

# SMALL FIRM PERFORMANCE: PATTERNS OF EVOLUTION IN GROWTH – PROFITABILITY SPACE

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## ABSTRACT

The aim of this paper is to provide a better understanding of the evolution of small firm performance. We do so by studying performance changes on a two dimensional “growth – profitability performance space”.

It is well established that both growth and profitability are important dimensions of SME performance. The majority of earlier studies tend to focus on the evolution of firm growth or profitability separately. Alternatively, they explore the impact of growth on profitability and vice versa.

A primary difficulty in studying this phenomena is the complex inter-relationship between growth and profitability. There are sound theoretical arguments that growth affects future profitability, and that profitability allows future growth. Of course, industry conditions and economic cycles affect the competitiveness of the market environment, and in turn both growth and profitability of firms. Microeconomic perspectives argue that a trade-off often exists between short term growth and profitability. Many econometric studies have empirically established relationships between growth and profitability, but the exact nature of these relationships and causality remains unresolved.

These considerations lead us to the central research question of this paper: *How do young and small firms evolve on the dual performance dimensions of profitability and growth?* The current paper adds to our knowledge of firm evolution by studying the dual performance measures of growth and profitability simultaneously. We examine the longitudinal behaviour of firms using the ABS BLS database of SME from 1995-1998.

In our analysis we assign firms to initial performance positions (low, medium, high) along the two performance dimensions (growth and profitability), for a total of nine groups. Consistent with previous research that reveals younger firms have higher average growth rates, our results indicate young firms are most likely to be in the higher growth performance groups. Interestingly, they are most likely to have either relatively high profits (Star Group) or relative low profits (Growth Focus). Of these two groups, not surprisingly, firms in the Star group have much better future

performance. However, the Growth Focus firms on average have poorer future performance than all other firms (other than low growth / low profit). In general, firms in the high profit groups had substantially better future prospects than firms in low performance groups. As firms age further, they are most likely to transition towards the Middle, Low Growth and Poor groups. Older firms are particularly unlikely to be in the high growth / low profit group.

## INTRODUCTION

The development and evolution of young firms is a central theme in entrepreneurship research. The outcome in terms of firm performance, particularly growth, has received considerable empirical and theoretical attention. Despite the impressive work to date, the simultaneous pattern of growth and profit performance evolution of small and/or young firms has received relatively little empirical attention. The purpose of this paper is to provide some additional insights into this phenomenon through empirical evidence of Australian SMEs.

The paper is organised as follows. We first look at profitability and growth as performance measures for SMEs. Following this we review the empirical evidence relating to growth – size – age and profitability – growth. This is followed by a review of the principal theoretical arguments underpinning our understanding of firm growth-profit evolution. We then make the case that insights can be gained by following the trajectory of growth and profit performance as separate, distinct performance measures. We apply this thinking to explore the evolution of a large panel of Australian SMEs over a four year period. The paper concludes with a discussion of the implications for both theory and practice.

## PROFITABILITY AND GROWTH AS PERFORMANCE MEASURES?

Profitability is universally recognized as a measure of business success. Given that entrepreneurship has even been defined as the creation of rents through innovation (Stewart, 1991) where rents are defined as above average earnings relative to competitors (Norton, 2002), then profitability measures are particularly appealing. Echoing the shift in strategy and finance away from accounting measures of profitability towards market based measures of profitability, Dess et al (2003) suggest that entrepreneurship research might benefit from the inclusion of more sophisticated measures of financial performance such as economic value added (EVA) and market value added (MVA). These measures provide additional insights since they incorporate the notions of cost of capital and the inherent riskiness of the firm's operations. This said, accounting profitability remains a widely used measure of firm success.

The same may have been true for growth a couple of decades ago, but after a long period of emphasis on core competencies and even downsizing this is no longer generally the case. In the entrepreneurship literature, however, it seems that growth is commonly interpreted as evidence of success. In fact, a comprehensive search of entrepreneurship research<sup>1</sup> shows that 'success' as title word is about twice as common as words reflecting firm level growth, and five times more common than profit and its derivatives. Further, a deeper look reveals that in many of the works 'success' is operationalized as 'growth', often without explicit justification for making this

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<sup>1</sup> This particular search was performed in the ICE part of the Julia database at [www.hj.se/ice](http://www.hj.se/ice). This database includes journal articles, books, research reports and even chapters in collective volumes.

connection. This leads to the suspicion that part of the reason why success is operationalized as growth rather than as some form of financial performance is that researchers tend to use available rather than the most relevant data (Cooper, 1995).

However, some justification can be put forward for interpreting growth as success, or using growth as the best available proxy. Reliable data on financial performance can be impossible to collect from small firms and may be irrelevant for very young ones (Brush & Vanderwerf, 1992; Chandler & Hanks, 1993; Van de Ven, Hudson, & Schroeder, 1984; Walsh & White, 1981). Further, there seems to be widespread consensus that larger firms have a higher chance of survival than smaller firms (Aldrich & Auster, 1986; Davidsson, Lindmark, & Olofsson, 1998; Stinchcombe, 1965; Storey, 1994). Under the assumption that firms show poor growth as well as poor financial performance shortly before they cease trading this would also indicate a positive relationship between growth and profitability. (J Wiklund, 1998) found just that; his multiple indicators of growth and financial performance, respectively, tended to be positively related to one another. This led him to conclude that 'Since growth and economic performance are positively related, growth may be a suitable strategy for those small firms wishing to improve their financial returns' (p. 215).

While firm founders in the non-empirical literature are often portrayed as growth-orientated risk takers, the growth intentions of founders of young and nascent firms in the real world tend to be very modest (Delmar & Davidsson, 1999; Dennis & Solomon, 2001) and actual growth of young firms not much more impressive (e.g. (Dahlqvist, Davidsson, & Wiklund, 2000)). The fact is that the overwhelming majority of firms never enter onto a growth trajectory; they are born small and remain small for their entire existence (Aldrich, 1999; Davidsson et al., 1998; Reynolds & White, 1997; Storey, 1994). Most new firms are imitative entrants in mature industries (Aldrich, 1999) and they may as a result simply lack profitable growth opportunities. For example, (Davidsson, 1989b) found that 40 percent of the business founders in his sample believed doubling their firm's size would not improve their personal income stream. Rightly or not, a majority also believed growth would make their firms more vulnerable and hence constitute a threat to the very survival of the firm. It has also been shown that growth is perceived to be associated with a range of other potential outcomes that may make expansion less attractive, even if it were profitable (Sapienza, Korsgaard, & Forbes, 2003; J. Wiklund, Davidsson, & Delmar, 2003).

Arguably then, growth as such is not a goal many business owners pursue. This is particularly true for employment growth. As a case in point, (Gray, 1990) reported survey results showing that zero percent (0%) of the business owner-managers' in the studied sample regarded growth in employment as an important goal. If growth is achievable at all, it is for most business owner-managers associated with both positive and negative outcomes. For growth to be attractive it has to be profitable; preferably profitable enough to make up for the adverse effects growth may have along other dimensions.

