

FIRM CHARACTERISTICS, CAPITAL RETURNS AND PROFITABILITY: AN ECONOMETRIC CROSS-SECTIONAL ANALYSIS OF UK ENTERPRISES

Dr. IOANNIS AZNAOURIDIS

University of Derby – UK / Mediterranean College – Greece

<https://doi.org/10.37602/IJSSMR.2026.9316>

ABSTRACT

Cross-sectional determinants of profitability are examined for a firm-level sample of UK enterprises ($N = 1,260$), using profit margin (%) as the dependent variable. Motivated by pronounced heterogeneity in accounting profitability, the analysis assesses whether margins vary systematically with firm size (employees; SME status), export orientation, labour-cost intensity (salaries as a % of turnover), operating scale (cost of production), credit capacity (credit limit), and capital-efficiency measures (ROSF, ROCE).

Profit margins average 6.11% and display non-trivial dispersion. SMEs report higher mean margins than large firms, although the magnitude is modest. Profit margins correlate positively with ROCE and ROSF, while ROCE and ROSF are strongly correlated with each other, motivating separate regression specifications.

In simple regressions, both return measures strongly predict profit margin ($R^2 \approx .27$ for ROSF; $R^2 \approx .33$ for ROCE). In multivariate models, credit capacity and SME status remain positively associated with profit margin, whereas export status and cost of production are not statistically significant. Model fit is stronger in the ROCE specification (adjusted $R^2 \approx .346$) than in the ROSF specification (adjusted $R^2 \approx .283$). Overall, cross-firm profitability differences in the UK are most consistently linked to capital efficiency and financing capacity, with limited evidence that export orientation independently explains profit-margin variation once firm characteristics are controlled for.

1.0 INTRODUCTION

Firm profitability remains one of the central concerns in corporate finance and industrial organization, as it captures both the efficiency of resource allocation and the capacity of enterprises to generate sustainable value under competitive conditions. Profitability is commonly treated not only as an outcome variable reflecting managerial performance and strategic positioning, but also as a key signal shaping investment decisions, access to finance, and long-term firm survival (Brealey, et.al., 2025; Damodaran, 2015). In empirical research, profitability is typically measured through accounting-based indicators such as profit margins, return on assets (ROA), and return on equity (ROE), each capturing different dimensions of firm performance and capital efficiency (Penman, 2013).

A substantial body of literature suggests that firm-level heterogeneity plays a decisive role in shaping profitability outcomes. Enterprises differ systematically with respect to characteristics such as size, labour intensity, cost structure, and capital allocation, all of which may influence

their ability to extract economic rents (Barney, 1991; Porter, 1985). For instance, firm size has been linked to profitability through multiple channels, including economies of scale, bargaining power, and access to diversified funding sources, though the direction of this relationship remains debated (Goddard, Tavakoli, & Wilson, 2005; Yazdanfar, 2013). Similarly, workforce-related measures - such as wage levels relative to turnover - have been examined as determinants of profitability, with mixed evidence regarding whether higher labour costs erode margins or, alternatively, enhance productivity and innovation through efficiency wage mechanisms (Akerlof & Yellen, 1986; Bryson, Forth, & Stokes, 2017).

Beyond labour characteristics, profitability is deeply intertwined with the returns generated on capital employed, reflecting how effectively firms utilize both equity and debt resources in producing operating surplus. Capital return indicators, such as return on capital employed (ROCE) or return on shareholder funds (ROSF) are widely used in corporate analysis and have been found to correlate positively with profit margins, suggesting that firms with stronger capital efficiency tend to achieve superior profitability levels (Koller, Goedhart, & Wessels, 2025; Petersen & Plenborg, 2012). However, the strength and stability of these relationships often depend on industry structure, firm lifecycle stage, and the broader macroeconomic environment (Banalieva & Eddleston, 2011; McGahan & Porter, 2002).

Despite the richness of existing research, an important limitation remains: many studies examine determinants of profitability in isolation or within sector-specific samples, producing inconsistent conclusions and limiting generalizability. In particular, it is not fully clear how firm characteristics - such as size, labour cost intensity (e.g., wages relative to turnover), and capital return measures - relate to profitability when examined simultaneously within a unified cross-sectional framework. This highlights the importance of firm level analysis across heterogeneous enterprises within a single economic context, such as the United Kingdom, where firm populations exhibit wide dispersion in productivity, wages, and capital efficiency (Bloom et al., 2012; Bloom & Sadun, 2012; Office for National Statistics [ONS], 2023).

Accordingly, the central research question guiding this study is: which firm-level factors systematically explain why some UK enterprises achieve higher profitability than others, and how does capital efficiency relate to this profitability dispersion? The aim of the research is to examine whether - and to what extent - firm characteristics influence (i) profitability (measured through profit margin), (ii) capital return indicators (ROCE and ROSF), and (iii) the relationship between profitability and capital returns. To address this aim, the study pursues the following objectives: (1) to describe the distribution and key descriptive statistics of firm profitability across the sample; (2) to test whether mean profitability differs across firm groups, particularly SMEs versus large firms and exporting versus domestic firms; (3) to test whether mean capital returns (ROCE) differ between SMEs and large firms; (4) to examine whether exporting status is associated with firm size using a chi-square test of independence; (5) to evaluate correlations between profitability, capital return measures, and key firm characteristics (including employment size, wage intensity, cost structure, and credit capacity); and (6) to estimate regression models assessing the extent to which ROCE and ROSF explain variation in profitability across firms.

By jointly evaluating firm characteristics and capital return measures in a single cross-sectional setting, this study contributes to a more coherent understanding of the structural drivers of

profitability variation across UK enterprises. The remainder of the paper is organized as follows: the next section describes the data and variables, followed by the empirical methodology and results; the final section discusses the findings and concludes.

2.0 RELATED LITERATURE AND HYPOTHESIS DEVELOPMENT

Firm profitability has long been treated as a core indicator of firm performance, reflecting the ability of enterprises to generate operating surplus and sustain competitive advantage under market constraints (Brooks & Yang, 2025). A key insight from the industrial organization and strategic management literatures is that profitability is shaped by persistent heterogeneity across firms, as differences in resources, capabilities, scale, and organizational efficiency allow some enterprises to extract rents more effectively than others (Porter, 1985; Barney, 1991). Empirical research has therefore focused on identifying firm characteristics that systematically explain variation in profitability across firms, typically using accounting-based measures such as profit margin, ROA, and ROE (Penman, 2013). In this context, the present study evaluates whether firm-level characteristics and capital return indicators jointly differentiate high-profitability UK firms from lower-performing ones, using a cross-sectional dataset of 1,260 UK enterprises.

2.1 Firm characteristics, scale, and profitability

One of the most frequently examined firm characteristics is scale. Firm size is often expected to influence profitability through economies of scale, scope efficiencies, bargaining power, and improved access to finance, yet the empirical evidence remains ambiguous. While some studies find that larger firms achieve higher profitability due to lower average costs and stronger market positioning, other work suggests diminishing returns to size, as organizational complexity, coordination costs, and bureaucratic inefficiencies may erode performance advantages (Goddard, Tavakoli, & Wilson, 2005; Yazdanfar, 2013). This ambiguity has led researchers to emphasize that profitability differences between SMEs and large enterprises are ultimately an empirical matter, contingent on the structure of costs, financing constraints, and strategic positioning. Consistent with this literature, the present study includes firm size measures (number of employees and an SME indicator) to examine whether profitability differs systematically between SMEs and large firms in the UK context.

2.2 Labour cost intensity and profit margins

A second strand of research focuses on labour costs and their relationship with profitability. In cost-based accounting frameworks, higher labour costs are expected to compress profit margins by increasing operating expenses, especially when wage levels rise faster than sales or productivity. However, alternative theoretical perspectives suggest that higher wages may improve performance by raising productivity, strengthening retention, and reducing monitoring and turnover costs, an argument commonly associated with efficiency wage mechanisms (Akerlof & Yellen, 1986, Aznaouridis, 2018). These competing theories imply that the relationship between labour cost intensity and profitability is uncertain and may depend on whether wage increases reflect inefficiency or productivity-enhancing investment in human capital. In cross-sectional firm datasets, wage intensity measures—such as salaries as a share of turnover—are frequently used to proxy labour cost pressure and to test whether higher wage

shares are associated with weaker profit margins and lower capital efficiency (Krugman & Wells, 2017; Besley & Brigham, 2007). In line with this literature, the present study examines labour cost intensity using salaries as a percentage of turnover.

2.3 Capital returns, capital efficiency, and profitability variation

Profitability is closely related to the returns generated on the capital employed by the firm. In corporate finance and valuation frameworks, firms that generate higher returns on invested capital are expected to exhibit stronger profitability and superior value creation potential, as capital efficiency reflects how effectively equity and debt resources are converted into operating surplus (Petersen & Plenborg, 2012; Koller, Goedhart, & Wessels, 2025). Capital return indicators such as ROCE and ROSF are widely used in corporate analysis because they capture complementary dimensions of capital efficiency: ROCE reflects performance relative to the total capital employed, while ROSF reflects returns relative to shareholder funds. Since both indicators derive from profitability and balance-sheet structure, they are commonly expected to co-move in firm-level data, although they may diverge depending on leverage and capital structure (Weston & Brigham, 1979, 1986; Petersen & Plenborg, 2012). Empirical studies frequently report a positive association between capital returns and profit margins, reinforcing the idea that firms with stronger capital efficiency tend to achieve superior profitability levels (Koller et al., 2025).

