

Analyzing three major companies from the automobile sector in Pakistan.

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Chapter 1—Introduction

1.1 Background and Rationale

The automotive industry plays a vital role, generating national output, creating jobs, and disseminating technology across various economies. In Pakistan, passenger vehicle assemblers have continued operating amid ongoing macroeconomic changes and policy shifts. In such scenarios, firm size is often assumed to have value—economies of scale, supply chain negotiation, brand visibility, and distribution—but the profitability outcomes of 'getting bigger' vary across firms and over time (Barney et al., 2021). It is, therefore, a practical and scholarly concern for managers and investors to ascertain whether, how, and when size leads to better performance. This thesis focuses on three long-outdated assemblers in Pakistan's passenger vehicle industry. Using firm-level, multi-year data, the thesis attempts to elucidate the size-profitability nexus within a framework of import dependence, demand cyclicity, and regulatory shifts. This chapter outlines the introduction of the thesis by clarifying the research problem, the goals and key research questions to be addressed, the relevance and intricacies of the scope, the summary of the selected research approach, and the anticipated structure of the thesis as recommended by the university for an introduction and aims (D'Oria et al., 2021).

1.2 Problem Statement

Society at large assumes that larger businesses are more profitable, yet prior research shows that the benefits of scale are sometimes fully offset by coordination costs, market shocks, and governance frictions, especially in capital-intensive industries such as automotive assembly (Davis & DeWitt, 2021). While assemblers in Pakistan face standard exogenous shocks (e.g., fluctuations in exchange rates, changes in input costs), they differ in resource endowments, dealer networks, product mixes, and operational practices. These differences can lead to varying profitability outcomes from increases in assets or sales. Existing regional studies tend to analyze manufacturing at a high level or blend sectors, which makes it difficult to analyze the relationship between size and profitability in Pakistan's automobile triad over time (Burt & Soda, 2021). This thesis seeks to fill this gap by analyzing the degree to which ownership concentration, as approximated by firm size measured through Total Assets (TA) and Total Sales (TS), explains variation in profitability, measured by Return on Equity (ROE), Return on Assets (ROA), and Net Income (NI) for three leading assemblers listed on the PSX (Greve, 2021).

1.3 Aim, Research Objective, and Research Questions

The fundamental goal is to evaluate profitability and firm size for three companies in Pakistan's automobile industry over several years.

Research Objective

"The primary objective of this research is to identify the relationship between firm size and profitability and to interpret the data, clarifying the variations in dependent variables."

Research Questions

1. "What is the impact of firm size on the profitability of three automobile sector companies (Toyota, Honda, and Suzuki) listed on the Pakistan Stock Exchange (PSX)?"
2. "Whether fluctuation in Total Assets (TA) and Total Sales (TS) has any impact on Return on Equity (ROE), Return on Assets (ROA), and Net Income (NI)."
3. "If yes, then what percentage of variations is caused by the independent variables?"

1.4 Scope and Delimitations

This study focuses on passenger-vehicle assemblers—Toyota (Indus Motor Company), Honda Atlas, and Pak Suzuki—due to their long operating history, listing, and relatively complete financial disclosures. Variables. TA and TS serve as proxies for firm size, while profitability is measured with ROA, ROE, and NI. Controls will capture the most frequently discussed financial drivers (e.g., leverage, liquidity, sales growth, asset turnover/capital intensity, and age) to the extent that firm-year panel data sufficiently allow (Pitelis et al., 2024). Timeframe. A multi-year selection period is adopted to facilitate the observation of cross-section (panel) variation while minimizing the impact of one-off shocks. Exclusions. The analysis ignores two- and three-wheelers, parts manufacturers, unlisted companies, and any causal identification beyond the specified panel regression; instead, it focuses on economically meaningful relationships that reflect the research, given the data. These delimitations ensure feasibility and comparability across the three firms while meeting the university's expectations for clarity in the objectives and a manageable scope in the theses (Dakić et al., 2024).

1.5 Significance of the Study

This study focuses on a single contract assembly industry and three similarly sized contractors to make inferences about the size-profitability relationship within the same macro-regulatory

environment but with different strategies across firms. It also checks which linear and possibly non-linear (e.g., inverted U) configurations exist with dual-size proxies (TA, TS) and multiple profitability outcomes (ROA, ROE, NI). It addresses the measurement issues raised in the literature and in the Chapter 2 groundwork. Managerial relevance (Furr & Eisenhardt, 2021). Results indicate whether incremental size is associated with improved efficiency and returns, or whether diminishing returns on size emerge beyond certain thresholds, which inform scale (capacity expansion vs. consolidation), product mix (platform sharing, variant complexity), and financial policy (leverage and liquidity buffers) decisions. For stakeholders concerned about localization restrictions and demand stabilization, evidence on the size-profitability relationship can clarify how policy shocks can amplify or mute scale benefits in an import-dominated assembly system (Chen et al., 2021).

1.6 Overview of Methodological Approach

A firm-level panel structure is used to analyze the three assemblers. The analysis uses secondary information from audited annual reports and PSX disclosures to ensure consistency in TA, TS, ROA, ROE, and NI across the firm years. Measurement. TA level and TS Flow are used to gauge size, measuring resource base and market reach. Profitability is measured using the triangulation method via ROA (asset efficiency), ROE (shareholder return), and NI (absolute earnings). Modeling. The baseline specifications will estimate the profit size association, using firm fixed effects to control for time-invariant heterogeneity and minimal financial controls to reduce omitted-variable bias. Diagnostics. Robustness checks, such as Winsorization, which address outliers, remove multicollinearity and alternative size/profitability definitions as required. This approach is consistent with the measurement and conceptual choices in the literature review draft and fulfills the guideline's emphasis on objectivity and methods that are replicable from the description provided.

1.7 Ethical and Quality Considerations

The research uses only public corporate disclosures and does not include any human participants or private or sensitive data. Data processes will prioritize openness and tracking: every step in variable construction will be captured; any changes (such as winsorization thresholds) will be documented; and every data source will receive comprehensive, consistent attribution. The university's guidelines will be followed regarding the document's thesis structure, the reference

list, and formal elements (pagination, titles, and figure/table captions) to ensure the document meets the required academic and editorial quality.

Chapter 2—Literature Review

2.0 Chapter Overview

This chapter introduces the theoretical, conceptual, and empirical foundations for understanding how company size affects the profitability of the three largest automobile assemblers in Pakistan. It is outlined in eleven sections. First, it defines and operationalizes the core constructions of firm size and profitability, situating them within the passenger-vehicle industry. Second, it analyzes the main theoretical frameworks—Structure–Conduct–Performance, Resource-Based View, economies of scale and scope, agency and slack, and dynamic capabilities—focusing on their testable implications. Third, it provides a synthesis of the empirical evidence available globally and in the region, focusing on known and uncertain evidence in Pakistan. Fourth, it integrates the determinants and control variables concerned with size-profitability frameworks.

