


**FACTORS AFFECTING RESPONSIBILITY ACCOUNTING: EVIDENCE FROM  
VIETNAMESE MANUFACTURING ENTERPRISES**

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ARTICLE INFO	ABSTRACT
<p><b>Article history:</b></p> <p><b>Received</b> 17 March 2023</p> <p><b>Accepted</b> 13 June 2023</p>	<p><b>Purpose:</b> This study aims to examine (i) the number of product lines and steps in the manufacturing process affect the responsibility cost center in a responsibility accounting system (ii) the level of technology application, the qualification of managers at all levels affect the budgetary control system integrated to the responsibility accounting system in Vietnamese manufacturing enterprises.</p>
<p><b>Keywords:</b></p> <p>Responsibility Accounting; Product Lines; Qualification of Manager; Technology Application; Steps in the Manufacturing Process.</p>	<p><b>Theoretical framework:</b> The research identifies and examined the impacts of the number of product lines, the number of steps in the manufacturing process on the number of responsibility cost centers, and the impacts of the level of technology application, the qualification of managers at all levels on the budgetary control system to contribute the responsibility accounting system theory.</p> <p><b>Design/methodology/approach:</b> A quantitative approach was applied with a sample of 108 Vietnamese manufacturing enterprises that is listed on the Vietnamese financial securities markets in 2020. OLS regression is applied to give a further analysis.</p>
	<p><b>Findings:</b> The regression findings support the significant positive impacts of the number of product lines and the number of steps in the manufacturing process on the number of cost centers as well as the significant positive correlation between the level of technology application and the effective budgetary control system, however, the effect of the qualification of managers at all levels is insignificant.</p> <p><b>Research, Practical &amp; Social implications:</b> This study provides factors impacting the number of cost centers and the budgetary control system. The results of this study support the contingency theory.</p> <p><b>Originality/value:</b> These findings can be useful for Vietnamese manufacturing enterprises to take measures to strengthen cost control through the responsibility accounting system, thereby improving business efficiency.</p> <p>Doi: <a href="https://doi.org/10.26668/businessreview/2023.v8i6.2188">https://doi.org/10.26668/businessreview/2023.v8i6.2188</a></p>

**FATORES QUE AFETAM A CONTABILIDADE DE RESPONSABILIDADE: EVIDÊNCIAS DE  
EMPRESAS MANUFATUREIRAS VIETNAMITAS**

**RESUMO**

**Objetivo:** Este estudo tem como objetivo examinar (i) o número de linhas de produtos e as etapas do processo de fabricação afetam o centro de custo de responsabilidade em um sistema de contabilidade de responsabilidade; (ii) o nível de aplicação da tecnologia e a qualificação dos gerentes em todos os níveis afetam o sistema de controle orçamentário integrado ao sistema de contabilidade de responsabilidade em empresas de fabricação vietnamitas.

**Estrutura teórica:** A pesquisa identifica e examina os impactos do número de linhas de produtos, o número de etapas no processo de fabricação sobre o número de centros de custos de responsabilidade e os impactos do nível

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de aplicação da tecnologia, a qualificação dos gerentes em todos os níveis sobre o sistema de controle orçamentário para contribuir com a teoria do sistema de contabilidade de responsabilidade.

**Projeto/metodologia/abordagem:** Foi aplicada uma abordagem quantitativa com uma amostra de 108 empresas manufatureiras vietnamitas listadas nos mercados de títulos financeiros do Vietnã em 2020. A regressão OLS é aplicada para fornecer uma análise mais aprofundada.

**Resultados:** Os resultados da regressão corroboram os impactos positivos significativos do número de linhas de produtos e do número de etapas do processo de fabricação sobre o número de centros de custo, bem como a correlação positiva significativa entre o nível de aplicação de tecnologia e o sistema de controle orçamentário eficaz; no entanto, o efeito da qualificação dos gerentes em todos os níveis é insignificante.

**Implicações sociais, práticas e de pesquisa:** Este estudo fornece fatores que afetam o número de centros de custo e o sistema de controle orçamentário. Os resultados deste estudo apóiam a teoria da contingência.

**Originalidade/valor:** Essas descobertas podem ser úteis para que as empresas de manufatura vietnamitas tomem medidas para fortalecer o controle de custos por meio do sistema de contabilidade de responsabilidade, melhorando assim a eficiência dos negócios.

**Palavras-chave:** Contabilidade de Responsabilidade, Linhas de Produtos, Qualificação do Gerente, Aplicação de Tecnologia, Etapas do Processo de Fabricação.