Building on these insights, the present study evaluates whether capital returns systematically explain profitability dispersion across UK enterprises. Specifically, it tests whether ROCE and ROSF are positively associated with profit margin at the cross-sectional level and whether they provide significant explanatory power in regression models predicting profitability.

2.4 Cross-sectional evidence and the UK context

Cross-sectional approaches provide a useful framework for identifying the structural correlates of profitability in heterogeneous firm populations, particularly within a shared institutional and macroeconomic environment. The UK is a relevant setting because prior evidence highlights substantial dispersion in productivity, wages, and managerial practices across UK firms, with meaningful implications for performance outcomes (Bloom et al., 2009, 2012; Bloom & Sadun, 2012; Brealey, et.al., 2025). Nevertheless, an important limitation in the broader profitability literature is that many studies examine determinants in isolation or within sector-specific samples, limiting comparability and generalizability (Brooks & Yang, 2025). The present study responds to this limitation by examining firm characteristics, labour cost intensity, and capital return measures simultaneously within a unified cross-sectional setting, offering integrated evidence on the relative importance of these factors for explaining profitability dispersion in UK enterprises.

2.5 Hypotheses

Drawing on the above literature, the study formulates the following hypotheses, which are tested using a combination of mean-comparison tests, correlation analysis, and cross-sectional regressions.

H1 (Capital efficiency and profitability). Firms with higher capital return measures (ROCE and ROSF) exhibit higher profitability (profit margin).

Rationale: Higher returns on capital reflect superior capital allocation and operational surplus generation, which are expected to be positively associated with profit margins (Koller et al., 2025; Petersen & Plenborg, 2012; Brooks & Yang, 2025).

H2 (Consistency of capital return indicators). ROCE and ROSF are strongly positively associated, reflecting overlapping dimensions of capital efficiency (Weston & Brigham, 1986).

Rationale: Both indicators capture returns generated by operating surplus relative to different capital bases and are therefore expected to co-move across firms (Petersen & Plenborg, 2012).

H3 (Labour cost intensity and performance). Higher labour cost intensity (salaries as a share of turnover) is associated with lower profitability and lower capital return measures (Steininger & Matzner, 2025).

Rationale: A higher wage share can compress profit margins and reduce the surplus available to generate returns, though efficiency-wage mechanisms imply the strength of this relationship is ultimately empirical (Akerlof & Yellen, 1986; Nimier, et.al., 2023; Bijnens, 2023).

H4 (Firm size category and profitability). SMEs exhibit different mean profitability levels than large firms.

Rationale: The profitability implications of firm size remain empirically ambiguous due to offsetting scale advantages and coordination costs, making group differences in profitability an empirical question (Goddard et al., 2005; Yazdanfar, 2013).

H5 (Firm size and export orientation). Exporting status is associated with firm size category (SME vs. large firm).

Rationale: Export participation is often related to scale, capabilities, and access to external markets, suggesting that the distribution of exporters and domestic firms may differ systematically between SMEs and large firms in cross-sectional samples (Wagner, 2007).

3.0 METHODOLOGY

3.1 Research Design

This study employs a quantitative cross-sectional design to examine how firm characteristics and capital return measures relate to profitability among UK enterprises. The cross-sectional setting allows systematic comparison across heterogeneous firms within a common macroeconomic and institutional environment and supports simultaneous evaluation of multiple firm-level drivers of profitability through regression-based inference (Wooldridge, 2016; Gujarati & Porter, 2009).

3.2 Data and Sample

The empirical analysis is based on secondary firm-level data from more than 1,200 UK enterprises, incorporating financial and operational information reported in the post-2023 period. The sample includes both SMEs and large firms, identified using an SME indicator (1 = SME, 0 = large), and distinguishes exporters from domestic-only firms using an export-status dummy (1 = exporter, 0 = domestic-only). These categorical indicators support descriptive group comparisons alongside multivariate modelling, enabling a systematic assessment of heterogeneity in profitability and performance across firm types (Field, 2018; Wooldridge, 2016).

3.3 Variables

Firm profitability (dependent variable) is proxied by Profit Margin (%), calculated as profit after tax relative to turnover. Since Profit Margin, ROCE, and ROSF share accounting components in their construction, the estimated associations should be interpreted as conditional relationships rather than strictly causal effects. In particular, part of the observed association between profitability and capital-return measures may reflect their common accounting basis rather than an entirely independent economic relationship.

Explanatory variables capture key dimensions of operating performance and financial structure: (a) firm size, measured by the number of employees (full-time equivalents), (b) labour cost intensity, proxied by salaries as a percentage of turnover, (c) capital efficiency indicators, captured through ROCE and ROSF, (d) cost structure, measured by Cost of Production (£) reflecting the annual cost of productive inputs, and (e) financial capacity, proxied by the Credit Limit (£) as an estimated creditworthiness measure based on market information, insolvency risk (12 months), and financial records.

Two binary indicators are included as controls: SME status (1 = SME, 0 = large firm [≥ 250 employees and/or annual turnover \geq £44 million]) and exporter status (1 = exporter, 0 = domestic-only firm).

Finally, derived fields such as “SME profit margin” and “large profit margin” are treated strictly as descriptive group indicators and are not included as independent regressors in the regression models.

3.4 Coding of binary indicators.

Two binary indicators capture key firm categories. In the regressions, coefficients on SME and exporter status are interpreted as conditional differences in the outcome relative to the omitted categories (large firms and domestic-only firms, respectively), holding the remaining covariates constant.

3.5 Empirical Strategy

The analysis proceeds in four steps. First, descriptive statistics (mean and standard deviation) are reported for all variables. Second, Pearson correlations and scatter plots are used to assess bivariate relationships between profitability, capital returns, and firm characteristics (Field, 2018). Third, differences in mean profitability and capital returns across SMEs versus large firms and exporters versus domestic firms are evaluated using independent-samples t-tests.

Since group variances appeared broadly comparable across the examined samples, the equal-variances specification was retained. The association between SME status and exporting status is tested using a chi-square test of independence (Field, 2018; Agresti, 2018). Fourth, cross-sectional regression models are estimated to assess the extent to which capital efficiency and firm characteristics jointly explain profitability variation (Wooldridge, 2016; Gujarati & Porter, 2009).

Baseline specifications estimate simple linear regressions of profit margin on ROCE and ROSF separately. Extended specifications estimate multiple regression models of the form:

$$(\text{Profit Margin})_i = \beta_0 + \beta_1(\text{WI})_i + \beta_2(\text{Es})_i + \beta_3(\text{CR})_i + \beta_4(\text{CP})_i + \beta_5(\text{CL})_i + \beta_6(\text{SME})_i + \beta_7(\text{E})_i + \epsilon_i$$

Where:

- (WI) Wage Intensity is measured by salaries as a percentage of turnover,
- (Es) number of employees
- (CR) Capital Returns are captured by ROCE and/or ROSF,
- (CP) cost of production
- (CL) credit limit
- (SME) and (E) exporter are binary indicators.

Given the conceptual overlap between ROCE and ROSF, models are estimated separately to avoid multicollinearity. A joint specification including both ROCE and ROSF was also estimated as a robustness check; however, due to substantial multicollinearity between the two return measures (high VIFs and unstable coefficient estimates), the joint results are not reported. Model results are evaluated using coefficient estimates, conventional significance thresholds, and goodness-of-fit measures (R^2 and adjusted R^2), consistent with standard econometric and multivariate modelling practices (Wooldridge, 2016; Gujarati & Porter, 2009; Hair et al., 2019). Given the cross-sectional nature of the data and the dispersion observed across firms, coefficient significance is interpreted cautiously, as heteroskedasticity may affect conventional standard errors. Potential multicollinearity concerns are addressed through alternative specifications and diagnostic interpretation. In particular, the strong association between employees and cost of production suggests that coefficient estimates for scale-related variables should be interpreted with caution. (Kutner, Nachtsheim, Neter, & Li, 2005).

- Model 1 (Capital returns measured by ROSF)

$$PM_i = \beta_0 + \beta_1 WI_i + \beta_2 Es_i + \beta_3 ROSF_i + \beta_4 CP_i + \beta_5 CL_i + \beta_6 SME_i + \beta_7 Exporter_i + \epsilon_i$$

- Model 2 (Capital returns measured by ROCE)

$$PM_i = \beta_0 + \beta_1 WI_i + \beta_2 Es_i + \beta_3 ROCE_i + \beta_4 CP_i + \beta_5 CL_i + \beta_6 SME_i + \beta_7 Exporter_i + \epsilon_i$$

4.0 EXPECTED CONTRIBUTION

This study contributes to the firm profitability literature by providing integrated cross-sectional evidence on how firm characteristics, labour cost intensity, and capital efficiency jointly relate to profitability dispersion among UK enterprises. Using a unified dataset of 1,260 UK firms,

the analysis evaluates whether profit margins systematically vary with firm scale (employees and SME status), wage intensity (salaries as a share of turnover), capital return measures (ROCE and ROSF), cost structure, and financial capacity. By assessing these factors simultaneously, the study clarifies which firm-level mechanisms are most strongly associated with higher profitability and whether capital efficiency explains profitability differences beyond basic firm characteristics. In addition to its research value, the findings offer practical relevance for managerial benchmarking and performance monitoring, particularly by highlighting how wage intensity and capital return metrics relate to profit margins across SMEs and large enterprises. Overall, the study strengthens empirical understanding of the structural drivers of profitability variation within the UK context.