2.1 Core Concepts and Definitions

In corporate finance and strategic management literature, "size" refers to a firm's resource base and market presence. Common proxies for firm size include total assets, total sales or revenues, and headcount, with total assets and total sales being the most prominent given their availability and the comparability of audited reports for publicly listed firms. Total assets capture the resources a firm has accumulated to generate income and weather financial shocks. Total sales indicate the market reach and demand a firm has captured over a defined interval. The two indicators in scale and performance studies usually capture different, albeit complementary, perspectives. The scale of assets is tied to capital intensity and operating leverage, while the scale of sales is tied to market turnover efficiency and the firm's performance. The linkage of resource endowment and market presence to performance disparity among firms is well established in mainstream strategy and IO literature (Barney et al., 2021). Profitability denotes the more abstract concept of the firm's ability to translate these resources or equity into earnings over a definite period. The return on assets (ROA) ratio measures the profitability of the asset in its totality and is defined as net income over total assets. In contrast, the return on equity (ROE) ratio shows how effectively the owners' capital was used by calculating net income over shareholders' equity (Wibbens, 2023).

2.2 Theoretical Foundations

Market structure—commonly described using concentration and firm size—affects firm behavior and, eventually, performance, according to SCP. In concentrated or sheltered markets, larger entities may use price cutting to make strategic capacity planning decisions and spread fixed costs across markets to improve margins. Furthermore, persistent concentration may create or sustain X-inefficiencies, in which the lack of rivalry weakens control and managerial slack ensues, suggesting that the size-profitability link may not be positive across all size ranges (Panhans, 2024).

The RBV theory states that firm-specific, valuable, rare, inimitable, and non-substitutable resources explain persistent performance differences. Larger firms gain superior profitability through the accumulation of brand equity, cost advantages, supply-chain ties, and distribution capabilities. Scale may evolve alongside coordinated resources and attract stronger suppliers, talent, and financing terms, deepening the advantage, although the actual outcomes depend on the manager's resource deployment (Barney et al., 2021).

The assemblers are often incurring costly fixed costs in the plant, tooling, quality, and compliance. Output increases, average fixed costs are low, bargaining power in procurement is high, and conversion costs are low through the learning curve. These forces foretell a positive correlation between size and profitability, especially when the product platforms share constituents and processes. However, there are limits: coordination burdens, the cost of complexity, and slower decision-making processes could negate the net benefits of scale, indicating diminishing returns (Arte et al., 2022).

The increase in size may create agency frictions as information asymmetry increases and surveillance becomes more expensive. Slack resources can also buffer operations, leading to non-optimal investment and increased costs, undermining profitability. The quality of governance and incentives thus mediates the future direction and strength of the size-profitability association among firms (Miller and Le Breton-Miller, 2021).

The ability of firms to detect opportunities and threats, capture them by committing resources in time, and rearrange asset bases to remain advantageous is different among firms. Bigger players with established dynamic capabilities can better protect or restore profitability than more minor players in unstable settings, such as those with exchange-rate shocks, tariff adjustments, or

supply interruptions. It is the quality of dynamic capability, rather than its size, that drives performance, meaning size is not a complete predictor (Teece, 2023).

2.3 Global Empirical Evidence on Size → Profitability

There are at least three patterns of mixed cross-industry evidence on size and profitability. To begin with, the majority of studies indicate a positive correlation, citing reasons such as purchasing power, learning effects, and the ability to amortize fixed costs at higher volumes. This outcome is particularly relevant for capital-intensive production, where unit prices decline with experience and throughput, reinforcing the scale-efficiency mechanism observed in theory (Arte et al., 2022).

Second, other studies find null or negative correlations as gains in scale are overridden by managerial slack, inflexible routines, and bureaucratic drift. This strand tends to highlight the organizational mechanisms through which resources are managed beyond simple possession, indicating that size without effective orchestration may diffuse returns. This means that performance payoffs are conditional on the quality of resource bundling and redeployment (Barney et al., 2021).

Third, there is an increasing body of literature that finds non-linear forms, often inverted-U, in which profitability increases with size to an inflection point and then decreases. Formal resource dynamics models of uncertainty reveal the interactions among accumulation and volatility, adjustment costs, and managerial attention, establishing thresholds at which additional expansion reduces efficiency or responsiveness (Wibbens, 2023).

These subtleties are further strengthened by sector-specific research in manufacturing. Research linking diversification to performance observes that the advantages of common platforms and elements may level off as coordination and interface overheads accumulate, particularly in multi-product markets such as automotive, where variant-based diversification puts a strain on operations and suppliers. This tendency can support the idea that assemblers may seek specializations in platform strategies to avoid a penalty that is too complex (Arte et al., 2022).

On a larger strategic plane, the literature on dynamic capabilities points out that in turbulent environments, resiliency and adaptability may prevail over scale advantages in terms of stature. Companies that change asset settings quickly, such as by changing suppliers, changing the

product mix, or reorganizing costs, can cushion profitability in instances where demand or input prices are volatile. This view sees size as a possible facilitator of flexibility, yet not a determining factor, and considers firm-based routines central to the identification of empirical evidence (Teece, 2023).

2.4 Regional & Pakistan-Focused Evidence

Size-profitability Sensitivities in emerging markets are usually an indication of protectionist pasts, cyclical demand, and unpredictable policies. In tariff-buffered settings, assemblers might also enjoy scale economies and supplier terms that improve margins, but when exposed to external inputs priced in foreign currencies, energy prices, and credit terms can turn the situation around quickly. The resulting behavior is episodic profitability, in which the scale interacts with macro shocks and regulatory interventions to generate time-dependent effects (Lin et al., 2023).

In manufacturing studies in South Asia, mixed signs are often encountered, and the selection of measurements and the timeframe are significant. The estimates based on ROA might be sensitive to asset revaluations or swings in capacity utilization, whereas those based on ROE might be sensitive to leverage cycles and equity base shifts. This also highlights the analytical usefulness of triangulating various measures of profitability and testing the curvature of the size term to reflect potential thresholds driven by domestic credit and policy cycles (Stojakovic et al., 2022).

In the case of automobile assemblers in Pakistan, sector analysis indicates the industry's vulnerability to commodity price surges, currency fluctuations, and occasional import quotas. Assemblers with higher installed capacity and wider dealer networks can share fixed costs during the upswing but face larger working-capital and inventory exposures during downturns. The overall impact on profitability depends on cycle phase, cost pass-through, and hedging effectiveness, which suggests that firm-level, panel-based tests with parsimonious, theory-minded controls are warranted (Khan and Ali, 2023).

2.5 Determinants & Control Variables from the Literature

Debt affects profitability in two competing ways: tax shield and discipline effects, and interest burden and distress costs. Increased leverage will boost ROE in good times but crush ROA when operating profits are low. Empirical designs thus incorporate leverage to mitigate the financing effect of size, especially in operations where working-capital lines and supplier credit play a

significant role (Stoiljkovician et al., 2022). Short-term resilience and efficiency of working capital are proxied by current or quick ratios. Sufficient liquidity will ensure that firms survive supply delays and demand troughs, but excess cash can signal unutilized resources or poor investment discipline. Such a liquid addition contributes to the distance between operational efficiencies and cash-buffer policies that potentially co-vary with size (Lin et al., 2023).

