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**RESPONSIBILITY ACCOUNTING IN CEMENT MANUFACTURING
ENTERPRISES IN NORTHERN VIETNAM**

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SUMMARY OF THE DISSERTATION

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INTRODUCTION

1. Rationale for the study

Within management accounting, responsibility accounting (RA) links authority with responsibility and supports planning, operational control and performance evaluation. In the cement industry, production is continuous and integrated, with closely interdependent stages; raw material and energy costs account for a substantial share of total costs, while control is allocated among production departments and functional units. RA therefore needs to be organised in relation to production stages, the scope of control, technical standards and responsibility-based performance indicators. Digital transformation, automation, energy conservation and sustainable development also place new demands on the management systems of cement enterprises.

Previous studies indicate that the organisation and application of RA depend on enterprises' operating characteristics, organisational structures, decentralisation, information systems, technology and resources. For cement manufacturing enterprises in Northern Vietnam, the research gap concerns the need for further evidence on existing RA practices and the factors affecting the extent of RA application in the current context. Accordingly, the dissertation addresses the topic "Responsibility Accounting in Cement Manufacturing Enterprises in Northern Vietnam".

2. Literature review and research gap

Studies on responsibility accounting have focused on management decentralization, the establishment of responsibility centres, the development of standards and budgets, information organisation, responsibility reporting, variance analysis, and performance evaluation. They have also examined factors influencing the implementation of responsibility accounting in different business contexts.

Building on previous studies, this dissertation examines the current state of responsibility accounting in cement manufacturing enterprises in Northern Vietnam. It provides additional evidence on the extent of responsibility accounting implementation across three dimensions: system design, system operation, and information use. It also tests five influencing factors, providing a basis for proposing improvements appropriate to the research context.

3. Research questions and objectives

The dissertation addresses four questions: (1) What are the theoretical foundations and core components of RA in manufacturing enterprises? (2) What is the current state of RA in cement manufacturing enterprises in Northern Vietnam? (3) Which factors affect the extent of RA application, and to what extent does each factor affect it? (4) What solutions should be proposed to improve RA in the enterprises studied?

The dissertation aims to systematise the theoretical foundations of RA, assess current practices and test the factors affecting the extent of RA application in cement manufacturing enterprises in Northern Vietnam, thereby proposing improvements appropriate to the industry context.

4. Research subject, scope and methods

The research examines RA and the factors affecting the extent of its application in cement manufacturing enterprises in Northern Vietnam. Current practices are considered across five components: organisation of responsibility centres; development of standards and budgets; organisation of information collection and processing, including variance identification and analysis; organisation of responsibility reporting; and performance evaluation and use of evaluation results.

The study covers domestic cement manufacturing enterprises in Northern Vietnam. Secondary data relate to 2023–2025, while primary data were collected in 2025.

The dissertation adopts a sequential mixed-methods approach, beginning with qualitative research followed by quantitative research, and combines document analysis, interviews and questionnaire surveys. The assessment of current practices covers 15 enterprises; model testing uses 238 valid individual responses from the same enterprises. Current practices are synthesised at enterprise level by cross-checking multiple information sources, whereas the model is tested at individual-response level. Data are analysed using descriptive statistics, Cronbach's alpha, exploratory factor analysis (EFA), confirmatory factor analysis (CFA) and covariance-based structural equation modelling (CB-SEM). Bootstrap analysis with 5,000 resamples is used to examine estimation bias. The extent of RA application is measured as a second-order latent variable reflected by three first-order components: RA system design, system operation and information use.

5. Contributions of the dissertation

First, the dissertation develops and tests a second-order latent measurement model of the extent of RA application, reflected by system design, system operation and RA information use. This approach provides an additional basis for assessing RA application across design, operation and information use in enterprise management.

Second, the dissertation develops and tests a model of five factors affecting the extent of RA application in cement manufacturing enterprises in Northern Vietnam: management commitment, accounting information systems, organisational structure and management decentralisation, production technology characteristics, and accounting personnel competence. Within the survey sample, all five factors have positive, statistically significant relationships with the extent of RA application; management commitment has the largest standardised regression coefficient.

In practical terms, the dissertation provides evidence on RA practices in the surveyed enterprises and proposes five groups of improvements. These are linked to conditions concerning management and decentralisation, information systems and production technology data, and human resources, providing a reference for enterprises to select implementation activities suited to their needs and available resources.

6. Structure of the dissertation

In addition to the Introduction, Conclusion, References and Appendices, the dissertation comprises three chapters:

Chapter 1: Theoretical Foundations of Responsibility Accounting in Manufacturing Enterprises.

Chapter 2: Current Responsibility Accounting Practices in Cement Manufacturing Enterprises in Northern Vietnam.

Chapter 3: Solutions for Improving Responsibility Accounting in Cement Manufacturing Enterprises in Northern Vietnam.

CHAPTER 1

THEORETICAL FOUNDATIONS OF RESPONSIBILITY ACCOUNTING IN MANUFACTURING ENTERPRISES

1.1. Concept and nature of responsibility accounting

1.1.1. Concept of responsibility accounting

Drawing on existing research perspectives and the research objectives, the dissertation defines responsibility accounting as follows: “Responsibility accounting is a component of the management accounting system organised around management decentralisation and responsibility centres. It provides financial and non-financial information for each area of responsibility to support planning, operational control, performance evaluation and decision-making at different management levels.”