5.0 RESULTS

5.1 Descriptive Overview of Profitability

Descriptive statistics for profit margin (%) indicate (Table 1) that average profitability in the sample of UK enterprises is 6.11% (median 5.12%, $N = 1,260$), with a standard deviation of 7.84 percentage points. Profit margins range from -19.45% to 39.11% , showing that a minority of firms operate with losses while a non-negligible upper tail of firms achieves substantially higher margins. The distribution is mildly right-skewed (skewness = 0.61) and exhibits positive excess kurtosis (kurtosis = 2.46), implying moderate asymmetry and a somewhat heavier tail relative to a normal distribution. The 95% confidence interval for the mean profit margin is $[5.68\%, 6.54\%]$, indicating a statistically stable estimate of central profitability within the sample.

5.2 Differences in Mean Profit Margin Between SMEs and Large Firms

An independent-samples t-test (two-sample, equal variances assumed) was conducted to assess whether mean profit margin differs between SMEs and large firms (Tables 2-4). SMEs reported a higher mean profit margin ($M = 6.65\%$, $SD = 7.79$, $n = 793$) than large firms ($M = 5.19\%$, $SD = 7.84$, $n = 467$), and this difference was statistically significant, $t(1258) = -3.21$, $p = .0014$ (two-tailed). The estimated mean difference was 1.46 percentage points, with a 95% confidence interval of $[0.57, 2.35]$, corresponding to a small effect size (Cohen's $d = 0.19$).

5.3 Export Status and Profit Margin: A Two-Sample t-Test

An independent-samples t-test (equal variances assumed) was conducted to assess whether mean profit margin differs between exporting and domestic firms (Tables 5-7). Exporting firms reported a profit margin of $M = 5.97\%$ ($SD = 7.85$, $n = 267$), compared to $M = 6.15\%$ ($SD = 7.84$, $n = 993$) for domestic firms. The difference was not statistically significant, $t(1258) = -0.33$, $p = .741$ (two-tailed). The estimated mean difference was -0.18 percentage points, 95% CI $[-1.25, 0.89]$, and the effect size was negligible (Cohen's $d = -0.02$). Thus, the null hypothesis of equal means cannot be rejected, indicating no systematic difference in profit margin between exporting and domestic firms in this sample.

Visual inspection of the histograms (Figs. 4-5) suggested broadly similar distributional shapes across exporting and domestic firms, with mild right-skewness and the presence of outliers.

5.4 Return on Capital Employed (ROCE): SMEs vs. Large Firms

To assess whether ROCE differs between SMEs and large firms, an independent-samples t-test (equal variances assumed) was performed (Tables 8–10). Descriptively, SMEs had a higher mean ROCE ($M = 17.68$, $SD = 19.43$, $n = 793$) relative to large firms ($M = 15.95$, $SD = 20.88$, $n = 467$). However, this difference was not statistically significant, $t(1258) = -1.48$, $p = .139$ (two-tailed). The estimated mean difference was 1.73 ROCE units, 95% CI $[-0.56, 4.02]$, corresponding to a small effect size (Cohen's $d = 0.09$). Accordingly, the null hypothesis of equal mean ROCE between SMEs and large firms cannot be rejected.

Visual inspection of the histograms (Figs. 6-7) indicated broadly similar distributional patterns across the two groups, with right-skewness and a long upper tail, suggesting the presence of high-ROCE outliers in both SMEs and large firms.

5.5 Association Between Export Status and Firm Size (χ^2 Test of Independence)

To examine whether export status (exporter vs. domestic) is associated with firm size (SME vs. large), a chi-square test of independence was conducted. The contingency table (Table 11) shows that among domestic firms, 651 were SMEs and 342 were large firms (total domestic = 993), whereas among exporters, 142 were SMEs and 125 were large firms (total exporters = 267).

The test revealed a statistically significant association between export status and firm size, $\chi^2(1, N = 1260) = 13.82$, $p = .00020$. This result remained significant with Yates' continuity correction, $\chi^2(1, N = 1260) = 13.29$, $p = .00027$. Accordingly, the null hypothesis of independence between export status and firm size was rejected, suggesting that export participation is not evenly distributed across SMEs and large firms ($N = 1,260$; 793 SMEs and 467 large firms).

Cramér's V indicated a small effect size ($V = .10$), consistent with a statistically significant but modest relationship.

5.6 Correlation Analysis and Correlation Matrix (Table 12)

Table 12 presents the correlation matrix for the key variables in the dataset, covering profitability metrics (Profit Margin), performance indicators (Return on Shareholder Funds and Return on Capital Employed), firm scale proxies (Number of employees, Cost of production), and financial capacity (Credit limit). The strongest correlation in the matrix is observed between Return on Shareholder Funds (ROSF) and Return on Capital Employed (ROCE) ($r = 0.877$), indicating a very high degree of co-movement between the two performance measures.

Profit Margin shows moderate positive correlations with both performance indicators, with a stronger association with ROCE ($r = 0.577$) than with ROSF ($r = 0.523$). Conversely, Salaries as a percentage of turnover displays a weak-to-moderate negative correlation with both performance variables ($r = -0.235$ with ROSF; $r = -0.244$ with ROCE), suggesting that higher labour-cost intensity is associated with lower returns.

Firm scale measures are strongly related: Number of employees is very strongly correlated with Cost of production ($r = 0.944$) and moderately correlated with Credit limit ($r = 0.629$). In contrast, neither employment nor cost of production shows substantive correlation with the performance variables (all $|r| < .08$), implying that firm size and production scale are not directly associated with ROSF or ROCE in simple bivariate terms within this dataset.

5.7 Linear Regression: Profit Margin (%) on Return on Shareholder Funds (ROSF %)

A simple linear regression was used to assess whether Return on Shareholder Funds (ROSF, %) is positively associated with Profit Margin (%). Visual inspection of the scatter plot indicated a clear positive linear association between the two variables, with higher ROSF values corresponding to higher profit margins.

The regression model was statistically significant, $F(1, 1258) = 474.40$, $p < .001$, explaining 27.38% of the variance in Profit Margin ($R^2 = .2738$; adjusted $R^2 = .2733$). ROSF was a positive and statistically significant predictor of Profit Margin ($\beta = 0.152$, $SE = 0.007$), $t = 21.78$, $p < .001$. The estimated regression equation was:

$$\text{Profit Margin} = 2,81 + 0,152 \cdot \text{ROSF}$$

The 95% confidence interval for the ROSF slope coefficient was [0.138, 0.165], indicating a robust positive effect. In practical terms, a one-unit (one percentage point) increase in ROSF is associated with an estimated 0.152 percentage point increase in Profit Margin.

5.8 Linear Regression: Profit Margin (%) on ROCE (%)

To evaluate whether capital efficiency is associated with profitability, a simple linear regression was estimated with Profit Margin (%) as the dependent variable and Return on Capital Employed (ROCE, %) as the predictor (Table 14). The scatter plot suggests an upward trend, indicating that firms with higher ROCE tend to report higher profit margins, although substantial variability is observed across observations.

The model was statistically significant, $F(1, 1258) = 626.47$, $p < .001$, explaining 33.24% of the variance in Profit Margin ($R^2 = .3324$; adjusted $R^2 = .3319$). ROCE emerged as a positive and statistically significant predictor ($\beta = 0.226$, $SE = 0.009$), $t = 25.03$, $p < .001$. The estimated regression equation was:

$$\text{Profit Margin} = 2,26 + 0,226 \cdot \text{ROCE}$$

The slope coefficient was precisely estimated (95% CI [0.208, 0.244]), implying that a one-percentage-point increase in ROCE is associated with an average increase of approximately 0.226 percentage points in profit margin.

5.9 Results: Multiple Linear Regression on Profit Margin (%)

Two OLS specifications were estimated to assess firm-level correlates of profitability, proxied by profit margin (%), using 1,260 observations. Both models include labour cost intensity (salaries as a % of turnover), firm size (employees), operational scale (cost of production), credit capacity (credit limit), SME status, and export orientation. The specifications differ only in the capital-efficiency measure: Model 1 includes ROSF, while Model 2 includes ROCE. This separation follows standard econometric practice given the conceptual overlap and potential collinearity between return measures (Gujarati & Porter, 2009; Kutner et al., 2005; Wooldridge, 2016).