(Lumpkin, 1996) suggested that performance is multidimensional in nature and as such multiple measures of performance should be considered. Echoing these thoughts, Dess et al (2003) suggest that multiple measures of economic and financial outcomes such as sale growth and profitability must be included in order to capture inherent tradeoffs between efficiency and effectiveness. The relationship between the different measures of performance can be complex

in nature with growing firms not necessarily performing better when financial performance is taken into account. Firms may also trade off performance along different dimensions, choosing for instance, to trade-off long term growth for short term profitability (Zahra, 1991). As such, the relationship between these measures warrants further research if a better understanding of firm performance is to be gained.

## GROWTH-PROFIT DYNAMICS – EMPIRICAL EVIDENCE

### Firm Growth, Size and Age

The relationship between firm growth, size and age has received a lot of attention empirically. Empirical evidence has quite clearly overturned Gibrat's Law, which holds that firm growth and size are independent. Although there is some evidence that the law holds for larger firms (Hall, 1987; Kumar, 1985) the work by Evans (1987a; 1987b) and Dunne, Roberts and Samuelson (1988; 1989) show that firm (proportional) growth reduces with both firm size and age. In addition, the variance in firm growth also decreases with size and age.

More recent work has extended these findings to a wider range of contexts (P. Dunne & Hughes, 1994; Farinas & Moreno, 2000; Honjo, 2004; Rodriguez, Molina, Perez, & Hernandez, 2003; Sleuwaegen & Goedhuys, 2002; Yasuda, 2005). Interestingly though, both Das (1995) and Shanmugan et al. (2002) revealed that in the developing economy of India, while growth rates diminished with size, they increase with age (for a given size).

### Growth-profitability relationship

With several theoretical perspectives suggesting that growth and profitability are positively related one would expect the empirical evidence to clearly demonstrate a positive association between the two, whether or not the research can determine the direction of causality. Accordingly, based on an impressive meta-analysis of 320 studies (Capon, Farley, & Hoenig, 1990) concluded that 'Growth, analyzed in 88 studies, is consistently related to higher financial performance.' However, on closer examination their own analysis (Table 5; p. 1154) discloses that a significant positive effect of growth on financial performance is found in across-industry studies only. In within-industry studies the effect is miniscule in magnitude and statistically non-significant. As their meta-analysis also shows that multiple studies have established a positive relationship between industry growth and firm level profitability their results do not establish that firms that grow more than their direct competitors consequently become more profitable. Rather, they suggest that firms in growing industries benefit from the higher growth- and profit rates of their industries.

While surprisingly few recent studies specifically investigate the relationship between growth and profitability there are relatively many that include both types of performance indicators, and some which report measures of their statistical association. (Mendelson, 2000) is an example of a within-industry study that found a relatively sizeable correlation between sales growth and ROS (return on sales), 0.39. (Chandler & Jansen, 1992), whose focus on young and small firms is particularly relevant in the present context report a correlation of 0.32 between profitability and growth. However, as their measures are two self-report indices the correlation estimate may be inflated (Crampton & Wagner, 1994; Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Recent

studies in strategic management have also reported positive, yet lower, levels of associations. (Cho & Pucic, 2005) report correlations ranging from 0.06 to 0.17 between revenue growth and various accounting-based profitability measures. Based on four-year longitudinal data – an exception in this context – (Baum & Wally, 2003) estimated the correlation between a growth index based on sales and employment, and a measure of profit related to assets, to 0.13. These authors also remark that due to weak relationships they abandoned their original plan of combining growth and profitability into the same performance index. Further, (Kim, Hoskisson, & Wan, 2004) reported a ROA-sales growth correlation of 0.18 while (Peng, 2004) arrived at a mere 0.09 – albeit statistically significant – for the correlation between sales growth and ROE. The reader should be cautioned that the latter two studies are based on particular, Asian contexts rather far removed from what our own empirical data sets cover.

A few recent studies have explicitly addressed the growth-profitability relationship as their main research question. One example is (Cox, Camp, & Ensley, 2002), who found a positive relationship between sales growth rate and profitability growth ( $R^2 = .117$ ,  $p < .001$ ). However, as their analysis builds on a survey of members of the Entrepreneur of the Year Institute there is the risk that their estimate is biased upwards. (Cowling, 2004) investigated an (apparently) large sample of UK firms across industries and concluded from a series of regression analyses that profit and growth tended to move together. This was contrary to the theory of a growth-profitability tradeoff, suggested by (Marris, 1967), that Cowling's study set out to test. However, Cowling also refers to Reid's study of micro-businesses in Scotland (presumably more relevant with respect to our own empirical domain), which found support for a trade-off between growth and profitability, i.e., a negative relationship (Reid, 1995). Likewise, (Roper, 1999), who studied a large sample of Irish firms, found sales growth and ROA to be very weakly related ( $r$  below 0.10 and not statistically significant).

Other relatively large studies have also failed to find evidence for a positive growth-profitability relationship. (Markman & Gartner, 2002) used longitudinal data on Inc. 500 firms and found that both change in sales and change in employment have weak *negative* correlations with change in profit. In the case of employment growth the relationship was statistically significant. Finally, (Sexton, Pricer, & Nenide, 2000), who analyzed over 75 000 firms in the Kauffman Longitudinal Financial Statement Database, found a very weak over all correlation between sales growth and profitability.

In summary, the empirical evidence on the relationship between growth and performance is inconclusive. That is, despite theoretical support of different kinds there is no evidence of a substantial, universal and positive relationship between growth and profitability. This demonstrates while the two dimensions of performance sometimes move together as suggested by theories reviewed in the previous section, there are frequent other instances when the growth-profit relationship is neutral or negative.

## GROWTH-PROFIT DYNAMICS – THEORETICAL PERSPECTIVES

### Theoretical arguments for and against growth leading to profitability

Basic economic theory, assuming inverted U-shape cost curves, implies that firms grow until they have reached the size where average variable cost is at a minimum (Besanko, Dranove & Shanley, 2004; Mansfield, 1979). In that range, increased size would, *ceteris paribus*, be associated with improved profitability. Assuming rational behavior, the firm would refrain from expanding beyond that point. Applying the more realistic assumption of L-shaped cost curves (Mansfield, 1979, pp. 203-206) the same rationally behaving firm would grow at least to the size where the cost curve flattens out, which corresponds to the idea of *minimum efficient scale* in industrial economics (Gupta, 1981). Up to that point growth would improve profitability. In this scenario, cost concerns do not hinder additional growth, but in the size range beyond minimum efficient scale profitability would be either be unrelated to (increases in) size or the relationship would be determined by factors other than production cost. In short, basic economic theory suggests that at least up to a point, *economies of scale* ensures that growth is rewarded with increased profitability.