This definition underpins the dissertation’s systemic approach to RA and the research framework for the extent of RA application in cement manufacturing enterprises in Northern Vietnam.

1.1.2. Nature of responsibility accounting

RA involves organising management accounting information in accordance with a decentralised structure, linking managers’ authority and responsibility to performance within their scope of control. Information is therefore compiled by responsibility centre and used to evaluate centre performance and managerial performance, and to support management decisions.

1.2. Roles of responsibility accounting in manufacturing enterprises

RA helps specify authority and responsibility at different management levels and provides a basis for control and performance evaluation within assigned responsibilities. Responsibility accounting information also supports coordination among departments, resource use and the achievement of enterprise-wide objectives.

1.3. Components of responsibility accounting in manufacturing enterprises

1.3.1. Organisation of responsibility centres in manufacturing enterprises

A responsibility centre is a management unit established through decentralisation, with a manager accountable for performance within assigned authority. The main types are cost, revenue, profit and investment centres. Their establishment should ensure alignment between managers’ authority, responsibility and controllability.

1.3.2. Development of standards and budgets in responsibility accounting

Standards and budgets quantify objectives and establish benchmarks for control and evaluation of managerial responsibility. In manufacturing enterprises, standards are developed for key inputs such as materials, labour and energy, taking account of technology

and operating capacity. Budgets are prepared for each type of centre, linking assigned targets to resources and managers' responsibilities.

1.3.3. Organisation of information collection and processing for responsibility accounting

RA information is collected from the accounting system and production, technical, operations and sales units, and includes financial and non-financial information. Data are recorded, processed and aggregated by centre, management level and area of responsibility. Variance identification and analysis form part of information processing: actual results are compared with standards, budgets or plans, and influencing factors, causes and controllability are examined to support reporting and evaluation.

1.3.4. Organisation of responsibility reporting

Responsibility reports are designed for each centre and management level, presenting assigned targets, actual results, variances, causes and recommendations. Reporting arrangements should specify preparers, recipients, deadlines and accountability. Explanations and feedback are linked to managers' authority and controllability, providing a basis for assessing responsibility and deciding corrective measures.

1.3.5. Performance evaluation and use of evaluation results in responsibility accounting

Performance is evaluated against assigned targets, actual results, managers' authority and controllability. Indicators combine financial and non-financial information and are appropriate to each type of responsibility centre. Evaluation distinguishes centre performance from managerial performance and considers factors beyond managers' control. Results are used to adjust operations, plans, decentralisation and incentive arrangements.

1.4. Factors affecting the extent of responsibility accounting application in manufacturing enterprises

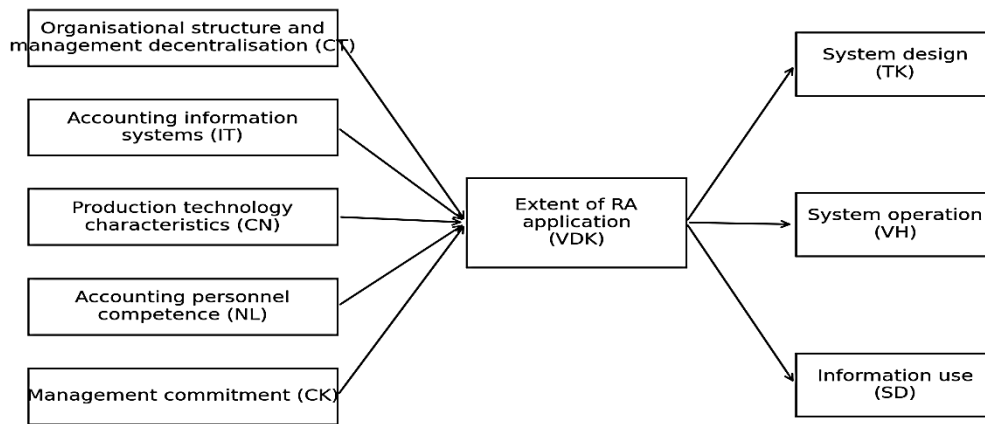
1.4.1. Theoretical foundations for the research model

The dissertation draws on three theoretical foundations. Contingency theory provides a basis for examining the alignment of RA application with organisational structure and management decentralisation, accounting information systems and production technology characteristics. The resource-based view provides a basis for considering accounting personnel competence. Institutional theory helps explain the role of management commitment in organising and sustaining management practices. These complementary foundations support factor selection and hypothesis development.

1.4.2. Research model and hypotheses

Based on the theoretical foundations, literature review and characteristics of cement manufacturing enterprises in Northern Vietnam, the dissertation develops a model comprising five potential influencing factors: organisational structure and management decentralisation (CT), accounting information systems (IT), production technology characteristics (CN), accounting personnel competence (NL), and management commitment (CK).

Figure 1.1. Proposed research model



Source: Proposed by the author.

The extent of RA application (VDK) is measured using a second-order reflective model comprising three first-order components: RA system design (TK), RA system operation (VH), and RA information use (SD). The model captures the common dimension shared by the three components rather than defining VDK as a sum or weighted composite of their scores. Arrows from VDK to TK, VH and SD represent measurement relationships; loadings indicate how strongly each component reflects VDK, rather than causal effects or an implementation sequence among design, operation and information use.

In the model, IT represents the accounting information system's capacity to organise, connect, update and provide data; NL represents accounting personnel's knowledge, skills and ability to perform their work. These factors are distinguished from VDK, which reflects the extent to which an enterprise designs and operates RA and uses its information.

