Abstract

Purpose – This paper aims to revisit the relationship between sales growth and profitability by exploring the direct and indirect effects of cost stickiness in the growth process. Cost stickiness refers to asymmetric variations of costs associated with increases and decreases in sales. Cost stickiness is analyzed as a strategic liability that negatively affects profitability because it contributes to organizational rigidity that causes opportunity costs.

Design/methodology/approach – The empirical design is based on a large sample of 65,599 French firms drawn from the Amadeus database and it covers the period 2010 to 2019. The authors take advantage of the presentation of expenses made by nature in Amadeus to calculate cost stickiness in a more direct way than what is commonly done in the literature. The authors use various regression models to test the hypotheses.

Findings – For firms that experience rapid growth in sales, cost stickiness has a positive moderating effect on the relation between sales growth and profitability because of a higher asset turnover efficiency. However, for firms that experience slow growth, no growth or a decrease in sales, cost stickiness plays a negative moderating effect on the relation between sales and profitability.

Originality/value – This work contributes to the discussion about the conditions under which high growth is associated with greater profitability and conceptualizes cost stickiness as a strategic liability. The empirical context, privately held firms, has been overlooked by previous research.

Keywords Cost structure, Rapid growth, Profitability, Strategic liability, SMEs, Sticky costs

1. Introduction

The idea that the resources firms have play a major role in explaining firm performance is greatly acknowledged in entrepreneurship and strategic management. Several influential theories are grounded on the idea that the access firms have to resources, the way firms acquire, combine and leverage these resources are essential pieces of our understanding of firms’ survival, growth and profitability (McKelvie and Wiklund, 2010; Sirmon et al., 2007). The Penrosean theory of growth (hereafter PTG, Penrose, 1959) is probably the oldest of these theories. According to the PTG, managers have a profit maximization goal that leads them to identify new business opportunities and invest to acquire new resources that fuel
growth. The PTG view of growth is that of a process where firms acquire new resources that allow the realization of business opportunities, leading to additional revenues and profits. Most importantly, the accumulation of resources is an endogenous factor that leads to growth as managers learn to use available slack resources into different ways (Nason and Wiklund, 2018).

The strong influence of the PTG in strategy research led scholars to focus on the characteristics of the strategic assets firms have and on the nature and quantity of the strategic resources firms hold. This, however, only tells “half of the story” as strategic assets also have costs that are often neglected in empirical studies and may become weaknesses depending on the context in which firms operate (Arend, 2004, 2006). Penrose (1959) initially argued that growth through diversification is motivated by the willingness to redeploy assets to more productive uses, which represent a clear acknowledgment of the existence of opportunity costs associated with the presence of assets.

Redeploying resource is, however, complex. Some resources are stickier than others, not only because of intrinsic characteristics but also because of the way they are acquired (Anderson et al., 2003; Mishina et al., 2004). Resources are indeed harder to redeploy when they correspond to sticky costs, while resources easily redeployed can be seen as more variable costs. The extent to which costs are sticky is thus a measure of internal rigidity, because sticky costs correspond to resources that are more difficult to reallocate. Therefore, cost stickiness is likely associated with opportunity costs and correspond to the “second half of the story” of the relationship between resources and performance. Our research is thus motivated by important calls made by strategy researchers about the need to take into consideration opportunity costs in the study of the relation between resources and firm performance (Mackey and Barney, 2013; Argyres et al., 2019). Specifically, for most decisions taken by managers, it is important to consider alternative ways “to do” and not only to oppose the decision “to do” versus the decision “not to do”. Typically, when firms acquire resources, it is important to go beyond the benefits related to acquiring resources, that, for instance, facilitate growth, but also to take into consideration the existence of “hidden” costs that could outweigh the expected benefits.

In this paper, we view resources as a two-sided coin. The upside is that resources can be leveraged for various purposes. The downside, on which we focus, is that resources are also costly to control and reallocate, and that some of these costs are opportunity costs. Indeed, when firms acquire assets “permanently” (meaning as fixed costs), their internal rigidity increases, which reduces their ability to capitalize on new business opportunities that could emerge. Dynamic reallocation of key strategic resources is essential for firm performance (Liebermann et al., 2017; Stagni et al., 2020). Specifically, we want to investigate the impact of cost stickiness on firm performance, a question of importance both for management research and accounting research.

We identify sticky costs [1] as salaries paid to permanent employees and amortization and depreciation expenses. We propose that cost stickiness represents a strategic liability in the sense of Arend (2004). Once acquired, the resources that correspond to sticky costs are difficult to transfer to another party, to dismiss, and bring opportunity costs because they focus the firm’s activities by entrenching the resources. Conversely, firms that have fewer sticky costs, for instance, because they use temporary workers, have more flexibility should they identify alternative, more profitable opportunities (Kuiate and Noland, 2019). Because cost stickiness is a strategic liability, its direct impact on profitability is expected to be negative because it induces opportunity costs, a hypothesis we confirm in our empirical analysis. However, strategic liabilities are only liabilities in given contexts. Firms that experience rapid growth benefit from a higher fraction of sticky costs because of the
operating leverage mechanism. We, therefore, predict and observe that there is a positive moderating effect of the proportion of sticky costs on the relation between rapid growth in sales and profitability.

Our results are based on a large sample of French firms. France is an adequate context to study the role of cost stickiness, because it is a country with strong labor rights protection (Botero et al., 2004). Thus, salaries do represent sticky costs in our context. Moreover, our sample includes mostly privately held, smaller firms, for which the redeployment of assets is much more complicated than for larger, more established privately held firms. Of course, we acknowledge that the strong labor rights protection in France limits the generalizability of our findings to other contexts.

The paper contributes to two streams of literature. First, the paper contributes to the literature in entrepreneurship and strategy on the relationship between growth and profitability by examining the effect of cost stickiness on the profitability of the firm, which is a way to reconcile previous inconsistent findings in the literature (Brush et al., 2000; Markman and Gartner, 2002; Davidsson et al., 2009; Coad et al., 2017). Specifically, we show that cost stickiness negatively affects profitability for most firms, but not for rapidly-growing firms. Indeed, for rapidly growing firms, we observe that sticky costs become a strategic asset, and thus have a positive effect on profitability. The context of rapid growth is particular in the sense that it corresponds to the exploitation of some of the most promising growth opportunities, for which cost stickiness is not problematic, because there are fewer opportunity costs in the context of high growth. The view of cost stickiness as a strategic liability is original in the discussion on how firms develop at the same time core capabilities and core rigidities (Leonard-Barton, 1992; Teece et al., 1997; Arend, 2004), and reach (or fail to reach) organizational ambidexterity (Raisch and Birkenshaw, 2008). The role of cost stickiness in a firm’s strategy is, we suggest, paramount because all firms, regardless of their size, complexity and degree of diversification, have sticky costs that directly influence their performance. We thus add to the discussion on the role of assets and resources for firm performance and show that resources associated with sticky costs represent a double-edged sword in the sense that they have either positive or negative effects on profitability depending on the speed of growth.

