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Activity-based costing usage and financial performance: The contingent role of competition

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Abstract

This study examines whether market competition strengthens the relationship between activity-based costing (ABC) usage and financial performance in UK non-manufacturing companies. Survey data from 204 UK service-sector companies with at least 50 employees and annual sales of at least £25 million were analysed using three-step hierarchical moderated ordinary least squares regression. Firm size and cost structure were included as controls, and supplementary checks addressed non-response bias, common method bias, sector composition, and a median-split specification of competition. ABC usage ($\beta = .176$, $p = .022$) and competition ($\beta = .427$, $p < .001$) were positively and independently associated with financial performance in the final model. However, the ABC usage $\times$ competition interaction was not significant ($\beta = .055$, $p = .346$; $\Delta R^2 = .003$), so the hypothesised moderating effect of competition was not supported. The evidence is more consistent with an additive or selection form of contingency fit than with an interaction form: competition is associated with ABC usage and financial performance but does not significantly alter the marginal performance contribution of ABC usage. Management accountants and finance managers should base decisions to extend ABC usage on its decision-support contribution to pricing, service mix, resource allocation, and cost control rather than on an expectation that its financial payoff necessarily increases with competitive intensity.

Keywords: ABC usage, Activity-based costing, Competition, Contingency theory, Financial performance, Moderated regression, Service sector.

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1. Introduction

Activity-based costing (ABC) has been advocated for more than three decades as a means of providing organisations with more accurate cost information than that generated by traditional volume-based costing systems [1, 2]. A large body of research has examined why organisations adopt ABC and, more recently, the extent to which they actually use it once adopted — a distinction that is important because adoption in name does not guarantee that ABC information is embedded

in day-to-day decision making [3-5]. A smaller, and more equivocal, literature has examined whether ABC usage translates into improved financial performance [6, 7].

Contingency theory suggests that the performance consequences of a management accounting practice such as ABC cannot be assessed in isolation: they depend on the fit between the practice and the context in which it operates [8, 9]. Competition is one of the most frequently cited contingent variables in this literature. Cooper and Kaplan [1] argued that intensifying competition encourages organisations to adopt more sophisticated costing systems because accurate cost information becomes increasingly important for pricing and product/service-mix decisions when competitors can readily undercut a mispriced offering. It is a separate empirical question, however, whether competition simply encourages greater ABC usage and, independently, better performance, or whether it more specifically strengthens the performance payoff of ABC usage — that is, whether competition acts as a moderator of the ABC usage–performance relationship.

This paper addresses that question using data from a cross-sectional postal and online survey of 204 UK non-manufacturing companies. The present paper tests directly whether competition moderates the ABC usage–financial performance relationship using hierarchical moderated regression, a method widely used to test contingency-theory predictions in the management accounting literature [10]. Beyond the core hypothesis tests, the paper also reports supplementary checks for non-response bias, common method bias, sector composition, and the sensitivity of the results to a median-split operationalisation of competition, strengthening confidence in the conclusions drawn.

The study makes four main contributions. First, and centrally, it provides a direct test, using moderated regression, of whether competition changes the size of the ABC usage–performance relationship — finding that it does not — which challenges the common, often implicit, assumption in contingency-based management accounting research that a contextual factor associated with a practice’s use will also moderate that practice’s performance consequences. Second, it explicitly differentiates its research question, theoretical model (an interaction rather than mediation model) and statistical method (hierarchical moderated regression rather than structural equation modelling) from prior work using an overlapping dataset [10] a distinction elaborated in Section 5.2, so that the two studies’ contributions can be correctly understood as independent rather than overlapping. Third, it contributes UK service-sector survey evidence to a literature that remains weighted towards manufacturing settings, and situates this evidence alongside a range of recent international studies on ABC usage and performance. Fourth, it offers a transparent methodological illustration — through the contrast between a continuous interaction test and an exploratory median-split subgroup comparison — of a pitfall that applied contingency-theory researchers should be alert to when interpreting moderator analyses. Figure 1 (Section 2) summarises the conceptual model and hypotheses tested in the remainder of the paper.

The remainder of the paper is organised as follows. Section 2 reviews the relevant literature and develops the study’s hypotheses. Section 3 describes the sample, data collection procedures and measures. Section 4 presents the results. Section 5 discusses the findings. Section 6 concludes. Practical implications and limitations/future research directions are presented in Sections 7 and 8 respectively.

2. Literature Review and Hypothesis Development

2.1. Contingency Theory and Costing Systems

Contingency theory holds that there is no management accounting system that is universally appropriate for every organisation; instead, the appropriateness of a system depends on the specific circumstances — or contingent factors — an organisation faces [8, 9]. The theory originated in the organisational-design literature, where early work showed that the “best” structure for an organisation depends on factors such as environmental uncertainty and task interdependence [11, 12] and was subsequently extended to management accounting on the argument that the design and use of accounting systems should likewise be understood as a response to the organisation’s operating context rather than as a matter of universally “best practice” [8]. Applied to costing systems specifically, this perspective implies that the intensity with which ABC is used, and the performance consequences of that use, should vary systematically with contingent factors such as competition, product or service diversity, business strategy, and organisational size [3, 13, 14].