The research hypotheses are as follows:

- H1: Organisational structure and management decentralisation positively affect the extent of RA application.
- H2: Accounting information systems positively affect the extent of RA application.
- H3: Production technology characteristics positively affect the extent of RA application.
- H4: Accounting personnel competence positively affects the extent of RA application.
- H5: Management commitment positively affects the extent of RA application.

CHAPTER 1 SUMMARY

Chapter 1 systematises the theoretical foundations of RA in manufacturing enterprises, establishes five research components and clarifies the relationships among authority, responsibility, information and performance evaluation. Drawing on contingency theory, the resource-based view and institutional theory, it develops a five-factor model and research hypotheses, together with a second-order latent measurement model of RA application reflected by system design, system operation and information use. These provide the basis for assessing current practices and testing the model in Chapter 2, and proposing improvements in Chapter 3.

CHAPTER 2

CURRENT RESPONSIBILITY ACCOUNTING PRACTICES IN CEMENT MANUFACTURING ENTERPRISES IN NORTHERN VIETNAM

2.1. Characteristics of cement manufacturing enterprises in Northern Vietnam and implications for responsibility accounting

2.1.1. Characteristics of the enterprises studied

Northern Vietnam contains many large cement manufacturing enterprises with long operating histories. Limestone and clay resources, transport networks and seaports facilitate production, transport and product sales. The dissertation selects 15 enterprises with different sizes, ownership structures and management arrangements to assess current practices. Their common characteristics include continuous production and substantial use of fixed assets, materials, fuel and electricity. Resource control and performance evaluation therefore need to be linked to departmental tasks, authority and coordination.

2.1.2. Management structures and decentralisation

The enterprises mainly adopt line-and-staff organisational structures. Roles and authority are allocated among the Board of Directors/Members' Council, executive management, functional departments and subordinate units. Decentralisation is specified in company charters, regulations and management procedures, with detailed authority varying by enterprise.

2.1.3. Production organisation, technology and products

The enterprises operate dry-process rotary kiln production lines with continuous processes and varying levels of automation. Control and monitoring systems provide data on output, consumption, quality and equipment, supporting the development of standards and responsibility-based control by production stage.

2.1.4. Accounting organisation and accounting information systems

Accounting is mainly centralised. Management information is generated from accounting data, production and technical data, and functional departments. Information technology facilitates data collection and processing, but RA requires information to be organised and attributed according to each manager's responsibilities and controllability.

2.2. Current responsibility accounting practices in cement manufacturing enterprises in Northern Vietnam

Based on surveys, interviews and cross-checking documents at 15 enterprises, RA practices are analysed across five components: responsibility centre organisation; standards and budgets; information collection and processing, including variance identification and analysis; responsibility reporting; and performance evaluation and use of evaluation results. Enterprise-level findings are classified as clear/complete, partial or unclear. "Unclear" indicates limitations in the evidence collected and does not provide sufficient grounds to conclude that an enterprise does not undertake the relevant activity. Individual survey responses are presented through descriptive statistics to provide respondents' perspectives on RA application.

2.2.1. Organisation of responsibility centres in cement manufacturing enterprises in Northern Vietnam

2.2.1.1. Establishment of accountable units as a basis for responsibility centres

Across the 15 enterprises, accountable managers are clearly identified in 14, functions and tasks in 13, and interdepartmental responsibilities in 12. However, linking targets to accountable parties is clearly documented in 11 enterprises, while alignment between authority and responsibility is evident in nine.

Table 2.1. Survey results on the establishment of accountable units

Code	Survey item	Mean	Std. dev.
TT1	The functions and tasks of departments, production departments and subordinate units are clearly defined.	4.08	0.51
TT2	Each unit has a person directly responsible for its operating results.	4.19	0.45
TT3	Responsibilities among units are clearly delineated.	4.14	0.45
TT4	Managers' authority is delegated in line with their assigned responsibilities.	4.08	0.46
TT5	The establishment of management units facilitates the specification of each unit's responsibilities.	4.18	0.48
Overall mean		4.13	0.35

Source: Survey data analysis.

The individual survey yields an overall mean of 4.13, indicating positive assessments of the establishment of accountable units and managers. Interviews nevertheless show that production managers are responsible for output, quality and consumption, while certain decisions on major costs, repairs and investment remain with higher management. Accountable units have thus been relatively clearly established, but authority, controllability and evaluation arrangements are not fully aligned.

2.2.1.2. Classification of responsibility centres

The term “responsibility centre” is not widely or consistently used in the surveyed enterprises. The study therefore identifies centre types through managers’ responsibilities and authority, and the information used to monitor and evaluate performance.

Cost centres have the clearest characteristics: 14 of 15 enterprises clearly assign production units responsibility for costs, output and consumption, while 12 track costs and evaluate results by unit or production department. The survey mean is 4.03. However, costs accumulated by production department do not fully coincide with costs controllable by its manager; this distinction is necessary when evaluating managerial performance.

Revenue centres are reflected in the assignment of revenue or sales-volume responsibilities in nine enterprises, but authority over revenue-related factors is clearly documented in only six. The survey mean is 3.63. Sales units mainly implement plans, while important pricing and commercial policy decisions often remain with higher management; evaluation therefore needs to consider assigned authority.

The characteristics of profit centres are not fully evident in the available evidence. For each criterion concerning joint revenue and cost responsibility and control over profit-generating factors, only one enterprise is classified as clear, while most are classified as partial or unclear. The survey mean is 3.17. Profit evaluation of managerial responsibility depends on how revenue, direct costs and allocated costs are identified and on managers’ control over them.

