

# **Enhancing Small Firms' Business Strategy through Improved Forecast Accuracy**

## **Brian Gibson**

School of Business Economics and Public Policy, University of New England, Armidale, NSW, Australia

## **K. Mark Weaver**

E J Ourso College of Business, Louisiana State University, Baton Rouge, LA, USA

## **Brent Gregory**

School of Business Economics and Public Policy, University of New England, Armidale, NSW, Australia

## **Abstract**

This paper presents a proposal, rather than a completed study report, in an attempt to attract interest in potential international partnerships to expand the reach of the project. It outlines the conceptual foundation and research method for a study that will use regular sales forecasts and comparable actual measures to investigate the association between forecast accuracy, selected management activities, and performance within small firms. Understanding the relationship between forecast accuracy, performance and management activities is important because forecasts and expectations have a vital influence upon many strategic decisions. Management activities such as the regular preparation of financial reports, the preparation of formal business plans, and engagement in formal networking with other firms are argued to provide strategic benefits to firms by helping to align goals and assisting managers to cope with uncertainty, and thereby improving the firms' performance. This paper outlines a research project designed to expand our understanding of these issues.

## **Introduction**

This paper outlines the conceptual foundation and research method for a study that will use monthly sales forecasts and comparable actual measures to investigate the association between forecast accuracy, selected management activities, and performance within small firms. Management activities such as the preparation of regular financial reports, the preparation of formal business plans, and engagement in formal networking with other firms are argued to provide strategic benefits to firms by helping to align goals and assisting managers to cope with uncertainty, and thereby improving the firms' performance. As argued by Gibson and Cassar (2004), understanding the relationship between forecast accuracy, performance and management activities is important because forecasts and expectations have a vital influence upon many strategic decisions. It is important, therefore, to understand the

accuracy with which forecasting occurs, the influence of forecast accuracy on a firm's performance, and possible influences (in terms of business management practices) on forecast accuracy.

This paper seeks to expand our understanding of these issues. The paper starts with a discussion of the importance of forecast accuracy. The next section identifies selected management activities and develops potential explanations of why each of these is likely to be associated with forecast accuracy. A section reviewing similar issues with respect to performance follows. After a section in which the anticipated relationships are modelled, the next section explains the planned research design and discusses variable definitions and measures. This is followed by some concluding comments.

## **The Importance of Forecast Accuracy**

As identified by Gibson and Cassar (2004) the potential importance of forecasting within firms can be illustrated in a number of areas. Lawrence et al. (2000), for example, suggest that sales forecasts are pivotal in relation to manufacturing, scheduling, and inventory replenishment decisions. Diamantopoulos and Winklhofer (1999) make similar suggestions when they identify higher inventory costs, poor customer services, and inefficient utilization of production resources as potential consequences of inaccurate forecasts. Also Winklhofer et al. (1996) emphasize the importance of forecast usage in the critical decision areas of planning and budgeting. Despite acknowledgement of this importance there is not a significant volume of research in forecasting that has been done to aid in understanding the strategic benefits to management (Wacker and Lummus 2002).

The general approach to testing forecast accuracy (normally in larger firms) uses either indirect approaches (such as laboratory tests of constructed expectations) or direct approaches (usually survey based). A disadvantage of these approaches is a likely lack of: (a) domain [or contextual] knowledge (Edmundson et al. 1988); and, (b) the presence of goal-setting pressures (to achieve forecasts) (Winklhofer et al. 1996). Unfortunately most, if not all (Diamantopoulos and Winklhofer 1999), data used in prior studies has relied on ex post self-reported measures of forecasting accuracy. The ideal, according to Diamantopoulos and Winklhofer (1999) would be to obtain estimates and then compare such estimates with actual figures at a later date. The data collection process and analysis proposed in the research outlined in this paper relies on such an ideal data collection approach.

Gibson and Cassar (2004) indicate that results from studies of intra-organisational forecast accuracy (mainly conducted in large firm settings) appear to be mixed. However there seems to be evidence that contextual information appears to be a prime determinant (although not always supported). Research process factors that may contribute to observed errors are classified as being due to inefficiency or bias (Lawrence et al. 2000) including interview bias, over-optimism bias, an incomplete or inaccurate information set, and poor interpretation of information. Other factors include task-related factors such as trend, seasonality, noise, instability, historical data, forecast horizon, feedback and presentation as well as subject and environment factors such as experience, contextual information and motivation.

