Managing Global Transitions

International Research Journal

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The Editor's Corner

At *Managing Global Transitions* we are proud to present you yet another number of our journal, which in this issue covers the topics of entrepreneurial intensity, leadership styles, sources of knowledge, external evaluation, and credit risk factors. Our main area of focus continues to remain the transition research. In addition to this MGT emphasizes the openness to different research areas, topics, and methods, as well as international and interdisciplinary research nature of scholarly articles published in the journal.

The current issue begins with a paper written by Pierre Erasmus and Retha Scheepers, who investigate the relationship between the entrepreneurial intensity and the shareholder value created by analyzing the data from South Africa. In the second paper, Chung-Wen Yang examines the effects of leadership style on the development and implementation of entrepreneurial orientation in small and medium-sized companies in Taiwan. In the third paper, Anja Cotič Svetina and Igor Prodan study the influence of knowledge sources on innovative performance which is based on the data from in-depth interviews with top executives of manufacturing firms in Czech Republic, Germany, Italy, Poland, Romania, Slovenia, and the United Kingdom. In the fourth paper, Karmen Rodman and Nada Trunk Širca investigate the professional competences of the eternal evaluation commission members in Slovenian higher education. In the last – fifth paper, Boštjan Aver presents the results of the analysis of credit risk factors of Slovenian banking system.

Boštjan Antončič
Editor

The Relationship Between Entrepreneurial Intensity and Shareholder Value Creation

Pierre Erasmus
Retha Scheepers

Innovation and entrepreneurship have long been regarded as sources of value and wealth creation. Previous research has shown that there is a positive relationship between enterprises' levels of entrepreneurship and their financial performance. Little research, however, has hitherto focused on measuring the relationship between entrepreneurship and shareholder value creation. In this study the relationship between the entrepreneurial intensity and the shareholder value created by an enterprise is investigated. An adapted corporate entrepreneurship (CE) measurement instrument is applied in order to gauge entrepreneurial intensity, while shareholder value creation is measured by the market-adjusted total share return (TSR) and the value based financial performance measure Economic Value Added (EVA). The study is conducted for a sample of enterprises listed in the industrial sector of the Johannesburg Securities Exchange (JSE) for the period 2003–2005. The contribution of the study is the focus on the relationship between entrepreneurial intensity and shareholder value creation, rather than purely on the accounting-based financial performance of an enterprise.

Key Words: entrepreneurial intensity, value based financial performance measures, economic value added
JEL *Classification:* L25, L26

Introduction

Innovation and entrepreneurship have been emphasised in recent years by the popular business press, corporate leaders and academics (Hamel and Breen 2007; Hof 2004; Planting 2004; Covin and Slevin 1991; Lumpkin and Dess 1996; Leibold, Probst, and Gibbert 2002). The potential of entrepreneurship to create value for various stakeholders (Morris 1998) and value for shareholders (Vozikis et al. 1999) has heightened academic

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interest in the field. A number of studies have investigated the relationship between the level of corporate entrepreneurship (CE) of an enterprise and its financial performance (Wiklund 1999; Wiklund and Shepherd 2003; 2005; Zahra 1991; Zahra and Covin 1995). However, most of these studies have concentrated on traditional accounting measures adapted from previous studies. The measures used in many of these studies did not build on a theoretical rationale of economic and entrepreneurship theory, despite the growing recognition of 'the importance of theory-based measures to entrepreneurship research' (Vozikis et al. 1999, 33).

Economic theory holds that firms exist to maximise value for shareholders. Many authors agree that one of the motivations for starting a business is the creation of wealth for the owner (Barringer and Ireland 2008; Longenecker et al. 2006). These two perspectives concur, in that one of the reasons for the existence of an enterprise is to create value for the owner, owners or shareholders. In the case of listed companies, their equity typically consists of publicly traded shares. The value of these shares changes over time, depending amongst others on the market's perception of the value of the company. Efficient market theory argues that these changes are based on the fact that 'investors continuously evaluate all information when valuing a share' (Fama 1974; 1991). Thus, if the market incorporates all information, measures should be derivable that allow for the evaluation and appraisal of the intensity of a firm's entrepreneurial orientation. Although the applicability of this rationale has received wide acceptance, the integration of entrepreneurship and finance theory remains limited (Brophy and Shulman 1992; Vozikis et al. 1999, 33).

Little previous research has focused on assessing the relationship between EI and shareholder value creation and, therefore, this study aims to focus on this research gap. The purpose of this study is twofold. Firstly, the EI of listed companies is determined and secondly, the relationship between the level of EI and the shareholder value created by a company, as represented by economic value added (EVA) and the market-adjusted total share return (TSR), is investigated. The contribution of this study is the focus on the relationship between EI and shareholder value creation, rather than merely on the financial performance of an enterprise. The next section provides an overview of the importance of the study, discusses the theoretical background of key concepts and highlights the problems of traditional versus value based financial measures. Subse-

quently the methodology, results and managerial implications are presented and discussed.

Importance of the Study

The importance of entrepreneurial behaviour in developing countries, such as South Africa, is emphasised by intensified competition in the global economy, the need for economic growth and the impact of entrepreneurial behaviour on future growth and value creation in listed companies.

Globalisation is transforming and integrating the world's economies (Hough 2004). Developing countries, such as South Africa, are experiencing the need to become more competitive and to operate globally (Gamble and Blackwell 2002) if sustainable economic growth and development is to occur (Porter 2004, 31). The World Economic Forum holds that the management of technology, innovation and information have emerged as key requirements for success in the 21st century (Claros et al. 2006). Therefore, South African companies need to become more entrepreneurial to increase their competitiveness, on both an organisational and country level.

Entrepreneurship is an important element in organisational development and economic growth (Antoncic and Hisrich 2001; Drucker 2002). Entrepreneurial behaviours and attitudes are key determinants of the ability of established firms to survive and prosper in turbulent environments (Lumpkin and Dess 1996). Consequently, listed companies, state-owned enterprises and small and medium-sized businesses are being urged to be more entrepreneurial. Several authors argue that traditional management methods that focused on control and efficiency no longer suffice in the knowledge economy where adaptability and creativity drive business success (Hamel and Breen 2007; Leibold et al. 2002). In South Africa entrepreneurship is also seen to be vital to address the issues of job creation, economic growth and the exploitation of opportunities (Von Broembsen, Herrington, and Wood 2005). The pursuit and exploitation of opportunities accentuate financial objectives for the firm, such as profitable customer acquisitions and market growth. Thus the creation of additional value, or wealth, for the owner-entrepreneur or for a group of owners (shareholders) is one of the main objectives of entrepreneurial activities. Such an emphasis makes the use of value based performance measures particularly relevant (Vozikis et al. 1999, 34).

The potential of entrepreneurial behaviour to create shareholder value

is implicit in the growth strategies companies pursue. When evaluating the financial performance of a company, it is important to distinguish between the value resulting from its current activities, and the value of future growth activities. According to O'Byrne (2000) it is not sufficient to merely maintain the current level of financial performance in order to maximise the shareholder value of a firm. The expected future growth in financial performance should also be considered, since it could significantly contribute to the total value of the firm. Madden (1999) indicates that firms which do not continuously act in an innovative way to increase their economic lifetime will ultimately cease to create economic value (the return on investment drops below the return required by investors). Such firms will face financial failure as investors move their investments to other firms that offer them acceptable levels of return.

To summarise, the importance of this study is emphasised by the role entrepreneurship could play in developing countries, such as South Africa; intensified competition in the global economy and the potential of entrepreneurial actions to create value for shareholders; and the impact of entrepreneurial behaviour on future growth and shareholder value creation in listed companies.

Theoretical Background

ENTREPRENEURIAL INTENSITY

Although there has been intense debate on how to define entrepreneurship, many authors (Morris and Kuratko 2002; Barringer and Ireland 2008) concur with Stevenson, Roberts, and Grousbeck (1989) that entrepreneurship can be described as 'the process of creating value by bringing together a unique combination of resources to exploit an opportunity'. This definition implies that (1) entrepreneurship may vary in terms of the extent and number of times it occurs, (2) entrepreneurship occurs in various contexts (start-up, corporate and others); (3) that it is a process that can be managed; and (4) that it creates value and it is opportunity-driven.

Implicit in the definition provided by Stevenson, Roberts, and Grousbeck (1989), entrepreneurship may vary in terms of extent and the number of times it occurs. Morris and Sexton (1998) refer to the varying levels of entrepreneurship as *Entrepreneurial Intensity* (EI). They view EI as a function of the degree and frequency of entrepreneurship as shown in figure 1 (Morris and Sexton 1996). The notion of entrepreneurial intensity is derived from the conjecture that entrepreneurial behaviour may
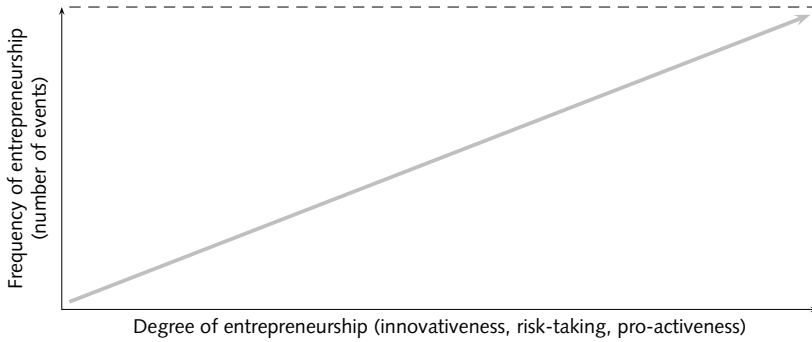
FIGURE 1   Entrepreneurial Intensity (adapted from Morris and Sexton 1996)

differ in terms of its levels of innovativeness, pro-activeness and risk-taking characteristics. This variation may be visualised as opposites on a conceptual continuum, where one extreme would represent conservative behaviour and another extreme would represent entrepreneurial behaviour (Barringer and Ireland 2008). Frequency of entrepreneurship refers to the number of times an enterprise acts entrepreneurially (for example, develops new products or processes), while the degree of entrepreneurship (also referred to as entrepreneurial orientation) could be assessed by three dimensions: innovativeness, risk-taking, and pro-activeness.

Innovativeness, the first dimension of the degree of entrepreneurship, refers to the ability to generate ideas that will culminate in the production of new products, services and technologies. Risk-taking, the second dimension, involves the determination and courage to make resources available for projects that have uncertain outcomes, in other words involve risk. Attempts are made to manage these risks by researching a market, recruiting and employing skilled staff or other strategies. Pro-activeness, the third dimension, indicates top management's stance towards opportunities, encouragement of initiative, competitive aggressiveness and confidence in pursuing enhanced competitiveness (Morris 1998). In the view of Morris and Sexton (1996) EI is a function of the degree and frequency of entrepreneurship. This is supported by Antoncic and Hisrich (2001). Conversely, Lumpkin and Dess (1996) argue that not three, but five dimensions should be used to measure entrepreneurship, namely autonomy, competitive aggressiveness, pro-activeness, innovativeness and risk-taking. In contrast with these views, this study argues for a view of autonomy as an internal condition that influences the organisational climate. Competitive aggressiveness forms part of the pro-

activeness sub-dimension. Other researchers support this view (Morris et al. 2006; Kreiser, Marino, and Weaver 2002).

The term *Entrepreneurial Intensity* (EI), therefore, refers to the variable nature of entrepreneurship within an established enterprise. As shown in figure 1, various positions of EI are possible, since different scores can be obtained on the frequency axis and degree of entrepreneurship axis. Although Morris and Sexton (1996) assessed entrepreneurial intensity in a corporate context, entrepreneurship can indeed occur in various contexts.

These organisational contexts may range from start-up firms, growing independent businesses, multinationals, even to non-profit organisations, such as semi-state institutions or organisations with a social purpose. Within these different contexts the definition of Stevenson, Roberts, and Grousbeck (1989) applies, since the process and required inputs are similar, even if the outputs differ. Although authors distinguish between corporate entrepreneurship, intrapreneurship and entrepreneurship (Birkinshaw 2003; Sharma and Chrisman 1999), the similarities between these contexts are generally greater than the differences (Morris and Sexton 1996). *Corporate Entrepreneurship* (CE), generally, refers to the development of new business ideas and opportunities within large and established corporations (Birkenshaw 2003). In most cases, CE describes the total process whereby established enterprises act in an innovative, risk-taking and pro-active manner (Zahra 1993; Dess, Lumpkin, and McGee 1999; Bouchard 2001), where intrapreneurship is generally used to refer to the behaviour of the individual. Guth and Ginsberg (1990) argued that CE is any effort to combine resources in new ways in order to create value for the firm. In all the different contexts entrepreneurship can be seen as a process with different stages.

Even though entrepreneurship and innovation are inherently unpredictable, chaotic and creating ambiguity, the entrepreneurial process can nevertheless be managed. Entrepreneurial events are characterised by different stages, such as opportunity identification, business concept definition, assessment of the resource requirements, acquisition of the needed resources, and then management and harvesting of the business (Morris and Kuratko 2002). The ability to act entrepreneurially is linked to the perception of opportunity.

The pursuit of opportunities also emphasises that those opportunities, which create the greatest value, should be exploited. Schumpeter (1934) pioneered the theory of economic development and value creation

through the process of technological change and innovation. He introduced the notion of 'creative destruction' (Schumpeter 1942) noting that, following a technological change, certain rents become available to entrepreneurs, which later diminish as innovations are adopted. These rents were later named Schumpeterian rents, defined as rents stemming from risky initiatives and entrepreneurial insights in uncertain and complex environments. Corporate entrepreneurship should not only focus on seeking new markets, but also create new opportunities in existing markets (Block and MacMillan 1993). Thus the creation of value or wealth for the owner-entrepreneur or for a group of owners (shareholder) is the objective of entrepreneurial activities. Such an emphasis makes the use of shareholder value creation (or destruction) particularly relevant (Vozikis et al. 1999).

To conclude, firms may vary in terms of the intensity of their entrepreneurial actions. Actions could be regarded as entrepreneurial if they are focused on opportunities and create value, regardless of the resources that firms control. The focus of this study is on the entrepreneurial intensity in established firms and the value that is created for shareholders.

SHAREHOLDER VALUE CREATION

Since the purpose of any enterprise is defined as long-term value creation, its corporate performance should be measured by considering the value it created (Monks and Minnow 2001). Value Based Management (VBM) could be defined as the process of continuously maximising shareholder value (Copeland, Koller, and Murin 1994). When applying VBM techniques, shareholder value creation becomes the main objective of all employees and the management of the enterprise.

According to Copeland et al. (1994), VBM is a combination of two elements. On the one hand it consists of adopting a value-creation mindset throughout an enterprise. All employees should understand that all their actions should be directed towards achieving this objective. Furthermore, this value-creation mindset needs to be combined with the necessary management processes and systems to ensure that the employees actually behave in a manner that creates value (Copeland et al. 1994).

PROBLEMS WITH TRADITIONAL FINANCIAL MEASURES

During the last three decades, a number of studies empirically analysed the relationship between CE and organisational performance (Goosen,

DeConing and Smit 2002; Kreiser, Marino and Weaver 2002; Zahra and Garvis 2000; Lumpkin and Dess 1996; Singh 1990). Although many of these report a positive relationship, most call for longitudinal designs since entrepreneurial activities contribute to the long-term performance of the enterprise (Goosen et al. 2002; Antoncic and Hisrich 2001). For example, the cost of implementing entrepreneurial initiatives may be high in the initial year of implementation, especially in the areas of product and process innovations. The returns on such investments may only be realised two to three years in the future, since radical product innovations may take time to diffuse through the market. Processes and business innovations need to be understood and used by employees to yield economies of scale or scope (Barringer and Ireland 2008; Schilling 2008). Zahra (1993) argues that the strength of the relationship between CE and organisational performance will increase over time. In contrast, other authors indicate that the existence of such a relationship depends on the circumstances in the external environment, and the perceptions of management (Zahra, Nielsen, and Bogner 1999).

The majority of the studies investigating the relationship between CE and financial performance utilised traditional accounting-based measures to evaluate financial performance. These traditional financial performance measures predominantly focus on the short-term financial performance of an enterprise (the measures are usually calculated for a fiscal year). The benefits of entrepreneurial activities are, however, usually experienced over the long-term, and this casts some doubt on the suitability of using the traditional measures to quantify financial performance (Vozikis et al. 1999, 35–36).

Furthermore, the accounting treatment of items such as research and development (R&D) and goodwill negatively influences the short-term financial performance of an enterprise. Although these expenses are expected to generate profits in future, the full amounts are usually allocated during the financial year in which they were incurred. This may have a negative effect on innovation, since management and divisions may postpone or decrease expenditure and efforts on R&D to maintain current profit levels. Value based measures aim to overcome some of the limitations of traditional financial measures.

TRADITIONAL VS. VALUE BASED FINANCIAL MEASURES

The major financial objective of an enterprise is the maximisation of shareholder value (Brigham and Houston 2001). All management deci-

sions and strategies should contribute towards this objective. Management, however, faces the problem of determining what the effect of its actions would be on the future financial performance of the enterprise. In order to quantify and manage financial performance, a significant number of traditional financial measures have been developed. These measures, however, are exposed to numerous weaknesses. Amongst others, the measures are exposed to accounting distortions (Stewart 1991; Ehrbar 1998), they exclude the enterprise's cost of capital (Young and O'Byrne 2001), and they are based on historic cost information rather than current replacement values (Peterson and Peterson 1996). In the majority of previous studies where the relationship between CE and financial performance were investigated, these traditional measures are applied as measures of financial performance (Goosen, DeConing, and Smit 2002; Kreiser, Marino, and Weawer 2002; Lumpkin and Dess 1996; Zahra 1993).

With a view to overcome some of the limitations associated with the traditional measures, a number of VB financial performance measures were developed. Proponents of the VB measures report high correlations between the measures and the creation of shareholder value (Stewart 1994; Walbert 1994; O'Byrne 1996) and they are considered to be a major improvement over the traditional financial performance measures. These measures attempt to remove some of the accounting distortions contained in the traditional measures. The most important improvement, however, is that the value based measures include the enterprise's cost of capital in their calculation. An enterprise's cost of capital is influenced by the market's perception of its risk and its expected future returns. By incorporating the cost of capital, the value based measures evaluate the market's perception of the current, as well as the expected future financial performance of the enterprise.

According to Brophy and Shulman (1992), these VB measures should more accurately reflect the financial performance of a company. In the case of listed companies, share prices reflect the market's perception of the risk and future return of the companies. Since their share prices are readily available, it should be easier to quantify cost of capital figures for listed enterprises than for smaller delisted or newer firms. They argue that by considering these VB measures, researchers are able to evaluate not only the current market valuation of a company, but also changes in this valuation.

One of the most well-known and widely applied VB measures is Economic Value Added (EVA®). This measure, which was developed and

trademarked by the New York consulting firm Stern Stewart, calculates the difference between an enterprise's Net Operating Profit after Tax (NOPAT) and a capital charge (Young and O'Byrne 2001). The capital charge is determined by multiplying the enterprise's Weighted Average Cost of Capital (WACC) with the invested capital at the beginning of the financial year. The EVA value represents the enterprise's economic, rather than accounting profit (Peterson and Peterson 1996), and makes provision not only for the cost of debt capital, but also the cost of all other forms of capital (Grant 2003). Maximising an enterprise's EVA should result in an increase in the shareholder value created (Stewart 1991).

In terms of the prerequisites identified in Goosen et al. (2002), EVA offers a number of improvements over the traditional financial performance measures. Most importantly, the implementation of a VBM system based on EVA should ensure an increased focus on the creation of shareholder value not only at the corporate level, but also at divisional levels (Young and O'Byrne 2001). Since EVA can be calculated and interpreted at the divisional level, employees are able to understand their influence on the enterprise's overall value creating ability. Alternatively, EVA can be translated into divisional value drivers in those cases where the calculation of the measure proves problematic, or where the value drivers are more directly linked and controlled by the division (Young and O'Byrne 2001). Translating EVA into these value drivers and combining it with EVA-based bonuses could enhance innovation (Young and O'Byrne 2001).

ENTREPRENEURIAL INTENSITY AND VALUE CREATION

A significant benefit from the measures EVA and TSR is that such an appraisal of the firm reflects not only the company's expected financial performance, but also the market's evaluation of the firm's entrepreneurial posture. This is a reflection of a company's current actions, including the company's pursuit of opportunities, and how such pursuits change a company's future competitiveness when valuing a share. Additionally the market evaluates the characteristics of a firm that may impact on the pursuit of future opportunities, such as new product, process, service or business developments in response to changes in the environment.

Furthermore, value based measures could provide greater insight than accounting measures alone. For example, the economic value added and created represents more than growth in a single accounting measure or in the size of the company. Rather, additional value creation occurs when the market place confers a positive judgment on the overall actions of the

firm. This is critical since it is possible for a firm to experience growth in accounting or size variables, without the creation of additional value.

The measure of EVA has the benefit of being based on the firm's outputs, i. e., cash flows resulting from the intensity of entrepreneurial actions (Bruton et al. 1996). Since the long-term view of the benefits of CE are taken into consideration and the timing (and risk) of the benefits are considered, EVA and TSR do not exhibit the problems associated with the traditional accounting-based measures.

Finally EVA has practical applicability, because there is evidence that it may provide insightful differentiation among various firms' EI positions, since all firms are not equally entrepreneurial. The differences between firms should be reflected in the value creation measure. Firms that create additional value over time should have a higher EI over time, as they have been the best at creating and pursuing opportunities in the environment. Those firms that destroy value over time should have the lowest EI. Therefore, it could be argued that value based measures, such as EVA (internal measure) and TSR (external measure), should show a positive relationship with increased EI.

Methodology

The objective of this study is firstly to determine the entrepreneurial intensity of listed companies and secondly to investigate the relationship between EI and EVA and EI and TSR respectively. The sample and measuring instruments will subsequently be discussed.

SAMPLE AND DATA COLLECTION

Data regarding the EI of companies were collected by a cross-section telephone survey between August and October 2005. The key respondent was the relevant Chief Information Officer (CIO). A total of 82 companies participated in this survey, and were included in the initial sample. In order to calculate the EVA and TSR values, the enterprises had to be listed on the Industrial Sector of the JSE Securities Exchange for the period 2003 to 2005. Since the industrial sector is the second largest sector in the South African economy and accounts for just over 16 percent of the country's GDP (Mboweni 2006), this is a legitimate sample for this type of study. Linked to the innovation imperative of established businesses and the fact that listed companies incorporate market perceptions of their cost of capital, this sample is well suited to the type of analysis conducted in this study. Because of the nature of their operations, enterprises listed in the Financial and Mining sectors were excluded from the

study. When considering the initial sample, a total of 79 enterprises provided complete EVA values for the period under investigation. In order to be included in this study, enterprises had to provide complete EVA, TSR and EI data. A total of 55 enterprises provided the necessary values, and are thus analysed in the remainder of the study.

MEASURING INSTRUMENTS

A measurement instrument was adapted to assess EI within South African enterprises. In order to ensure its validity and reliability, items from existing measuring instruments that have proved to be reliable and valid in previous research studies were used where possible, such as the Entrepreneurial Performance Index (EPI) of Morris and Sexton (1996) and the ENTRESCALE (Kwandwalla 1977; Miller and Friesen 1978; Covin and Slevin 1989; Knight 1997). These were enhanced by questions formulated by the researchers (based on the literature) to ensure that each variable in the measurement instrument was represented by at least three items. Respondents needed to indicate their answers on a 9-point Likert scale, since it is easier for a respondent to visualise a 9-point scale, as opposed to a 7-point scale, when participating in a telephone interview. EI consists of the degree and frequency of entrepreneurship. Degree of entrepreneurship consists of three dimensions: innovativeness, risk-taking and proactiveness.

- *Innovativeness:* Three items measure the relative innovativeness of a company: emphasis on R&D or marketing of existing products, the number of new products and degree of change in product lines over the last two years. Respondents were asked to indicate to what extent their companies reflect these types of behaviour. The mean score, calculated as the average of three items, was used to assess a company's relative innovativeness.
- *Risk-taking:* Three items assess the relative risk-taking propensity of a company: the degree of risk (low vs. high) of projects; the strategic posture (wait-and-see or bold and aggressive) of the company and the type of behaviour to achieve goals (cautious vs. bold). The items requested respondents to specify to what extent their companies reflect these types of characteristics. The mean score, calculated as the average of three items, measured a company's relative risk-taking propensity.
- *Proactiveness:* Three items gauged the proactiveness dimension of

a company: posture towards competitors, initiator of action and first-to-market or follower strategy. Respondents were required to signify to what extent their companies reflect these types of actions. The mean score, calculated as the average of three items, was used to determine the relative proactiveness of a company.

Frequency, which refers to the number of entrepreneurial events, may be applied to many different areas, including the introduction of new products, services, processes, as well as new businesses. The Entrepreneurial Performance Instrument (EPI) questionnaire, used by Morris and Sexton (1996), contained a number of items to measure frequency. These items were related to new product, new service and new process introductions. Since this study viewed new business development as a part of CE, the questionnaire was expanded to include this dimension as well.

- *Product frequency:* Respondents were informed that new product introductions refer to repositioning of products, product improvements, and additions to product lines, new category entries as well as new-to-the-world products. They were requested to rank the degree of product improvements over the past two years, compared to the past five years relative to their own performance and the performance of their competitors on a 9 point Likert-scale with 1 being significantly less and 9 being significantly more. They were also asked to indicate the degree of change in their products (improvements or 'new-to-the-world' products). The mean of three items provided an indication of product frequency.

