

## **Assessing the Impact of Firm Attributes on the Adoption of Innovations in Sri Lankan SMEs**

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### **Introduction**

Small and Medium Enterprises (SMEs) are widely acknowledged as the engine of sustainable economic development in both developed and developing economies. They play a crucial role in utilizing local resources efficiently, mobilizing savings, providing workforce training and supporting multinational and transnational corporations in many ways, including tiered supply, subcontracting and service outsourcing. SMEs also contribute to building local technological capacity and globally account for 95% of all businesses. They represent 90% of all enterprises, including microenterprises in Asia.

Despite these strengths, SMEs are often highly vulnerable. In developing Asian countries, 60% of SMEs failed in their first year and around 70% of them were closed shortly after starting. This fragility is largely attributed to global competition, rapid technological changes, and sustainability challenges within the globalized economy (Noe et al., 2017). To survive and grow, SMEs must adopt appropriate strategies—among them, innovations take first place. Schumpeter (1934) recognized that innovations have been as central to the long-term success of SMEs, and Kotler (2003) warned that firms neglecting innovation face high risks. SMEs not only rely on innovations for survival but also contribute significantly to their diffusion. SMEs are more active than larger firms in introducing new products, processes, and organisational methods. According to the ILO (2007), SMEs stimulate local economies by introducing innovations that drive growth and development.

This study explores the determinants of SME innovation using the OECD Oslo Manual (2005) framework, which defines innovation in four aspects: product, process, marketing, and organizational. Drawing on Abderrezzak et al. (2016) and Hue (2017), the study classifies determinants into organizational (firm characteristics and owner characteristics), institutional and geographical factors. Using a resource-based approach (Soon et al., 2017), the analysis attempted to investigate the impact of firm attributes on adopting innovations.

### Objectives

The main objective of this study is to examine the impact of firm attributes on the adoption of innovations on the aspects of product, process, organizational and marketing in Sri Lankan SMEs.

### Methodology

The impact of firm attributes has been assessed using the Ordinary Least Squares (OLS) regression method. As the objective of this study is to identify the impact of firm characteristics on innovation, owner characteristics, institutional support, and geographical determinants have been incorporated as control variables. Owner characteristics comprise nine variables, which have been indexed using factor analysis. Institutional support is captured through seventeen indicators and averaged to create a composite measure. Geographical characteristics are represented by a standardized index incorporating three elements: location (urban vs. Non-urban), distance to the nearest city and accessibility to a bus route. The independent variables have been selected from the models developed by de Mel et al (2009). The sample consists of 115 SMEs, and primary data were collected through a survey conducted across five provinces in Sri Lanka in 2022. The researcher has used STATA 13.0 for the analysis. The OLS regression model specified for this study is as follows:

$$Y = \beta_0 + \beta_1 \text{Size} + \beta_2 \text{Sector} + \beta_3 \text{Comp} + \beta_4 \text{Export} + \beta_5 \text{Reg} + \beta_6 \text{Loan} + \beta_7 \text{Diverse} + \beta_8 \text{Custom} + \beta_9 \text{OwnerCha} + \beta_{10} \text{InstSup} + \beta_{11} \text{GeoLocation} + \varepsilon$$

where, Y - Number of types of innovations adopted

Size - Firm size (number of workers)

Sector - Sector of the firm operates (manufacturing or other),)

Comp	- Level of competition (number of competitors)
Export	- Exporting activities of the firm (yes or no, binary)
Reg	- Registration status of the firm (yes or no, binary)
Loan	- Whether the firm received a bank loan (yes or no, binary)
Diverse	- Diversification (proportion of revenues coming from other than main product)
Custom	- Proportion of goods custom-made to the total production
$\varepsilon$	- Error term

## **Results and Discussions**

Access to bank loans is a consistently positive and significant determinant of product, process, organizational, and marketing innovations. Financial accessibility enables SMEs to invest in new products, improve logistics, restructure organizations, and enhance branding.

The proportion of goods tailored to customer preferences positively affects all four innovation types. Customization encourages firms to innovate in product design, streamline processes, adopt flexible organizational practices, and develop unique marketing strategies. This supports the demand-pull theory of Schmookler (1966) and is consistent with local observations.

Export orientation negatively affects product innovation. As per the previous studies standardization of products to meet global compliance may reduce the incentive to innovate locally. This finding aligns with Filippetti and Archibugi (2011), who note that exporters in developing countries often adopt innovations rather than originating.