While scale economies are undoubtedly one factor to consider in most economic production, and while very small and young firms – unlike large corporations – have some similarity with the highly abstracted firms in microeconomic theory, the latter are not the of same species as the real world organizations we also call ‘firms’ (Penrose, 1959). For one thing, real world firms can grow by adding products to their assortment. In addition, the standard microeconomic analysis is a static comparison of production units of different size. There is no time and hence no growth process in the model. By contrast, the strategy school emanating from the Boston Consulting Group in the 1970s is intended as an actionable theory for business organizations in the world as we know it. According to this theory not only static economies of scale in production, but *experience curve effects* (Amit, 1986; Stern & Stalk, 1998) pertaining to all aspects of the firm’s operations can be the basis of cost advantages. This leads to a cost advantage for the firm with the highest cumulative volume in any industry and hence to a positive relationship between market share and profitability (Buzzell, Gale & Sultan, 1975), Based on evidence of a positive relationship also between industry market growth and profitability (Capon et al, 1990) the recipe for profitable growth becomes to launch and secure large market shares for new products in high growth markets.

In a similar vein, and more closely related to the reality of young and small firms, the literature on first mover advantages (Lieberman & Montgomery, 1988) suggests that new entrants can create a lasting advantage by rapidly building a dominant position for themselves in the market. For example, based on evidence from research on new internal ventures (MacMillan & Day, 1987) suggested that new firms become more profitable when the enter markets quickly and on a larger scale.

Hence, there are a number of rather strong and straightforward theoretical reasons to believe that growth leads to profitability. However, even in the supportive literature it is observed that growth does not always enhance profits. Growth beyond minimum efficient scale is associated with unknown or reversed effect on profitability, and pursuing growth in low growth markets or by increasing sales for products with low initial market share is no guaranteed recipe for financial success. Moreover, the reviewed theories are not those that currently enjoy the highest

recognition. Contemporary strategy theory tends to have much less of a pro-growth ideology, and this is likely not without good reason. Empirical research on expansion through more and less related diversification (Christensen & Montgomery, 1981; Montgomery, 1982; Rumelt, 1974) and on mergers and acquisitions (Jensen & Ruback, 1983; Ravenscraft, 1987), as well as theoretical arguments from the resource- and knowledge-based views of the firm (Barney, 1991; Kogut & Zander, 1992) clearly suggest many forms of expansion have a questionable influence on financial performance. The first-mover advantages reasoning has also been challenged (Tellis & Golder, 1996) Lieberman & Montgomery, 1998). Hence, while growth may sometimes be conducive to financial performance this should not be expected to universally be the case.

Moreover, as pointed out by Penrose (1959), growth is not just a change in size, but also a process. In this process the firm may encounter an array of managerial challenges that reduce or reverse any profitability-enhancing effects of increased size. This is recognized in the stages-of-development literature (e.g., (Churchill & Lewis, 1983; Greiner, 1972; Hambrick & Crozier, 1985; Hanks, Watson, Jansen, & Chandler, 1993; Kazanjian & Drazin, 1989). Penrose (1959) argued that managerial capacity set a limit to the growth rate a firm can achieve. In the process of growth, the fact that existing managers have to train new managers becomes an inescapable bottleneck. A reasonable interpretation is that long before the firm reaches the theoretical limit, the costs to growth will dominate the benefits. Although the resulting larger firm may eventually reach higher profitability than the original, smaller firm, this line of reasoning suggests that in the process of reaching this state, there is a trade-off between growth and profit. This was suggested also by (Marris, 1967), although he based his trade-off argument on the cost of capital to finance growth.

### **Theoretical arguments for and against profitability leading to growth**

The fact that a firm shows high profitability indicates that it has created a product that has considerable value above cost for its customers, and that the firm has developed a business model that allows it to appropriate a substantial share of that value (cf. (Alvarez & Barney, 2004; Amit & Zott, 2001). Once in possession of such a value creating product and value-appropriating mechanism it appears unlikely that a firm currently showing above-average profits would have exhausted all profitable growth opportunities. From a rationalistic, theory-based view – analogous to the monopolist model in microeconomics (Mansfield, 1979) – one would expect the firm to have turned first to the most profitable customers or market segments. Unless non-economic adverse effects suggest otherwise, it would then continue to expand into gradually less and less profitable segments, until the absolute level of profitability gets too low. If the expansion into less attractive segments is accompanied with scale- and/or experience effects growth could go on for quite some time without being associated with markedly falling levels of profitability.

While this scenario explains a sequence leading from profitability to growth it does not suggest a causal mechanism linking the two variables. Rather, it is an assumed innovation that drives both. A causal mechanism can, however, be derived from the well established fact that business owner-managers prefer financing through retained earnings to debt, and debt to external equity. This is referred to as (external) ‘control aversion’ and ‘the pecking order hypothesis’ in the literature (Cressy & Olofsson, 1996; Sapienza et al., 2003). While Sapienza et al (2003) also discuss other theoretical explanations for this we will here limit the discussion to arguments derived from

Agency Theory (Fama, 1987; Jensen & Meckling, 1976). In short, asymmetric information among the parties creates agency costs that may make growth funded by infusion of external funds less profitable and therefore less attractive. Firms that lack retained earnings to finance their growth may therefore refrain from pursuing growth that would have been profitable, had such internal funds been available. More specifically, taking the owner-manager's perspective, this principal may fear that the venture capitalist (agent) will shirk and not contribute value to the firm on par with what the cost of the capital calls for (Sapienza et al, 2003). The venture capitalist, in turn, can also be regarded a principal who fears adverse selection and moral hazard problems on the part of the entrepreneurs (agents). *Ceteris paribus*, entrepreneurs with less promising prospects would be more willing to share ownership than those with more promising prospects. Once externally funded, the entrepreneur may increase spending on items such as luxurious travel and office equipment, as the cost of such is now carried in part by the external investor. In order to prevent this, the VC will increase monitoring costs. This in turn increases the cost of capital, which in the end makes the arrangement less attractive to the entrepreneur. In addition, when relying on external financing the owner-manager has to consider the psychological cost of losing control over the company (Sapienza et al., 2003; J. Wiklund et al., 2003). All of this suggests that business owner-managers may be much more willing to pursue growth opportunities when they can do so based on retained earnings. This implies profits driving growth.

Finally, it cannot be ruled out that another purely psychological mechanism also contributes to a causal relationship running from profitability to growth. One reason for the modest growth aspirations among nascent and recent business founders may be that they are not sure they are capable of running a larger firm, or a growing one. Aspiration Level Theory (Lewin, Dembo, Festinger, & Sears, 1944), later echoed in Achievement Motivation Theory (McClelland, 1961), suggests that aspirations tend to gravitate towards the attainable. It may be the case that founders of firms that become profitable not only gain the financial means to expand their firms, but also the self-confidence to embark on a growth path. In line with this, (Westerberg, 1998) found that self-confidence of the manager was important for growing firms, especially in turbulent environments.

The main argument against profitability leading to growth, based on the theories reviewed in the previous sub-section, is that some firms cannot achieve high profitability in the first place without growing large enough to overcome disadvantages to small scale (Aldrich & Auster, 1986). To try to become profitable first and then conquer the market based on self-financed growth is not viable in situations when the firm has competitors and experience effects or first-mover advantages are truly at work. In addition, which is important from a societal perspective, the entrepreneur may have a fixed income goal or prefers to maximize utility rather than profit. If so, the combination of income- and substitution effects may lead to less rather than more growth for a firm that is currently small but generating a comfortable level of profit (Davidsson, 1989a).

