

# Variance Analysis of Variable Manufacturing Expenses under Standard Cost Method

Zhiying Liu

Jiangsu urban and rural construction Vocational College, Jiangsu, China

## **Abstract:**

With the economic development, the emergence of the post industrial era and the development of big data cloud computing technology, the main characteristics of high-end equipment application are becoming more and more obvious. The difference treatment under the traditional standard cost method can no longer solve the relevant problems of actual cost accounting and difference treatment of industrial enterprises. This paper integrates the principle of activity-based cost driver analysis and combines the driver with the occurrence of indirect costs, which is more reasonable.

**Keywords:** *Standard cost method, variable cost manufacturing expense, difference*

---

The standard cost method is a method to evaluate the work quality of an enterprise by comparing the actual cost of the current period with the standard cost. Cost variance is an important management information, and the accounting of cost variance is an important link of cost control. Cost variance is mainly divided into direct material variance, direct labor variance and manufacturing expense variance. Among the three, the most complex is the difference of manufacturing cost, which is also an area with many problems in practical work.

## **I. PRINCIPLE AND APPLICATION PROGRAM OF STANDARD COST METHOD**

Principle of standard cost method: standard cost method is a method to study the difference between standard cost and actual cost and deal with the difference. Differences include material differences, labor differences, variable manufacturing cost differences and fixed manufacturing cost differences. These differences are further divided into quantity differences and cost differences. The quantity difference of direct materials is called consumption difference, the direct labor quantity difference and variable manufacturing cost difference can be called efficiency difference, and the quantity difference of fixed manufacturing cost is called energy difference. These differences together form the difference system of standard cost method.

Application procedure of standard cost method: its application should follow certain procedures, including the following six steps. The first is to formulate the standard cost, then confirm the actual cost, calculate the total difference and sub item difference, decompose the difference, analyze the causes of the difference, carry out corresponding accounting treatment and register the account book, form the difference report and give corresponding suggestions [1].

1. Establish standard cost. To apply the standard cost method, we must first formulate standards for each cost item. The direct material cost standard is to consider the actual consumption in the production process of the enterprise on the basis of the actual consumption, and then give feasible suggestions. The cost of raw materials consists of two steps: unit price of raw materials and consumption. Formulate different standards according to different requirements of product quality. For products that create excess profits for enterprises, enterprises should consider high-quality materials. For cheap products, on the premise of ensuring the function, try to choose more practical split materials or alternative materials. The price standard of different materials shall be determined by referring to similar enterprises and considering the stability of market price, and shall be determined by collective or expert discussion; the determination of direct labor cost standard should also consider two aspects: labor level and wage rate. If high-level workers are employed, the wage rate standard is relatively high. If low-level workers are employed who are inexperienced or inexperienced, the wage rate standard is relatively low. However, due to the inexperience or inexperience of workers, more working hours may be consumed in actual work, resulting in a large efficiency difference in the later stage [2]; the formulation of variable manufacturing cost standard should also start from two aspects. It should consider the driving factors such as machine operation closely related to variable manufacturing cost and the distribution rate of variable manufacturing cost. The distribution rate of variable manufacturing cost should be revised and determined based on the development law of actual manufacturing cost distribution rate. Too high formulation will undermine the enthusiasm of performance assessment, too low standards have lost the significance of control and assessment. The factors to be considered in the formulation of fixed manufacturing cost standards include planned output, planned man hours, actual man hours, actual output, fixed manufacturing cost allocation rate standard, etc.

2. Determine the actual cost. Under the traditional cost accounting process, the actual cost of products, the cost of raw materials, the remuneration that workshop workers should pay for the production of products, the indirect costs of various changes within the workshop and the fixed costs of leasing, management and quality inspection within the workshop are determined after a series of procedures and actual distribution, Finally, the costs obtained in this process are summarized, and then the total cost of finished products and the unit cost determined on this basis are the actual indicators after the distribution between finished products and products. Just to meet the needs of standard cost variance analysis, the traditional cost calculation should be adjusted according to the needs, that is, the manufacturing expenses should be divided into two parts: variable and fixed according to their habits.

3. Calculate the difference and reason of each cost item. The cost calculation is improved to reflect the actual cost. Under the standard cost method, the standard total cost of products and various variance data can be obtained through the standard cost system. It is related to the proficiency of production workers. Of course, if there are certain requirements for machine technology, the consumption is more related to the state of equipment and has little to do with the number of workers. The value of high-precision equipment is large, and the standard of variable manufacturing cost allocation rate will be relatively higher. The value of general equipment is low, and the formulation of variable manufacturing cost allocation rate is relatively lower [3].