Second, the paper contributes to the literature in accounting on cost stickiness in several ways. First, current research on cost stickiness almost exclusively considers large, public-listed firms and neglects privately held firms. Except for the notable works of Prabowo et al. (2018), who consider firms that delisted from public equity markets and Xu et al. (2023), who examine cost stickiness for business group affiliated firms, we know of no previous work that examined cost stickiness in privately held firms, like the small- and medium-sized enterprises (SMEs) population we examine. This shortcoming is problematic for several reasons. First, privately held firms have a more constrained access to financial resources than publicly listed firms held firms, which makes adjustment costs more difficult to cover. Thus, the literature on asymmetric cost behavior overlooks the fact that “sticky” costs are stickier for privately held firms (Xu et al., 2023). Second, privately held firms, which are often small- and medium-sized firms, represent the majority of existing firms and contribute largely to jobs creation and value added in most economies, especially in European countries (European Commission, 2020). Examining privately held firms is thus important for ecological validity purpose and because it has potentially strong implications for practitioners. Third, privately held firms use domestic accounting standards to prepare their financial statements instead of international standards, like IFRS rules. In particular, most privately held firms in Europe, the context of this study, disclose profit and losses (P&Ls) statements that are presented by nature of the expense and not by function of the expense.
Identification of sticky costs is easier in P&Ls presented by nature because direct information about salaries and amortization and depreciation are available.

Our second contribution to the accounting literature is the examination of the relation between sticky costs and firm performance, which is relatively underdeveloped (Chen et al., 2012; Chen et al., 2019; Grau and Reig, 2021; Jang and Yehuda, 2021). Previous research on sticky costs mostly seeks to identify factors that explain asymmetric cost behavior, not the impact of asymmetric cost behavior on performance. By investigating the relationship between cost stickiness and firm performance, we extend conceptually and empirically the discussion on cost stickiness by acknowledging that, depending on the growth context, cost stickiness can have radically different impacts on performance.

The rest of the paper is organized as follows. First, in Section 2, we develop our theoretical framework grounded in rapid growth and cost stickiness research through the concept of strategic liability. Then, Section 3 describes our methodological design, data source, empirical approach and choice of variables. Next, Section 4 presents our results and several robustness tests. Section 5 concludes the paper, discusses the results and their implications and highlights several limitations and avenues for future research.

### 2. Theoretical framework and hypotheses development

#### 2.1 Rapid growth and profitability

Which dimension of firm’s growth best describes the performance of the firm is a highly debated topic in the strategic management and strategic entrepreneurship literature (McKelvie and Wiklund, 2010; Demir et al., 2016). Scholars and public policies often view growth in sales and in employment as important outcomes of the growth process, but these two dimensions are poorly correlated and not interchangeable (Shepherd and Wiklund, 2009). Entrepreneurs and managers view the recruitment of new employees and growth in sales as intermediate steps of the growth process, but the ultimate goal is to increase profits (Achtenhagen et al., 2010). The excessive focus on rates of growth in sales and employees as more or less comparable outcomes has hampered theoretical progress and prevented empirical knowledge accumulation (McKelvie and Wiklund, 2010; Coad et al., 2014).

Furthermore, studying growth and growth speed is highly challenging due to the proliferation of approaches and a lack of articulation between growth measures and growth theories in empirical studies and in seminal theoretical works in the field (Delmar et al., 2003; Coad et al., 2017; Erhardt, 2019).

To be clear, we focus on one dimension of the growth process, namely, the relation between growth in sales and profitability. Our approach is in line with the PTG and the resource-based view in the sense that one key assumption of these theories is that the actions of managers are motivated by a willingness to maximize profits (Penrose, 1959; Pitelis, 2007). Managers decide to grow the firm because they identify new business opportunities that will increase the profits of the firm (Achtenhagen et al., 2010). A fundamental channel that theoretically explains why growth in sales should lead to higher profitability is the increased economies of scale and scope that come with growth (Porter, 1985; Chandler, 1990; Makadok, 1999). The role of economies of scale is stronger for smaller firms that have a limited bargaining power with their suppliers because of a limited reputation that results in higher costs when purchasing key resources (Penrose, 1959; Stinchcombe, 1965; Aldrich and Auster, 1986).

There have been important empirical works on the relation between growth in sales and profitability in the last 20 years. Adopting an Agency theory approach, Brush et al. (2000) observe a positive relation between sales growth and profitability for large, publicly listed firms. They further show that this relation was negatively moderated by the presence of free
cash flow, suggesting that managers engage in “growth at all costs” strategies when the governance of the firm is poor. Markman and Gartner (2002) focus on “extraordinary growth rates” between 559% and 31,000% and observe no positive relation between growth and profitability. They propose that rapid growth, despite the benefits in terms of economies of scale and scope, destabilize the organization of the firm and creates “a series of sizeable hurdles that diminish a firm’s ability to generate profits” (p. 66). Qian (2002) reports that expansion through product diversification and internationalization only increases profitability up to a certain threshold after which it negatively affects profitability on a sample of US SMEs. Davidsson et al. (2009) show that firms that grow without securing profitability first are more likely to experience failure. They show that firms that grow smoothly both in sales and in profits are those that maximize their survival chances. Steffens et al. (2009) document that the desirable state of “high-growth in profits and in sales” is more likely for younger firms than for older firms but not persistent over time.

More recently, Coad et al. (2017) used structural vector autoregression techniques to study high-growth firms and non-high-growth firms and how the various dimensions of growth (in employment, in sales, in profits and in assets) are intertwined. They conclude that for “normally” growing firms, the growth process starts with growth in employment, followed by growth in sales, then growth in profits, and last, growth in assets. For fast-growing firms, however, the imbrication of the dimensions of growth is less clear and these authors report that growth in profits drives growth in other dimensions. Majeed et al. (2021) observe that high-growth is temporary, fueled by innovation and leads to greater returns. Overall, these empirical results present mixed evidence of a positive relation between growth and profitability. The various challenges associated with the management of larger and growing organizations appear to offset the benefits related to economies of scale (Gartner, 1997). Whether growth is positively or negatively associated with sales appears to be an empirical question, so we do not make a formal hypothesis with respect to this relation.

2.2 Cost stickiness and profitability
A key factor of profitability for all firms is the cost structure, defined as the extent to which costs are sticky. Sticky costs are expenses that do not change much (in the short run) when sales revenue changes, such as salaries of permanent employees or depreciation and amortization. Although on a long-enough horizon, sticky costs become less sticky and a fraction of variable costs becomes sticky, the distinction between sticky and variable costs makes sense to measure the extent to which a firm’s operations present a high degree of operating risk. The larger the proportion of sticky costs in the cost structure, the more difficult it is to maintain profitability when sales revenue decreases.

