

# Measuring entrepreneurship

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Entrepreneurship has long been seen as a key driving force of a free market economy. Modern definitions of entrepreneurship emphasise a strong link between entrepreneurship and innovation and distinguish entrepreneurship from simple form of management. Entrepreneurship is also seen as a critical link between new knowledge and economic growth as it facilitates the transfer of knowledge. In the absence of internationally comparable indicators that capture the real innovative nature of entrepreneurship it is difficult to draw firm conclusions about the true level of entrepreneurial activity in Australia or any other country. Given the likely effect of entrepreneurship on economic growth, indicators that capture its innovative nature will be important for good policy outcomes in a small open economy like Australia.

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## Introduction

Entrepreneurship has been identified by many researchers as a major driving force of a free market economy. However, it was only recently that economists began to synthesise the knowledge about entrepreneurship and analyse its impact on economic growth.

This new interest in entrepreneurship appears to have been triggered by research and development (R&D) and innovation developments. Many countries, particularly in Europe, that have had significant increases in R&D and innovation expenditures over the last two decades have not experienced the boost to economic growth they were expecting from such investment. Some empirical studies (Shanks and Zheng PC 2006; Jaumotte and Pain 2005a, b, c) also question the positive relationship found between R&D and innovation expenditures, and economic performance. According to these studies, the rate of return on R&D and innovation expenditures typically quoted appears to be implausibly high. There are clearly a number of other influences that affect any direct empirical relationship between knowledge inputs and economic outputs at either firm level or country level. Many researchers now believe that the missing link could be the entrepreneur.

This paper looks into the nature of entrepreneurship, its link to innovation and economic growth and the difficulties with its measurement. It forms part of series of articles on the economic importance of innovation and links to a paper on venture capital (Regan and Tunny, 2008) also in this edition of the *Economic Roundup*. Entrepreneurship is a multifaceted and heterogeneous activity. Therefore, good understanding of its nature and proper measurement of its intensity are important for public policy. The paper outlines recent findings in this area before looking at measurement difficulties arising from the entrepreneurship indicators that are currently used. Australia's comparative position based on some of these is also provided. The final section of the paper explains the need to derive new indicators that will capture the innovative nature of entrepreneurship in order to be able to assess its impact on economic performance.

## Entrepreneurship and innovation

The definition of entrepreneurship has evolved over time. While in the eighteenth and nineteenth century (Cantillon 1775; Say 1803; Mill 1848) the term was used to describe the process of bearing the risk to organise factors of production to deliver a product or service demanded by the market, modern approaches focus more on the concept of innovation.

Schumpeter (1934) equated entrepreneurship with the concept of innovation applied to a business context:

‘The entrepreneur is the innovator who implements change within markets through the carrying out of new combinations. The carrying out of new combinations can take several forms; 1) the introduction of a new good or quality thereof, 2) the introduction of a new method of production, 3) the opening of a new market, 4) the conquest of a new source of supply of new materials or parts, 5) the carrying out of the new organization of any industry.’

As such, the entrepreneur moves the market to a new equilibrium. Schumpeter’s definition also emphasises the combination of resources. Yet, the managers of existing businesses are not typically regarded as entrepreneurs.

Numerous modern definitions of entrepreneurship are mostly a re-working and expansion of Schumpeter’s definition. Most modern definitions include a strong link between entrepreneurship and innovation, and distinguish entrepreneurship from a simple form of management. Entrepreneurship is thus seen as the process of identifying, developing, and bringing forward new innovative ways of doing things for the exploitation of commercial opportunities.

## Link to economic growth

The increased focus in recent years on R&D and innovation appears to have raised interest in the relationship between entrepreneurship and economic growth.

Robert Solow (1956) provided a growth accounting framework that included only two explicit factors of production: physical capital and labour, as well as the implicit factor of technological change. While the specification of these factors has seen considerable evolution, such as the link between the endogenisation of knowledge investments and technological change explored by Romer (1986) and Lucas (1993), growth theory has generally remained focused on these three factors in the decades after Solow’s path-breaking article (Audretsch 2007).

Throughout the 1960s, 1970s and 1980s, the dominant view was that economic growth was generated by large corporations investing heavily in R&D and education automatically leading to innovation and technology entrepreneurship. However, this view was not able to explain the paradox in the 1980s and 1990s where, for many countries, high investment in human capital and R&D did not generate the expected economic growth.