5.9.1 Model 1 (ROSF specification)

The ROSF-based model is jointly significant ($F(7,1252) = 72.02, p = 1.33 \times 10^{-87}$) and explains a moderate share of the variation in profit margins ($R^2 = 0.287, \text{Adj. } R^2 = 0.283$). ROSF is strongly and positively related to profit margin ($\beta = 0.152, p = 3.65 \times 10^{-86}$). Credit limit is likewise positive ($\beta = 1.13 \times 10^{-7}, p = 0.00091$), consistent with higher credit capacity being associated with higher margins, and the SME indicator remains positive ($\beta = 1.416, p = 0.00065$), and is associated with higher profit margins for SMEs relative to large firms, *ceteris paribus*. Firm size (employees) is negatively associated with profit margin ($\beta = -1.03 \times 10^{-4}, p = 0.045$), although the magnitude is economically small. By contrast, salaries as a percentage of turnover are positive but only marginally significant at the 10% level ($\beta = 0.032, p = 0.081$), while cost of production and export status are not statistically significant ($p = 0.787 > 0.10$).

5.9.2 Model 2 (ROCE specification)

The ROCE-based model demonstrates stronger overall fit ($F(7,1252) = 96.19, p = 2.18 \times 10^{-112}$) and higher explanatory power ($R^2 = 0.350, \text{Adj. } R^2 = 0.346$). ROCE is the dominant predictor of profitability ($\beta = 0.230, p = 3.28 \times 10^{-111}$). Credit limit remains positive ($\beta = 1.31 \times 10^{-7}, p = 5.67 \times 10^{-5}$), and the SME indicator is also positive ($\beta = 1.398, p = 0.00042$). In this specification, labour cost intensity becomes statistically significant ($\beta = 0.0476, p = 0.0074$). By contrast, cost of production remains insignificant ($p = 0.287$), and export status is not significant ($\beta = -0.618, p = 0.161$). The coefficient on employees remains negative and is borderline significant ($\beta = -9.67 \times 10^{-5}, p = 0.050$), indicating at most weak evidence of margin compression with firm size once financial and operational controls are included.

Overall, the results indicate that profit margins are most consistently associated with capital efficiency (especially ROCE), credit capacity, and SME status, whereas export orientation and cost of production are not statistically significant once firm-level controls are introduced. The ROCE specification also provides a materially stronger fit ($\text{Adj. } R^2 = 0.346$ vs 0.283), suggesting that returns on employed capital better account for cross-firm profitability differences than returns on shareholders' funds in this sample.

6.0 DISCUSSION

The descriptive evidence indicates that profitability among UK firms exhibits moderate dispersion and systematic heterogeneity, consistent with evidence that accounting-based profitability varies substantially across enterprises even within the same national context (McGahan & Porter, 2002). Profit margin is an informative indicator of operating performance, reflecting the combined effects of pricing, cost structure, and efficiency (Penman, 2013). The

mild right-skewness suggests that most firms cluster around modest positive margins, while a smaller subset attains comparatively high-profit outcomes. Methodologically, the observed departures from normality - particularly excess kurtosis and upper-tail concentration - support complementing descriptive summaries with regression-based analysis and appropriate diagnostics when examining profitability determinants (Gujarati & Porter, 2009; Wooldridge, 2016). Overall, these distributional features motivate the study's focus on whether firm characteristics and capital-efficiency measures help explain cross-sectional differences in profitability.

The results indicate that SMEs exhibit statistically higher profit margins than large firms, suggesting that profitability - when measured as a margin rather than absolute earnings - does not necessarily increase monotonically with firm size. Although large firms may benefit from economies of scale and stronger market positioning, these advantages can coincide with higher organizational complexity, greater fixed-cost commitments, and intensified price competition, which may compress margins, particularly in retail-like settings (Lee, 2009; Majumdar, 1997). By contrast, SMEs may sustain relatively higher margins through organizational agility, local market responsiveness, and tighter cost control, mechanisms often linked to resilience and performance under competitive conditions (Bamiatzi & Kirchmaier, 2014). Importantly, although the SME-large firm difference is statistically significant, the effect size is small, implying modest economic magnitude in this sample. Accordingly, the result should not be interpreted as a general claim of SME superiority in profitability. Firm performance is shaped by multiple structural and strategic determinants, including capital intensity, leverage, industry conditions, and competitive positioning—which may confound simple size comparisons (Dang et al., 2018; Goddard et al., 2005).

The results show no statistically significant difference in profit margin between exporting and domestic firms, suggesting that export participation, in itself, is not associated with a profitability-margin premium in this sample. This is consistent with evidence that the export–profitability relationship is heterogeneous and context-dependent: exporting may bring productivity gains through learning, scale, and market diversification, while also imposing additional costs related to logistics, regulatory compliance, coordination, exchange-rate exposure, and intensified competition in foreign markets (Bernard & Jensen, 1999; Wagner, 2012). From a theoretical perspective, exporters may exhibit higher efficiency (and potentially higher margins) due to self-selection of more productive firms into exporting and/or learning-by-exporting mechanisms (Melitz, 2003; Wagner, 2007). However, the absence of a margin premium in the present data suggests that any such benefits may be offset by export-related cost burdens and the pricing and competitive dynamics typical of international markets, where firms may accept lower margins to secure market access or expand volume (Wagner, 2012). Moreover, profitability differentials may only become evident after controlling for firm size, industry, capital structure, and export intensity, because a binary export-status indicator is coarse and does not capture heterogeneity in export scale, destinations, or product-market conditions (Wagner, 2007, 2012). Consistent with the multivariate results reported above, exporter status remains statistically insignificant once firm size and other firm-level controls are included, suggesting no independent margin premium conditional on observed characteristics. Future work could strengthen inference by extending the specification to incorporate sectoral controls, measures of leverage/capital structure and export intensity, and

by testing robustness to alternative functional forms and heteroskedasticity-consistent standard errors (Wooldridge, 2016).

The results show that, although SMEs exhibit a slightly higher mean ROCE than large firms, the difference is not statistically significant, indicating that capital efficiency - as measured by ROCE - does not vary systematically with firm size in this sample. This pattern is consistent with the view that while SMEs may benefit from agility and operational flexibility, large firms can offset potential structural disadvantages through superior access to capital, process optimization, and asset utilization, leading to broadly comparable returns on employed capital (Dang et al., 2018; Lee, 2009). The absence of a statistically significant ROCE gap is consistent with evidence that profitability and efficiency measures often reflect complex interactions among firm size, capital structure, industry dynamics, and strategic positioning, rather than size effects alone (Goddard et al., 2005; Majumdar, 1997). The histogram patterns (Fig. 6 & 7) reinforce this interpretation: both groups display non-normality and pronounced dispersion, with a long right tail indicating that high-ROCE outcomes occur for a subset of firms irrespective of size. Such heterogeneity suggests that average comparisons may mask within-group variation driven by managerial quality, sectoral differences, and investment strategies. Accordingly, the analysis could be extended by estimating a dedicated multivariate specification with ROCE as the dependent variable, in order to assess whether firm size influences capital efficiency conditional on leverage/capital structure, capital intensity, and industry membership. In addition, approaches such as quantile regression could be used to test whether the size-ROCE relationship differs across the distribution of returns, given the pronounced heterogeneity observed in the data (Wooldridge, 2016).

The correlation structure provides supporting evidence on how scale, credit capacity, and performance co-move in the sample. The strong ROCE/ROSF correlation ($r = 0.877$) indicates that the two return measures capture closely related dimensions of financial performance (Penman, 2013), while profit margin correlates positively with both return metrics in a pattern consistent with basic accounting relationships linking operating profitability to return-based indicators (Higgins et al., 2022). Labour-cost intensity shows modest negative correlations with return measures, consistent with the view that cost structure - particularly labour costs - can matter for profitability and efficiency (Bloom & Van Reenen, 2007), whereas employees, cost of production, and credit limit co-move strongly, indicating that financial capacity scales with firm size and operational scale (Dang et al., 2018; Lee, 2009). Overall, these correlations motivate the multivariate strategy by suggesting a conceptual separation between scale/financial capacity and profitability/returns, while also signaling potential multicollinearity concerns when ROCE and ROSF are included simultaneously as regressors.