Research in accounting on sticky costs goes back 20 years ago when Anderson et al. (2003) questioned the standard assumption in cost accounting according to which costs vary symmetrically for increases and decreases in sales. They built on the idea that, when future demand is uncertain, managers may decide to take time to assess future demand before adjusting resource allocations and associated costs, because downside resource-allocation adjustments are costly. In the Anderson et al. (2003) model, managers decide to reduce costs only when decreases in demand are stable. The Anderson et al. (2003) study has had a seminal influence in the cost accounting literature (and beyond). For instance, cost stickiness (or asymmetric costs behavior) has been investigated in relation with analysts’ earnings forecast (Weiss, 2010; Kama and Weiss, 2013), agency problems (Chen et al., 2012) and firm profitability (Chen et al., 2019) among others. Empirical evidence consistent with the asymmetric costs behavior theory is abundant and spans multiple countries and industries. In particular, country-specific differences, like the institutional context, play an important
role in explaining asymmetric cost behavior (Malik, 2012; Banker et al., 2013). For instance, the strength of labor rights protection conditions the adjustment costs associated with layoffs during downside resource-adjustments (Golden et al., 2020). Few papers in accounting research have explicitly sought to examine the performance-impact of sticky costs. Notable exceptions are Chen et al. (2012), who examined sticky costs under the lens of agency theory; Chen et al. (2019), who articulated cost stickiness and financing decisions; and Jang and Yehuda (2021), who examined cost stickiness in the context of mergers and acquisitions. We know of no previous study adopting a strategy-based reasoning to the examination of fixed costs.

The profitability of firms that operate with a high proportion of sticky costs is more sensitive to rapid changes in sales revenue, but increases and decreases in sales revenue do not have a symmetric impact on sticky costs, and thus on profitability (Anderson et al., 2003; Chen et al., 2012). A common explanation to this asymmetric cost behavior is that managers take time before making costly resource-allocation adjustments (reduction in sticky costs) in sales decreasing contexts. It is only when sales durably decline that costs will be adjusted. For these reasons, the impact of the cost structure on profitability has been studied conditionally when sales grow (Chen et al., 2019) or in interaction with other operating and environmental factors (Grau and Reig, 2021). When sales grow, a higher proportion of sticky costs positively influences profitability for US publicly listed firms (Chen et al., 2019), but the relation is negative when the direction of sales growth is not specified (Grau and Reig, 2021). The direct impact of the cost structure on a firm's profitability is a question that has been relatively overlooked and that deserves theoretical attention. The fact that firms have more or less sticky costs in their cost structure reflects a decision to acquire new resources and assets (permanent employees, plants, buildings, software, etc) permanently rather than temporarily once a business opportunity has been identified and the decision to invest in this opportunity taken.

We propose that the proportion of sticky costs in the cost structure of the firm is a strategic liability in the sense of Arend (2004). Strategic liabilities are the opposite of the strategic assets defined in Barney (1991) seminal work and extend by others (Powell, 2001; Barney, 1991). Strategic assets that are rare, valuable, inimitable, and not substitutable are sources of sustained competitive advantages that provide firms with rents. When a firm has many strategic assets, its profits are incredibly high. The more a given asset is rare, valuable, inimitable and not substitutable, the higher is the corresponding rent. Conversely, strategic liabilities “damage and destroy a firm’s ability to pursue rents” (Arend, 2004, p. 1006) and have three characteristics that mirror those of strategic assets. Strategic liabilities harm the present and future performance and value of the firm because of the costs they imply (costliness of strategic liabilities). Strategic liabilities are supply-restricted in the industry in the sense that they are scarce (not all the competitors have them) and they cannot be easily transformed in a way that would reduce their negative impact on performance (inconvertibility of strategic liabilities). Last, strategic liabilities are appropriated by the firm, meaning that the firm cannot avoid paying the corresponding costs because doing so would be even more costly. It is not possible to transfer a strategic liability to another party (Arend, 2004).

We show here that the proportion of sticky costs in the cost structure of the firm meets the three characteristics of strategic liabilities. First, the proportion of sticky costs is costly because it causes inefficiencies. Acquiring fixed assets and hiring permanent employees instead of using (for instance) temporary workers increases the proportion of sticky costs and builds at the same time a core capacity and a core rigidity for the firm (Leonard-Barton, 1992). The permanent nature of sticky costs ensures the entrenchment of the corresponding resources in the firm and reflects a clear focus toward a given project. At the same time, it
decreases the ability of the firm to react fast to changes in its environment and to adapt to new business opportunities. As such, the costliness of sticky costs comes from opportunity costs that correspond to missed opportunities because of the current focus of the firm’s resources toward a restricted pool of activities.

The economic inconvertibility of the cost structure is relatively intuitive. It is difficult to adjust the sticky costs part of the cost structure [2] of the firm because the corresponding assets are immobile (tangible assets), highly specialized (intangible assets) and inseparable of other assets (production workers). As noted by Arend (2004, p. 1007), “there are difficulties in isolating and identifying the factors and then either changing them into something else or something else into them”. Typically, it is challenging to identify what can be “converted” in the cost structure of manufacturing firms since permanent employees and the plants in which they work can hardly be considered separately in identifying a strategic liability. There are plenty of examples of firms that prefer closing up plants and dismissing employees than restructuring and reorganizing their facilities. As shown by Maksimovic and Philipps (1998), when demand declines in the industry, there are only modest gains in redeploying assets when firms go bankrupt. The opposite is true, however, in high growth industries, which indicates that the strategic liabilities are only liabilities in given contexts.

The resources that correspond to sticky costs cannot be transferred to another party and are appropriated by the firm, because transferring them would be more costly. It is impossible to relocate plants by simply transferring them and the employees somewhere else because the costs of doing so would be greater than to simply create a new plant and hire new employees. The previous arguments indicate that the proportion of sticky costs in the cost structure meets the defining conditions of strategic liabilities. The higher the proportion of sticky costs in the cost structure of the firm, the stronger are the previous characteristics. It follows that there is a negative relation between the proportion of sticky costs and the profitability of the firm:

\[ H1. \quad \text{There is a negative relationship between the proportion of sticky costs and profitability.} \]

2.3 The moderating role of cost structure on the relationship between rapid sales growth and profitability

The view of the cost structure as a strategic liability does not mean that it will have a negative impact on profitability regardless of the operating context and environment in which a firm operates (Arend, 2004). To a large extent, any asset and capability can be useful in some contexts and detrimental in others (Schoonhoven, 1981). If the demand for a firm’s product and services increases fast, then a high proportion of sticky costs turns out to be a profit-maximization factor because the asset turnover efficiency increases until the maximum capacity of production of the fixed assets and employees is reached. In other words, the operating leverage effect plays a positive role as firms move away from their breakeven point in periods of rapid growth, assuming everything else constant. It seems important to notice that the moderating effect of the cost structure is a different dimension of the economies of scale and scope than that of higher volumes of sales. Economies of scale and scope correspond to lower unitary costs that result from larger volumes of production. As such, economies of scale and scope correspond to a decrease in the operating costs (mostly the variable costs because firms acquire larger volumes of supply at a lower unitary costs) that, in turn, positively affects profitability (Silberston, 1972). If a firm has a high proportion of sticky costs, there is a positive moderating effect on the relation between sales growth and profitability because the firm does not need to acquire new fixed assets or hire new employees while firms that have a high
proportion of variable will be forced to do so to match production and demand. These two dimensions of economies of scale (lower unitary variable and sticky costs) combine when firms grow rapidly and have a high proportion of sticky costs.