Romer (1986) and Lucas (1993) assumed automatic spillover of knowledge from the firm or organisation where it was generated to a third party for commercialisation.

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Based on this assumption, public policy has mainly focused on investing in education and R&D and supporting R&D in large businesses and in academia. However, recent research (Audretsch 2007), argues that entrepreneurship represents a critical link between R&D and economic growth as it facilitates the transfer of knowledge created in incumbent organisations to other organisations. According to Audretsch, this transfer is unlikely to happen automatically due to so called 'knowledge filters'. These knowledge filters include various institutional, managerial, information and knowledge barriers that prevent a new idea or knowledge from being commercially developed. The entrepreneurial activity of individuals within or outside incumbent organisations generating R&D reduces the effect of these filters and increases the impact of new investments in R&D and human capital on economic growth. This activity of entrepreneurial individuals may not necessarily go against the efforts of the incumbent organisations to protect their intellectual property and secure most of the returns from the commercialisation of new knowledge. The knowledge that spills over is often knowledge not recognised by the incumbent organisations as commercially valuable.

In many OECD countries there has been a new focus on entrepreneurship capital in recent years, a factor not considered in Solow's or Lucas' models of economic growth. The result is a growing consensus that investment in new economic knowledge alone will not guarantee economic growth. Rather, key institutional mechanisms are a pre-requisite for such knowledge investments to become transmitted and transformed into economic knowledge, through the process of spill-over and commercialisation (Audretsch 2007). These views see entrepreneurship as a driving force of economic growth due to its invaluable role as a conduit of knowledge spillovers and commercialisation.

Entrepreneurship and competition both determine the degree to which innovation contributes to productivity and thereby economic performance. Commercialised innovation by one firm is likely to have a small effect on the economic performance of a country, but competition and sound institutions force other firms to either come up with innovations of their own or loose market share. Within this dynamic process, the entrepreneurship which occurs on both small and large scales has been considered to be responsible for a substantial share of efficiency improvements in an open economy.

## Entrepreneurship indicators

While countries have a strong desire to understand levels of entrepreneurship and the factors that influence them, entrepreneurship data are in a relatively early stage of development (OECD 2006). Good comparable databases at the international level are simply not available at present and at this stage, international rankings provide little meaningful guidance to policy analysts.

There has been some comparative analysis on policies that support entrepreneurship (OECD 1998) but very little or no work on statistical measures of entrepreneurship. An OECD Ministerial Meeting in Istanbul in 2004 called for countries to develop more robust statistics on entrepreneurship to improve policy development and monitoring. As a result, the OECD has commenced work on the development of a 'periodic scoreboard' of internationally-comparable entrepreneurship indicators to assist evidence-based policy development. The work is currently in progress with the first results expected in 2008.

The job of finding the right indicators of entrepreneurship is not an easy one. Entrepreneurship is an inherently intangible concept: a complex and dynamic activity that is often interlinked with a range of other business activities and outcomes in the economy. Thus, the key issue in measuring entrepreneurship is how to disentangle the entrepreneurial activity from other, more ordinary business activities.

As previously noted, modern definitions usually equate entrepreneurship with the commercial pursuit of new innovative concepts or combinations. Consistent with these definitions, indicators of entrepreneurship should aim to reflect the levels of commercial activity triggered by the desire of economic agents to commercialise new concepts or combinations and should exclude other, non-entrepreneurial business activities.

Unfortunately, none of the existing business indicators seem able to isolate the activities that relate to commercialisation of new concepts only. For example, the approach based on new start-ups or the importance of small business and self-employment in the economy usually produces biased results as it includes activities driven purely by self-employment objectives<sup>2</sup>. Another approach uses venture capital, a very narrow and specialised form of finance with its own measurement issues, as a proxy for the level of innovative business activity in the economy. This measure may not include all entrepreneurial activities as entrepreneurs will often have access to a number of other forms of finance.

Given the problems with the measurement of entrepreneurship, there have been very few attempts to assess Australia's entrepreneurial activity in an international context. OECD (1998) commented that in several respects the Australian business sector cannot be considered as particularly entrepreneurial, a conclusion based predominantly on the rate of enterprise creation and expansion as well as on anecdotal evidence (for example, some well known world-class inventions originating in Australia such as the black-box flight recorder which were commercialised elsewhere). Other proxies for

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2 This is particularly the case in transition and developing economies.