### THE DUALITY AND DYNAMICS OF GROWTH AND PROFITABILITY

Taken together, the preceding sections paint a complex picture of growth and profitability. Both growth and profitability are generally considered valid performance metrics for small / new firms, empirical evidence suggests there is at least a weak correlation between the two, but causality and lag affects are ambiguous, while there are theoretical arguments that profitability can lead to growth, and growth can lead to profitability.

It becomes clear, as noted by many others, that neither growth nor profitability alone provide a complete picture of firm performance. Nor is a composite index very complete. High profitability at medium growth, is qualitatively very different from medium profitability at high growth. Moreover, if these are measured at a single point in time, the theoretical arguments above suggest that future prospects of the firm are likely to be very different. Hence, a dynamic picture on both dimensions of firm performance is important.

To further elaborate the importance of a dynamic view of firm performance, consider two plausible low profit / high growth firms. Firm A is deliberately building size in an attempt to combat economy of scale disadvantage, but with a unique resource configuration expects to become highly profitable, with average growth. In contrast, Firm B is established by an inexperienced entrepreneur, who has a poor understanding of the business's cost structure. They price their product too low, leading to rapid, but unprofitable, growth. The firm ultimately recovers before bankruptcy, but only with substantial contraction in size and relatively low levels of profitability.

The above considerations have motivated our key research questions in this paper: *how do young and small firms evolve on the dual performance dimensions of profitability and growth?*

## METHOD

### Data Source

We use a large, longitudinal secondary data source to examine these research questions. The data is sourced from the Business Longitudinal Survey (BLS) conducted by the Australian Bureau of Statistics (ABS) over the period 1995 to 1998<sup>2</sup>. The sampling frame was all employing businesses on the ABS business register employing fewer than 200 employees, excluding primary industries other than mining, government enterprises, utilities and public services (education, health, libraries, museums, parks etc.). The survey was designed to provide information on the growth and performance of Australian employing businesses and to identify selected economic and structural characteristics of these firms. A large cross-sectional survey of 8,375 businesses was conducted in 1994-95. We use this full sample for our cross-sectional analyses. A subset of approximately half of these firms were selected to be included in an ongoing panel. Each subsequent year, the panel consists of those businesses remaining live, supplemented by a sample of new businesses added to the ABS business register in that year. Completed responses were collected from between 84% and 90% of the panel for the surveys in 1995-96 to 1997-98. We use all cases that have complete data in any two subsequent years, or have complete data in the first year and cease business during the second. This means that our longitudinal analyses use information from a total of 5,031 businesses with between 3,548 and 3,717 businesses being included in any one analysis.

### Measures

The performance measures used in this paper are sales growth and return on assets. Sales growth was preferred over employment growth based on emerging consensus in the literature

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<sup>2</sup> Refers to financial years ending in July of nominated year.

that for most purposes sales is the more relevant growth indicator (Davidsson & Wiklund, 2000; Delmar, 1997; Delmar, Davidsson, & Gartner, 2003; Hoy, McDougall, & Dsouza, 1992; Weinzimmer, Nystrom, & Freeman, 1998). The specific formula used was the change in sales from the previous year as a percentage of the sales in the previous year. For the Australian data, sales data for two years prior to the first survey year were reported. Hence sales growth could be calculated in the first year (1995).

For the Australian data, Internal Rate of Return (IRR) was used as the profitability measure, calculated as the net profit (operating profit or loss before tax and extraordinary items) as a percentage of total assets in each year. IRR was the preferred measure because it measures economic rents before accounting for taxes and extraordinary items. As such it is the purest measure of the operational performance of the firm. Also, it is normalised relative to the capital employed.

We are concerned with how firm's shape their performance and not external or industry effects on performance. It is well established that firm performance varies according to both firm-specific and industry effects (Rumelt 1991; McGahan & Porter 1997, 2002). To reduce the confounding influence of industry effects, we use performance measures relative to other firms within the same industry<sup>3</sup>. Both growth and profitability measures were adjusted for industry variations by subtracting the industry median.

## Analysis

Our research focus is concerned with the dual growth-profit performance of firms over time. Consequently, we follow a firm's trajectory in a two-dimensional growth-profit performance space. To allow a tractable analysis, we classified firms into nine groups in any time period as shown in Figure 1. Firms were first separated into a 3x3 classification based on the two performance dimensions – sales growth and profitability. Specifically, firms were classified into tri-tiles (three equal percentile groups) for both relative sales growth and relative net profit margin. They were then divided into the nine performance groups as shown below<sup>4</sup>.

We use this schema to investigate evolution of firm performance in two ways. First we indirectly analyse evolution by looking at differences in performance group distributions against firm age using the larger 1st year cross-sectional data set (n=8,375). Here we recognise that cross-sectional distributions reflect the outcome of the underlying dynamic processes. It is reasonable to assume, at least as a first-order approximation, that this underlying dynamic process of firm evolution is stationary. That is, the process of firm development does not change over time. This approach has a long tradition in studying firm growth / age distributions (see review by de Wit, 2005).

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<sup>3</sup> The industry division (ANZSIC division for Australian data; SNI 92 divisions for Swedish data) were used as the basis for industry groupings. In preliminary work, we used the subdivisions (2 digit code) for the Australian data. However, only the industry division was available for the Swedish data. The substantive results of the paper were not affected.

<sup>4</sup> In preliminary work, we also used several other methods of categorising firms to ensure our results were not an artefact of the categorisation schema. For example, we categorised firms into four groups (no middle category), each group representing a quarter of the figure below. We also repeated the analysis for quartiles defined over the entire population, rather than relative to industry. For each categorisation schema, the substantive results presented in the paper were supported. These additional analyses are available from the first author on request.

**Figure 1: Performance Groups: Categorising Firms by Growth and Profitability**

		Growth Tri-tile		
		1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>
Profit Tri-tile	1 <sup>st</sup>	Poor	Low Profit	Growth Focus
	2 <sup>nd</sup>	Low Growth	Middle	High Growth
	3 <sup>rd</sup>	Profit Focus	High Profit	Star

Second we directly study the performance dynamics of individual firms. For each group in one year, the proportion that moved to each group (or ceased business) was determined. We examine both shorter term transitions (1 Year) and longer term transitions (3 Years with the available data). In the analyses we will also include transitions to “Exit” as a separate category. This is an ambiguous category including not only financial failures but also voluntary closures and lucrative outright sales of firms to new owners (Gimeno, Folta, Cooper, & Woo, 1997; Headd, 2003). Consequently it should not be merged with the Poor category or be interpreted as a pure failure category.

## RESULTS

### Age Variations of Performance Groups

Figure 2 shows the proportion of firms in each of our nine performance categories for young ( $\leq 4$  years), middle aged (5-12 years) and older (13+ years) firms. Figure 3 shows the trend of these proportions over a finer categorisation of firm age, while Table 1 indicates which differences are statistically significant.