Smaller firms are more likely to engage in processing innovations, based on their needs for operational efficiency and adaptability. Higher competition negatively affects process innovation, due to resource diversion toward survival strategies. The competitive pressure in resource-scarce settings can suppress innovation.

Registered firms are more likely to engage in process innovations, due to better access to formal resources and government support Programmes. However, this relationship is marginal and may depend on local administrative effectiveness.

Institutional support shows a significant negative relationship with both process and organizational innovations, while having a negative but insignificant effect on marketing innovations. This suggests a misalignment between public Programmes and the actual innovation needs of SMEs.

**Table 1: Output of the OLS models**

Variables	Any Innovation	Product Innovation	Process Innovation	Organizational Innovation	Marketing Innovation
Size	-0.01418 (0.01524)	0.000022 (0.01524)	-0.00897** (0.00413)	-0.000506 (0.00721)	-0.00472 (0.00449)
Competition	-0.14565** (0.07295)	-0.01563 (0.07295)	-0.0616*** (0.01977)	-0.03510 (0.03454)	-0.03333 (0.02151)
Export	-1.20870 (2.03314)	-0.88566** (2.03314)	0.571311 (0.55093)	-0.17208 (0.96269)	-0.72225 (0.59959)
Registration	6.13266* (3.53574)	0.520511 (3.53574)	1.798257* (0.95811)	2.518497 (1.67416)	1.295400 (1.04272)
Loan	3.10731*** (1.07950)	0.523410** (1.07950)	0.85846*** (0.29252)	1.027415** (0.51114)	0.698033** (0.31835)
Diversification	0.01460 (0.03477)	0.003241 (0.03477)	0.009260 (0.00942)	-0.00450 (0.01646)	0.006608 (0.01025)
Custom	0.06542*** (0.02075)	0.02008*** (0.02075)	0.010989** (0.00562)	0.022174** (0.00982)	0.012171** (0.00612)
OwnerCha	-0.59166 (0.88998)	-0.22193 (0.88998)	-0.05799 (0.24116)	-0.19943 (0.42140)	-0.11229 (0.26246)
InstSupport	-2.9340*** (1.07442)	-0.38685* (1.07442)	-0.77197** (0.291146)	-1.4552*** (0.50873)	-0.31995 (0.31686)
Geo_index	0.365671 (0.82028)	0.045791 (0.82028)	-0.037457 (0.222278)	0.296090 (0.38840)	0.061247 (0.24190)
_Cons	13.7460*** (4.64406)	2.240748** (4.64406)	3.35473*** (1.258440)	5.59374*** (2.19895)	2.556778* (1.36958)
Observations	115	115	115	115	115
Prob > F	0.0002	0.0001	0.0001	0.0172	0.0391
R-squared	0.2722	0.2916	0.2818	0.1815	0.1622
Adj R-squared	0.2022	0.2234	0.2127	0.1028	0.0816

Note: Standard errors are given in the parenthesis. \*, \*\* and \*\*\* represents the variables are statistically significant at 10%, 5% and 1% level of significant respectively.

## **Conclusion and Policy recommendations**

This study highlights several critical insights into the innovation behaviour of Sri Lankan SMEs. The consistent positive impact of bank loan accessibility across all innovation types underscores the essential role of finance in enabling innovations. In Sri Lanka, where many SMEs face collateral-related credit constraints, this finding signals the urgent need to expand accessible and innovation-linked financing mechanisms. Similarly, the positive association of product customisation with innovation suggests that customer-oriented strategies are a practical pathway for SMEs to enhance competitiveness through incremental innovations.

However, increased competition was found to discourage product and process innovations. In the Sri Lankan context, this may reflect market saturation in certain sectors and price-driven competition that leaves little room for innovation investments. It also indicates a need for strategic support to help SMEs move from survival-based competition to value-based competition. The negative relationship between institutional support and innovation may point to the inefficiency or misalignment of government Programmes and public sector initiatives. Many such initiatives in Sri Lanka tend to be bureaucratic and detached from the ground-level challenges of SMEs, resulting in limited uptake or practical impact.

Based on these findings, several policy actions are recommended. First, Sri Lanka should enhance innovation-oriented credit schemes, particularly through institutions like the SME Banks and Regional Development Banks (RDB), targeting process and product innovations with favourable terms. Second, existing institutional support services should be restructured to be more demand-driven, localized, and participatory, including mentoring, innovation vouchers, and technical consultancy services. Third, fostering SME collaboration through industry clusters and value chains can help reduce the adverse effects of intense competition. Finally, innovation Programmes should actively promote customer-centric business models and product tailoring as viable strategies for SME growth in both urban and rural settings.

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