- *Service frequency:* Service introductions include modifications of existing services, additions and services not offered before, and respondents were asked to rate the degree of service improvements over the last two years compared to the past five years relative to their own performance and that of competitors; as well as the degree of change in service offerings (improvements or services that did not previously exist in the market) on a 9-point Likert scale. Service frequency was assessed by the mean of these three items.

- *Process frequency:* Process innovations refer to new systems for managing inventories, an improved process for collecting outstanding debtors or other processes that could improve the effectiveness or efficiency of operations. Respondents were required to appraise the degree of process improvements over the last two years compared

TABLE 1   A summary of Cronbach Alpha coefficient values to determine the internal consistency of Entrepreneurial Intensity

Construct	Cronbach Alpha Coefficient Values
Degree of Entrepreneurship	0.88
Innovativeness	0.80
Risk-taking	0.88
Proactiveness	0.77
Frequency	0.79
Frequency Product	0.68
Frequency Service	0.74
Frequency Process	0.77
Frequency Business	0.67

to the past five years relative to their own performance, that of their competitors, and also to what extent these processes were new (improvements or processes not previously used in industry). The mean score of these three items provided an indication of the process frequency of a company's behaviour.

- *Business development frequency:* New business was seen as new markets, acquisitions and mergers, internal ventures and spin-offs. Respondents were asked to evaluate the degree of business development over the past two years, compared to the past five years relative to the company's own performance and that of competitors. Additionally the degree of new business development (market penetration or market development) was also assessed. Business development was measured by the mean of these three items.

Cronbach Alpha coefficients were computed to assess the internal consistency of the constructs assessed by the measurement instrument. These values are shown in table 1. The two constructs *frequency* and *degree of entrepreneurship* Cronbach Alpha coefficients were 0.79 and 0.88 respectively. The dimensions of degree of entrepreneurship innovativeness, risk-taking and pro-activeness were 0.80, 0.88 and 0.77 respectively. The dimensions of frequency product, service, process and business were 0.68, 0.74, 0.77 and 0.67 respectively. These coefficients would appear to satisfy Nunally's (1978) suggested minimum criteria for internal reliability. Coefficients lower than 0.5 are regarded as questionable, coefficients close to 0.70 as acceptable and coefficients of 0.80 as good (Sekaran 1992).

The EVA figures used in this study were obtained from the McGregor BFA Database (2005). The EVA values for the most current financial year (EVA$_{2005}$) were downloaded. In order to investigate the longitudinal nature of the relationship between EI and EVA, the change in EVA over the period 2003 to 2005 (EVA$_{2003-2005}$) was also calculated. Since the absolute monetary values of EVA are influenced by the size of the enterprise, the EVA values were standardised by dividing the figures by the enterprise's invested capital at the beginning of the financial year (IC$_{t-1}$).

$$\text{EVA} = \text{NOPAT} - (\text{WACC} \times \text{IC}_{t-1}). \tag{1}$$

Dividing throughout with IC$_{t-1}$ yields:

$$\frac{\text{EVA}}{\text{IC}_{t-1}} = \frac{\text{NOPAT}}{\text{IC}_{t-1}} = \frac{\text{WACC} \times \text{IC}_{t-1}}{\text{IC}_{t-1}} = \text{ROCE} - \text{WACC}, \tag{2}$$

where: ROCE = Return on Capital Employed and WACC = Weighted Average Cost of Capital.

The resulting figures provide an indication of the percentage margin earned above (or below) the enterprise's WACC. Positive values indicate excess returns, while negative values indicate returns below the WACC.

The market-adjusted share return (TSR) was calculated as the difference between the annual compounded return on a company's shares, and that of the All Share Index (ALSI). This value represents the excess return earned on the share above (or below) the overall market return. In order to calculate the annual compounded share return, the monthly returns on the share (consisting of the monthly capital gain/loss and all dividends received during the month) were calculated first. A twelve-month period ending December 2005 was used to calculate the compounded annual return on a share. Similarly, the monthly returns on the ALSI index were calculated (including dividend payments), and compounded over the corresponding period. Both the share and ALSI compounded returns were obtained from the McGregor BFA database (2005).

The statistical analysis was conducted using Statistica version 7.1. Correlations and best subset regression analyses were used to determine the relationship between EI, its constructs and EVA and TSR.

Results

The first part of this section describes the sample by focusing on the size of companies (as measured by the number of employees) and also provides descriptive statistics of entrepreneurial intensity and its constructs.
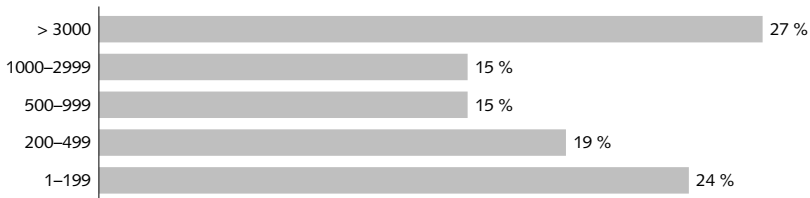
FIGURE 2   Size of companies in the sample, reflected by the number of employees ($n = 72$)

TABLE 2   Descriptive statistics of degree and frequency of entrepreneurship and its dimensions

Variables	Mean	Median	Std. dev.	Coef. var.	N
Degree of entrepreneurship	5.4634	5.4444	1.1023	0.2018	82
Innovativeness	5.4715	5.3333	1.5126	0.27648	82
Pro-activeness	6.1056	6.3333	1.5404	0.2523	82
Risk-taking	4.8130	4.667	1.738	0.3611	82
Frequency of entrepreneurship	5.8894	5.9167	1.3308	0.2260	82
Product	5.8694	6.0000	1.5168	0.2584	82
Service	5.7843	5.6667	1.7561	0.3036	82
Process	5.6573	6.0000	1.8179	0.3213	82
Business	5.8148	5.8333	1.6358	0.2813	82
Entrepreneurial Intensity	11.4469	11.2222	2.0206	0.1765	82

The second part contains the results from the correlation analyses, while the final part presents the results of the best subset regression.

The sample of firms used in the study consists of listed companies on the Industrial Sector of the JSE. As shown in figure 2 most of the companies (27%) employed 3000 and more employees, while 24% employed less than 200 employees. Thus both smaller and larger companies formed part of the sample.

Table 2 contains descriptive statistics of entrepreneurial intensity and its dimensions, using the mean, median, standard deviation and coefficient of variation to describe the data.

Table 2 describes the Entrepreneurial Intensity of companies listed in the Industrial Sector of the JSE. Examining the dimensions of degree of entrepreneurship, it would be seen that most companies score the highest on the pro-activeness dimension with a mean of 6.11, while their risk-taking propensity is the lowest with a mean of 4.81. The frequency of

TABLE 3   Correlation coefficients between EVA_{2005} and $EVA_{2003-2005}$
and the independent variables (p values in parentheses)

Correlations	EVA_{2005}	$EVA_{2003-2005}$
Entrepreneurial Intensity	0.0841 (0.5341)	0.2823** (0.0368)
Degree of entrepreneurship	0.1474 (0.1919)	0.3057*** (0.0065)
Innovativeness	0.0882 (0.4364)	0.1532 (0.1805)
Risk taking	0.1189 (0.2935)	0.1857 (0.1036)
Pro-activeness	0.0962 (0.3962)	0.3032*** (0.0070)
Frequency	0.0637 (0.6378)	0.1598 (0.2439)
Product	0.1904 (0.1091)	0.1716 (0.1554)
Service	0.1313 (0.2895)	0.2624** (0.0347)
Process	0.0540 (0.6592)	0.1344 (0.2780)
Business	−0.0015 (0.9903)	−0.1603 (0.1916)

NOTES   *** Significant at the 1 percent level. ** Significant at the 5 percent level.

entrepreneurship overall has a higher mean of 5.89 compared to degree of entrepreneurship (mean = 5.46). Product frequency innovations are the highest (mean = 5.87), while process innovations are the lowest (mean = 5.66).

The next section contains an analysis of the relationship between EI and EVA and between EI and TSR by employing correlation analysis. Thereafter a best subset regression analysis is used to determine which of the dimensions of degree and frequency of entrepreneurship explains the majority of the variance in EVA and TSR.

Correlation Analysis

ENTREPRENEURIAL INTENSITY AND ECONOMIC VALUE ADDED

Perusal of table 3 indicates that the correlations between EVA_{2005} and the independent variables are all statistically insignificant. The correlation coefficients are all low, and indicate that no statistically significant relationships exist between EVA_{2005} and any of the independent variables.

The value of EVA_{2005}, however, is calculated by considering only the most recent financial information. When investigating the relationship between CE and financial performance a longitudinal approach is preferred (Goosen, DeCining, and Smit 2002). To address this approach, the change in an enterprise's level of EVA from 2003 to 2005 ($EVA_{2003-2005}$) was also calculated. When the correlations between this measure and the

independent variables were considered, some were found to be statistically significant.

The correlation between EI and $EVA_{2003-2005}$ is statistically significant ($p < 0.05$). It appears that as the degree of entrepreneurship increases, there is also an increase in the economic value added. This finding is supported by the literature, which argues that higher levels of entrepreneurship should lead to value creation by the enterprise over the longer term (Hayton 2005; Goosen, DeConing, and Smit 2002; Zahra, Nielsen, and Bogner 1999).

In general, the degree of entrepreneurship exhibits a statistically significant relationship with $EVA_{2003-2005}$ ($p < 0.01$). The components of the degree of entrepreneurship, innovativeness, pro-activeness and risk-taking, exhibit varying levels of significance. Although numerous authors (Barringer and Bluedorn 1999; Birkinshaw 2003; Dess et al. 1999) advocate the importance of innovation in today's complex business environment, it appears that there is no statistically significant correlation between innovativeness and $EVA_{2003-2005}$ in the case of this dataset. In addition, no statistically significant correlation was found between risk-taking and $EVA_{2003-2005}$. The companies used for this analysis are listed companies and are accountable to shareholders. It is therefore, reasonable to expect that they would be cautious and careful in managing risk regarding uncertain investments. However, a statistically significant correlation exists between pro-activeness and $EVA_{2003-2005}$ ($p < 0.01$). Pro-activeness reflects the tendency of top management to anticipate future trends, opportunities and initiate strategies, rather than follow competitors. This type of commitment is essential for VBM systems to be successfully implemented in companies.

No statistically significant correlation was found between frequency of entrepreneurship and $EVA_{2003-2005}$. In terms of its dimensions: product, process or business frequency, no statistically significant correlation was found. However, frequency of service innovations shows a statistically significant correlation with $EVA_{2003-2005}$ ($p < 0.05$). This is a surprising finding, but may be ascribed to service innovations generally being less costly to implement than product, process and business innovations.

ENTREPRENEURIAL INTENSITY AND TOTAL SHARE RETURN

Examination of table 4 indicates that the correlation between EI and TSR is not statistically significant. A statistically significant correlation,

TABLE 4 Correlation coefficients between TSR and the independent variables

Variables	TSR
Entrepreneurial Intensity	0.1460
Degree of entrepreneurship	0.2217**
Innovativeness	0.0721
Risk taking	0.1262
Pro-activeness	0.2663**
Frequency	−0.0345
Product	0.0073
Service	−0.0193
Process	−0.2179*
Business	−0.2050*

NOTES ** Significant at the 5 percent level. * Significant at the 10 percent level.

however, exists between the degree of entrepreneurship and TSR. One should bear in mind that the TSR measure used in these analyses represents excess return earned on the share above the overall market return. Therefore, it would appear that as the degree of entrepreneurship increases, the shareholder value increases in excess of the market return. Even though the TSR values are calculated for the current year only, these values should reflect market perceptions with regard to future financial performance in an efficient market (Biddle, Bowen, and Wallace 1997). The literature argues that the strength of this value creation will increase over time as levels of entrepreneurship increase (Hayton 2005; Goosen, DeConing, and Smit 2002; Zahra, Nielsen, and Bogner 1999).

Similarly to the results obtained for $EVA_{2003-2005}$, the components of the degree of entrepreneurship show varying significance levels. No statistically significant correlation between innovativeness and TSR and risk-taking and TSR was found. However, a statistically significant correlation exists between pro-activeness and TSR ($p < 0.05$). Pro-activeness reflects the tendency of top management to spot trends and opportunities to take initiative in the market, rather than being reactive and following competitors. This finding also implies that a pro-active attitude of top management generates excess shareholder returns.

Comparable to the results of EI and $EVA_{2003-2005}$ no statistically significant correlation was found between frequency of entrepreneurship and TSR. In terms of its dimensions: product or service frequency, no statis-

tically significant correlation was found. However, frequency of process and business innovations show a statistically significant negative correlation with TSR ($p < 0.10$). This finding is to be expected, and may be ascribed to the cost of process and business innovations often being high in the year they are implemented, while the returns realised from these innovations are generally evident over a longer term.

Additionally it should be pointed out that several external market factors also influence TSR. Examples of these include general economic conditions, irrational market behaviour, and global market crises. Since EI only partly contributes to the overall TSR value, it is unrealistic to expect very high correlations with TSR.

Regression Analysis

Multiple regression analysis was used to assess the degree of relationship between the VB measures and the dimensions of degree and frequency of entrepreneurship. The first regression model assessed was the relationship between degree and frequency of entrepreneurship and the change in EVA ($EVA_{2003-2005}$). These results indicated that although the degree of entrepreneurship had a statistically significant relationship with $EVA_{2003-2005}$, only 7.62% (adjusted $R^2 = 0.0762$) of the variance in $EVA_{2003-2005}$ was explained by degree of entrepreneurship. The second regression model assessed the relationship between EI and TSR, to determine whether higher levels of entrepreneurship resulted in excess share returns. Again, the results indicated that degree of entrepreneurship had a significant relationship with TSR. The adjusted regression coefficient, however, was only 0.0938. Therefore, it was decided to use best subset regression analysis to determine how the separate dimensions of degree and frequency of entrepreneurship influence these two VB measures.

Best subset regression analysis runs all possible regressions between the dependent variable and all possible subsets of independent variables and enables the user to find the best regression model, given a specified number of independent variables (fewer than 14). It excludes variables which do not contribute to increasing the regression coefficient. The criterion used in determining which estimated regression equations are the best for only a number of predictors is the value of the coefficient of determination (R^2) (Hair et al. 2006). Consequently, best subset regression analysis has the benefit over stepwise regression, forward selection and backward elimination for which the best model for a given number of variables will be found.

TABLE 5 Summary of the best subset regression analysis conducted to determine the most relevant dimensions of EI for $EVA_{2003--2005}$

Variables	β	Std. err. of β	B	$t(50)$	p-level
Intercept	–	–	−16.7512	−1.68	0.09*
Pro-activeness	0.2905	0.1317	2.9436	2.21	0.03**
Risk taking	0.1894	0.1256	1.6972	1.51	0.13
Product	−0.3938	0.2222	−4.2504	−1.77	0.08*
Service	0.7415	0.2092	6.9883	3.54	0.00**
Business	−0.3769	0.1434	−3.6043	−2.63	0.01**
Innovativeness	–	–	–	–	–
Process	–	–	–	–	–

NOTES $R = 0.5657$, $R^2 = 0.3200$, adjusted $R^2 = 0.2520$, $F(5,50) = 4.7051$, $p < 0.0013$; std. err. of estimate: 13.3818; ** significant at the 5 percent level, * significant at the 10 percent level.

The results of the best subset regression analysis in table 5 indicate that pro-activeness, service, business and product innovations are statistically significant contributors to the variance in $EVA_{2003-2005}$ at the 90% confidence level. Pro-activeness ($t = 2.21$) and service innovations ($t = 3.54$) are positively and significantly related to $EVA_{2003-2005}$, while product and business innovations are negatively and significantly related to the change in $EVA_{2003-2005}$. The independent variables explain 25% (adjusted $R^2 = 0.25$) of the variation in $EVA_{2003-2005}$.

It is interesting to note that especially service innovations and the pro-activeness dimension of the degree of entrepreneurship contribute towards this relationship to the change in EVA. Product and business innovations show a negative relationship towards the change in EVA, since these innovations are often costly and the results seem to indicate that the return on these innovations may be longer than the three year period used in the analysis above. These results suggest that entrepreneurial strategies could yield long-term benefits. However, if firms are only focused on short-term annual financial results their long-term entrepreneurial intensity and competitiveness may decline.

A best subset regression analysis was also conducted with TSR as dependent variable, but weak results were obtained. It seems that TSR, which is an external measure of shareholder value creation, is influenced by many external factors, such as general economic conditions, irrational market behaviour, political instability of emerging markets, and

global market crises. Thus the influence of EI on the overall TSR value is weak.

Conclusions

This study contributes to the current literature by describing the EI of manufacturing firms listed on the JSE and focusing on the relationship between EI and shareholder value creation, rather than merely on the accounting-based financial performance measures of an enterprise. Data obtained from companies listed on the JSE for the period 2003–2005 strongly suggest that the relationship between EI and financial performance should be viewed longitudinally. The results indicate that there is a statistically significant relationship between EI and the change in an enterprise's level of EVA from 2003 to 2005. It appears that companies with higher degrees of entrepreneurship create more economic value added over the longer term. In particular, the pro-active dimension of the degree of entrepreneurship appears to contribute toward this value creation. Similar results were found when the association between EI and TSR was examined. No statistically significant relationship exists between EI and TSR, but a statistically significant relationship exists between degree of entrepreneurship and TSR, again with the pro-activeness dimension contributing to this relationship with shareholder value creation. It appears that companies with higher degrees of entrepreneurship create excess returns for shareholders above market returns.

Frequency of entrepreneurship (in general) was not found to exert a statistically significant relationship with EVA and TSR. The correlation analysis indicates that frequency of product innovations shows no relationship with EVA or TSR. Frequency of service innovations, however, shows a statistically significant correlation with $EVA_{2003-2005}$ ($p < 0.05$). This may be ascribed to service innovations generally being less costly than product, process and business innovations. Frequency of process and business innovations has a statistically significant negative correlation with TSR ($p < 0.10$). This finding is to be expected, since process and business innovations are generally more costly and take a longer period to realise returns.

The best subset regression analysis supports the above findings and indicates that EI explains 25% of the variance in the change in EVA. The constructs: pro-activeness, service, product and business showed the best regression equation with the change in EVA. Pro-activeness and service innovations exhibit a positive relationship with the change in EVA, which

indicates that the market evaluates top management stance towards opportunities, encouragement of initiative, and competitive aggressiveness positively, as well as service innovations. However, the negative relationship observed for product and business innovations suggest that the cost of entrepreneurial initiatives is high and may in some instances only be recouped over a longer period (more than three years).

Only companies listed on the JSE could be included in this study, since published financial and share data are not available for unlisted companies. Consequently it would prove difficult to calculate EVA, cost of capital and TSR values for unlisted companies over a period of time. The specific focus on only those companies that provided complete EVA and TSR data over the period investigated, however, could expose the study to a survivorship bias.

Future researchers should measure EI longitudinally and ought to determine whether it is a stable characteristic of a company or whether it varies over time. These measures could then be correlated with VB measures. Whereas this study investigated the relationship between EI and historic EVA and TSR values, investigating the effect of current EI levels on future EVA and TSR values could provide further insight. Additional future research could focus on determining whether enterprises that incorporate VB measures in their compensation systems may differ in terms of EI from those that do not.

References

Antoncic, B., and R. D. Hisrich. 2001. Intrapreneurship: Construct refinement and cross-cultural validation. *Journal of Business Venturing* 16 (5): 495–527

Barringer, B. R., and A. C. Bluedorn. 1999. The relationship between corporate entrepreneurship and strategic management. *Strategic Management Journal* 20 (5): 421–44.

Barringer, B. R., and R. D. Ireland. 2008. *Entrepreneurship: Successfully launching new ventures.* 2nd ed. Upper Saddle River, NJ: Pearson Prentice Hall.

Biddle, G. C., R. M. Bowen, and J. S. Wallace. 1997. Does EVA beat earnings? Evidence on associations with stock returns and firm values. *Journal of Accounting and Economics* 24 (3): 301–36.

Birkinshaw, J. 2003. The paradox of corporate entrepreneurship. *Strategy and Business* 30:46–58.

Block, Z., and C. MacMillan. 1993. *Corporate venturing.* Boston, MA: Harvard Business School Press.

Bouchard, V. 2001. Exploring corporate entrepreneurship: A corporate strategy perspective. Paper delivered at European Entrepreneurial Learning Conference, Lyon.

Brigham, E. F., and J. F. Houston. 2001. *Fundamentals of financial management.* Concise 3rd edition. Mason, OH: South-Western College Publications.

Brophy, D. J., and J. M. Schulman. 1992. A finance perspective on entrepreneurship research. *Entrepreneurship Theory and Practice* 13 (3): 68–85.

Bruton, G. D., A. Merikas, D. Prasad and G. S. Vozikis. 1996. Measuring corporate entrepreneurial performance: Value creation as an alternative approach. *Journal of Small Business and Entrepreneurship* 13 (3): 68–85.

Claros, A. L., L., Altinger, J. Blanke, M. Drzeniek, and I. Mia. 2006. The global competitiveness index: Identifying the key elements of sustainable growth. In *The global competitiveness report 2006–2007,* 1:3–50. Geneva: World Economic Forum.

Copeland, T., T. Koller, and J. Murrin. 1994. *Valuation: Managing and measuring the value of companies.* 2nd ed. New York: Wiley.

Covin, J. G., and D. P. Slevin. 1989. Strategic management of small firms in hostile and benign environments. *Strategic Management Journal* 10 (1): 75–87.

———. 1991. A conceptual model of entrepreneurship as firm behaviour. *Entrepreneurship Theory and Practice* 16 (1): 7–25.

Dess, G. G., T. T. Lumpkin, and J. E. McGee. 1999. Linking corporate entrepreneurship to strategy, structure, and process: Suggested research directions. *Entrepreneurship Theory and Practice* 23 (3): 85–102.

Drucker, P. F. 2002. *Innovation and entrepreneurship.* Oxford: Butterworth-Heineman.

Ehrbar, A. 1998. EVA: *The real key to creating wealth.* New York: Wiley.

Fabozzi, F. J., and J. L. Grant. 2000. *Value-based metrics: Foundations and practice.* New Hope, PA: Fabozzi.

Fama, E. F. 1974. Empirical relationships between dividend and investment decisions of firms. *American Economic Review* 64 (3): 304–18.

———. 1991. Efficient capital markets 2. *Journal of Finance* 46 (5): 1575–617.

Gamble, P. R, and J. Blackwell. 2002. *Knowledge management: A state of the art guide.* London: Kogan Page.

Grant, J. L. 2003. *Foundations of economic value added.* 2nd ed. Hoboken, NJ: Wiley.

Goosen, C. J., T. J. DeConing, and E. v. d. M. Smit. 2002. Corporate entrepreneurship and financial performance: The role of management. *South African Journal of Business Management* 33 (4): 21–7.

Guth, W., and A. Ginsberg. 1990. Guest editor's introduction: Corporate entrepreneurship. Special issue, *Strategic Management Journal* 11:5–16.

Hair, J. F., W. C. Black, B. J. Babin, R. E. Anderson, and R. L. Tatham. 2006. *Multivariate data analysis.* 6th ed. Upper Saddle River, NJ: Prentice Hall.

Hamel, G., and B. Breen. 2007. *The future of management.* Boston, MA: Harvard Business School Press.

Hayton, J. C. 2005. Promoting corporate entrepreneurship through human resource management practices: A review of empirical research. *Human Resource Management Review* 15 (1): 21–41.

Hisrich, R. D, and M. P. Peters. 2002. *Entrepreneurship.* 5th edition. New York: McGraw-Hill.

Hitt, M., D. Ireland, M. Camp, and D. Sexton. 2002. *Strategic entrepreneurship: Creating a new mindset.* Oxford: Blackwell.

Hof, R. D. 2004. Now more than ever, innovation is the answer. *Business Week,* 1 March.

Hornsby, J. S., D. W. Naffziger, D. F. Kuratko, and R. V. Montagno. 1993. An interactive model of the corporate entrepreneurship process. *Entrepreneurship Theory and Practice* 58 (1): 28–39.

Hornsby, J. S., D. F. Kuratko, and S. A. Zahra. 2002. Middle managers' perception of the internal environment for corporate entrepreneurship: Assessing a measurement scale. *Journal of Business Venturing* 17 (3): 253–73.

Hough, J. 2004. Globalisation in the knowledge economy. Unpublished inaugural address, University of Stellenbosch.

Knight, G. A. 1997. Cross-cultural reliability and validity of a scale to measure firm entrepreneurial orientation. *Journal of Business Venturing* 12 (3): 213–25.

Kreiser, P., L. Marino, and L. M. Weaver. 2002. Assessing the relationship between entrepreneurial orientation, the external environment and firm performance. In *Frontiers of entrepreneurship research 2002,* ed. W. D. Bygrave, C. G. Brush, P. Davidsson, J. Fiet, P. G. Greene, R. T. Harrison, M. Lerner, G. D. Meyer, J. Sohl, A. Zacharakis, 268–338. Babson Park, MA: Babson College.

Kwandwalla, P. N. 1977. *The design of organisations.* New York: Harcourt, Brace, Jovanovich.

Leibold, M., G. Probst, and M. Gibbert. 2002. *Strategic management in the knowledge economy.* New York: Wiley.

Longenecker, J. G., C. W. Moore, J. W. Petty, and L. E. Palich. 2006. *Small business management: An entrepreneurial emphasis.* Mason, OH: South-Western.

Lumpkin, G. T., and G. G. Dess. 1996. Clarifying entrepreneurial orienta-

tion construct and linking it to performance. *Academy of Management Review* 21 (1): 135–72.