When it comes to small firms, there are few studies that concentrate on small firm forecasting accuracy. This is despite the fact that, given the unstable environment in which they operate, small firms may be more dependent on sales forecasts than their larger counterparts (Peterson 1996: 10). Smith et al. (1996) is one study that examines differences in forecasting between large and small firms. They

suggest that for small firms (firms with less than \$US50million turnover) the following significant differences exist:

- The smaller the company, the more executives involved in the forecasting process;
- The smaller the firm, the higher the degree of subjectivity used in the forecasting process; and,
- Smaller firms tend to use less complex, less quantitative and more qualitative forecasting techniques than do larger firms. (Smith et al. 1996: 46-47).

Also Winklhofer et al. (1996) identify a number of other size related differences from prior studies:

- Smaller firms use sales forecasts less frequently for planning (Peterson 1993);
- Smaller firms are less likely to develop specific industry and customer forecasts (Peterson 1993); and,
- Small firms tend to make greater use of sales forecast for personnel planning (White 1986).

More recently, Flores et al. (2007) indicate that differences exist between large and small firms in respect of techniques used and conclude there is support for a managerial strategy encouraging managers to consider applying additional resources to forecasting efforts. Also, Cassar and Gibson (2007) report that contrary to conventional expectations, forecasts made by the managers of small firms are not overly optimistic. While systematic over-estimation was not found, managers of small firms did tend to make forecasts that were generally too extreme, and tended to over-extrapolate previous growth. These results are consistent with propositions that overconfidence biases and representative heuristics influence the revenue forecasts made in small firms.

Cassar and Gibson (2008) report a mean absolute forecast error of around fifteen percent (median ten percent) of forecasted revenue and suggest this level of the error is greater than that observed from forecasts by inside management and financial analysts of large firms. This supports the belief that smaller firms are less accurate in their forecasts than larger firms. In support of their earlier analysis (Cassar and Gibson 2007), they also suggest that the forecasting errors of the sample firms are symmetrically distributed, and on average, neither pessimistically nor optimistically biased.

The preceding discussion indicates that forecasting is an important function and its accuracy is critical but that the measurement of accuracy has had some difficulties both in practical and theoretical terms. The same issues exist for small firms as exist for large firms although small firms appear to have lower levels of accuracy. Also, research in the small firm domain is less common.

### **Management Activity Influences**

An essential premise of the research reported in this paper is that engagement in certain management activities should enhance the capacity for a firm's managers to update their environmental knowledge and expectations and hence facilitate more accurate forecasts. The mechanism by which these key processes integrate is captured in the following description of the three key activities explored in this research. While the range of management activities is broad, we are constrained by data availability and temporal considerations to a focus on three major practices, namely financial reporting, business planning and networking.

### *Financial reporting*

The preparation and use of interim (more often than annually) financial reports should improve forecast accuracy as it allows managers to access summarized financial information of their firm's recent activities (Cassar and Gibson 2008). In other words, interim financial reporting allows managers to update their prior beliefs about firm performance and to provide feedback with greater confidence. Such notions of interim reporting improving forecast accuracy among users of financial statements is common in the literature that examines publicly traded firms (Leftwich et al. 1981, Bradbury 1992). As well as using the reports themselves, managers also have a larger set of contextual information to assist in their forecasting. For example, managers benefit from information about invoicing and accounts receivable relationships with major customers, from participating in meetings with providers of production and marketing functions, and even from informal discussions with sales staff that enable them to update their prior expectations. While this contextual information may represent a lesser reliance on interim financial reports, on the premise that this information is used in the report preparation, the existence of such reports is expected to improve forecast accuracy. Cassar and Gibson (2008) report such an association between internal accounting report preparation and forecast accuracy.

### *Business planning*

As pointed out by Gibson and Cassar (2004), while there is a desire to examine strategic planning in small firms "the empirical evidence on the impact of formal strategic planning is thin on the ground and largely inconclusive" (O'Regan and Ghobadian 2002: 665). Part of the reason for this lack of evidence is that "the tools and techniques most commonly cited are invariably associated with business rather than strategic planning" (Stonehouse and Pemberton 2002: 859).