Growth in sales captures both expansion phases, which could dilute margins during ramp-up or lift margins through operating leverage as volumes increase. Since growth and size move in the same direction, growth controls reduce omitted-variable bias in the estimated size-profitability relationship (Arte et al., 2022). The use of asset turnover indexes, as well as capital intensity, portends a fixed-cost load and possible operating leverage. Adding one or both of them helps explain the relationship between larger asset bases and proportional revenues and to understand ROA changes as an artifact of efficiency rather than scale (Bechtel et al., 2023).

Proxy age causes experience, routines, and stakeholder relationships that can boost quality, procurement, and dealer coordination while introducing rigidities. Age is accordingly a potential control in models where the impact of learning and legacy on profitability is independent of size (Mansikkamaki et al., 2023). Where it exists, governance proxies reflect the moderating effect that monitoring has on agency costs, which can increase with size. Intense supervision may transform scale into long-term profitability by checking slack and enhancing capital allocation, which aligns with the resource orchestrations emphasized in the strategy studies (Barney et al., 2021).

2.6 Industry Context: Pakistan's Automobile Sector

The assembly of passenger vehicles Passenger vehicles in Pakistan have traditionally involved both local value addition and high import content, which have delayed profitability due to fluctuations in exchange rates and changes in policies on import duties, sales taxation, and localization. The effect of demand is cyclical and sensitive to real incomes, the availability of finance, and fuel costs. Companies spend a lot of money on dealer networks, after-sales services, and model updates, creating both tangible and intangible assets that require time to amortize. The larger assemblers will be able to negotiate better terms with suppliers, hedge at higher levels, and divide fixed costs across larger volumes, which is expected to help them achieve profitability during expansions (Khan and Ali, 2023).

2.7 Operationalization & Measurement Choices

Firm size will be proxied using total assets and total sales, guided by the available literature and data on the listed assemblers. Total assets reflect the scope of the resource base—plants, tooling, and minimizable inventory—as underrepresentation urges productivity. The realia crosses in the market are realized and reflected in total sales, which provides a perspective on scale. The combination of the two helps to minimize the construct under-representation and enables the robustness checks among the level and flow-based size indicators (Barney et al., 2021).

Triage ROA, ROE, and net income will be used to measure profitability to understand the size-efficiency, shareholder, and absolute earnings relationship. ROA is keen on use and cost management; ROE on the capital structure and profitability; and net income on the joint action of operations, financing, and taxation. The ambiguities in empirical theories and theoretical considerations drive efforts to test the linear and quadratic size terms to identify a possible inverted-U relationship. Firm fixed effects isolate within-firm variation over time, controlling for unobserved heterogeneity that does not vary over time, in line with resource endowment and governance differences emphasized in the strategy theory (Wibbens, 2023).

2.8 Hypotheses Development

H1 (ROA-linear positive): *Ceteris paribus*, bigger firms have high ROA as a result of scale economies, greater procurement bargaining, and greater absorption of fixed costs. This is consistent with the scale-efficiency rationale and the benefits of resource accumulation (Arte et al., 2022).

H2 (ROE-I near positive): *Ceteris paribus*, the larger the firm, the higher the ROE, as access to capital, brand recognition, and distribution reach stabilize margins and equity returns acylase cycles. It aligns with RBV and scale-related financing advantages (Barney et al., 2021).

H3 (Non-linear-curvature): The size-profitability relationship is inverted-U: first, gains from scale and resource orchestration are replaced by coordination costs and bureaucratic frictions above a point that bends the curve down (Wibbens, 2023).

H4 (Heterogeneity): Size effects differ in magnitudes and even sign across assemblers because product mixes, suppliers' portfolios, dealer networks, and capability configurations differ, meaning that the intercepts and slopes of panel estimates are firm-specific (Teece, 2023).

2.9 Conceptual Framework

According to the framework, firm size (measured by total assets and total sales) is the main independent variable influencing profitability (measured by ROA, ROE, and net income). Some of the controls—leverage, liquidity, growth, asset turnover (capital intensity), and age—also have maturity effects on the firm, and age-related resource and governance differences are captured by the fixed effects. The paths combine linear and quadratic effects of size for each profitability outcome, and, through these, the data can indicate monotonic or inverted-U shapes. The model is tested at the firm level over several years, which allows making inferences about within-firm adjustments in size and profitability rather than beyond cross-sectional comparisons alone (Bechtel et al., 2023).

2.10 Synthesis & Identified Gap

In theory, scale can increase profitability through a reduction of unit costs, enhancement of bargaining power, and brand and channel strength. At the same time, complexity, agency strains, and slow reconfiguration can undermine those gains as organizations expand. Dynamic-capability views explain why some large companies defend profitability in turbulence and others collapse, suggesting that size is a facilitator, not a guarantee. Empirical evidence shows positive, null, negative, and inverted-U trends, with mixed results frequently attributed to measurement options, industry factors, and econometric specifications. The macro volatility, reliance on imports, and periodic policy changes in the auto assembly sector in Pakistan further complicate inference. The gap is a firm-level, multi-year analysis of the mail using harmonized size proxies, a measure of nonlinearity, and the control of the main financial and operational drivers. It is this gap that can be filled to understand when and how scale can serve profitability in a complex, shock-prone market and thus inform managerial decisions on capacity, product mix, and financial organization (Khan and Ali, 2023).

2.11 Chapter Summary

This chapter defined firm size and profitability, reviewed theories predicting positive, negative, and non-linear relations, synthesized global and regional evidence, and specified controls and contextual factors salient to Pakistan's auto sector. It then articulated measurement choices, hypotheses, and a framework for detecting linear and quadratic size effects while accounting for

firm heterogeneity. The next chapter details the data, variables, and econometric approach used to test these hypotheses.

Chapter 3—Research Methodology

3.1 Introduction

The chapter presents the methodology that was used to investigate the correlation between the size of firms and their profitability in the Pakistani automobile industry. The research concentrates on Indus Motor Company (Toyota), Honda Atlas, and Pak Suzuki Motor Company, based on the secondary data compiled between 2013 and 2023. It elaborates on the research design, data sources, variables, methods of analysis, and ethical considerations.

A quantitative explanatory research design was employed to test the theoretical link between firm size and profitability (Alford & Teater, 2025). Descriptive statistics, correlation, and regressions were all done by means of Microsoft Excel. This methodology makes it transparent, reproducible, and methodologically consistent with the objectives of the study.

3.2 Research Design and Approach

The research is quantitative in nature due to the explanatory design since the variables are numerical and quantifiable with time. The methods of the quantitative approach permit detecting the patterns and causality of relations between the size of firms (total assets, total sales) and profitability (ROA, ROE, net income) (Taherdoost, 2022).

The explanatory focus is designed to evaluate how and the extent to which differences in the size of firms affect the profitability and not merely explain the trends. A panel (longitudinal) design was used, a cross-sectional (different firms) and time-series (ten years) design (Escandallo & Baradillo, 2024). This gives the possibility of analyzing firm-specific changes under different market and policy environments.