## FACTORES QUE AFECTAN A LA CONTABILIDAD RESPONSABLE: DATOS DE EMPRESAS MANUFACTURERAS VIETNAMITAS

### RESUMEN

**Objetivo:** Este estudio tiene por objeto examinar (i) el número de líneas de productos y las etapas del proceso de fabricación afectan al centro de costes de responsabilidad en un sistema de contabilidad de responsabilidad; (ii) el nivel de aplicación de la tecnología y la cualificación de los directivos a todos los niveles afectan al sistema de control presupuestario integrado con el sistema de contabilidad de responsabilidad en las empresas manufactureras vietnamitas.

**Marco teórico:** La investigación identifica y examina las repercusiones del número de líneas de productos y del número de etapas del proceso de fabricación en el número de centros de costes de responsabilidad, así como las repercusiones del nivel de aplicación de la tecnología y de la cualificación de los directivos a todos los niveles en el sistema de control presupuestario para contribuir a la teoría del sistema de contabilidad de responsabilidad.

**Diseño/metodología/enfoque:** Se aplicó un enfoque cuantitativo con una muestra de 108 empresas manufactureras vietnamitas que cotizaron en los mercados de valores financieros de Vietnam en 2020. Para profundizar en el análisis se aplica la regresión OLS.

**Resultados:** Los resultados de la regresión corroboran los efectos positivos significativos del número de líneas de productos y del número de etapas del proceso de fabricación sobre el número de centros de costes, así como la correlación positiva significativa entre el nivel de aplicación de la tecnología y el sistema eficaz de control presupuestario; sin embargo, el efecto de la cualificación de los directivos a todos los niveles es insignificante.

**Implicaciones sociales, prácticas y para la investigación:** Este estudio aporta factores que afectan al número de centros de costes y al sistema de control presupuestario. Las conclusiones de este estudio apoyan la teoría de la contingencia.

**Originalidad/valor:** Estas conclusiones pueden ser útiles para que las empresas manufactureras vietnamitas tomen medidas para reforzar el control de costes mediante el sistema de contabilidad de responsabilidad, mejorando así la eficiencia empresarial.

**Palabras clave:** Contabilidad de Responsabilidad, Líneas de Productos, Cualificación de Directivos, Aplicación de Tecnología, Etapas del Proceso de Fabricación.

### INTRODUCTION

Management accounting with the role of providing useful information for managers in decision - making has been increasingly interested in theoretical and practical research. Studies focus on a general assessment of the use of management accounting information (Phi Anh D.N., 2016; Afirah & Noorhayati, 2018) or consider each technique and tool of management

accounting (Ngoc & Oanh, 2019; Sriyono et al., 2022; Mashkooor et al., 2023). As an important mechanism in a management accounting system, responsibility accounting supports managers to interact with business strategies and structures (Simons, 2000; Anthony and Govindarajan, 2001). Traditional assumption of responsibility accounting is that managers should individually accountable for their in-charge departments or projects that they are given a certain level of authority to make decisions, thus, the delegation of responsibility for departmental managers is the starting point of a responsibility accounting system (Merchant, 1985; Simon et al., 1954; Horngren et al., 2006 and Okoye et al., 2009).

In the literature, several studies are addressing the factors affecting responsibility accounting considering many aspects, such as information asymmetries, the organizational hierarchical structure (Demski and Sappington, 1989), and the effectiveness of accounting works (Nguyen, 2020). Recently, literature has reported good results in responsibility accounting. However, there is still much development in research of responsibility accounting in different fields. This study identifies and examines the impacts of several specific circumstances of businesses on two separate elements of the responsibility accounting system, which are the number of responsibility cost centers and the budgetary control system integrated into the responsibility accounting system. Particularly, this study addresses the following research questions: Is there a relationship between the number of product lines and the number of steps in the manufacturing process with the responsibility cost center in a responsibility accounting system? Is there a relationship between the level of technology application, and the qualification of managers at all levels with the budgetary control system integrated into the responsibility accounting system?

The remainder of this paper is as follows: Section 2 will relate to the literature review on responsibility accounting and theoretical framework before proposing research hypotheses. Section 3 will describe the research methodology. Section 4 will present the results of the study and further discussion. Section 5 will give a conclusion of the study, and identify limitations and implications of this study.