Conversely, when sales growth is slow, or even negative, sticky costs become a liability because the corresponding resources are hard to reallocate. The ability to quickly reallocate resources from declining markets to growing markets strongly affects firm performance (Dickler and Folta, 2020). Internal redeployment of resources indeed the sunk costs associated with market entry (Liebemann et al., 2017; Stagni et al., 2020). We thus propose that:

\[ H2. \] The proportion of sticky costs has a positive moderating effect on the relationship between rapid sales growth and profitability.

3. Methods
3.1 Sample
We use the well-known Amadeus database from Bureau Van Dijk to collect our data. Amadeus contains financial and accounting information for publicly listed and privately held European firms. We decide to focus on a single country, France. Our choice is motivated by three arguments. First, labor rights protection varies greatly from one country to another and is very strong in France, making salaries a cost that can be considered as sticky for French firms (Botero et al., 2004). Second, Amadeus' coverage of French firms is good because it is mandatory for French firms to disclose a full set of annual financial statements, including an income statement, a balance sheet and accompanying notes. In countries where such legal reporting requirements are lower, the coverage of Amadeus is relatively poor, especially for smaller firms. For instance, Kalemli-Özcan et al. (2019) identify that Amadeus' coverage of sales turnover, a key variable for our study, represents approximately 80% of the information provided by Eurostat over the period we consider in this study for France. Third, French income statements are presented by nature of the expenses and not by function of the expenses, which makes it possible to identify salaries, amortization and depreciations, purchases of supply and other detailed expenses. In other countries or accounting systems, income statements are presented by function of expenses, including, for example, selling, general and administrative expenses (SG&A) or the cost of goods sold (COGS). Previous studies have shown that SG&A are stickier costs than COGS (Chen et al., 2019), but all the costs included in SG&A cannot be considered as sticky because SG&A is an aggregate of salaries and various purchases of supplies. The fact that Amadeus provides access to expenses classified by nature, and that the coverage of this data are good for French firms greatly facilitates the identification of sticky versus variable costs. Still, it is important to acknowledge that Amadeus has a limited coverage of the smallest firms (especially micro firms) even in the case of France. Thus, we cannot exclude that the number of micro firms included in our sample does not reflect the reality.

We collect our data for the period 2010 to 2019 because Amadeus has a 10-year extraction limit. Both publicly listed and privately held firms are included in the sample. We exclude firms operating in the finance industry. The initial sample includes 92,528 firms and 852,557 firm-year observations. Due to missing values and the calculation of growth rate variables, the final sample used in the regressions includes 65,599 firms and 436,993 firm-year observations.

3.2 Validity of the sticky costs measure
In this section, we assess the sticky nature of our measure of sticky costs following the approach of Anderson et al. (2003) and Chen et al. (2019). We calculate sticky costs as the
The sum of the salaries and the amortization and depreciation expenses. Variable costs are estimated as operating costs (sales revenue less operating income) less sticky costs. The sticky nature of the costs can be estimated as the sensitivity of costs to changes in sales revenue. It is, however, important to distinguish between increases and decreases in sales since the relation between costs and revenues is not symmetric (Anderson et al., 2003). We, therefore, estimate the following model with pooled ordinary least squares to assess the stickiness of costs:

\[
\text{Change in costs}_{i,t} = \beta_0 + \beta_1 \times \text{Change in sales}_{i,t} + \beta_2 \times \text{Change in sales}_{i,t} \\
\times \text{Decline dummy}_{i,t} + \epsilon_{i,t},
\]

where the \text{Change in costs}_{i,t} is the logarithmic change in either sticky, variable or total operating costs between years \(t - 1\) and \(t\) for firm \(i\), \text{Change in sales}_{i,t} is the logarithmic change in sales between years \(t - 1\) and \(t\) for firm \(i\) and \text{Decline dummy}_{i,t} is a dummy variable that equals one if sales decreased between years \(t - 1\) and \(t\) for firm \(i\) and zero otherwise. We use robust standard errors clustered at the company level in the estimation.

The \(\beta_1\) coefficient indicates the change in costs for a 1% increase in sales and the sum \(\beta_1 + \beta_2\) indicates the change in costs for 1% decrease in sales. The closer \(\beta_1\) is to zero, the more sticky are the costs, so \(\beta_1\) is a measure of the stickiness of the costs. If \(\beta_1\) is positive, a negative \(\beta_2\) coefficient reflects asymmetric adjustments of the costs to increases and decreases in sales. The results of the regressions are displayed in Table 1 below. The \(\beta_1\) coefficient is positive and statistically significant (\(p = 0.000\)) for sticky, variable and total operating costs. More importantly, the \(\beta_1\) coefficient is much lower for our measure of sticky costs (0.498) than for variable (0.928) and total costs (0.779). These results confirm that our sticky costs are indeed stickier than the variable costs. Using the “nlcom” command for Stata 16, we estimate whether the sum of the \(\beta_1 + \beta_2\) coefficients is statistically significant. It is the case for the sticky (0.416, \(p = 0.000\)), variable (0.854, \(p = 0.000\)) and total operating costs (0.711, \(p = 0.000\)). The sum of the \(\beta_1 + \beta_2\) coefficient is smaller for sticky costs than for variable costs, which confirms that it is more difficult to reduce sticky costs when sales decrease than to reduce variable costs. These results are totally comparable to those observed by Chen et al. (2019) and validate our choice of measuring sticky costs as salaries plus amortization and depreciation expenses. In the main analysis, we use the proportion of

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Change in sticky costs</th>
<th>Change in operating costs</th>
<th>Change in variable costs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coef.</td>
<td>St. error</td>
<td>Coef.</td>
</tr>
<tr>
<td>Change in sales</td>
<td>0.498</td>
<td>0.003</td>
<td>0.779</td>
</tr>
<tr>
<td>Change in sales * Decline dummy</td>
<td>-0.082</td>
<td>0.004</td>
<td>-0.068</td>
</tr>
<tr>
<td>Constant</td>
<td>0.011</td>
<td>0.000</td>
<td>0.004</td>
</tr>
</tbody>
</table>

| No. of observations | 654,923 | 655,228 | 650,612 |
| F statistics and \(p\)-value | 19,311.01 | 0 | 88,493.65 | 0 | 81,908.76 | 0 |
| \(R^2\)             | 0.267 | 0.764 | 0.641 |

Notes: Standard errors are robust and clustered at the firm-level. \(p\)-values are reported below the coefficients.