Consistent with this motivation, the multivariate OLS results indicate that profit margins are explained most robustly by capital-return performance and financing capacity rather than by scale or export status. Across both specifications, ROSF and ROCE are strongly and positively associated with Profit Margin (Fama & French, 1995; Jensen, 1986), and credit limit remains consistently positive and statistically significant - although the estimated coefficient magnitude is economically modest - supporting the view that financing capacity and borrowing constraints shape firms' ability to sustain margins (Fazzari, Hubbard, & Petersen, 1988; Beck, Demirgüç-Kunt, & Maksimovic, 2005; Stiglitz & Weiss, 1981). SME status is also positively associated with profit margin in both models, consistent with accounts emphasizing flexibility,

specialization, and leaner organizational structures in smaller firms (Audretsch, 1995; Storey, 1994; Williamson, 1981; Ayyagari, Beck, & Demirgüç-Kunt, 2007). Beyond these robust correlates, labour cost intensity is positive in both specifications and statistically stronger under the ROCE model; contrary to H3, this suggests that wage intensity may proxy for skill intensity, productivity, or value-added production rather than operating cost pressure alone, consistent with efficiency-wage mechanisms (Akerlof & Yellen, 1986; Nimier et al., 2023; Bijmens, 2023). Firm size (employees) is negative with weak-to-borderline significance, offering limited evidence consistent with coordination costs or organizational complexity (Jensen & Meckling, 1976; Williamson, 1981). This divergence between the negative bivariate correlations and the positive multivariate coefficient suggests that wage intensity may capture different mechanisms once firm characteristics and capital efficiency are controlled for, potentially reflecting skill intensity and value-added production rather than labour-cost pressure alone. In contrast, export status and cost of production are not statistically significant in either multivariate specification, suggesting that exporting and production-cost levels - at least as measured here - do not independently differentiate profit margins once capital efficiency, credit capacity, labour intensity, and firm structure are controlled for (Bernard & Jensen, 1999; Melitz, 2003). Overall, the evidence indicates that profit margins are more consistently associated with capital efficiency and financing capacity than with cost-side variables alone, while SME status and wage intensity contribute to capturing heterogeneity in firm outcomes; future work could strengthen inference by incorporating sector-level controls, testing for heteroskedasticity and using robust standard errors, and exploring interaction terms or non-linear effects (Wooldridge, 2016).

7.0 CENTRAL CONCLUSION WITH POLITICAL ECONOMY IMPLICATIONS

The empirical evidence indicates that profit margins do not mechanically increase with either firm size or internationalisation. In the multivariate results, SMEs exhibit higher profit margins than large firms, while exporter status does not confer a statistically significant margin premium once financial and operational controls are introduced. Instead, profit margins are most consistently associated with capital efficiency (especially ROCE, which also delivers the stronger model fit relative to ROSF) and financial capacity (credit limit), suggesting that the ability to sustain margins is closely tied to how effectively firms deploy capital and how securely they can access liquidity and external finance.

From a political economy perspective, these patterns frame profit margins as institutionally mediated and financially conditioned distributive outcomes, rather than straightforward rewards for scale or global market participation. Export orientation is frequently promoted as a route to upgrading and competitiveness, yet the absence of an independent margin effect is consistent with environments in which intensified price competition, compliance and logistics burdens, exchange-rate exposure, and geopolitical risk can offset productivity gains, leading firms to expand market reach without securing higher margins. Similarly, although scale can bring market power and cost advantages, the weak and negative association between employment scale and margins is consistent with the possibility that coordination costs, organizational complexity, and strategic pricing choices may dilute the margin benefits of growth, especially in competitive sectors.

The policy implication is that strategies focused narrowly on export promotion or firm expansion are unlikely to be sufficient for improving profitability in a sustainable way. Policies that ease financing constraints, strengthen firms' balance-sheet resilience, and improve the allocation and productivity of capital - alongside measures that stabilise key cost conditions and support capability upgrading - are more directly aligned with the correlates of margins observed in the multivariate evidence. Overall, the findings underscore a central tension of contemporary capitalism: success is often pursued through scale, reach, and integration, yet firm sustainability ultimately hinges on margins, which remain deeply shaped by the financial architecture of production and the institutional conditions under which competition and investment are organised.

8.0 LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

This study is subject to several limitations that should be considered when interpreting the results. First, the analysis relies on cross-sectional firm-level data, which restricts causal inference and does not allow examination of dynamic adjustment processes in profitability. Second, while the models control for key firm characteristics, unobserved heterogeneity related to managerial quality, industry structure, and strategic positioning may remain, raising the possibility of omitted-variable bias. Third, export orientation is captured through a binary indicator, which does not account for heterogeneity in export intensity, destinations, sectoral exposure, or product-market conditions. Finally, accounting-based performance measures such as ROCE and ROSF share common components with profit margin, which may mechanically strengthen observed associations. Future research could address these limitations by using panel data, incorporating sectoral fixed effects, employing alternative measures of internationalisation and financial constraints, and conducting robustness checks using instrumental-variable or quantile-regression approaches.

REFERENCES

1. Agresti, A. (2018). *An introduction to categorical data analysis* (3rd ed.). Wiley.
2. Akerlof, G. A., & Yellen, J. L. (1986). *Efficiency wage models of the labor market*. Cambridge University Press.
3. Audretsch, D. B. (1995). *Innovation and Industry Evolution*. MIT Press.
4. Ayyagari, M., Beck, T., & Demirgüç-Kunt, A. (2007). Small and medium enterprises across the globe. *Small Business Economics*, 29(4), 415–434.
5. Aznaouridis, I. (2018). Μισθοί και παραγωγικότητα εργασίας [Wages and Labour Productivity], *Studies of the School of Economics*, Study No. 1, Αθήνα: ΓΕΣ/ΣΧΟ.
6. Bamiatzi, V. C., & Kirchmaier, T. (2014). Strategies for superior performance under adverse conditions: A focus on small and medium-sized high-growth firms. *International Small Business Journal*, 32(3), 259–284. <http://dx.doi.org/10.1177/0266242612459534>
7. Banalieva, E. R., & Eddleston, K. A. (2011). Home-region focus and performance of family firms: The role of family versus nonfamily leaders. *Journal of International Business Studies*, 42(8), 1060–1072, <https://doi.org/10.1057/jibs.2011.28>
8. Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99–120. <https://doi.org/10.1177/014920639101700108>

9. Beck, T., Demirgüç-Kunt, A., & Maksimovic, V. (2005). Financial and legal constraints to firm growth: Does firm size matter? *Journal of Finance*, 60(1), 137–177.
10. Becker, G. S. (1993). *Human capital: A theoretical and empirical analysis* (3rd ed.). University of Chicago Press.
11. Bernard, A. B., & Jensen, J. B. (1999). Exceptional exporter performance: Cause, effect, or both? *Journal of International Economics*, 47(1), 1–25. [https://doi.org/10.1016/S0022-1996\(98\)00027-0](https://doi.org/10.1016/S0022-1996(98)00027-0)
12. Besley, S., Brigham, E. (2007). *Essentials of Managerial Finance* (14th ed.), South-Western College Pub.
13. Bijnens, G., Duprez, C. & Jonckheere, J. (2023). Have greed and rapidly rising wages triggered a profit-wage-price spiral? Firm-level evidence from Belgium, *Economics Letters*, 232, 111342. DOI: 10.1016/j.econlet.2023.111342, Retrieved January 05, 2026 from https://www.nbb.be/doc/ts/publications/blog/230623_greedflation.pdf.
14. Bloom, N., & Van Reenen, J. (2007). Measuring and explaining management practices across firms and countries. *Quarterly Journal of Economics*, 122(4), 1351–1408. Retrieved January 07, 2026 from <https://doi.org/10.1162/qjec.2007.122.4.1351>
15. Bloom, N., Kretschmer, T., & Van Reenen, J. (2009). Work-life balance, management practices, and productivity. In R. B. Freeman & K. L. Shaw (Eds.), *International differences in the business practices and productivity of firms* (pp. 15–54). University of Chicago Press. Retrieved January 4, 2026 from <http://www.nber.org/chapters/c0441>
16. Bloom, N., Genakos, C., Sadun, R., & Van Reenen, J. (2012). Management practices across firms and countries. *Academy of Management Perspectives*, 26(1), 12–33. Retrieved January 4, 2026 from https://www2.aueb.gr/users/cgenakos/Research.files/BGSVR_AMP.pdf
17. Bloom, N., Sadun, R., & Van Reenen, J. (2012). Americans do IT better: US multinationals and the productivity miracle. *American Economic Review*, 102(1), 167–201.
18. Bloom, N., Sadun, R., & Van Reenen, J. (2012). The organization of firms across countries. (Working Paper). National Bureau of Economic Research. <https://doi.org/10.3386/w26202>
19. Bloom, N., & Sadun, R. (2012). The Organization of Firms Across Countries. *The Quarterly Journal of Economics*, 127(4), 1663–1705. Retrieved January 3, 2026 from https://www.hbs.edu/ris/Publication%20Files/Organization_of_Firms_16f72765-808c-4ef4-ace6-534c9e411be2.pdf
20. Brealey, R. A., Myers, S. C., Allen, F. & Edman, A. (2025). *Principles of Corporate Finance*, McGraw Hill Education.
21. Brooks, R., Yang, J. (2025). *Financial Management: Core Concepts* (5th ed.) Pearson.
22. Bryson, A., Forth, J., & Stokes, L. (2017). Does employees' subjective well-being affect workplace performance? *Human Relations*, 70(8), 1017–1037. Retrieved January 4, 2026 from <https://doi.org/10.1177/00187267176930773>
23. Dang, C., Li, F., & Yang, C. (2018). Measuring firm size in empirical corporate finance. *Journal of Banking & Finance*, 86, 159–176. <https://doi.org/10.1016/j.jbankfin.2017.09.006>
24. Damodaran, A. (2014). *Applied corporate finance* (4th ed.). Wiley.
25. Fama, E. F., & French, K. R. (1995). Size and book-to-market factors in earnings and returns. *Journal of Finance*, 50(1), 131–155.

