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Factors influencing the cost-based pricing method: the empirical study of Vietnamese feed mills

Abstract. The authors have investigated and assessed factors influencing the method of cost-based pricing in feed mills in Vietnam. Data were surveyed and collected from 199 feed mills in Vietnam by 2017 and analysed by using statistical tools. The Vietnamese feed mills include large-scale enterprises and small and medium enterprises. The respondents were mainly administrators and accountants. Notable results were found regarding five factors influencing the method of cost-based pricing in Vietnamese feed mills, namely: (1) capacity; (2) dissimilar expense; (3) level of influence which determines the selling price; (4) information cost and (5) market share. The results of analysis of variance (ANOVA) and regression analysis indicate that cost information has the strongest impact on the cost-based pricing method of the enterprises. The second strongest impact is the scale. Finally, the factors with the lowest impact are the selling price and the market share.

Based on the results obtained, the authors present new proposals in the application of cost management accounting methodology in product pricing at feed mills in Vietnam. Firstly, an enterprise should invest in a cost management accounting system to provide cost information that is useful for managers in making pricing decisions, especially when cost information is the most significant factor in pricing methods at feed mills in Vietnam. Secondly, determining the price is an important decision that all companies must implement. The recommendations are given for business managers and accountants regarding the cost-based pricing method in feed mills in Vietnam.

Keywords: Feed Mills; Cost-based Pricing; Vietnam

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Фактори, що впливають на витратне ціноутворення:**емпіричне дослідження в'єтнамських комбікормових заводів**

Анотація. Це дослідження було проведено з метою вивчення та оцінки факторів, що впливають на витратне ціноутворення на в'єтнамських комбікормових заводах. Дані було отримано від 199 в'єтнамських комбікормових заводів й оброблено з урахуванням статистичних методів станом на 2017 рік. Досліджувані комбікормові заводи представлено великими, середніми й малими підприємствами. До числа респондентів належать переважно адміністратори й бухгалтери. У ході дослідження значущими було визначено п'ять факторів, що впливають на витратне ціноутворення на в'єтнамських комбікормових заводах, а саме: потужність; несхожі витрати; ступінь впливу, що визначає відпускну ціну; вартість інформації та частка ринку. Результати дисперсійного та регресійного аналізу показали, що інформація про витрати й масштаб впливають на витратне ціноутворення найбільшою мірою. У той же час найменший вплив на витратне ціноутворення мають такі фактори, як відпускну ціна й частка ринку.

Ключові слова: комбікормові заводи; витратне ціноутворення; В'єтнам.

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Факторы, влияющие на затратное ценообразование:**эмпирическое исследование вьетнамских комбикормовых заводов**

Аннотация. Данное исследование было проведено с целью изучения и оценки факторов, влияющих на затратное ценообразование на вьетнамских комбикормовых заводах. Данные были получены от 199 вьетнамских комбикормовых заводов и обработаны с учетом статистических методов по состоянию на 2017 год. Исследуемые комбикормовые заводы представлены крупными, средними и малыми предприятиями. К числу респондентов относятся преимущественно администраторы и бухгалтеры. В ходе исследования значимыми были определены пять факторов, влияющих на затратное ценообразование на вьетнамских комбикормовых заводах, а именно: мощность; несходные расходы; степень влияния, определяющая отпускную цену; стоимость информации и доля рынка. Результаты дисперсионного и регрессионного анализа показали, что информация о затратах и масштаб влияют на затратное ценообразование в наибольшей степени. В то же время наименьшее влияние на затратное ценообразование имеют такие факторы, как отпускная цена и доля рынка.

Ключевые слова: комбикормовые заводы; затратное ценообразование; Вьетнам.

1. Introduction

The feed industry in Vietnam is established and developed in association with the Vietnamese livestock industry. The feed market in Vietnam is growing rapidly with an increase of 13-15% per year, approximately 18-20 million tons/year. It is expected that by 2020, the scale may reach 25-26 million tons per year. However, current domestic production hardly meets domestic demand. This shows that Vietnam's feed market is a potential market for feed mills [28].

Determining a reasonable selling price to bring about business efficiency is one of the most important issues of corporate governance. When making pricing decisions, managers rely on different sources of information for different pricing strategies, but cannot ignore the information of costs. Therefore, a management accounting system to control the cost information and selling price in changeable business situations is essentially necessary to sustain and develop each enterprise. In developed countries, modern cost management accounting systems are developed and utilized to provide useful information for managers in pricing. Hall and Hitch (1939) were the first to undertake research on UK companies using costs as the basis for price decisions. This study shows that about 80% of firms have applied the cost-based valuation approach, with only a few companies valuing marginal revenue and marginal costs as the model to maximise profits. Companies in the sample say they set prices based on full cost and added a desired margin. The study by Huda (2006) has examined 1,000 businesses in the UK's food processing and other industries [16]. Research results show that when pricing is cost-effective, variable cost information is used by executives because using full cost information can lead to costly mistakes. Nick (1997) has studied transfer pricing methods in electronics and chemicals in US companies operating both locally and internationally. The most common transfer pricing methods used in chemical companies are market price and cost-based pricing. The most common methods in electronic companies are market price, minus cost of sales, and pricing based on full cost of production. 56% of chemical companies use the cost-oriented method, while only about 46% of electronics companies use this method [21].

The above analysis has shown that most businesses around the world tend to use cost-based pricing methods. In an increasingly competitive business, there has been a shift from using the cost information to determine the selling price into fully cost-based pricing to value based pricing on variable costs or at market prices.