Madden, B. J. 1999. CFROI *valuation: A total system approach to valuing the firm.* Boston, MA: Butterworth-Heinemann.

Martin, J. D., and J. W. Petty. 2000. V*alue based management: The corporate response to the shareholder revolution.* Boston, MA: Harvard Business School Press.

Mboweni, T. T. 2006. South Africa's economic policy challenges. Address of Governor of the South African Reserve Bank at the 16th meeting of the Central Bank Governors' Club, Irkutsk.

McGregor. 2005. McGregor BFA Version 04.211. Http://www.mcgregorbfa .com.

Miller, D., and P. Friesen. 1983. Strategic-making and environment: The third link. *Strategic Management Journal* 4 (3): 221–35.

Monks, R. A. G., and N. Minow. 2001. *Corporate governance.* 2nd ed. Oxford: Blackwell.

Morgan, R. E., and C. A. Strong. 2003. Business performance and dimensions of strategic orientation. *Journal of Business Research* 56 (3): 163–176.

Morris, M. H. 1998. *Entrepreneurial intensity: Sustainable advantages for individuals, organisations and societies.* Westport, CT: Quorum.

Morris, M. H., J. Allen, M. Schindehutte, and R. A. Avila. 2006. Balanced management control systems as a mechanism for achieving corporate entrepreneurship. Unpublished paper.

Morris, M. H., and D. F. Kuratko. 2002. *Corporate entrepreneurship.* Orlando, FL: Harcourt College.

Morris, M. H., and D. L. Sexton. 1996. The concept of entrepreneurial intensity: Implications for company performance. *Journal of Business Research* 36 (1): 5–13.

Nunnally, J. C. 1978. *Psychometric theory.* New York: McGraw-Hill.

Peterson, P. P., and D. R. Peterson. 1996. *Company performance and measures of value added.* Charlottesville, VA: The Research Foundation of The Institute of Chartered Financial Analysts.

Planting, S. 2004. Listen, learn, lead and support excellence. *Financial Mail,* 5 March.

Porter, M. E. 1980. *Competitive strategy.* New York: Free Press.

O'Byrne, S. F. 1996. EVA® and market value. *Journal of Applied Corporate Finance* 9 (1): 116–25.

Schilling, M. 2008. *Strategic management of technological innovation.* 2nd ed. Boston, MA: McGraw-Hill.

Schumpeter, J. A. 1934. *The theory of economic development.* Boston, MA: Harvard University Press.

———. 1942. *Capitalism, socialism and democracy.* New York: Harper.

Sekaran, U. 1992. *Research methods for business: A skill building approach.* 2nd ed. New York: Wiley.

Sharma, P., and J. J. Chrisman. 1999. Towards a reconciliation of the definitional issues in the field of corporate entrepreneurship. *Entrepreneurship Theory and Practice* 23 (3): 11–27.

Slevin, D. P., and G. P. Covin. 1990. Juggling entrepreneurial style and organizational structure. *Sloan Management Review* 31 (2): 43–53.

Singh, H. 1990. Management buyouts: Distinguishing characteristics and operating changes prior to public offering. Special issue, *Strategic Management Journal* 11:17–27.

Stevenson, H., M. Roberts, and H. Grousback. 1989. *New business ventures and the entrepreneur.* Homewood, IL: Irwin.

Stewart, G. B. 1991. *The quest for value: The EVA™ management guide.* New York: HarperBusiness.

Stewart, G. B. 1994. EVA™: Fact and fantasy. *Journal of Applied Corporate Finance* 7 (2): 71–84.

Volberda, H. W., C. Baden-Fuller, and F. A. J. Van Den Bosch. 2001. Mastering strategic renewal: Mobilising renewal journeys in multi-unit firms. *Long Range Planning* 34 (2001): 159–78.

Von Broembsen, M., E. Wood, and M. Herrington. 2005. *Global entrepreneurship monitor: South African report 2005.* Cape Town: UCT Graduate School of Business, University of Cape Town.

Vozikis, G. S., G. D. Bruton, D. Prasad, and A. A. Merikas. 1999. Linking corporate entrepreneurship to financial theory through additional value creation. *Entrepreneurship Theory and Practice* 24 (2): 33-43.

Walbert, L. 1994. The Stern Stewart performance 1000: Using EVATM to build market value. *Journal of Applied Corporate Finance* 6 (4): 109–20.

Wiklund, J. 1999. The sustainability of the entrepreneurial orientation-performance relationship. *Entrepreneurship Theory and Practice* 24 (1): 37–48.

Wiklund, J., and D. Shepherd. 2003. Knowledge-based resources, entrepreneurial orientation, and the performance of small and medium-sized businesses. *Strategic Management Journal* 24 (13): 1307–14.

———. 2005. Entrepreneurial orientation and small business performance: A configurational approach. *Journal of Business Venturing* 20 (1): 71–91.

Young, S. D., and S. F. O'Byrne. 2001. EVA *and value-based management: A practical guide to implementation.* New York: McGraw Hill.

Zahra, S. A. 1991. Predictors and financial outcomes of corporate entrepreneurship: An exploratory study. *Journal of Business Venturing* 6 (4): 259–85.

————. 1993. Environment, corporate entrepreneurship and financial performance: A taxonomic approach. *Journal of Business Venturing* 8 (4): 319–40

Zahra, S. A., and G. Covin. 1995. Contextual influences on the corporate entrepreneurship-performance relationship: A longitudinal analysis. *Journal of Business Venturing* 10 (1): 43–58.

Zahra, S. A., and D. M. Garvis. 2000. International corporate entrepreneurship and company performance: The moderating effect of international environmental hostility. *Journal of Business Venturing* 15 (5–6): 469–92.

Zahra, S. A., A. O. Nielsen, and A. C. Bogner. 1999. CE, knowledge, and competence development. *Entrepreneurship Theory and Practice* 23 (3): 169–89.

The Relationships Among Leadership Styles, Entrepreneurial Orientation, and Business Performance

Chung-Wen Yang

This study aims to contribute to the knowledge of leadership styles and entrepreneurial orientation at small and medium enterprises as well as their effects on business performance. This study examines how leadership style can affect the development and implementation of entrepreneurial orientation in small and medium enterprises in Taiwan. It is also designed to examine the effects of leadership styles and entrepreneurial orientation on business performance. Significant conclusions from this study are that different leadership styles may affect business performance; that transformational leadership is significantly more correlated to the business performance than is transactional leadership and passive-avoidant leadership; that entrepreneurial orientation is positively related to performance; and that transformational leadership with higher entrepreneurial orientation can contribute to higher business performance.

Key Words: leadership styles, entrepreneurial orientation, business performance
JEL *Classification:* M10

Introduction

An effective leader influences followers in a desired manner to achieve desired goals. Different leadership styles may affect organizational effectiveness or performance (Nahavandi 2002); Entrepreneurs have become the heroes of economic development and contemporary enterprises (Sathe 2003). Entrepreneurial orientation is a commonly used measure in the literature (Morris and Kuratko 2002). This concept is the presence of organizational-level entrepreneurship (Wiklund and Shepherd 2005).

Some researchers have tried to combine the two concepts into entrepreneurial leadership to explore both leadership and entrepreneurship behavior (Gupta et al. 2004; Tarabishy et al. 2005). They have tried

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to combine entrepreneurship with leadership into a new form of leadership called entrepreneurial leadership. This new leadership model has been used to show both entrepreneurship and leadership behavior (Tarabishy et al. 2005). In the dynamic, complex, and uncertain competitive environment, a type of entrepreneurial leader who is distinct from the behavioral form of leaders is needed (Cohen 2004).

This study was designed to examine how leadership styles can affect the development and implementation of entrepreneurial orientation in Small and medium enterprises (smes) in Taiwan. smes exert a strong influence on the economies of Taiwan. It also examines the effects of entrepreneurial orientation and leadership styles on business performance. The findings could contribute new knowledge in the fields of leadership and entrepreneurship, especially entrepreneurial leadership

Literture Review and Hypothesis Development

LEADERSHIP STYLES AND BUSINESS PERFORMANCE

Leadership style is the 'relatively consistent pattern of behavior that characterizes a leader' (DuBrin 2001, 121). Today's organizations need effective leaders who understand the complexities of the rapidly changing global environment. Different leadership styles may affect organizational effectiveness or performance (Nahavandi 2002). This study focuses on three different leadership styles: transformational leadership, transactional leadership, and passive-avoidant leadership measured through the Multifactor Leadership Questionnaire (mlq; Bass and Avolio 1995). The concepts of transformational and transactional leadership have been considerable interest in the leadership literature over the past several years (Avolio and Bass 2004).

Transformational and transactional leadership are not viewed as opposing leadership styles. Leaders can be both transformational and transactional (Lowe et al. 1996). In general, transformational leadership is more effective than transactional leadership (Gardner and Stough 2002). Some researchers have found data supporting the conclusion that transformational leadership is superior to transactional leadership (Bass et al. 2003; Dvir et al. 2002). Transformational leadership is more strongly correlated than transactional leadership with higher productivity and performance (Lowe et al. 1996), higher level of organizational culture (Block 2003), and higher level of emotional intelligence (Gardner and Stough 2002). Therefore, the researcher hypothesizes:

H1 *Can the top-level managers' leadership styles (transformational leadership, transactional leadership, and passive-avoidant leadership) predict higher business performance?*

ENTREPRENEURIAL ORIENTATION AND BUSINESS PERFORMANCE

Entrepreneurial orientation is a commonly used measure in entrepreneurship literature. Entrepreneurial orientation is the presence of organizational-level entrepreneurship (Wiklund and Shepherd 2005). Several researchers have agreed that entrepreneurial orientation could be explained by innovation, proactiveness, and risk taking (Wiklund 1999). A large proportion of entrepreneurship studies assume entrepreneurial orientation to be a unitary concept (Covin and Slevin 1989; Dess et al. 1997; Wiklund 1999). The notion of a single factor entrepreneurial orientation concept also has been examined in some studies. Because the three dimensions of entrepreneurial orientation can vary independently of one another (Krauss et al. 2005; Kreiser et al. 2002; Lumpkin and Dess 1996; Lyon et al. 2000; Venkatraman 1989), this study included a comparison of the dimensions of entrepreneurial orientation and total entrepreneurial orientation with other variables.

The assumption of entrepreneurial orientation is that entrepreneurial businesses differ from other types of businesses. Successful corporate entrepreneurship must have an entrepreneurial orientation (Covin and Slevin 1989; Wiklund 1999; Wiklund and Shepherd 2003). This study compared three dimensions of the entrepreneurial orientation and the total entrepreneurial orientation with business performance. Hence, the researcher hypothesizes:

H2 *Can the entrepreneurial orientation (innovation, proactiveness, and risk-taking) of* SMEs *in Taiwan predict the business performance?*

LEADERSHIP STYLES AND ENTREPRENEURIAL ORIENTATION

The study tried to combine these two concepts: leadership and entrepreneurship. The aim was to examine how leadership can affect the development and implementation of entrepreneurial orientation in SMEs in Taiwan. Entrepreneurial leadership is an effective and needed leadership style (Cohen 2004; Fernald, Solomon, and Tarabishy 2005; Tarabishy et al. 2005). Entrepreneurial leadership was coined by those who realized that a change in leadership style was necessary. Entrepreneurial leaders play a critical role in the success of new business ven-

tures. Wah (2004) suggested that future leadership research use more quantitative approaches to survey Chinese entrepreneurial leaders. Entrepreneurial leadership is understandable because of the uncharted and unprecedented territory that lies ahead for businesses in today's dynamic markets (Tarabishy et al. 2005). Thornberry (2006) stated that 'entrepreneurial leadership is more like transformational leadership than it is like transactional leadership, yet it differs in some fundamental ways' (p. 24). The study also examines the effects of entrepreneurial orientation and leadership styles on business performance. Given this view the researcher hypothesizes:

H3 *Can the top-level managers' leadership styles (transformational leadership, transactional leadership, and passive-avoidant leadership) and entrepreneurial orientation of SMEs (innovation, proactiveness, and risk-taking) predict higher business performance?*

Methodology

RESEARCH DESIGN

This study used a quantitative research method to examine the relationship among leadership styles, the entrepreneurial orientation, and business performance of SMEs in Taiwan; a sample of top-level managers from SMEs in Taiwan was used. SMEs represent a major part of most modern economies. According to the White Paper on Small and Medium Enterprises in Taiwan (Ministry of Economic Affairs 2006), SMEs account for 97.8% of all businesses in Taiwan. This study focused on SMEs to control for organizational size. The population for the study was based on the CD-ROM version of the *2006 Directories of Corporations* (China Credit Information Service 2006). The CCIS is the leading business information agency in Taiwan, and its 2006 directories provide basic background information for 20,302 enterprises in Taiwan. Surveys were addressed to top-level managers, who were identified as the CEOs, owners, founders, managers, presidents, or heads of SMEs. Top-level managers were targeted because they are the most informed about the business' overall operational activities.

INSTRUMENTATION

Three survey instruments were used. The first was the Multifactor Leadership Questionnaire (MLQ), which was used to measure top-level managers' leadership style (transformational, transactional, and passive-

avoidant). The MLQ is one of the most widely used instruments to measure transformational and transactional leadership behaviors (Avolio and Bass 2004). The MLQ Leader 5x short form consists of 45 items that measure aspects of transformational leadership (attributed charisma, idealized influence, inspirational motivation, individualized stimulation, and intellectual consideration), transactional leadership (contingent reward and management-by-exception: active), and passive-avoidant leadership (management-by-exception: passive and laisser-faire leadership) on a 5-point scale.

The second assessment tool was the Entrepreneurial Orientation Questionnaire (EOQ), the most widely utilized instrument for measuring entrepreneurial orientation. It was developed by Covin and Slevin (1989), based on the earlier study of Khandwalla (1976/1977) and Miller and Friesen (1982). The EOQ, which contains nine items and uses a 7-point scale, measures three dimensions of entrepreneurial orientation (innovation, proactiveness, and risk-taking). It is used to assess three components of entrepreneurial orientation, with three items measuring innovation, three items measuring proactiveness, and three items measuring risk-taking.

The third assessment tool was a business performance scale developed by the researcher according to the suggestions of previous studies. Business performance is a multidimensional construct (Wiklund and Shepherd 2005). Previous studies have often used self-reports to gather business performance data, and these results have proven to be reliable (Knight 2000). Wiklund (1999) suggested that performance measures should include both growth and financial performance. Furthermore, public information is unreliable because most SMEs are privately held and have no legal obligation to disclose information. Respondents may be reluctant to provide actual financial data (Tse et al. 2004). Hence, this study used subjective, self-reported measures of business performance including growth and financial performance. The business performance scale was developed by the research according to suggestions of previous studies. The scale contains eight items and uses a 7-point Likert-type scale. Four indicators of growth were utilized: sales growth, employment growth, sales growth compared to competitors, and market share growth compared to competitors. The three financial performance indicators were gross profit, return on assets (ROA), and return on investment (ROI). In addition, the researcher used an indicator of 'overall performance/success' to business performance (Lumpkin and Dess 1996).

A sample should be large enough to provide a credible result. Gay and Airasian (2003) said that, when the population size is about 5,000 or more, a sample size of 400 should be adequate (p. 113). Furthermore, because the similar studies in Taiwan reported a low response rate for mailed surveys, the researcher randomly selected 3,000 top-level managers of SMEs in Taiwan through the 2006 Directories of Corporations (CD version; China Credit Information Service 2006). Questionnaires were delivered to 3,000 top-level managers via post service. Of these, 449 questionnaires were returned, but 26 surveys were not usable because they were incomplete.

The 423 usable surveys were examined for accuracy of data entry, non-response bias, missing values, reliability, and validity. None of the nine variables – transformational leadership, transactional leadership, passive-avoidant leadership, outcomes of leadership, innovation, proactiveness, risk-taking, total entrepreneurial orientation, and total business performance – violated the assumption of normality. Finally, 17 surveys were deleted due to outliers, so 406 surveys without missing data remained for analysis.

Data Analysis

The Statistical Package for the Social Sciences (SPSS 13.0) computer program for Windows was used to conduct the statistical analysis of all data in this study. The Cronbach' alpha coefficients of the MLQ ranged from .79 to .90. The Cronbach' alpha coefficients of the EOQ ranged from .78 to .84; the overall Cronbach' alpha coefficient of the EOQ was .87. The Cronbach' alpha coefficient of the business performance was .91. All the coefficients were greater than .70, exceeding the recommended minimum level of .7 (Nunnally 1978). This ensured that these three scales had a very satisfactory degree of reliability. The results concerning evidence of reliability were consistent with previous studies involving two of the instruments used in this study: the Multifactor Leadership Questionnaire (MLQ; Bass and Avolio 1995) and the Entrepreneurial Orientation Questionnaire (EOQ; Covin and Slevin 1989). The business performance scale also showed high reliability and inter-item correlations.

A Pearson product-moment correlation coefficient was used to examine the relationship between the leadership styles and the business per-

TABLE 1　Intercorrelations for leadership styles and business performance ($N = 418$)

Measure	TF	TA	PA
Business Performance	.25***	.13**	−.10*

NOTES　TF = transformational leadership, TA = transactional leadership, PA = passive-avoidant leadership; * $p < .05$, ** $p < .01$. *** $p < .001$.

formance of SMES in Taiwan. Transformational leadership was significantly positively correlated with total business performance ($r = .25$, $p < .001$). There was a small, positive correlation between transformational leadership and business performance. Transactional leadership was significantly positively correlated with total business performance ($r = .13$, $p = .009$). There was a small, positive correlation with total business performance ($r = .13$, $p = .009$). There was also a small, positive correlation between transactional leadership and business performance. Passive-avoidant leadership was significantly negatively correlated with business performance ($r = -.10$, $p = .036$). There was a small, negative correlation between passive-avoidant leadership and business performance. As shown in table 1, transformational leadership had a stronger relationship with business performance than did transactional leadership, both with small and positive correlations. Passive-avoidant leadership had a very small, negative correlation.

LEADERSHIP STYLES TO BUSINESS PERFORMANCE

A standard multiple regression was performed with business performance as the dependent variable, and scores on the MLQ (transformational leadership, transactional leadership, and passive-avoidant leadership) as independent variables. An analysis for evaluation of assumptions was performed to reduce the number of outliers and improve the normality, linearity, and homoscedasticity of residuals. With the use of $p < .001$ criterion for Mahalanobis distance, no multivariate outliers were found in the sample ($N = 406$). No cases had missing data and no suppressor variables were found. A residual analysis was conducted to check assumptions. To check the scatterplot of the standardized residuals and the normal probability plot, assumptions about residuals were met.

Table 2 shows the correlations between the variables, unstandardized regression coefficients (B), and the standardized regression coefficients (β). This regression model was significantly different from zero, $F (3,402) = 9.85$ and $p < .001$. The regression coefficient of transformational leadership was different from zero, and 95% confidence limits were .28 to .79.

TABLE 2   Regression analysis summary for the top-level managers' leadership styles predicting business performance

Variable	B	SEB	β
Transformational leadership	.53	.13	.26***
Transactional leadership	−.06	.13	−.03
Passive-avoidant leadership	−.14	.08	−.09

NOTES $R^2 = .07$, adjusted $R^2 = .06$ ($N = 406$, $p < .001$), *** $p < .001$.

Only one independent variable contributed significantly to prediction of business performance, transformational leadership: $p < .001$, $sr^2 = .04$.

Altogether, 6% (adjusted R^2) of the variability in business performance was predicted by MLQ scores on these three independent variables. Transactional leadership and passive-avoidant leadership were not good predictors of the business performance. The transformational leadership of top-level managers contributed the most to the business performance of SMEs.

LEADERSHIP STYLES TO BUSINESS PERFORMANCE:
DISCRIMINANT FUNCTION ANALYSIS

The researcher divided business performance into two categories by its mean ($M = 4.32$): higher business performance and lower business performance. A direct discriminant function analysis was performed using three MLQ variables (transformational leadership, transactional leadership, and passive-avoidant leadership) as predictors of membership in the two groups (higher business performance and lower business performance). No cases were identified as multivariate outliers with $p < .001$. An analysis for evaluation of assumptions of linearity, normality, multi-collinearity, and homogeneity of variance-covariance matrices did not violate multivariate analysis.

A discriminant function analysis indicated a strong association between groups and predictors, χ^2 (3) = 14.91 and $p = .002$. Table 3 presents the correlation of predictor variables with discriminant functions, which suggested that the good predictors for distinguishing between higher business performance and lower business performance were transformational leadership and transactional leadership.

SMEs with higher business performance had higher scores on transformational leadership ($M = 3.10$, $SD = .45$) than on transactional leadership ($M = 2.72$, $SD = .49$) or passive-avoidant leadership ($M = 1.33$, SD

TABLE 3   Correlation of predictor variables from the MLQ with discriminant functions (function structure matrix) and standardized discriminant function coefficients

Predictor variable	Correlation with discriminant functions	Standardized discriminant function coefficients
	Function 1	Function 1
Transformational	.96	1.10
Transactional	.46	−.23
Passive-avoidant	−.27	−.20

TABLE 4   Means and standard deviations of predictor variables from the MLQ as a function of business performance ($N = 406$)

Predictor variable	Lower business perf.		Higher business perf.	
	M	SD	M	SD
Transformational Leadership	2.91	.51	3.10	.45
Transactional Leadership	2.63	.52	2.72	.49
Passive-avoidant Leadership	1.40	.63	1.33	.62

= .62). SMEs with lower business performance also had higher scores on transformational leadership ($M = 2.91$, $SD = .51$) than on transactional leadership ($M = 2.63$, $SD = .52$) or passive-avoidant leadership ($M = 1.40$, $SD = .63$). Table 4 presents the results.

   Higher business performance differs from lower business performance on transformational leadership, $F(1,404) = 14.01$ and $p < .001$. The group of higher business performance did not differ from the group of lower business performance on transactional leadership, $F(1,404) = 3.24$ and $p = .07$, or passive-avoidant leadership, $F(1,404) = 1.14$ and $p = .29$. Among the three different leadership styles, transformational leadership (Wilks' $\lambda = .96$) was the best predictor of higher business performance. Table 5 presents the predictor variables.

TABLE 5   Predictor variables from the MLQ in stepwise discriminant function analysis

Predictor variable	Wilks' λ	Equivalent $F(1,404)$
Transformational leadership	.96	14.01***
Transactional leadership	.99	3.24
Passive-avoidant leadership	.99	1.14

NOTES $^* p < .05$, $^{***} p < .001$.

TABLE 6   Classification analysis for business performance

Actual group membership		Predicted group membership			
		Lower bus. perf.		Higher bus. perf.	
	N	*n*	%	*n*	%
Lower Business Performance	200	105	52.5	95	47.5
Higher Business Performance	206	88	42.7	118	57.3

NOTES   Overall percentage of correctly classified cases (54.9%).

TABLE 7   Intercorrelations for dimensions of entrepreneurial orientation and measure of business performance ($N = 406$)

Measure	Innovation	Proactiveness	Risk-taking	Total EO
Business Performance	.32***	.33***	.26***	.37***

NOTES   EO = Entrepreneurial orientation, *** $p < .001$.

Table 6 shows the classification analysis for the business performance; 54.9% of cases were classified correctly. The group with higher business performance was more likely to be correctly classified (57.3% correct classifications) than the group with lower business performance (52.5% correct classifications).

ENTREPRENEURIAL ORIENTATION AND BUSINESS PERFORMANCE

A Pearson product-moment correlation coefficient was calculated to examine the relationship between entrepreneurial orientation and business performance of SMEs in Taiwan. Table 7 shows the intercorrelations for dimensions of entrepreneurial orientation and business performance.

Innovation was significantly positively correlated with business performance ($r = .32$, $p < .001$). There was a medium, positive correlation between innovation and the business performance. Proactiveness was significantly positively correlated with business performance ($r = .33$, $p < .001$). There was a medium, positive correlation between proactiveness and business performance. Risk-taking was significantly positively correlated with business performance ($r = .26$, $p < .001$). There was a small, positive correlation between risk-taking and business performance. Total entrepreneurial orientation was significantly positively correlated with business performance ($r = .37$, $p < .001$). There was a medium, positive correlation between total entrepreneurial orientation and business performance.

TABLE 8   Regression analysis summary for scores on EO of SMEs in Taiwan predicting business performance variable

Variable	B	SEB	β
EO-innovation	.14	.05	.18**
EO-proactiveness	.17	.05	.20**
EO-risk-taking	.06	.04	.08

NOTES $R^2 = .146$, adjusted $R^2 = .14$ ($N = 404$, $p < .001$); *** $p < .001$, ** $p < .01$.

ENTREPRENEURIAL ORIENTATION TO BUSINESS PERFORMANCE

A standard multiple regression was performed with business performance as the dependent variable and scores on entrepreneurial orientation as the independent variables. An analysis for evaluation of assumptions was performed to reduce the number of outliers and improve the normality, linearity, and homoscedasticity of residuals. With the use of $p < .001$ criterion for Mahalanobis distance, two multivariate outliers were found. After deleting these outliers, 404 cases without missing data continued to be analyzed. A residual analysis was conducted to check assumptions. To check the scatterplot of the standardized residuals and the normal probability plot, assumptions about residuals were met.

Table 8 presents the correlations between the variables, unstandardized regression coefficients (B), and standardized regression coefficients (β). This regression model was significantly different from zero, $F(3,400) = 22.81$, $p < .001$.