An alternative, though not mutually exclusive, theoretical lens is the resource-based view, which regards costing information as an internal capability that can generate a sustained competitive advantage when it is valuable, rare, and difficult for rivals to imitate [15]. Under this view, the financial performance benefit of ABC usage would be expected to hold broadly across contexts because it reflects a superior internal information-processing capability, rather than being conditional on external market characteristics such as competition. The present study is grounded primarily in contingency theory because it more directly generates competing, testable predictions about whether competition changes the size of the ABC usage–performance relationship (a moderation prediction) as opposed to simply being correlated with both variables (a selection prediction); nonetheless, the resource-based view offers a plausible explanation for why the present results show robust, context-independent direct effects rather than a significant interaction.

Drazin and Van de Ven [16] distinguish between different “forms of fit” that can be tested empirically, and this typology has since become a standard reference point for classifying contingency-based management accounting studies [17]. A selection form of fit examines only the association between contingent factors and the design or use of a system, implicitly assuming that organisations adapt their systems to their context and that this adaptation alone is sufficient for effective functioning. An interaction (moderation) form of fit goes further, examining whether the joint effect of a contingent factor and a system characteristic on performance differs from the sum of their separate effects — that is, whether the contingent factor changes the marginal performance contribution of the system. A mediation (or systems) form of fit examines whether a contingent factor influences performance indirectly through the system, implying a causal chain running from context, through system use, to outcomes. Gerdin and Greve [17] further note that the moderation and

mediation forms of fit are frequently conflated in the management accounting literature, and that failing to distinguish them carefully can lead to misleading conclusions about whether, and how, a contingent variable matters for performance.

Much of the early ABC literature adopted a selection form of fit, focusing on which factors are associated with ABC adoption or usage without directly linking these factors, ABC and performance in a single model (see [10], for a review). This leaves open the question of whether contingent factors such as competition change the performance payoff of ABC usage or simply drive both ABC usage and performance independently — a distinction with direct implications for managerial decision making, since a moderation finding would imply that ABC usage is a more valuable investment specifically in highly competitive markets, whereas a selection or purely additive finding would imply that its value is broadly similar regardless of competitive intensity.

2.2. ABC Adoption Versus ABC Usage

A recurring methodological issue in the costing-systems literature is the distinction between ABC adoption and ABC usage. Early studies typically measured ABC adoption as a binary variable capturing whether an organisation had or had not implemented an ABC system (e.g. [18-20]). This measure is straightforward to collect but is a relatively coarse proxy for how embedded ABC information actually is in decision making, since a nominally “adopted” system may in practice be used only sporadically, while a company that has not formally adopted ABC may nonetheless draw on activity-based cost information on an ad hoc basis [3]. In response, subsequent research has increasingly measured the intensity, or extent, of ABC use directly, typically via Likert-type items capturing how extensively activity-based information is applied to costing decisions [4, 5, 21]. A recent systematic literature review of more than a thousand ABC studies published over three decades confirms that this adoption/usage distinction, and the accompanying heterogeneity in how ABC is operationalised, remains a persistent feature of the literature and a recurring source of inconsistent findings across studies [22]. This usage-based approach is the one followed in the present study: rather than treating ABC as a binary adopted/not-adopted characteristic, the analysis models the extent of ABC usage as a continuous predictor, consistent with the view that the performance consequences of ABC are likely to depend on how thoroughly the information is actually applied, not merely on whether a system carrying the ABC label has been formally implemented. Evidence from Saudi Arabian hospitals also illustrates the continued relevance of ABC adoption in service settings: Alshamlan and Zverovich [23] found that 28% of surveyed hospitals used ABC, with adoption varying by hospital characteristics [23].

2.3. ABC Usage and Financial Performance

The rationale for expecting ABC usage to improve financial performance is that ABC assigns overhead costs to products or services on the basis of the activities that consume resources, rather than on the basis of volume-related allocation bases such as direct labour or machine hours [2]. More accurate cost information is expected to improve pricing, product/service-mix, and cost-management decisions, which should, in turn, improve financial performance [24, 25]. Empirical evidence on this relationship is mixed. Cagwin and Bouwman [6] found that ABC use was associated with improved return on investment under certain conditions — specifically, when it was combined with other contemporaneous improvement initiatives such as total quality management and just-in-time systems — suggesting that ABC’s performance effect may itself be contingent on complementary organisational practices rather than universal. Other studies find weak or non-significant direct effects of ABC on financial performance, suggesting that any performance benefit of ABC usage may operate through intermediate, non-financial outcomes such as improved cost control or service quality rather than through a direct path to financial performance [7, 10].