Investment centre characteristics are the least clearly evident in the available evidence. No enterprise is classified as clear/complete on either of the two enterprise-level criteria. Investment management responsibility is partially evident in eight enterprises, while the linkage of capital efficiency and investment decision authority with managerial responsibility is partially evident in six. The survey mean is 2.70. Enterprises have designated units to advise on and implement projects and monitor operating results, but capital employed, decision authority and managerial performance evaluation are not fully linked.

Table 2.2. Summary of survey results on types of responsibility centres

Responsibility centre type	Overall mean	Std. dev.
Cost centre	4.03	0.50
Revenue centre	3.63	0.54
Profit centre	3.17	0.52
Investment centre	2.70	0.57

Source: Survey data analysis.

Overall, cost centre characteristics are more clearly evident than those of revenue, profit and investment centres. Improvement requires assigned responsibilities to be linked to each manager's authority, controllability and performance evaluation information.

2.2.2. Development of standards and budgets

2.2.2.1. Development of standards at responsibility centres

Standards are mainly developed by production stage, product and resource input, with coordination among technical, planning, finance and accounting, and production units. Standards for electricity and fuel are clearly established in all 15 enterprises, materials in 14 and labour in 13. However, review and adjustment when production conditions change are clearly evident in only 10 enterprises, fewer than those that establish standards.

Table 2.3. Survey results on the development and use of standards

Code	Survey item	Mean	Std. dev.
DM1	Material standards are established by product or production stage.	3.95	0.60
DM2	Electricity and fuel standards are established to support cost control.	4.07	0.69
DM3	Labour standards are established for each unit.	4.06	0.66
DM4	Standards are reviewed when technology or production conditions change.	3.92	0.69
DM5	Standards are used as a basis for control and evaluation of units' responsibilities.	4.11	0.64
Overall mean		4.02	0.52

Source: Survey data analysis.

The overall mean is 4.02. Use of standards for control and evaluation of managerial responsibility scores highest (4.11), while review of standards scores lowest (3.92). Together with interviews, the results show that standards support production management and cost control, but updating and linking targets to managers' authority and controllability

remain uneven. Evaluation of managerial responsibility needs to distinguish variances within a unit's control from those affected by decisions made by higher management.

2.2.2.2. Preparation of budgets at responsibility centres

Budgets cover production, sales, revenue, costs, repairs and investment. Units propose targets and resource requirements; functional departments consolidate and balance proposals before submitting them for approval. Budget use for control and evaluation of managerial responsibility is clearly evident in 11 enterprises, managers' participation in 10, and assignment of departmental targets in nine. Specification of budgets by area of responsibility and regular monitoring are each clearly evident in eight enterprises.

Table 2.4. Survey results on budget preparation and use

Code	Survey item	Mean	Std. dev.
DT1	Budgets are prepared for each responsibility centre.	3.74	0.72
DT2	Centre managers participate in budget preparation.	3.99	0.63
DT3	Budget targets are assigned to each centre.	3.87	0.68
DT4	Budget implementation is monitored regularly.	3.81	0.72
DT5	Budgets are used for control and evaluation of managerial responsibility.	3.90	0.67
Overall mean		3.86	0.56

Source: Survey data analysis.

The overall mean is 3.86. Managers' participation scores highest (3.99), while budgeting by responsibility centre scores lowest (3.74). Interviews show that final decisions on targets mainly rest with enterprise leadership. Budgets are thus used for planning, target assignment and operational control, but their specification and monitoring by area of responsibility, and alignment with managers' control, require further improvement.

2.2.3. Organisation of information collection and processing for responsibility accounting

2.2.3.1. Organisation of information sources for responsibility accounting

Information sources include accounting systems, functional departments, and production and sales units, covering financial and non-financial data. Collection of non-financial information is clearly evident in 12 enterprises, timely updating in 11, and support from ERP, DCS or production management systems in eight. These findings reflect support for RA data collection and do not represent the number of enterprises possessing technological systems.

Table 2.5. Survey results on the organisation of information sources for responsibility accounting

Code	Survey item	Mean	Std. dev.
NT1	Financial information for responsibility accounting is collected from relevant units.	3.79	0.61
NT2	Non-financial information on output, quality, consumption and operations is collected for responsibility-based management.	3.94	0.64
NT3	Information is updated promptly to meet management needs.	3.91	0.65
NT4	ERP and/or DCS systems support data collection for responsibility accounting.	3.79	0.64
NT5	Information is organised by unit or responsibility centre.	3.97	0.64
Overall mean		3.88	0.49

Source: The author's survey data analysis.

The overall mean is 3.88, indicating relatively positive assessments of information source organisation. However, document analysis and interviews show that technical and accounting data are not fully aligned in identification codes and updating times, requiring reconciliation before aggregation by responsibility. The main limitation concerns linking data sources for responsibility-based control.

2.2.3.2. Recording, processing and aggregation of information by responsibility centre

Enterprises record technical data by equipment, production line and stage, and accounting data by account, cost object, product and accounting period. Revenue recording and information aggregation by responsibility are clearly evident in nine enterprises; cost recording and information coding in eight; and information processing suited to each management level in seven.