For the two regression coefficients that differed significantly from zero, 95% confidence limits were calculated. The confidence limits for innovation were .05 to .22; for proactiveness, they were .07 to .28. Two of the independent variables contributed significantly to prediction of business performance, innovation ($sr^2 = .02$) and proactiveness ($sr^2 = .02$). Altogether, 14% (adjusted R^2) of the variability in business performance was predicted by entrepreneurial orientation scores on these three independent variables. Risk-taking was not a good predictor of business performance.

LEADERSHIP STYLES AND ENTREPRENEURIAL ORIENTATION

The relationship between the top-level managers' leadership styles and the entrepreneurial orientation of SMEs in Taiwan was examined using Pearson product-moment correlation coefficient. Transformational leadership was significantly positively correlated with innovation ($r =$

TABLE 9　Intercorrelations for leadership styles and the EOQ measures (N = 406)

Measure	TF	TA	PA
EO-innovation	.22***	.13*	.03
EO-proactiveness	.23***	.09	−.03
EO-risk-taking	.14**	.05	.05
Total entrepreneurial orientation	.24***	.11*	.02

NOTES　*TF* = transformational leadership, *TA* = transactional leadership, *PA* = passive-avoidant leadership; * $p < .05$, ** $p < .01$, *** $p < .001$.

.22, $p < .001$), proactiveness ($r = .23$, $p < .001$), risk-taking ($r = .14$, $p = .004$), and total entrepreneurial orientation ($r = .24$, $p < .001$). There was a small, positive correlation between transformational leadership and all dimensions of entrepreneurial orientation. Transactional leadership was significantly positively correlated with innovation ($r = .13$, $p = .01$) and total entrepreneurial orientation ($r = .11$, $p = .029$). There was a small, positive correlation between transactional leadership and innovation or total entrepreneurial orientation. There were no significant relationships between passive-avoidant leadership and entrepreneurial orientation. As shown in table 9, transformational leadership had a stronger relationship on total entrepreneurial orientation than transactional leadership, but with a small and positive correlation.

LEADERSHIP STYLES TO ENTREPRENEURIAL ORIENTATION

A standard multiple regression was performed with the total entrepreneurial orientation as measured by the EOQ as the dependent variable and scores on the MLQ (transformational leadership, transactional leadership, passive-avoidant leadership) as the independent variables. An analysis for evaluation of assumptions was performed to reduce the number of outliers and improve the normality, linearity, and homoscedasticity of residuals. With the use of $p < .001$ criterion for Mahalanobis distance, no multivariate outliers were found. No cases had missing data and no suppressor variables were found for the sample ($N = 406$). A residual analysis was conducted to check assumptions. To check the scatterplot of the standardized residuals and normal probability plot, assumptions about residuals were met.

Table 10 indicates the correlations between the variables, unstandardized regression coefficients (B), and standardized regression coefficients (β). This regression model was significantly different from zero, $F(3,402)$

TABLE 10   Regression analysis summary for the top-level managers' leadership styles predicting the total entrepreneurial orientation

Variable	B	SEB	β
Transformational leadership	.62	.13	.30***
Transactional leadership	−.18	.13	−.09
Passive-avoidant leadership	.07	.08	.05

NOTES $R^2 = .063$, adjusted $R^2 = .056$ ($N = 406$, $p < .001$). *** $p < .001$.

$= 8.95$ and $p < .001$. The regression coefficient of transformational leadership was different from zero, and 95% confidence limits were .36 to .88. Only transformational leadership contributed significantly to prediction of the total entrepreneurial orientation, $p < .001$ and the semipartial correlations $sr^2 = .05$.

Altogether, 5.6% (adjusted R^2) of the variability in the total entrepreneurial orientation was predicted by MLQ scores on these three independent variables. Transactional leadership and passive-avoidant leadership were not good predictors of the total entrepreneurial orientation. Hence, the transformational leadership of top-level managers contributed the most to the total entrepreneurial orientation of SMEs.

LEADERSHIP STYLES AND ENTREPRENEURIAL ORIENTATION TO BUSINESS PERFORMANCE: DISCRIMINANT FUNCTION ANALYSIS

The researcher divided business performance into two categories by its mean ($M = 4.32$): higher business performance and lower business performance. A direct discriminant function analysis was performed using three variables of the MLQ and three variables of the EOQ as predictors of membership in the two groups. Predictors were transformational leadership, transactional leadership, passive-avoidant leadership, innovation, proactiveness, and risk-taking. The groups were higher business performance and lower business performance. Two cases were identified as multivariate outliers with $p < .001$. After deleting these cases, 404 cases remained for analysis. An analysis for evaluation of assumptions of linearity, normality, multi-collinearity, and homogeneity of variance-covariance matrices did not violate multivariate analysis.

A discriminant function indicated a strong association between groups and predictors, $\chi^2 (6) = 45.04$ and $p < .001$. Table 11 presents the correlation of predictor variables with discriminant functions, which suggested that the good predictors for distinguishing between higher business per-

TABLE 11   Correlation of predictor variables from MLQ and EOQ with discriminant functions (function structure matrix) and standardized discriminant function coefficients

Predictor variable	Correlation with discriminant functions	Standardized discriminant function coefficients
	Function 1	Function 1
Transformational leadership	.54	.41
Transactional leadership	.26	−.08
Passive-avoidant leadership	−.13	−.13
Innovation	.84	.55
Proactiveness	.76	.27
Risk-taking	.59	.20

TABLE 12   Means and standard deviations of predictor variables from MLQ and EOQ as a function of business performance

Predictor variable	Lower business perf.		Higher business perf.	
	M	SD	M	SD
Transformational Leadership	2.92	0.52	3.01	0.49
Transactional Leadership	2.63	0.52	2.68	0.51
Passive-avoidant Leadership	1.40	0.63	1.37	0.62
Innovation	4.41	1.27	4.77	1.27
Proactiveness	4.26	1.15	4.56	1.17
Risk-taking	3.68	1.26	3.95	1.30

formance and lower business performance were transformational leadership, innovation, proactiveness, and risk-taking.

Table 12 shows the innovation, $F(1,402) = 33.68$ and $p < .001$; the proactiveness, $F(1,402) = 27.40$ and $p < .001$; and the risk-taking, $F(1,402) = 16.62$ and $p < .001$. Innovation was the best predictor of group membership (Wilks's $\alpha = .923$). As shown in table 13, higher business performance differs from lower business performance on four variables: transformational leadership, $F(1,402) = 13.86$ and $p < .001$; innovation, $F(1,402) = 33.68$ and $p < .001$; proactiveness, $F(1,402) = 27.40$ and $p < .001$; and risk-taking, $F(1,402) = 16.62$ and $p < .001$. Innovation was the best predictor of group membership (Wilks' $\alpha = .923$).

Table 14 reports the classification analysis for business performance; 63.4% cases were classified correctly. The group with higher business performance was more likely to be correctly classified (65.4% correct classifi-

TABLE 13   Predictor variables from MLQ and EOQ in stepwise discriminant function analysis

Predictor variable	Wilks' λ	Equivalent F (1,402)
Transformational leadership	.967	13.86***
Transactional leadership	.992	3.21
Passive-avoidant leadership	.998	0.84
Innovation	.923	33.68***
Proactiveness	.936	27.40***
Risk-taking	.960	16.62***

NOTES   ***$p < .001$.

TABLE 14   Classification analysis for business performance

Actual group membership		Predicted group membership			
		Lower bus. perf.		Higher bus. perf.	
	N	n	%	n	%
Lower business performance	199	122	61.3	77	38.7
Higher business performance	205	71	34.6	134	65.4

NOTES   Overall percentage of correctly classified cases (63.4%).

cations) than the group with lower business performance (61.3% correct classifications).

Conclusion

In a comparison of three different leadership styles ($N = 406$), the mean for transformational leadership ($M = 3.00$) is higher than the mean for transactional leadership ($M = 2.68$) and for passive-avoidant leadership ($M = 1.37$). The results are similar to the results of a study ($N = 27{,}285$) by Avolio and Bass (2004) in which the mean for transformational leadership ($M = 2.85$) was higher than the mean for transactional leadership ($M = 2.27$) and for passive-avoidant leadership ($M = .84$). Furthermore, a comparison of the three dimensions of entrepreneurial orientation ($N = 406$) shows that the mean for innovation ($M = 4.77$) is higher than the mean for proactiveness ($M = 4.56$) and for risk-taking ($M = 3.95$). Total entrepreneurial orientation has a mean of 4.43 and a standard deviation of 1.02. These results are similar to those of Covin and Slevin (1989); in their results, the scale had a mean of 4.33 and a standard deviation of 1.23. In another study, Covin et al. (2006) found that the scale had a mean of 4.05 and a standard deviation of 1.08.

The study confirmed the results of Covin and Slevin (1989) who found that entrepreneurial orientation was positively related to performance. Consistent with much of the literature reviewed (Smart and Conan 1994; Wiklund and Shepherd 2005; Zahra and Covin 1995), the findings from the current study suggest that high levels of total entrepreneurial orientation may contribute positively to business performance. A comparison of the three dimensions of entrepreneurial orientation shows that high levels of innovation and proactiveness may contribute positively to business performance. The attributes that appear to contribute to high business performance are innovation and proactiveness. Risk-taking is not a significant contributor to predicting business performance, but it is significantly positively correlated with business performance in this study. Although risk-taking is considered an attribute of entrepreneurship, successful entrepreneurs are not gamblers (Kuratko and Hodgetts 2001). Indeed, Drucker (1985) argued that successful entrepreneurs are typically not risk takers. Entrepreneurs usually take carefully calculated risks and avoid taking unnecessary ones (Begley and Boyd 1987). The relationship between risk-taking and business performance is likely to be affected by other influences such as environmental factors (Krauss et al. 2005; Kreiser et al. 2002).

Different leadership styles may affect performance. Transformational leadership is significantly more correlated to the business performance than transactional leadership and passive-avoidant leadership. Among the three different leadership styles, transformational leadership is the best predictor of the business performance. This study supports the position of Gardner and Stough (2002) that transformational leadership is more effective than transactional leadership. Transformational leadership is more strongly correlated than transactional leadership with higher productivity and performance (Bass et al. 2003; Lowe et al. 1996). Eggers and Leahy (1995) reported that both management and leadership skills such as financial management, communication, motivation of others, vision, and self-motivation play important roles in determining the growth rate of a small business. The results of this study confirmed these findings because key aspects of transformational leadership include idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration (Avolio and Bass 2004). Finally, transformational leadership with higher entrepreneurial orientation can contribute to higher business performance. This study supports the idea of entrepreneurial leadership, which is viewed to be more transforma-

tional than transactional in nature but with some fundamental differences (Thornberry 2006).

References

Avolio, B. J., and B. M. Bass. 2004. *Multifactor leadership questionnaire: Manual and sample set.* 3rd ed. Redwood City, CA: Mind Garden.

Bass, B. M., and B. J. Avolio. 1995. *Multifactor leadership questionnaire: Manual leader form, rater, and scoring key for* MLQ Redwood City, CA: Mind Garden.

Bass, B. M., B. J. Avolio, D. I. Jung, and Y. Berson. 2003. Prediction unit performance by assessing transformational and transactional leadership. *Journal of Applied Psychology* 88 (2): 207–18.

Begley, T. M., and D. P. Boyd. 1987. Psychological characteristics associated with performance in entrepreneurial firms and smaller businesses. *Journal of Business Venturing* 2 (1): 79–93.

Block, L. 2003. The leadership-culture connection: An exploratory investigation. *Leadership and Organization Development Journal* 24 (5–6): 318–34.

China Credit Information Service. 2006. *2006 Directories of corporations in Taiwan.* CD version. Taipei: China Credit Information Service.

Cohen, A. R. 2004. Building a company of leaders. *Leader to Leader,* no. 34:16–20.

Colbert, F. 2003. Entrepreneurship and leadership in marketing the arts. *International Journal of Arts Management* 6 (1): 30–9.

Covin, J. G., and D. P. Slevin. 1989. Strategic management of small firms in hostile and benign environments. *Strategic Management Journal* 10 (1): 75–87.

Covin, J. G., K. M. Green, and D. P. Slevin. 2006. Strategic process effects on the entrepreneurial orientation-sales growth rate relationship. *Entrepreneurship Theory and Practice* 30 (1): 57–81.

Dess, G., G. Lumpkin, and J. Covin. 1997. Entrepreneurial strategy making and firm performance: Tests of contingency and configurational models. *Strategic Management Journal* 18 (9): 677–95.

Drucker, P. F. 1985. *Innovation and entrepreneurship.* New York: Harper and Row.

DuBrin, A. J. 2001. *Leadership: Research findings, practice, skills.* 3rd ed. Boston, MA: Houghton Mifflin.

Dvir, T., D. Eden, B. J. Avolio, and B. Shamir. 2002. Impact of transformational leadership on follower development and performance: A field experiment. *Academy of Management Journal* 45 (4): 735–44.

Eggers, J. H., K. T. Leahy. 1995. Entrepreneurial leadership. *Business Quarterly* 59 (4): 71–6.

Fernald, L. W. Jr., G. T. Solomon, and A. Tarabishy. 2005. A new paradigm: Entrepreneurial leadership. *Southern Business Review* 30 (2): 1–10.

Gardner, L., and C. Stough. 2002. Examining the relationship between leadership and emotional intelligence in senior level managers. *Leadership and Organization Development Journal* 23 (1–2): 68–78.

Gay, L. R., and P. Airasian. 2003. *Educational research: Competencies for analysis and application.* 7th ed. Upper Saddle River, NJ: Prentice Hall.

Gupta, V., I. C. MacMillan, and G. Suriec. 2004. Entrepreneurial leadership: Developing and measuring a cross-cultural construct. *Journal of Business Venturing* 19 (2): 241–60.

Khandwalla, P. N. 1976/1977. Some top management styles, their context and performance. *Organization and Administrative Sciences* 7 (4): 21–51.

Knight, G. A. 2000. Entrepreneurship and marketing strategy: The SME under globalization. *Journal of International Marketing* 8 (2): 12–32.

Krauss, S. I., M. Frese, C. Friedrich, and J. M. Unger. 2005. Entrepreneurial orientation: A psychological model of success among southern African small business owners. *European Journal of Work and Organizational Psychology* 14 (3): 315–44.

Kreiser, P. M., L. D. Marino, and K. M. Weaver. 2002. Assessing the psychometric properties of the entrepreneurial orientation scale: A multi-country analysis. *Entrepreneurship Theory and Practice* 26 (4): 71–94.

Kuratko, D. F., and R. M. Hodgetts. 2001. *Entrepreneurship: A contemporary approach.* 5th ed. Mason, OH: South-Western.

Lowe, K. B., K. G. Kroeck, and N. Sivasubramaniam. 1996. Effectiveness correlates of transformational leadership: A meta-analytic review of the MLQ literature. *Leadership Quarterly* 7 (3): 385–415.

Lumpkin, G. T., G. G. Dess. 1996. Clarifying the entrepreneurial orientation construct and linking it to performance. *Academic Management Review* 21 (1): 135–72.

Lyon, D. W., G. T. Lumpkin, and G. G. Dess. 2000. Enhancing entrepreneurial orientation research: Operationalizing and measuring a key strategic decision making process. *Journal of Management* 26 (5): 1055–85.

Miller, D., and P. H. Friesen. 1982. Innovation in conservative and entrepreneurial firms: Two models of strategic momentum. *Strategic Management Journal* 3 (3): 1–25.

Morris, M. H., and D. F. Kuratko. 2002. *Corporate entrepreneurship.* Fort Worth, TX: Harcourt.

Nahavandi, A. 2002. *The art and science of leadership.* 3rd ed. Upper Saddle River, NJ: Prentice Hall.

Nunnally, J. O. 1978. *Psychometric theory.* New York: McGraw-Hill.

Sathe, V. 2003. *Corporate entrepreneurship: Top managers and new business creation.* Cambridge: Cambridge University Press.

Smart, D. T., and J. S. Conant. 1994. Entrepreneurial orientation, distinctive marketing competencies and organizational performance. *Journal of Applied Business Research* 10 (3): 28–38.

Tabachnick, B. G., and L. S. Fidell. 2001. *Using multivariate statistics.* 4th ed. Boston, MA: Allyn and Bacon.

Ministry of Economic Affairs. 2006. *White paper on small and medium enterprises in Taiwan, 2006.* Taipei: Ministry of Economic Affairs.

Tarabishy, A., G. Solomon, L. W. Fernald, Jr., and M. Sashkin. 2005. The entrepreneurial leader's impact on the organization's performance in dynamic markets. *Journal of Private Equity* 8 (4): 20–9.

Thornberry, N. 2006. *Lead like an entrepreneur.* Blacklick, OH: McGraw-Hill.

Tse, A. C. B., L. Y. M. Sin, O. H. M. Yau, J. S. Y. Lee, and R. Chow. 2004. A firm's role in the marketplace and the relative importance of market orientation and relationship marketing orientation. *European Journal of Marketing* 38 (9–10): 1158–72.

Venkatraman, N. 1989. Strategic orientation of business enterprises: The construct, dimensionality, and measurement. *Management Science* 35 (8): 942–62.

Wah, S. S. 2004. Entrepreneurial leaders in family business organizations. *Journal of Enterprising Culture* 12 (1): 1–34.

Wiklund, J. 1999. The sustainability of the entrepreneurial orientation-performance relationship. *Entrepreneurship Theory and Practice* 24 (1): 37–48.

Wiklund, J., and D. Shepherd. 2003. Knowledge-based resources, entrepreneurial orientation, and the performance of small and medium-sized businesses. *Strategic Management Journal* 24 (13): 1307–14.

———. 2005. Entrepreneurial orientation and small business performance: A configurational approach. *Journal of Business Venturing* 20 (1): 71–91.

Yammarino, F. J., A. J. Dubinsky. 1994. Transformational leadership theory: Using levels of analysis to determine boundary conditions. *Personnel Psychology* 47 (4): 787–811.

Zahra, S., and J. G. Covin. 1995. Contextual influence on the corporate entrepreneurship-performance relationship: A longitudinal analysis. *Journal of Business Venturing* 10 (1): 43–58.

How Internal and External Sources of Knowledge Contribute to Firms' Innovation Performance

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This paper investigates the extent to which different knowledge sources contribute to firms' innovation performance. The empirical analysis estimates the relationships in the structural model of the influence of knowledge sources on innovative performance using data collected through personal interviews at 303 firms. The results reveal that internal sources have the most important influence on firms' innovative performance and confirm that, in their innovation process, firms mostly rely on knowledge developed through in-house R&D efforts, continuous improvement, and internal education and training programs. The data show that in-house learning is not sufficient for generating innovation and that firms need to supplement internal knowledge with knowledge acquired outside the firm. They mainly need to secure links with firms and institutions in the global environment if they want to secure the inflow of new ideas and approaches that will eventually lead to innovations.

Key Words: knowledge, innovation, structural equation modeling
JEL *Classification:* O30, O31

Introduction

An interactive view of innovation has been developed within the framework of a learning economy, in which innovation is seen as a technical and social process based on the complex interaction between firms and their environment (Asheim and Isaksen 1997). Most authors agree that the use of internal and external knowledge sources contributes positively to firms' innovation performance, but the relationship has been empirically tested only to a limited extent (Capello 1999; Caloghirou, Kastelli, and Tsakanikas 2004; Capello and Faggian 2005). This paper investigates the extent to which various knowledge sources contribute to firms' innovation performance. More specifically, it identifies on the one

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hand the level of importance of internal knowledge sources embodied mainly in in-house R&D efforts. On the other hand, it looks at external sources of knowledge and identifies how the use of local, national, and international knowledge sources determines firms' innovation performance. This paper extends the work of other scholars as to what are the sources of innovation, by considering how knowledge sources at different spatial levels influence the innovation performance of firms. While most authors analyzed the role of external knowledge sources in general (Caloghirou, Kastelli, and Tsakanikas 2004; Willoughby and Galvin 2005; Tsai and Wang 2007; Love and Mansury 2007), we divide them according to the geographical proximity to the observed firm. As such, this is one of the few empirical papers that assesses simultaneously to what extent internal, local, national and international knowledge sources contribute to firms' innovation.

The empirical analysis is based on a survey that was carried out in seven European countries: the Czech Republic, Germany, Italy, Poland, Romania, Slovenia, and the United Kingdom. The relationships in the structural model of the influence of sources of knowledge on innovation performance are estimated using data collected through personal interviews at 303 firms. The results reveal that internal sources have the most important influence on firms' innovative performance and confirm that, in their innovation process, firms mostly rely on knowledge developed through in-house R&D efforts, continuous improvements and internal education, and training programs. The data show that in-house learning alone is not sufficient for generating innovation and the firms need to supplement internal knowledge with knowledge acquired outside the firm. They mainly need to secure links with firms and institutions in the extra-local environment in order to secure the inflow of new ideas and approaches that will eventually lead to innovations.

The paper is structured in five sections. The next section presents the theoretical framework on which the empirical analysis is based. The main focus is on the literature describing the importance of internal and external knowledge sources and how they contribute to firms' innovative performance. Then four hypotheses are developed, which are later empirically tested. The third section describes the methodology used, including the sampling and data collection process, data analysis, and operationalization and measure validation. The fourth section is dedicated to presenting the empirical findings together with a graphic presentation of the structural model. The results are summarized and the main findings discussed in the last section.

Acquiring Knowledge for Innovation: Theory and Hypotheses Development

Until the 1980s, understanding of the innovation process was strongly influenced by the linear model of innovation, which suggested that development of innovations follows a straight research-to-market trajectory. In this model a central role was given to R&D activity, and firms' innovative performance was mainly seen as a consequence of R&D investment. This research-based and technocratic view of the innovation process could not explain the success of several SME firms that had limited resources for in-house R&D but were able to base their competitiveness on constant innovation. This phenomenon of innovative SMEs has become especially apparent in several SME clusters that have emerged all over Europe and the rest of the world. Since then, several scholars and practitioners have tried to reveal the dynamics behind small and medium-sized firms' innovativeness. More than a decade ago it became obvious that innovations rarely occur as creative acts of individual geniuses, but more often as a result of interactive processes. Individuals can not learn new things in a cognitive vacuum and learning always takes place in relation to some kind of social context (Johnson 1992; Lundvall 1992). From the perspective of innovation, new knowledge is not only developed in R&D departments but also in connection with ordinary production activities of firms and other actors through the interactive learning process (Eriksson 2005). Firms cooperate with their suppliers, customers, knowledge institutions (universities, laboratories, etc.), and even with their competitors when developing new products and services or improving production processes. The interactive model of innovation explains the process of innovation as a network of knowledge-flows both within the organization, and in the relationship between the organization and the environment (Santos 2000).

INTERNAL AND EXTERNAL SOURCES OF KNOWLEDGE

This section aims to show how complex the process of knowledge acquisition is, and to present the idea that firms need to acquire new knowledge from numerous internal and external sources in order to constantly generate innovations and maintain their competitive edge.

According to the general trend towards more composite knowledge, where new products and processes typically combine many technologies from several scientific disciplines, it is important to understand that firms today can hardly learn and innovate in isolation (Pavitt 1998; Johnson, Loren, and Lundvall 2002). While in large firms information and

knowledge are still mainly transferred through functional interaction among R&D, production, marketing, and organization departments and functional teams (Capello 1999), small and medium-sized firms increasingly need to rely on external knowledge sources. Accordingly, knowledge sources can be firstly divided into internal and external sources, whereas external sources can be further divided into local, national, and international sources, depending on where the source of knowledge is located (Belussi, McDonald, and Borrás 2002). Internally, firms acquire knowledge through in-house research and development activities and by learning from continuous improvements in processes. Employee skills represent another important source of new knowledge, and firms often organize internal education and training programs in order to further build and improve the internal knowledge base. If firms do not have appropriate knowledge inside the firm, they can acquire it externally by cooperating with customers and suppliers, as well as other firms, or by forming partnerships with public, semi-public, and private institutions. In terms of geographic location, these external actors can be located in close geographic proximity (locally), somewhere in the country (nationally), or elsewhere (internationally).

Among external sources of knowledge, inter-firm collaboration has probably received the most widespread research attention. It is widely recognized that the innovative process often involves interaction between the manufacturer and users of products. Usually such interaction between producers and end users involves not only an exchange of technical knowledge but also important information about market requirements and trends. Another important source of knowledge comes from the other side of the supply chain. Suppliers of equipment and material (Geenhuizen 1997) can bring important insight into the organization of production, logistics and other functions. But inter-firm cooperation extends far beyond the relationships that develop between supply chain partners. Studies of successful firms reveal that some sort of collaborative arrangements develop between business partners as well as between competitors. For example, a study of the Cambridge region revealed that 76% of firms possess close links with other firms (Keeble et al. 1998). When analyzing the nature of inter-firm cooperation they identified everything from joint ventures, subcontracting, and research collaborations to the sharing of equipment and information about customers. Accordingly, we perceive both vertical as well as horizontal inter-firm relationships as sources of important external sources of knowledge and

interactive learning (Camagni 1993; Yeung 2005; Steiner and Hartmann 2006).

Knowledge exchange not only appears between firms but can often be found between firms and institutions. Universities, research institutes, science parks, incubators, and other knowledge institutions are actively involved in a set of relationships occurring in the business environment (Gunasekara 2006) and are particularly seen as lead players in the innovative activity of firms providing scientific research inputs for innovating firms (Keeble and Wilkinson 2000). According to Gambarotto and Solari (2004), in addition to channeling information and knowledge, support organizations can also help translate academic codified knowledge into practical and accessible know-how. In line with the modern understanding of innovation, the research process is oriented toward problem-solving and as such requires two-way research interaction between knowledge organizations and industry actors combined with several other institutions.