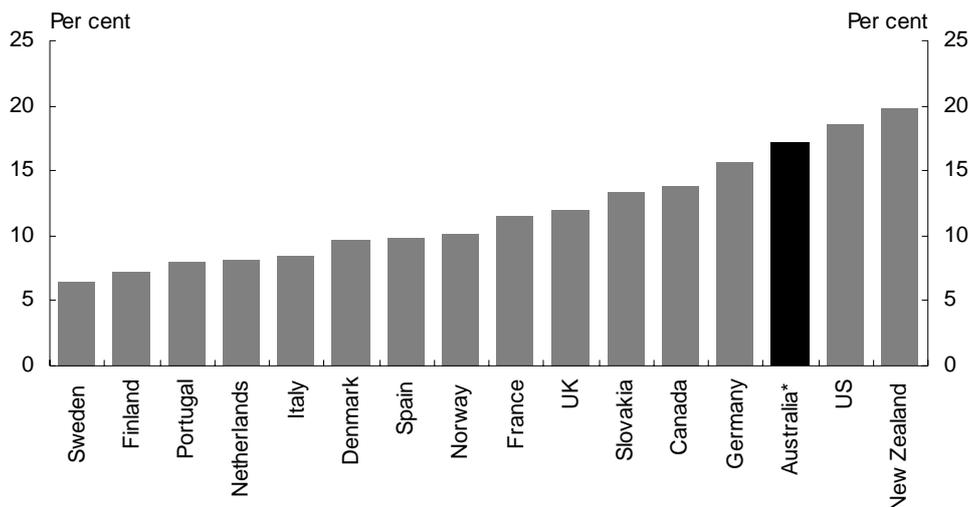
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entrepreneurship such as the importance of small and medium enterprises (SME) in the economy were also considered.

The pace at which firms are starting up and closing down – firm dynamics – is a commonly used indicator of the level of entrepreneurial activity in the economy. This indicator reflects the Schumpeterian notion of ‘creative destruction’, the level of turbulence in the economy that leads to commercialisation of new innovative ways of doing things and thus to economic growth. However, the databases used for different countries are often not comparable, so it is difficult to draw any firm conclusions in this regard.

With all the caveats about this approach, more recent data than those used in the OECD study (Chart 1) show that Australia ranks high on this criterion. The annual business start-up rate for Australia has been around 17 per cent in recent years, the third highest among the selected OECD countries.

**Chart 1: Raw business start-up rate for selected countries**



Source: Treasury calculations based on Vale 2006 and ABS 2007 cat no 8165.0.

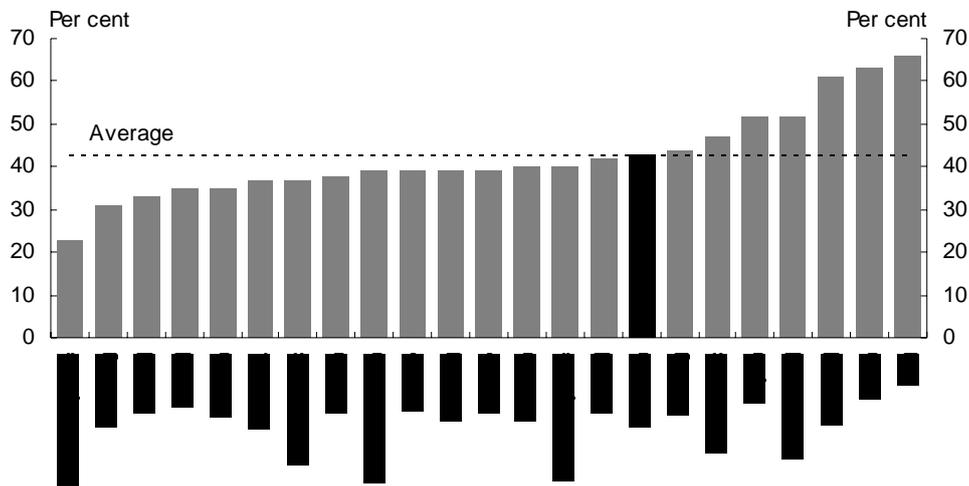
Note: Average rates between 2000 and 2004. \* Australia average for 2003 and 2004.