Table 2.6. Overview of information recording and aggregation in the surveyed enterprises

Code	Survey item	Mean	Std. dev.
XL1	Costs are recorded by responsibility centre.	3.64	0.67
XL2	Revenue is recorded by accountable unit.	3.77	0.65
XL3	Information is coded by responsibility centre.	3.74	0.63
XL4	Information is processed to suit each management level.	3.61	0.66

XL5	Information is aggregated by responsibility centre for managerial evaluation.	3.82	0.66
Overall mean		3.72	0.53

Source: Survey data analysis.

The overall mean is 3.72. Information aggregation for managerial evaluation scores highest (3.82), while processing suited to each management level scores lowest (3.61). Systems support data recording and aggregation, but accounting objects are not fully aligned with areas of responsibility. In particular, costs accumulated by production department may include allocations or costs resulting from higher-level decisions and should be distinguished from managers' controllable costs.

2.2.3.3. Variance identification and analysis

Enterprises compare actual results with plans, standards or budgets, focusing on output, consumption, costs and revenue. However, variance analysis by unit or responsibility centre is clearly evident in five enterprises, and identification of causes linked to each unit's responsibilities in four. Most enterprises demonstrate only partial implementation of these activities.

Table 2.7. Survey results on variance identification and analysis

Code	Survey item	Mean	Std. dev.
SL1	Variances are analysed by responsibility centre.	3.18	0.66
SL2	Variances are identified by comparing actual results with plans, standards or budgets.	3.33	0.68
SL3	The causes of variances are identified in relation to each unit's responsibilities.	3.34	0.67

Source: Survey data analysis.

Item means range from 3.18 to 3.34, with centre-level analysis scoring lowest. Interviews indicate that variances may simultaneously reflect technical conditions, market conditions and decisions by higher management. Where a variance occurs does not necessarily define the responsible manager's scope of responsibility. Improvement requires analysis results to be linked to authority, controllability and managerial responsibility to support explanations and performance evaluation.

2.2.4. Organisation of responsibility reporting

2.2.4.1. Organisation of reporting systems for responsibility accounting

All 15 enterprises have production, cost and plan implementation reports by unit or production stage. However, reports are clearly organised by centre or area of responsibility in six enterprises, report indicators are linked to unit responsibilities in seven, and timely

provision of reports is clearly evident in five. Reports support management, but the extent to which they reflect managers' authority and controllability remains uneven.

Table 2.8. Survey results on responsibility reporting

Code	Survey item	Mean	Std. dev.
BC1	The enterprise prepares reports for each responsibility centre.	3.44	0.69
BC2	Reports reflect indicators within each centre's responsibilities.	3.59	0.65
BC3	Reports compare actual results with plans, standards or budgets.	3.57	0.65
BC4	Reports are prepared on time.	3.47	0.71
BC5	Reports are designed to meet the information needs of each management level.	3.65	0.68
Overall mean		3.54	0.54

Source: Survey data analysis.

The overall mean is 3.54. Report design suited to management information needs scores highest (3.65), while reporting by centre scores lowest (3.44). Together with documents and interviews, the findings indicate a need to align reporting scope and assigned targets with managers' control and ensure timely information provision.

2.2.4.2. Explanations and feedback on reported variances

Explanations are provided through management reports and production meetings, focusing on target achievement, variance causes and corrective measures. Feedback on variance analysis is clearly evident in three enterprises, partial in eight and unclear in four; the corresponding survey item (SL4) has a mean of 3.25.

Explanations and feedback support operational adjustments, cost control and problem resolution. However, links among variance causes, controllability, the parties providing explanations and responsibility for corrective action remain limited. Each manager's responsibility for controllable factors should therefore be clarified, with feedback linked to specific corrective measures.

2.2.5. Performance evaluation and use of evaluation results

2.2.5.1. Performance indicators and evaluation methods

Enterprises use financial and non-financial indicators, mainly comparing actual results with plans, standards or budgets. Use of indicators for production and sales units is clearly evident in nine and eight enterprises respectively, while alignment of indicators with each centre or area of responsibility is evident in six. Profit is mainly considered at

enterprise level or in relatively independent units; use of ROI and RI to evaluate managerial responsibility is not widespread.

Table 2.9. Survey results on performance indicators and evaluation methods

Code	Survey item	Mean	Std. dev.
DG1	Evaluation indicators are developed to suit each responsibility centre.	3.34	0.60
DG2	The indicator system combines financial and non-financial indicators.	3.50	0.63
DG3	Evaluation indicators are aligned with managers' authority and controllability.	3.42	0.75
DG4	Criteria for evaluating the achievement of indicators are clearly specified.	3.33	0.66
DG5	Evaluation methods are appropriate to each centre's operating characteristics.	3.51	0.67
Overall mean		3.42	0.53

Source: Survey data analysis.

The overall mean is 3.42. Evaluation methods score highest (3.51), while specification of achievement criteria scores lowest (3.33). Together with documents and interviews, the results show that indicator systems exist but need to be more clearly linked to each manager's authority, controllability and performance.

2.2.5.2. Organisation of responsibility centre performance evaluation

Operating results are reviewed through management reports, meetings, interim reviews and year-end reviews. Evaluation criteria are clearly evident in six enterprises; joint evaluation of units and their managers, and consideration of controllability, in five. Regular evaluation and focus on indicators within assigned responsibilities are each clearly evident in four enterprises.