Inter-firm collaboration, as well as partnerships with institutions, were long believed to be mainly limited to the local level and were studied within the context of clusters. However, with globalization and advances in information and communication technology, the geographic scope of this interaction is widening and often spreads across national borders. If firms want to succeed in the innovation race, they need to have access to the most advanced technical and organizational knowledge in their fields, which means they have to search for appropriate knowledge with no regard to its location. The use of geographically close sources has several benefits that stem from constant face-to-face interactions, knowledge spillovers, and the transmission of tacit knowledge (Camagni 1991; Keeble 2000; Capello and Faggian 2005). However, this does not imply that the mere use of local knowledge sources is sufficient in terms of knowledge creation and innovation. Research shows that limiting knowledge acquisition to the local level can lead to a lock-in effect (Grabher 1993; Keeble and Wilkinson 1999; 2000). In order to maintain a constant inflow of new knowledge, firms need to nurture links inside, as well as outside, the cluster.

TOWARD THE RESEARCH HYPOTHESES

The following paragraphs present the main theoretical arguments for the role of knowledge sources in firms' innovation performance, and develop four hypotheses.

In-house R&D efforts have been consistently proven to contribute to firms' innovative potential. A systematic review of studies investigating the use of knowledge in SMEs has shown that internal managerial and entrepreneurial teams, as well as other employees, play a crucial role in knowledge creation and, consequently, innovation (Thorpe et al. 2005). Additionally, a firm's in-house expertise for R&D has a considerable positive effect on the absorptive capacity of firms. Cohen and Levinthal (1990) define absorptive capacity as 'the ability of a firm to recognize the value of new, external information, assimilate it, and apply it to commercial ends.' This means that continuous improvements in its internal knowledge base are also important for increasing a firm's capability to assimilate and transform external knowledge and information into new products, services, and processes. As Lundvall and Nielsen (1999) argue, a strong internal knowledge base is the key to successful innovation. In line with their arguments, we posit that the greater the use of internal knowledge sources, the more innovations the firm will be able to create, as well as exploit knowledge from external sources and transform it into innovation. Therefore, we have formulated the following hypothesis:

H1 *The extent of usage of internal knowledge positively influences firms' innovative performance.*

What collective and interactive learning literature argues in general is that a firm's learning capacity does not depend solely on individual skills and the organization of the firm (internal to the firm), but it is also context dependent on the institutional set-up of its business environment (Lorenzen 1998; Tomassini and Sarcina 2005). In recent decades companies have been facing an increase in uncertainty and risk (Geenhuizen 1997). Firms in many industries are facing a turbulent environment with changes taking place in market, technology, and industrial organization. Responding to various uncertainties, companies have increasingly externalized their sources of knowledge. In order to increase or deploy their own knowledge effectively, firms often need to supplement their knowledge with that of other firms and organizations, which often happens in some form of collaborative arrangements. The growing importance of inter-organizational collaboration can be explained by the nature of contemporary knowledge (Dunning 2000): the development of new knowledge can be highly expensive; the outcome of much investment in augmenting knowledge (by R&D) is highly uncertain; many kinds of knowledge become obsolete quite quickly; and complex prob-

lems require multi-disciplinary team solutions. In addition, competitive pressures are forcing firms to introduce new products and services to the market at an increasing pace, and for many (especially small and medium-sized) firms it is impossible to rely only on internal resources for necessary knowledge production. Consequently, firms and other organizations are increasingly engaging in inter-organizational cooperation projects (Eriksson 2005).

There are several institutional environments in which firms acquire knowledge and learn. Lundvall (1992) emphasizes the national level as an institutional framework for learning and innovation, because of its homogeneity with respect to culture, technical and educational institutions, and historically-built relations between actors and firms. Other researchers focus on the regional and local levels as the most important environments for knowledge acquisition and innovation. Recently an increasing number of scholars have proven that firms often search for knowledge internationally (Malmberg and Power 2005). What these theories have in common is the fact that external knowledge sources provide an important complement to in-house learning and innovation efforts, and thus contribute to improved innovative performance (Caloghirou, Kastelli, and Tsakanikas 2004).

The importance of inter-organizational relationships has been mainly developed and studied in the context of localized clusters, where a number of firms, knowledge and research institutions, and other actors are located in close geographic proximity. The literature on localized and collective learning argues that the local level is the most appropriate environment for knowledge exchange and interactive learning due to cultural, social, and organizational proximity (Lundvall 1992; Belussi and Pilotti 2000; Steiner 2006), which has led to formulation of the following hypothesis:

H2 *The more a firm uses local sources of knowledge, the more it develops knowledge sharing that positively contributes to innovative performance.*

The main problem of the localized learning literature is that it has sometimes been read in a way that places local knowledge acquisition as a superior form that might sometimes take the place of knowledge acquisition and learning at the national and international levels; some authors even believe that it can replace internal R&D efforts (Capello and Faggian 2005). This stream of literature describes clusters and other local net-

works as being somehow self-sufficient in knowledge terms. This has led to a rather heated debate in recent years (Malmberg and Maskell 2006), proving that interactions with distant partners are at least as important as those with local actors. Several authors have empirically proven that learning might be best understood as a combination of close and distant interactions (Malmberg and Maskell, 2006; Wolfe and Gertler 2006; Britton 2003; Cumbers, MacKinnon, and Chapman 2003; Henry and Pinch 2001; Tödling and Kaufmann 1999).

Recently many authors have stressed the importance of linkages with external firms, institutions, or even networks, which provide access to external knowledge and technology, and prevent the lock-in effect. The most recent contribution to this discussion comes from Malmberg and Maskell (2006), who submit that neither the argument for localized interactive learning nor the existence of localized capabilities in any way presupposes that most knowledge exchange and learning interaction should be local. They believe that extra-local knowledge flows can be expected to connect to the local knowledge flows so that the two become mutually reinforcing. This happens when the external sources 'pump' information and news about markets and technologies into the local environment and consequently intensify the local interaction and benefit the local actors.

The main idea of this literature is that intense localization within a certain local environment does not mean isolation from the extra-local environment. Firms form networks and partnerships with firms and other organizations at the local, national and international levels in order to enhance their knowledge base and innovation potential. Business and social contacts can be more frequent, intensive, and easier to maintain if they are facilitated by proximity (all types); however, firms must nurture their relationships with firms and organizations outside the local area and even try to engage in global networks (Malmberg and Maskell 2006; Bathelt, Malmberg, and Maskell 2002). This will provide them with access to information on rapidly changing technologies and market opportunities and provide a constant influx of new knowledge needed in the innovation process. The role of the national knowledge sources was extensively discussed in the literature dealing with national systems of innovation (Lundvall, 1988; 1992; Lundvall et al. 2002), while the role of international sources has mainly been studied in the context of R&D partnerships (Knudsen 2006). Based on this literature, both national and international sources of knowledge are expected to positively contribute to firm's innovation performance. As Simmie (2006) suggests, innovation

must be understood in terms of trading nodes in an international system that encompasses local, national and international knowledge spillovers and multilayered economic linkages that extend over several different spatial scales.

The above discussion underpins the last two hypotheses:

H3 *The more a firm uses national sources of knowledge, the more it develops knowledge sharing that positively contributes to innovative performance.*

H4 *The more a firm uses international sources of knowledge, the more it develops knowledge sharing that positively contributes to innovative performance.*

Methodology

The methodology is discussed in terms of the sampling and data collection process, data analyses, operationalization, and measure validation.

SAMPLING AND DATA COLLECTION PROCESS

Data for testing the structural equation model for explaining the influence of knowledge sources on innovation activity were collected within the research project WEID (West-East ID: Industrial Districts' Re-Location Processes; Identifying Policies in the Perspective of the European Union Enlargement) conducted under the 5th EU Framework Program. Eleven European research partners were included in the project: Fondazione Istituto Guglielmo Tagliacarne (Italy), Eurochambres Aisbl (Belgium), Istituto per lo Sviluppo della Formazione dei Lavoratori (Italy), Libera Università Internazionale degli Studi Sociali 'Guido Carli' (Italy), Manchester Metropolitan University (United Kingdom), Omnimotio s. r. o. (Czech Republic), Landesinstitut Sozialforschungsstelle Dortmund (Germany), University of Ljubljana (Slovenia), University of Reading (United Kingdom), University of Roskilde (Denmark), and University of Aurel Vlaicu in Arad (Romania). Based on the literature review, interviews with managers, and work with focus groups within the WEID research group, a questionnaire for in-depth interviews was developed. The questionnaire was initially prepared in English and then first translated into the local languages (Czech, German, Italian, Polish, Romanian, and Slovenian), and after that back-translated into English (Brislin 1970; Brislin 1980; Hambleton 1993). The translation followed the 'etic approach' – an approach where there is little or no attempt to decenter or adapt the measure to another cultural context (Craig and

Douglas 2005). In-depth interviews with top executives from manufacturing firms from the Czech Republic, Germany, Italy, Poland, Romania, Slovenia, and the United Kingdom were conducted on the basis of the structured questionnaire developed. For the analyses, 303 usable responses were obtained. The composition of the sample was comparable to the population.

DATA ANALYSES

Reliability was assessed using Cronbach's (1951) alpha. Construct and discriminant validity, as well as convergent validity, were assessed using exploratory and confirmatory factor analysis (Floyd and Widaman 1995). Exploratory factor analysis and reliability analysis was conducted in SPPS. The EQS Multivariate Software version 6.1 (Bentler and Wu 2006) was utilized for confirmatory factor analysis and testing of the proposed structural model. Since a small amount of non-normality was found in the data, the Elliptical Reweighted Least Square (ERLS) estimation method was used (Sharma, Durvasula, and Dillon 1989). As recommended by Shook, et al. (2004), the fit of the model was assessed with multiple indices: NFI (the normed-fit-index), NNFI (the non-normed-fit index), CFI (the comparative fit index), GFI (the goodness-of-fit index), SRMR (the standardized root mean square residual), and RMSEA (the root mean square error of approximation). Values of NFI, NNFI, CFI, and GFI greater than 0.90 indicate a good model fit (Hair et al. 1998; Byrne 2006). Hu and Bentler (1999) suggest that values of SRMR smaller than 0.08 indicate an acceptable fit. Values of RMSEA less than 0.05 indicate good fit, and values as high as 0.08 represent reasonable errors of approximation in the population (Browne and Cudeck 1992). The chi-square is reported, but is not given major consideration because it is highly sensitive to sample size and the number of items in the model (Bentler and Bonett 1980).

OPERATIONALIZATION AND MEASURE VALIDATION

In this study, independent and dependent variables were measured through scales previously tested and developed by the WEID research group.

Internal Sources of Knowledge

Internal sources of knowledge were measured with six items. Respondents were asked to indicate (on a 5-point Likert-type scale ranging from

'not important at all' to 'very important') how important the following internal sources of knowledge are for their company: knowledge gained through in-house research and development (INT01), knowledge gained from continuous improvement of production processes (INT02), knowledge developed through their company's internal education and training programs (INT03), organizational skills learned from continuous improvement of their production processes (INT04), organizational skills of the professional managers within their local company (INT05), and organizational skills gained from their company's internal education and training programs. The factor analysis indicated that all factor loadings were above 0.4 and significant. Cronbach's alpha of 0.80 indicates strong internal consistency of six items operationalized to measure this construct.

Local, National, and International Sources of Knowledge

Local, national, and international sources of knowledge were each measured with 10 items. Respondents were asked to indicate (on a 5-point Likert-type scale ranging from 'not important at all' to 'very important') how important the following local, national, and international sources of knowledge are for their company: knowledge derived from interactions with clients and/or suppliers (local clients and/or customers – LOC01; national clients and/or customers – NAT01; and international clients and/or customers – INAT01), knowledge derived from cooperation with other companies (LOC02, NAT02, and INAT02), knowledge gained from interactions with public institutions such as universities, public research centers, local government, and so on (LOC03, NAT03, and INAT03), knowledge gained from interactions with semi-public institutions such as chambers of commerce, industry associations, trade unions, and so on (LOC04, NAT04, and INAT04), knowledge provided by consultants and private research centers (LOC05, NAT05, and INAT05), organizational skills gained from interactions with clients and/or suppliers (LOC06, NAT06, and INAT06), organizational skills gained from cooperation with other companies (LOC07, NAT07, and INAT07), organizational skills learned from interactions with public institutions such as universities, public research centers, local government, and so on (LOC08, NAT08, and INAT08), organizational skills learned from interactions with semi-public institutions such as chambers of commerce, industry associations, trade unions, and so on (LOC09, NAT09, and INAT09), and organizational skills learned from consultants and pri-

vate research centers (loc10, nat10, and inat10). The factor analysis indicated that all factor loadings were above 0.4 and significant for all three constructs. To test for convergent validity of the constructs and to compare the one-factor structure with the three-factor structure (where factors are correlated), the confirmatory factor analysis was conducted. The results showed that one-factor structure is not appropriate because of the overall poor model fit (chi-square = 1420.029, 368 df, probability 0.000; nfi = 0.80; nnfi = 0.81; cfi = 0.84; gfi = 0.69; srmr = 0.12; and rmsea = 0.10). The confirmatory factor analysis showed that the three-factor structure fits the data reasonably well, with the following fit indices: chi-square = 681.457, 365 df, probability 0.000; nfi = 0.90; nnfi = 0.94; cfi = 0.95; gfi = 0.82; srmr = 0.08; and rmsea = 0.05. Cronbach's alphas of 0.85 (local sources of knowledge), of 0.86 (national sources of knowledge), and of 0.86 (international sources of knowledge) indicate strong internal consistency of items operationalized to measure these constructs.

Innovation Performance

Innovation performance was measured with five items. Respondents were asked to indicate whether their company had registered patents abroad in the last three years (ip01), and to indicate whether their company had introduced or adopted any major changes to their products (ip02), processes (ip03), organization of production (ip04), and organization of sales and distribution (ip05). The factor analysis indicated that all factor loadings were above 0.4 and significant. Cronbach's alpha of 0.75 indicates strong internal consistency of five items operationalized to measure this construct.

Control Variables

Control variables were also included and operationalized as follows: (1) firm's size was operationalized as the number of employees, and (2) the region was operationalized as a dichotomous variable, where '0' represented western European countries (Italy, Germany, and United Kingdom) and '1' represented eastern European countries (Czech Republic, Poland, Romania, and Slovenia).

Findings

The structural relationships in the model of the influence of sources of knowledge on the innovation performance were estimated using the El-

liptical reweighted least square (ERLS) method in EQS 6.1 (Bentler and Wu 2006). EQS reported that parameter estimates appeared in order, and that no special problems were encountered during the optimization. The resulting model goodness-of-fit indices indicated a moderately good model fit (chi-square = 1600.305, 812 df, probability 0.000; NFI = 0.86; NNFI = 0.92; CFI = 0.93; GFI = 0.76; SRMR = 0.08; and RMSEA = 0.06). The variance explained for the innovation performance was 20%.

The model, which includes hypothesized relationships and results of the model test, is depicted in figure 1. An examination of our hypotheses is presented in the following section.

HYPOTHESES TESTING

Hypothesis H1 proposed that the extent of the usage of internal sources of knowledge is positively related to the innovation performance. The results presented in figure 1 show that the internal sources of knowledge have a significant, positive, and high path coefficient of 0.31. The result thus provides strong support for hypothesis H1.

Hypothesis H2 proposed a positive relationship between local sources of knowledge and firms' innovation performance. Hypothesis H2 was not supported by the findings (significant standardized path coefficient of –0.26), because the result was the opposite of what was predicted, indicating that local sources of knowledge are negatively related to innovation performance.

Hypothesis H3 assessed the relationship between national sources of knowledge and firms' innovation performance. Hypothesis H3 was not supported by the findings (non-significant standardized coefficient of –0.01).

Hypothesis H4 predicted that the extent of international sources of knowledge would be positively related to firms' innovation performance. The results indicate a significant relationship between international sources of knowledge and firms' innovation performance (positive significant standardized coefficient of 0.25). The results thus support hypothesis H4.

OTHER FINDINGS

Other findings will be discussed in terms of the impact of control variables and the relationships between variables.

The impact of firm size and region as a dichotomous control variable was assessed (western European countries versus eastern European
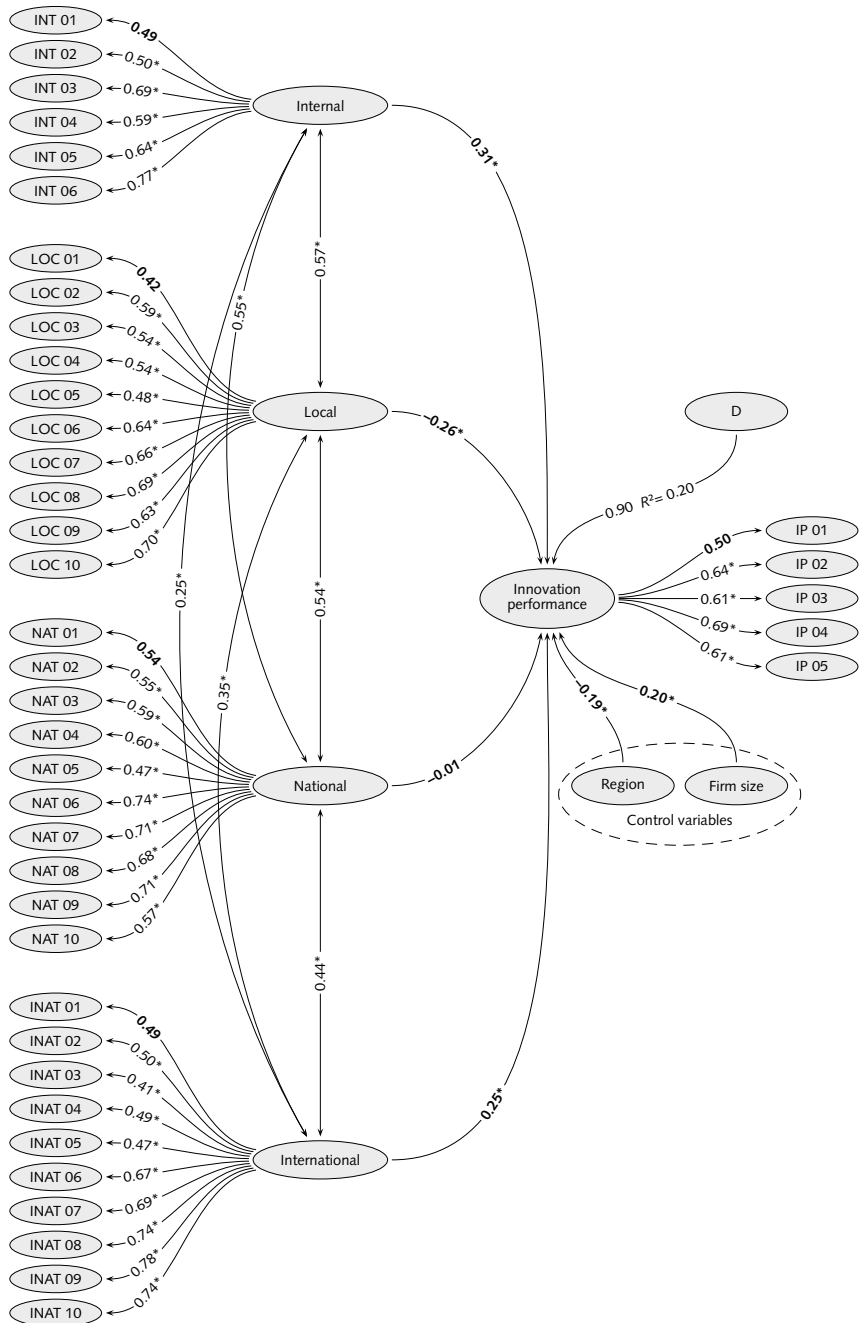
FIGURE 1   The model of the influence of sources of knowledge on the innovation
performance (bolded parameters are fixed; * sig. < 0.05)

countries). Although the model fit indices and the structural coefficients of the relationship between independent variables and innovation performance did not reveal substantial variations with the introduction of control variables, both control variables were found significantly related to the innovation performance. The results indicate that firms from eastern European countries are significantly less innovative than firms from western European countries (negative significant standardized coefficient of −0.19), and that larger firms are significantly more innovative than smaller firms (positive significant standardized coefficient of 0.20).

The results also show that internal, local, national, and international sources of knowledge are significantly correlated among each other. While the correlations between internal and international, local and international, and national and international sources of knowledge were moderate (correlation coefficient of 0.25, 0.35, and 0.44 respectively), the correlations among internal, local, and national were somewhat higher (correlation coefficient between 0.54 and 0.57). Nevertheless, multi-collinearity was not detected among any of the variables in the multivariate model.

Discussion and Conclusion

The results presented in the previous section reveal that internal knowledge sources are only some of the sources of innovation. Our research confirmed that in-house learning is crucial for firms' innovation performance; however, interactive learning outside the firm also significantly contributes to innovativeness. According to these results, it is mainly cooperation with international business partners that contributes to innovation.

The significant, positive, and high path coefficient confirms the importance of in-house R&D activities, continuous process improvements, and internal education programs, which together boost firms' innovativeness. This means that innovation performance to a great extent depends on a firm's own efforts. This is not surprising, given the fact that innovations strongly influence a firm's competitive position in the market. Consequently, firms try to keep the innovation inside the firm, mainly relying on internal knowledge sources. Know-how historically was – and in large measure remains – a kind of knowledge developed within the confines of a firm (already discussed in Hudson 1999), and our results have proven that the boundaries of the firm are still signif-

icant for knowledge related to innovations that are central to the core competencies and strategic goals of the company.

Nevertheless, the increasing complexity of the knowledge base upon which the production process depends is increasing the social division of labor in knowledge production, yet is also resulting in growing long-term cooperation between firms (Hudson 1999). According to localized learning literature, we expected local knowledge sources to positively contribute to firms' innovation performance; however, the results proved the opposite. The findings might at first seem surprising because they indicate that the use of local knowledge sources impedes innovation. However, much of the literature warns that sole dependence on local knowledge sources can lead to the lock-in effect, whereby firms are 'locked' into the existing technological trajectory of the local environment and are unable to continuously develop new products and services and implement innovations in processes and organization (Visser and Boschma 2004; Malmberg and Maskell 2006). Camagni (1991) has already stressed that firms need linkages with the external business environment. Especially in times of rapid technological change, external (non-local) links might provide local firms with the complementary assets that are needed to adapt to the changing economic and technological environment. In areas of production characterized by fast innovation and technological change, 'local firm involvement in wider national and global networks is absolutely essential for long-term regional growth,' and 'the milieu has to open up to external energy in order to avoid 'entropic death' and a decline in its own innovative capacity' (Camagni 1991, 139). Our results are not in line with the older literature on localized learning (Capello 1999), which often positioned learning at the local level as somehow superior to that at other spatial levels. Nevertheless, our study confirms what most of the recent literature is arguing by saying that innovation performance is a result of combining several internal as well as external knowledge sources, the latter coming from different geographical levels. Local knowledge sources are important for firms to a certain extent, as geographic proximity and concentration of firms can provide enormous opportunities for the transmission of sticky, non-articulated forms of knowledge between firms (Tödling, Lehner, and Trippl 2004). However, localized learning does not necessarily lead to innovation. Our results indicate that access to codified external knowledge should be secured through interaction with firms and institutions outside the local environment, and

we show that new value is created by combining these various types of knowledge.

In today's globalized economy, where supply chains are distributed all around the globe and specialized knowledge and research institutions are scattered in numerous locations, there is no reason to believe that a firm will find the precise knowledge needed in its innovation process within the local environment. Accordingly, firms search for the necessary knowledge elsewhere and often look for appropriate innovation partners irrespective of the geographic space. While our research did not reveal a significant influence of national knowledge sources, it has proven that international sources have a strong, positive, and significant influence on firms' innovation performance. Keeble and Wilkinson (2000) have already supported these ideas with the empirical findings of the European network. Numerous firms possess close functional links with firms and knowledge centers in their countries and abroad, and view such wider networks as very important for successful research and innovation. Extra-local networking appears to be an important process whereby high-tech firms sustain their innovative activity and competitive advantage.

Our research confirms that firms need to incorporate the internal learning process with knowledge acquired outside the firm. They need to secure extra-local links in order to secure the inflow of new knowledge needed in the innovation process and prevent the lock-in effect. As Oinas and Malecki (2002) suggest, the innovation system can be understood as being internationally distributed and not only as an activity primarily confined within a given local environment. In line with their approach, Simmie (2006, 133) suggests that 'innovation must be understood in terms of trading nodes in an international system that encompasses both local and international knowledge spillovers and multilayered economic linkages extending over several different spatial scales.' To sum up, one can conclude that internal learning and interactive learning with firms and institutions in a wider business environment mutually reinforce each other and bring optimal results in terms of innovation performance. In this respect, our results are in line with existing studies (Caloghirou, Kastelli, and Tsakanikas 2004; Love and Mansury, 2007) that verify the importance of external sources and imply that innovations come from a number of sources and develop in a number of ways (Willoughby and Galvin 2005). However, those studies mainly focus on the type of sources (for example suppliers and customers, scien-

tific system, public institutions, etc.) but do little to explain how location of those knowledge sources influences the innovation performance of firms. In this respect our study brings additional insight into the complex process of innovation and proves that not all external knowledge sources are equally important for innovation. According to our results, firms need to establish and nurture collaboration with different partners in the wider international environment in order to boost their innovativeness.