More recent evidence, largely from outside the UK, continues to report a broadly positive, though not universally significant, association between ABC usage and financial or organisational performance. In a structural equation model of Thai firms, Vetchagool, et al. [26] found that extensive use of ABC for cost analysis, cost strategy and cost evaluation directly improved operational performance and indirectly improved financial performance through that operational-performance channel — a pattern broadly consistent with a mediation form of fit rather than a large direct effect. Al-Dhubaibi [27] similarly emphasises that the performance value of ABC depends on the extent and quality of its implementation rather than on adoption alone. Studies of specific national and sectoral contexts report generally positive associations between ABC usage and profitability or performance, including Greek companies [28] Zambian small and medium-sized enterprises [29] Ghanaian SMEs [30] and healthcare providers using both ABC and time-driven ABC [31]. A recent bibliometric review further documents growing interest in applying ABC-based costing to support sustainability and environmental-impact objectives, alongside its more traditional financial-performance applications [32]. This equivocal but broadly positive evidence base is one of the motivations for testing the direct ABC usage–performance relationship explicitly, alongside its interaction with competition, in the present study.

H₁: ABC usage is positively associated with financial performance.

2.4. The Contingent Role of Competition

Cooper and Kaplan [1] argued that competition is a key driver of the demand for sophisticated costing information: as competition intensifies, the cost of basing prices and product/service decisions on distorted cost information rises, because competitors are more likely to exploit any mispricing through targeted competition on the underpriced items. Consistent with this argument, several studies report a positive association between competition and the sophistication or usage of costing systems (e.g. [13, 14]). More recent research continues to identify competitive intensity as a leading contingent driver of management accounting practice adoption: for example, Nguyen and Nguyen [33] found that competitive intensity, alongside business needs and regulatory pressure, was a strong predictor of the adoption of innovative ABC tools

among Vietnamese manufacturing firms, while Pires and Alves [34] show, within a contingency framework, that environmental uncertainty (a construct closely related to competitive intensity) shapes both the perceived relevance of accounting information and organisational performance. Competition has also been linked directly to financial performance and to the design of management control systems more broadly, on the logic that firms operating in highly competitive markets that succeed in managing costs and pricing effectively tend to outperform less cost-conscious rivals, while those that do not adapt their control systems to a competitive environment are more likely to be competed away [35].

Beyond these separate, direct associations, contingency theory further predicts an interaction (moderation) effect: because accurate cost information is of greater decision-making value when competitive pressure is high, the financial performance benefit of ABC usage should be larger in more competitive environments than in less competitive ones. Under low competition, mispriced products or services are less likely to be immediately exploited by rivals, so the marginal value of ABC's more accurate cost information is lower; a company facing little competitive pressure can absorb a degree of cost distortion without materially harming its financial results, whereas a company facing intense competition cannot. This reasoning implies that competition should not simply raise the general level of ABC usage and performance but should specifically strengthen the ABC usage–financial performance relationship, over and above any separate, additive contribution that each variable makes on its own. Directly relevant recent evidence on this specific type of moderation question is mixed: in a large US survey, Baird, et al. [36] found that the use of traditional and contemporary management accounting practices positively moderated the effect of competitive-force intensity on competitive advantage and organisational performance, indicating that, for some management accounting practices and some outcome measures, competition-related moderation effects can be detected; whether the same holds specifically for ABC usage and financial performance, in a UK service-sector setting, is the empirical question addressed by H3 below.

H₂: Competition is positively associated with financial performance.

H₃: Competition positively moderates the relationship between ABC usage and financial performance, such that the relationship is stronger under conditions of higher competition.

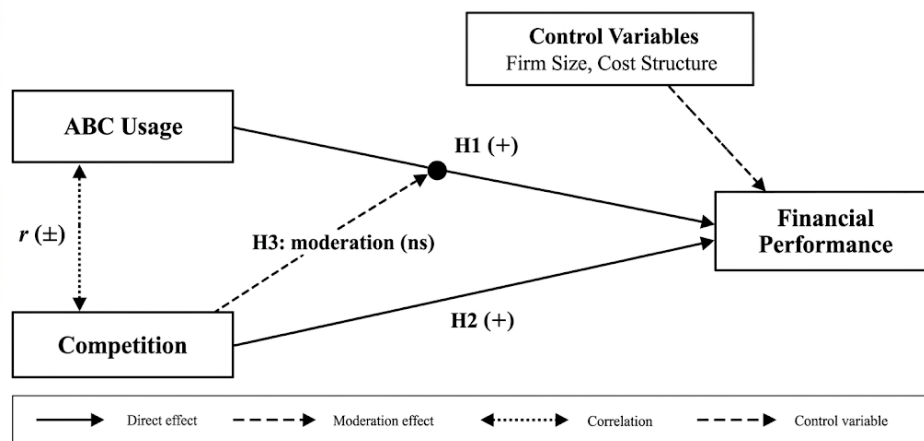


Figure 1.
Conceptual research model.