It is clear that young firms tend to be overrepresented in Star, Growth Focus and High Growth performance categories. This, of course, not surprising given previous research indicating the negative growth-age relationship. What is interesting is that these high growth firms are more likely to have either high profit (Star 19.5%) or low profit (Growth Focus 17.8%) than middle profit (High Growth 14.4%). Young firms are underrepresented in all other performance groups, though least likely to be Low Growth (6.0%).

As firms age, the proportion of firms in the two high growth corners – Star and Growth Focus – decrease very substantially with firm age ( $\sim 12\%$  decrease). Table 1 indicates these shifts are significant at the 0.05 level. The High Growth group decreases a little, but the decrease is not significant.

Alternatively, substantively increasing as a proportion of firms quite with firm age are the Middle and Low Growth ( $\sim 10\%$  increase). Again, Table 1 indicates these shifts are statistically

**Figure2: Distributions of Performance Groups for Young, Mid & Old Firms**

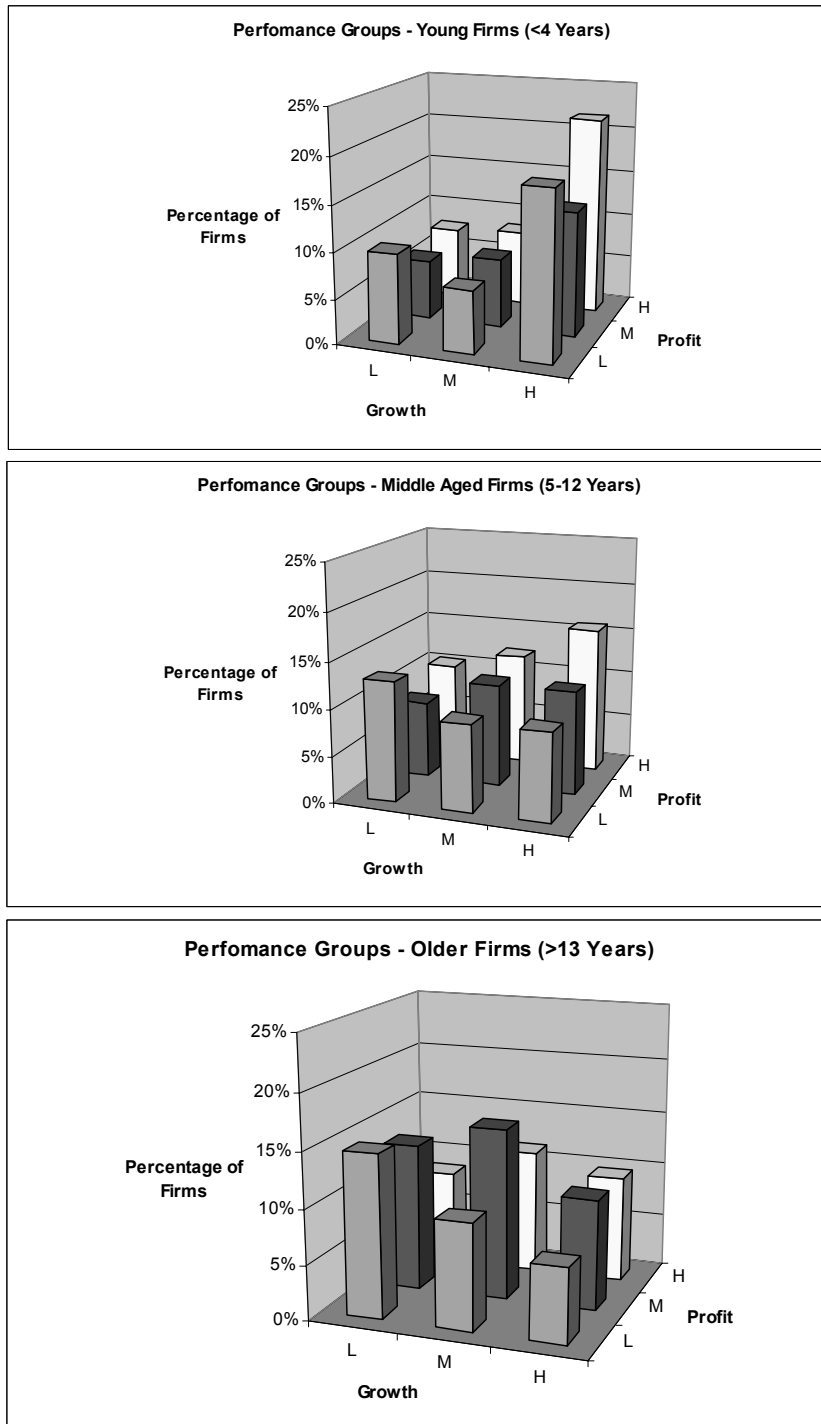


Figure3: Performance Group Proportions for Different Firm Age Groups

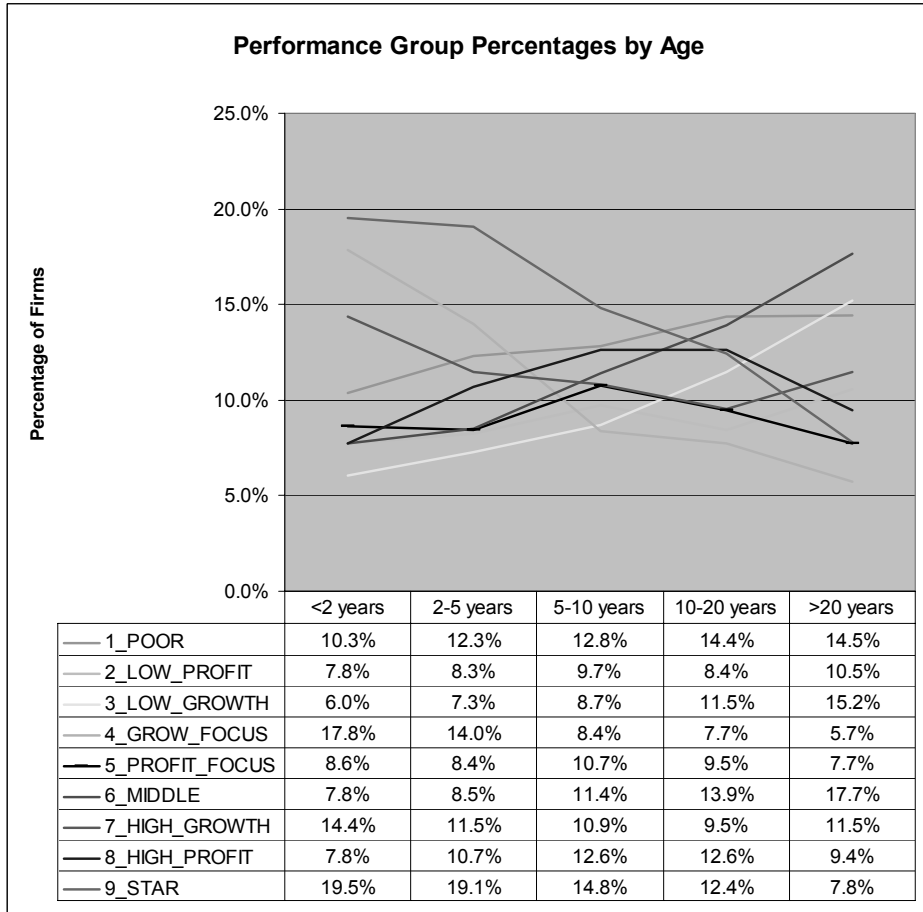


Table 1: z Tests of Performance Group Proportions Differences by Age Groups

	age5				
	<2 years	2-5 years	5-10 years	10-20 years	>20 years
	(A)	(B)	(C)	(D)	(E)
<b>Poor</b>				A	A
<b>Low Profit</b>					D
<b>Low Growth</b>				ABC	ABCD
<b>Growth Focus</b>	CDE	CDE	E	E	
<b>Profit Focus</b>			BE		
<b>Middle</b>			AB	ABC	ABCD
<b>High Growth</b>	D				
<b>High Profit</b>			AE	AE	
<b>Star</b>	CDE	CDE	DE	E	

significant. The Poor group also increases as a proportion of firms over time (~5%), and is statistically significant.

The results indicated above include the combined influence of firm age and firm size. To isolate firm age effects, group proportions across firm age were conducted for three categories of firm size. The most substantial shifts, decrease in Star and Growth Focus with firm age, and increase in Middle and Low Growth were maintained across all size classes, and mostly remained statistically significant (though some comparisons were no longer significant, almost certainly due to the reduced power of the tests with smaller sample sizes).

In summary, consistent with previous research, younger firms tend to be over represented in the three higher growth groups. However, the growth differences with firm age were not consistent across profit categories. Looking at shifts in growth (or profit) over time tell only part of the story.

Results are based on two-sided tests with significance level 0.05. For each significant pair, the key of the category with the smaller column proportion appears under the category with the larger column proportion.

### **Firm Transitions**

Next we investigate the transition of firms between performance groups over time. For the single year transition (1995 to 1996), Table 3 displays the proportion of each 1995 Performance group that shift to each 1996 performance group. Table 4 indicates which differences are statistically significant at the 0.05 level (z tests). We graphically display the transitions to the worst performing group (Poor), the best performing group (Star) and Middle in Figure 4. Tables 5 and 6 and Figure 5 illustrate the same results for the longer 3 year transition 1995 to 1998 (the longest shift available with our data).

Generally the 1-year and 3-year transition patterns are quite similar, though the three year pattern is more “diffuse” or spread.

As expected, the diagonals tend to be quite high. Of these, Middle, Poor and High profit are strongest (>20% over 3 years), and Growth Focus and High Growth are lowest (<15% over 3 years).

