

Characterization of the Business Life Cycle from A Financial Perspective: A Study of Ecuadorian Manufacturing Companies

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Abstract

Financial statements play a critical role in business decision-making by providing a complete view of the financial structure of the company. Prior research has established a relationship between a firm's life cycle stage and factors such as dividend policy, capital intensity, inventory management, and the firm age. The objective of this study is to determine the characteristics that increase the probability that a company is in a life cycle stage, analyzing financial statements of 609 manufacturing companies in Ecuador in the period 2017 to 2019. A cluster study is conducted to determine whether the companies present differential characteristics according to the specific stage of the life cycle. Furthermore, the determinants of the life cycle stages are analyzed through a logistic regression model. Finally, using financial indicators, we examine the financial management of each group. The results reveal that companies in early stages (introduction and growth) face high levels of debt, while those that reach maturity prioritize dividend payments. Finally, companies in the decline phase present major challenges that compromise their level of income and their longevity over time. Although age shows a linear relationship with the different stages of the business life cycle, it should not be considered as the only explanatory variable.

Keywords: life cycle; cluster; financial statements; Ecuador

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Introduction

Research on the life cycle of firms has attracted considerable interest. Contemporary literature has observed a significant relationship between the life cycle stage and aspects such as dividend payout, capital intensity (Elsayed and Wahba, 2016; Mousavi et al., 2022), inventory management (Hasan and Habib, 2017), and organizational capital (Hasan and Cheung, 2018), as well as cash flow patterns (Dickinson, 2011).

Based on this premise, the life cycle of organizations, characterized by unique factors, plays an important role in management decision-making (Biswas et al., 2022). Factors such as resources, strategies, and the competitive environment (Dickinson, 2011) create different organizational structures and systems, which, as a consequence, create an environment in which the comparability between companies and the analysis of their financial information vary according to the stage of the life cycle (Hasan and Habib, 2017). In line with the above, the present study aims to determine the characteristics that raise the probability that a company is in a life cycle stage.

The information studied corresponds to the financial statements of 609 companies in the manufacturing sector of Ecuador during the period 2017 to 2019, representing a total of 1 067 observations. The methodology includes a cluster analysis in order to group the companies according to their characteristics. Subsequently, each firm's life cycle stage is identified based on prior literature. In a second phase, the determinants of the life cycle stages of the companies were

analyzed using a logistic model that included dividend payments, revenue growth, capital intensity, and company age as explanatory variables. Ultimately, the companies in each cluster were compared according to their financial performance.

The study shows that companies in the introduction and growth stages have higher levels of debt than those in the maturity or decline stages, which is an important risk factor for the former, since it could affect their survival. On the other hand, entities in the mature stage are characterized by being stable in the market, due to their average revenue growth and high dividend payments. Companies in decline reflect a contraction in revenue growth and low member remuneration, which, coupled with the changing market reality, could lead these entities to consider risky business strategies to avoid incurring losses. The results indicate that the growth of income and the payment of dividends are determinants of the stage of the life cycle of a company, showing that in the early stages the 4 levels of debt are high due to the need to invest in productive assets, the growth in sales is sustained until reaching the stage of maturity, and also, the companies do not prioritize the payment of dividends until they become consolidated in the market; this is due to their need to reinvest the results generated. The changing environment that a company faces demands continuous innovation and the development of tactics that adapt to different market conditions, competitors, technological advances, and customer needs. Restrepo-Morales et al. (2024) point out the relevance of innovating in products and services if short-term benefits are sought and of planning investments in new technologies and the need for modern management practices to consolidate a competitive position in the long

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term. In view of this, the present research contributes to the literature by providing information that facilitates the planning of timely and efficient business strategies, since management, by knowing the factors that lead a company to be in a certain stage of the life cycle, will be able to align strategies that respond to the moment it is going through, since these will differ according to the stage it is in during its years of operation. In addition, the study combines several strategies commonly used in the literature that in synergy allow valuable findings to understand the behavior of the business ecosystem of an emerging country with low development of the stock market, which serve as a basis for other organizations that develop in similar contexts.

The research is structured as follows: this section presents the introduction, which contextualizes the study. Subsequent sections cover the literature review, methodology, results, and conclusions, including limitations and future research.

Review of Literature

The knowledge of financial information is imperative, since, from its analysis, it is possible to consolidate it according to similar characteristics according to different study groups (Fodor et al., 2021). The formation of sets simplifies the analysis, allowing the identification of strengths and weaknesses, whether in the area of liquidity, performance, solvency, or efficiency. This discernment, enabled by strategic grouping, not only makes it possible to identify areas for improvement but also fosters the conception of approaches that are applicable and beneficial to companies (Fenyves et al., 2020). Thus, the information provided by financial statements is presented as an ideal resource to discern the critical points where the company faces challenges (Valaskova et al., 2018).