## **LITERATURE REVIEW**

### **Responsibility Accounting, Responsibility Centers, and Budgetary Control**

Traditionally, the starting point of a responsibility accounting system is the delegation of responsibility for departmental managers (Merchant, 1985; Simon et al., 1954; Horngren et al., 2006; Okoye et al., 2009 and Kaplan and Atkinson, 2007) because this system is a

mechanism used to assess managers' performance based on what they are accountable for (Holmstrom, 1982; Antle and Smith, 1986; Antle and Demski, 1988). After that, Scott and Tiessen (1999), Bushman et al. (1995), and Rowe (2004) considered responsibility accounting as not only a system to assess the individual performance of managers, but it could also assess the aggregate performance of a group of managers who are in charge of projects or activities. The delegation of responsibility mentioned above results in the establishment of responsibility centers, these centers might be departments, projects, and activities (Hoque, 2001), and the managers who are in charge of these responsibility centers are authorized to make certain decisions related to the operation of their in-charge responsibility centers.

In the beginning, Gordon (1963) stated that there are two types of responsibility centers including cost center and profit center: (i) In a cost center, managers are accountable for their controllable costs. In businesses, production departments, human resources departments, accounting departments, etc. could be easily considered as cost centers. In the cost center, managers' performance is assessed based on cost savings. (ii) In a profit center, managers take responsibility for both controllable costs and revenue, therefore, selling stores and sales departments are profit centers. In a profit center, managers' performance is assessed based on profit maximization.

Then, Melumad et al. (1992), Garrison (2000) and Garrison et al. (2010) added one more type of responsibility center which is the investment center. In this center, managers are accountable for maximizing both profit and return on investment. Therefore, return on investment is a key criterion in assessing the performance of managers who are in charge of investment centers. A business segment and a subsidiary could be considered an investment center

Kaplan and Atkinson (2007) also added one more type of responsible center called the revenue center. In this center, managers are accountable for maximizing their controllable revenue. Therefore, sales departments could be considered revenue centers. However, it is more likely that costs are practically incurred during the sales, therefore, costs and revenues are more likely to be incurred together. Hence, the revenue center where managers are only accountable for maximizing their controllable revenue is mostly rare in practice.

As mentioned, a responsibility accounting system is a mechanism used to assess managers' performance based on what they are accountable for (Holmstrom, 1982; Antle and Smith, 1986; Antle and Demski, 1988). One of the most popular methods to assess managers' performance is using a budgetary control system (Gharayba, 2011). In a responsibility

accounting system, a budget is prepared for each responsibility center. Okwo et al. (2005) concluded that budgetary control is a must to achieve an effective responsibility accounting system. Nyakuwanika (2012) and Rowe et al. (2008) recommended the engagement of managers of all responsibility centers in the process of budget planning, as these lower-level managers are the ones who do the work and they are the experts in their work.

### **Theoretical Framework and Hypothesis Development**

This study will rely on the contingency theory to develop the hypothesis. Contingency theory is commonly used in management accounting (Otley, 1980). According to the contingency theory, there is no optimal organization structure for all enterprises, but the specific context and circumstances of each enterprise must be considered when designing a proper organizational structure (Horngren, 1982; Fisher, 1995; Chenhall, 2006). In this paper, the organization structure is under the form of the accounting system, specifically the responsibility accounting system. Therefore, it is expected that there is a relationship between the responsibility accounting system and specific circumstances of businesses, such as the number of product lines, the number of steps in the manufacturing process, the level of technology application, and the qualification of managers at all levels.

Regarding the number of product lines, previous research showed that the more product lines, the more production cost distortion (Hwang et al., 1993; Gupta, 1993). Therefore, it is predicted that the responsibility accounting system would become more complex as it needs to classify costs in more detail to achieve accuracy. It is also expected that the need to control a variety of product lines would lead to the establishment of more administrative cost centers. Hence, a hypothesis is presented as follows:

*H1: There is a positive relationship between the number of product lines and the number of cost centers*

Regarding the number of steps in the manufacturing process, Hwang et al. (1993) also concluded that the more steps, the harder to allocate costs incurred accurately. Therefore, it is predicted that each step of the manufacturing process could be considered as an activity cost pool. As a result, it is expected to see an increase in the number of cost centers by the number of activity cost pools to efficiently control costs incurred. Hence, a hypothesis is presented as follows:

*H2: There is a positive relationship between the number of steps in the manufacturing process and the number of cost centers*

Regarding the level of technology application, previous research showed that an effective information technology system could support the management of businesses (LaMarco, 2018). With the application of an effective information technology system, the budgetary control system integrated with each responsibility center is predicted to be improved in both the planning process and communication process. Hence, a hypothesis is presented as follows:

*H3: There is a positive relationship between the level of technology application and the responsibility budgetary control system*

Regarding the qualification of managers at all levels, Nyakuwanika (2012) concluded that this factor affects the application of responsibility accounting in enterprises, especially in budgetary control. Nyakuwanika (2012) and Rowe et al. (2008) recommended the engagement of managers of all responsibility centers in the process of budget planning, as these lower-level managers are the ones who do the work and they are the experts in their work. Thus, their qualification, in turn, is also predicted to impact the budget control in each responsibility center. Hence, a hypothesis is presented as follows:

*H4: There is a positive relationship between the qualification of managers at all levels and the responsibility budgetary control system*

## **METHODOLOGY**

### **Data and Sample Selection**

The data source is collected from the survey. A quantitative approach was applied with a sample of 300 Vietnamese manufacturing enterprises that are listed on the Vietnamese financial securities markets. These enterprises are chosen randomly and data is collected for 2020 via two separate sources.