Note: Solid arrows denote the hypothesised direct effects (H1, H2); the dashed arrow denotes the hypothesised moderation effect (H3), which was not statistically supported (ns). The dotted vertical line denotes the bivariate correlation between ABC usage and competition ($r = .64$, $p < .01$), consistent with a selection form of fit. The dotted diagonal line denotes the control variables, firm size and cost structure.

3. Methodology

3.1. Sample and Data Collection

Data were drawn from a cross-sectional survey questionnaire administered by post and, where preferred, online, following the design recommendations of Dillman, et al. [37] for maximising response quality and minimising measurement error in mail surveys. The sampling frame was constructed from the FAME (Financial Analysis Made Easy) database, restricted to UK non-manufacturing (service-sector) companies that were privately owned, located in England, Scotland or Wales, employed at least 50 people, and reported annual sales revenue of at least £25 million. This medium/large-company threshold follows prior costing-systems research on the grounds that smaller companies are less likely to have the resources to invest in ABC [13, 38]. After removing companies used in the pilot study and companies without complete contact details, 2,969 companies met the criteria, from which a random sample of 2,000 was drawn and sent the questionnaire, each carrying a printed batch code (identifying whether it was part of the initial mailing or a subsequent reminder) used later to test for non-response bias. A total of 204 usable responses were received, a response rate of approximately 10.2%, which is broadly in line with response rates reported for comparable postal surveys of management accountants and finance directors in the UK costing-systems literature.

Respondents were predominantly finance directors, management accountants and other senior finance staff responsible for costing decisions within their business unit. Table 1 (see Section 4) reports the industry composition of the achieved sample; the largest sectors represented are wholesale and retail trade (31.9%), administrative and support services (17.6%), professional/scientific/technical services (13.2%), and information and communication (12.3%), with the remainder spread

across transportation and storage, accommodation and food services, real estate, education, human health and social work, arts and entertainment, and other service activities.

3.2. Measures

ABC usage. ABC usage was measured with a single item asking respondents to indicate the extent to which their business unit used activity-based costing information, on a five-point scale ranging from 1 (“not at all”) to 5 (“very large extent”), consistent with prior activity-management usage research [3-5].

Competition. Competition was measured with a four-item, five-point Likert scale capturing the intensity of competition faced by the business unit for its major services (e.g. competition for price, quality and market share). The scale showed good internal consistency (Cronbach’s $\alpha = .875$) and the four items were averaged to form a single composite score.

Financial performance. Financial performance was measured with a three-item, five-point Likert scale asking respondents to rate their business unit’s performance, relative to that of similar competitors over the previous three years, on measures including profitability and return on investment. The scale showed good internal consistency (Cronbach’s $\alpha = .882$) and the three items were averaged to form a composite score. Subjective, perceptual performance measures of this kind are widely used in survey-based management accounting research because objective, business-unit-level financial data are frequently unavailable or commercially sensitive, and because prior work shows that perceptual and objective performance measures are highly correlated [39].

Control variables. Two control variables previously linked to both costing-system usage and performance were included: firm size, measured as the natural logarithm of the number of employees, and cost structure, measured as the proportion of indirect (overhead) costs to total operating costs. Larger organisations and those with a higher proportion of indirect costs typically face greater cost-allocation complexity and are more likely to have the resources to invest in and benefit from more sophisticated costing systems [13, 38].

3.3. Non-Response Bias

Because the achieved response rate was moderate (10.2%), non-response bias was assessed using the extrapolation method commonly applied in survey-based management accounting research, which compares early and late respondents on the assumption that late respondents resemble non-respondents more closely than early respondents do [40]. Respondents were classified as “early” if they returned the questionnaire before the first reminder ($n = 59$) and “late” if they returned it after the first or second reminder ($n = 145$). Independent-samples t-tests found no statistically significant differences between early and late respondents on any of the five study variables: ABC usage ($t = 0.08$, $p = .936$), competition ($t = 0.09$, $p = .930$), financial performance ($t = -1.28$, $p = .202$), firm size ($t = 0.92$, $p = .361$), or cost structure ($t = 0.61$, $p = .540$). These results provide no evidence of systematic non-response bias in the achieved sample.