Although this study has many strengths, it also has some limitations that need to be acknowledged. Firstly, with regard to local knowledge sources, the problem of knowledge internalization deserves mention; that is, when firms overestimate the role of in-house activities and downgrade the role of the local environment in which they operate. The knowledge exchange between local firms and institutions mainly happens in a socialized way in the form of knowledge spillovers. As soon as a firm acquires this local knowledge, it incorporates it into the existing knowledge base, making it internal to the firm (Henry and Pinch 2000; Cole 2007). Accordingly, firms might underestimate the importance of being located in the local environment, because they take for granted the benefits of the specialized local labor market, the proximity of similar firms, and close linkages with local universities and other knowledge organizations. Secondly, the model of the influence of sources of knowledge on innovation performance is not comprehensive (it includes a limited number of elements in order to make the empirical examination feasible) because it ignores some other factors that influence innovation performance. Thirdly, although the causal directions hypothesized in the model were suggested by the theory, the cross-sectional nature of this study cannot prove the causation but can only support a set of hypothesized paths (Kline 2005). Therefore, the possibility of reverse causality cannot be eliminated.

References

Asheim, B., and A. Isaksen. 1997. Location, agglomeration and innovation: Towards regional innovation systems in Norway. *European Planning Studies* 5 (3): 299–330.

Bathelt, H., A. Malmberg, and P. Maskell. 2002. Clusters and knowledge: Local buzz, global pipelines and the process of knowledge creation. DRUID Working Paper 02-12.

Belussi, F., and L. Pilotti. 2000. Knowledge creation and collective learn-

ing in the Italian local production systems. Http://www.decon.unipd.it/assets/pdf/dp/0021.pdf.

Belussi, F., F. McDonald, and S. Borrás. 2002. Industrial districts: State of the art review. Research report, Project West–East ID: Industrial districts re-location processes; Identifying policies in the perspective of the European Union enlargement.

Bentler, P. M., and D. G. Bonett. 1980. Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin* 88 (3): 588–606.

Bentler, P. M., and E. J. C. Wu. 2006. EQS 6.1 *for Windows.* Encino: Multivariate Software.

Brislin, R. W. 1970. Back-translation for cross-cultural research. *Journal of Cross-Cultural Psychology* 1 (3): 185–216.

———. 1980. Translation and content analysis of oral and written material. In *Handbook of cross-cultural psychology,* ed. H. C. Triandis and J. W. Berry. Boston, MA: Allyn and Bacon.

Britton, J. N. H. 2003. Network structure of an industrial cluster: Electronics in Toronto. *Environment and Planning* 35 (6): 983–1006.

Browne, M. W., and R. Cudeck. 1992. Alternative ways of assessing model fit. *Sociological Methods Research* 21 (2): 230–58.

Byrne, B. M. 2006. *Structural equation modeling with* EQS: *Basic concepts, applications, and programming.* 2nd ed. Mahwah, NJ: Erlbaum.

Caloghirou, Y., I. Kastelli, and A. Tsakanikas. 2004. Internal capabilities and external knowledge sources: Complements or substitutes for innovative performance? *Technovation* 24 (1): 29–39.

Camagni, R. 1991. Local milieu, uncertainty and innovation networks: Towards a new dynamic theory of economic space. In *Innovation networks: Spatial perspective,* ed. R. Camagni, 121–43. London: Belhaven.

———. 1993. Inter-firm industrial networks: The costs and benefits of cooperative behaviour. *Journal of Industry Studies* 1 (1): 1–15.

Capello, R. 1999. Spatial transfer of knowledge in high technology milieux: Learning versus collective learning processes. *Regional Studies* 33 (4): 353–65.

Capello, R., and A. Faggian. 2005. Collective learning and relational capital in local innovation processes. *Regional Studies* 39 (1): 75–87.

Cohen, W. M., and D. A. Levinthal. 1990. Absorbtive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly* 35 (1): 128–52.

Cole, A. 2007. The knowledge-based theory of the cluster. A critical re-examination. Papers in Evolutionary Economic Geography 0708, Utrecht University.

Craig, C. S., and S. Douglas. 2005. *International marketing research.* 3rd ed. Chichester: Wiley.

Cronbach, L. J. 1951. Coefficient alpha and the internal structure of tests. *Psychometrika* 16 (3): 297–334.

Cumbers, A., D. MacKinnon, and K. Chapman. 2003. Innovation, collaboration and learning in regional clusters: A study of SMEs in the Aberdeen oil complex. *Environment and Planning* A 35 (9): 1689–706.

Dunning, J. 2000. *Regions, globalisation and the knowledge-based economy.* New York: Oxford University Press.

Eriksson, M. L. 2005. Organising regional innovation support: Sweden's industrial development centres as regional development coalitions. PhD diss., Linköping University.

Floyd, F. J., and K. F. Widaman. 1995. Factor analysis in the development and refinement of clinical assessment instruments. *Psychological Assessment* 7 (3): 286–99.

Gambarotto, F., and S. Solari. 2004. The role of reconnection of competencies and institutions in the collective learning process Http://www.eco.unipmn.it/eventi/eadi/papers/gambarottosolari.pdf.

Geenhuizen, M. 1997. A microscopic view on spatial innovation: The case of the Netherlands. In *The dynamics of innovative regions: The GREMI approach,* ed. E. Ratti, A. Bramanti, and R. Gordon, 265–77. Aldershot: Ashgate.

Grabher, G., ed. 1993. *The embedded firm: On socioeconomics of industrial networks.* London: Routledge.

Gunasekara, C. 2006. The generative and developmental roles of universities in regional innovation systems. *Science and Public Policy* 33 (2): 137–50.

Hair, J. F., R. E. Anderson, R. L. Tatham, and W. C. Black. 1998. *Multivariate data analysis.* 5th ed. Upper Saddle River, NJ: Prentice-Hall.

Hambleton, R. K. 1993. Translating achievement tests for use in cross-national studies. *European Journal of Psychological Assessment* 9 (1): 57–68.

Henry, N., and S. Pinch. 2001. Neo-marshallian nodes, institutional thickness, and Britain's 'motor sport valley': Thick or thin. *Environment and Planning* 33 (7): 1169–83.

Hu, L., and P. M. Bentler. 1999. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling* 6 (1): 1–55.

Hudson, R. 1999. The learning economy, the learning firm and the learning region: A sympathetic critique of the limits to learning. *European Urban and Regional Studies* 6 (1): 59–72.

Johnson, B. 1992. Institutional learning. In *National systems of innovation:*

Towards a theory of innovation and interactive learning, ed. B. A. Lundvall, 23–44. London: Pinter.

Johnson, B., E. Lorenz, and B.A. Lundvall. 2002. Why all this fuss about codified and tacit knowledge? *Industrial and Corporate Change* 11 (2): 245–62.

Keeble, D. 2000. Collective learning processes in European high-technology milieux. In *High technology clusters, networking and collective learning in Europe,* ed. D. Keeble and F. Wilkinson, 199–229. Adelshot: Ashgate.

Keeble, D., and F. Wilkinson. 1999. Collective learning and knowledge development in the evolution of regional clusters of high-technology SMES in Europe. *Regional Studies* 33 (4): 295–303.

———. 2000. *High-technology clusters, networking and collective learning in Europe.* Adelshot: Ashgate.

Keeble, D., C. Lawson, H. Lawton Smith, F. Wilkinson, and B. Moore. 1998. Collective learning processes and inter-firm networking in innovative high-technology regions. Working Paper 86, ESCR Centre for Business Research, University of Cambridge.

Kline, R. B. 2005. *Principles and practice of structural equation modeling.* 2nd ed. New York: Guilford.

Knudsen, L. G. 2006. Determinants of 'openness' in R&D collaboration: the roles of absorptive capacity and appropriability. Paper presented at the DRUID-DIME Academy Winter 2006 PHD Conference, Aalborg.

Lorenzen, M. 1998. Localised learning: Why are inter-firm learning patterns institutionalised within particular localities? DRUID Working Paper 05-22.

Love J., and M. A. Mansury. 2007. External linkages, R&D and innovation performance in US business services. *Industry and Innovation* 14 (5): 477–96.

Lundvall, B. A. 1988. Innovation as an interactive process: From user-producer interaction to national system of innovation. In *Technical change and economic theory,* ed. G. Dosi, C. Freeman, G. Silverberg, and L. Soete, 269–349. London: Pinter.

———. 1992. *National systems of innovation: Towards a theory of innovation and interactive learning.* London: Pinter.

Lundvall, B. A., and P. Nielsen. 1999. Competition and transformation in the learning economy: The Danish case. *Revue d'Economie Industrielle* 88 (2): 67–90.

Lundvall, B. A., B. Johnson, E. S. Andersen, and B. Dalum. 2002. National systems of production, innovation and competence building. *Research Policy* 31 (2): 213–31.

Malmberg, A., and D. Power. 2005. (How) do (firms in) clusters create knowledge? *Industry and Innovation* 12 (4): 409–31.

Malmberg, A., and P. Maskell. 2006. Localised learning revisited. *Growth and Change* 37 (1): 1–18.

Oinas, P., and Malecki, E. J. 2002. The evolution of technologies in time and space: From national and regional to spatial innovation systems. *International Regional Science Journal* 25 (1): 101–31.

Pavitt, K. 1998. Technologies, products and organisation in the innovating firm: What Adam Smith tells us and Joseph Schumpeter doesn't. *Industrial and Corporate Change* 7 (3): 433–52.

Santos, D. 2000. Innovation and territory: Which strategies to promote regional innovation systems in Portugal? *European Urban and Regional Studies* 7 (2): 147–57.

Sharma, S., S. Durvasula, and W. R. Dillon. 1989. Some results on the behavior of alternate covariance structure estimation procedures in the presence of non-normal data. *Journal of Marketing Research* 26 (2): 214–21.

Shook, C. L., D. J. Ketchen, G. T. M. Hult, and K. M. Kacmar. 2004. An assessment of the use of structural equation modeling in strategic management research. *Strategic Management Journal* 25 (4): 397–404.

Simmie, J. 2006. Do clusters or innovation systems drive competitiveness? In *Clusters and regional development: Critical reflections and explorations,* ed. B. Asheim, P. Cooke, and R. Martin, 164–88. New York: Routledge.

Steiner, M. 2006. Do clusters 'think?': An institutional perspective on knowledge creation and diffusion in clusters. In *Clusters and regional development: Critical reflections and explorations,* ed. B. Asheim, P. Cooke, and R. Martin, 199–218. New York: Routledge.

Steiner, M., and C. Hartmann. 2006. Organisational learning in clusters: A case study on material and immaterial dimensions of cooperation. *Regional Studies* 40 (5): 493–506.

Thorpe, R., R. Holt, A. Macpherson, and L. Pittaway. 2005. Using knowledge with small and medium-sized firms: A systematic review of the evidence. *International Journal of Management Reviews* 7 (4): 257–81.

Tödling, F., and A. Kaufmann. 1999. Innovation systems in regions of Europe: A comparative perspective. *European Planning Studies* 7 (6): 699–717.

Tödling, F., P. Lehner, and M. Trippl. 2004. Knowledge intensive industries, networks and collective learning. Paper presented at the 44th European Congress of the European Regional Science Association, University of Porto, Portugal.

Tomassini, M, and R. Sarcina. 2005. Knowledge and learning. Research re-

port, Project West-East ɪᴅ: Industrial districts' re-location processes; Identifying policies in the perspective of the European Union enlargement.

Tsai, K.-H., and J.-C. Wang. 2007. A longitudinal examination of performance of two ways on innovation in Taiwan: Internal ʀ&ᴅ investment and external technology acquisition. *International Journal of Technology Management* 39 (3–4): 235–47.

Visser, E.J., and R. Boschma. 2004. Learning in districts: Novelty and lock-in in a regional context. *European Planning Studies* 12 (6): 793–808.

Willoughby K., and P. Galvin 2005. Inter-organizational collaboration, knowledge intensity, and the sources of innovation in the bioscience-technology industries. *Knowledge, Technology, and Policy* 18 (3): 56–73.

Wolfe, D. A., and M. S. Gertler. 2006. Clusters from inside out: Local dynamics and global linkages. In *Cluster in urban and regional development,* ed. A. Cumbers and D. MacKinnon, 101–24. New York: Routledge.

Yeung, H. W. C. 2005. The firm as social networks: An organisational perspective. *Growth and Change* 36 (3): 307–28.

Ensuring Professionalism of the External Evaluation Commission: The Slovenian Case Study

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In 2006–2007, the Slovenian higher education (HE) system took the first steps toward building a national model of institutional external evaluation (IEE), which would be comparable with other European models. In the first part of the article, the authors discuss the main tendencies within the European HE area. This is followed by an outline of the developments in the field of quality assurance within Slovenian HE, stressing the years 2006 and 2007. The scientific contribution of the article lies in the evaluation outcomes of the national pilot IEES, with focus on the professional competences of the External evaluation commission (EEC) members. Observation results stress the importance of the proper training of EEC members. The authors propose that a systematic follow-up on the EEC work needs to be established and a code of ethics drawn up, highlighting the preferred values and principles of EEC members.

Key Words: quality assurance, higher education, external evaluation, institutional evaluation, external evaluation commission
JEL *Classification:* M42, 128

Introduction

The present article is the result of the research, implemented during the national pilot IEES in the period 2006–2007. The Slovenian developing HE quality assurance system uses as its reference points the guidelines provided by various European institutions for quality assurance in HE. But in these documents little attention is paid to the EEC members training. It is indispensable to underline that the professional competences of the EEC members' has a direct impact on the HEI representatives' perception of IEE. The role of the EEC in IEE, especially during a visit to the HEI, is the key to successful understanding, experiencing and acceptance

of the IEE process and its outputs, provided by the representative of the evaluated HEIS.

This was one of the reasons why the evaluation case study of pilot national IEES in four evaluated HEIS was carried out. Using observation as their research method of choice, the research team sought the answers to the question: What were the fields, stages and tools that should have been improved in pilot IEES? Before the observation began, an observation checklist had been drafted to ensure a coordinated approach of all observers involved. By the triangulation of three methods (observation, questionnaire survey and experience presentations) we tried to ensure a correct understanding of the conclusions made by observers and sustain the findings.

The authors have come to the conclusion that, since the main interest of pilot IEES lied in the assessment of national IEE tools, the professional competences of the EEC members had been partly neglected. Observation results thus stress the importance of the proper training of EEC members in research methodology, HE activities and the related national legislation, besides the IEE procedures. The authors propose that a systematic follow-up on the EEC work needs to be established and a code of ethics drawn up, highlighting the preferred values and principles of EEC members. In spite of all that, the development, improvement and comparability of the IEES and the EEC members are threatened as long as the national evaluation body is not affiliated in the European Association for Quality Assurance in Higher Education (ENQA) and is not present in the European Quality Assurance Register (EQAR).

The potential future researches are presented in the last section.

Theoretical Framework

QUALITY ASSURANCE IN EUROPEAN HIGHER EDUCATION

European HE systems are facing many challenges, arising from their national or international environments (Faganel, Trunk and Dolinšek 2005, 317; Srikanthan and Dalrymple 2003, 126): liberalisation and the lifting of boundaries in the labour market, employment and education, marketisation (Logaj and Trnavčevič 2006, 79–80) and the fading of the divide separating the public sector from the private, the transition of HEIS from their status as elite institutions to mass institutions, and the adoption of life-long learning. The emergence of new educational programmes and HEIS is creating confusion and uncertainty for different HE stakehold-

ers. Simultaneously, the governments provide fewer funds (per capita) to meet those challenges.

The increasingly competitive world requires development of knowledge society, and one of the Bologna process objectives is to provide the guidelines for quality assurance to the national quality assurance systems and likewise individual institutions for quality assurance. In addition to the Bologna declaration (1999), a more significant quality assurance orientation in the main European documents can be noted. Following the Rectors' Meeting in Salamanca, Prague Communiqué, Berlin Communiqué, Bergen Communiqué and London Communiqué (see http://www.ond.vlaanderen.be/hogeronderwijs/bologna/documents/), quality in HE becomes the core notion in establishing a coordinated European HE area.

West Europe is trying to upgrade (self-)evaluations with institutional and programme accreditation. In the mirror are more managerial and leadership approaches to run the HEIS. In East (transition) Europe the institutional and programme accreditation guarantees for the quality, although the HEIS and the environment are not satisfied enough. The HEIS need the support in undertaking the challenges. They do not demand judgments on teaching and learning quality, but they ask for help to develop and improve the HEIS' strategic and quality management. Support of institutional and programme development is the main reason for implementation of (external) evaluations in these countries. In 'Bologna' countries the target is more the establishment of the European quality network, as ENQA and Agencies' network, than the improvement of the existing national systems of accreditation and evaluation. In some European countries quality assurance is an internal responsibility of each HEI and is based on an internal evaluation of the institution's programmes. In other countries quality assurance system incorporates an external evaluation or accreditation. In the first case, external peers evaluate programmes and institutions, while, in the second case, an external independent agency grants a specific 'quality label' to programmes and institutions which have met a set of pre-defined requirements (Orsingher 2006, 1).

Bearing in mind the autonomy of HEIS and considering the demand of the environment for transparency and accountability, the education sector has recognized a need for developing shared criteria and a common methodology in quality assurance. At the same time it is important to leave enough room for innovation and diversity, because of the na-

tional policy differences. Consequently, the Standards and guidelines for quality assurance in the European higher education area emerged, formulated by the ENQA in cooperation with the European university association (EUA), European association of institutions in higher education (EURASHE) and the European student information bureau (ESIB, today European students' union). The standards were adopted in the Berlin Communiqué (2003).

'There is no uniform model of HE quality assessment in the EU [European Union], which would be agreed-upon, and it cannot be expected either – because this is the domain of national affairs, even though they do maintain a degree of international comparability' (Dolinšek, Trunk Širca, and Faganel 2005, 20). While many differences in implementation practices remain, various movements for the development of national and international quality assurance systems can be noticed, showing agreement on some common principles. These take the form of guidelines, drafted by European institutions for quality assurance. The documents are discussed in this article, following two assumptions. First, these guidelines are an optimal product of the experiences, concerning good practice. Second, these institutions and national agencies act as independent bodies, so their work is primarily targeted at creating IEE strategies for achieving a maximum of positive effects in each HEI as well as its wider environment.

EXTERNAL EVALUATION COMMISSION IN EUROPEAN HIGHER EDUCATION

Seen as a tool for quality assurance, IEE has many purposes. First, the IEE shows accountability towards various stakeholders. Accountability is interpreted not just towards the funding authorities, looking for a good return on investments – as value for money, but as understanding quality as transformation of the participants that are potentially capable of considering the concerns of all stakeholders' groups (Srikanthan and Dalrymple 2003, 128). Unfortunately, this interpretation has been missing from all approaches to quality in HE so far (Harvey 1998; Srikanthan and Dalrymple 2003, 128).

The very important purpose of IEE is to improve the capability of single HEIs to define their target and choose the most suitable strategies, but having regard to the stakeholders' opinion and requirements. IEE facilitates the improvement cycle of single HEIs, because it serves as a diagnostic instrument and means of producing guidelines or planning inputs. This can in turn become a strategic tool of HEI operation. As many au-

thors suppose, the introduction of IEE process and methodology enables transparency within European higher education and improves international credibility (Dolinšek, Trunk Širca, and Faganel 2005, 20), whilst it also provides the basis for funds allocation (Čuš 2006). The purpose is also to reinforce institutional development by disseminating examples of good practice in the areas of internal quality management and strategic change (EUA 2005, 4).

The ENQA's standards and guidelines see the use of the site-visits as one of the widely-used elements of external review processes (2007, 20–21). The role of the EEC in the IEE, especially during a visit to the HEI, is the key to a successful understanding, experiencing and acceptance of the IEE process and its outputs from the HEI representatives. The professional competences of the EEC members have a direct impact on the HEI representatives' perception of IEE.

The EUA is trying to ensure the quality of its EEC members by introducing a requirement that each member be previously appointed rector or prorector and have successfully passed the examination (Kralj 2006, 4). Hereby the EUA model disregards the invaluable insight of other stakeholders, which can significantly contribute to a comprehensive view of the HEI quality.

In addition to general criteria for EEC members' selection (FINHEEC 2006, 19; ENQA 2007, 20), many institutions for quality assurance in higher education invest into training of the EEC members for their tasks, considering the differences in their backgrounds, which range from the corporate sector to the non-profit sector. In addition, the majority of EEC members are students with limited experiences and stakeholders with varying degrees of knowledge in national HE legislation. Rossi's claim (2004, 27) that 'ideally, every evaluator should be familiar with the full repertoire of social research methods' poses a vague outline of the qualifications of EEC members. FINHEEC (2006, 20) arrange a special training for the EEC members, with the focus on the objectives and different phases of the IEE process, the responsibilities of the EEC and IEE methods. At the same time, the EEC members become acquainted with the situation in quality assurance in Finland and abroad. A long-term member of evaluation commissions within the Quality Assurance Agency in Higher Education (QAA) underlined in the description of her experience (Broady-Preston 2002, 3) that 'the training emphasized the importance of teamwork rather than individual effort. For some academics, the process of open and free sharing of information was a difficult one to grasp'.

The experience of the Inspectorates of Education in Europe, while

partly consistent in its content with the work of quality assurance agencies, shows a multitude of models and criteria used for inspector recruiting and training among different European countries (Standaert 2000, 34–6): past experience in education, interviews, trainings, written tests on various themes, in-service training, 'in-house' refresher training, supervision of a mentor, tutor support, closely observation, etc. Generally speaking, a limited number of countries do have a well-defined approach to beginner staff training, but little attention is paid to the systematic, continuous on-the-job training of inspectors.

QUALITY ASSURANCE IN SLOVENIAN HIGHER EDUCATION

Quality assurance in Slovenian HEIs has two branches: accreditation and evaluation. Accreditation is needed before new HEIs are founded or new educational programmes are offered, and is renewed every seven years. Complying with amendments to the 2004 Higher Education Act (ZVIS-D), article 80, these subsequent accreditation processes take into account the findings of institutional self-evaluation and external evaluation reports. These requirements additionally encouraged the HE area to establish a national system of quality assurance, especially systemically coordinated IEEs, which would provide the HEIs with the desired comparability and credibility within Europe.

Consequently, in 2004, national Criteria for monitoring, assessment and assurance of quality in the higher education institutions, study programmes, science and research, artistic and professional work (the Criteria) were adopted (Merila za spremljanje [...] 2004). The Criteria were based upon standards prescribed by ENQA, EUA and UNESCO. The other important landmark was the Act Amending the Higher Education Act (ZVIS-E) of September 2006, which grants the Council for Higher Education of the Republic of Slovenia independence, hereby meeting the necessary condition for the Council's independent and unbiased decision-making in the processes of assessing and assuring quality.

The Criteria only represent the initial stage in introducing a comparable quality assurance system. In 2006, the Slovenian national commission for quality in higher education (NCQHE) was entrusted with elaborating IEE procedures and testing the Criteria in practice. Due to this intention, the NCQHE had to perform a pilot IEEs. The project was financed by the Ministry of higher education, science and technology. Once the testing phase is over, the IEE procedure will be paid for by the HEI itself, or rather – the IEE will constitute the HEI's investment. By investing in

the culture of quality now, the HEI expects to limit the cost for quality assurance in the future (Wagenaar 2006).

Observing Visits at Evaluated Higher Education Institutions

The ENQA's guidelines (2007, 25) suggest that an institution, providing quality assurance structures, has in place internal quality assurance procedures which include an internal feedback mechanism, an internal reflection mechanism and an external feedback mechanism in order to inform and underpin its own development and improvement. The research group (hereinafter referred to as 'we') followed this recommendation to gather the responses on EEC work quality, as is apparent from the empirical section of this article.

DESCRIPTION OF THE METHODOLOGY

Due to the need for an all-encompassing research approach, where the researcher not only obtains the answers to his/her questions, but can also fully grasp the existing social situation and get a full picture of the group, organization, or relationship (Flere 2000, 81), we opted for the systematic observation of visits to the evaluated HEIs. Standaert (2000, 49) suggests that the 'real [quality] assessment can only be done by observing the inspector at work'. Since site-visits are a key part of the IEE process, we decided to observe the entire course of site-visits at individual HEIs, which meant a two-day observation of on-site activity. All four HEIs, participating in the pilot IEE project, were included in the observation processes and are hereinafter referred to as individual study cases.

We undertook – by means of independent, in-depth insight into the activities of the IEE participants in the pilot project – the task of identifying the fields, stages or tools to be improved and proposing corrective measures. This article, however, focuses only on one part of the findings, relating to the professional competences of EEC members. This research is an evaluation case study, using a qualitative research approach.

The observation plan was laid out in advance. An observation checklist was drawn up as the most important coordination tool the four observers had. It was previously submitted for peer review to all the participating observers. During the EEC training workshop, where a methodological approach to HEI visits was simulated, one observer was also tasked with verifying the applicability of the observation checklist.

Observers were independent in the sense that they have not, either previously or at the time of the study, been involved in the pilot project

or any other forms of the NCQHE activities. Our trust in their professionalism was based on their current research work in the field of HE, quality or evaluation. Immediately before the beginning of the study, all observers had been studying research methodology and they took part in the EEC training. The observation included four observers, so as to minimize the influence of the potential shortcomings of observers' personalities (Milić 1965, 382–6, in Flere 2000) and thus analyzed all study cases, which, in three instances, took place simultaneously. The observers were separated from the groups that were evaluated and watched the process without partaking in the interviews.

The evaluated HEI were notified in advance about the observers' attendance. Moreover, the attendance and role of the observers were likewise confirmed by the NCQHE. The EEC or the observers themselves introduced the observer and explained their role to each of the interviewed HEI groups.