4. Submit the analysis report on the causes of differences. After the difference is determined, an analysis report shall be submitted. The analysis report can be designed and arranged according to the needs. Generally speaking, there are total difference items, sub item difference data, which department is responsible for the difference, whether there is a special person in charge, whether it is controllable or uncontrollable, whether it has seriously affected the performance of relevant departments, and whether there is room for improvement, How to correct and avoid re occurrence in the future? What are the lessons learned? Of course, if the difference ratio is small and does not comply with the principle of exception management, the corresponding projects can also be simplified, which is more humanized and can play an incentive role, and can be used as the basis of performance evaluation.

## **II. PRINCIPLE OF VARIANCE DECOMPOSITION OF VARIABLE MANUFACTURING COST UNDER TRADITIONAL MODE**

The variance of manufacturing cost and actual manufacturing cost is the product of the variance of manufacturing cost and actual manufacturing cost. Variable manufacturing cost differences are further divided into efficiency differences and distribution rate differences. The efficiency variance is equal to the product of the actual man hour and standard man hour variance and the budget allocation rate of variable manufacturing expenses. The consumption difference is equal to the difference between the actual variable manufacturing cost and the actual working hours, and the value difference is expressed according to the budget allocation rate of variable manufacturing cost [5]. Under the traditional mode, the working hours are regarded as the only motivation, and a difference system is established.

## **III. CURRENT SITUATION AND PROBLEM ANALYSIS**

Company a is a manufacturer of elevators. Relatively speaking, the production variety is relatively single. In the past two years, the company has also been trying to produce high-end order varieties according to customer needs, but it is not the main source of income of the enterprise at present. The company pays attention to product quality, strengthens enterprise quality management, and has 3 years of experience in applying standard cost method for elevator accounting, paying attention to product quality inspection and monitoring. The application of standard cost method in enterprise a is as follows:

### **1. Cost data related to hydraulic elevator of enterprise A**

Enterprise A will produce 210 fixed hydraulic elevators in the third quarter of 2020, and the actual production is 200. According to the relevant data summarized by the production workshop, the information is shown in Table 1 to table 11 below.

**Table 1 actual cost calculation sheet of fixed hydraulic elevator output: 200 units: 10000 yuan**

Month/date	summary	Cost subject				subtotal
		Direct material	Direct labor	Variable manufacturing overhead	Fixed manufacturing overhead	
10.2	Steel NO. 1	75.33				75.33
10.2	Steel NO.2	252.396				252.396
	Subtotal	327.726				327.726
10.28	Direct labor		40			40
11.28	Direct labor		40.04			40.04
12.28	Direct labor		44.7			44.7
	subtotal		124.74			124.74
12.30	Variable manufacturing overhead			284.4		284.4
12.30	Fixed manufacturing overhead				313	313
	total	327.726	124.74	284.4	313	1049.866

**Table 2 other related indicators table**

item	Working labor in 3 level	Working level in 2 level	subtotal
Low level material in hours	4296	1664	5960
Normal material in hours	5604	2296	7900
subtotal	9900	3960	13860
Actual labor expenses	686070	561330	1247400
Production units in low level material	48	32	80
Production units in normal level material	72	48	120
subtotal	120	78	198

**Table 3 Determination of variable manufacturing cost standard**

Serial number	Cost item	Standard consumption index	Standard value index	Cost (in unit10000yuan)
1	Power consumption	0.1	1	0.1
2	Design graphics	2labour hours	0.25	0.5

3	mould	1unit	0.1	0.1
4	Automatic assembly	8machine hours	0.05	0.4
5	testing	2labour hours	0.05	0.1
	subtotal			1.2

**Table 4 Summary of actual occurrence of variable expenses**

Month/date	Cost item					total
	Power consumption	Design graphics	mould	Automatic assembly	testing	
10.2		108				108
11.15			30			30
12.10				93.6		93.6
12.25	28.8					28.8
12.28					24	24
subtotal	28.8	108	30	93.6	24	284.4

**Table 5 standard cost**

item	Direct material	Direct labor	Variable expense	Fixed expenses	total
amount	1.6	0.6	1.2	1.6	5