3.4. Common Method Bias

Because ABC usage, competition and financial performance were all reported by the same respondent in the same survey instrument, the results are potentially susceptible to common method bias — the possibility that observed relationships are inflated, or otherwise distorted, by shared measurement method rather than reflecting genuine underlying associations [41]. Several procedural remedies recommended by Podsakoff, et al. [41] were incorporated into the survey design, including guaranteeing respondent anonymity, separating the predictor and criterion items across different sections of the questionnaire, and providing clear construct definitions to reduce ambiguity in item interpretation. As a statistical check, a Harman’s single-factor test was conducted by entering all competition and financial performance items into an unrotated principal components analysis; the first, largest factor accounted for 62.4% of the total variance among these items — above the conventional, if approximate, 50% threshold sometimes used as an informal warning sign [41]. This result should be treated as a genuine limitation of the study rather than explained away: common method variance cannot be ruled out on the basis of this test, and the possibility that shared method variance contributes to the size of the observed associations, particularly the direct effects of ABC usage and competition on financial performance, should be borne in mind when interpreting the results. Some mitigating context is nonetheless worth noting. The elevated single-factor variance is also consistent with competition and financial performance being theoretically related constructs that would be expected to share substantial variance even in the absence of any method effect (their raw bivariate correlation is $r = .62$), and common method bias is generally understood to inflate, rather than create, interaction effects [42] which if anything works against, rather than for, the possibility that the non-significant ABC usage $\times$ competition interaction is a method artefact. Even so, because a Harman’s single-factor test is a relatively weak diagnostic and no marker-variable or multi-method data were collected, common method bias is retained as an explicit limitation of the study in Section 8, and the main-effect estimates in particular should be interpreted with appropriate caution.

3.5. Analytical Approach

Hypotheses were tested using three-step hierarchical ordinary least squares (OLS) regression, a standard approach for testing moderation predictions in contingency-based management accounting research [10]. Step 1 entered the two control variables. Step 2 added ABC usage and competition, to test H1 and H2. Step 3 added the interaction term, ABC usage $\times$ competition, to test H3. All continuous variables, including the dependent variable, financial performance, were standardised (mean = 0, SD = 1) before estimation, and the interaction term was formed as the product of the two standardised focal predictors. Standardising the predictor variables before computing the interaction term both reduces non-

essential multicollinearity between the interaction term and its constituent main effects [43] and yields directly comparable, standardised regression coefficients (β) across all three steps; these standardised coefficients are reported consistently throughout the Abstract, Results, Table 3 and Discussion, so that the same numerical values can be cross-checked across every part of the paper. Variance inflation factors (VIFs) were inspected in the final model to confirm that multicollinearity did not bias the coefficient estimates. Two supplementary analyses were also conducted to probe the robustness of the main findings: (1) re-estimating the final model with an added dummy variable for the largest single sector in the sample (wholesale and retail trade) to rule out sector composition as an alternative explanation, and (2) a median-split subgroup comparison, in which the sample was divided into higher- and lower-competition halves and the ABC usage–financial performance slope was compared across the two subgroups. Consistent with recommended practice, the median-split analysis is treated strictly as a supplementary, illustrative robustness check rather than as primary evidence for or against H3, given the well-documented statistical costs of dichotomising continuous variables, including loss of statistical power and spurious apparent effects [44]; the continuous interaction test in Step 3 remains the principal, and only confirmatory, test of H3 throughout the paper.

4. Results

4.1. Descriptive Statistics and Correlations

Table 1 presents descriptive statistics for the study variables ($N = 204$). On average, respondents reported a relatively modest extent of ABC usage ($M = 2.43$, $SD = 1.54$, on the 1–5 scale), moderate-to-high competition ($M = 3.14$, $SD = 0.95$) and financial performance close to the scale midpoint ($M = 2.88$, $SD = 0.94$), indicating that, on average, respondents rated their business unit's performance as broadly comparable to that of similar competitors. The standard deviation on ABC usage (1.54) is relatively large compared with its mean, reflecting substantial variation in the extent to which ABC information is used across the sampled companies.

Table 1.
Descriptive statistics ($N = 204$).

Variable	Mean	SD	Min.	Max.
ABC usage	2.43	1.54	1	5
Competition	3.14	0.95	1	5
Financial performance	2.88	0.94	1	5
Firm size (log employees)	6.49	1.47	3.89	11.00
Cost structure (indirect/total costs)	0.10	0.12	0.00	0.65

Note: ABC usage, competition and financial performance are measured on 5-point Likert scales. Firm size is the natural log of the number of employees. Cost structure is the proportion of indirect to total operating costs.

Table 2 reports Pearson correlations among the study variables. Consistent with H1 and H2, financial performance is positively correlated with both ABC usage ($r = .53$, $p < .01$) and competition ($r = .62$, $p < .01$). ABC usage and competition are themselves positively correlated ($r = .64$, $p < .01$), consistent with Cooper and Kaplan [1] argument that competitive pressure encourages the use of more sophisticated costing information; this correlation is taken into account in the regression analysis below through variable standardisation and VIF diagnostics. Firm size and cost structure are also positively correlated with all three focal variables, confirming their relevance as controls, although the correlation between firm size and cost structure is itself small and non-significant ($r = .11$, n.s.), indicating that these two controls capture largely distinct aspects of organisational context.