26. Fazzari, S. M., Hubbard, R. G., & Petersen, B. C. (1988). Financing constraints and corporate investment. *Brookings Papers on Economic Activity*, 1988(1), 141–206.
27. Field, A. (2018). *Discovering statistics using IBM SPSS statistics* (5th ed.). Sage.
28. Goddard, J., Tavakoli, M., & Wilson, J. O. S. (2005). Determinants of profitability in European manufacturing and services: Evidence from a dynamic panel model. *Applied Financial Economics*, 15(18), 1269–1282. <https://doi.org/10.1080/09603100500387139>
29. Gujarati, D. N., & Porter, D. C. (2009). *Basic econometrics* (5th ed.). McGraw-Hill/Irwin.
30. Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate data analysis* (8th ed.). Cengage.
31. Higgins, R. C., Koski, J., Todd, M. (2022). *Analysis for financial management* (13th ed.). McGraw-Hill Education.
32. Jensen, M. C. (1986). Agency costs of free cash flow, corporate finance, and takeovers. *American Economic Review*, 76(2), 323–329.
33. Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(4), 305–360.
34. Koller, T., Goedhart, M., & Wessels, D. (2025). *Valuation: Measuring and managing the value of companies* (8th ed.). Wiley.
35. Krugman, P., Wells, R. (2017). *Economics* (5th ed.), Vibrant Publishers
36. Kutner, M. H., Nachtsheim, C. J., Neter, J., & Li, W. (2005). *Applied linear statistical models* (5th ed.). McGraw-Hill/Irwin.
37. Lee, J. (2009). Does size matter in firm performance? Evidence from U.S. public firms. *International Journal of the Economics of Business*, 16(2), 189–203. <https://doi.org/10.1080/13571510902917400>
38. Majumdar, S. K. (1997). The impact of size and age on firm-level performance: Some evidence from India. *Review of Industrial Organization*, 12(2), 231–241. DOI 10.1023/A:1007766324749
39. McGahan, A. M., & Porter, M. E. (2002). What do we know about variance in accounting profitability? *Management Science*, 48(7), 834–851.
40. Melitz, M. J., & Redding, S. J. (2014). Heterogeneous firms and trade. In G. Gopinath, E. Helpman, & K. Rogoff (Eds.), *Handbook of International Economics* (Vol. 4). Elsevier.
41. Melitz, M. J. (2003). The impact of trade on intra-industry reallocations and aggregate industry productivity. *Econometrica*, 71(6), 1695–1725. <https://doi.org/10.1111/1468-0262.00467>
42. Nickell, S. J. (1996). Competition and corporate performance. *Journal of Political Economy*, 104(4), 724–746.
43. Nimier-David, E., Sraer, D., & Thesmar, D. (2023). The effects of mandatory profit-sharing on workers and firms: Evidence from France (NBER Working Paper No. 31804). National Bureau of Economic Research.
44. https://www.nber.org/system/files/working_papers/w31804/w31804.pdf
45. Office for National Statistics - ONS. (2023). UK productivity introduction: July to September 2023. Office for National Statistics. Retrieved January 02, 2026 from <https://www.ons.gov.uk/economy/economicoutputandproductivity/productivitymeasures/articles/gdpandthelabourmarket/julytoseptember2023>

46. Penman, S. H. (2013). *Financial statement analysis and security valuation* (5th ed.). McGraw-Hill Education.
47. Penrose, E. (1959). *The theory of the growth of the firm*. Oxford University Press.
48. Petersen, C., & Plenborg, T. (2012). *Financial statement analysis: Valuation, credit analysis, executive compensation* (2nd ed.). Pearson.
49. Porter, M. E. (1985). *Competitive advantage: Creating and sustaining superior performance*. Free Press, Harvard Business School
50. Ross, S. A., Westerfield, R. W., & Jaffe, J. (2025). *Corporate finance* (11th ed.). McGraw-Hill.
51. Ross, S. A., Westerfield, R. W., & Jordan, B.D. (2024). *Fundamentals of Corporate Finance*, McGraw-Hill.
52. Steininger, L., Matzner, A. (2025). Monetary policy and the firm-level labor share: a story about capital, (ECB, Working Paper 3024), European Central Bank, Retrieved January 05 2026 from <https://www.ecb.europa.eu/pub/pdf/scpwps/ecb.wp3024~53ac4adc18.en.pdf>
53. Stiglitz, J. E., & Weiss, A. (1981). Credit rationing in markets with imperfect information. *American Economic Review*, 71(3), 393–410.
54. Storey, D. J. (1994). *Understanding the Small Business Sector*. Routledge.
55. Wagner, J. (2012). International trade and firm performance: A survey of empirical studies since 2006. *Review of World Economics*, 148(2), 235–267. <https://doi.org/10.1007/s10290-011-0116-8>
56. Wagner, J. (2007). Exports and Productivity: A Survey of the Evidence from Firm-Level Data, *The World Economy*, 30(1):60-82, DOI:10.1111/j.1467-9701.2007.00872.x
57. Weston, J.F., Brigham, E.F. (1979). *Study Guide for Essentials of Managerial Finance and Managerial Finance*, The Dryden Press.
58. Weston, J.F., Brigham, E.F. (1986). *Βασικές Αρχές της Χρηματοοικονομικής Διαχείρισης και Πολιτικής* [Fundamental Principles of Financial Management and Policy], Αθήνα: Παπαζήσης.
59. Williamson, O. E. (1981). The economics of organization: The transaction cost approach. *American Journal of Sociology*, 87(3), 548–577.
60. Wooldridge, J. M. (2016). *Introductory econometrics: A modern approach* (6th ed.). Cengage Learning.
61. Yazdinfar, D. (2013). Profitability determinants among micro firms: Evidence from Swedish data. *International Journal of Managerial Finance*, 9(2), 150–160. Retrieved January 04, 2026 from <https://doi.org/10.1108/17439131311307565>

Appendix A: Tables

Table A1	
<i>Profit Margin (%) all firms</i>	
Mean	6,11
Standard Error	0,22
Median	5,12
Mode	4,24
Standard Deviation	7,84
Sample Variance	61,39
Kurtosis	2,46
Skewness	0,61
Range	58,56
Minimum	-19,45
Maximum	39,11
Sum	7698,76
Count	1260
Confidence Level(95.0%)	0,43
Confidence Interval	[5.68, 6.54]

Table 2	
<i>Profit Margin (%) Large firms</i>	
Mean	5,19
Standard Error	0,36
Median	4,17
Mode	3,87
Standard Deviation	7,84
Sample Variance	61,42
Kurtosis	3,19
Skewness	0,57
Range	57,18
Minimum	-19,45
Maximum	37,73
Sum	2424,20
Count	467
Confidence Level(95.0%)	0,71
Confidence Interval	[4.48, 5.90]
	4,48
	5,90

Table 3
Profit Margin (%) SME firms

Mean	6,65
Standard Error	0,28
Median	5,51
Mode	4,24
Standard Deviation	7,79
Sample Variance	60,66
Kurtosis	2,09
Skewness	0,65
Range	56,74
Minimum	-17,63
Maximum	39,11
Sum	5274,56
Count	793
Confidence Level(95.0%)	0,54
Confidence Interval	[6.11, 7.19]
	6,11
	7,19

Table 4
t-Test: Two-Sample Assuming Equal Variances

	Large Firms	SMEs
Mean	5,191006424	6,651399753
Variance	61,42172309	60,65601661
Observations	467	793
Pooled Variance	60,93965669	
Hypothesized Mean Difference	0	
df	1258	
t Stat	-3,207226267	
P(T<=t) one-tailed	0,000686987	
t Critical one-tailed	1,646065788	
P(T<=t) two-tailed	0,001373973	
t Critical two-tailed	1,961851518	

Table 5

Profit Margin (%) exporting firms

Mean	5,97
Standard Error	0,48
Median	5,56
Mode	3,87

Standard Deviation	7,85
Sample Variance	61,59
Kurtosis	1,87
Skewness	0,36
Range	52,49
Minimum	-14,76
Maximum	37,73
Sum	1593,89
Count	267
Confidence Level(95.0%)	0,95

Confidence Interval	[5.02, 6.92]	5,02	6,92
---------------------	--------------	------	------

Table 6

Profit Margin (%) domestic firms

Mean	6,15
Standard Error	0,25
Median	5,02
Mode	2,40
Standard Deviation	7,84
Sample Variance	61,39
Kurtosis	2,63
Skewness	0,68
Range	58,56
Minimum	-19,45
Maximum	39,11
Sum	6104,87
Count	993
Confidence Level(95.0%)	0,49

Confidence Interval	[5.66, 6.64]	5,66	6,64
---------------------	--------------	------	------

Table 7

t-Test: Two-Sample Assuming Equal Variances

	Variable 1	Variable 2
Mean	5,969625484	6,147905337
Variance	61,58942028	61,39058262
Observations	267	993
Pooled Variance	61,43262619	

Hypothesized Mean Difference	0
df	1258
t Stat	-0,329949677
P(T<=t) one-tail	0,37074646
t Critical one-tail	1,646065788
P(T<=t) two-tail	0,74149292
t Critical two-tail	1,961851518