Over the three years, shifts to the highest performing Star group are dominated by the Star (~16%) and High Profit (~18%) groups. Table 6 show these two groups dominate all the other categories statistically.

Alternatively, shifts to the lowest performing Poor group are dominated by firms that were originally in the Poor, Low Profit or Growth Focus groups (all ~ 20% over 3 year transitions). These three groups dominate most of the others statistically, other than the high growth group is also reasonable likely to transition to Poor (~15%).

Shifts to the Middle performance group are dominated above all by Middle (~24% over 3 years), which is statistically higher than all other transitions. This is followed by High Growth, Low Growth and Low Profit (all ~ 15%). The three corner groups (other than Star) – Profit Focus, Growth Focus and Poor – are all relatively unlikely to transition to Middle (<8%).

Overall, the results point to firms in either the *High Profit* and *Star* groups having the brightest future prospects – on average tending to be significantly more likely to be performing very well in the future, less likely to be in the low performing groups. Conversely, firms initially in the *Poor*, *Low Profit* or *Growth Focus* tend to have the least impressive future performance – more likely to move to the poor group, less likely to move to highest performing group. Of these, Low Profit is more likely to at least make it to the Middle Group. Firms in Middle group have a relatively high likelihood of remaining in the Middle group.

Table 2: Independent Test of Size and Age

Performance Group	Firm Size																	
	<\$500K						\$500K-\$1.5M						>\$1.5M					
	<4 years		5-12 years		>13 years		<4 years		5-12 years		>13 years		<4 years		5-12 years		>13 years	
Column %	Column %	Column %	Column %	Column %	Column %	Column %	Column %	Column %	Column %	Column %	Column %	Column %	Column %	Column %	Column %	Column %	Column %	Column %
Poor	10.0%	15.0%	19.7%	7.0%	11.8%	16.3%	11.2%	11.0%	11.7%	7.2%	9.2%	9.9%	7.2%	9.6%	11.0%	9.4%	11.7%	9.4%
Low Profit	5.3%	8.9%	9.9%	8.9%	8.9%	9.9%	7.2%	9.6%	9.4%	9.2%	9.9%	9.2%	9.6%	9.6%	9.6%	9.4%	9.4%	9.4%
Low Growth	5.7%	8.1%	12.5%	3.8%	3.8%	15.1%	9.2%	8.7%	13.3%	8.0%	15.1%	9.2%	8.7%	8.7%	8.7%	13.3%	13.3%	13.3%
Growth Focus	19.7%	9.6%	6.8%	18.5%	7.3%	7.2%	16.1%	10.4%	6.5%	7.3%	7.2%	16.1%	10.4%	10.4%	6.1%	6.5%	6.5%	6.5%
Profit Focus	10.3%	13.7%	11.8%	8.3%	10.9%	8.2%	4.4%	6.1%	7.2%	10.9%	11.8%	11.2%	16.2%	16.2%	19.5%	19.5%	19.5%	19.5%
Middle	5.3%	6.7%	10.4%	5.7%	5.7%	11.8%	11.2%	14.0%	12.9%	12.0%	9.1%	16.1%	14.0%	14.0%	12.9%	12.9%	12.9%	12.9%
High Growth	12.0%	8.0%	5.3%	12.7%	12.7%	12.1%	7.6%	9.6%	9.9%	12.7%	12.1%	16.1%	9.6%	9.6%	9.9%	9.9%	9.9%	9.9%
High Profit	6.3%	14.8%	13.9%	12.7%	11.3%	10.3%	16.9%	14.3%	9.6%	11.3%	10.3%	16.9%	14.3%	14.3%	9.6%	9.6%	9.6%	9.6%
Star	25.3%	15.2%	9.8%	22.3%	19.3%	10.3%	16.9%	14.3%	9.6%	19.3%	10.3%	16.9%	14.3%	14.3%	9.6%	9.6%	9.6%	9.6%
Poor	(A)	(B)	(C)	(A)	(B)	(C)	(A)	(B)	(C)	(A)	(B)	(C)	(A)	(B)	(C)	(A)	(B)	(C)
Low Profit			AB			A			A			A						
Low Growth			A			AB			AB			AB						
Growth Focus	BC		AB	BC			BC			BC			BC					
Profit Focus			AB															
Middle			A															
High Growth			C															
High Profit			A															
Star	BC		C	C			C			C			C					

Results are based on two-sided tests with significance level 0.05. For each significant pair, the key of the category with the smaller column proportion appears under the category with the larger column proportion.

a Tests are adjusted for all pairwise comparisons within a row of each innermost subtable using the Bonferroni correction.