However, in Vietnam, feed mills have still focused on financial accounting to obtain cost information for product pricing. This accounting system cannot provide managers with appropriate, timely and reliable cost information for the

product pricing decisions. Therefore, feed mills will be less likely to stand firmly in the increasingly competitive business environment. Thus, the paper studies and assesses factors influencing the method of cost-based pricing in feed mills in Vietnam.

2. Brief Literature Review

The research by Gordon et al. (1981) was been conducted basing on 44 manufacturing companies including 22 companies from Canada and 22 enterprises from the United States, and interviewed the key leaders in charge of pricing decisions in the companies. The interview was carried out with detailed questionnaires consisting of both open and closed questions. The four industries targeted for research are food processing, chemicals, transport equipment and heavy equipment industries. The results of the research indicate that the cost-based pricing method is used with a margin plus a percentage based on cost. Even in businesses where competitor pricing is top priority, cost information is also important in assessing whether companies can sell product lines at market prices. Gordon et al. (1981) pointed out that large companies in this study have a stronger preference for smaller competitors in terms of using competitive or market conditions in setting prices. In contrast, cost-based pricing has been more dominant for products made to the customer's requirements, as opposed to mass-produced products. In addition, strong companies tend to rely more on cost on the basis of product quality. Thus, according to Gordon et al. (1981), there were three factors that influence the cost-based pricing approach: cost information, product characteristics (mass production or on-demand production) and enterprise scale. [10]

Guilding et al. (2005) surveyed 280 companies in the UK and Australia to investigate the cost-based pricing method and find out factors affecting it. They identified three possible factors of enterprise scale, competition level, and business line. The study concludes that the competition and business line influences the cost-based pricing method. The scale of a business does not affect this one [12].

The study by Huda (2006) examined 1,000 businesses in the food processing and other industries in the UK. The research identified seven factors that influence the cost-based pricing method, including business strategies, scale, market share, competition, product response required by customers, influence in determining the selling price and cost information. The study used the SEM sample to analyse and conclude that companies with lower market share pay more attention to cost-based pricing. They tend to operate in smaller markets where the product may tend to be produced on demand and not set prices. Hence, they can pay more attention to product pricing on a cost basis. The study indicated that the cost-based pricing method is more important than

on-demand products and is not important to standard products. The magnitude of the impact on selling price determination has a positive influence on the cost-based pricing method. The study found little effect of the enterprise scale on this method. At the same time, the study also pointed out that cost information and unique strategies have a positive impact on the cost-based pricing method. In contrast, competition has a negative impact on this [16].

The research by Peter and Chris (2013) explored factors that impact the cost-based pricing method in travel organisations in the UK. The results of the research have indicated that the enterprise scale influences the cost-based pricing method. The enterprise scale was found to be positively correlated with the pricing method on a full cost basis ($p = 0.01$, $\alpha = 0.05$). At the same time, the research pointed out that the full cost pricing method in large enterprises was more important than small businesses. Other pricing methods have not found a significant relationship with the enterprise scale [22].

Through an overview of the research on the factors affecting the cost-based pricing method, the authors have identified the following factors: business strategies, enterprise scale, market share, competition, product characteristics (on-demand or mass production), cost information, influence in determining the price and business line. However, the results of the studies are different. Skinner (1970) found product characteristics did not affect the cost-based pricing method. Skinner's survey shows that the number of companies manufacturing mass-produced products and the number of companies that produce products according to customer requirements using the cost-based pricing method were roughly equivalent, with 67% and 75% respectively [26]. At the same time, Gordon et al. (1981) and Huda (2006) point out that the product characteristics influence pricing methods on a cost basis. In terms of enterprise scale factor, Guilding et al. (2005) and Huda (2006) concluded that the enterprise scale did not affect cost-based pricing [22; 16]. Meanwhile, Gordon et al. (1981), and Peter and Chris (2013) argued that the enterprise scale did [10; 22]. However, Guilding and Huda undertook their research in manufacturing businesses; Peter Lane and his colleagues performed their research in service businesses. Various characteristics of business lead to various conclusions. Mill (1988) investigated that there was no difference in the type of business for cost-based pricing, with 71 percent of manufacturing companies and almost 70 percent of travel companies using this method [20]. According to the study by Guilding et al. (2005), it has been concluded that types of business influence cost-based pricing and are divided into three groups of manufacturing enterprises, service enterprises and retail enterprises [12].

There are a number of factors influencing cost-based pricing, and Guilding et al. (2005) proposed a three-factor costing sample that affects pricing on a cost basis, including: enterprise scale, business line and cost information. Huda (2006) mentioned seven factors impacting cost-based pricing, namely business strategies, scale, market share, competition, product response required by customers, influence in determining the selling price and cost information [12].

Business strategies

According to Garrison et al. (2010), three major business strategies are friendliness with customers - knowing and meeting customer needs; excellent operation - providing products as fast as possible at the lowest cost, and leading products - providing the highest quality products. Enterprises with low cost strategies often require large-scale production, pursue cost reduction goals from experience or fixed cost control [9]. According to Govindarajan and Anthony (1983), enterprises operate under the strategy of leading quality, but cannot ignore the cost. Companies applying this strategy need accurate product cost information in order to identify higher profits from increased cost products combined with quality strategy [11]. Hughes and Gjerde (2003) argue that the product diversification is more flexible in prices, but highly costly. Regarding products which are different

from those of competitors, competitive pricing cannot provide businesses with information about the price. In fact, different products make competition-based pricing less important. Therefore, the more diversified products are, the more it affects cost-based pricing [17].