Table 2.10. Survey results on the organisation of performance evaluation

Code	Survey item	Mean	Std. dev.
TC1	Evaluation is conducted regularly on a monthly, quarterly or annual basis.	3.14	0.64
TC2	Evaluation is based on assigned indicators and information on actual results.	3.36	0.68
TC3	Units/responsibility centres and their respective managers are evaluated.	3.28	0.66

TC4	Evaluation focuses on achievement of indicators within each centre's responsibilities.	3.18	0.69
TC5	Factors beyond managers' control are considered when evaluating them.	3.30	0.66
Overall mean		3.25	0.53

Source: Survey data analysis.

The overall mean is 3.25. The basis for evaluation scores highest (3.36), while regularity scores lowest (3.14). Evaluation is undertaken, but the distinction between unit performance and managerial performance, and consideration of uncontrollable factors, remain uneven.

2.2.5.3. Use of evaluation results in management

Evaluation results are used for operational management, cost control, plan adjustments, rewards and improvement of management arrangements. However, only three to five of the 15 enterprises are classified as clear for each activity, while "partial" accounts for the largest share. Use of variance analysis to adjust operations is clearly evident in six enterprises; the corresponding survey item (SL5) has a mean of 3.37.

Table 2.11. Survey results on the use of evaluation results in management

Code	Survey item	Mean	Std. dev.
UD1	Evaluation results are used in managing production and business operations.	3.00	0.67
UD2	Evaluation results are used to control costs and improve operating efficiency.	3.13	0.64
UD3	Evaluation results are used to adjust plans, standards and budgets.	3.14	0.64
UD4	Evaluation results are used in recognition and reward programmes and evaluation of managers.	2.94	0.59
UD5	Evaluation results are used to improve decentralisation arrangements and the responsibility accounting system.	3.15	0.64
Overall mean		3.07	0.49

Source: The author's survey data analysis.

The overall mean is 3.07, below that for indicators and methods (3.42) and evaluation organisation (3.25). Use for recognition, rewards and managerial evaluation scores lowest (2.94). These results reflect incomplete alignment among assigned targets, controllability, managerial performance and decisions following evaluation; greater attention is needed to translating evaluation results into specific management measures.

2.2.6. Synthesis of current practices across the dimensions of responsibility accounting application

RA components have been established, but the alignment of authority, information and evaluation varies. Findings are synthesised across three dimensions to connect current practices with the quantitative model.

Table 2.12. Overview of responsibility accounting practices by application dimension

Dimension	Aspects of current practices reflected	Main findings
System design	Establishment and classification of responsibility centres; development of standards, budgets and management indicators	Basic components exist; their specification by responsibility centre varies with decentralisation and the organisation of management units.
System operation	Information collection and processing; responsibility reporting and variance analysis	Financial and non-financial information is diverse; data integration, reporting and attribution of information by responsibility vary across enterprises.
Information use	Use of information for control, performance evaluation, feedback and decision support	Information is used more widely for operational management and control; its use for evaluation of managerial responsibility and system feedback varies.

Source: The author's synthesis of research findings.

2.3. ANALYSIS OF FACTORS AFFECTING THE EXTENT OF RESPONSIBILITY ACCOUNTING APPLICATION IN CEMENT MANUFACTURING ENTERPRISES IN NORTHERN VIETNAM

2.3.1. Quantitative research design

The study uses CB-SEM, measuring the extent of RA application (VDK) as a second-order latent variable reflected by design (TK), operation (VH) and information use (SD). The five independent factors and these three components are measured by 32 observed variables on a five-point Likert scale. Scales are drawn from theory and previous studies, with wording reviewed through qualitative research to suit cement manufacturing enterprises.

2.3.2. Survey sample description

The survey was conducted from March to June 2025 at 15 purposively selected enterprises. Of 250 questionnaires distributed, 243 were returned and 238 were valid, representing 95.2% of those distributed. Respondents were selected according to their positions and knowledge of the survey topics. The CB-SEM analysis uses individual-level responses and does not adjust for within-enterprise dependence. The findings are therefore interpreted as reflecting the perceptions of respondents in the 15 surveyed enterprises.

2.3.3. Descriptive statistics

Means for influencing factors range from 3.20 to 3.85: CK is highest (3.85), followed by CT (3.32), IT (3.31), and CN and NL (both 3.20). For VDK components, TK has the highest mean (3.85), followed by SD (3.73) and VH (3.57). These results reflect respondents' assessments; relationships between the factors and VDK are examined through the structural model.

2.3.4. Measurement model assessment

Table 2.13 presents Cronbach's alpha, composite reliability (CR) and average variance extracted (AVE) for the eight first-order constructs.

Table 2.13. Reliability and convergent validity assessment

Construct	No. of items	Cronbach's alpha	CR	AVE
Organisational structure and management decentralisation (CT)	4	0.788	0.791	0.487
Accounting information systems (IT)	4	0.886	0.888	0.665
Production technology characteristics (CN)	4	0.777	0.778	0.468
Accounting personnel competence (NL)	4	0.848	0.850	0.588
Management commitment (CK)	4	0.885	0.885	0.659
RA system design (TK)	4	0.853	0.854	0.594
RA system operation (VH)	4	0.830	0.834	0.558
RA information use (SD)	4	0.867	0.871	0.631

Source: Analysis results.

Cronbach's alpha for the eight scales ranges from 0.777 to 0.886. EFA yields a KMO value of 0.919, a significant Bartlett's test ($p < 0.001$), and a cumulative percentage of variance explained of 59.799%. The eight factors are consistent with the intended scale structure, and all 32 observed variables are retained. CFA yields $\text{CMIN/df} = 1.284$, $\text{CFI} = 0.979$, $\text{TLI} = 0.976$, $\text{GFI} = 0.915$ and $\text{RMSEA} = 0.035$, indicating that the measurement model fits the survey data.