A questionnaire was sent to chief accountants and management accountants of sample enterprises by email, depending on who is more approachable. However, only 108 valid responses were received at the end. After that, OLS regression is applied to give a further analysis.

### **Measurements**

To examine hypothesis H1: there is a positive relationship between the number of product lines and the number of cost centers, and hypothesis H2: there is a positive relationship



between the number of steps in the manufacturing process and the number of cost centers, following variables are examined in the Table 1.

Table 1. Description of variables for hypothesis H1 and H2

Variables	Description
<b>COSTCENTER</b>	A dependent variable represents the number of cost centers reported by 108 respondents.
<b>PLINES</b>	An independent variable represents the number of products and services provided to external customers reported by 108 respondents.
<b>STEP</b>	An independent variable represents the number of steps in the companies' manufacturing process reported by 108 respondents.

Source: Prepared by the authors (2023)

To examine the hypothesis H3: there is a positive relationship between the level of technology application and the responsibility budgetary control system and hypothesis H4: there is a positive relationship between the qualification of managers at all levels and the responsibility budgetary control system, following variables are explained in Table 2.

Table 2. Description of variables for hypothesis H3 and H4

Variables	Description
<b>BUDGET</b>	A dependent variable represents the effectiveness of the budgetary control system reported by 108 respondents, measured by a 5-point scale, ranging from "strongly disagree" at 1 point to "strongly agree" at 5 points. Survey statement: The budgetary control system is effectively integrated with each responsibility center in the company.
<b>TECH</b>	An independent variable represents the effectiveness of the information technology system reported by 108 respondents, measured by a 5-point scale, ranging from "strongly disagree" at 1 point to "strongly agree" at 5 points. Survey statement: The information technology system is effectively integrated with operational systems at responsibility centers.
<b>QUAL</b>	An independent variable represents the qualification of managers at all levels reported by 108 respondents, measured by a 5-point scale, ranging from "strongly disagree" at 1 point to "strongly agree" at 5 points. Survey statement: Managers in charge of each responsibility center are experts in their work.

Source: Prepared by the authors (2023)

## Model

This study estimates two models. The first one is to examine the impact of the number of product lines and the number of steps in the manufacturing process on the number of cost centers established in production as follows:

$$\text{COSTCENTER}_i = \alpha + \beta_1 \text{PLINES}_i + \beta_2 \text{STEP}_i + \varepsilon_{i,t} \quad (1)$$

In which:

COSTCENTER: the number of cost centers

PLINES: the number of products and services provided to external customers

STEP: the number of steps in the manufacturing process

The second model is to examine the impact of the level of technology application and the qualification of managers at all levels on the budgetary control system that is integrated into the responsibility accounting system as follows:

$$\text{BUDGET}_i = \alpha + \beta_1 \text{TECH}_i + \beta_2 \text{QUAL}_i + \varepsilon_{i,t} \quad (2)$$

In which:

BUDGET: the effectiveness of the budgetary control system

TECH: the effectiveness of the information technology system

QUAL: the qualification of managers at all levels

## RESULTS AND DISCUSSION

Table 3. Descriptive statistics

Variables	Obs	Mean	Std Dev	Min	Max
<b>COSTCENTER</b>	108	24.476	41.237	3	238
<b>PLINES</b>	108	14.208	10.818	1	35
<b>STEP</b>	108	5.614	4.078	3	18
<b>BUDGET</b>	108	3.337	2.636	2	5
<b>TECH</b>	108	2.937	2.012	1	4
<b>QUAL</b>	108	4.091	2.924	2	5

Source: Prepared by the authors (2023)

Table 3 gives a summary of descriptive statistics for the sample. As can be seen from the table, on average, the number of cost centers used to collect costs is 24.476, ranging from 3 centers to 238 centers. The number of products and services provided to external customers ranged from 1 product/service to 35 products and services, with the average figure being 14.208. The average number of steps in the manufacturing process for the sample is 5.614, ranging from 3 to 18 steps. The effective integration of the budgetary control system and responsibility centers was evaluated at approximately 3.337 points for most sample companies. The average point for the effective integration of the information technology system and operational systems at responsibility centers was 2.937, ranging from 1 point to 4 points. Furthermore, the average point for the qualification of managers at all levels was 4.091.

