Empirical explorations of firm innovation, government intervention and firm performance in European countries
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Innovation in the form of new products and processes are all crucial for firm competitiveness, firm productivity and long term economic growth (Romer, 1990; Baumol, 2002; Bhide, 2011). Associated with the process of innovation in markets is the presence of market failures arising from: the partial-appropriability and public good nature of knowledge (Baldwin, 1969; Jaffe, 1998); information asymmetries (Rosenburg, 2004; Rodrik, 2009); and systems failures (Boschma, 2009). The broad objectives of the research within this thesis are: firstly, to analyse the process of innovation across innovation types using the firm as a unit of analysis; secondly, to examine the firm innovation-productivity relationship; and thirdly to examine the relationship between government intervention and firm performance in Europe. There are four empirical paper contributions to the literature in the areas of innovation, government intervention and firm performance.

The data used for the analyses stems from the third (2005) and fourth (2009) editions of the Business Environment and Enterprise Performance Surveys (BEEPS). The BEEPS editions are a joint initiative conducted by the World Bank Group (World Bank) and the European Bank for Reconstruction and Development (EBRD). BEEPS contain information on firm characteristics, the location of the firm and the business environment of the firm. The survey methodology for BEEPS is stratified random sampling and country sampling frames are constructed from National statistical institutes, Chamber of Commerce membership lists, industry registers and commercial sources such as the Yellow Pages (Synovate, 2005).

When investigated the links between innovation-productivity and subsidies-firm performance, there are a number of empirical concerns. Firstly, there may be the concern of simultaneity and omitted variable bias. For instance, firms self-select to innovate if they expect the returns of innovation (firm performance) to be beneficial to the firm’s success. Hence, expected firm productivity is motivating the firm to innovate and innovation is also driving firm productivity. In the case of government
intervention, firms are chosen to be subsidised by policymakers based on the expected outcomes the intervention will achieve and/or firms may also self-select themselves to apply for subsidies from government sources, if they expect it will have positive consequences on their firm performance. There may also be heterogeneity differences between innovators/non-innovators and subsidised/non-subsidised firms that are not observed that explain productivity changes, and this must also be taken into account in the empirical models. Hence, to control for these concerns chapters three, four and six employ an endogenous switching model and the conditional expectations, treatment and heterogeneity effects for firms are estimated. This is the first occasion in the literature that an endogenous switching model has been employed to measure the innovation-productivity and the subsidy-firm performance relationship.

The first contribution of the thesis is presented in chapter three. This paper explores the process of innovation cross innovation types and the innovation-productivity relationship across innovation types for a sample of firms in Ireland. The paper identifies that a firm's innovation effort, capital intensity, firm size, location and its operating environment are key variables in explaining a firms' propensity to innovate. However, the importance of these factors differs across innovation types. We find mixed results on the effect of innovation on the productivity of innovators across innovation types. The results indicate in the counterfactual analysis that all types of innovation have a positive effect on the productivity levels of non-innovating firms.

The second contribution of the research is presented in chapter four. This paper is similar in approach to chapter three but expands the analysis to an examination of the innovation process and the innovation-productivity relationship to different innovation system types (innovation driven economies versus transition driven economies) and partitions the sample to compare results between the manufacturing and service sectors. The results suggest that innovation is found to have a positive effect on the productivity levels of firms across all innovation and economy types. Some of the findings provide support for the traditional patterns previously found in the innovation literature, in which innovation efforts and investments in physical and human capital are found to be important for product and process innovations in manufacturing and service firms and across all types of economies. Other institutional factors including policy support are also found to be important for both manufacturing and service firms, while economic geography is found to be important primarily for service firms. Finally, the conditional expectations, treatment and heterogeneity analysis examined in this paper outlines a rationale for policy intervention towards non-innovating firms as well as innovating firms depending on where the transitional heterogeneity effects are greatest.

The third contribution of this thesis is presented in chapter five. This paper examines the link between innovation and product discontinuation using the firm as a unit of analysis in order to enhance our understandings of the product life cycle (PLC). The examination of product life cycles using the firm as a unit of analysis is novel to the literature. Furthermore, a key objective of the paper is to compare the results between manufacturing and service firms. The literature has focused primarily on PLC
patterns and has completely overlooked service-life-cycles (SLC’s). Our understanding of innovation patterns has essentially been on the basis of technological innovation in manufacturing industries (Tether, 2003). The results indicate that product and service life cycles have similar patterns where innovation was significant for product/service discontinuation and process innovation was found to be important for product innovations. Similarly, monopoly power was important for innovation in both industry types. However, there were also some key differences, particularly in relation to firm age and economic geography effects. The principle conclusion of the paper is that it is not appropriate to assume that the process of innovation in manufacturing firms will be identical to the process of innovation in service firms.

The fourth contribution of this research is presented in chapter six of the thesis. The purpose of this contribution is to identify what types of firms are more likely to receive subsidies from policymakers and the effect that the subsidies have on the performance of firms. Rodrik (2009) argues that it is extremely easy to make the case for industrial policy and it’s a case of how to implement industrial policy and not why. But from an empirical perspective, it is far from clear if government subsidies are good or bad in achieving long term growth at all (Bergstrom, 2000). Industrial policy is at the centre stage of Europe’s 2020 new growth model strategy (European Commission, 2010). Hence, the motivation of this final contribution is to provide more clarity on the subsidy-firm performance relationship. The paper identifies an economic geography ‘dualism’ effect with subsidy allocation and that the targeted firms are larger, they export and are more high-tech. These types of firms may be identified as ‘winners’, but the heterogeneity analysis identifies that policymakers are targeting the ‘weaker’ firms within this category type of firms. However, the treatment effect analysis suggests that policymakers are targeting the wrong firms if they want to maximise productivity returns.
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