Observers were informed in advance about the subject observed, the particular observation process and the key rules of unobtrusive observation. Even so, some situations arose during the observation process (especially outside the interviews) that saw the observer transform from unobtrusive to participant, as the participants would often perceive their observer as a 'social stranger' (Flere 2000, 89) and initiate interaction with him.

With the help of their laptop computers, our observers would record their impressions and participant statements or added them by hand to their observation checklists intended for that particular interview. After the observation was complete, each observer wrote an observation report. The observation coordinator qualitatively processed the reports they had received. The analyses results were then presented to all at the final NCQHA project meeting.

During the final meeting of the NCQHE pilot project, one more survey was carried out (in addition to observation) among the representatives of evaluated HEIs and EEC members that attended. The survey was conducted through two survey questionnaires, one for the EEC members and the other for the representatives of HEIs. All persons meeting a prerequisite condition were included (i. e. the presence of EEC members or HEI representatives at site-visits). Of 12 EEC members present, 11 respondents answered the questionnaire. Additionally, all 7 HEI representatives present answered the survey.

At the final meeting, the EEC Chairs and the representatives of evalu-

ated HEIs were also given an opportunity to explain their own suggestions and observations regarding the methodology of pilot IEE to all present. By the triangulation of these methods (observation, questionnaire survey and experience presentations) we tried to ensure a correct understanding of the conclusions made by observers and to sustain the findings.

RESEARCH LIMITATIONS

Observation is based on a more or less subjective appreciation of the situation, which is also the main limitation of the research. Although the feasibility of unobtrusive observation may be questioned, as the observed individuals may differ in their attitude towards the observer's presence and consequently react to it, this type of observer role ensures the highest possible credibility of all the different observation methods (Flere 2000, 88).

A further limitation to observation lies in the fact that these research techniques can provide an extremely detailed image of what is going on and how long it has been happening, but they do not enable an all-embracing description as to why things happen (Easterby-Smith, Thorpe and Lowe 2005, 144). Thus it is necessary to analyze these perceptions, in other words: 'What is recorded must be meaningfully processed in accordance with our understanding of the observation focus' (Flere 2000, 81). The answers to W-questions were hence obtained through surveys and with the help of participants, presenting their experience at the final meeting.

Empirical Findings

The EEC members used the interview as their main method of data collection during their visits at HEIs. This method 'requires a high level of skill in the interviewer, who needs to be knowledgeable about the interview topic and familiar with the methodological options available, as well as have a grasp of the conceptual issues of producing knowledge through conversation. Interview research is a craft that, if well carried out, can become art' (Kvale 1996, 13).

Observers' findings, such as 'emphasis on personal opinion and experience ... expressing own notions, opinions and views ... transition to a friendly approach ... providing advice and instruction ... the presence of judgments and instant suggestions ... patronizing ... a very inquisitive approach of the commission', all mark the professionalism of the

eec work. In one studied case, 'the group interviews transformed into plenary sessions which, quite often – in terms of their content – disregarded the evaluation questions'. This begs the question of what could be regarded as an optimal methodological approach of the interviewer, and results in the following, largely incompatible, hypothetical possibilities. The first possibility is for the eec to empathize with hei representatives, as this is likely to encourage trust and a greater openness from hei representatives in sharing information. However, the levels of objectivity, dispassion and suggestiveness in the communication on the part of eec members are questionable. The second possibility builds on the presupposition that the eec must act dispassionately, thus distancing themselves from the representatives of evaluated heis, refrain from revealing their own perspective, personal experience, etc. In this case, the eec can expect a more pronounced reticence in communication from hei representatives.

Based on their experience, enqa (2007, 12) also presented some fairly substantial discrepancies as to what ought to be the appropriate relationship ruling the interaction between heis and eec members. Some professionals, mainly from agencies accrediting programmes or institutions, take the view that external quality assurance is essentially a matter of 'consumer protection', requiring a clear distance to be established between the quality assurance agency and the heis whose work they evaluate. Meanwhile other agencies understand the main purpose of external quality assurance to be the provision of advice and guidance in the pursuit of improving the standards and quality of study programmes and related qualifications. The effort to establish a balance between accountability and improvement has emerged as a key responsibility of the eec members.

In connection to the paragraphs above, the study case confirmed the thoughts of Kvale (1996, 101), who argues that an interaction among interview participants leads to emotional statements about the topics being discussed. This was due to the fact that 'the evaluator's role was too often mistaken for that of a counsellor' and, in one case, 'a verbal argument provoked a defensive reaction among faculty representatives – silence', in other words, a communication hurdle with some of the hei representatives. In spite of this, the eec's work does comply with the eua guidelines (2005, 22), which emphasize that the eec 'does not judge the quality of teaching and learning or that of research, nor does it rank or compare one university against others' and that 'it should be emphasized that the

main preoccupation of the team is to be helpful and constructive rather than threatening or punitive'.

Even the implementation of the questions asked by EEC members that were supposed to be mostly open-ended, was not optimal. 'Questions were formulated too explicatively ... it started out fine, but there was a lot of extra information, directing subsequent answers ... questions were aimed at obtaining interviewees' opinions instead of the data that would enable the evaluation of work within the HEI ... questions were suggestive, rooted in unfounded or vague conclusions and judgments' were the findings made by three observers, potentially pointing out some problems in acquiring unbiased information. One of the key characteristics underlying open-ended questions, as carefully analyzed by Foddy (1993, 128), is that they should not imply answers. One of the observers, however, did note that 'the questions [asked by EEC members] did eventually become more structured and goal-oriented', which implies that there were some self-evaluation or self-correction measures applied by EEC members in one study case.

The triangulation of methods as an approach combining several independent methods and measurements (Easterby-Smith, Thorpe, and Lowe 2002, 181) within the EEC's work, proved optimal in two study cases under observation. This can be concluded from the following feedback: 'the obtained information was verified in different target groups and questions were asked about the issues that remained unclear from the previously acquired materials' or 'the commission turned to their questionnaire and the documentation for support'. In two other instances, the triangulation of methods was misinterpreted and implemented incorrectly. The interviewees were sometimes asked 'unnecessary questions, where answers were already apparent from the questionnaire' and 'questions seeking opinions of faculty representatives, instead of information, which would enable work evaluation', or provided 'information or drew conclusions from the interviews that had not been validated [in other evaluated groups]'.

Standaert (2000, 47) argues that less attention should be paid to members' familiarity with legislation, as this is already sufficiently represented in administration. But the observation findings indicate a lower credibility of those EEC members (coming from different fields of activity) who displayed only superficial knowledge of the legislation regulating HE or HEI work in general. The survey questionnaire dealt with this study topic. The EEC members rated the claim that 'commission members had

adequate knowledge of higher education' with an average of 4.18, while the representatives of HEIs gave it the average rating of 4.14 (on a scale of 1 to 5, with 5 being 'agree completely' and 1 being 'completely disagree'; all average values mentioned in this article represent the regular arithmetic mean). Despite the satisfactory (more or less rational) results that the IEE participants gave, the observers marked the spontaneous responses on weak legislative knowledge as critical (the HEI representatives were astonished when they identified the gap, as was noticed also from their voice sound).

In the survey questionnaire for EEC members, the statement that 'commission members had adequate qualifications to carry out external evaluation' received an average of 3.82 (on a scale of 1 to 5, with 5 being 'agree completely' and 1 'completely disagree'), while this same claim, using the same scale, received an average grade of 4.71 from the representatives of evaluated HEIs. In the presentations at the NCQHE final meeting the necessity to upgrade the evaluators' competences was also pointed out more by the EEC members (3 statements), than by the HEI representatives (just 1 statement regarding the methodology in general).

In response to the following questions 'In your opinion, should there be additional topics included in the training of EEC members? If "yes", which?' all 11 EEC members who answered the survey questionnaire, responded affirmatively. Their suggestions mostly mirror the need to learn about the examples of good IEE practice in the HE systems of other countries, and for more research methodology training. These trainings should be organized as workshops, ranging from interactive participants' work to partial simulations of the IEE process.

Implications

Due to this pilot IEEs, the Slovene HE system took a historic step toward in establishing a national quality assurance system. While the main focus of these pilot IEEs was on testing of the evaluation tools, the quality of other, accompanying elements defining IEE success, i. e. the professional competences of EEC members, stayed in the background. This is the main conclusion. The presented study provides a starting point for self-improvement and proposes some guidelines for future measures at the national level.

The most crucial among these is the introduction of more intensive EEC members training, as emphasized by the EEC members. It seems sensible that the QAA's evaluators training programme, which focuses

mainly on research methodology (2006, 19–20), should be expanded with an educational module on higher-education legislation. Also it is necessary that a Code of ethics is formed and considered by the iee participants. The document ought to emphasize the preferred values and principles of the eec members' work, hereby facilitating the correct choice of approach towards establishing interaction with the evaluated hei. Including the iee Manual, Code of ethics, national higher-education legislation and research methodology the framework for the eecs' training is formulated. At this stage it would be indispensable to determine at national level, which body would be responsible for eecs' trainings. The next precondition for acquiring quality eec members is to define the necessary qualifications or criteria for appointing members, besides the necessary training. It is indispensable to link these activities to the potential national act, which would define the body (and its formation) that will grant the licences and assess the quality of eec members. This body would be responsible for creating and developing the National evaluators register. In this way the evaluators' mobility would be stimulated and the necessary quantity of evaluators would be easier to provide.

The main limitation for now is the non affiliation of the Slovenian evaluation body in the enqa and eqar that is enabled in the summer 2008 (see http://www.eqar.eu/). Negative impact is expected not just on the evaluators' mobility and knowledge exchange, but on the development, improvement and comparability of the iees as well. In spite of granting the Council for higher education of the Republic of Slovenia independence (zvis-e 2006), the necessary conditions that would allow for affiliation in the enqa and eqar are not fulfilled.

Finally, we wish to emphasize the need for a systematically organized feedback on the eec's work. This could become an important source of information for self-improvement that could require just a minimal financial input. Beside this internal feedback mechanism, it would be worth supporting future research that would be focused on the contributions of the foreign evaluators to the quality of the eecs (in the pilot project the eec was formed just of the national subjects), looking both from the eec members' perspective and from the perspective of the evaluated hei representatives.

The interesting further research that we propose is the accordance of the objectives, regarding the hei quality, comparing the eec – external – view on hei quality and the hei Quality commission – internal – view

on HEI quality. We have to emphasize that the evaluations main target is not just assuring accountability toward the stakeholders, but mainly to sustain the HEI's improvement.

This paper presents a unique methodology approach in setting up the external feedback mechanism in the IEE; complementing the observation with the questionnaire survey and the experience presentations. The need of a many-sided view on the ECC work contributes to the reliability of the findings.

Acronyms

EEC – External Evaluation Commission
ENQA – European Association for Quality Assurance in Higher Education
EUA – European University Association
HE – Higher Education
HEI(s) – Higher Education Institution(s)
IEE(s) – Institutional External Evaluation(s)
Criteria – Criteria for monitoring, assessment and assurance of quality in the higher education institutions, study programmes, science and research, artistic and professional work
NCQHE – National Commission for Quality in Higher Education
QAA – Quality Assurance Agency in Higher Education
UNESCO – United Nations Educational, Scientific and Cultural Organization

References

Broady-Preston, J. 2002. The Quality Assurance Agency (QAA) and subject review: The viewpoint of the assessor. *Libri* 52:195–8.
Čuš, F. 2006. Vzpostavljanje nacionalnega evalvacijskega sistema. Handouts presented at the training Posvet in skupne priprave na pilotske institucionalne zunanje evalvacije NKKVŠ, Brdo pri Kranju.
Dolinšek, S., N. Trunk Širca, and A. Faganel. 2005. Vpeljava sistemov vodenja kakovosti v visokošolske zavode. *Kakovost,* no. 1:20–23.
Easterby-Smith, M., R. Thorpe, and A. Lowe. 2002. *Raziskovanje v managementu.* Koper: Fakulteta za management Koper.
ENQA. 2007. *Standards and guidelines for quality assurance in the European higher education area.* Helsinki: European Association for Quality Assurance in Higher Education.
EUA. 2005. Institutional evaluation programme guidelines: Self-evaluation and site visits 2005. Http://eua.cu.edu.tr/files/ euakdpsureciyapilacakisler.pdf.

Faganel, A., N. Trunk Širca, and S. Dolinšek. 2005. Managing diversity and moving towards quality assurance in Slovenian higher education. Paper presented at the INQAAHE conference, Wellington.

FINHEEC. 2006. Audits of quality assurance system of Finnish higher education institutions: Audit manual for 2005–2007. Http://www.kka.fi/pdf/julkaisut/KKA_406.pdf.

Flere, S. 2000. *Sociološka metodologija.* Maribor: Pedagoška fakulteta.

Foddy, W. H. 1993. *Constructing questions for interviews and questionnaires: Theory and practice in social research.* Cambridge: Cambridge University Press.

Kralj, A. 2006. Institucionalna evalvacija: 10-letne izkušnje. Paper presented at the symposium Vzpostavljanje kakovosti na Univerzi na Primorskem in mednarodni vidiki kakovosti na univerzah, Ankaran.

Kvale, S. 1996. *InterViews: An introduction to qualitative research interviewing.* Thousand Oaks, CA: Sage Publications.

Logaj, V., and A. Trnavčevič. 2006. Internal marketing and schools: The Slovenian case study. *Managing Global Transitions* 4 (1): 79–96.

Merila za spremljanje, ugotavljanje in zagotavljanje kakovosti visokošolskih zavodov, študijskih programov ter znanstvenoraziskovalnega, umetniškega in strokovnega dela. 2004. *Uradni list Republike Slovenije,* no. 124/2004.

Orsingher, C. 2006. *Assessing quality in European higher education institutions: Dissemination, methods and procedures.* Heidelberg: Physica.

QAA. 2006. Handbook for institutional audit: England and Northern Ireland 2006. Http://www.qaa.ac.uk/reviews/institutionalAudit/handbook2006/handbookComments.pdf.

Rossi, P. H., M. W. Lipsey, and H. E. Freeman. 2004. *Evaluation: A systematic approach.* 7th ed. Thousand Oaks, CA: Sage.

Srikanthan, G., and J. Dalrymple. 2003. Developing alternative perspectives for quality in higher education. *International Journal of Educational Management* 17 (3): 126–36.

Standaert, R. 2000. Inspectorates of education in Europe: A critical analysis. Ministry of Education Flanders, Utrecht.

Wagenaar, R. 2006. Creating a culture of quality: Quality assurance at the University of Groningen in the Netherlands. In *Assessing quality in European higher education institutions: Dissemination, methods and procedures,* ed. C. Orsingher, 71–92. Heidelberg: Physica.

ZVIS-D. 2004. Zakon o spremembah in dopolnitvah Zakona o visokem šolstvu. *Uradni list Republike Slovenije,* no. 63/2004.

ZVIS-E. 2006. Zakon o spremembah in dopolnitvah Zakona o visokem šolstvu. *Uradni list Republike Slovenije,* no. 94/2006.

An Empirical Analysis of Credit Risk Factors
of the Slovenian Banking System

Boštjan Aver

The study presents the results of an analysis of credit risk factors of the Slovenian banking system. The objective of the empirical analysis is to establish which macroeconomic factors influence the systematic credit risk of the Slovenian banking loan portfolio. The research results have confirmed the main hypothesis that certain macroeconomic factors have a major influence on the examined credit risk. We could conclude that the credit risk of the loan portfolio depends on the employment or unemployment rate in Slovenia, on short and long-term interest rates of Slovenian banks and the Bank of Slovenia, and on the value of the Slovenian stock exchange index. We cannot claim that the examined credit risk depends on the inflation rate in Slovenia, the growth of GDP (industrial production), EUR and USD exchange rates or the growth of Slovenian import and export.

Key Words: Slovenian banking system, credit risk factors,
    loan portfolio, Bank of Slovenia, macroeconomic factors
JEL *Classification:* G11, G21

Introduction

Empirical studies on credit risk factors have shown that the factors that influence risk in all sorts of investments and cause credit risk are mainly *different macroeconomic factors* (Saunders 1997; Crouhy, Galai, and Mark 2000). Changes in economic policies, political changes and the goals of leading political parties also influence the range of the investment credit risk (Saunders 1997; Belkin, Suchower, and Forest 1998). Since these factors are difficult to examine, there is no point in including them in 'the research model'. Our objective is therefore to establish which macroeconomic factors influence the systematic credit risk of the Slovenian banking system.

Foreign researchers, such as Saunders (1997), Asarnow (1996), Crouhy, Galai, and Mark (2000), Carty and Lieberman (1996), as well as Carty and Fons (1993), have determined that the range of the credit risk of an individual investment (e. g. loan) is influenced by risk factors, which can

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be divided into those influencing the risk of all investments and causing investment's systematic credit risk and those influencing the risk of an individual investment and causing investment's unsystematic credit risk. *The factors influencing the systematic credit risk* are macroeconomic factors, changes in economic policies, political changes and the goals of leading political parties. Macroeconomic factors include the inflation rate, the employment rate, growth in gross domestic product, stock index and exchange rate movements, and conjuncture fluctuations in the economy. Changes in economic policies are represented by changes in monetary and tax policies, economic legislation changes, as well as import restrictions and export stimulation (Saunders 1997; Temeljotov Salaj 2005)[1]. *The factors influencing the unsystematic credit risk* are primarily the factors of individual customers, such as their personality, their financial solvency and capital, credit insurance and general terms and conditions. In the case of companies, specific factors of the industry sector and the company are emphasised (Mramor 1996). Industry factors include the structure and economic successfulness of the industry, maturity of the industry and its stability, while company factors include factors such as general characteristics of the company, management, financial position, sources of funds and financial reporting.

When deciding about new bank customers it is thus important to consider the credit risk of an individual customer, which can nowadays be measured with the help of various modern credit models (Aver 2003). However, in assessing the influence of an individual obligor on the bank operation risk and the influence of capital requirements, the risk of the entire bank portfolio (see Asarnow 1996) must also be taken into account. Customer risk and portfolio risk are specified by the expected loss and standard deviation of the loss, which defines the unexpected loss (Ong 2000). The latter is often assessed as a multiple of the standard deviation of the loss (Bessis 1998).

According to CreditMetrics™ technical document (JP Morgan 1997), company credit risk may also be influenced by *systematic market risk,* which is reflected in the changes in interest rates, stock index, exchange rates and unemployment level. The probability of default of a company and the probability of its credit rating migration is thus related to market risk. In an ideal world, the methodological tool for bank risk measurement should therefore link market risk and credit risk, which banks are exposed to in their operations.

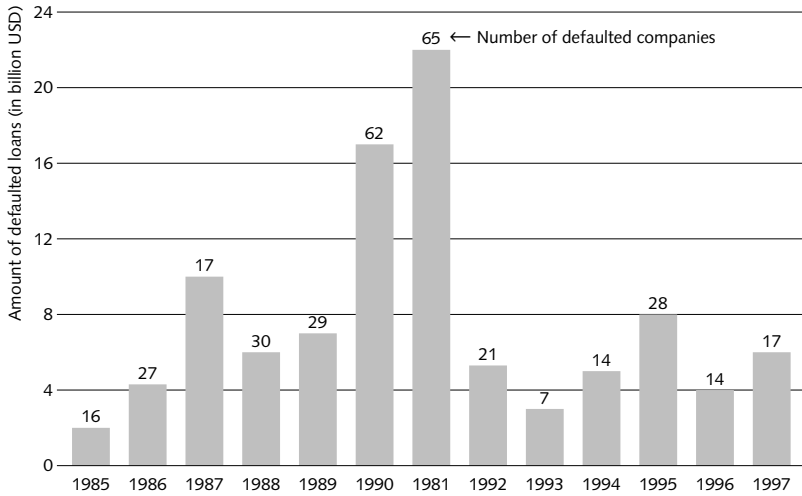Figure 1 presents the *influence of the state of world economy* on default

FIGURE 1   Number of defaulted companies and the amount of defaulted loans
(adapted from Crouhy, Galai, and Mark 2000, 319)

probabilities of companies or frequencies of default of foreign companies in the period from 1985 to 1997. In 1990 and 1991, when the world economy was in recession, the frequency of company defaults rose substantially. On the other hand, during the period after 1991, which was characterised by a growing economy, the number of defaults declined.

Actual default probabilities of companies vary over time, depending on the state of economy. In 1996, Carty and Lieberman conducted a study on average probabilities of default and their standard deviations for individual credit rating categories of bank obligors in the period from 1970 to 1995, the results of which are provided in table 1. Similar studies have been conducted by Carty and Fons (1993) and Lucas and Lonski (1992).

Tom Wilson and McKinsey and Company (Paul-Choudhury 1998) developed CreditPortfolioView, a multifactorial model for credit risk measurement, which can be useful for generating the distribution of default probabilities and credit rating migration probabilities for different industry sectors and for each individual country. CreditPortfolioView takes into account that default probabilities and probabilities of obligor credit rating migrations *depend on the state of the economy*. When the economy is not doing well, the probability of default of companies and credit downgrades increase, and vice versa when the economy is strong (Belkin, Suchower, and Forest 1998). Slower economic growth thus causes more frequent credit rating migrations, with lower credit rating classes having

TABLE 1   One-year default probabilities in the period from 1970 to 1995

Credit rating category	One-year default probability	
	Average	Standard deviation
AAA	0.00%	0.00%
AA	0.02%	0.12%
A	0.01%	0.05%
BAA	0.15%	0.30%
BA	1.22%	1.35%
B	6.32%	4.78%

NOTE   Adapted from Moody's Investor Service 1995.

FIGURE 2   Markov transition matrix

Initial rating	Rating at year-end							
	AAA	AA	A	BBB	BB	B	CCC	Def.
AAA								
AA								
A					Recession			
BBB								
BB					Expansion			
B								
CCC								

NOTE   Adapted from Wilson 1997.

a higher correlation with macroeconomic factors. Credit rating migrations during the time of economic recession and expansion can be clearly illustrated with the Markov transition matrix, as shown in figure 2.

As economic growth depends on macroeconomic factors, CreditPortfolioView takes into account the links between macroeconomic variables and default and credit rating migration probabilities of companies. *The model includes* the unemployment rate, gross domestic product growth, the level of long-term interest rates, foreign exchange rates, government expenditures and the savings rate *among macroeconomic factors* (Belkin, Suchower, and Forest 1998).

During a period of recession, default probabilities of speculative-grade obligors are higher than their average default probability, as frequencies of obligor migrations to lower credit rating categories are increasing and frequencies of upward obligor migrations are decreasing. The contrary

holds true for the period of economic expansion. The probabilities of obligor credit rating migrations thus depend on the credit cycle, the industry sector and the country, the credit cycle, however, being the most important factor in the variability of company default probabilities (Bangia, et al. 2002).

The Duffie and Singleton model has been generalised by Lando (1997) and Jarrow and Turnbull (1998) with an assumption that the intensity of default or the obligor default probability (λ) depends on the vector of various macroeconomic variables (X_t), such as risk-free interest rate, stock index, etc. The obligor default probability is modelled in the form of the Cox distribution, which has the characteristics of the Poisson distribution and depends on the vector of macroeconomic variables (X_t):

$$\lambda(t) = \lambda(X_t). \tag{1}$$

In 1997, Duffie and Singleton derived a risk-adjusted short-term interest rate (Y):

$$Y(t) = r(t) + \lambda(t)\text{LGD} + 1. \tag{2}$$

In order to simplify the model implementation, Jarrow and Turnbull suggested the following:

1. the risk-free interest rate $r(t)$ is in accordance with the one-factor Vasicek model from 1977,

2. the obligor default probability $\lambda(t)$ depends on the change in the risk-free interest rate $r(t)$ and unexpected changes in the value of the market index $W_M(t)$:

$$\lambda(t) = \lambda_0 + \lambda_1 r(t) + \lambda_2 W_M(t), \tag{3}$$

where λ_0, λ_1 and λ_2 are constants. $W_M(t)$ indicates unexpected changes in the value of the market index according to the value of the stock index $M(t)$, for which standard lognormal distribution is presupposed:

$$dM(t) = [r(t)dt + \sigma_M dW_M(t)]M(t). \tag{4}$$

1. the level of loss given default (LGD) is constant,

2. the liquidity premium (l) depends on the risk-free interest rate $r(t)$, the stock index $M(t)$ and the variability of the daily value of the stock index:

$$l(t) = l_0 + l_1 r(t) + l_2 M(t) + l_3 [M_H(t) - M_L(t)]^2, \tag{5}$$

where $M(t)$ is the stock index value on a certain day, while $M_H(t)$ and $M_L(t)$ indicate its highest and lowest daily value.

In the following sections, we explain the underlying conceptual and methodological framework and the results of the analysis conducted according to foreign findings on the example of the Slovenian banking sector.

Developing the Hypotheses

On the basis of conducted studies and analyses, Saunders (1997), Asarnow (1996), Crouhy, Galai, Mark (2000), Carty and Lieberman (1996), as well as Carty and Fons (1993) have determined that the range of the credit risk of an individual investment is influenced by risk factors which influence the systematic credit risk and risk factors which influence the unsystematic credit risk of an investment. The factors influencing the systematic credit risk are macroeconomic factors, changes in economic policies, political changes and the goals of leading political parties. Macroeconomic factors include primarily the inflation rate, the employment rate, growth in gross domestic product, stock index and exchange rate movements, and conjuncture fluctuations in the economy. Changes in economic policies are represented by changes in monetary and tax policies, economic legislation changes, as well as import restrictions and export stimulation (Saunders 1997; Mramor 1996).