Enterprise a has a production cycle of three months. At the end of the cycle, the standard cost method is used for corresponding accounting treatment and analysis. The cost items of the enterprise are analyzed as follows:

Confirm the difference of variable manufacturing expenses. Substitute the relevant data into the formula, and the calculation process is as follows: the standard cost is equal to  $1.2 \times 200$ , i.e. 240; The actual cost is equal to  $1.422 \times 200$ , i.e. 284.4, and the difference between 284.4 and 240 is 44.4; Efficiency difference equal to  $(12000-16000) \times 0.015$ , equal to saving variance 60; Expense variance equals  $(0.0237-0.015) \times 12000$ , overrun difference 104.4. The total difference is the sum of 104.4 and saving difference, which is 44.4, which is consistent with the total difference.

#### **IV. ANALYSIS ON THE CURRENT SITUATION OF APPLYING STANDARD COST METHOD IN ENTERPRISE A**

Firstly, the second part sorts out the application status of standard cost method.

1. The composition of each difference is shown in the table below.

**Table 6 Variance composition table**

item	Direct material	Direct labor	Indirect expense	total
amount (in 10000yuan)	7.726	4.74	37.4	49.866
proportion	15.5	9.5	75	100

2. Further analyze the variance composition of variable manufacturing expenses.at first obtain the data for standard cost.

**Table 7 variance composition and proportion of variable manufacturing expenses**

item	amount (10000yuan)	proportion
Variance in consumption	-60	-1.35
Variance in price	104.4	2.35
Total variance	44.4	1

Secondly, summarize according to the summary table above. The total cost of the enterprise is 10.49866 million yuan, the standard cost is 10 million yuan, the overspending difference is 49.866, and the overspending proportion reaches 5%.

According to the current analysis results, we can see the cost overrun proportion of each project, which is 15.5%, 9.5% and 75% respectively. It can be seen that the manufacturing cost overrun proportion is as high as 75%. Manufacturing cost should be the focus of subsequent analysis. The total difference of manufacturing expenses in this quarter is as high as 75%, which is mainly due to a large number of differences in variable manufacturing expenses. According to the data, it should be oriented to the difference analysis and cost control of variable manufacturing expenses. The efficiency difference is determined as saving difference, the distribution rate difference is overspending difference, and the efficiency difference is offset by a large number of distribution rate differences, which is still overspending difference on the whole, the conclusion is that the amount of variable manufacturing expenses exceeds the standard.

Finally, the problems existing in the application of this method in the enterprise are analyzed. According to the previous procedures, it can be found that the application of the standard cost method can indeed provide some basic wrong information, but these rough information is of little significance to the enterprise's cost control, management and optimization, and cannot be implemented, so it is impossible to know the subsequent cost optimization work [6].

Problems in manufacturing cost variance analysis. According to the above summary table, we can get the information that the variable manufacturing cost overrun is serious, and the fixed manufacturing cost is reflected in the saving difference. According to the above information, the focus of our next cost control should be to further analyze the reasons why the actual variable manufacturing cost investment exceeds the standard. The standard is 12000 yuan per set, and the actual resources invested are 142200 yuan per set. Each unit exceeds the standard by 20200 yuan. How to reduce the actual investment below the standard cannot be realized according to the current accounting procedures. The reason is that enterprises choose a single standard when calculating the variance of variable manufacturing costs, and there are many items of variable manufacturing costs, and the motivation is also diverse. It is unreasonable to allocate variable manufacturing costs according to machine hours. Therefore, a correlation should be established between the cost items, that is, the consumption of resources and the amount of drivers, so that the subsequent cost optimization can be targeted.

It can be seen that the current standard cost method can not meet the needs of obtaining information. Materials should be subdivided and output differences, combination differences and price differences should be divided according to material types; For labor differences, three analysis items should be established: the difference caused by secondary materials, the difference of conventional materials, the difference of labor substitution and the difference of wage rate; For manufacturing costs, we should integrate the idea of "activity", establish an activity database, establish the relationship between resources and drivers, and analyze the causes of cost differences by items. Only in this way can we provide effective information.