In addition to the issue of non-comparability of data from different countries, the main disadvantage of this approach is that it includes new start-ups that are simply a supply response to an increased demand for existing products/services or a way of finding self-employment. Similarly a high rate of closing downs may just mean a higher rate of failure due to factors not necessarily related to failed attempts to commercialise new concepts or ideas. Additionally, industry structure is likely to influence the rate of start-ups and close-downs significantly. For example, an economy heavily based on services is more likely to result in higher start-up and close-down rates due to a generally higher number of SMEs in the service economy. Australia’s relatively strong

position in Chart 1 may be the result of a number of one-off factors such as the 50 year high in the terms of trade.

Another related indicator often used as a proxy for entrepreneurial activity is the size of the small business sector in a country. It is widely recognised that SMEs and the entrepreneurship generated by them, are a key source dynamism and innovation in developed and emerging economies and make important contributions to job creation, economic growth and productivity (OECD 2005). Again, internationally comparable data in this area are unfortunately limited. Chart 2 provides information on firm size by employment in the manufacturing sector in OECD countries. According to this measure Australia ranks around average.

**Chart 2: Proportion of employment in the manufacturing sector, by small business, 2001**



Source: OECD 2005 SME and Entrepreneurship Outlook.  
 Note: Small businesses are those with 99 employees or less.

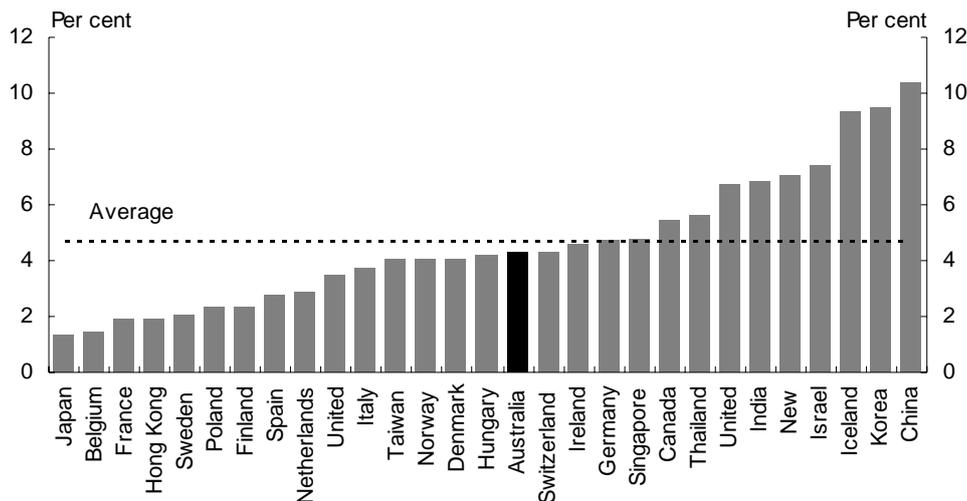
However, this measure is again influenced by industry structure as well as the level of economic activity in general. For example, an economy with a large service sector has a high share of SMEs in total employment and an economy with a high unemployment rate is more likely to have a high self-employment rate. In the above chart, transition countries and southern European countries rank very high, which is mostly a result of their industry structure (southern Europe) or a high unemployment rate (transition countries). Therefore, it is very difficult to draw clear conclusions about the level of entrepreneurial activity based purely on firm size measures.

More recently, there have been attempts to use entrepreneurship indicators of a more behavioural nature. Stam, Suddle, Hessels and Stel (2007) investigated whether the presence of ‘ambitious entrepreneurs’ is a more important determinant of national

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economic growth than 'entrepreneurial activity' in general. While this study did not attempt to distinguish between innovative and ordinary ventures it did distinguish between ambitious ventures and less ambitious ventures in terms of expected employment expansion. Those ventures that expected to employ between 6 and 19 more employees within five years after the start of the firm were classified as moderate growth ventures and those that expected 20 or more employees as high growth ventures and were therefore distinguished from ordinary ventures that expected to employ less than six more employees within the next five years. The results of the study suggest that 'ambitious entrepreneurship' contributes more strongly to economic growth than entrepreneurial activity in general. It could be assumed that many of the ambitious entrepreneurs were likely to be ambitious due to the innovative nature of their ventures. According to the ambitious entrepreneurship method, Australia ranked around the middle, and just below the average, of the developed and developing countries that participated in the Global Entrepreneurship Monitor (GEM) in 2002 (Chart 3).

**Chart 3: Total Entrepreneurial Activity (TEA) Medium and High Growth**



Source: Stam, Suddle, Hessels and Stel (2007).