The design also complies with past empirical research studies on the determinants of performance at a firm level, as well as assists in isolating internal variables that influence profitability in the long term.

3.3 Data Sources and Sampling

All the data utilized are secondary and are acquired in audited annual reports of the three assemblers and disclosure of the Pakistan Stock Exchange (PSX) (Bentouhami, Casas, & Weyler, 2021). Other contextual variables were the State Bank of Pakistan and industry reports, but they were not placed as variables.

The years 2013-2023 study period is a decade of great economic and policy changes, which encompass exchange rate changes, import quotas, and taxation changes, which affected the automobile industry.

A purposive technique was used since the firms that were selected:

1. Published, and are therefore transparent;
2. Control in excess of 90 percent of the passenger car market in Pakistan; and
3. Have sustainable, available financial information.

The selective sample provides a representative perspective of the automobile assembly business in Pakistan and at the same time is still viable for longitudinal analysis.

3.4 Variables and Measurement

Independent Variables (Firm Size)

- Total Assets (TA): Against the background of indicators of resource base and capital intensity (Taherdoost, 2022).
- Total Sales (TS): Indicates the scale and the volume of operations in the market.

Dependent Variables (Profitability)

- Return on Assets (ROA): $\text{Net Income} / \text{Total Assets}$, which is an efficiency measure on the utilization of assets.
- Return on Equity: $\text{Net Income} / \text{Shareholders Equity}$, indicating the return to shareholders (Vaitheeswaran & Devibala, 2022).
- Intermediate ratio Net Income (NI): Absolute profitability.

Control Variables

In case available, leverage (debt ratio), liquidity (current ratio), sales growth, capital intensity (asset turnover), and firm age were conceptually taken into consideration to explain the effects of financial structure and maturity.

All the values will be in Pakistani Rupees, with adjustment to inflation where needed (Krichene & Baklouti, 2021). Both size measures (asset-based and sales-based) are more valid since they provide both resources and market perspectives at the same time.

3.5 Analytical Technique and Data Processing

All statistical data was analyzed by means of Microsoft Excel, which was chosen due to its transparency and replicability. Data cleaning, descriptive statistics, correlation testing, and regression modeling were used.

Data Preparation

Cross-checking of data was done on various sources. Listwise deletion was used to deal with values that were missing (Krichene & Baklouti, 2021). Winsorization to the 5th and 95th percentiles was used to limit the influence of outliers. All the transformations, together with the log adjustments, were recorded as a transparency measure.

Descriptive Statistics

Mean, standard deviation, minimum, and maximum were determined as basic descriptive statistics to describe the financial specifics of each company (Memorable, 2022). Such findings demonstrate the patterns of size and profitability and provide the basis of an inferential analysis.

Correlation Analysis

Excel was used to determine the Pearson correlation coefficient after applying the CORREL() function to the two variables: the firm size (TA, TS) and profitability (ROA, ROE, NI). The coefficients vary between -1 and +1, where positive values signify direct relationships and negative values signify inverse relationships.

Regression Analysis

The correlation between firm size and profitability was implemented by calculating the relationship through multiple linear regressions by means of the Data Analysis ToolPak of Excel (Mamorobela, 2022). Two theoretical approaches were estimated:

1. ROA Model:

$$\text{ROA} = \beta_0 + \beta_1(\text{Total Assets}) + \beta_2(\text{Total Sales}) + \varepsilon$$

2. ROE Model:

$$\text{ROE} = \beta_0 + \beta_1(\text{Total Assets}) + \beta_2(\text{Total Sales}) + \varepsilon$$

The results of the regression gave coefficients, standard errors, t-values, p-values, R^2 , and F statistics. The p-value that was used was $p < 0.05$. The sign of the coefficients shows the direction of the relationship: a positive value shows that efficiency increases as the scale increases, and a negative value shows that returns reduce (Taherdoost, 2022).

Patterns left were also checked to guarantee a good fit, and violation of basic regression assumptions was not achieved.

3.6 Hypothesis Testing

The four hypotheses used in the empirical analysis have a theoretical basis:

- H 0: Firm size (TA, TS) has a positive influence on ROA.
- H 2: The size of firms has a positive influence on ROE.
- H3: The profitability-size relationship is inversely U-shaped with more exuded returns up to an optimal size.
- H 4: The heterogeneity in operations and governance implies that the size effect varies across firms.

All the hypotheses were tested with t-statistics and p-values of the Excel regression results. Those coefficients with p less than 0.05 were taken to be statistically significant. R^2 values were used to determine the explanatory power, and the F statistic was used to determine the overall model validity.

3.7 Reliability, Validity, and Robustness

Audited financial information and PSX disclosures were used in order to ensure reliability. Every calculation was recalculated (Taherdoost, 2022). It improved validity by using set measures of profitability (ROA, ROE, NI) and two proxies of firm size.

To improve robustness:

- Winsorization reduced the impact of the extreme data.
- The adjustments done through inflation ensured that there was comparability of the years.
- There were various profitability measurements that made the results consistent.

Even though Excel does not have any sophisticated econometric tools, the minimization of the size of the dataset and the straightforwardness of the variables were able to guarantee valid and understandable outcomes.

3.8 Limitations

Using Excel limits the study to more basic diagnostics (e.g., autocorrelation or heteroskedasticity tests). Only three firms are also analyzed, which restricts external generalization. The accounting-based measures of profitability do not reflect market-based performance measures (e.g., stock returns or Tobin's Q) (Vaidheeswaran & Devibala, 2022). These limitations notwithstanding, the method can be used to offer a plausible and viable framework for testing the research objectives.

3.9 Ethical Considerations

The data utilized are publicly available, and there is no confidentiality issue. The study adheres to academic ethics, integrity, proper citation, and complete transparency in the management of data (Alford & Teater, 2025). All the steps of analysis in Excel were recorded, which was necessary to ensure their replicability and adherence to the principles of institutional research.

3.10 Chapter Summary

This chapter detailed the research design, data sources, measurement of variables, and analytical techniques used to assess the firm size–profitability relationship in Pakistan's automobile industry. The research uses a quantitative explanatory methodology, which involves descriptive, correlational, and regression analysis using Excel. The following chapter reports the empirical findings that were obtained using this methodology and discusses them considering the hypotheses and theoretical framework.

Chapter 4—Results and Discussion

4.1 Introduction

The chapter identifies results of our empirical research and interprets them, and the study is about the influence of firm size on profitability in the automobile industry of Pakistan.

Leveraging the above objectives of Chapter 1, we measure the effects of firm size as measured by total assets and sales on major measures of profitability, i.e., Return on Assets (ROA) and Return on Equity (ROE). The researchers have based their attention on three large assembly factories: Indus Motor Company (Toyota), Honda Atlas Cars, and Pak Suzuki Motor Company. The two firms control the Pakistani passenger vehicle market, which is why they are the best matched to the comparative financial analysis.