According to M. Porter (1985), business strategy is the search for a favourable competitive position over competitors in an industry. He believes that the difference leads to efficiency. In a market, if any product differs from substitute ones, the cost-based pricing method becomes important to determine the selling price and ensures sales of the products, with the difference being higher than costs to make that difference [23]. Therefore, the first hypothesis is proposed as follows.

H1: Business strategy has a direct relationship with the cost-based pricing method.

Enterprise scale

According to the CARD Project 030/06 VIE (2010), the size of the enterprise is measured by its production capacity. Large-scale enterprises are those with a production capacity of 60,000 tons/year, while the companies with a production capacity of less than 60,000 tons/year are classified as small and medium enterprises [24].

Considering the relationship between enterprise scale and pricing, cost-based pricing is only appropriate for price-set enterprises, mainly those which are large-scale and manufacture different products. Large enterprises can invest in the modern pricing methods and highly accurate cost information. In addition, small-scale enterprises often offer product prices at market prices.

Gordon et al. (1981) argue that companies with large revenues and assets tend to set prices above competitive prices, while small-scale enterprises tend to offer competitive prices. Large enterprises often dominate the market and have the ability to set prices for the market, which means that they are able to use cost information to determine the price [10]. In addition, according to Guiding et al. (2005), large enterprises could invest resources to develop the modern cost system for effective cost-based pricing. In contrast, small businesses often accept prices and offer prices according to market prices [12]. Therefore, the second hypothesis is proposed as follows.

H2: The enterprise scale has a direct relationship with the cost-based pricing method.

Market share

Product characteristics and product quality of enterprises with large market share are different from those of other enterprises. Leading enterprises may determine selling prices of products on the market so they are often based on cost information. Generally, enterprises with a larger market share need more resources to invest in complex accounting methods to accurately determine indirect costs of products. Accurate costing may determine the reasonable selling price. In enterprises with a small market share with popular products, they impose industry prices on their products and then use cost-related information to decide the quantity of produced and consumed products.

However, many enterprises with a low market share tend to operate in a niche market where products are mainly made under customers' requirements. Enterprises with a lower market share pay more attention to cost-based pricing. At the same time, the lower the market share is, the more attention they pay to the cost-based pricing method. Gordon et al. (1981) argue that enterprises entering the market to maximise their market share often determine prices based on market factors rather than on the cost [10]. Therefore, the third hypothesis is proposed as follows.

H3: The market share has a positive relationship with the cost-based pricing method.

Competition in business environment

Over the past 20 years, enterprises in the world have become increasingly dependent on each other. The reduction of tariffs, quotas and other barriers to free trade, the improvement in global transport systems, the development of the Internet and the growing complexity of international

markets have truly created the global market. In the global market, companies compete with both domestic and foreign companies. The new competitive environment makes product pricing increasingly important. Prices must be competitive and generate the desired profit.

Guiding (2005) argues that the more intensive the competition is, the more important information is. Costs need to be accurately calculated in order to determine the lowest price. Higher prices will make enterprises reduce their competitiveness on the market unless the products are different. If products with new features to meet needs of customers and add values for customers, businesses must consider additional costs of creating new features. The price and quality of competitive products play an important role in surviving of products. However, in competitive markets, competitors' information is more important than cost information especially when products are not different from those of competitors, with the goal of dominating the market [12]. Thus, the fourth hypothesis is proposed as follows.

H4: Competition in the business environment has an indirect relationship with the cost-based pricing method.

Product characteristics

An enterprise may have one or more products. Product characteristics affect the cost of production. Products with complex texture are constituted with many components. They must satisfy with high technical requirements and require many processing and manufacturing steps. The more complicated products are, the more equipment and tools it is required to manufacture them. Therefore, product pricing should take into account the complexity and diversity of products. Business products can be mass produced or ordered. Products are ordered according to customer requirements, which differ from other products on the market in terms of characteristics and costs incurred. Businesses determine the price of the product according to customer requirements based on cost instead of market factors.

Gordon et al. (1981) argue that enterprises manufacturing products required by customers more rely on the cost-based pricing method rather than market factors [10]. Drury (2004) believes that enterprises trading products according to customers' orders will force their customers to accept the price offered by enterprises based on additional cost because there is no price for such specific products [5]. Guiding et al. (2005) claim that products which meet the customers' special needs lead to high prices, which increases the importance of the cost-based pricing method application. Therefore, the higher requirements are made by customers regarding products, the more impact on the cost-based pricing method occurs [12]. Therefore, the fifth hypothesis is proposed as follows.

H5: Product characteristics have a direct relationship with the cost-based pricing method.

Cost information:

Blois et al. (2000) argue that cost knowledge is an important input for pricing. The cost of the product forms the basis from which a price can be set. Cost is the starting point of the price: the enterprise needs to calculate the cost accurately as the basis for determining the reasonable price of the product. High cost will make enterprises lose competitiveness; low prices will not generate desired profits [3]. Atkinson et al. (2006) hold the view that managers use cost information to assist in pricing. Cost information is important information to help managers set prices and make product structure decisions [2]. Many accounting documents are emphasised in many price-driven industries by the market. Cost data, however, help companies determine the level of profit maximisation and find a combination of products that maximise profits and identify products that are lost.