After running the correlation matrix and VIF test, the result shows that no multi-collinearity issues exist among variables. Data then is put into regression and the following results are received:



Table 4. Regression results

Variables	Coef.
<b>Test of H1 and H2</b>	
Dependent variable is COSTCENTER	
Constant	2.898
PLINES	1.153**
STEP	0.704**
Adjusted R-squared	0.337
<b>Test of H3 and H4</b>	
Dependent variable is BUDGET	
Constant	1.216
TECH	0.351*
QUAL	0.115
Adjusted R-squared	0.249

\* ( $p \leq 0.10$ ) = Significant at 10%.

\*\* ( $p \leq 0.05$ ) = Significant at 5%.

\*\*\* ( $p \leq 0.01$ ) = Significant at 1%.

For both regressions, number of observations = 108

Source: Prepared by the authors (2023)

Table 4 presents the regression results for the two models. For the first model testing hypotheses H1 and H2, the dependent variable in the regression estimation is the number of cost centers. The R-squared is 33.7% implying that 33.7% of the dependent variable could be explained by this model. Then, it is clear that the regression result (coeff: 1.153) supports hypotheses H1 and H2. Specifically, at the 5% level, 1 line of production increase could statistically significantly contribute to the establishment of 1.153 cost centers. Similarly, the regression result (coeff: 0.704) also implies a significant positive correlation between the number of cost centers and the number of steps in the manufacturing process at 5% level, that for each step increase in the manufacturing process could result in 0.704 cost center established. These results are consistent with the previous studies of Hwang et al. (1993) and Gupta (1993).

For the second model testing hypotheses H3 and H4, the dependent variable in the regression estimation is the effectiveness of the budgetary control system, measured by the effective integration of the budgetary control system and responsibility centers. The R-squared is 24.9% implying that 24.9% of the dependent variable could be explained by this model. It could be seen from Table 4 that there is a statistically significant positive relationship between the effectiveness of the information technology system and the effectiveness of the budgetary control system integrated with responsibility centers at 10% level, with an estimated coefficient is 0.351. This result is similar to the study of LaMarco (2018). But in this research, there is no

statistically significant to conclude that there is a positive relationship between the qualification of managers at all levels and the effectiveness of the budgetary control system. This result is in contrast to the study of Nyakuwanika (2012) and Rowe et al. (2008).

The above results support the idea developed from the contingency theory that specific circumstances of businesses impact the accounting system. In particular, the number of production lines and the number of steps in manufacturing a product is associated with the number of cost centers. Also, the effectiveness of the information technology system is statistically significantly associated with the effectiveness of the budgetary control system integrated with responsibility centers.

## CONCLUSION

The study examines the impacts of several specific circumstances of businesses on two separate elements of a responsibility accounting system, which are the number of responsibility cost centers and the budgetary control system integrated into the responsibility accounting system, in the context of Vietnamese manufacturing enterprises. Based on the idea developed from the contingency theory and previous studies, this study hypothesized the positive relationship between 2 specific circumstances of businesses and the number of responsibility cost centers and also hypothesized a positive relationship between 2 other specific circumstances of businesses and the budgetary control system integrated to the responsibility accounting system. With this approach, this study focuses on 108 Vietnamese manufacturing enterprises listed on Vietnamese financial securities markets for 2020.

The results show statistically significant positive impacts of the number of production lines and the number of steps in manufacturing products on the number of cost centers. In addition, the results show a statistically significant positive correlation between the effectiveness of the information technology system and the effectiveness of the budgetary control system integrated with responsibility centers. But there is an insignificant positive relationship between the qualification of managers at all levels and the effectiveness of the budgetary control system in the findings. This study provides factors impacting the number of cost centers and the budgetary control system. The results of this study also support the contingency theory.

There are still several limits in this study. Certainly, the results above are only limited to a small sample of 108 Vietnamese manufacturing enterprises. Secondly, this study only examines the impacts of factors on two elements of a responsibility accounting system.

However, there are still other aspects needed to be considered in responsibility accounting. Thirdly, data used for the model is collected from a survey which is sent to chief accountants or management accountants, depending on who is more approachable. However, it is a matter of fact that a responsibility accounting system affects the whole organizational structure and there are many connections among departments/activities throughout the enterprise under this system, therefore, data could be collected from other managers from other departments/activities to achieve better understanding. Further research could address these limitations.

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