Financial indicators result in a crucial tool in the examination of financial statements with a view to decision-making (Linares-Mustaros et al., 2018). These parameters enable a careful and accurate analysis of economic performance, the level of performance, and optimal operation (Dickinson et al., 2018). Corporate health then focuses primarily on the evaluation of results derived from financial indicators, particularly in terms of costs and operational management, for the purpose of classifying a company as healthy (Balasubramanian et al., 2019). In the same vein as financial results, it is also important to consider strategies on innovation, as these affect organizational performance as a result of a chain of strategic decisions that promote the evolution of the company in changing contexts (Buarque et al., 2024). The definition of strategies and policies regarding the financial performance of organizations can be approached considering the foreseeable trend of the company within its life cycle. As with any living organism, the cycle of an entity begins with its birth or establishment, undergoes a stage of growth or maturity, and eventually reaches a state of decline or death, a series of phases that firms may or may not experience in their entirety, and although common, not necessarily in a sequential order (Kazem and Hameedi, 2022; Mousavi et al., 2022). The usefulness of the organizational life cycle theory lies in its ability to guide the formulation of strategies according to the current situation of the company, allowing it to move forward or backward

to another stage according to its objectives. According to Elsayed and Wahba (2014), the life cycle view facilitates the understanding of the dynamic evolution and long-term progress of the organizational and financial performance of firms. This is due to its close relationship with firms' decisions and performance, reflected in their cash holdings, net investment in fixed assets, debt, acquisitions, and diversification decisions, among others (Habib and Hasan, 2019).

There are various perspectives regarding the stages or phases that can be identified in the life cycle of an organization (Mousavi et al., 2022). Authors such as Dickinson (2011), Gort and Klepper (1982), Hanks et al. (1994), Lester et al. (2003), and Miller and Friesen (1984) propose five-stage models: birth, growth (survival), maturity (success), restructuring (shakeout), and decline. On the other hand, Kazanjian (1988) has chosen to divide the life cycle into four stages: conception, commercialization, growth, and stability, as have Mintzberg (1984), Jawahar and McLaughlin (2001), and Elsayed and Wahba (2014), who only establish a different denomination, namely, introduction, development, maturity, and decline. Some studies even discuss a lesser classification (Aharony et al., 2006; Karacaer and Gulec, 2017; Mokhova and Zinecker, 2013), in which three stages of the business life cycle are determined.

In the business life cycle literature, various accounting-financial performance measures and entity-specific characteristics, including age, growth, size, strategies, financial position, and decision-making, among others, are considered to attribute the different stages (Shahzad et al., 2019). Miller and Friesen (1984), for example, show that in the birth phase are the smaller, younger, and owner-managed entities; that the growth phase is characterized by larger, rapidly developing companies with a more formal structure; that in the maturity phase, there are the stable, efficient companies, but with a reduced level of innovation; and finally, that in the decline phase are located the entities with high risk aversion that begin to stagnate. Habib and Hasan (2019) indicate that during the initial phase of business development there are scarce resources, which leads to low or even negative operating cash flows and profits, whereas significant investments in fixed assets result in increased revenues during the growth stage, commonly generating profits. The same authors point out that mature companies encounter less uncertain scenarios compared to other stages of the life cycle, providing stable cash flow and profitability, while the decline stage represents lower R&D investment for firms.

Authors such as Dickinson (2011), in a study of firms listed on major New York stock exchanges, evidence that the combination of operating, investment, and financing flows at a given point in time contribute significantly to the mapping of the organizational life cycle. Castro et al. (2016), based on this concept, analyze a group of companies listed in Europe and determine that the capacity for indebtedness increases in larger and more mature companies due to less asymmetry of information, market positioning, or the level of knowledge that society has about the entity. This is consistent with Zhao and Xiao (2019), who observe that Chinese firms in their early development stage experience pronounced financial constraints. Despite this, companies in both the initial and growth stages display the highest debt ratios.

Anthony and Ramesh (1992) contribute to the literature on life cycle and its relationship with dividend payout, sales growth, capital spending, and firm age, they determine that the first three measures are quite (under) valued by the capital market during the growth (stagnation) stage. Elsayed and Wahba (2016) add inventory management to their analysis, highlighting the negative effects on organizational performance as a result of increasing the volumes of inventories in the early growth or maturity stages, whereas similar actions in the growth or revival stage will have a positive and significant effect. In agreement, Sridharan and Joshi (2018), with a sample of Indian listed companies, reexamine the relationship between ownership structure and financial performance of entities, incorporating the life cycle as a key factor in producing reliable results, and point out that it is disadvantageous for a family-owned company to have foreign ownership in its introduction stage because of the potential agency conflict.

The introduction stage of the organizational life cycle is characterized by uncertainty in revenue generation, profitability, and cash flows (Biswas et al., 2022). Typically, firms in introduction do not engage in dividend payments, as they need liquidity to remain in the market, and the cash generated is allocated to projects that provide growth opportunities (Bhattacharya et al., 2020). In addition, entities in this stage are commonly younger (age), smaller in size, and have less involvement in activities related, for example, to corporate social responsibility (CSR) relative to companies in another stage of the life cycle (Hasan and Habib, 2017). However, despite facing revenue and operational capacity constraints due to their business size, these limitations can be attenuated significantly if innovation processes are incorporated from the initial stages, allowing them to improve their performance and adaptability (Bachtiar et al., 2024); as Rexhepi and Jusufi (2023) argue, concrete practices such as digitization increase resilience, efficiency, and competitiveness. According to Shahzad et al. (2022), in this phase, companies intensify their efforts in innovation with the aim of consolidating a competitive advantage and securing an early market positioning. In a complementary manner, Yang et al. (2022) corroborate that these companies increase their investments in research and development (R&D), a strategy that responds to the constant pressure exerted by technological advances.