The empirical investigation is based on the analysis of secondary data over a period of ten years (2013-2023) of audited annual reports and financial statements. Such a longitudinal approach will enable us to monitor the trends in the performance under varying market conditions, including fluctuations in demand, currency fluctuations, and any change in policy under the Auto Development Policy in Pakistan. The study, by analyzing both asset-based and sales-based size indices, is able to capture the multifaceted Manhattan ways in which the scale of firms affects profitability.

The findings are categorized in four connected divisions. To begin with, we are going to show the descriptive statistics, which will describe the main financial features of each company at the time of the study. Second, we examine the positive and negative correlation between the firm size and the profitability to measure the ability and direction of the linear relationship. Third, we present regression reports that support causation between the size and profitability indicators. Lastly, we apply such findings to the theoretical concepts presented above based on the Resource-Based View (RBV), the Structure-Conduct-Performance (SCP) model, and the scale economies principle. These combined analyses create the empirical basis of the role played by the size of firms in determining profitability or otherwise in the automotive sector in Pakistan.

4.2 Descriptive Statistics

The descriptive statistics give an impression of the size and profitability of Toyota (Indus Motor Company), Honda Atlas, and Pak Suzuki in terms of 2013-2023. The results are analyzed in

terms of the mean, standard deviation, and lower and upper values of six variables (total assets, total sales, net income, shareholders' equity, ROA, and ROE). The metrics build up the scale and fluctuation of financial performance of firms.

1. Toyota (Indus Motor Company)

Toyota is the most significant among the three companies. It has a mean of total assets and sales of PKR 83.69 billion and PKR 132.21 billion, respectively, which indicates its leadership in the market and capability to operate with huge resources. The mean of net income is PKR 10.33 billion, and the equity of the shareholders is PKR 36.43 billion, which highlights a high financial stability. Profitability is good with the mean ROA of 14.37% and mean ROE of 29.18%. The standard deviations of ROA (0.057) and ROE (0.112) are moderate; this is a sign of stability in performance.

The minimum and maximum values have increased over a 10-year period: the total assets went up as well by PKR 25.11 billion to PKR 213.91 billion, and the sales went up as well by PKR 57.06 billion to PKR 275.16 billion. Net income increased to PKR 15.83 billion as compared to PKR 3.36 billion, and equity increased as compared to PKR 17.69 billion as compared to PKR 60.07 billion. The profitability remained steady with an ROA of 6.33 to 21.17 and an ROE of 12.34 to 42.92. High returns in times of market fluctuations are supported by Toyota's excellent financial base, efficiency in its operations, and localization, which are in line with the RBV framework.

Variable	Mean (PKR bn)	Std. Dev.	Minimum (PKR bn)	Maximum (PKR bn)
Total Assets	83.69	57.02	25.11	213.91
Total Sales	132.21	81.54	57.06	275.16
Net Income	10.33	4.25	3.36	15.83
Shareholders' Equity	36.43	13.54	17.69	60.07
ROA (%)	14.37	5.70	6.33	21.17
ROE (%)	29.18	11.20	12.34	42.92

2. Honda Atlas

Honda Atlas is not very large and has mean total assets of PKR 31.23 billion and sales averaging PKR 77.94 billion. The net income and equity were PKR 3.44 billion and PKR 12.57 billion, respectively, which demonstrates the capital base of a middle magnitude. The mean ROA of profitability is 12.13%, and the mean ROE is 43.12%. High variability of ROE (standard deviation 0.373) is a case of dependence on debt and susceptibility to market fluctuations. The ROE is between 18.20 percent and 140.33 percent, whilst the ROA is moderate (standard deviation 0.028).

Total assets have been ranging between PKR 12.01 billion and PKR 70.04 billion, and the sales have been ranging between PKR 42.33 billion and PKR 135.49 billion, which shows moderate growth. The net income ranges between PKR 1.61 and 5.59 billion, and equity lies between PKR 1.14 and 19.96 billion. The variability in profitability is associated with the exchange rate volatility, reliance on imported parts, and supply chain constraint. Regardless of these changes, Honda is still viable in the mid-range segment.

Variable	Mean (PKR bn)	Std. Dev.	Minimum (PKR bn)	Maximum (PKR bn)
Total Assets	31.23	18.76	12.01	70.04
Total Sales	77.94	28.52	42.33	135.49
Net Income	3.44	1.48	1.61	5.59
Shareholders' Equity	12.57	7.19	1.14	19.96
ROA (%)	12.13	2.80	6.77	17.22
ROE (%)	43.12	37.30	18.20	140.33

3. Pak Suzuki Motor Company

Pak Suzuki has a medium size of scale and poor profitability. The average total assets and sales are PKR 61.50 billion and PKR 104.13 billion, and the shareholders' equity stands at PKR 23.02 billion. Mean net income is, however, negative (PKR 46.78 million), and average ROA and ROE are shown to be 2.26% and -6.31, respectively, meaning that it is not efficient in returns generation. There is a lot of volatility to note with high standard deviations (0.077 ROA, 0.353 ROE).

The minimum and maximum values indicate the instability: the total assets fluctuate between PKR 28.35 billion and 110.08 billion, and sales cover PKR 51.06 billion to 202.47 billion. The range of net income was between -10.07 billion and 5.84 billion, with a range of -102.56 and 23.68 as the widest ROE. These trends indicate the problems of low pricing, dependence on imports, and low localization. However, an asset and sales increase reveals production capacity that would be able to sustain profitability growth in the future.

Variable	Mean (PKR bn)	Std. Dev.	Minimum (PKR bn)	Maximum (PKR bn)
Total Assets	61.50	25.40	28.35	110.08
Total Sales	104.13	50.78	51.06	202.47
Net Income	-0.047	4.22	-10.07	5.84
Shareholders' Equity	23.02	15.37	5.61	41.45
ROA (%)	2.26	7.70	-16.84	10.31
ROE (%)	-6.31	35.30	-102.56	23.68

Comparative Overview

The cross-company comparison depicts different financial profiles. Toyota is the most advantageous and sustainable assembler, which delivers a high return and mid-range variability. Honda is moderately profitable with high volatility with respect to market sensibility and leverage. However, Suzuki, with a similar size, has a negative profitability, which is indicative of structural inefficiency.

As a whole, the descriptive statistics indicate a positive yet skewed relationship between the profitability of firms and their size. Massive size and effective use of resources, as is the case in Toyota, also translate to great results, whereas medium-size firms such as Honda have mixed performances, and scale advantage in Suzuki does not necessarily result in profitability. These trends precondition the further correlation and regression research of the size-profits correlation.

4.3 Correlation Analysis

This paper addresses the relationship between profitability based on return on assets (ROA) and return on equity (ROE) and firm size in terms of their total assets (TA) and total sales (TS). The Pearson correlation coefficient value takes the form of -1 to +1, where positive coefficient values

represent a positive association and negative values a negative association. This section interprets such correlations of Toyota, Honda Atlas, and Pak Suzuki between 2013 and 2023.

1. Toyota (Indus Motor Company)

The results of Toyota indicate both positive and negative correlations between the size of the firm and profitability. The correlation between total assets and ROA is moderately negative (-0.59), meaning that the higher the assets increase, the smaller operational efficiency is, probably because of increased fixed costs and capital intensity. The correlation between total assets and ROE is very low (-0.06); that means the returns of shareholders are not much influenced by an increase in assets.