Regardless of these difficulties, there is important evidence that supports the assertion that businesses practicing formal business planning techniques are more successful than those not using them (Gibson and Cassar 2002, Stewart 2002, Woods and Joyce 2003). Whether it is genuine strategic planning or just a formal approach to business planning, engagement in business planning should ensure the manager of a small firm has more information about the critical relationships within their business. This information, and the planning process itself, should contribute to better forecasting.

### *Networking*

Networks are "the media through which [economic] actors gain access to a variety of resources held by other actors." (Hoang and Antoncic 2003: 166). One of the major resources provided through such networks is information (Gibson and Cassar 2004). Network constructs generally follow a dual categorization "that seeks to understand (1) how networks affect the entrepreneurial process and how they lead to positive outcomes for the entrepreneur or their firms (networks as independent variables) and (2) how entrepreneurial processes and outcomes in turn influence network development over time (networks as dependent variables)" (Hoang and Antoncic 2003: 172). The literature on networks has identified a number of potential differences that influence the nature of our understanding. These include the relative influences of personal versus business focused networks, the potential significance of the depth of ties, and the signalling potential of networks.

Regardless of how we treat these different approaches, the end result is an expectation that small firm performance will be enhanced by network activities. This should occur because business focused networks should provide useful business information, advice and access to informal alliances (Butler et al. 2003, Brown and Butler 1995, Butler and Hansen 1991). Butler et al. (2003) also identify similar results from other research that is more focused on entrepreneurs (Cooper et al. 1995, Deeds and Hill 1999). Finally, there are other suggestions “that networking practices do have a significantly positive effect on business excellence. This supports the general hypothesis that the strength of the relationship between networking practices and business excellence is significant and positive” (Terziovski 2003: 91).

A significant influence in all of these network understandings is that associated with improved information. One way in which the positive outcomes from networking are likely to emerge is through the impact of improved information generated through the network on the forecasting ability of the firm manager.

### **Determining Performance**

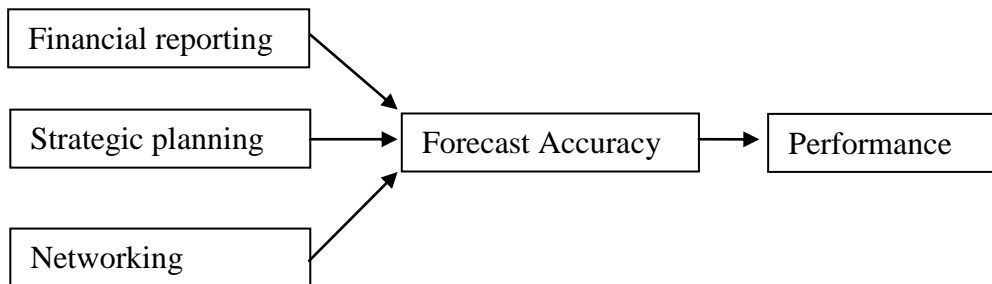
As suggested by Gibson and Cassar (2005) the diverse nature of the performance construct in small firms is reflected in the variety of operational definitions used in empirical studies. Many of these definitions and the measures that derive from them are what Reid and Smith (2000) identify as relativist performance evaluation measures that ask “what goals a firm has set, and then enquires into the extent to which these goals have been achieved” (168). While such approaches neglect the fundamental requirement that performance evaluation cannot be divorced from the market nexus and that even “life-style” targets must ultimately enable the firm to pass the long-run test of economic survival (Reid and Smith 2000: 168), they do represent a viable alternative in the face of the difficulties experienced in gaining more representative measures.

For example, a difficulty with the use of financial or economic measures in small firms is that, unless a case study approach involving investigation of detailed firm data is used, they usually have to be ascertained from survey responses of the firms’ owners who often may not appreciate the fine distinction necessary in financial definitions. Reported profit, for example, may be before or after the owner’s own remuneration. The owner’s remuneration may be reflective of a market rate for similar employment, but is just as likely to be adjusted to reflect life-style wishes or personal taxation circumstances. Liabilities may include debt that is arguably equity (debt secured by personal assets) and many personal assets used in the business may not be reflected on balance sheets. Measures involving profit and returns on assets or investment may not, therefore, produce comparable outcomes. While sales growth is likely to suffer least from these potential data problems and hence provide the most consistent and comparable indicator of economic performance from a financial perspective (Gibson and Cassar 2005), it requires long run reliable sales measures which are rarely available without significant effort on the part of business owners.