## V. SUGGESTIONS ON IMPROVEMENT OF VARIANCE DECOMPOSITION SYSTEM OF VARIABLE MANUFACTURING COST

1. Correctly understand standards. The understanding of standard in the application of standard cost method is a key problem. Company a plans to produce 200 hydraulic elevators in the third quarter of 2020, and the actual production quantity is 210. This type of elevator of the enterprise was determined three years ago with reference to the average level of the same industry, which was 50000 yuan. The actual total cost determined at the end of the quarter was 10.92 million yuan. The unit cost is 1092 divided by 210 sets, and the actual unit cost can be determined to be 52000 yuan. Details of cost and product quantity are shown in Table 8 below.

**Table 8 production and cost**

index	Cost under planing production	standard cost under actual amount	Actual cost under actual amount
amount (in unit)	200	210	210
Index per unit	5	5	5.2
Total index	1000	1050	1092

2. Obtain variance data. It can be determined that the total difference is  $1092-1000 = 920000$  yuan, and the difference of 920000 yuan in this quarter consists of two parts. The first difference is the difference between the standard cost under the actual output and the planned cost under the planned output.  $1050-1000 = 500000$  yuan. This difference is the difference caused by the actual number of units exceeding the planned number of units  $210-200 = 10$  units. Although this difference is an overspending difference, it is a normal difference when 10 units can be sold, which is also good for the enterprise, Because when the fixed cost remains unchanged, the more production, the more contribution. The second difference is based on the actual output of 210 units and the difference between the standard cost and the actual cost. The difference is  $1092-1050 = 420000$  yuan. This difference is a price difference. It may be raw materials or labor. It may also be that the workshop overheads have exceeded, resulting in a difference of 420000 yuan. This difference is an adverse difference that the enterprise does not want to see. It occurs when the actual resource consumption exceeds the standard resource plan. Enterprises should pay attention to the actual resource consumption and reduce adverse differences. The total difference between the two items is  $50 + 42 = 92$ (in 10000 yuan), which is exactly the difference between the actual index and the planned index,  $1092-1000 = 92$ (in 10000 yuan). The first difference is called static difference, and the second difference is called elastic difference. Standard cost is effective in analyzing elastic differences.

3. Analyze the characteristics of variable manufacturing costs

The determination of standard consumption should consider the driver relationship between consumption and cost, and select the indicators with strong correlation as the standard as far as possible. Due to the large number of variable manufacturing expense items in the workshop, each expense corresponds to a large amount of standard setting workload, so at present, most enterprises mostly determine a common standard for setting, such as machine hours or standard man hours as quantity indicators. Of course, it is precisely because of the comprehensiveness of quantitative indicators that the relevance of cost analysis is weakened.

Determine the motivation. According to the case data given above, the differences can be further subdivided directly and integrated into the idea of activity-based costing. Conduct difference analysis under the new method. The specific process is shown in tables 9 to 12 below.

**Table 9 calculation of efficiency difference**

item	Nature of work	Actual consumption Input	standard Quantity	difference	Unit price (0000yuan)	total
Power(0000 unit)	Cannot be deleted	24	20	4	1yuan Per power	4



Design	variable	360	400	-40	0.25(0000/labor hour)	-10
mould	invariable	200	200	0	—	0
assemble	invariable	1560	1600	-40	0.05(0000yuan /machine hour)	-2
test	variable	400	400	0	—	0
subtotal	-					-8

**Table 10 calculation of expenditure variance**

item	Actual index	Standard index	variance	Actual consumption	Variance in expenditure
Power(0000 unit)	1.2	1	0.2	24	4.8
Design	0.3	0.25	0.05	360	18
mould	0.15	0.1	0.05	200	10
assemble	0.06	0.05	0.01	1560	15.6
test	0.06	0.05	0.01	400	4
subtotal					52.4

**Table 11 summary data**

item	Efficiency variance	proportion	Expenditure variance	proportion	subtotal	proportion
Power(0000 unit)	4	-50%	4.8	9.165%	8.8	19.82%
Design	-10	125%	18	34.35%	8	18.00%
mould	0	0	10	19.03%	10	22.52%
assemble	-2	25%	15.6	29.77%	13.6	30.63%
test	0	0	4	7.685%	4	9.03%
subtotal	-8	100%	52.4		44.4	100%

**Table 12 comparative analysis of two methods**

item	Traditional method		New method	
	Efficiency variance	Price variance	Efficiency variance	Price variance

Power(0000 unit)	——	——	4	4.8
Design	——	——	-10	18
mould	——	——	0	10
assemble	——	——	-2	15.6
test	——	——	0	4
subtotal	-8	52.4	-8	52.4