Stepanyan (2012) points out that, due to limited capital and difficult access to external financing in the first years of life, entities do not usually afford large investments in tangible fixed assets, so only those that have the information and resources necessary to make the right decisions in the face of uncertainty prevail. However, to continuously finance operating and investment outflows, introductory companies need external financing, so financing cash flows would be expected to be positive (Drobetz et al., 2015). For their part, Hasan and Cheung (2018) indicate that a growth in sales increases the probability that an entity is in the introduction stage. Contrary to Elsayed and Wahba (2016), who highlight a low sales volume in organizations caused by fluctuating demand, relatively small order quantities, and limited market options at this stage of the life cycle.

In the growth stage, relatively young entities exhibit a large increase in sales, make higher investments in property, plant, and equipment, and have low dividend payout ratios (Anthony and Ramesh, 1992). The latter is due to the fact that, despite being a stage in which uncertainty decreases, the expected returns from investment opportunities are high and the need for financing is also high, so shareholders will prefer to reinvest their profits rather than distribute them (Karacaer and Gulec, 2017). In line with this, Drobetz et al. (2015) highlights that as in the first stage of the life cycle, companies are still expected to present negative operating cash flows, which requires strong external financing and therefore high debt ratios to maintain high investment. These entities also have a greater capacity to present quality accounting information, due to the possible presence of analysts and investors (Bakarich et al., 2019). As for earnings, these will gradually be positive as long as the companies survive the introduction stage and continue to develop. Maqsood et al. (2025) highlight that companies at this stage of the life cycle drive digital transformation more strongly, defined as the integration of digital technologies to enhance their development. Likewise, Yang et al. (2025) evidence a favorable influence of such transformation in the generation of high-quality innovation that significantly impacts business performance.

As competition increases and the product market becomes saturated, profitable investment opportunities decrease for maturity-stage companies, so minimal or no growth would be expected from them (Aharoni et al., 2006). In sum, due to the high level of existing assets and the decrease in uncertainty and financial costs, organizations do not prioritize the reinvestment of profit, so shareholders will prefer that managers start paying dividends at this stage (Liu and Chou, 2017). And is that, according to Chowdhury and Shams (2021), as the entity moves toward maturity, it accumulates earnings and positive operating cash flows sufficient to allocate some form of compensation. This means that, at the maturity stage, companies are more stable, better developed, and have competitive advantages and effective governance. This can also be reflected in indicators such as the inventory turnover of organizations, which undergoes a clear slowdown at this stage due to slow sales growth (Elsayed, 2014). At this stage, it is key for companies to take advantage of innovation opportunities, such as the adoption of strategies disclosed by competitors or the formalization of intellectual property rights (Tolstov, 2024). In addition, these companies present more complete disclosures on their performance in green innovation, which includes advances in technologies for resource conservation and pollution reduction. In turn, these initiatives contribute to improved business performance (Rauf et al., 2025).

In the decline phase, firms are characterized by poor sales performance and high dividend payout in an attempt to maintain their performance by reducing costs to increase net return and/or maintain market value (Mousavi et al., 2022). This contradicts Bhattacharya et al. (2020), as their evidence suggests that the propensity to pay dividends increases first from the introduction to the growth stage, peaks at the maturity stage, and then declines at the stage of decline, i.e., it has a non-linear behavior. In general, entities that have reached this stage lack productive capacity, which, together with highly uncertain

returns from long-term investment projects, makes them relatively less attractive to financial analysts and investors, hindering their loan capacity (Chen et al., 2021). This is in line with Mokhova and Zinecker (2013), who point out that companies in a declining phase are less likely to use loans due to the loss of solvency. From the perspective of Jirásek and Bílek (2018), the decline stage can mean two scenarios for organizations: their absolute disappearance or a successful revival. However, during this phase, firms have a low willingness to engage in open or collaborative innovation processes (Sai et al., 2022). Faced with these constraints, they look for ways to recover their performance and opt for shorter innovation projects with high efficiency in the ratio between investment and impact (Haiyan et al., 2020).

The life cycle of companies, unlike the life cycle of products, should not necessarily progress in a linear way through all the stages described above, for as indicated by Dickinson et al. (2018), it is appropriate for entities to zone strategically, i.e., they can move back and forth between stages given their need for conditions that fit their previously established goals and objectives.

Methodology

The analysis of companies by life cycle stage, considering their structural characteristics and financial performance indicators, was based on accounting data submitted to the Superintendence of Companies, Securities and Insurance, the official regulatory body in Ecuador. The group of analysis brings together the economic units of the manufacturing sector that conduct activities of furniture manufacturing, beverage manufacturing, and manufacturing of other non-metallic mineral products for the period between 2017 and 2019. These three sectors concentrate 12% of the income of the manufacturing sector, grouped in 678 companies, and generate 23 228 job positions for the year 2019. Table 1 shows the composition of the sample.

Table 1
Data sample.