Given such difficulties in gaining data to measure performance, we propose for this study a relative measure of performance. While performance may need to be measured using a very “blunt” instrument, the underlying expectation in this project is that performance, however measured, should be responsive to the managerial practices used in a firm which are in turn moderated by improved forecast accuracy.

## The Relationship between Forecast Accuracy, Management Activities, and Performance

Central to the research outlined in this paper is the model reflected in figure 1. This model indicates that the selected management practices of financial reporting, strategic planning, and networking, independently and collectively are associated with improved forecast accuracy by managers of the firm and that collectively these are associated with improved performance.



**Figure 1.** The associations between management practices, forecast accuracy and performance

### Proposed Research Design

#### *Sample*

The data to be utilized for the analysis in this project will be obtained, initially, from a longitudinal survey of small firms in the New England region of NSW Australia. The authors are exploring an extension to southern and western USA and possibly other regional centres around the world. Participants in the Australian pilot will be part of a primary data collection process to identify changes in business sales activity on a monthly basis with the view to developing an activity index for the region. Participants in this index project will provide their actual sales on a monthly basis. The index project is not the focus of this paper, but it is involvement in this project with a community output focus that we believe will ensure a continuity of participants. For this project, participants in the index project will also be asked to provide their forecast of sales for the current month and for the ensuing month thereby (with the actual data subsequently provided as part of the index project) providing data enabling the determination of forecast accuracy. To ensure the data reporting burden does not become too cumbersome, the participants will also be asked to provide other information about their business performance and selected management activities by way of short add-ons to the basic sales data request each month. For example three or four questions may be included in month one to determine some basic demographic characteristics. The following month there may be several questions about the relative performance of the firms. Then in the next month the focus may be on several questions about the use of internally generated financial reports etc. Data collection for this project is planned to occur over a four month period, although the activity index data collection is planned to be ongoing so further data can possibly be gathered at later stages.

## *Variable Measures*

### Forecast Accuracy Measure

To measure the accuracy of forecasts by firms we will use absolute forecast error (AFE), calculated as:

$$AFE = |A - F| / |F|$$

where F is the income forecast and A is actual income.

To determine differing aspects of the forecasting process we will use different time measures of A and F. For example there will be data to compare forecasts made at the commencement of a month with actual results for that period, or forecasts made for the subsequent month can be compared with actual results for that month. It will also be possible to aggregate periods (for example, sum forecast for three consecutive months and compare to actual for the same three months) to determine an accuracy measure over a longer time frame (subject, of course to careful interpretation given possible domain knowledge influences).

The predictions of sales, consistent with all responses in the survey, will be confidential. Therefore, respondents will be able to report their best prediction of sales knowing that such forecasts will not be disclosed to any other parties either inside or outside the organisation. This reduces the potential impact of goal setting pressures often associated with forecasting in (especially large) firms. Actual sales will be self-reported in subsequent responses. Following firms longitudinally over several months and obtaining directly comparable forecast and actual measures overcomes reliance upon post event self-assessed measures of forecast accuracy that is present in most of the extant research.

### Management Activities and Performance Measures

Each of the management activities will be reported as a dichotomous measure based upon responses to the following questions:

**Financial reporting** – “In the last financial year, did your business prepare financial reports (consisting of at least a profit or income statement) more often than annually?”

**Business planning** – “Do you prepare and use in your business either a documented formal strategic plan or a formal business plan?”

**Networking** – “Does your business engage in formal or informal information exchanges with other businesses?”

**Performance** will be reported using a series of measures based on responses to the following questions (using a 5 point likert scale):

“How would you describe the overall performance of your business last year?”

“How would you describe the overall performance of your business relative to your major competitors?”

“How would you describe the overall performance of your business relative to other businesses like yours in the industry?” (Runyan et al. 2008)

A significant criticism of all three management activity variables and the performance variable used in this study is the reliance on dichotomous or restrictive measures that fail to capture the richness of the management activities or performance. For example, if financial reports are prepared monthly or quar-

terly they might be expected to have greater influence on forecast accuracy and performance. Also the degree of planning which has gone into a formal plan may differ significantly. However, we are wary of, at least initially, the potential detrimental impact on response rates if we seek too much detailed information too soon. It is anticipated as time and trust develop, finer measures may be able to be collected. In the meantime, the measures proposed are easily collected and are likely to be consistent across firms.