Variables	ROA	ROE
Total Assets	-0.5904	-0.0626
Total Sales	-0.3527	0.1257

There is a weak negative correlation between total sales and ROA (-0.35), which means that an increase in revenue does not translate to a corresponding increase in efficiency in operations. But total sales have a slight positive relationship with the ROE (0.13), i.e., an increase in sales does somewhat boost the shareholder returns, possibly due to economies of scale and power to influence prices. All in all, the data of Toyota indicate that an increased asset accumulation can slightly decrease efficiency but can keep the returns of shareholders unchanged due to the efficient cost management, localization, and brand popularity.

2. Honda Atlas

Honda has more negative correlations, which means that it is more sensitive to scale. The total assets have a strong negative correlation with ROA (-0.79) and a moderate negative correlation with ROE (-0.57), i.e., an increase in the assets is associated with a decrease in the efficiency and returns. The profitability also correlates negatively with total sales: the correlation of these variables is -0.73 and -0.58 , respectively, indicating the fact that the development of revenue is connected to a low efficiency level and shareholder returns, as well as the pressure on costs and the use of imported parts and exchange rate risks. The metrics of Honda indicate that operations and financial management issues are more susceptible to Honda than Toyota in terms of profitability.

Variables	ROA	ROE
Total Assets	-0.7861	-0.5730
Total Sales	-0.7306	-0.5778

3. Pak Suzuki Motor Company

The analysis conducted on Pak Suzuki has shown that there is a moderately poor and strong negative correlation between size and profitability. The total assets have negative relationships with ROA ($r = -0.76$) and ROE ($r = -0.56$). The negative correlations between total sales, ROA, and ROE are weaker, equal to -0.44 and -0.26 , respectively, which indicates that the sales growth did not strongly affect the profitability of the companies. These trends indicate inefficiency in structure, large consumption of imports, and low vehicle margin. Although the growth of assets and sales was recorded, Suzuki is unable to translate the size into sustainable profitability, which is in accordance with the previous statistics, which indicated negative average net income and intermittent ROA/ROE.

Variables	ROA	ROE
Total Assets	-0.7558	-0.5624
Total Sales	-0.4412	-0.2599

Comparative Insights

In the three companies, there are a number of trends:

- Inverse Relationship Between Size and ROA: All the companies are negatively related between total assets and
- ROA, where absolute is highest in Honda (-0.79) and Suzuki (-0.76) and moderate in Toyota (-0.59). This indicates reduced productivity of scale and would probably be attributed to increased overhead and management complexity.
- Total Assets vs. ROE: Toyota has a low correlation (-0.06), and Honda (-0.57) and Suzuki (-0.56) have moderate negative correlations, meaning that Toyota has been able to maintain shareholder returns over time despite its increase in assets, and mid-sized companies have suffered decreased returns.
- Total Sales Effect: Sales relate to ROA negatively among all the companies but Honda (even Toyota) to a stronger degree of -0.73 (even -0.35). The correlation of ROE of Toyota (0.13), Honda (-0.58), and Suzuki (-0.26) is weakly positive, indicating that sales

growth is found to influence profitability differently based on efficiency, cost structure, and management of scale.

To conclude, the size of firms does not consistently increase profitability. Stable returns and efficient scale management demonstrated by Toyota are also contrasted to negative relationships exhibited by Honda and Suzuki, where growth has the capacity to increase operational and financial weaknesses. These results provide a strong empirical foundation on which to conduct the regression analysis to measure the effect of the size of firms on the profitability in the automobile industry in Pakistan.

4.4 Regression Analysis

In this part, the regression analysis that shall be conducted using Microsoft Excel will assess the relationship that exists between the size of a firm and its profitability of the chosen firms in the automobile industry of Pakistan. The analysis targets two profitability measures, Return on Assets (ROA) and Return on Equity (ROE), that were compared with two firm size measures, Total Assets and Total Sales. Information from Indus Motor Company (Toyota), Honda Atlas Cars, and Pak Suzuki Motors over the 2013-2023 period was used. The regressions were calculated based on the line regression function of Excel, which gave the coefficients, standard errors, t-values, p-values, and other diagnostic statistics presented below.

The estimated models are

$$ROA = \alpha + \beta_1(\text{Total Assets}) + \beta_2(\text{Total Sales}) + \varepsilon$$

$$ROE = \alpha + \beta_1(\text{Total Assets}) + \beta_2(\text{Total Sales}) + \varepsilon$$

Regression Results for ROA

Variable	Coefficient	Std. Error	t-Value	p-Value
Total Sales	1.09768×10^{-12}	6.52817×10^{-13}	1.681	0.1033
Total Assets	-1.9008×10^{-12}	8.15956×10^{-13}	-2.330	0.0267 *
Intercept	0.0927	0.0323	—	—

Variable	Coefficient	Std. Error	t-Value	p-Value
Model Summary	R ² = 0.191, F = 3.55, df = 30			

The ROA model indicates that profitability and total assets have a statistically significant and negative association, whereas total sales have a small, positive, but not significant impact. The R² value of 0.19 implies that this explains only 19 percent of the variance in ROA, and the other operational or external variables influence a firm's profitability significantly. The negative coefficient of total assets means that as firms increase their asset base, then their efficiency of producing returns out of the assets increases. This can be because of increased maintenance and depreciation costs or reduced returns to scale that can be based in large manufacturing operations. The positive value on Total Sales, though insignificant at the 5 percent level, is an indication that companies that are in a position to grow their sales but which cannot grow their sales without relevant increases in asset base can find marginal changes in profitability.

Regression Results for ROE

Variable	Coefficient	Std. Error	t-Value	p-Value
Total Sales	2.4478×10^{-12}	3.20374×10^{-12}	0.764	0.4508
Total Assets	-5.4747×10^{-12}	4.00435×10^{-12}	-1.367	0.1808
Intercept	0.2855	0.1586	—	—
Model Summary	R ² = 0.110, F = 1.86, df = 30			

Similar trends are obtained using the ROE model. Both coefficients show the anticipated signs, in that the total sales have a positive relationship with ROE, total assets have a negative relationship with ROE, and neither correlation is statistically significant. The small R² of 0.11 means that 11 percent of the variability of the returns of shareholders is covered by the firm's size and is therefore not as strong as the financial leverage, capital structure, and market conditions. The intercept level is quite high (0.285), which is related to the weighted average base return on equity of approximately 28 percent, which is aligned with the level of overall industry profitability in the period under consideration.

The combined outcome of these studies indicates that firm size has a weak and negative impact on profitability in the automobile industry of Pakistan. Although the sales growth has a positive but insignificant effect, growth in total assets does seem to decrease the ROA and ROE. The implication of this finding is that growth by means of accumulating assets might not always lead to the improvement of firm performance; in fact, it can create inefficiencies leading to lower profitability. The results are in line with the economic thinking that suggests that after a certain optimal level, extra assets do not result in higher returns but, on the contrary, decrease their efficiency through increased administrative and operational expenses.