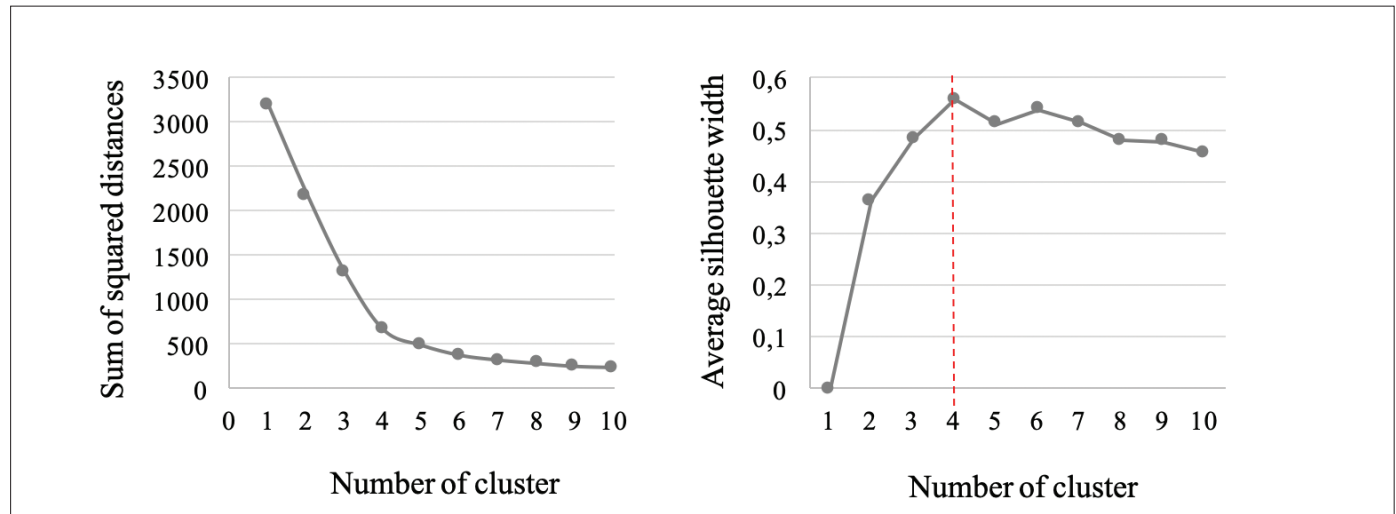
Industry	Companies		
	Operating	Eliminated from the study	Analyzed
Furniture	328	88	241
Beverages	431	117	313
Minerals	534	21	513
Total	1 293	226	1 067

The initial sample was composed of 1 293 observations, from which were excluded those that had no activity during the study period. In addition, those with incorrect or erroneous data were eliminated, the final sample consisted of 1 067 observations corresponding to 609 companies. To reduce the distortion caused by outliers, all variables were winsorized at the lower and upper 2% tails of their distributions. The study applied a cluster analysis by the k-means method, which grouped the objects into clusters considering the variables dividend payout (DP), sales growth (CV), capital intensity (CI), and firm age, based on previous studies (Elsayed and Wahba, 2014; Mousavi et al., 2022), which were standardized for clustering. The selected methodology made it possible to achieve internally homogeneous clusters and, at the same time, heterogeneous clusters among themselves (Caro and Guardiola, 2017), identifying patterns that characterize companies at different stages of the life cycle. Fodor et al. (2021) argue that cluster analysis makes it possible to group entities according to their financial performance, independent of the economic activity they perform. Based on the aforementioned variables, an analysis of variance of the means (ANOVA) was performed to determine whether there are significant differences between the clusters.

Choice of the optimal number of clusters

The choice of the number of clusters integrated in the analysis responded to a methodological strategy based on both theoretical foundations and statistical criteria in order to guarantee the soundness and coherence of the proposed model. From the conceptual dimension, we resorted to the approaches proposed by the literature specialized in organizational theories, particularly the non-sequential perspective of the organizational life cycle formulated by Miller and Friesen (1984). This theoretical line was complemented by the proposals of Jawahar and McLaughlin (2001) and Elsayed and Wahba (2016), who consolidate an approach that identifies four distinct organizational phases.

In parallel, a statistical analysis was conducted to empirically validate the optimal structure of the cluster model. To address this trade-off, indicators such as the sum of internal squared errors and the average silhouette coefficient, which provide information on the compactness and separation of the clusters, were analyzed.

Figure 1. Elbow of the sum of squared errors and average silhouette.

The findings indicate that a four-cluster solution offers a suitable trade-off between model parsimony and the quality of segmentation, optimizing within-cluster homogeneity and minimizing inter-cluster overlap (figure 1).

In a second phase, the factors that determine whether a company is in one of the stages of the cycle were studied, aligned with previous studies (Chowdhury and Shams, 2021; Zhao and Xiao, 2019). The proposed model is specified as follows:

$$StageLC_{it} = \beta_0 + \beta_1 PD_{it} + \beta_2 RG_{it} + \beta_3 CI_{it} + \beta_4 Age_{it} + \beta_5 \sum_{Z=1}^3 + \beta_6 Year_{it} + \varepsilon_{it} \quad (1)$$

Where the dependent variable StageLC takes a value equal to 1 when the company is in a certain stage of the life cycle; otherwise, its value is 0.