Table 8		Table 9	
ROCE large firms		ROCE small firms	
Mean	15,95	Mean	17,68
Standard Error	0,97	Standard Error	0,69
Median	11,73	Median	13,97
Mode	10,93	Mode	16,08
Standard Deviation	20,88	Standard Deviation	19,43
Sample Variance	435,86	Sample Variance	377,43
Kurtosis	1,31	Kurtosis	1,20
Skewness	0,68	Skewness	0,79
Range	129,03	Range	126,08
Minimum	-39,14	Minimum	-37,13
Maximum	89,89	Maximum	88,95
Sum	7449,44	Sum	14018,83
Count	467	Count	793
Confidence Level(95.0	1,90	Confidence Level(95.0	1,35
Confidence Interval	[14.05, 17.85]	Confidence Interval	[16.32, 19.16]
	14,05		16,32
	17,85		19,03

Table 10		
t-Test: Two-Sample Assuming Equal Variances		
	Variable 1	Variable 2
Mean	15,9516916	17,67822195
Variance	435,864788	377,4321915
Observations	467	793
Pooled Variance	399,077335	
Hypothesized Mean Difference	0	
df	1258	
t Stat	-1,48168348	
P(T<=t) one-tail	0,06933748	
t Critical one-tail	1,64606579	
P(T<=t) two-tail	0,13867496	
t Critical two-tail	1,96185152	

	SME	LARGE	
Domestic Firm	651	342	993
Exporter	142	125	267
	793	467	1260

	Profit Margin (%)	Number of employees	Salaries as a % of turnover	Return on Shareholder Funds (%)	Return on Capital Employed (%)	Cost of production (£)	Credit limit (£)
Profit Margin (%)	1						
Number of employees	-0,058176843	1					
Salaries as a % of turnover	-0,079292472	-0,02636	1				
Return on Shareholder Funds (%)	0,523298493	-0,052	-0,23483	1			
Return on Capital Employed (%)	0,576574122	-0,07114	-0,24383	0,877352	1		
Cost of production (£)	-0,047294278	0,943729	-0,04259	-0,04067	-0,05529	1	
Credit limit (£)	0,019764023	0,628994	-0,03387	-0,00192	-0,03429	0,52344	1

A good answer will make two scatter plots in part g, produce three related EXCEL regression outputs, and interpret the EXCEL output.

Regression Statistics									
Multiple R	0,523298493								
R Square	0,273841313								
Adjusted R Square	0,27326408								
Standard Error	6,67934845								
Observations	1260								
ANOVA									
	df	SS	MS	F	Significance F				
Regression	1	21164,90251	21164,90251	474,4037042	1,66415E-89				
Residual	1258	56124,02922	44,61369572						
Total	1259	77288,93172							
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%	
Intercept	2,810311715	0,241578678	11,63311156	8,8004E-30	2,336370218	3,2842532	2,336370218	3,284253212	
ROSF (%)	0,151627507	0,006961518	21,78081046	1,66415E-89	0,137970042	0,165285	0,137970042	0,165284971	

Regression Statistics									
Multiple R	0,576574122								
R Square	0,332437718								
Adjusted R Square	0,331907064								
Standard Error	6,404190279								
Observations	1260								
ANOVA									
	df	SS	MS	F	Significance F				
Regression	1	25693,75609	25693,75609	626,4684	1,5697E-112				
Residual	1258	51595,17563	41,01365312						
Total	1259	77288,93172							
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%	
Intercept	2,258955761	0,237118808	9,526683198	8,02E-21	1,793763868	2,724147653	1,793763868	2,724147653	
ROCE (%)	0,226030125	0,009030603	25,02935001	1,6E-112	0,208313422	0,243746827	0,208313422	0,243746827	

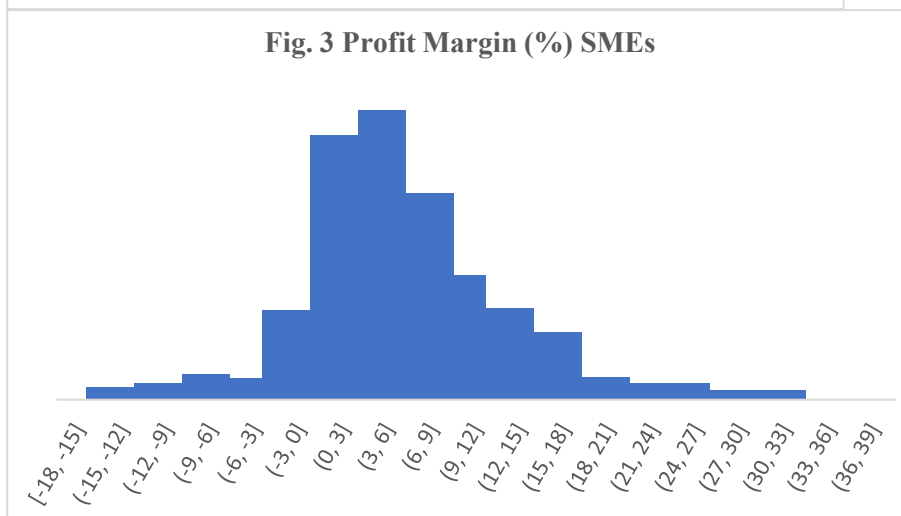
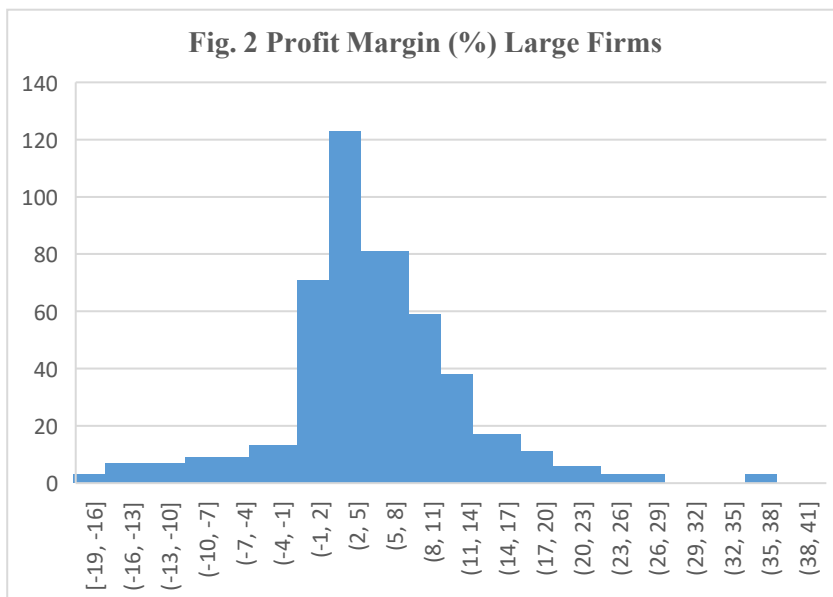
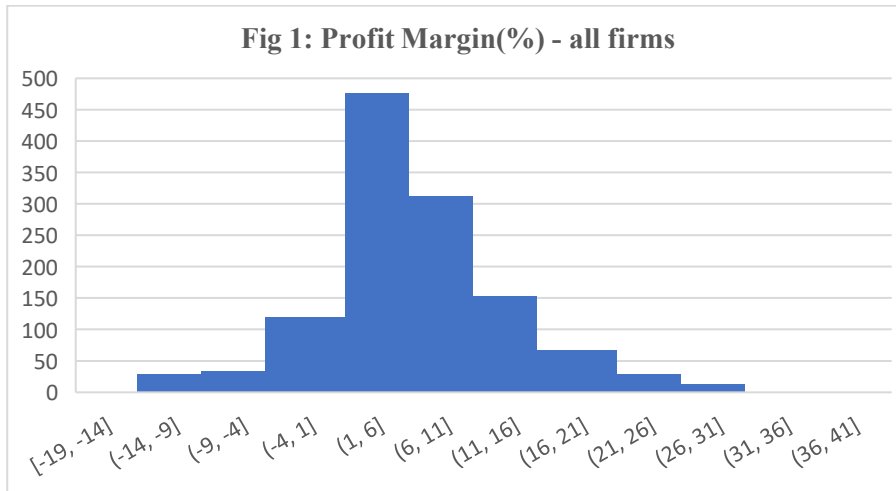
Table 15. ROSF

SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0,535803127							
R Square	0,287084991							
Adjusted R Squared	0,283099045							
Standard Error	6,633998467							
Observations	1260							
ANOVA								
	df	SS	MS	F	Significance F			
Regression	7	22188,49229	3169,785	72,0242955	1,33002E-87			
Residual	1252	55100,43944	44,00994					
Total	1259	77288,93172						
	Coefficients	Standard Error	t	P value	Lower95%	Upper 95%	Lower95,0%	Upper 95,0%
Intercept	1,221683992	0,519053951	2,353674	0,01874278	0,203372511	2,239995473	0,203372511	2,239995473
Number of employees	-0,00010346	5,1643E-05	-2,0033	0,04536061	-0,000204773	-2,13991E-06	-0,000204773	-2,13991E-06
Salaries as a % of turnover	0,03242352	0,018544753	1,748393	0,08064104	-0,003958698	0,068805739	-0,003958698	0,068805739
Return on Shareholder Funds (%)	0,152154013	0,00714295	21,30129	3,6456E-86	0,138140541	0,166167485	0,138140541	0,166167485
Cost of production (€)	2,87586E-07	2,54199E-07	1,131341	0,25812815	-2,11117E-07	7,86289E-07	-2,11117E-07	7,86289E-07
Credit limit (€)	1,13103E-07	3,40152E-08	3,325063	0,00090958	4,63697E-08	1,79836E-07	4,63697E-08	1,79836E-07
SME indicator 1=SME Size 0=Large	1,416070796	0,414064239	3,41993	0,00064653	0,603734491	2,228407101	0,603734491	2,228407101
Exporter 0 = Domestic sales only 1 =Export Sales	-0,12468961	0,460735473	-0,27063	0,78671895	-1,028588368	0,77920915	-1,028588368	0,77920915

Table 16 ROCE

SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0,59136647							
R Square	0,349714302							
Adjusted R Square	0,346078519							
Standard Error	6,335904011							
Observations	1260							
ANOVA								
	df	SS	MS	F	Significance F			
Regression	7	27029,04481	3861,29212	96,1868008	2,1809E-112			
Residual	1252	50259,88691	40,1436796					
Total	1259	77288,93172						
	Coefficients	Standard Error	t	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0,416740594	0,500497286	0,83265305	0,40519923	-0,565165297	1,398646484	-0,565165297	1,398646484
Number of employees	-9,66592E-05	4,93238E-05	-1,9596865	0,05025403	-0,000193426	1,07234E-07	-0,000193426	1,07234E-07
Salaries as a % of turnover	0,047620075	0,01775509	2,68205212	0,00741346	0,012787065	0,082453086	0,012787065	0,082453086
Return on Capital Employed (%)	0,230330441	0,009265056	24,8601249	3,285E-111	0,212153693	0,248507188	0,212153693	0,248507188
Cost of production (€)	2,58877E-07	2,42791E-07	1,06625642	0,28651331	-2,17444E-07	7,35199E-07	-2,17444E-07	7,35199E-07
Credit limit (€)	1,31101E-07	3,24502E-08	4,04005989	5,669E-05	6,7438E-08	1,94764E-07	6,7438E-08	1,94764E-07
SME indicator 1=SME Size 0=Large	1,398330216	0,395381227	3,53666315	0,00042002	0,622647375	2,174013057	0,622647375	2,174013057
Exporter 0 = Domestic sales only 1 =Export Sales	-0,618108686	0,440493081	-1,40322	0,16079921	-1,482294695	0,246077323	-1,482294695	0,246077323

Appendix B: Figures



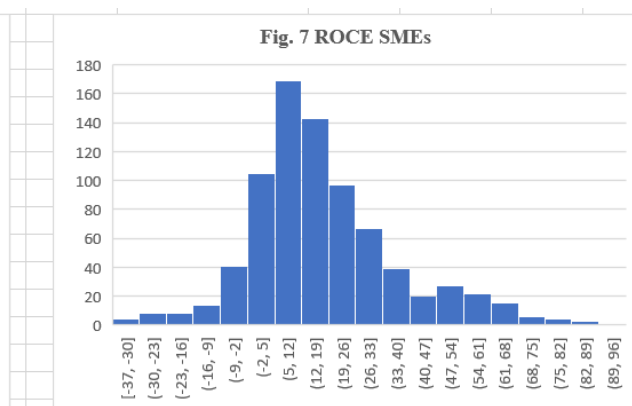
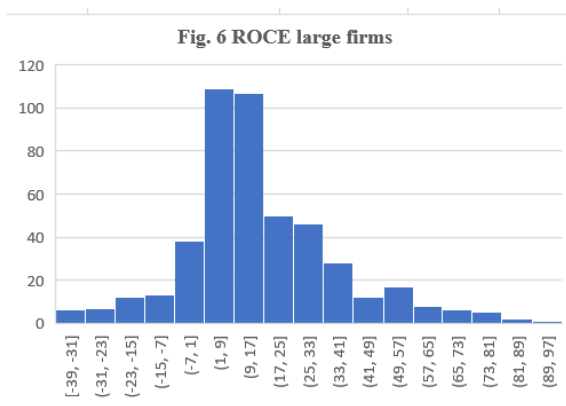
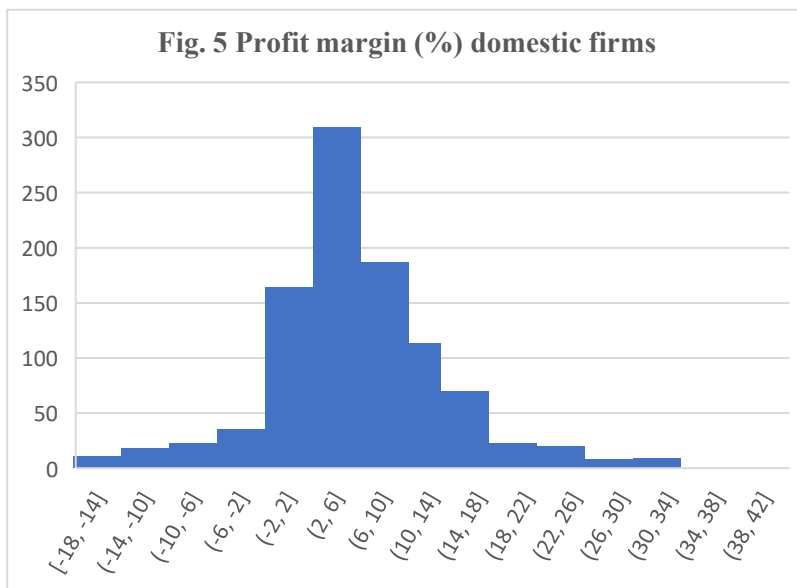
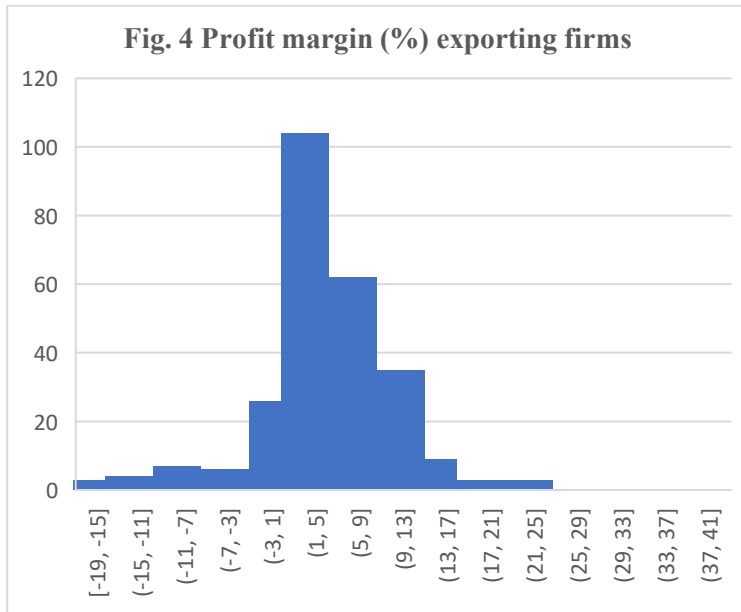


Fig. 8 Regression ROSF (%)

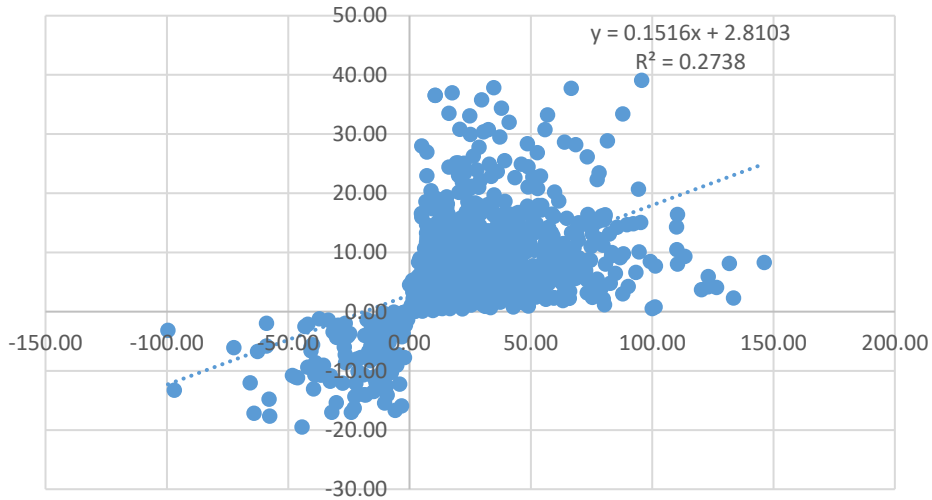


Fig. 9 Rgression ROCE (%)