According to Kotler (2000), costs are considered important for establishing a cost plan. The company sets a price target that covers all costs: produce, distribute and plus a reasonable profit margin. Therefore, managers should keep track of the costs carefully as if these costs outweigh the costs of competitors, the company will be less profitable and in

a disadvantageous position [19]. Hence, the sixth hypothesis is proposed as follows.

H6: Cost information has a direct relationship with the cost-based pricing method.

Influence in determining the selling price

In the competitive market, there are a number of large companies that dominate the price, and many small companies become price pursuers and must accept prices determined by the market. Therefore, for companies that accept prices, cost information is not used to set prices, but instead prices are set at market prices. Gordon et al. (1981) point out that price-pursuing companies are more interested in market conditions than in costing companies [10]. Guiding et al. (2005) also argue that companies that manufacture products with no difference are those who accept the price. In such a case, cost information could not be valuable in determining the price [12]. Therefore, the seventh hypothesis is proposed as follows.

H7: The level of influence in selling price determination is positively correlated with the cost-based pricing method.

3. Research Methodology

Data and sample

Samples are carried out in feed mills in Vietnam by 2017. According to animal feed association, there were 199 feed mills in Vietnam in 2017. Of which, there are 138 domestic enterprises, accounting for 74.3% and 61 foreign-invested enterprises, accounting for 25.7%. This is the whole range of research which is based on the sample. The authors divide the enterprises into two groups. The first group is large-scale enterprises. The other group is represented by small and medium-sized enterprises. The sample was stratified randomly according to the following general formula:

$$N = (Nt^2 * pq) / (N\varepsilon^2 + t^2 * pq) . \quad (1)$$

The authors collected samples for the study with the following requirements:

- reliability is 95.0% (Reliability coefficient $t = 95\%$) [In the Table of Reliability, the coefficient t is calculated by the function Nt of Lyapunov, $t = 1.96$];
- the deviation of sampling does not exceed 7% ($\varepsilon = 0.07$);
- with the overall sample structure of 20% of large enterprises and 80% of small and medium-sized enterprises. Since $p + q = 1$, then $p * q$ will be $0.8 * 0.2 = 0.16 \Rightarrow pq = 0.16 \Rightarrow$ substitute the formula for the sample size (n).

$$\begin{aligned} N &= (Nt^2 * pq) / (N\varepsilon^2 + t^2 * pq) = \\ &= (199 * 1.96^2 * 0.16) / (199 * 0.07^2 + 1.96^2 * 0.16) = \\ &= 77 \text{ enterprises.} \end{aligned} \quad (2)$$

As such, the study will take the minimum sample size of 77 enterprises to survey. The group of authors selected 77 enterprises to survey, including 14 large enterprises and 63 small enterprises to send questionnaires. With 23 observed variables in the study, the minimum number of samples in factor analysis and regression analysis is fold from 5 to 10 times in view of the observed variables (Hair et al., 1998) [13]. So the minimum number of samples in this study is $23 * 5 = 115$ units. The group of authors used the survey samples in this research, with $n = 388$ survey units, which guaranteed the requirement about the sample scale minimum (see Table 1).

Research processing

Firstly, it should be pointed out that the study was conducted with the use of the qualitative method. Through the study of previous studies, the authors combined the factors that impact the cost-based pricing method. Then, using in-depth interview techniques and direct discussion, the group conducted 11 interviews in which there were 5 face-to-face interviews with managers, including one Deputy General Director, one Deputy Director, one Chief Accountant and six face-to-face interviews with accountants in four feed mills in Vietnam. That allowed the authors to explore the ideas

Tab. 1: Survey sample description

Type of enterprises	Number of enterprises receiving the questionnaire	Number of enterprises answering the questionnaire	Number of delivered questionnaires	Number of answered questionnaires
Large enterprises	16	10	144	76
Administrators			48	24
Accountants			96	52
Small enterprises	61	56	244	142
Administrators			122	72
Accountants			122	70
Total	77	66	388	218

Source: Compiled by the authors

and the scope of the preliminary questionnaire directly for further discussion and discovery of new factors. The total documents and comments from the group discussions made it possible for the group of authors to determine the factors impacting the pricing method on the basis of cost, including: the business strategy, the business scale, the market share, the level of competition, the level of customer satisfaction, the level of impact in terms of the determination of the selling price and cost information.

Further, the study was conducted with the use of quantitative methods: through the technique of collecting primary data sources from questionnaires sent to respondents at sample businesses via the internet from Google Drive, mailed or interviewed by phone, face-to-face interviews.

The questionnaires were used to collect quantitative data to describe and verify the hypotheses. The questions in the questionnaire included open and closed questions. The purpose of open questions was to collect information that explained the relationships between the independent variables and the dependent variable or collected information about the new variables and the new factors. Off-site interviews and interviews have not been identified yet. Closed questions were used to collect information to describe the factors impacting the cost-based pricing approach at the livestock feed mills in Vietnam. The question of level was based on a five point Likert scale from 1 to 5 (1 = strong disagree, 2 = agree, 3 = neutral, 4 = agree and 5 = strongly agree). All variables in the questionnaire were constructed

with regard to the suggestions in the research paper (Table 2).

Analysis methods

After receiving the questionnaire, the answer sheet was processed prior to updating the SPSS 19 data analysis software. Further, the group of authors performed the scaling (Table 1) and tested the sample in four steps:

- 1) checked the quality of the scale (Cronbach's Alpha test);
- 2) analysed the exploratory factors (EFA);
- 3) tested the correlation coefficient;
- 4) used the multivariate linear regression model.