According to ElBannan (2021), it is important to know what determines that a company is in the introduction stage, due to the high risk of sustaining itself in the market, which, from the perspective of Mousavi et al. (2022), requires management strategies that exercise dynamic management with high levels of innovation. Possibly, companies make efforts to be in a stage of growth or maturity, as this attracts new investors, analysts, and creditors, given their future potential for the former and, for the latter, their desired performance stability (Dickinson et al., 2018; Liu and Chou, 2017), so identifying the variables that characterize this stage will provide management with important information. On the other side, being located in a stage of decline places management in a difficult scenario due to the high risk of survival in the market (Stepanyan, 2012), a context in which the right decision-making becomes a vital factor for the continuity of operations. Therefore, three estimations were made, where the dependent variable StageLC took the value of 1 according to the stage of the life cycle in which the company was, considering Introduction, Growth-Maturity, or Decline. The independent variables included in model (1) are detailed in Table 2.

The coefficients of the model are estimated by a logistic regression analysis. To ensure the reliability of the estimators, the theoretical foundations associated with this method, such as predictive ability and quantification of type I and type II errors, are examined.

In addition, by means of an analysis of variance (ANOVA), we studied whether the financial characteristics of the companies differ according to the stage of the life cycle in which they are, considering return on assets (ROA), current liquidity (LC), inventory turnover (RI), and indebtedness (DB), variables that are detailed in Table 2

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Table 2*Variables description.*

Variable	Abbreviation	Description
Dividend payment	DP	Dividends paid / Operating result
Revenue growth	RG	$\text{Revenue}_t - \text{Revenue}_{t-1} / \text{Revenue}_{t-1}$
Capital intensity	CI	Non-current assets / total assets
Company age	Age	Year of analysis – year of incorporation
Return on assets	ROA	Net income / total assets
Current liquidity	CL	Current assets / current liabilities
Inventory turnover	IT	Cost of sold / inventory
Debt ratio	DB	Total liabilities / total assets

Results and discussion

This section presents and analyzes the findings of the study of Ecuadorian companies, seeking to identify patterns, relationships and re-

levant implications on the life cycle of companies and the variables that determine it.

Table 3*Descriptive statistics.*

Variable	Mean	Median	Std. Dev.	Min.	Max.
PD	0.042	0.000	0.170	0.000	0.883
RG	2.347	0.015	4.247	-0.990	10.000
CI	0.409	0.387	0.314	0.000	0.990
Age	19.308	14.000	16.288	2.000	100.000
ROA	0.041	0.015	0.129	-0.313	0.469
CL	2.666	1.275	4.705	0.067	26.173
IT	29.479	7.799	65.637	0.091	351.160
DB	0.614	0.669	0.316	0.000	0.995

Table 3 presents the descriptive statistics of the variables included in the study. The companies are characterized by an average increase in revenues of 2.35 times those obtained in the previous year, which contrasts with a median of 0.02 and a standard deviation of 4.25, suggesting that Return on assets ROA Net income / total assets Current liquidity LC Current assets / current liabilities Inventory turnover IR Cost of sales/inventory Indebtedness DB Total liabilities/total assets growth may be concentrated in a few companies. The business groups show a return on assets of 4.1% together with an average liquidity of 2.67, which would reflect the capacity of the entities to generate resources. In addition, it is shown that on average the companies distribute 4% of the operating profit generated among their shareholders,

allowing the remaining profits to increase equity. Entities leverage an average of 61.4% with third-party resources and show an average investment in long-term assets of 40.9% in relation to total assets. On average, the companies have been in operation for 19.3 years; however, the sample includes young companies with two years of experience and some that have been in business for 100 years.

The grouping of the companies by virtue of the cluster study is shown in Table 4. Each group shows particular characteristics related to sales, dividend payments, investment in fixed capital, and age, variables that were considered according to the methodology detailed in the previous section.

Table 4*Empirical Characterization of firm Variables Stratified by Life Cycle Phase*

Variables	Introduction (n=402)		Growth (n=244)		Maturity (n=53)		Decline (n=368)	
	Mean	Std.Dev.	Mean	Std.Dev.	Mean	Std.Dev.	Mean	Std.Dev.
PD **	0.004	0.033	0.002	0.023	0.754	0.169	0.008	0.041
RG **	0.044	1.077	9.690	0.990	1.923	4.096	0.055	1.074
CI **	0.149	0.153	0.388	0.299	0.455	0.284	0.699	0.177
Age **	14.102	11.643	18.098	13.705	37.396	26.090	23.193	17.567

Note. PD = Dividends / Operating profit. RG = Revenuet – Revenuet-1 / Revenuet-1. CI = non-current assets / Total assets. Age = Analysis year – year of incorporation. ** Show statistically significant differences at the 0.05 level according to ANOVA.

The results of the cluster analysis show that 37.7% of the companies (402 observations) are in the introduction stage, in contrast to 5% (53 observations) in the maturity stage. The companies identified in the introduction stage are characterized by low sales growth and lower investment in fixed assets than the rest of the groups. According to Hasan and Habib (2017), these characteristics can bring uncertainty and generate volatile financial results in companies, which increases the probability of abandoning their activities. In addition, companies show low dividend payments, possibly as a strategy to boost their future profits through reinvestment of earnings, which would drive them to advance to the next stages of the life cycle, aligned with Fitri et al. (2016).

Organizations in the decline stage coincide with the low sales growth of those in the introduction stage, however, they are differentiated by their high capital intensity, which would not be generating the expected revenues. Regarding dividend payments, the results diverge from the findings of Mousavi et al. (2022), who explain that in the decline stage companies are distinguished by low sales growth and high dividend payout value. According to Anthony and Ramesh (1992), this is due to the fact that in the decline stage the behavior of dividend payments can respond to two possible scenarios: the first would respond to growth opportunities for new investments that would generate future positive returns, and the second scenario, with a deficit in cash flow, would exhibit business stagnation resulting in reduced dividend payments.