## **Control Variables**

There are several characteristics of the firm that might have an influence upon the preceding variables. Both firm size and age may be associated with management activities, forecast accuracy and performance because they act as a proxy for variability in income streams. Firm size has been shown to influence the presence of certain management activities and firm forecast accuracy, with larger firms being more frequent users and being more accurate than smaller firms. This relationship is probably a consequence of larger firms abilities to commit more resources to forecasting (Winklhofer et al. 1996, Jelic et al. 1998, Diamantopoulos and Winklhofer 1999, Cheng and Firth 2000). We represent size initially by the number of employees (including working owners) in the firm.

Firm age has also been shown to influence these variables, with older firms having, for example, greater forecast accuracy. This relationship is most likely due to older firms having a greater history of trends and time series behavior, and greater knowledge of the business environment (Winklhofer et al. 1996, Jelic et al. 1998, Diamantopoulos and Winklhofer 1999, Cheng and Firth 2000). We represent age as the number of years the firm has been in operation under the control of the current owners.

Industry membership may also have an influence as different industries experience differing levels of variability in revenue and earnings streams, and also have varying control over such streams (Winklhofer et al. 1996, Jelic et al. 1998). We control for industry effects through a series of indicator variables for each major Australia and New Zealand Standard Industry Classification (ANZSIC) code.

## **Conclusions**

This paper has focused on a conceptual framework to represent the anticipated relationship between: (i) managerial activities that generate information for decision making (using as examples: financial reporting; business planning; and, networking); forecast accuracy (as one of the most important elements of effective decision making); and, (iii) performance (using a self assessment metric). Understanding the relationship between forecast accuracy, performance and management activities is important because forecasts and expectations have a vital influence upon many strategic decisions. Management activities such as the regular preparation of financial reports, the preparation of formal business plans, and engagement in formal networking with other firms are argued to provide strategic benefits to firms by helping to align goals and assisting managers to cope with uncertainty, and thereby improving the firms' performance. The paper has also provided an outline of a research method using regular sales forecasts and comparable actual measures to investigate these associations. Data collection in the New England region of Australia will have hopefully commenced and data collection plans will be well advanced in several regions of the USA by the time this paper is being considered. We believe the fundamental question is important and have prepared this paper outlining our



proposed research in an attempt to attract interest in potential international partnerships to expand the reach of the project.

## References

- Bradbury, M. E. 1992. 'Voluntary semiannual earnings disclosures, earnings volatility, unexpected earnings and firm size.' *Journal of Accounting Research*, 30:Spring, 137-45.
- Brown, B. & Butler, J. E. 1995. 'Competitors as Allies: A Study of Entrepreneurial Networks in the U.S. Wine Industry.' *Journal of Small Business Management*, 33:3, 57-66.
- Butler, J. E., Brown, B. & Chamornmarn, W. 2003. 'Informational Networks, Entrepreneurial Action and Performance.' *Asia Pacific Journal of Management*, 20, 151-74.
- Butler, J. E. & Hansen, G. S. 1991. 'Network Evolution, Entrepreneurial Success, and Regional Development.' *Entrepreneurship and Regional Development*, 3, 1-16.
- Cassar, G. & Gibson, B. 2007. 'Forecast Rationality in Small Firms.' *Journal of Small Business Management*, 45:3, 283-302.
- Cassar, G. & Gibson, B. 2008. 'Budgets, Internal Reports and Manager Forecast Accuracy.' *Contemporary Accounting Research*, 25:3, 707-37.
- Cheng, T. Y. & Firth, M. 2000. 'An Empirical Analysis Of The Bias And Rationality Of Profit Forecasts In New Issue Prospectuses.' *Journal of Business Finance and Accounting*, 27, 423-46.
- Cooper, A. C., Folta, R. B. & Woo, C. 1995. 'Entrepreneurial Information Search.' *Journal of Business Venturing*, 10, 107-20.
- Deeds, D. L. & Hill, C. W. L. 1999. 'An Examination of Opportunistic Action within Research Alliances: Evidence from the Biotechnology Industry.' *Journal of Business Venturing*, 14, 141-63.
- Diamantopoulos, A. & Winklhofer, H. 1999. 'The Impact Of Firm And Export Characteristics On The Accuracy Of Export Sales Forecasts: Evidence From UK Exporters.' *International Journal of Forecasting*, 15, 67-81.
- Edmundson, R., Lawrence, M. & O'Connor, M. 1988. 'The Use of Nontime Series Information in Sales Forecasting: A Case Study.' *Journal of Forecasting*, 7, 201-11.
- Flores, B. E., Stading, G. L. & Klassen, R. D. 2007. 'The business forecasting process: a comparison of differences between small and large Canadian manufacturing and service firms.' *International Journal of Management and Enterprise Development*, 4:4.
- Gibson, B. & Cassar, G. 2002. 'Planning Behaviour Variables in Small Firms.' *Journal of Small Business Management*, 40:3, 171-86.
- Gibson, B. & Cassar, G. 2004. 'Best Practice Management Activities and Forecast Accuracy.' Paper presented at Regional Frontiers of Entrepreneurship Research 2004.
- Gibson, B. & Cassar, G. 2005. 'Longitudinal Analysis Of Relationships Between Planning And Performance In Small Firms.' *Small Business Economics*, 25:3, 207-22.
- Hoang, H. & Antoncic, B. 2003. 'Network-Based Research In Entrepreneurship A Critical Review.' *Journal of Business Venturing*, 18, 165-87.
- Jelic, R., Saadouni, B. & Briston, R. 1998. 'The Accuracy Of Earnings Forecasts In IPO Prospectuses On The Kuala Lumpur Stock Exchange.' *Accounting and Business Research*, 29:Winter, 57-72.
- Lawrence, M., O'Connor, M. & Edmundson, B. 2000. 'A Field Study Of Sales Forecasting Accuracy And Processes.' *European Journal of Operational Research*, 122, 151-60.