4. Analysis Results and Discussion

Reliability Analysis

Measurement factors are evaluated for reliability through coefficients Cronbach's alpha. Cronbach's alpha is a statistical test about the degree of rigor or the ability to explain a research concept of aggregate of observable variables in the scale. This method is used to eliminate unsuitable variables and limit waste variables in the research model (Hoang and Nguyen, 2008) [15]. Hair et al. (1998) consider that Cronbach's alpha from 0.8 to near 1 is a good measurement, from 0.7 to near 0.8 is an employable measurement, from 0.6 and more is acceptable if the concept is new or researched in a new situation [13]. The results of Cronbach's alpha are presented in Table 3.

Thus, all of the Cronbach's alpha coefficients of 6 independent variables are valid, with Cronbach's alpha > 0.7. The correlation coefficients transform the total of the observed variables are qualified > 0.3, which makes the given scales statistically significant.

Factor analysis

After analysing Cronbach's alpha confidence coefficient, the scales were continued being evaluated by EFA exploratory factor analysis method. To identify and determine related concepts, we used the method of exploratory factor analysis for 20 variables that impacted the cost-based pricing method, using the principal axis factoring and the promax rotation (Anderson and Gerbing, 1988) and a stop point when extracting factors, with Eigenvalues > 1.00. The results of the rotated factor matrix are shown in Table 4.

Tab. 2: Interpretation and scale coding

Name of variables	Type of variables	Code	Measurement	Source	Expected directions
Business strategies	Independent	STRA 1	Product selling price	Huda (2006)	+
		STRA 2	Production costs	Huda (2006)	+
		STRA 3	Expenses for R&D	Huda (2006)	+
		STRA 4	Expenses for marketing	Huda (2006)	+
		STRA 5	Product quality	Huda (2006)	+
		STRA 6	Brand image	Huda (2006)	+
		STRA 7	Product features	Huda (2006)	+
Scale	Independent	SCA 1	Production capacity	Huda (2006)	
Market share	Independent	SHA 1	Assessing the market share of enterprises in the market	Guiding et al. (2005), Huda (2006), Pham et al. (2010)	+
		SHA 2	Market share influencing the cost-based pricing method	Huda (2006)	+
Competition	Independent	COMP 1	Price competition	Huda (2006)	-
		COMP 2	Quality competition	Guiding et al. (2005), Huda Al-Husar (2006)	-
		COMP 3	Number of competitors in the market	Guiding et al. (2005), Huda (2006)	-
Satisfaction of products required by customers	Independent	SATIS 1	Standardized products	Guiding et al. (2005), Huda (2006)	+
		SATIS 2	Products satisfying with customers' requirements	Huda Al-Husar (2006)	+
Cost information	Independent	COST 1	Accurate cost of products to compete in the market	Huda (2006)	+
		COST 2	Cost information to reduce costs	Huda (2006), Peter and Chris (2013)	+
		COST 3	Cost determining the selling price	Huda (2006), Peter and Chris (2013)	+
		COST 4	Cost deciding on product structure or stopping production	Huda (2006), Peter and Chris (2013)	+
Influence on pricing	Independent	ISP 1	Enterprises having little influence on pricing	Huda (2006), Peter and Chris (2013)	+
		ISP 2	Enterprises having significant influence on pricing	Huda (2006)	+
Cost-based pricing method	Dependent	PRICE 1	Costs of products determining the price	Huda (2006)	+
		PRICE 2	Revenue of the products determined according to the percent of the total sold products of enterprises and sales expenses	Huda (2006), Guiding et al. (2005)	+

Source: Compiled by the authors

From the 20 observed variables, the factors impacting the cost-based pricing method were included in the factor analysis. The observed variables satisfy the requirements of factor analysis.

In particular, the results show that KMO = 0.636 satisfies the condition $KMO > 0.5$ (Kaiser, 1974). Thus, it can be concluded that factor analysis is appropriate to existing data. Similarly, Bartlett's test < 0.05 means that the variables are related and are eligible for factor analysis by EFA [18].

The results of the exploratory factor analysis show that seven factors are extracted from the Eigenvalues > 1.00 . The 20 observed variables are grouped into 7 factors. The total average variance extract is 78.058 and indicates that the seven factors account for 78.058% of the variability of the observed variables.

The variables of distinct strategy factors, low cost strategy factors, market share, competition, customer satisfaction, level of influence in price determination, cost information