Companies in the growth phase exhibit higher year-on-year increases in revenues, reflecting a rapid expansion in sales. This behavior suggests a disruptive effect in their sectors and a growing need for external financing to sustain their expansion strategies. They account for 38.8% of their total assets in long-term investments and generate the lowest average dividend payments compared to companies in other stages. According to the literature, growing companies focus their investments on innovation and improvement of their products, seeking a differentiating factor in the market, which has a direct

impact on increasing their revenues (Hasan and Habib, 2017), and may be a response to low profit sharing. Zhao and Xiao (2019) indicate that companies at this stage move towards a relatively stable business model and persist in seeking further investment to continue their development.

On the other hand, there are few companies that have reached maturity and are characterized by higher dividend payments to their partners, 35.4% of profits are delivered as a return on investment. This implies that mature companies are much more attractive to investors seeking short-term profitability and allows them to obtain financing on favorable terms, an aspect that exacerbates the financial constraints faced by companies in the early stages of their life cycle. For Aharony et al. (2006) this is explained by the stability generated at this stage, which allows shareholders to reduce their interest in reinvesting profits and prioritize the payment of dividends. In addition, these are the companies that have the longest permanence in the market, which, in accordance with Chen et al. (2021), could be aligned with having acquired more experience to be efficient in the development of their activities.

The initial results show that the business community is characterized by a sustained growth of sales in the early stages of the business life cycle, decreasing in the later stages. The behavior of dividend payments could respond to the fact that companies would initially generate small profits that would be reinvested, with the aim of growing and establishing themselves in the market, consequently in the maturity stage, they deliver the highest returns to investors, and in view of the possible decrease in profits in the decline stage, they reduce such payments. As organizations go through different stages, it is shown that the investment in tied-up capital grows, a behavior aligned with the results found by Anthony and Ramesh (1992), Bhattacharya et al. (2020), and Hasan and Cheung (2018). This trend is as expected given that as the company increases its revenues, its investments grow; without, however, in the face of stabilization or contraction of revenues, the speed at which long-term investment contracts are lower.

Table 5*Results of Logistic Regression Models.*

Independent Variables	Dependent Variable: Stage of the Company Life Cycle		
	Introduction	Growth - Maturity	Decline
	Beta	Beta	Beta
PD	-20.796*** (2.936)	42.497*** (14.134)	-25.438*** (3.061)
GR	-1.784*** (0.198)	3.361*** (1.124)	-1.440*** (0.148)
CI	-30.365*** (3.546)	-0.390 (2.209)	22.760*** (2.248)
Age	-0.218*** (0.031)	0.097* (0.051)	0.112*** (0.015)
Constant	17.088*** (2.071)	-18.566*** (6.319)	-11.408*** (1.151)
Year dummies	yes	yes	yes
Observations	1 067	1 067	1 067
R ²	0.891	0.980	0.846
Prob > chi2	0.000	0.000	0.000
Classification %	97.56%	99.53%	96.44%
Type I Error	3.73%	0.67%	5.71%
Type II Error	1.65%	0.39%	2.43%

Note. StageLC = Dichotomous variable, equal to 1 when the company is in a specific life cycle stage: Introduction, Growth-Maturity or Decline, otherwise, its value is 0. DP = Dividends paid / Operating profit. RG = Revenuet – Revenuet-1 / Revenuet-1. CI = non-current assets / Total assets. Age = Analysis year – Year of incorporation. Standard errors are shown in parentheses. *, ** and *** denote significance at the 10%, 5% and 1%, respectively.

Table 5 shows the results of the logistic regression of model (1), according to the three estimations performed. The negative and significant influence of all the explanatory variables in the introduction stage is highlighted. Thus, as revenues grow (CV), the dividend payout (PD) and investment in fixed capital (IC) increase, and firms operate a longer time in the market (Age), the lower the probability of being located in this stage. In agreement with the results of the estimation made by Drobetz et al. (2015), who state that in the case of dividend payments or an increase in operating income, the chances of the company being in the introduction stage decrease.

The results show that revenue growth (CV) and higher dividend payments (PD) are factors that increase the probability of a company being categorized as a growing or mature entity. The positive relationship of these variables in the stages of boom and stability stands out, since these indicators invert their relationship when the companies start in the market or when they are about to disappear, which makes their survival difficult. This indicates that stable revenue growth and sustained dividend payments are a fundamental characteristic of companies that have reached financial maturity, as an indicator of operating efficiency and a competitive position in the market, signals that can increase their valuation by investors and financial markets. The behavior in the last stage would respond to companies being affected by factors such as declining demand, lack of innovation, cash flow problems, among others (Bakarich et al., 2019; Karacaer and Gulec, 2017). This decline in

the business and financial performance of declining firms represents a critical factor for the economies of developing countries, as these organizations face an imminent risk of closure, with adverse consequences on employment, value generation, and national productivity. In this context, the ability of management teams to identify signs of organizational decline in a timely manner and to deploy effective strategies to reverse the trend is particularly important.