- Leftwich, R. W., Watts, R. L. & Zimmerman, J. L. 1981. 'Voluntary corporate disclosure: The case of interim reporting.' *Journal of Accounting Research*, 19:Supplement, 50-77.
- O'Regan, N. & Ghobadian, A. 2002. 'Effective Strategic Planning In Small And Medium Sized Firms.' *Management Decision*, 40:7, 663-71.
- Peterson, R. T. 1993. 'Forecasting Practices In Retail Industry.' *Journal of Business Forecasting*, 12, 11-14.
- Peterson, R. T. 1996. 'An Analysis Of Contemporary Forecasting In Small Business.' *The Journal of Business Forecasting*:Summer, 10-12.
- Reid, G. C. & Smith, J. A. 2000. 'What Makes a New Business Start-Up Successful?' *Small Business Economics*, 14:165-182.
- Runyan, R., Droge, C. & Swinney, J. 2008. 'Entrepreneurial orientation versus small business orientation: What are their relationships to firm performance?' *Journal of Small Business Management*, 46:4, 567-88.
- Smith, H. C., Herbig, P., Milewicz, J. & Golden, J. E. 1996. 'Differences In Forecasting Behaviour Between Large And Small Firms.' *Journal of Marketing Practice: Applied Marketing Science*, 2:1, 35-51.
- Stewart, K. S. 2002. 'Formal Business Planning And Small Business Success: A Survey Of Small Businesses With An International Focus.' *Journal of American Academy of Business*, 2:1, 42-48.
- Stonehouse, G. & Pemberton, J. 2002. 'Strategic Planning In SMEs: Some Empirical Findings.' *Management Decision*, 40:9, 853-61.
- Terziovski, M. 2003. 'The Relationship Between Networking Practices And Business Excellence: A Study Of Small To Medium Enterprises (SMEs).' *Measuring Business Excellence*, 7:2.
- Wacker, J. G. & Lummus, R. R. 2002. 'Sales forecasting for strategic resource planning.' *International Journal of Operations & Production Management*, 22:9/10, 1014-31.
- White, H. R. 1986. *Sales Forecasting: Timesaving and Profit-making Strategies that Work*. London, UK: Scott, Foresman and Company.
- Winklhofer, H., Diamantopoulos, A. & Witt, S. 1996. 'Forecasting Practice: A Review Of The Empirical Literature And An Agenda For Future Research.' *International Journal of Forecasting*, 12:June, 193-221.
- Woods, A. & Joyce, P. 2003. 'Owner-managers and the Practice of Strategic Management.' *International Small Business Journal*, 21:2, 181-95.