

Non-Technical Summary:

Corporate Responses to Macroeconomic Changes and Shocks

1. Background and Objectives

There has been little analysis of how macroeconomic fluctuations may influence corporate and managerial behaviour. The project aimed to help fill this gap by considering how firms in aerospace and biotechnology industries responded to economic change in the period from early 2002 to the end of 2004.

2. Methodology

The analysis is based on a series of real time case studies of businesses in the aerospace and biotechnology sectors.

3. Results

3.1 The UK Economy During the Study Period

The growth of the UK economy remained positive throughout the study period but although it did not suffer a deep business cycle trough, growth was below trend. Furthermore, financial markets were depressed particularly for high-technology stocks and the world economy suffered from a series of geopolitical shocks.

3.2 Entrepreneurial Responses in Biotechnology

Despite the prevalence of economic change and geopolitical shocks, most biotechnology entrepreneurs believed that the majority of macroeconomic variables had only a negligible impact on their firms. Most changes almost never influenced important decisions they made, particularly about the development and commercialisation of science. The reason for this is the emergent nature of the biotechnology industry and the long gestation time for each firm to develop products.

Yet, all the biotechnology entrepreneurs reported that one economic variable has had a very important effect on their firms: the decline in the stock market and the effect on the availability of finance. Only those firms that had large enough cash reserves and revenue streams to fund future development felt relatively insulated from the changes in the capital markets.

The fall in the valuation of technology-based firms had a variety of impacts on many biotechnology firms in the study. First, they tried to generate new finance through increasing revenue streams. Second, the 'discipline of expensive hard to get money' encouraged many firms to try to improve efficiency. Third, many altered their business model in response to the demands of the financial sector in order to obtain finance, albeit on considerably less favourable terms than during the height of the financial bubble.

The fall in valuations and the lack of prospective exits caused venture capitalists to continue financing firms with later stage technologies that were closer to market. These were perceived to be lower risk with greater potential for an eventual exit (that is, the venture capitalists could sell their share in the firms or it could be floated on the stock market). The private biotechnology firms responded by dropping their earlier stage technologies to concentrate on later stage products nearer to market. The retrenchment in financial markets has created a funding problem for the biotechnology industry. Our research suggests that such financing gaps increased during the downcycle – and this may have permanent impacts on the commercial exploitation of such technologies.

3.3 Managerial Responses in Aerospace

Managers in the aerospace industry, unlike those in biotechnology, were acutely aware of the business cycle and macroeconomic changes (particularly the exchange rate). These firms had developed a set of strategies for resilience through learning lessons from previous recessions – such as the aerospace recession of the early 1990s. This, combined with the maturity and size of the firms in the sector, meant that the sector was far more stable than the biotechnology sector.

The first strategy was to develop a portfolio of activities that were driven by different cycles to create a company less vulnerable to one industrial or technological cycle. The second was to reduce the risk attached by changing their source of revenue. Traditionally revenue was based around selling high value equipment. Yet the highly volatile nature of this market meant that even when times were buoyant there was a high degree of uncertainty about future revenues. Many of these firms, therefore, were moving to an emphasis on service and aftermarket revenues which are much more recurring and stable.

In a highly cyclical industry such as aerospace it is impossible to avoid the business cycle. Firms also used these adverse external events and made a 'virtue of necessity' in order to push through organisational change. First there was strategy 'burying of bad news', which was used by a number of the companies in the sample. In effect, management believed that excess capacity needed to be reduced but only implemented such changes in the context of external events (such as 9/11). Second, many of the firms implemented long-term organisational change which is notoriously hard to achieve successfully. The global crisis in aviation gave them the opportunity to improve their operational efficiency by implementing process improvements and rationalising the supply chain.

4. Conclusions and Impacts

The impact of economic change was apparent in both sectors studied. It particularly influenced the young firms in the biotechnology sector who were at 'critical junctures' in their development and required finance to grow. Many of these firms did not have the competences to cope easily with the changes in financial markets. Furthermore, the failure to acquire finance may prevent the commercialisation of technology and may have an impact on long-term growth. The companies in the more mature aerospace sector had 'learned' to cope with change and uncertainty and had developed competences and capacity to deal with such factors.

This study suggests that when considering the microfoundations of macroeconomics, account should be taken of the variety of corporate responses to economic change and fluctuations. It also suggests that policy-makers should consider the cyclical nature of finance gaps in high-technology industries. This research has been disseminated through a range of publications and by presentations to academic, policy and practitioner audiences; and further dissemination activity is planned.