The results also show a feature highlighted by authors such as Chowdhury and Shams (2021), where the age of organizations shifts from having a negative influence in the early stages of the business life cycle to a positive one. This suggests that companies in the initial phase are commonly young compared to those in the maturity or decline stage, ratifying that over time companies acquire the necessary experience to apply strategies that allow them to position themselves in the market; however, they remain for a short time in a stable phase, as they possibly fail to innovate and adapt to new market proposals and move into a stage of contraction in which strategies to reinvent themselves are vital to avoid disappearing.

To better understand what characterizes Ecuadorian companies in each stage of their life cycle and according to the literature, Table 6 shows some financial indicators that show significant variations in terms of profitability, liquidity, debt, and efficiency, depending on the phase in which the organizations find themselves.

Table 6*Financial Performance Measures Stratified by Organizational life Cycle Phase.*

Variables	Introduction (n=402)		Growth (n=244)		Maturity (n=53)		Decline (n=368)	
	Mean	Std.Dev.	Mean	Std.Dev.	Mean	Std.Dev.	Mean	Std.Dev.
ROA **	0.539	0.142	0.032	0.119	0.099	0.118	0.024	0.117
CL**	2.983	4.817	2.688	4.885	1.791	1.751	2.447	4.753
IT **	19.632	46.427	33.726	70.879	28.153	66.089	37.090	77.088
DB **	0.656	0.324	0.638	0.316	0.565	0.217	0.560	0.311

Note. ROA = Net income / Total assets. CL = Current assets / Current liabilities. IT = Cost of goods sales / Inventory. DB = Total liabilities / Total assets. **Statistical significance: Variables marked with** indicate statistically significant differences at the 0.05 level based on ANOVA.

Firms in the early stages of introduction and growth exhibit high levels of indebtedness for their investment needs, which is consistent with the results found by Zhao and Xiao (2019) and Faff et al. (2016).

Leverage levels should be monitored reiteratively, especially in the introduction phase, given the conditions of financial uncertainty that characterize this stage. The literature suggests that companies in the introduction and growth phases often face financial constraints, such as high costs in obtaining credit, due to their initial position in the market (Castro et al., 2016). Regarding inventory management, it is evident that it is the entities in the introductory stage that have the lowest average turnover (19,632), which may respond to the weak positioning in the market, limited by their production and sales volumes. This scenario changes when companies are growing, since organizations in this second phase choose to stabilize production and product availability, prioritizing immediate delivery and avoiding short term shortages, which is reflected in a higher turnover in relation to the first stage of the life cycle (Elsayed, 2014). When companies reach maturity, where their market power stabilizes, their inventory turnover is reduced for several reasons, among which stands out the deceleration of the pace of production, which is focused on stabilizing costs and increasing efficiency (Miller and Friesen, 1984). Finally, declining organizations reflect the changing reality of the market, where demand may go through a sustained decline, forcing entities to liquidate their inventories, commonly at reduced prices, to avoid incurring losses and avoid the risk of obsolescence.

Despite the remarkable growth in sales experienced by companies in the growth stage, they do not necessarily reflect the most outstanding performance. Instead, it is observed that those in the maturity stage achieve a return of 9.937% in relation to the investment made. Authors such as Ramzan and Lau (2023) explain that this dynamic emerges from the efficient management of non-current assets by mature companies, which translates into superior financial performance and greater wealth for shareholders. This approach highlights the importance of efficient management as a determinant of financial performance.

In relation to liquidity indicators, it is noted that companies in a declining phase exhibit higher current liquidity. However, it is important

to highlight that, despite having liquidity, it would be necessary to know whether the resources are being used efficiently to improve the performance of the organizations, since a lack of operational management of investments may be the cause of lower performance. These results are consistent with the conclusions obtained by Habib and Hasan (2019), who argue that in the decline stage, higher investment does not necessarily translate into better performance and that assets may lose value due to the decrease in growth opportunities, as also highlighted by Elsayed and Wahba (2016).

The analysis of the financial characteristics of companies throughout the different stages of their life cycle reveals valuable findings for decision-making. In the early stages, firms intensify their innovation efforts to consolidate an initial competitive position (Shahzad et al., 2022), relying increasingly on the integration of digital technologies as the backbone of sustainable development (Yang et al., 2022). From a financial point of view, firms in the introduction stage show high ROA, high liquidity, and low inventory turnover, a configuration that, although it could suggest a competitive advantage, should be interpreted with caution due to the potential distortion caused by a reduced asset base and inefficient use of resources. As organizations evolve towards the growth and maturity stages, greater financial strength is observed, characterized by an increase in inventory turnover, sustained ROA, moderate levels of debt, and efficient liquidity management. These conditions make them particularly attractive to investors. At this stage, firms tend to adopt innovations already proven in the market, seeking to extend the profitability of existing products and processes (Tolstov, 2024). Finally, companies in the decline phase show a sustained decline in value generation, evidenced by a markedly lower ROA despite maintaining debt levels similar to those of mature companies. Given this scenario, strategic decisions tend to be oriented towards low-cost innovation projects, rapid implementation, and high efficiency in the investment-impact ratio in order to preserve resources and mitigate risks (Haiyan et al., 2021).

In this context, the results offer valuable insights into strategic decision-making. For introducing and growing companies, the need to balance indebtedness highlights the importance of cautious financial strategies to mitigate risks and ensure a sound financial position.