Source: Created by author
sticky costs as an independent variable, which is calculated as sticky costs (salaries plus amortization and depreciation) divided by total operating costs.

3.3 Variables

3.3.1 Dependent variable. The dependent variable throughout the paper is a firm’s profitability. We decide to use the return-on-assets (ROA) measure of profitability (operating income divided by total assets), a common measure in strategic management that ensures comparability of the results with most previous papers (Davidsson et al., 2009; Chen et al., 2019; Grau and Reig, 2021). Alternatively, we use other profitability measures as robustness tests and obtained comparable results as indicated in Section 4.4.

3.3.2 Independent variables. There are two independent variables in this study, namely, rapid growth in sales and the proportion of sticky costs in the cost structure. Rapid growth in sales is measured as a dummy variable that equals to one if a given firm’s annual growth rate is in the last percentile of the industry annual growth rate distribution and zero otherwise. This measure is commonly accepted in the rapid growth literature but implies a potential bias toward smaller firms that tend to over represent when relative growth measures are used (Coad et al., 2014; Demir et al., 2016; Erhardt, 2019). Thus, we check whether the results hold when we exclude the smallest firms, those with less than ten employees and obtain comparable results. The results of this alternative regression are unreported but available upon request. We also use a different threshold for rapid growth and consider alternatively consider firms in the last five percentiles of the growth rate distribution as rapidly growing firms. The results were again comparable. We already presented our measure of sticky costs in the previous section.

3.3.3 Control variables. The study of firm’s profitability has highlighted the need to include several control variables in our research design to alleviate the risk that unobserved factors are correlated with our dependent variable. First, we control for firm’s size (natural logarithm of total assets) and age (number of years since firm’s creation) because larger and older firms have a more established reputation and bargaining power with their suppliers that increase profitability (Penrose, 1959; Stinchcombe, 1965; Aldrich and Auster, 1986). Second, the existence of financial slack resources is an important factor of profitability according to the behavioral theory of the firm (Cyert and March, 1963). We, therefore, include a firm’s cash holdings (cash divided by total assets), working capital (inventories plus receivables less payables divided by sales) and financial leverage (short term financial debt plus long-term financial debt divided by total assets) as measures of financial slack, recoverable slack and potential slack (Bradley et al., 2011b; Bradley et al., 2011a). Because the relation between various forms of financial slack and profitability is nonlinear, we also include the squared terms of cash holdings, working capital and financial leverage in our regression.

Third, we decide to include the one-year lagged profitability of the firm in our model because profitability is persistent over time. Fourth, we include three industry-level control variables: the annual mean industry ROA, the industry competition (Hirschmann–Herfindahl index, annual sum of the squared market shares of the firms in a given industry) and the mean size of the competitors. All industry-specific calculations use the four-digit Standard Industrial Classification (SIC) codes. We calculate each the mean for each variable with the data of our sample. For instance, the annual industry-mean ROA is the mean of the ROA of all the firms in the sample that operate in a given industry. Fifth, we include year dummies to account for the influence of macroeconomic conditions. All our variables are winsorized at the first and last percentiles to limit the influence of outliers.
3.4 Econometric approach

We work with panel data, and our dependent variable, profitability, is driven likely driven by many factors that we cannot explicitly observe because of limitations of our data set. To control for unobserved heterogeneity at the firm-level, we can use either fixed or random effects. A Hausman test rejects the use of random-effects (chi-squared = 138,979.67, \( p = 0.000 \)) so we decide to use a firm and year-fixed effects model to conduct our empirical analysis. We do not use a mean-adjusted value of the dependent variable, because even profitability is industry-dependent, the use of an industry-mean-adjusted dependent variable can lead to inconsistent estimates [3] (Gormley and Matsa, 2014). We use robust standard errors clustered at the firm-level in all the regressions. We use as a control estimation an instrumental variable (IV) approach and the results obtained are similar. We detail this alternative approach in the robustness tests.

4. Results

4.1 Univariate analysis

The first step of our empirical analysis is the analysis of the descriptive statistics of the variables we use. We present a summary of the descriptive statistics in Table 2 below. The average firm has a profitability of 6.8% [4] (median is 6.0%) and salaries and depreciation and amortization represent on average 53.1% of total assets, which indicates that the proportion of sticky costs is high. By construction, there is 1% of rapidly-growing firms in all industry-year. The average firm is 18.9 years old (median is 12) and holds 1.6 M euros of total assets (median is 1.3 M), which means that most of our firms are small but not especially young. On average firms, firms hold 19.7% [5] of their total assets as cash and equivalents, 15.7% [6] as working capital and the financial leverage represents 12.1% of the total assets [7]. With respect to profitability and cash, our sample firms are largely comparable to the average population of French firms, but they hold more working capital and are less indebted than the average population of French firms. When compared to other studies that used a similar source of data, our sample firms hold more cash and less debt (Botoc and Anton, 2017; Anton and Nucu, 2022).

We now compare the two subsamples of rapidly-growing firms and nonrapidly-growing firms to see if there are statistically significant differences in the means of the variables for these two subsamples. We present these refined descriptive statistics in Table 3. Rapidly-

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>SD</th>
<th>25th percentile</th>
<th>Median</th>
<th>75th percentile</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROA</td>
<td>0.068</td>
<td>0.121</td>
<td>0.015</td>
<td>0.060</td>
<td>0.120</td>
</tr>
<tr>
<td>Sticky costs</td>
<td>0.531</td>
<td>0.380</td>
<td>0.264</td>
<td>0.442</td>
<td>0.694</td>
</tr>
<tr>
<td>Rapid growth dummy</td>
<td>0.013</td>
<td>0.115</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>Age</td>
<td>23.377</td>
<td>14.330</td>
<td>12.000</td>
<td>21.000</td>
<td>31.000</td>
</tr>
<tr>
<td>Size</td>
<td>7.408</td>
<td>1.604</td>
<td>6.368</td>
<td>7.203</td>
<td>8.315</td>
</tr>
<tr>
<td>Cash</td>
<td>0.197</td>
<td>0.187</td>
<td>0.043</td>
<td>0.140</td>
<td>0.304</td>
</tr>
<tr>
<td>Working capital</td>
<td>0.157</td>
<td>0.211</td>
<td>0.040</td>
<td>0.123</td>
<td>0.216</td>
</tr>
<tr>
<td>Financial leverage</td>
<td>0.121</td>
<td>0.153</td>
<td>0.003</td>
<td>0.065</td>
<td>0.182</td>
</tr>
<tr>
<td>Mean industry ROA</td>
<td>0.064</td>
<td>0.025</td>
<td>0.051</td>
<td>0.066</td>
<td>0.079</td>
</tr>
<tr>
<td>Industry competition</td>
<td>0.002</td>
<td>0.029</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>Mean size of competitors</td>
<td>7.020</td>
<td>0.834</td>
<td>6.344</td>
<td>7.010</td>
<td>7.507</td>
</tr>
</tbody>
</table>

Note: There are 436,993 firm-year observations
Source: Created by author

Table 2. Descriptive statistics
growing firms are less profitable, have a lower proportion of sticky costs, are younger, larger, hold less cash, more working capital and are more indebted than nonrapidly growing firms. These observations are in line with the statistics reported in Boţoc and Anton (2017), who studied a population of high growth firms. The most important information is likely the fact that rapidly-growing firms hold a lower fraction (38.5% versus 53.3% of total assets) of sticky costs (permanent workers and tangible and intangible assets) than nonrapidly growing firms.