While this study makes some progress towards excluding ordinary business ventures from the measure of entrepreneurial activity, it did not base its findings on the innovative nature of entrepreneurship. The group of 'ambitious entrepreneurs' was likely to also include a number of businessmen who were optimistic about future expansion for reasons not related to the innovative nature of their venture (such as confidence in local market conditions at a particular time).

Another proxy for high entrepreneurial activity in the economy is the level of venture capital activity. Australia's venture capital intensity was around the median for the OECD but is lower than the OECD average (Regan and Tunny, 2008).<sup>3</sup>

Contrary to most other indicators that quite often overestimate the level of entrepreneurship in a country; the venture capital investment indicator is more likely to lead to underestimation. The venture capital indicator does not include a potentially large number of entrepreneurs who are reluctant to acquire funds from a venture capitalist as this often means losing operational and management freedom. For many entrepreneurs the desire for operational freedom often plays a critical role in their decision to undertake the entrepreneurial activity in the first place.

### Why is good measurement so important?

The most important implication of good or bad measurement of entrepreneurial activity is its effect on public policy. If properly designed, good indicators can give an early warning of existing regulatory or other impediments to entrepreneurship. Similarly if conducted poorly, the measurement may lead to inappropriate policy interventions which may have negative side-effects in other areas of economic and social activities without a resulting increase in the entrepreneurial activity. This is particularly important in a small open economy operating at near full capacity. In such an economy, any government-induced reallocation of scarce resources that is not addressing a market failure results in an opportunity cost for the economy as a whole.

Entrepreneurship is a broad concept and as such encompasses a number of activities that could be affected by government policies. To flourish, entrepreneurship generally requires efficient financial markets, a simple and transparent corporate taxation system, labour market flexibility and bankruptcy rules adapted to the realities of the business world. Factors that seem critical for entrepreneurial activity are the level of risk and complexity and the expected rate of return to the individual from such activity. Thus, it is generally accepted that government policies should create a simple and transparent institutional and tax environment that encourages trouble-free entry of new innovative ventures and facilitates fast exit of failed ventures. However, the extent to which governments should do more, and seek to actively support or subsidise entrepreneurial activity remains unclear – the data are simply not yet good enough to provide a reliable answer to that question, beyond a general presumption that such interventions only make economic sense in response to market failures.

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3 The OECD average appears to have been skewed upwards due to a very high result for Iceland. The OECD has suggested caution when interpreting the venture capital data for Iceland due to some specific local market factors influencing the results.

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The renewed focus on the relationship between entrepreneurship and economic growth across the OECD runs the risk of generating a range of policy initiatives which go beyond general policies that support freedom of markets and reduce regulatory impediments to individual initiative. Due to the complex nature of entrepreneurship, new policy initiatives could affect a range of economic and government activities. It is for this reason that new, more reliable indicators of entrepreneurial activity should be developed to assess and guide the policy activity aimed at stimulating entrepreneurship.

In general, it will be important to link any new measures of entrepreneurship to the actual commercial activity arising from new ideas and not to restrict ourselves to measures of regular business activity that we know are currently easy to collect or produce. Improvements to existing techniques and surveys may well allow production of useful, comparable data in the future that will enable a proper assessment of entrepreneurial activity across a range of countries.

The ABS is expected to release details of its Business Longitudinal Database Record Files in mid-2008. These data sets contain useful information that could be used in designing better indicators of entrepreneurial activity in Australia. Ideally, this could be coordinated with the OECD's efforts to develop better and more consistent indicators of entrepreneurship across its member states.

## Conclusion

Modern definitions of entrepreneurship emphasise a strong link between entrepreneurship and innovation. Entrepreneurship is seen as a critical link between new knowledge and economic growth as it facilitates the transfer of knowledge. These factors distinguish entrepreneurship from more simple forms of management and ordinary business activities.

Notwithstanding this, existing indicators fail to capture the innovative nature of entrepreneurship. Furthermore, comprehensive and internationally comparable data for entrepreneurial activity are not yet available. In the absence of data that capture the real innovative nature of entrepreneurship it is difficult to draw firm conclusions about the true level of entrepreneurial activity in Australia or any other country.

The complex nature of entrepreneurship and its importance for economic growth demand internationally comparable indicators that will be able to distinguish entrepreneurship from ordinary business activities. When this becomes available, it will likely improve the quality of public policy initiatives aimed at supporting entrepreneurial activity.

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