For mature companies, the emphasis on dividend distribution suggests the importance of maintaining a balance between financial stability and generating shareholder value. Finally, the high number of companies in the decline phase is evidence of the need for special attention to ensure their survival and boost their recovery. Consequently, the findings provide valuable information to guide the formulation of effective strategies to drive business development and sustainability throughout the life cycle.

Table 7

Emphasizing Modeling and Classification.

Independent Variables	Dependent Variable: Stage of the Company Life Cycle		
	Introduction	Growth - Maturity	Decline
	Beta	Beta	Beta
PD	-20.590*** (2.933)	40.088*** (12.022)	-26.176*** (3.190)
RG	-1.753*** (0.192)	3.056*** (0.903)	-1.436*** (0.148)
CI	-29.758*** (3.455)	1.023 (1.903)	22.741*** (2.266)
Age	-0.215*** (0.031)	0.060 (0.039)	0.114*** (0.016)
Constant	16.519*** (2.009)	-18.401*** (5.545)	-10.913*** (1.165)
Sector dummies	yes	yes	yes
Observations	1 067	1 067	1 067
R ²	0.890	0.979	0.852
Prob > chi2	0.000	0.000	0.000
Classification %	97.38%	99.25%	96.91%
Type I Error	3.73%	1.35%	5.16%
Type II Error	1.95%	0.52%	2.00%

Note. StageLC = Dichotomous Variable, equal to 1 if the company is in a specific life cycle stage: Introduction, Growth-Maturity or Decline, otherwise, its value is 0. DP = Dividends paid / Operating profit. RG = $\text{Revenue}_t - \text{Revenue}_{t-1} / \text{Revenue}_{t-1}$. CI = non-current assets / Total assets. Age = Analysis year – Year of incorporation. Standard errors are shown in parentheses. *, ** and *** denote significance at the 10%, 5% and 1%, respectively.

The results confirm the relationship and significance of the variables included in the study. Thus, mainly, sales growth and dividend payments are determining factors for a company to be in a certain phase of its life cycle.

Conclusions

The findings show that, in the period analyzed, most Ecuadorian companies in the furniture manufacturing, beverage manufacturing, and non-metallic mineral product manufacturing sectors have been in the introduction stage. The results are conclusive in showing that firms in the introduction and growth stages exhibit the highest levels of indebtedness. This pattern could point to a common financing strategy during the early stages of development, where investments are essential for growth. However, it highlights the need for careful

Robustness tests

In order to give robustness to the results obtained, three new estimations are made considering the model proposed (1), with a different proposal of the control variable. The industry variable is defined as a dichotomous variable that takes a value of 1 according to the sector of activity of the company, be it the manufacture of furniture, the manufacture of beverages, or the manufacture of other non-metallic mineral products, similar to that established by Fodor et al. (2021). The results are shown in Table 7 and are similar to previous findings.

analysis, especially for firms in the introduction phase, as high indebtedness in an environment of financial uncertainty could have negative implications for long-term survival.

The research highlights the importance of assessing various indicators in addition to the age of the company for a more accurate identification of its life cycle. Although mature companies, with an average time on the market of 37 years, show stability and make higher dividend payments, it is stressed that company age should not be considered as the only indicator. The inclusion of metrics such as sales growth, capital intensity, and indebtedness provides a more complete picture of the financial characteristics and strategies of companies at each stage. The decline is mainly due to falling sales growth and dividend payments and high investment in property, plant, and equipment.

The presence of a small group of mature companies in the study could denote that not all companies manage to reach this stage. Those that do may have demonstrated greater stability and the ability to adapt over time. In addition, the mention that mature companies make the highest dividend payments could indicate that these companies are in a phase where generating shareholder value becomes a priority. This would evidence the weaknesses of the business ecosystem to ensure that companies can consolidate in the market.

The results of the logistic regression model highlight the negative influence of the variables age, dividend payment, capital intensity, and revenue growth on the introductory phase of the companies, possibly explained by the lack of experience and the prioritization of reinvestment instead of profit sharing in search of stable and lasting growth over time. This situation is reversed when moving to the growth-maturity stage, as older organizations tend to acquire a better position in the market, which is reflected in a higher level of income and the ability to make or increase dividend payments. Despite their years of life, factors such as declining demand, lack of innovation, and cash flow problems, among others, cause the company to significantly reduce its sales and shareholder compensation, although not necessarily its investment in capital tied up in the last stage of the life cycle.

The loss of dynamism in declining companies represents a significant threat to employment and productivity in developing countries. In this scenario, the ability of management teams to detect deterioration in a timely manner and execute appropriate response strategies becomes a critical need for economic development. Although the study focuses on the Ecuadorian context, its results can be applied to other emerging markets that share similar economic structures and challenges, along with a growing pressure to integrate into globalized economies through innovative strategies. In this context, understanding the relationship between business life cycles from a financial perspective can provide valuable guidance for the design of public policies, business support programs, and institutional frameworks that foster viable and sustainable strategies.

Among the limitations of the study, the restricted access to non-financial information of the companies stands out, which would allow the inclusion of other variables related to the characteristics of the company or management. As future lines of research, it is essential to incorporate variables related to innovation and investment in research and development (R&D), given that these factors are key determinants of competitiveness and business growth. It is also proposed to study new economic sectors within manufacturing or activities such as marketing or construction, which will make it possible to obtain information on the behavior of companies according to the activity they conduct.

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