Based on the above-mentioned findings of foreign researchers and experts, particularly in terms of the macroeconomic factors which can influence the range of systematic credit risk, the main hypothesis can be developed:

H1 *The range of the credit risk of the Slovenian banking system depends on specific macroeconomic factors.*

The main hypothesis can be further divided into several subhypotheses. The results of testing the latter represent the basis of confirming or rejecting the main hypothesis (H1). In order to confirm or reject individual subhypotheses, it is necessary to determine the influence of specific macroeconomic variables on the credit risk of our banking system. The subhypotheses (H1-1 to H1-7) and examined variables for testing them are as follows:

H1-1 *The systematic credit risk of the Slovenian banking system depends on the inflation rate in Slovenia. Examined variables:* REVALOR, CZP *and* DPC.

H1-2 *The systematic credit risk of the Slovenian banking system depends on the employment or unemployment rate in Slovenia. Examined variables:* ZAPOSL *and* BREZPOSL.

H1-3 *The systematic credit risk of the Slovenian banking system depends on the growth in Slovenian gross domestic product. Examined variable:* RASTINDU.

H1-4 *The systematic credit risk of the Slovenian banking system depends on the short-term and long-term interest rate activities of banks and the Bank of Slovenia. Examined variables:* MEDBOM, LOMBOM, ZOM, OMTEKPO, OMSTAN, OMOS, OMPOTR, NOMOBS, NOMPOTR, NOMOS, NOMSTAN, NOMDOBS *and* NOMDOS.

H1-5 *The systematic credit risk of the Slovenian banking system depends on the movement of specific exchange rates. Examined variables:* EUR *and* USD.

H1-6 *The systematic credit risk of the Slovenian banking system depends on the movement of the value of the Slovenian stock exchange index (*SBI*) or the movement of share trade on the organised securities market. Examined variables:* SBI *and* PROMDELN.

H1-7 *The systematic credit risk of the Slovenian banking system depends on the Slovenian export and import growth. Examined variables:* IZVOZ *and* UVOZ.

In examining the influence of 25 chosen macroeconomic variables on the Slovenian banking system credit risk, factorial analysis is employed in order to find new dimensions of macroeconomic factors, which represent common characteristics of some macroeconomic variables. Thus, *the second hypothesis* can be developed:

H2 *The method of principal components and choice of two factors will provide us with good enough partial correlation coefficients between individual macroeconomic variables and both factors, so that the first factor and second factor will together account for more than 50% of the overall credit risk variance.*

Thus, the used empirical analysis of the credit risk factors of the Slovenian banking system portfolio is based on monthly *data* of 25 chosen macroeconomic factors and the calculated indicator of the Slovenian banking system portfolio credit risk for the period from 31 December 1995 to 30 November 2002. The evaluation of the initial hypothesis (H1): *The range of the credit risk of the Slovenian banking system depends on*

specific macroeconomic factors, was based on the set research model explained below.

Research Methodology

DATA COLLECTION AND OPERATIONALISATION
OF THE VARIABLES

According to the findings of foreign researchers such as Saunders (1997), Crouhy, Galai, and Mark (2000), Belkin, Suchower, and Forest, (1998), Carty and Lieberman (1996), as well as Carty and Fons (1993), the *data* on potential factors that influence systematic credit risk could be found among different macroeconomic variables, e. g. inflation rate, employment or unemployment rate, the increase in gross domestic product (industrial production), the movement of short and long term interest rates of banks and the central bank, the movement of exchange rates (e. g. EUR and USD), the movement of the value of the stock exchange index and share trade, and other macroeconomic factors (e. g. import and export). Thus, 25 different macroeconomic factors were chosen to test the stated hypothesis.

The research model design is shown in figure 3. The figure presents chosen factors which can influence the systematic credit risk and which represent the entry model variables used to determine which of the chosen 25 macroeconomic variables have a significant influence on the range of the Slovenian banking system credit risk.

The following *data sources* were used in the analysis:

- GVIN – *Gospodarski vestnik* database,
- SORS – Statistical Office of the Republic of Slovenia database,
- Bank of Slovenia database (the archive of financial data from the *Bulletins of the Bank of Slovenia*),
- monthly balance sheets and profit and loss accounts of all Slovenian banks for the period from 31 December 1995 to 30 November 2002,
- other publicly available materials of the Bank of Slovenia.

The conducted analysis of the Slovenian banking system portfolio is a quantitative analysis, since the attributes used to describe the systematic credit risk factors of the banking portfolio are *numerical,* not descriptive. The influence of specific macroeconomic factors on the range of the Slovenian banking system credit risk has been examined with the help of SPSS software and specific statistical methods, such as *multiple linear regression and factorial analysis.*

FIGURE 3 Systematic credit risk factors

Inflation rate	REVALOR	Revalorisation clause
	CZP	Consumer goods prices*
	DPC	Retail prices
Employment	ZAPOSL	Employment rate
	BREZPOSL	Unemployment rate
GDP	RASTINDU	Industrial production
Interest rates	MEDBOM	Interbank IR
	LOMBOM	Lombard IR
	ZOM	Default IR
	OMTEKPO	Real IR on current business loans*
	OMSTAN	Real IR on long-term home loans
	OMOS	Real IR on long-term fixed asset loans
	OMPOTR	Real IR on short-term consumption loans
	NOMOBS	Nominal IR on short-term current asset loans*
	NOMPOTR	Nominal IR on short-term consumption loans
	NOMOS	Nominal IR on long-term fixed asset loans
	NOMSTAN	Nominal IR on long-term home loans*
	NOMDOBS	Nominal IR on short-term foreign exchange loans for current assets
	NOMDOS	Nominal IR on long-term foreign exchange loans for fixed assets
Exchange rates	EUR	EUR exchange rate
	USD	USD exchange rate*
Stock exchange market	SBI	Slovenian stock exchange index
	PROMDELN	Stock exch. trade and the trade on the free share market*
Export/import	IZVOZ	Import of goods and services
	UVOZ	Export of goods and services

* Systematic credit risk.

THE SAMPLE

The established model is based on the data of the variety of macroeconomic credit risk factors, collected on monthly basis, as well as on monthly data of the calculated indicator of the Slovenian banking system portfolio credit risk for the period from 31 December 1995 to 30 November 2002. The chosen assessment period of the Slovenian banking system

after 1995 is the most appropriate one for the analysis, since the period before the end of the year 1995 would mystify the results of the analysis to a great extent.

In that period, the range of the Slovenian bank portfolio credit risk was being contracted due to different system effects, among others, due to the implementation of the rehabilitation programme in Ljubljanska banka, d. d. and Kreditna banka Maribor, d. d. (in 1993), as well as in LB Komercialna banka Nova Gorica, d. d. (in 1994). System measures are also visible in the period from March 1994 to September 1996, namely in the exchange of poor receivables with government bonds.

Taking into account the examined period from 31 December 1995 to 30 November 2002, when there were no significant system effects on the range of the Slovenian bank credit risk, good results can be obtained on the basis of a statistical analysis of the effect of macroeconomic factors on the credit risk of the Slovenian banking system portfolio. At the same time, monthly data for all *independent variables and dependant variables* can be examined as individual cases and not as time series, thus neglecting the time influence or the time components on the credit risk range.

The *indicator of loan portfolio credit quality* was first defined as a ratio between the range of formed value corrections for credit risk of loans to the non-banking sector[2] (government excluded) and the range of gross loans given to the non-banking sector (government excluded). The loans given to the government were excluded. According to the methodology of the Bank of Slovenia, the loans given to the government are included in the loans given to the non-banking sector. Therefore, they influence or have greater effect on the percentage of the formed value corrections, since receivables to the government had better ratings. We analysed the mentioned indicator of the credit quality of the Slovenian banking system loan portfolio in the period from December 1995 to November 2002.

DATA ANALYSES

We can establish which of the 25 chosen macroeconomic variables influence the range of the Slovenian banking system portfolio credit risk with the *method of multilinear regression.* The following indicator (TVEG1) was defined for measuring the credit risk:

> *Value corrections for the credit risk of loans given to the non-banking sector/gross loans to the non-banking sector.*

The multiple linear regression model can also be presented as (see figure 3):

$$\text{TVEG1} = \beta_1 + \beta_2\text{REVALOR} + \beta_3\text{CZP} + \beta_4\text{DCP} + \beta_5\text{ZAPOSL}$$

$$+ \beta_6\text{BREZPOSL} + \beta_7\text{RASTINDU} + \beta_8\text{MEDBOM}$$

$$+ \beta_9\text{LOBOM} + \beta_{10}\text{ZOM} + \beta_{11}\text{OMTEKPO} + \beta_{12}\text{OMSTAN}$$

$$+ \beta_{13}\text{OMOS} + \beta_{14}\text{OMPOTR} + \beta_{15}\text{NOMOBS}$$

$$+ \beta_{16}\text{NOMPOTR} + \beta_{17}\text{NOMOS} + \beta_{18}\text{NOMSTAN}$$

$$+ \beta_{19}\text{NOMDOBS} + \beta_{20}\text{NOMDOS} + \beta_{21}\text{EUR} + \beta_{22}\text{USD}$$

$$+ \beta_{23}\text{SBI} + \beta_{24}\text{PROMDELN} + \beta_{25}\text{IZVOZ}$$

$$+ \beta_{26}\text{UVOZ} + u \tag{6}$$

The analysis of the influence of the 25 chosen macroeconomic variables on the credit risk of the Slovenian banking system could also be conducted with a *factorial analysis (method of principal components),* by finding new dimensions of macroeconomic factors that represent common characteristics for some of the macroeconomic variables.

Findings and Results

RESULTS OF MULTIPLE LINEAR REGRESSION MODEL

As a result, we get a *multiple linear regression model* of seven statistically significant variables, with *R*-square being equal to 0.863. This means that 86.3% variability of the systematic credit risk of the Slovenian banking system portfolio is explained by linear dependency on seven macroeconomic factors. It can be noticed that the increase in the real interest rate for short-term consumption loans, the increase in the Slovenian stock exchange index, a decreasing number of employees in Slovenia, an increasing securities interest rate (interest rate of the Bank of Slovenia for securities exchange) and the increase in the real interest rate on home loans have the greatest influence on the increase in credit risk. In a way, the mentioned results are logical. On the other hand, the two results, the increase in the real interest rate for long-term loans for current assets and the increase in the inter-banking interest rate, which have an effect on the decrease of the Slovenian banking system portfolio credit risk, seem less logical.

The obtained results are shown in table 2 and figure 4. Table 2 shows partial regression coefficients for all 7 macroeconomic factors which have a significant influence on the range of the examined credit risk, as well

TABLE 2   Partial regression coefficients and *T*-test for testing their influence

Variable	(1)	(2)	(3)	(4)	(5)	(6)
Constant	17.62368	1.981	–	8.898	0.000	–
OMPOTR	0.45794	0.068	2.902	6.775	0.000	0.614
SBI	0.00050	0.000	0.551	6.046	0.000	0.570
OMOS	−0.66577	0.119	−2.681	−5.577	0.000	−0.539
ZAPOSL	−0.00001	0.000	−0.463	−4.441	0.000	−0.454
MEDBOM	−0.05264	0.014	−0.350	−3.684	0.000	−0.389
LOMBOM	0.09185	0.027	0.179	3.343	0.001	0.358
OMSTAN	0.12914	0.066	0.600	1.949	0.050	0.218

NOTES   Column headings are as follows: (1) unstandardized coefficients: *B*, (2) standard error, (3) standardized coefficients: *β*, (4) *T*-test: *t*, (5) significance, (6) partial correlation coefficients.
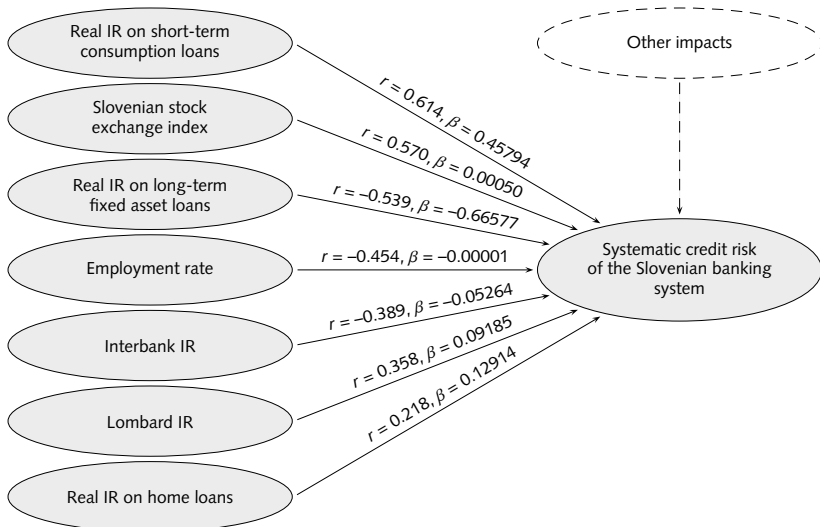
FIGURE 4   Dependence of the Slovenian banking system credit risk on seven macroeconomic variables on the basis of partial correlation coefficients (*r*) and partial regression coefficients (*β*); $R^2 = 0.863$

as *T*-test results in relation to testing the characteristics of the independent variables' influence on the credit risk. Moreover, figure 4 illustrates an extended linear regression model, which fully explains the variability of the systematic credit risk range of the Slovenian banking system portfolio.

RESULTS OF FACTORIAL ANALYSIS – METHOD OF PRINCIPAL COMPONENTS

In examining the influence of 25 chosen macroeconomic variables on the Slovenian banking system credit risk, factorial analysis was employed in order to find new dimensions of macroeconomic factors that represent common characteristics for some of the macroeconomic variables.

The method of principal components and choice of two factors provided us with partial correlation coefficients between individual macroeconomic variables and both factors. The first factor (various interest rates of the Slovenian banking system) explains 58.8% of the credit risk variance, while the second factor (other macroeconomic factors) explains 10.8%. Thus, the entire model explains approximately 69.6% of the overall credit risk variance. The rest of the variance can be ascribed to specific impacts that are not included in the model. The obtained result is relatively good, although it should be borne in mind that there exist other credit risk factors besides the examined ones.

The obtained communalities for individual macroeconomic variables show what extent of the individual variable variance is accounted for by both factors. Despite the fact that only the variables with a communality higher than 0.2 should be included in the analysis, the variables of consumer goods prices (CPZ) and retail prices (DPC) – their explained variance with both factors being less than 20% – have also been included in the analysis. The explained variance of the other 18 macroeconomic variables with both factors is more than 20%. Therefore, they can be included in the examined analysis without difficulty.

Thus, the results of the factorial analysis have shown that 20 macroeconomic variables are connected into 2 significant factors. The following 10 variables form the part of the first factor and they represent short and long-term real and nominal interest rates:[3] real interest rate on current business loans, real interest rate on long-term current asset loans, real interest rate on long-term home loans, real interest rate on short-term home loans, nominal interest rate on short-term current asset loans, nominal interest rate on short-term consumption loans, inter-bank interest rate, nominal interest rate on long-term home loans, nominal interest rate on long-term current asset loans and back interest rate.

The macroeconomic variables that form the second factor are the following: export of goods and services, import of goods and services, the rate of industrial production, the number of all people employed in

Slovenia, retail prices, cost of goods sold, USD exchange rate, EUR exchange rate, the value of the Slovenian stock exchange index, stock exchange trade and the trade on the free share market.

The first factor could be labelled as 'interest rates of the Slovenian banking system', for it comprises different real and nominal (short and long-term) interest rates of Slovenian banks. The second factor could be labelled as 'other macroeconomic factors', for it comprises 10 different macroeconomic variables, e. g. export (import) of goods and services, employment rate, growth rate of production, exchange rate, developments on the securities market and the inflation rate in Slovenia.

It is possible to show the position of the above-average and below-average risk of portfolios of our banking system regarding the first factor that represents the interest rates of the Slovenian banking system and regarding the second factor representing other macroeconomic factors. The group of the 46 above-average risk portfolios of the Slovenian banking system lie in the top right square,[4] which means that the above-average risk portfolios have high values of the first factor (high short and long-term interest rates) and medium values of the second factor (variety of macroeconomic factors). On the other hand, the below-average risk portfolios of our banking system lie in the bottom left square,[5] which means that these portfolios have low values of short and long-term interest rates and low values of the variety of macroeconomic factors. The position of the above-average and below-average portfolios of our banking system regarding the first factor, which represents the interest rates of the Slovenian banking system, and regarding the second factor, which represents other macroeconomic factors, is shown by figure 5.

Conclusions and Implications

The results of the analysis of the credit risk of the Slovenian banking system for the period from December 1995 to November 2002 show that *specific macroeconomic factors have important influence on the range of the credit risk of the Slovenian banking system portfolio.* The increase in credit risk is highly influenced by the increase in short and long-term interest rates of Slovenian banks, the increase in the value of the Slovenian stock exchange index and the decrease in the number of employees.

In the examined period of 84 months, one of the most prominent features of the portfolio has shown above-average risk in the period of high real and nominal interest rates on different short and long-term loans, during the period of high loan on securities interest rates and high inter-
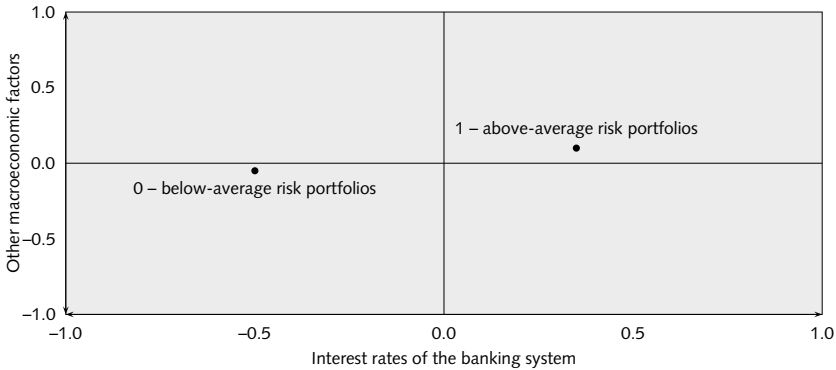
FIGURE 5 Position of the above-average and below-average portfolios of the Slovenian banking system

bank interest rate, in the period of high unemployment (or low employment) and in the period of low EUR and USD exchange rates. Taking into account the theory of macroeconomic factors' influence on credit risk, the given results are fairly logical and expected.

The *examined macroeconomic variables are related by 2 characteristic factors.* The first is represented by the interest rate of the Slovenian banking system, which includes different real and nominal interest rates for both short and long-term loans. The second can be described as the other macroeconomic factors, as it consists of different macroeconomic variables. The high value of the first factor and the medium value of the second factor is the most significant in the group of 46 above-average risk portfolios of the banking system. On the other hand, the low value of both factors is significant for the group of below-average risk of all credit risk factors.

The analysis findings have shown that certain macroeconomic factors have significant influence on the range of the Slovenian banking system credit risk. Therefore, we can conclude that, among other factors, Asian and Russian crises most probably influenced the increase of the range of the loan portfolio credit risk in non-bank sectors in the period between 1997 and 1998. On the other hand, favourable movements of macroeconomic government environment, the growth of consumption prior to VAT implementation, good business results in the real sector and growth of the economies of the most important market partners influenced the increase in the quality of credit portfolios of banking systems between 1999 and 2000. Thus, we can state with certainty that *credit risk in Slove-*

*nian banks shows positive reactions and that banks have prompt reaction
time in cases of unfavourable market situation.*

In spite of the analysis findings showing that macroeconomic factors
have substantial influence on the range of the credit risk in the Slovenian
banking system, we cannot overlook the *influence of other factors that the
analysis does not explain – limitations of the research model.* These are the
other factors that could have influenced credit risk in the banking system
in the examined period between December 1995 and November 2002:

- the first case of bankruptcy in Slovenia: the bankruptcy of Komer-
  cialna banka Triglav d. d. in 1996, due to compulsory liquidation,
- stricter criteria for client categorisation since January 1997 (since
  that date, the receivables insured by assets put in pledge could be
  solely categorised into one group higher than the debtor's credit
  rating);
- the influence of the bank business results on provisions policy
  (more conservative policy on estimating bank clients is typical for
  the period of higher profits and preparation for new investments),
- considerably higher net provisions for credit risk for the portfolio
  of the bank s k b d. d. in December 2001.

The results of the influence of the chosen macroeconomic factors on
the credit risk in the banking system have *confirmed the main hypothesis*
(h1), as certain macroeconomic factors have major influence on the ex-
amined credit risk. Further, we also *confirmed some subhypotheses* (h1-2,
h1-4 and h1-6), concluding that the credit risk portfolio of the Slove-
nian banking system depends on the employment or unemployment
rate in Slovenia (h1-2), on short and long-term interest rates activities
of Slovenian banks and the Bank of Slovenia (h1-4), and on the value
of the Slovenian stock exchange index (h1-6). Contrary to that, we can-
not claim that the examined credit risk depends on the inflation rate in
Slovenia (h1-1), the growth of g d p – industrial production (h1-3), e u r
and u s d exchange rates (h1-5) or the growth of Slovenian import and
export (h1-7).

On the basis of the obtained factorial analysis results we can *also con-
firm the second hypothesis* (h2) that more than 50% of the overall credit
risk variance of the examined Slovenian banking system portfolio can be
accounted for by the two factors together.

The conducted analysis and obtained results of the study of credit risk
factors in Slovenia can also be *beneficial to banks in other countries in*

transition, which do not yet apply the latest credit risk measurement and management methods . Moreover, an *important challenge is seen in reconducting the study of the influence of macroeconomic factors* on the range of the credit risk of the Slovenian banking system portfolio with the data which are yet to become available in the following years. It would also be useful to undertake such studies in other countries, particularly in the area of ex-Yugoslavia, where different findings about the influence of individual macroeconomic factors on the credit risk can be expected to arise due to a higher risk of their banking system portfolio and lower economic development. The results of our analysis are also applicable to other financial institutions such as insurance companies or pension funds in risk managements of their financial investments. Finally, it will be useful to elaborate the study of credit risk factors by employing new and coming statistical tools such as structural equation modelling or gravitational macroeconomic models, which can further increase the reliability of results.

Notes

1 In addition to the mentioned factors, the systematic credit risk of an investment may also be influenced by the environment, e. g. the movements of immovable property value, etc. (Temeljotov Salaj 2006).
2 Provisions and charges.
3 A high partial correlation coefficient associated with the first factor is significant for the 10 variables mentioned.
4 The value of the first factor is 0.38 and the value of the second factor is 0.09.
5 The value of the first factor is –0.5 and the value of the second factor is –0.12.

References

Asarnow, E. 1996. Best practices in loan portfolio management. *Journal of Lending and Credit Risk Management* 78 (7): 14–24.

Aver, B. 2003. Modeli za oceno potencialnih kreditnih izgub banke. *Bančni vestnik* 52 (9): 46–50.

Bangia, A., F. X. Diebold, A. Krohimus, C. Schagen, and T. Schuermann. 2002. Ratings migration and the business cycle, with application to credit portfolio stress testing. *Journal of Banking and Finance* 26 (2–3): 445–74.

Belkin, B., S. Suchower, and L. Forest. 1998. The effect of systematic credit risk on loan portfolio value-at-risk and loan pricing. *CreditMetrics Monitor,* Q1:17–28.

Bessis, J. 1998. *Risk management in banking.* Chichester: Wiley.

Carty, L., and J. Fons. 1993. Measuring changes in credit quality. Special report, Moody's Investors Service.

Crouhy, M., D. Galai, and R. Mark. 2000. *Risk management.* New York: McGraw-Hill.

Jarrow, R. A., and S. M. Turnbull. 1999. The intersection of market and credit risk. *Journal of Banking and Finance* 24 (1–2): 271–99.

JP Morgan. CreditMetrics™ technical document. 1997. JP Morgan, New York.

Lucas, D. J., and J. Lonski. 1992. Changes in corporate credit quality 1970–1990. *The Journal of Fixed Income* 1 (4): 7–14.

McDonough, W. 1998. Amending the accord. *Risk Magazine* 11 (9): 46–51.

Mramor, D. 1996. *Analiza kreditne sposobnosti podjetja: Ocena kreditne sposobnosti podjetja.* Ljubljana: CISEF.

Moody's Investor Service. 1995. *Corporate bond defaults and default rates: 1970–1994.* New York: Moody's Investor Service.

Ong, M. K. 2002. *Internal credit risk models: Capital allocation and performance measurement.* London: Risk Books.

Paul-Choudhury, S. 1998. McKinsey's model alternative. *Risk Magazine* 11 (1): 7.

Saunders, A. 1997. *Financial institutions management: A modern perspective.* 2nd ed. New York: Irwin.

Temeljotov Salaj, A. 2005. Sinergični učinek opazovalca grajenega okolja. *Urbani izziv* 16 (2): 48–54.

———. 2006. The quality of a built environment and legislation. Paper presented at the ENHR conference Housing in an Expanding Europe: Theory, Policy, Participation and Implementation, Ljubljana. Http://enhr2006-ljubljana.uirs.si/publish/w08_TemeljotovSalaj.pdf.

Wilson, T. C. 1997. Measuring and managing credit portfolio risk: Modelling systemic default risk. *Journal of Lending and Credit Risk Management* 79 (11): 61–72.

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Jackson, R. 1979. Running down the up-escalator: Regional inequality in Papua New Guinea. *Australian Geographer* 14 (5): 175–84.

Lynd, R., and H. Lynd. 1929. *Middletown: A study in American culture.* New York: Harcourt, Brace and World.

University of Chicago Press. 2003. *The Chicago manual of style.* 15th ed. Chicago and London: University of Chicago Press.

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