard" and "Actual" Cost

Cost items	Effecting factors	w_i	h_i	$w_{i*} h_i$	Δp_{std}	Δp_{Act}	Result	
							Accept	Reject
Profit	Require intensity	0. 2	0.3	0.06	13%	14%	√	
	Active Capacity Supplier	0.1	0.3	0.03				
	New entrants risk	0.2	0.5	0.01				
	Similar goods or substitutes	0.15	0.2	0.03				
Variable costs	Product's demand	0. 2	0.3	0.06	10%	16%		√
	Product's processes	0. 2	0.2	0.04				
Equipment and machinery Costs	Products main resource	0. 2	0.3	0.06	6%	12%		√
R&D Costs	Production variety	0.1	0.3	0.03	3%	8%		√
Raw materials	Changes in import or export tariffs	0.1	0.5	0.05	7%	8%	√	
	Number of raw material supplier	0.1	0.2	0.02				

As can be seen in table 5, Profit and raw material had reasonable cost, because there is no significant difference between (Δp_{std} & Δp_{Act}).
But variable costs, equipment and machinery costs and R&D costs, could not be accepted, due to unacceptable difference between standard and actual cost (more than 5%). To finilise these costs, they should be regarded during negotiation process, more deeply.

6. Conclusion and future researches

In this paper, determining the fair and reasonable price, as a problematic issue in contract management, has been discussed. Studies depict that fair price determination, should be regarded from both hard(analytical) and soft(negotiation) viewpoints. Although there a lot of administrative recommendations and policies for determining reasonable price, but there is no comprhensive analytical model in this topic. To fill this gap, this paper has tried to develop an analytical model, in which, purchaser can systematically analyze and make judgment about supplier price and detect inconsistencies in costs items. In this model, factors affecting the price are recognized and determine their impact (their weight) on price. With these values and amount of their changes (during the analyzing period), maximum level of variation in price (acceptance level) can be calculated.
Hence, the main contribution and innovation of this paper can be stated in these two dimensions:

1. In this model, those factors which have impact on price and each cost items, have been collected and classified in 3 categories. Although these factors may not complete and other factors may be added in these 3 categories, but they can be regarded as a useful guide for buyer to analyze proposed price with a structured tool, especially at an early stages of analysis. It is possible that purchaser, recognize other factors during the negotiation with supplier, that can enrich affecting factors and consequently, improve the accuracy of calculations.
2. This model can easily convert qualitative factors to quantitative and comparable ones. So, any judgment about the price and costs are tangible.

As well as discussed in text, there are several factors involved in determining a fair and reasonable price that impact of each factor on price, can't be predicted accurately. Hence, the issue of determining the fair price can be categorized as unstructured problems that should solved by means of appropriate tools. Therefore, it seems that use of "expert systems" concepts for this purpose, is a useful approach for feature researches. Also, using the historical data for each supplier to recognize their pricing structure can be used to complete the system knowledge-base. Moreover, due to dynamic nature of mentioned factors and their interrelations, "System dynamics" theories can be applied to analyze their influences on the price, more effectively.

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