Table 2.
Correlation matrix ($N = 204$)

Variable	1	2	3	4	5
1. ABC usage	—				
2. Competition	.64**	—			
3. Financial performance	.53**	.62**	—		
4. Firm size (log employees)	.43**	.49**	.43**	—	
5. Cost structure	.29**	.31**	.21**	.11	—

***Note:** ** $p < .01$ (two-tailed).*

4.2. Hierarchical Moderated Regression

Table 3 presents the results of the three-step hierarchical regression predicting financial performance. All coefficients reported in Table 3 and in the text below are standardised regression coefficients (β), obtained by standardising all continuous variables (including the dependent variable) to a mean of 0 and a standard deviation of 1 before estimation; standardisation is used throughout, rather than unstandardised coefficients, so that the size of the ABC usage, competition and interaction effects can be compared directly on a common scale, and so that the coefficients reported here correspond exactly to those reported in the Abstract. In Step 1, the control variables (firm size and cost structure) jointly explained 20.8% of the variance in financial performance ($R^2 = .208$, $F(2, 201) = 26.46$, $p < .001$), with both firm size ($\beta = .410$, $p < .001$) and cost structure ($\beta = .161$, $p = .012$) individually significant, confirming that larger business units and those with a higher proportion of indirect costs reported better financial performance even before any costing-system or competition variables were entered.

In Step 2, the addition of ABC usage and competition produced a substantial and statistically significant increase in explained variance ($\Delta R^2 = .223$, $F(2, 199) = 38.96$, $p < .001$), bringing total explained variance to 43.1% ($R^2 = .431$, $F(4, 199) = 37.71$, $p < .001$). Both predictors were independently significant: ABC usage ($\beta = .201$, $p = .005$) and competition ($\beta = .430$, $p < .001$) were each positively associated with financial performance, providing support for H1 and strong support for H2. The standardised effect of competition was more than twice the size of the standardised effect of ABC usage at this step, indicating that, of the two focal predictors, competition is the stronger correlate of financial performance in this sample.

In Step 3, the ABC usage $\times$ competition interaction term (formed from the standardised ABC usage and competition variables) was added. The interaction term was not statistically significant ($\beta = .055$, $p = .346$), and its inclusion produced only a negligible, non-significant increase in explained variance ($\Delta R^2 = .003$, $F(1, 198) = 0.89$, $p = .346$, n.s.), bringing total explained variance to 43.4% ($R^2 = .434$, $F(5, 198) = 30.33$, $p < .001$). The main effects of ABC usage ($\beta = .176$, $p = .022$) and competition ($\beta = .427$, $p < .001$) remained significant in the presence of the interaction term — and are, by construction, identical to the figures reported in the Abstract. H3 is therefore not supported: in this sample, competition does not significantly strengthen (or weaken) the association between ABC usage and financial performance. Variance inflation factors in the final model ranged from 1.15 to 2.02, well below conventional thresholds of concern (e.g. 10), indicating that multicollinearity is not a plausible explanation for the non-significant interaction.

Table 3.

Hierarchical moderated regression results: dependent variable = financial performance (N = 204).

Predictor	Model 1	Model 2	Model 3
Firm size (log employees)	0.410***	0.133*	0.130*
Cost structure	0.161*	-0.001	0.006
ABC usage (standardized)		0.201**	0.176*
Competition (standardized)		0.430***	0.427***
ABC usage $\times$ Competition			0.055
R ²	0.208	0.431	0.434
Adjusted R ²	0.201	0.420	0.419
ΔR^2	—	0.223***	0.003 (n.s.)
F for ΔR^2	—	$F(2,199) = 38.96***$	$F(1,198) = 0.89$ (n.s.)
Model F	$F(2,201) = 26.46***$	$F(4,199) = 37.71***$	$F(5,198) = 30.33***$

Note: Table entries for predictors are standardised regression coefficients (β), estimated after standardising all continuous variables (including financial performance) to a mean of 0 and standard deviation of 1; the interaction term is the product of standardised ABC usage and standardised competition. Because all variables are standardised, the constant is approximately 0 in every model and is omitted from the table. $p < .05$, ** $p < .01$, *** $p < .001$ (two-tailed); n.s. = not significant.*

4.3. Robustness Checks

Sector control. Because wholesale and retail trade companies made up the largest single sector in the sample (31.9%), the final model was re-estimated with an added standardised dummy variable equal to 1 for wholesale and retail trade companies and 0 otherwise. The sector dummy was not significant ($\beta = .048$, $p = .374$), and the standardised coefficients for ABC usage ($\beta = .177$, $p = .021$), competition ($\beta = .428$, $p < .001$) and the ABC usage $\times$ competition interaction ($\beta = .050$, $p = .393$) were essentially unchanged from the main model ($R^2 = .436$), indicating that the pattern of results is not driven by the sectoral composition of the sample.