Tab. 3: Cronbach's alpha of the research variables

Observed variables	Average scale if eliminating variables	Variance scale if eliminating variables	Variable correlation - Total	Alpha if eliminating variables
Difference strategy; Alpha = .866				
STRA3 Expenses for research and development	12.4312	9.804	.669	.845
STRA 4 Expenses for marketing	12.4174	10.751	.583	.864
STRA 5 Product quality	12.4954	10.288	.794	.816
STRA 6 Brand image	12.5734	9.693	.720	.830
STRA 7 Product features	12.3945	10.535	.705	.835
Low cost strategy; Alpha = .868				
STRA 1 Sales expenses	2.6009	1.024	.771	.
STRA 2 Production costs	2.6239	1.250	.771	.
Market share of the enterprise; Alpha = .863				
ISP 1 Market share influences pricing methods on a basis of cost	2.4633	1.089	.760	.
ISP 2 Evaluate the enterprises' market share in the market	2.5367	1.190	.760	.
Level of competition; Alpha = .738				
COMP 1 Price competition	6.6651	1.883	.532	.689
COMP 2 Quality competition	6.6284	1.995	.556	.661
COMP 3 Number of competitors	7.0000	1.788	.602	.604
Satisfaction of products required by customers; Alpha = .787				
SATIS 1 Standardised products	1.6284	.585	.656	.
SATIS 2 Products satisfying with customers' requirements	1.7982	.789	.656	.
Influence on pricing; Alpha = .897				
ISP 1 Enterprises having little influence on pricing	3.2569	.865	.817	.
ISP 2 Enterprises having significant influence on pricing	3.2569	.717	.817	.
Cost information; Alpha = .825				
COST 1 Accurate cost of products to compete in the market	11.6606	4.631	.648	.781
COST 2 Cost information to reduce costs	12.0092	4.617	.566	.819
COST 3 Cost determining the selling price	11.8899	4.550	.670	.771
COST 4 Cost deciding on product structure or stopping production	12.1239	4.247	.724	.745
Valuation method on cost base; Alpha = .827				
PRICE 1 Costs of products determining the price	3.5550	.700	.708	.
PRICE 2 Revenue of the products determined according to the percent of the total sold products of enterprises and sales expenses	3.5505	.848	.708	.

Source: Compiled by the authors

Tab. 4: Rotated factor matrix

Observed variables	Factor						
	1	2	3	4	5	6	7
STRA 6 Brand image	.847						
STRA 3 Expenses for research and development	.828						
STRA 7 Product features	.813						
STRA 5 Product quality	.766						
STRA 4 Expenses for marketing	.723						
COST 4 Cost deciding on product structure or stopping production		.867					
COST 3 Cost determining the selling price		.843					
COST 1 Accurate cost of products to compete in the market		.806					
COST 2 Cost information to reduce costs		.722					
COMP 3 Number of competitors			.869				
COMP 2 Quality competition			.817				
COMP 1 Price competition			.714				
STRA 2 Production costs				.928			
STRA 1 Sales expenses				.902			
SHA 1 Assessing the market share of enterprises in the market					.942		
SHA 2 Market share influencing the cost-based pricing method					.887		
ISP 2 Enterprises having significant influence on pricing						.930	
ISP 1 Enterprises having little influence on pricing						.911	
SATIS 1 Standardised products							.914
SATIS 2 Products satisfying with customers' requirements							.865

Notes: Extracted method: Principal Factor Analysis. Rotation method: Promax with Kaiser Normalization.

Total Average Variance Extracted: 78.058.

* Accreditation Bartlett < 0.05 .

KMO: 0.636.

Source: Calculated by the authors

are downloaded to the same factor and have the coefficient factor greater than 0.5.

Therefore, all the scales selected for the variables in the model meet the requirements and can be used in the next analyses.

Regression Analysis

Looking at Table 5, we find that the capacity factors, the level of impact determining the selling price, cost information, the market share, dissimilar strategies are the same-trend relationship with the cost-based pricing method. The significance level of the factors was less than 0.05, with linear correlation coefficients being 0.271, 0.336, 0.452, 0.272 and 0.202 respectively. This indicates that the impact level between factors is significant.

The results of the correlation analysis also show that there is not enough proof to confirm the relationship between the low cost strategy factor, the level of customer satisfaction and the level of competitiveness with the cost-based pricing method, Since the level of significance observed with regard to the relevant factors is greater than 0.05.

Based on the results of the correlation analysis, the authors eliminated the variables which have no statistical significance and focused on capacity, dissimilar expense, the level of impact determining the selling price, information cost, the market share and the cost-based pricing method while conducting the regression analysis. The results of the analysis are shown in Table 5.

Analysing linear regression model

Let us research the multivariate regression model using the formula:

$$PRICE = b_0 + b_1 * STRA + b_2 * SCA + b_3 * SHA + b_4 * ISP + b_5 * COST, \quad (3)$$

where:

- PRICE is the cost-based pricing method;
- STRA corresponds to business strategies;
- SCA is scale;
- SHA is the market share;
- ISP is the impact on pricing;
- COST is cost information;

b_1 - b_5 are corresponding impact coefficients of independent variables to the cost-based pricing method.

The verification of the model suitability is shown in Table 6.

The results of the variance analysis in Table 6 show that the dependent variance is divided into two parts: the

Tab. 6: Verification of the model suitability

ANOVA ^a						
	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	47.955	5	9.591	21.361	.000 ^b
	Residual	95.188	212	.449		
	Total	143.143	217			

Notes: ^a - Predictors: (Constant), STRA, SCA, SHA, ISP, COST.
^b - Dependent Variable: PRICE.

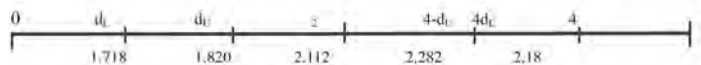
Source: Compiled by the authors

regression and the residual. The results of ANOVA analysis show that the sum of squares regression is 47.955, and the sum of squares residual is 95.188 and their sum, called the sum of all squares, is 143.143. Thus, the result of squared deviation of the regression is 47.955/5 = 9.591, and of the surplus is 95.188/212 = 0.525.

From the above calculated results we have the result of $F = 9.591/0.449 = 21.361$. Based on the statistical distribution table with F statistical, used to test the level of suitability model with the observed data, we have then value $F = 21.361$, corresponding with the level of the observed significance < 0.0001. Provided the p -value of F -testing is very small, we can conclude that there exists a linear relationship between the cost-based pricing method and at least one of the factors which are the capacity, dissimilar expense, the level of impact determining the selling price, cost information, the market share.