Figure 4: Performance Group 1-Year Transitions to Poor, Middle and Star

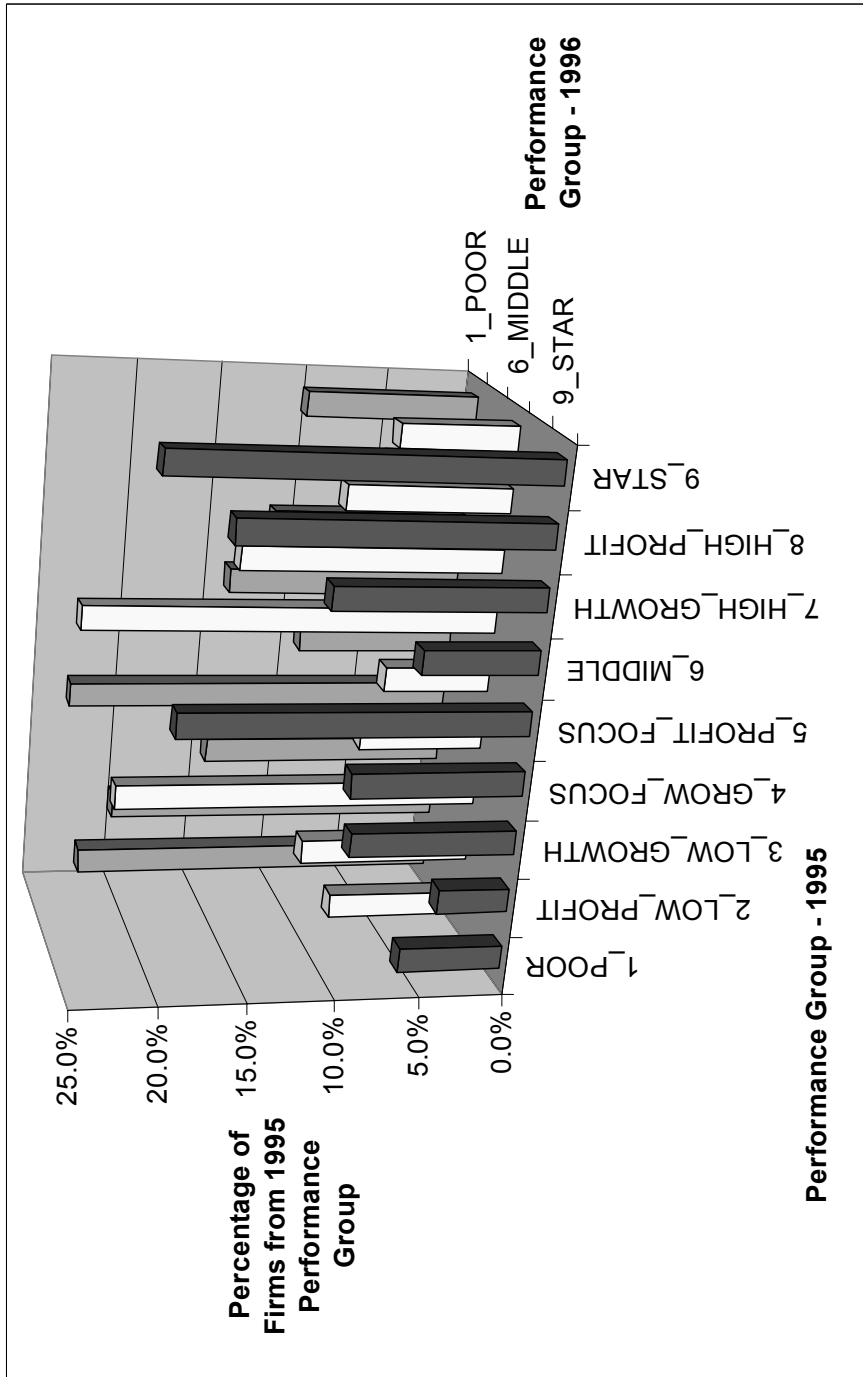


Table 3: 1-Year Performance Group Transitions

		Performance Group - 1995									
		Poor	Low Profit	Low Growth	Growth Focus	Profit Focus	Middle	High Growth	High Profit	Star	
Performance Group 1996	Poor	22.1%	20.2%	14.7%	23.2%	9.5%	14.1%	11.7%	5.0%	10.4%	
	Low Profit	14.1%	<b>18.3%</b>	4.7%	15.0%	4.2%	8.5%	6.9%	2.2%	3.1%	
	Low Growth	5.9%	7.1%	<b>13.4%</b>	8.4%	7.4%	9.8%	12.6%	8.3%	8.0%	
	Growth Focus	13.1%	10.6%	4.1%	<b>10.8%</b>	1.8%	3.7%	7.2%	1.7%	3.2%	
	Profit Focus	2.6%	1.9%	4.7%	2.9%	<b>15.8%</b>	5.2%	4.1%	13.3%	16.8%	
	Middle	8.2%	10.3%	21.6%	7.4%	6.3%	<b>24.1%</b>	15.4%	9.7%	7.0%	
	High Growth	10.1%	12.5%	12.5%	10.3%	5.3%	12.8%	<b>15.4%</b>	5.8%	5.9%	
	High Profit	3.1%	5.1%	5.6%	2.1%	19.3%	7.8%	6.9%	<b>30.4%</b>	17.1%	
	Star	6.1%	4.2%	9.7%	10.0%	20.0%	6.7%	12.1%	17.7%	<b>21.7%</b>	
	Exit	14.8%	9.9%	9.1%	10.0%	10.5%	7.4%	7.6%	6.1%	6.8%	

Table 4: 1-Year Performance Group Transitions – z Tests of Column Differences

		Performance Group - 1995									
		Poor	Low Profit	Low Growth	Growth Focus	Profit Focus	Middle	High Growth	High Profit	Star	
Performance Group 1996		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	
	Poor	CDFGH I				H					
	Low Profit	CEFGH I	EFGHI	H	CEFGH I	H	H	H		H	
	Low Growth	CEFGH I	CEFGH I		CEFGH I		CEHI	HI			
	Growth Focus			ABDEH I			A	ABEHI			
	Profit Focus	CEFGH I	CEFHI		CEFHI			EFHI			
	Middle					ABCDF G	AB		ABCDF G	ABCDF G	
	High Growth			ABDEG HI			ABDEG HI	ABDEH I			
	High Profit	EHI	EHI	EHI	EHI		EHI	ADEHI			
	Star		D	D		ABCDF G	AD	AD	ABCDE FGI	ABCDF G	

Results are based on two-sided tests with significance level 0.05. For each significant pair, the key of the category with the smaller column proportion appears under the category with the larger column proportion.