Median-split subgroup comparison. As a supplementary, illustrative check, the sample was split at the median value of competition ($Mdn = 3.13$) into higher-competition ($n = 102$) and lower-competition ($n = 102$) subgroups, and the standardised ABC usage–financial performance slope was estimated separately within each subgroup, controlling for firm size and cost structure. The ABC usage slope was larger and more precisely estimated in the higher-competition subgroup ($\beta = .396$, $p < .001$, $R^2 = .250$) than in the lower-competition subgroup ($\beta = .193$, $p = .074$, $R^2 = .087$). Taken at face value, this pattern is directionally consistent with H3. However, because dichotomising a continuous moderator is known to lose statistical power and can produce apparent subgroup differences even when the underlying continuous interaction is not significant [44] this subgroup comparison is reported as suggestive, exploratory evidence only; the continuous, standardised interaction test reported in Table 3, which found no significant interaction, is treated as the primary and more reliable test of H3.

5. Discussion

5.1. Interpretation of the Main Findings

The results provide clear support for H1 and H2 but not for H3. ABC usage and competition are each independently and positively associated with financial performance, even after controlling for firm size and cost structure and after accounting for the correlation between ABC usage and competition. This is consistent with the broader logic of Cooper and Kaplan [1]: organisations that use ABC more extensively, and organisations that operate in more competitive markets, tend to report better financial performance. However, the data do not support the more specific contingency-theory prediction that competition changes the strength of the ABC usage–financial performance relationship: the effect of ABC usage on financial performance is statistically indistinguishable across levels of competition in this sample once the interaction is tested using the full, continuous measure of competition. This non-result is, in itself, a substantive finding rather than simply a rejected hypothesis: it indicates that although competition is strongly and independently related to both ABC usage and financial performance, it does not alter the marginal performance contribution that ABC usage makes once it is

in place. The theoretical contribution of the paper therefore does not rest on the (unsurprising) observation that competition is related to performance, but on the more specific and less obvious finding that competition does not significantly change the size of the ABC usage–performance relationship — a result that runs against the common, often implicit, assumption in contingency-based management accounting research that any contextual factor found to be associated with a practice’s adoption or use will also moderate that practice’s performance consequences [17].

This pattern is informative when read alongside Drazin and Van de Ven [16] distinction between forms of fit, as elaborated by Gerdin and Greve [17]. The present results are consistent with an additive or selection form of fit, in which competition is associated with the extent of ABC usage ($r = .64$) and separately, additively, with financial performance, rather than with an interaction form of fit, in which competition would condition the size of the ABC usage–performance relationship itself. The moderated-regression design directly tests, and finds no support for, an interaction form of fit. It does not test a mediation form of fit because no non-financial mediating variables, such as service quality or cost reduction, are modelled here. Future research could examine mediation explicitly using suitable longitudinal or structural-equation designs.

5.2. Reconciling the Continuous and Subgroup Evidence

The median-split subgroup analysis reported in Section 4.3 found a numerically larger and more precisely estimated ABC usage–performance slope among higher-competition firms than among lower-competition firms, a pattern that, superficially, appears to align with H3. The continuous interaction test, however, which uses the full information in the competition variable rather than an artificial two-group split, found no significant interaction. This divergence is not unusual in applied contingency-theory research and is a useful methodological illustration in its own right: median splits can produce apparently supportive subgroup contrasts even where the underlying continuous interaction is weak or absent, because dichotomisation discards within-group variance and can inflate the apparent difference between groups [44]. The more conservative conclusion, and the one favoured here, is that the continuous test in Table 3 provides the more trustworthy evidence, and that H3 is not supported. Future studies with larger samples could usefully revisit this question using simple-slopes analysis at multiple, non-dichotomised points along the competition distribution, or using latent moderated structural equation methods that can accommodate measurement error in the interaction term more fully than OLS.

5.3. Theoretical Implications

The findings contribute to a small but growing body of work cautioning against assuming that any contingent factor associated with the selection or use of a management accounting practice will necessarily also moderate its performance consequences [10, 17]. This is the paper’s central theoretical contribution: not that competition is related to financial performance — a relationship well established since Khandwalla [35] and unsurprising given the present sample — but that competition, despite being strongly and independently related to both ABC usage and financial performance, does not significantly alter the marginal performance contribution of ABC usage itself. Competition’s role here appears better characterised as an antecedent that raises both the extent of ABC usage and the level of financial performance — potentially through a common underlying driver, such as more capable or more cost-conscious management — rather than as a boundary condition that changes the marginal value of ABC information itself. Several theoretical accounts are consistent with this pattern. Under the resource-based view, a genuine information-processing capability such as sophisticated costing should yield benefits relatively independently of the specific external market conditions a firm happens to face, because the capability’s value derives from its internal rarity and inimitability rather than from the immediate competitive context [15]. Alternatively, ABC information may function as a broadly applicable decision-support capability whose performance contribution does not scale multiplicatively with competitive intensity in the way that information-asymmetry arguments would predict; once a business unit can see its costs accurately, that visibility may support better pricing and resource-allocation decisions in both high- and low-competition settings, even if the incentive to acquire that visibility in the first place is greater under high competition. This interpretation also usefully qualifies findings from adjacent studies that do report management accounting practices moderating the effects of competitive forces on performance [35]: whether a moderating role is found may depend on which management accounting practice, which performance outcome, and which operationalisation of competition is examined, underlining the value of testing, rather than assuming, moderation relationships on a practice-by-practice basis.