Next, we present a correlation matrix between the variables used in this study in Table 4 below. Profitability (ROA) is negatively correlated with the fraction of sticky costs, which was expected and with rapid-growth, which is unexpected according to our hypotheses. Profitability is also negatively correlated with size, age, working capital and financial leverage, but positively correlated with cash holdings. Because there are statistically significant correlations between our independent and control variables, we calculate the variance inflation factors (VIF) to ensure that multicollinearity does not severely affect our data. The highest VIF is 2.30 and the mean VIF is 1.47, so well below the commonly accepted threshold of five above which multicollinearity is an issue.

### Table 3.
Descriptive statistics for rapid-growth firms versus nonrapid-growth firms

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean (nonrapid-growth)</th>
<th>Mean (rapid-growth)</th>
<th>t-statistics (difference in means)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROA</td>
<td>0.068</td>
<td>0.062</td>
<td>3.852</td>
<td>0.000</td>
</tr>
<tr>
<td>Sticky costs</td>
<td>0.533</td>
<td>0.385</td>
<td>29.467</td>
<td>0.000</td>
</tr>
<tr>
<td>Age</td>
<td>23.440</td>
<td>18.735</td>
<td>24.933</td>
<td>0.000</td>
</tr>
<tr>
<td>Size</td>
<td>7.403</td>
<td>7.781</td>
<td>−17.884</td>
<td>0.000</td>
</tr>
<tr>
<td>Cash</td>
<td>0.197</td>
<td>0.162</td>
<td>14.350</td>
<td>0.000</td>
</tr>
<tr>
<td>Working capital</td>
<td>0.157</td>
<td>0.199</td>
<td>−15.026</td>
<td>0.000</td>
</tr>
<tr>
<td>Financial leverage</td>
<td>0.121</td>
<td>0.154</td>
<td>−16.390</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Notes: There are 431,157 nonrapid-growth firm-year observations and 5,836 rapid-growth firm-year observations

Source: Created by author

### Table 4.
Correlation matrix

<table>
<thead>
<tr>
<th>Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  ROA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2  Sticky costs</td>
<td>−0.056</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3  Rapid growth dummy</td>
<td>−0.006 −0.045</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4  Age</td>
<td>−0.063 −0.096 −0.038</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5  Size</td>
<td>−0.039 −0.425 0.027 0.359</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6  Cash</td>
<td>0.249 0.069 −0.022 −0.003 −0.251</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7  Working capital</td>
<td>−0.058 −0.192 0.023 0.120 0.149 −0.132</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8  Financial leverage</td>
<td>−0.149 −0.077 0.025 −0.145 0.017 −0.279 −0.013</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9  Mean industry ROA</td>
<td>0.188 0.161 −0.026 −0.131 −0.171 0.096 −0.043 −0.076</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 Industry competition</td>
<td>−0.011 −0.043 0.087 0.041 0.143 −0.038 0.006 0.015 −0.054</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 Mean size of competitors</td>
<td>−0.057 −0.324 0.039 0.220 0.471 −0.178 0.144 0.013 −0.257 0.078</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: There are 436,993 firm-year observations. Correlation coefficients higher than 0.004 in absolute value are statistically significant at the 0.05 level

Source: Created by author
4.2 Multivariate analysis

In this section, we present the results of our firm and year-fixed regressions on the relationship between profitability (dependent variable), rapid-growth (independent variable) and the fraction of sticky costs (independent variable). According to our hypotheses, we expect a positive coefficient for the relation between rapid-growth and profitability, a negative coefficient for the relation between the proportion of sticky costs in the cost structure and profitability and a positive coefficient for the interaction term between rapid-growth and the proportion of sticky costs. The results of the estimations are presented in Table 5. Model 1 includes the rapid-growth dummy and the proportion of sticky costs as independent variables. As expected, the rapid-growth term is positive and statistically significant ($p = 0.000$) indicating that rapid-growth is related to higher profitability. As expected, the term for the proportion of sticky costs is negative and statistically significant ($p = 0.000$), indicating that firms with a higher proportion of sticky costs have a lower profitability ($H1$).

Many empirical studies report nonlinear relationships between the role played by resources and firm performance (Bradley et al., 2011a). Even if we made no theoretical prediction about a nonlinear relation between sticky costs and profitability, we check the linearity of the relation by including the squared term of the fraction of sticky costs in Model 2 of Table 5. The linear and the squared terms of the fraction of sticky costs are negative and statistically significant ($p = 0.000$), suggesting a possible quadratic, inverted U-shape relation between sticky costs and profitability. The turning point is, however, negative and equals $-5.53$, so largely outside the data range for the fraction of sticky costs that is positive by definition. In other words, there is no inverted-U shaped relation, but the (negative) slope of the relation between these two variables is not constant and decreases (becomes more negative) when the fraction of sticky costs increases.

To refine the empirical analysis, we decide to calculate the annual industry-mean level of sticky costs and calculate the deviation to this mean for each firm-year observation. Our intuition is that the change in the slope we identified in Model 2 depends on whether firms hold a higher or a lower fraction of sticky costs than the annual-industry mean fraction of sticky costs. Indeed, it is important to take into account both firm-specific and industry-specific factors in the study of firm performance and high growth (Dillen and Vandekerkhof, 2021). To present the results more clearly, we also create a dummy variable $D$ that equals to one if the deviation to the industry-mean fraction of sticky costs is positive and zero otherwise. The dummy variable $1-D$ thus equals to one if the deviation to the industry-mean fraction of sticky costs is negative and zero otherwise. We include in the regression the interaction terms between this dummy variable $D$ and the deviation to the industry-mean fraction of sticky costs and between the dummy $1-D$ and the deviation to the industry-mean fraction of sticky costs. The results are displayed in Model 3 of Table 5. They show that for firms that have a fraction of sticky costs below the industry-mean, the coefficient is $-0.078$ ($p = 0.000$) and for firms that have a fraction of sticky costs above the industry-mean, the coefficient is much higher at $-0.134$ ($p = 0.000$). The difference between these two coefficients is statistically significant at $p = 0.000$. In terms of economic significance, a one-standard deviation increase in the proportion of sticky costs decreases profitability by 5.57% for firms with a fraction of sticky costs below the industry-mean. A one standard deviation increase in the proportion of sticky costs decreases profitability by 9.61% for firms with a proportion of sticky costs above the industry-mean.