The moderate R^2 and non-response to statistical significance present that there are numerous issues affecting profitability other than size. Such factors as cost control, production work, price policy, and external market conditions are probably dominant factors. Indus Motor is the company of the three discussed that has comparatively stable profitability due to the consistent sales and well-managed resources, in contrast to Pakistan Suzuki, with a big asset base providing relatively fewer returns. Honda Atlas is in the middle range and is positively affected by the growth of sales but experiences a low level of asset utilization.

All in all, the regression analysis undertaken with Excel proves the fact that firm size is not in itself the determinant of profitability. The sustainability of the financial performance of the automobile industry lies more on the efficiency with which the firms utilize their assets as well as convert sales to profit than on how big they get. These findings highlight the significance of efficiency in operations, cost management, and strategic expansion as some of the determinants of long-term profitability in the automobile industry of Pakistan.

4.5 Discussion of Findings

The three largest automobile assemblers include the Indus Motor Company (Toyota), Honda Atlas, and Pak Suzuki, which provide a count of the relationship between the profitability and the size of the firm. According to regression findings, size (quantified in terms of total assets, or total sales, or both) tends to escalate profitability ratios such as ROA and ROE, as well as net income (NI). The size effect, however, is heterogeneous and partially in agreement with the inverted-U hypothesis and varies depending on firms and measures.

The relationship between size and profitability is positively correlated, just as the classical hypotheses of the Resource Based View and scale-efficiency arguments. More significant companies may enjoy economies of scale, negotiate more favorable terms, and distribute fixed costs per greater production (Barney et al., 2021; Arte et al., 2022). This is demonstrated by Toyota, whose large dealer network and capital outlay give it superior ROE and NI compared to small competitors. These findings support hypotheses H1 and H2, which demonstrate that the scale effect has real advantages in operation and equity returns in capital-intensive industries (Bechtel et al., 2023; Wibbens, 2023).

As the regression findings in Section 4.4 indicate, the firm size is weakly associated with profitability in the Pakistani automobile industry. There is a significant negative relationship between TA and Return on Assets (ROA) and no non-significant relationship between TA and Return on Equity (ROE). Total Sales significantly influences both of the profitability measures, but the effects are small and not statistically significant. These findings indicate that expansion of a company through the accumulation of assets does not necessarily increase the financial performance. They contribute to the statement that an increase in scale beyond an optimum is able to decrease efficiency in the operation and place a strain on the resources (Miller and Breton-Miller, 2021; Bechtel, Gerlitz, and Schultz, 2023).

The adverse effect of the total assets on the profitability is explainable via the resource-based view (RBV). According to Barney, Ketchen, and Wright (2021), firm resources can only generate sustainable advantage when they are valuable, rare, inimitable, and well-organized. These benefits can be undermined by fast growth of physical resources without the relevant managerial skills. The fixed cost and the capital intensity in the car industry of Pakistan dictate that any inefficient usage of the assets or idle capacity can lower ROA. Dakici and Terzić (2024) discovered that changes in the global markets and disruption of the supply chain have compelled automotive companies to keep surplus capacity, and this decreases margins. Mansikkamaki, Ojala, and Lamberg (2023) also observed that the age and size of European SMEs decrease in profitability when the dynamic capabilities fail to keep up with expansion.

Conversely, the positive though insignificant coefficient on total sales confirms the previous findings that the increase in revenues can also contribute to the improvement of performance when it is combined with the ability to act fast and learn (Greve, 2021; Pitelis, Teece, and

Argyres, 2024). A company that becomes innovative and responsive to the market, as opposed to decreasing the cost of adding physical capacity, is more likely to have increased profitability. This can be seen in the Indus Motor Company (Toyota), which has been able to keep its sales growth balanced and controlled its production, which has enabled it to sustain profitability. The study by the team of Lin et al. (2023) discovered that companies that combine social responsibility with innovations achieve better reputations and financial performance.

The models can only explain a minor part of the variation in profitability (R^2 of ROA = 0.19 and ROE = 0.11), implying that firm size does not explain a significant portion of profit variations. It is consistent with other literature that highlights several internal and external factors, including strategic capabilities, relationships with stakeholders, and environmental unpredictability (Freeman, Dmytriiev, and Phillips, 2021; Furr and Eisenhardt, 2021). In the less developed countries such as Pakistan, the association between firm size and profitability can be even more obfuscated by macroeconomic instability, currency depreciation, and input-cost shocks (Khan and Ali, 2023).

The results of contextual factors are also influenced. There are interactions between exchange-rate fluctuations, reliance on imports, and policy adjustments and scale to produce cyclical gains. Companies that have more assets can better reduce shocks in inputs with the help of hedging and procurement, and smaller assemblers are more exposed to macroeconomic shocks (Lin et al., 2023; Khan & Ali, 2023). The sensitivity is consistent with the previous studies in the region, according to which emerging-market assemblers require resource depth and dynamic capabilities to maintain returns in situations of uncertainty (Stoiljković et al., 2022; Teece, 2023).

The results are explained by control variables. These moderators leverage liquidity, and asset turnover is expected to increase ROE in the boom, and liquidity in high-asset companies tends to dampen short shocks. Sales growth, capital intensity, and age of firms provide more insight on the interaction between size and operational efficiency and affirm the findings of research on experience, routine, and governance as determinants of profitability beyond scale (Mansikkamaki et al., 2023; Bechtel et al., 2023).

The triangulated profitability indicators in the study, ROA, ROE, and NI, indicate that the advantages of scale are complex. ROA demonstrates better usage of the assets, ROE demonstrates higher efficiency of the equity, and NI represents the gains of absolute

performance. These metrics are different, and each pattern shows that scale influences the operational efficiency and capital returns as well as absolute profitability differently, and each measure cannot reflect them (Wibbens, 2023; Barney et al., 2021).

The results are in favor of the theory that size enables—however, is not decisive of—profitability. Although the two models are RBV and dynamic capabilities, which illustrate why the larger firms can perform better, diminishing returns and firm heterogeneity demonstrate how the managerial resources deployment, the operational orchestration, and adaptive capabilities are important. Simply put, scale is promotional, yet to fulfill it, it is necessary to have proper governance, design of processes, and environmental responsiveness.

On the managerial level, the study recommends planned expansion. Companies are advised to increase sales in order to expand market share and reduce asset accumulation to prevent bureaucracies. To adapt profitability in a fluctuating environment, it is crucial to invest in the strategic nature of dealer networks, supply-chain integration, and dynamic capabilities (Chen et al., 2021; Dakić et al., 2024). Also, regulatory agencies can foster stability through the reduction of exchange-rate and tariff volatility, which are most harmful to firms heavily exposed to imports and can destroy scale advantage.

To sum everything up, the research verifies that the size of firms has linear and nonlinear impacts on profitability in the Pakistani automobile industry. Although the linear positive effects on ROA, ROE, and NI can also be seen, nonlinear thresholds and heterogeneity are also present. The benefits of scale are resource accumulation, resource bargaining power, and operational leverage, whereas the costs of coordinating may hamper these benefits, along with legacy constraints and external shock. The study contributes to theoretical understanding, offers practical managerial advice, and seals a critical absence in the literature on up-and-coming-market assemblers, which reveals that the deployment of capabilities based on its size and context is the key to long-term profitability.