6. Conclusion

This paper examined whether competition moderates the relationship between ABC usage and financial performance among 204 UK non-manufacturing companies. Consistent with contingency theory, both ABC usage and competition were positively and independently associated with financial performance. Contrary to the moderation hypothesis, however, competition did not significantly strengthen the ABC usage–financial performance relationship in the primary, continuous-variable test, suggesting that, in this setting, competition functions as an independent driver of ABC usage and performance rather than as a boundary condition on the performance payoff of ABC usage. Supplementary robustness checks — controlling for sector composition and testing for non-response bias — supported the reliability of this conclusion, although an exploratory median-split subgroup comparison offered a more mixed, and more cautiously interpreted, picture, and the possibility of common method bias means the effect sizes reported should be treated as indicative rather than definitive.

The study contributes to the costing-systems literature in several ways. First, and centrally, it provides direct empirical evidence, using moderated regression, that a contextual factor — competition — strongly and independently associated

with both ABC usage and financial performance does not itself significantly alter the performance consequences of ABC usage, challenging the common, often implicit, assumption in contingency-based management accounting research that a contingent factor found to be associated with a practice will also moderate that practice's performance effects. Second, it explicitly differentiates its research question, theoretical model and statistical method from prior mediation-based work using an overlapping dataset ([10]; see Section 5.2), addressing a moderation question that earlier structural equation modelling of the same broader survey programme did not itself test, and avoiding overstating what a moderated-regression design can establish about mediation. Third, it offers UK service-sector evidence on ABC usage and performance, a context that remains comparatively under-represented relative to manufacturing-sector ABC research, and connects this evidence to a growing body of recent international studies on ABC usage and organisational performance (e.g. [26, 27, 31, 36]). Fourth, it demonstrates, through the contrast between the continuous interaction test and the median-split subgroup comparison, a concrete methodological caution relevant to applied contingency-theory researchers regarding the interpretation of dichotomised moderator analyses.

7. Practical Implications

From a practical standpoint, the findings suggest that managers in highly competitive service markets should not necessarily expect the financial payoff from extending ABC usage to be disproportionately larger than it would be in a less competitive market; rather, both greater ABC usage and stronger competitive positioning appear to be independently associated with better financial performance, and organisations may derive the largest benefit by using ABC information to support the operational improvements — such as service quality and cost control — that ultimately drive financial results, regardless of the immediate competitive intensity they face. For finance directors and management accountants deciding whether to invest further in extending ABC usage, the results imply that the business case for doing so should rest primarily on the practice's own, relatively consistent contribution to financial performance across contexts, rather than on an expectation that its value will be sharply higher specifically because the market is competitive. From a policy perspective, professional accounting bodies and educators may wish to emphasise ABC's broadly applicable decision-support value rather than positioning it primarily as a tool whose payoff is contingent on operating in a highly competitive market.

8. Limitations and Future Research

The cross-sectional design precludes causal inference; longitudinal data would allow the direction of the ABC usage–performance relationship to be examined more rigorously and would permit lagged tests of whether increases in ABC usage precede improvements in financial performance. Financial performance was measured using a subjective, perceptual scale rather than objective accounting data; although perceptual measures are common in this literature and correlate well with objective measures [39] future studies could combine both or triangulate survey responses against archival financial statement data drawn from FAME or a comparable database. Because ABC usage, competition and financial performance were all self-reported by the same respondent, common method bias could not be ruled out: the Harman's single-factor test reported in Section 3.4 found that a single factor accounted for 62.4% of the variance among the competition and financial performance items, above the conventional informal threshold. Future studies should collect data from multiple respondents or multiple sources. The response rate (10.2%), while comparable to similar UK postal surveys and unassociated with detectable non-response bias in the present tests, means that non-response bias cannot be entirely ruled out. The single-item measure of ABC usage cannot be assessed for internal consistency in the same way as the multi-item competition and financial performance scales; future studies could develop and validate a multi-item ABC usage scale. Future research could also extend the moderated-regression approach to other contingent factors and formally test mediation using structural equation modelling with a larger sample and explicit mediating variables.

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