We turn our attention to $H2$ with the results of Model 4 in Table 5 in which we include the interaction terms between the rapid-growth dummy variable and the negative and positive deviations to the industry-mean proportion of sticky costs. For firms that have a fraction of sticky costs above the industry-mean and that are rapidly growing, the...
Table 5.
Firm and year-fixed effects regression of the relation between rapid growth, resource entrenchment and profitability
<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coef.</td>
<td>St. error</td>
<td>Coef.</td>
<td>St. error</td>
</tr>
<tr>
<td>Mean industry ROA</td>
<td>0.662</td>
<td>0.016</td>
<td>0.663</td>
<td>0.016</td>
</tr>
<tr>
<td>Industry competition</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>Mean size of competitors</td>
<td>-0.002</td>
<td>0.004</td>
<td>-0.003</td>
<td>0.004</td>
</tr>
<tr>
<td>Constant</td>
<td>0.095</td>
<td>0.030</td>
<td>0.083</td>
<td>0.030</td>
</tr>
<tr>
<td></td>
<td>0.001</td>
<td>0.005</td>
<td>0.006</td>
<td>0.006</td>
</tr>
<tr>
<td>Firm and year fixed effects</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>No. of observations</td>
<td>436,993</td>
<td>436,993</td>
<td>436,993</td>
<td>436,993</td>
</tr>
<tr>
<td>F-statistics and p-value</td>
<td>909.10</td>
<td>0.000</td>
<td>874.51</td>
<td>0.000</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.663</td>
<td>0.663</td>
<td>0.663</td>
<td>0.663</td>
</tr>
</tbody>
</table>

**Notes:** Standard errors are clustered at the firm level. $p$-values are reported below the coefficients.

**Source:** Created by author
The coefficient for the impact of rapid growth is $0.027 + 0.031 = 0.058$. The interaction term between rapid-growth and a negative deviation to the industry-mean fraction of sticky costs is not statistically significant. In other words, rapid-growth is always related to higher profitability, but for firms that have a fraction of sticky costs above the industry-mean, the relation is more than twice as strong. This result provides support to $H2$ and suggests that rapidly growing firms benefit from a higher proportion of entrenched, permanently acquired resources that are used in an efficient way in the rapid-growth context.
4.3 Additional results

In this section, we provide more detailed evidence about the categories of firms for which our hypotheses are corroborated. Indeed, we considered so far all the firms available in Amadeus and it is important to assess whether the results are valid for all firms or not. We first refine the empirical analysis by distinguishing between large firms and SMEs because economies of scale depend on the size of the organizations (Makadok, 1999). SMEs are defined according to the criteria of the European Commission as firms that have less than 250 employees and either sales revenue lower than 50 M euros or total assets lower than 43 M euros. Firms that do not meet these criteria are considered large. We present the results of the estimations by firm size subsamples in Table 6.

As can be observed, the coefficients of all our independent variables, including the interaction terms between them, have the same sign for both large firms and SMEs. However, for large firms, the relation between rapid-growth and profitability is not statistically significant ($p = 0.159$). We observe a positive relation between rapid growth and profitability in the case of SMEs only. We also observe that the relation between the fraction of sticky costs and profitability is negative for both large firms and SMEs. For both subsamples, we observe that the relation is more negative for firms that have a fraction of sticky costs above the annual industry-mean. This provides support to $H_1$ regardless of firm size. With respect to the interaction terms, we find support for $H_2$ for SMEs only, as the interaction terms are not statistically significant for large firms. Taken together, these results suggest that the benefits of rapid-growth in terms of profitability are larger for SMEs, which is consistent with the idea that smaller firms that grow fast benefit more from economies of scale. For large firms, sticky costs represent additional rigidity and negatively affect profitability.

It is important to look specifically at firms that have a negative profitability because these firms either have not reached profitability yet or experienced a decline in profitability (Davidsson et al., 2009). For firms with negative profitability, we see no statistically significant impact of rapid growth. The sticky costs ratio is however still negatively associated with profitability and this relation is statistically significant. This observation echoes the view of Davidsson et al. (2009), who identified that growing fast without ensuring strong profitability does not lead to long-term performance.

4.4 Robustness tests

In this section, we perform several additional tests to ensure the robustness of our findings. First, we check whether our results depend on the choice of the variables we made. We use an alternative measure of profitability, ROE instead of ROA, and an alternative threshold to define rapidly-growing firms as those in five highest percentiles of the annual sales growth distribution of their industry. The results of the regressions, unreported for brevity but available upon request, confirm the results.

Second, our previous empirical analysis revealed that the negative relation between the fraction of sticky costs and profitability is more pronounced when the fraction of sticky costs is above the industry-mean. However, one could argue that considering the industry-mean as a threshold does not make sense for smaller and larger firms that can endogenously decide to set the fraction of sticky costs at a given level depending on their size (among other variables). To ensure that our measure of sticky costs is not biased by these considerations, we use a two-stage regression approach. In the first stage, we regress the fraction of sticky costs on the firm size, age and cash holdings, because these variables are good proxies of the market position, reputation and availability of versatile resources (Nason and Wiklund, 2018). The concept of resource...
versatility is close to the stickiness of costs in the sense that sticky costs are, by essence, not versatile and that versatile resources are not sticky. These first stage regressions are performed separately for each industry-year. Then, we use the residuals of these first stage regressions as measures of the deviation to the industry-standard level of sticky costs and include them as the independent variable in our firm and year-fixed effects regressions of profitability. The results are unreported for brevity but available upon request. Overall, the results observed with this alternative measure of sticky costs largely corroborate our previous observations. For large firms, the proportion of sticky costs is negatively related to profitability, but only for firms that have a fraction of sticky costs that is above the industry-mean. It is also worth noting that in this specification, we observe a positive relation between rapid-growth and profitability for large firms, which was not the case with our initial measure of sticky costs. For SMEs, we observe that the coefficient of the interaction term between rapid-growth and a below industry-mean fraction of sticky costs is negative and statistically significant so the benefits of rapid-growth in terms of profitability are offset by a low level of sticky costs.

Third, it is important to acknowledge that our fixed-effects model may not adequately control for the endogenous determination of sticky costs and profitability. We thus decide to rely on alternative approach based on IV. We use the mean region – and industry – sticky costs ratio using Nomenclature of Territorial Units for Statistics code at the third-level to identify regions in which firms operate and two-digit SIC codes to identify the industry. Such an instrument seems suited because geography is considered a factor that affects corporate decisions but not performance (Gogineni et al., 2022). Our point is that firms based in the same region and which operate in the same industry are likely to have close organizational structures, including their cost structure. We do not report the results for brevity, but we obtain results comparable to those of the main estimations.