CR and AVE are calculated from standardised loadings in the measurement component of the SEM model. All scales have CR above 0.70; six have AVE above 0.50. CT and CN have AVE of 0.487 and 0.468 respectively and are retained based on joint consideration of reliability, theoretical content and scale assessment results. The five independent factors satisfy the Fornell–Larcker criterion for discriminant validity.

2.3.5. Structural equation model testing

The SEM model yields $CMIN/df = 1.321$, $CFI = 0.976$, $TLI = 0.973$ and $RMSEA = 0.037$. For second-order VDK, the standardised loadings of TK, VH and SD are 0.571, 0.813 and 0.816 respectively; CR is 0.782 and AVE is 0.551.

Table 2.14. Research hypothesis testing results

Hyp.	Relationship	Std. β	S.E.	C.R.	p	Conclusion
H1	CT $\rightarrow$ VDK	0.224	0.051	3.161	0.002	Supported
H2	IT $\rightarrow$ VDK	0.232	0.029	4.082	<0.001	Supported
H3	CN $\rightarrow$ VDK	0.199	0.042	2.874	0.004	Supported
H4	NL $\rightarrow$ VDK	0.115	0.025	2.305	0.021	Supported
H5	CK $\rightarrow$ VDK	0.427	0.036	6.308	<0.001	Supported

Source: AMOS analysis results.

Note: β denotes the standardised regression coefficient. S.E, C.R. and p are taken from the unstandardised estimates.

All five factors have positive, statistically significant relationships with VDK, supporting H1–H5. Management commitment has the largest standardised regression coefficient (0.427), followed by IT (0.232), CT (0.224), CN (0.199) and NL (0.115).

Table 2.15. Assessment of estimation bias using Bootstrap

Hyp.	Relationship	Estimate	Mean	Bias	SE-Bias
H1	CT $\rightarrow$ VDK	0.162	0.160	−0.002	0.001
H2	IT $\rightarrow$ VDK	0.116	0.119	0.003	0.002
H3	CN $\rightarrow$ VDK	0.120	0.118	−0.002	0.001
H4	NL $\rightarrow$ VDK	0.058	0.055	−0.003	0.001
H5	CK $\rightarrow$ VDK	0.226	0.232	0.006	0.002

Source: AMOS analysis results and the author's compilation.

Note: Estimate is the unstandardised coefficient estimated from the original sample; Mean is the mean coefficient across Bootstrap resamples; Bias = Mean – Estimate; SE-Bias is the standard error of the bias.

Bootstrap analysis with 5,000 resamples yields mean coefficients close to the original estimates, with bias ranging from –0.003 to 0.006. All mean coefficients are positive, consistent with the direction of relationships in the model.

2.3.6. Discussion and research implications

The results support measuring VDK as a second-order latent variable through TK, VH and SD, and identify positive, statistically significant relationships between all five factors and VDK. Management commitment has the largest standardised regression coefficient.

Theoretically, the results provide additional evidence consistent with contingency theory, the resource-based view and institutional theory, and support measurement of VDK through design, operation and information use. Practically, they highlight conditions relating to management commitment, information systems, decentralisation, production technology and accounting personnel competence. These conditions are combined with limitations identified in current practices to develop solutions in Chapter 3.

2.4. OVERALL ASSESSMENT OF RESPONSIBILITY ACCOUNTING PRACTICES IN CEMENT MANUFACTURING ENTERPRISES IN NORTHERN VIETNAM

2.4.1. Achievements

The surveyed enterprises have relatively clearly defined functions, tasks and accountable managers within units, with cost responsibility clearly identified by production department and stage. Standards and budgets have been developed and used for planning and resource control. Financial and non-financial data, software, and production management and monitoring systems provide an information foundation for management. Management reports meet basic operational needs; financial and non-financial indicators and evaluation results are used for operational control, plan review, and some recognition and reward activities.

2.4.2. Limitations and issues to be addressed

First, responsibility centre establishment does not fully align authority with responsibility, particularly for revenue, profit and investment; lead and supporting responsibilities across production stages are not consistently defined.

Second, standards and budgets are not consistently linked to each centre's responsibilities; participation in developing, reviewing and updating targets remains uneven.

Third, data are not consistently standardised and aggregated by responsibility centre. Overhead allocation, identification of controllable costs and analysis of variance causes remain limited.

Fourth, reports are not consistently organised by responsibility centre and management level; explanations, feedback responsibilities and follow-up on recommendations are not fully specified.

Fifth, evaluation indicators and criteria are not fully aligned with managers' authority and controllability. Use of ROI and RI for investment evaluation of managerial responsibility, and use of evaluation results to review decentralisation, indicators and coordination, remain limited.

2.4.3. Causes of the limitations

These limitations are explained by functional decentralisation that is not fully linked to decision authority over factors determining results, and by standards, budgets, information, reporting and evaluation that are not consistently organised by responsibility centre. Continuous production, interdependence among stages and incomplete coordination increase difficulties in variance analysis and responsibility attribution. Differences in data codes, measurement units, recording times and reconciliation responsibilities limit information consistency. Evaluation and follow-up processes are not closely linked to controllability and responsibility for implementing recommendations. Quantitative findings provide additional evidence on conditions supporting system improvement and are combined with the assessment of current practices to develop solutions in Chapter 3.