Verification of correlation

In research with $k' = 5$ (k' is the number of independent variables in the model), $n = 218$, the level of significance < 0.05 on the table DW: $dL = 1.718$ and $dU = 1.820$. Appending to the DW value bar, it can be seen that $1.718 < 2.170 < 2.282$, so there is no superlative 1st chain relationship in the model:



Verification of multicollinearity (VIF)

In this research, sig regression coefficients of the independent variables are less than or equal to 0.05. Therefore, the independent variables have significance for the dependent

Tab. 5: Correlation Coefficients

	Capacity	Dissimilar expense	Level of impact determining the selling price	Cost information	Market share	Low expense	Customer needs	Competitive	Cost-based pricing method	
Capacity	Correlation coefficient r	1								
	Level of significance									
Dissimilar expense	Correlation coefficient r	.003	1							
	Level of significance	.967								
Level of impact determining the selling price	Correlation coefficient r	.029	.446**	1						
	Level of significance	.673	.000							
Cost information	Correlation coefficient r	.051	.100	.273**	1					
	Level of significance	.455	.142	.000						
Market share	Correlation coefficient r	.082	.202**	.273**	.161*	1				
	Level of significance	.231	.003	.000	.017					
Low expense	Correlation coefficient r	.068	-.075	.003	.003	.050	1			
	Level of significance	.315	.270	.970	.969	.465				
Customer needs	Correlation coefficient r	.072	-.102	-.265**	-.038	.037	-.050	1		
	Level of significance	.289	.132	.000	.574	.465				
Competitive	Correlation coefficient r	.033	-.132	-.050	-.122	-.037	.011	.083	1	
	Level of significance	.632	.051	.463	.072	.584	.877	.224		
Cost-based pricing method	Correlation coefficient r	.271**	.202**	.336**	.452**	.272**	-.098	.027	-.015	1
	Level of significance	.000	.003	.000	.000	.000	.150	.694	.824	

Notes: **. p < 0.01; *. p < 0.05 level (2-tailed).

Source: Compiled by the authors

variable, which is why no variable is removed. The VIF coefficient is less than 10 (Table 7), no multicollinearity happens, therefore no variable is removed from the model.

After many repeated handlings of the regression models by different methods, the authors selected the Enter method (put all the variables into the regression equation) the result of which gives the best regression model:

$$PRICE = 0.397 + 0.383 \cdot COST + 0.417 \cdot SCA + 0.147 \cdot ISP + 0.104 \cdot SHA \quad (4)$$

Based on the results of the linear regression analysis in Table 8, we see that the scale factors (.237, $p = 0.000$), the market share (.0.136, $p = 0.022$), information cost (.0.367, $p = 0.000$), the level of impact determining the selling price (.0.164, $p = 0.014$) have a same-trend relationship and have statistical significance with regard to the cost-based pricing method. The dissimilar strategy factor doesn't have a relationship with the cost-based pricing method because of the significance level of the test $t = 0.311 > 0.05$. Therefore, the following hypotheses are accepted:

H2: The enterprises' scale has a relationship with the cost-based pricing method.

H3: The market share has a relationship with the cost-based pricing method.

H6: The level of impact determining the selling price has a relationship with the cost-based pricing method.

H7: The information cost has a relationship with the cost-based pricing method.

There is not enough statistical evidence to prove the factors such as the low cost strategy, the dissimilar strategy, the level of competition, the level of respond on products following the requirements of customers in feed mills in Vietnam. Therefore, the hypotheses H1, H4, and H5 are not accepted.

Such a result suggests that the larger the feed mills are, the greater impact they have on the cost-based pricing method. The enterprises with a large market share, or large-scale enterprises, are able to set prices. These enterprises often use the method of pricing on a larger cost basis. Therefore, the higher the market share is, the greater impact on the cost-based pricing method we observe. This result is in contrast to the results of Huda (2006), who says that the market share has a contrast relationship with the basis [16]. The low market share enterprises are impacted by the cost-based pricing method. This difference is due to Huda (2006) who researched the figures for feed mills and other industries [16]. Products of such industries are neither standardised nor mass produced. There are many products which do not meet the requirements of customers. This research was conducted based on data from the feed mills industry in Vietnam. Products in Vietnam are standardized and mass produced, with products of feed enterprises being no different. The enterprises which have a small market share also produce the same products as large market share enterprises do.

The level of impact determining the selling price has the same-trend relationship with the cost-based pricing method we observe. The beta is 0.164 because the level of impact determining the selling price is the verification of the impact that the feed mills in the market on the price of their products, regardless of the fact whether the firm establishes or accepts the price. Enterprises frequently set prices on the feed market using the cost-based pricing method. Therefore, the greater level of impact determining the selling price is, the greater impact on the cost-based pricing method we observe. This result is similar to the researches by Huda (2006) and Gordon et al. (1981), when they considered setting a favourite price on the cost-based pricing method then accepting the price [16; 10].

The enterprises' scale has the same-trend relationship with the cost-based pricing method we observe. Large-scale enterprises are those that set prices on the feed market in Vietnam. They often use the method of determining the selling price based on a full cost basis. Therefore, the larger the scale of an enterprise is, the more it impacts the cost-based pricing method. However, this result was not same as the results obtained by Huda (2006) and Guiding et al. (2005), when the researchers concluded that the scale did not link with the cost-based pricing method. This difference is due to the fact that large enterprises, according to Huda (2006) and Guiding et al. (2005), produced many product lines, and each product line has a market share with certain restrictions [16; 12]. Hence, it is possible that the abovementioned researches failed to explore the relationship between the scale and the cost-based pricing method.