5. Conclusion and discussion

5.1 Discussion

In this paper, we investigate whether the way firms acquire resources, and the associated stickiness, influences their performance. Building on the concept of strategic liability, we proposed that the proportion of sticky costs (resources permanently acquired) negatively affect profitability because it creates a rigidity in the firm’s operations by focusing them toward a limited set of activities. We integrate this idea in the study of the relation between sales growth and profitability, based on economies of scale. Our results show that rapid growth in sales has a positive relation with profitability that is positively moderated by a high proportion of sticky costs. However, the relation between the proportion of sticky costs in the cost structure and profitability is negative. This provides support to the idea that the proportion of sticky costs represents a strategic liability, a result we confirm for firms of all sizes. Our results echo the findings of Silge and Wöhmann (2021), who observed that investors negatively value cost stickiness for publicly listed firms.

Our work brings a new step in the discussion on cost stickiness in accounting research by showing that the relationship between cost stickiness and firm performance is contingent on growth speed. Previous research documented a negative relationship between cost stickiness and firm performance (Chen et al., 2012; Jang and Yehuda, 2021), an observation we confirm with the notable exception of the high growth context. Our conceptualization cost stickiness as a strategic liability helped bring forward this important boundary condition. Cost stickiness is indeed associated with less internal flexibility, but this lack of flexibility is not problematic in high-growth contexts.
A key practical takeaway from our study is the fact that firms should not underestimate the opportunity costs associated with a rigid cost structure. We only observe a positive impact of a rigid cost structure in the context of high growth, which is by definition rare and hardly predictable. Thus, for most entrepreneurs and managers, it seems wise to adopt a cautious approach and maintain a flexible cost structure. Interestingly, the positive moderating role of sticky costs on the relation between sales growth and profitability is characteristic of SMEs. The fact that economies of scale contribute more to the profitability of SMEs than of larger firms in the context of high growth is not surprising (Makadok, 1999) although previous results on this topic have been mixed (Markman and Gartner, 2002; Coad et al., 2017).

5.2 Limitations and directions for future research
This study has, of course, limitations. While we were able to provide a new perspective on the role played by resources on profitability with our focus on sticky costs thanks to our data set, we acknowledge several limitations of the Amadeus database as well. The most severe limitation is the absence of detail related to the direction of sales growth. Amadeus only provides the overall level of sales and does not allow the distinction between sales growth that results from a product diversification strategy, an expansion strategy or mergers and acquisitions. The only dimension of growth for which we could obtain data in Amadeus is the fraction of sales in foreign countries, which is a proxy of internationalization of activities. However, the coverage for this variable is dramatically poor, especially for privately held, smaller firms, so we were unable to include this variable in our analysis. The role of growth mode (external versus internal growth) is not anecdotal, because cost stickiness in the context of mergers and acquisitions is associated with lower performance (Jang and Yehuda, 2021).

The fact that we cannot identify more precisely the direction of sales growth is both a theoretical and an empirical limitation. Indeed, the process of growth is multidimensional by nature and the relation between sales growth and profitability is likely contingent to the growth mode (McKelvie and Wiklund, 2010), especially for smaller firms (Ebben and Johnson, 2005). The economies of scale and scope associated with larger size and sales growth typically depend on whether firms decide to diversify their activities or not. Past research has highlighted that the relation between resource characteristics and growth depends on the growth strategy of the firm (Mishina et al., 2004). It would, therefore, be interesting to see future research examine whether the relation between rapid-growth and profitability changes depending on whether firms pursue market expansion or diversification strategies and what role entrenched resources and the cost structure of the firm play in this relation.

Another important limitation is related to the French context. It is well-known that France has a very strict labor rights protection system (Botero et al., 2004). While this context facilitates the identification of salaries as sticky costs, it also limits the generalizability of our findings to other institutional settings. Indeed, higher labor adjustment costs have been found to be associated with increased cost stickiness (Banker et al., 2013). It would, therefore, be interesting to conduct replication studies in other countries where labor rights protection is weaker to confirm the validity of the results and to examine whether and to what extent labor adjustment costs play a moderating role in the relationship between cost stickiness and firm performance.

Last, we consider out of the scope of the paper to examine the influence cost stickiness can have on firm performance through financing conditions. Higher cost stickiness is associated with increased operating risk that mature firms counterbalance with lower indebtedness to
limit financial risk (Chen et al., 2019). Costa et al. (2021) report that cost stickiness is more pronounced for financially constrained firms. Because fast-growing firms are financially constrained (Bottazzi et al., 2014), it would be highly interesting to examine the cost stickiness-financial constraints nexus and its influence on rapid growth and profitability.

5.3 Conclusion
Investigating the role played by the modes of resource acquisition in the study of growth as a process is and remains a promising field of research (McKelvie and Wiklund, 2010; Nason and Wiklund, 2018). We try to push research outside the consideration of internal, external and hybrid growth modes, which have been relatively well-explored, to the trade-off all firms, especially the smallest ones, face when deciding to hire employees (temporarily or permanently) and purchasing assets (definitely or via leasing). We hope that the contribution of this paper will stimulate research in this domain.

Notes
1. The concept of sticky costs has first been introduced in the accounting literature by Anderson et al. (2003).
2. Sunk costs, like research and development or marketing expenses, also play an important role in the cost structure of the firm and, in turn, on firm outcomes like sales turnover (Liebermann, 2022). We do not play down the role of sunk costs but view their role as being out of the scope of the present study. Besides, we do not have valid empirical proxies to examine sunk costs in Amadeus.
3. Gormley and Matsa (2014) recommend against the use of industry-mean adjusted dependent variable as an additional control. In the reported regressions, we include the industry-mean profitability. We also perform the regressions without this control variable and the results are the same.
4. By comparison, the average ROA for the global population of French firms is 5.2% and for SMEs about 7.5% in recent years (Observatoire du Financement des Entreprises, 2019).
5. By comparison, the average cash ratio for the global population of French firms is about 14.0% and for SMEs about 19.0% in recent years (Observatoire du Financement des Entreprises, 2019).
6. By comparison, the average working capital for the global population of French firms is about 4.4% and for SMEs about 9.0% in recent years (Observatoire du Financement des Entreprises, 2019).
7. By comparison, the average financial leverage for the global population of French firms is about 40% and for SMEs about 28% in recent years (Observatoire du Financement des Entreprises, 2019).

References
Cost stickiness as a strategic liability


Further reading

Corresponding author
Vivien Lefebvre can be contacted at: vivien.lefebvre@em-strasbourg.eu

For instructions on how to order reprints of this article, please visit our website: www.emeraldgrouppublishing.com/licensing/reprints.htm
Or contact us for further details: permissions@emeraldinsight.com