CHAPTER 2 SUMMARY

Chapter 2 outlines the enterprises' characteristics, analyses RA practices across five components and tests factors affecting the extent of RA application. The enterprises have established foundations in cost centres, standards, information and management tools. However, development remains uneven, with incomplete links among authority, targets, information, reporting and evaluation of managerial responsibility.

CB-SEM identifies positive, statistically significant relationships between all five factors—CT, IT, CN, NL and CK—and the extent of RA application. The assessment of current practices and quantitative findings provide the practical and empirical basis for the improvements proposed in Chapter 3.

CHAPTER 3

SOLUTIONS FOR IMPROVING RESPONSIBILITY ACCOUNTING IN CEMENT MANUFACTURING ENTERPRISES IN NORTHERN VIETNAM

3.1. Basis for proposing responsibility accounting improvements in cement manufacturing enterprises in Northern Vietnam

The solutions draw on theory, findings on current practices, model testing, the legal context and cement industry development directions. Five groups address the five RA components, guided by controllability. Implementation conditions and priorities reflect research findings, management needs and enterprise resources.

3.2. Solutions for improving responsibility accounting

3.2.1. Improving the organisation of responsibility centres

Establish and classify centres by objectives, authority, controllability and measurability. Specify decision authority, delegation limits, accountability and coordination across production stages in management regulations, the centre register and the delegation framework.

3.2.2. Improving standards and budgets by responsibility centre

Link standards to production conditions and responsibilities; standardise development, approval and updating. Combine top-down and bottom-up budgeting, assigning targets with resources and responsibilities. Distinguish authorised budget revisions from flexible budgeting for variance analysis.

3.2.3. Improving the organisation of accounting information collection and processing for responsibility accounting

Standardise centre codes, indicators, units, data periods, sources and verification responsibilities. Link accounting, production and technical data; record, reconcile and aggregate information by centre. Analyse variances against consistent benchmarks, distinguishing causes within and beyond managers' control.

3.2.4. Improving responsibility reporting

Design reports by centre type and management level, presenting targets, results, variances, causes and recommendations. Specify preparers, recipients, deadlines, explanation and feedback responsibilities. Record corrective actions, implementers, deadlines and outcomes for follow-up.

3.2.5. Improving performance evaluation and use of evaluation results

Select financial and non-financial indicators and methods suited to each centre; apply ROI and RI where investment centres have corresponding authority. Distinguish centre from managerial performance, considering uncontrollable factors. Obtain feedback before

approval; use results to improve operations, review standards, budgets and decentralisation, reward and develop managers, and improve RA.

3.3. Conditions for implementing the solutions

Three groups concern management commitment, organisational structure and decentralisation; information systems and production technology data; and human resources. Ensure leadership, resources, data availability and staff capabilities. Proceed through standardisation, piloting and expansion, prioritising existing systems and using pilot results.

3.4. Recommendations

The State and regulatory authorities should strengthen professional guidance on management accounting and RA, and support management and data-use capabilities suited to enterprises.

Educational institutions and professional organisations should strengthen practical training in budgeting, variance analysis, reporting, managerial responsibility evaluation and financial and non-financial data processing.

The Vietnam Cement Association should facilitate experience sharing and training, and may develop consumption and equipment efficiency benchmarks using voluntary, confidential and comparable data.

Enterprises should integrate RA improvement into management programmes, specifying objectives, lead units, coordination, schedules and expected results. Executive management should review results and feedback to guide adjustments and expansion.

3.5. Research limitations and future research directions

The study uses cross-sectional data from 238 individuals in 15 enterprises and tests direct relationships between five factors and VDK; the solutions have not been piloted. Future research may broaden the scope, refine scales, examine mediation and moderation, combine data sources and collection periods, and pilot the solutions.

CHAPTER 3 SUMMARY

Chapter 3 proposes five groups of solutions to link authority, targets, information, reporting and performance evaluation, together with three groups of implementation conditions and supporting recommendations. The solutions are designed to suit enterprises' production characteristics, decentralisation and resources, with the aim of strengthening control, accountability and management decision support.

CONCLUSION

The dissertation systematises the theoretical foundations of RA, emphasising the alignment of decentralisation, controllability and accountability. It also develops a model examining five factors related to the extent of RA application. The extent of application is measured through system design, system operation and information use.

Findings from 15 enterprises show that the components supporting RA have been established, but links among authority, responsibility, information and performance evaluation remain incomplete. Quantitative results identify positive, statistically significant relationships between all five factors and the extent of RA application; management commitment has the largest standardised coefficient.

On this basis, the dissertation proposes five groups of solutions and three groups of implementation conditions suited to each enterprise's needs and readiness. The findings add to the theoretical and empirical foundations and provide proposed solutions that enterprises can use as a reference for improving RA in cement manufacturing enterprises in Northern Vietnam.

LIST OF PUBLISHED ARTICLES

1. Nguyen Thuy Linh (2025), “*Assessing the application level of responsibility accounting in control of energy costs at cement production enterprises in the northern region of Viet Nam*”, Vietnam Economic & Financial Review, December 2025.
2. Nguyen Thuy Linh (2026), “*The relationship between responsibility accounting and internal control: A management control theory perspective*”, Accounting and Auditing Review, March 2026.
3. Nguyen Thuy Linh (2026), “Material flow cost accounting in Vietnam’s cement industry”, Economics and Finance Review, March 2026.