Cost information is the same-trend with the cost-based pricing method. The beta is 0.367. When enterprises use cost information many times in decision making, it greatly impacts the cost-based pricing method. Cost information has the strongest impact because, according to the survey, enterprises often use cost information in product pricing. The most commonly used pricing method is the full cost pricing. Therefore, full information is essential for enterprises. In large enterprises, there is a system of development cost accounting so that they only use the cost-based pricing method to determine the selling price outside and the internal price transfer at the enterprise. To determine the selling price, small and medium-sized enterprises base their prices on those of competitors, especially those of large enterprises. However, cost information is still a concern for small and medium-sized enterprises because they still have to determine the cost of the product to be sold at market prices to ensure that the business is profitable. Therefore, cost information is considered by the feed mills, regardless of the size of the enterprise. Therefore, the level of impact on cost information by using the cost-based pricing method is significant. This result fits with the findings of Huda (2006), showing that cost information and the method of pricing on a cost-basis have the same-trend relationship [16].

Tab. 7: Verification of multicollinearity

Model	Collinearity Statistics	
	Tolerance	VIF
1 (Constant)		
COST Information cost	.915	1.093
SHA Market share	.904	1.107
ISP Level of impact	.724	1.380
SCA Capacity	.992	1.008
PRICE Dissimilar strategy	.793	1.261

Source: Compiled by the authors

Tab. 8: Results of linear regression analysis

	Regression coefficient is not standardised		Regression coefficient is standardised	t	Sig.
	B	The standard error	Beta		
B0	.397	.319		1.245	.214
COST	.383	.061	.367	6.268	.000
SHA	.104	.045	.136	2.308	.022
ISP	.147	.059	.164	2.488	.014
SCA	.417	.099	.237	4.208	.000
PRICE	.062	.061	.064	1.016	.311

Source: Compiled by the authors

The results of the analysis of the regression models show that if the adjusted R^2 is 0.319, the independent variables have the ability to explain 31.9% for the dependent variable. Cost information has the strongest influence to the cost-based pricing method, as shown by a standardised beta coefficient of 0.367. The factor which is the second influential is the scale, with a standardised beta coefficient of 0.237. The level of impact determining the selling price and the market share have the lowest impact, with the standardised beta coefficients being 0.162 and 0.136, respectively.

This paper has shown that cost information has the strongest impact on the cost-based pricing of the enterprise.

5. Conclusions and Recommendations

We have identified the factors which impact the cost-based pricing method in the feed mills in Vietnam, i.e. the scale of enterprises, the market share, the level of impact determining the selling price and cost information. Based on the results of the research, the authors present new proposals in the application of cost management accounting methodology in product pricing at feed mills in Vietnam.

Firstly, an enterprise invests in a cost management accounting system to provide cost information that is useful for managers in making pricing decisions, especially when cost information is the most significant factor in pricing methods at feed mills in Vietnam. In addition, businesses should sort costs into variable costs and fixed costs. Firms should apply the least squares method by using Microsoft Excel through the Intercept, Slope and RSQ functions to separate the mixed cost into variable cost components and fixed costs. Small-scale enterprises should allocate general costs by using a rational basis of allocation, between the basis of the selected distribution and the overhead that has a causal relationship. Large-scale enterprises have a large portfolio of products, often resulting in large overheads. These firms can apply the ABC approach to allocating generic costs to products.

Secondly, the research has shown that determining the price is an important decision that all companies must implement, namely:

(1) For setup price firms:

In the short term, price-setting firms are firms with market power. These firms often apply cost-plus methods to price their products. IBs provide variable cost information and increased fixed costs for the administrator to make the decision in this case. In the long term, the basis for pricing is the sum of expected costs and benefits. The reason is that the company must earn enough revenue to cover all costs and profit in terms of its products. Depending on the targets of the company, the desired profit will be adjusted accordingly. The most

important issue in this regard is that the full cost information includes variable costs and fixed costs. Variable costs can be calculated for the product. For fixed costs, companies should use the ABC method to determine the product.

(2) For follow firms:

In the short term, follow firms will be based on variable costs as the basis for pricing the product. Companies need to use price information to incorporate variable cost information and resource capacity to determine the composition of consumer products in the short term. In the long term, enterprises can adjust the supply of resources for a product. Businesses should use the full cost information to conduct periodic profit analysis that serves to differentiate between profitable and non-profitable products to ensure that only profitable products are sold.

Based on the findings in this research, some recommendations are given for business managers and accountants in view of the cost-based pricing method in feed mills in Vietnam.

Business managers

Firstly, it is essential to enhance the awareness about the importance of cost management accounting in business operations especially in making pricing decisions. Secondly, it is important to eliminate decision-making thinking based on the insights and personal experience of the managers. Thirdly, it is recommended to have programs and training plans for accountants. Finally, it is vital to create funding conditions and provide time for the application of cost management accounting methods at enterprises.

Accountants

It is necessary to improve awareness about the role and importance of providing information of in management accounting in decision making of executives. Moreover, each accountant should improve professional knowledge on cost management accounting. From there, they should actively propose, build, orient and gradually apply the method of cost management accounting in providing useful information to managers.

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