Figure 5: Performance Group 3-Year Transitions to Poor, Middle and Star

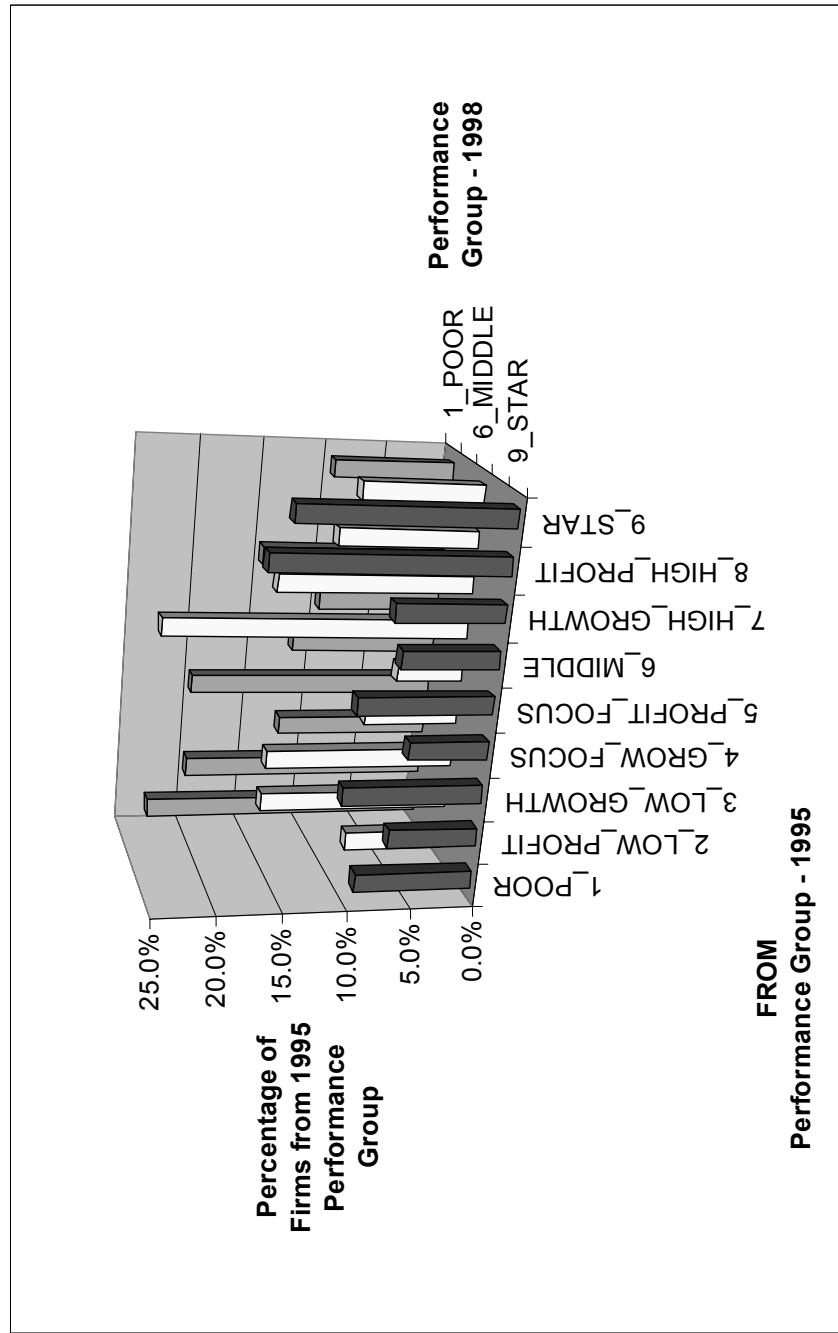


Table 5: 3-Year Performance Group Transitions

		Performance Group – 1995									
		Poor	Low Profit	Low Growth	Growth Focus	Profit Focus	Middle	High Growth	High Profit	Star	
Performance Group 1998	Poor	22.8%	19.8%	12.5%	19.9%	11.8%	9.9%	14.9%	6.0%	9.7%	
	Low Profit	12.2%	18.2%	5.7%	11.1%	4.4%	8.6%	7.2%	5.7%	6.1%	
	Low Growth	10.0%	7.0%	18.1%	8.8%	9.2%	15.1%	12.9%	8.7%	7.7%	
	Growth Focus	8.7%	7.9%	4.9%	13.4%	3.5%	4.8%	6.0%	1.7%	7.3%	
	Profit Focus	3.9%	2.1%	5.7%	3.6%	17.5%	4.3%	4.5%	12.4%	12.6%	
	Middle	8.0%	15.3%	15.1%	7.5%	5.3%	23.9%	15.4%	11.0%	9.5%	
	High Growth	10.9%	8.3%	12.8%	13.7%	7.5%	11.0%	14.4%	5.0%	9.1%	
	High Profit	3.2%	4.1%	7.5%	4.9%	18.4%	8.1%	7.7%	22.4%	14.8%	
	Star	9.3%	7.0%	10.9%	6.2%	10.5%	7.5%	8.4%	18.1%	16.4%	
	Exit	10.9%	10.3%	6.8%	11.1%	11.8%	6.7%	8.7%	9.0%	6.7%	

Table 6: 3-Year Performance Group Transitions – z Tests of Column Differences

		Performance Group - 1995									
		Poor	Low Profit	Low Growth	Growth Focus	Profit Focus	Middle	High Growth	High Profit	Star	
Performance Group 1998		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	
	Poor	CEFGH I	CEFHI	H	CEFHI	H		FHI			
	Low Profit	CEGHI	CDEFG HI		CEHI		E				
	Low Growth			ABDEH I			ABDEH I	BI			
	Growth Focus	EFH	EH	H	BCEFG HI		H	H		EH	
	Profit Focus			B		ABCDF G			ABCDF G	ABCDF G	
	Middle		ADEI	ADEI			ABCDE GHI	ADEI	E		
	High Growth	H		H	BEHI		H	BEHI		H	
	High Profit			A		ABCDF G	A	A	ABCDF GI	ABCDF G	
	Star			D					ABCDE FG	ABCDE FG	

Results are based on two-sided tests with significance level 0.05. For each significant pair, the key of the category with the smaller column proportion appears under the category with the larger column proportion.

## CONCLUSIONS

In this paper we enhance our understanding of SME evolution by exploring the trajectory of firms in a two-dimensional growth-performance space. We found this approach offered additional insights that are obscured looking at profitability and growth independently.

Consistent with previous research that reveals younger firms have higher average growth rates, our results indicate young firms are most likely to be in the higher growth performance groups. Interestingly, they are most likely to have either relatively high profits (Star Group) or relative low profits (Growth Focus). Of these two groups, firms in the Star group have much better future performance. In fact, the Growth Focus firms on average have poorer future performance than all other groups (other than Poor). In general, firms in the high profit groups had substantially better future prospects than firms in low performance groups.

As firms age further, they are most likely to transition towards the Middle, Low Growth and Poor groups. Older firms are particularly unlikely to be in the Growth Focus group.

Small business owners will find the results useful in helping chart pathways that will maximize their success. Policy makers will find the results useful to help prioritise assistance to young firms that show the most promise of success.

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