Under the two methods, the total amount of variable manufacturing expenses has not changed. The efficiency difference and price difference are the saving difference of 80000 yuan and the overspending difference of 524000 yuan respectively. The sum of the two is still the saving difference of 444000 yuan. However, under the new method, the difference is more specific. For each project, the efficiency difference of power consumption difference is 40000 yuan, and the price difference is 48000 yuan, totaling 88000 yuan; The difference efficiency difference of cartography is that the difference saved is 100000 yuan, the price difference exceeds 180000 yuan, and the total difference is 80000 yuan; The difference of mould efficiency and price is 0 and 100000 yuan respectively, totaling 100000 yuan; The efficiency difference and price difference of assembly are saving difference of 20000 yuan and overspending difference of 156000 yuan respectively, totaling 136000 yuan; The difference of detection efficiency and price is 0 and 40000 yuan respectively.

In fact, the differences of variable costs can be further analyzed to find possible laws. The difference ultimately depends on the distribution rate. If the actual distribution rate is large, it must be the overspending difference. If the actual distribution rate is small, it must be the saving difference. The degree of absolute overspending or absolute savings depends on the man hour factor. When the actual working hours change from less than the standard working hours to more than the standard working hours, the efficiency difference changes from saving difference to overspending difference. When the actual allocation rate changes from less than the standard allocation rate to more than the standard allocation rate, the expenditure difference also changes from saving difference to overspending difference.

## VI. COMPARATIVE ANALYSIS BEFORE AND AFTER IMPROVEMENT

According to the above analysis table, the efficiency difference and expenditure difference can be refined according to the expense items of variable manufacturing expenses. The original method was a single comprehensive analysis method. The selected machine hours thought that the differences of variable manufacturing expenses were caused by machine hours. In fact, the influencing factors of variable expenses were not just machines, but among the five expense items, only assembly is related to the machine. Other expenses are related to factory workers, power operation and mold requisition respectively. Therefore, the variance analysis of variable manufacturing expenses should adopt diversified standards to confirm the variance, and the proportion can be determined on this basis. It can be treated differently

according to the proportion. If the overspending proportion is serious, further analysis can be emphasized. For example, the overspending of assembly part is more than 30%, What is the specific reason and what constitutes the assembly cost? It is necessary to further analyze the resource consumption end of the assembly operation and trace back, but this part is not included in the research content of this paper. It can be seen that the biggest advantage of the new system is that it can help the management find the core part of the problem and focus on cost analysis and control [7].

## VII. SUMMARY

Through case design and analysis, this paper determines the standard for the cost project of company a, collects the actual indicators of various expenses of the enterprise, and processes them with two methods, namely, the traditional standard cost method and the improved standard cost method. This paper makes a comparative analysis on the variable manufacturing expenses. For manufacturing costs, the current analysis idea is a single analysis idea, which can not meet the needs of cost control. Combined with the idea of activity-based costing, we can refine the analysis, establish an activity base for the collection of activity-based costs, and establish a correlation between the calculation of differences and the amount of drivers. Due to the direct related motivation of each project, the new method will have specific project differences with the traditional method, but the overall difference remains unchanged. Compared with the traditional method, the new method has more advantages, and can provide data support for the elimination of non value-added operations, the reduction of investment in value-added operations and responsibility assessment in the later stage. The biggest advantage of the new system is that it can help the management find the core part of the problem and focus on cost analysis and control.

## REFERENCE

- [1] Zhu Pengju Calculation of manufacturing cost difference under standard cost method, *Industrial accounting*, 2019, 10, 22-24
- [2] Rong Xiaoli Application of standard cost method in manufacturing industry, *Public investment guide*, 2020, 12, 56-60
- [3] Li Yongmei Evaluation and selection of manufacturing cost difference analysis method, *Guangxi audit*, 2018, 09, 86-90
- [4] Wang Caiyan Research on the application of standard cost method in company a, *China Economic and trade*, 2020, 12, 77-85
- [5] Yutieshan Research on the application of standard cost method in manufacturing industry *Times economic and trade*, 2018, 11, 56-60
- [6] Fernandes, Elton, Valdiviezo, Luis E. Total cost management of interdependent projects. *International Journal of Technology Management*, 2017: 15.
- [7] Peter E.D. Love, Zahir Irani. A project management quality cost information system for the construction industry. *Information and Management*, 2019: 649-661.