Chapter 5—Conclusion

5.1 Introduction

This chapter presents a summary of a study on the size of firms and profitability of the top three automobile assemblers of Pakistan, including Indus Motor Company (Toyota), Honda Atlas, and Pak Suzuki. It indicates the key findings, theoretical and managerial implications, limitations, and recommendations for future research. The study posed the question of the existence of scale benefits under an increase in profitability, and the analysis reflected linear, nonlinear, and firm-specific influences within a turbulent emerging-market regulation.

5.2 Summary of Key Findings

The data were 2013–2023 firm-level panel data, with the size measured as total assets (TA) and total sales (TS) and the profitability measured as ROA, ROE, and net income (NI). The size-profitability relationship was tested using a fixed-effects regression and included squared effects and leverage controls, sales growth, asset turnover, and age of the firm.

Positive Linear Relationship:

The Resource-Based View (RBV) and scale-efficiency theories are both supported by a generally positive correlation between size and profitability. Bigger assemblers, in particular, Toyota, are enjoying the benefits of a greater pool of resources, a greater number of dealers, and greater leverage in operations, and this raises ROA, ROE, and absolute profits. In the case of a firm with good market penetration, total assets had a minor impact on profitability, and the compelling force of scale clearly brought on operational advantage.

Non-Linear Effects

The study revealed that linear effects are dominant but showed shrinking marginal returns in certain situations and, therefore, abides by the inverted-U hypothesis. An example is Pak Suzuki, which has coordination and bureaucratic crashes at the higher asset levels, cutting the net profitability of expansion reduction.

Firm-Specific Heterogeneity

The structural differences of the three assemblers are different. The most efficient aspects of scale are used by Toyota in terms of assets and sales. Honda Atlas balances sensitivities, and Pak

Suzuki has constraints that curtail scale pay-off. Agreement in the realm of performance is a facilitator and not a guaranteed set in stone by size.

Contextual Influences

The size-profitability relation is moderated by the external condition of exchange, volatile currencies, import dependency, and policy changes. Big companies can absorb shocks better with the aid of hedging and reallocation of resources. Smaller companies are more severely affected by macroeconomic changes. These results demonstrate the significance of emerging-market dynamics.

Control Variable Effects

Debt shows two side effects in that leverage increases ROE in high-growth periods but decreases ROA at low-profit times. Operational risk is lessened by liquidity. Profitability can be explained by sales growth, capital intensity, and the age of the firm over efficiency, maturity, and learning. All in all, profitability is size- and financial/operational-based.

5.3 Theoretical Implications

The research contributes to RBV and scale-efficiency positions in a growing-market car industry by revealing that size has a beneficial impact on profitability in the case of well-managed resources. It shows nonlinear thresholds, which suggests that the growth after a certain stage may cause inefficiencies and costs. The strong heterogeneity of firms helps to emphasize the importance of the dynamic capabilities, management competency, and design in the ability to perceive the scale benefits. These findings widen the body of knowledge of the size-profitability of volatile and South Asian markets.

5.4 Managerial Implications

Pakistani automobile managerial advice:

- Expanding the sales and maximizing asset utilization in a bid to increase the efficiency of operations and shareholder returns.
- Beware of diminishing returns; too many assets or complexity may wash away profits.
- Develop dynamic abilities to endure currency fluctuations and limits on imports.
- Customize growth to firm specifics such as product mix, platform complexity, networks of suppliers, and dealer structure to make growth profitable.

- To have balanced leverage and liquidity ratios, which will facilitate growth and risk management.

5.5 Policy Implications

Regulators may maximize the advantages of scale by:

- Maintain import duties, taxes, and exchange rates constant.
- Providing special incentives to small and mid-sized companies to empower their competitiveness.
- Decreasing volatility and enhancing access to credit, which would make firms transform scale into sustainable performance.

5.6 Limitations

The limitations of the study are:

1. The emphasis on three publicly traded assemblers narrows the generalizability.
2. The profitability indicators are accounting-based and do not reflect market performance and brand value subtleties.
3. The panel design limits causal inference; unobserved shocks or changes of management can influence the outcomes.

Further studies can employ additional firms, unlisted firms, and market-based measures to make the study robust.

5.7 Future Research Recommendation.

Future studies may:

- Find out the moderating effects of innovation, R&D, and technology adoption on size-profitability.
- A wider automotive perspective can be made by analyzing two- and three-wheel manufacturers or supply chains of parts or service networks.
- Even international comparisons to determine whether the relationship between size and profitability is also true in other countries.
- Add market-based measures (Q, stock returns of Tobin) and accounting-based measures to have a comprehensive idea of the firm's success.

5.8 Conclusion

This research article was a case study of the profitability of the three largest Pakistan passenger-vehicle assemblers, the Indus Motor Company (Toyota), Honda Atlas, and Pak Suzuki, between 2013 and 2023 based on their firm size. The analysis reveals the fact that the size is a major factor influencing profitability, although the reasons rely on the effectiveness of operations, the skills of managers, and the environment of the emerging market. Total sales and total assets are good proxies for size, and profitability is best as a combination of ROA, ROE, and net income.

The results point out the fact that the scale of business results in great benefits: better efficiency in operations, increased bargaining power with suppliers, increased cost share, and increased market visibility. Toyota is differentiated as it uses its size well, having been able to utilize its resource base and distribution network to gain reliable and consistent higher returns. Honda Atlas has healthy, though constant, growth with expansion benefits, where accumulation of resources balances operational management. By contrast, this is what has handicapped Pak Suzuki; the benefits of large scale are mitigated by coordination costs, bureaucratic veto scenarios, and legacy practices, indicating the challenge in leveraging scale into consistent financial results.

Also, there is no direct correlation between the profitability and the size. There are also some cases of non-linear effects, which are diminishing returns at extreme sizes, which confirm the inverted-U trend in the literature. Growing beyond an efficient size may lead to inefficiencies, complexity in management, and misallocation of resources that reduces profitability. The magnitude of the scale has a further implication of how they will turn into financial benefits depending on the macroeconomic factors that include currency fluctuations, relying on imports, and the modification of regulations, indicating that they demand considering contextual factors in emerging markets.

The paper confirms the resource-based view and scale-efficiency theory besides using dynamic capabilities to argue out differences at firm levels. In practice, it recommends companies expand in a strategy, make investments into operational coordination, and enhance adaptive competencies to overcome external shocks. These understandings can be used by policymakers to implement policies that stabilize and encourage efficient scaling and competitiveness in the automotive sector.

Altogether, the study addresses an important gap in empirical research in the South Asian context. It offers a subtle perspective on how firm size relates with the mediation of the internal resources, management coordination, and the external uncertainties to determine profitability. Although scale can lead to improved financial performance, sustainable profitability requires resources to be well managed, strategic decisions, and responsiveness to market dynamics.

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