



## Learning by exporting: Lessons from high-technology SMEs

James H. Love<sup>a,\*</sup>, Panagiotis Ganotakis<sup>b</sup>

<sup>a</sup> Economics and Strategy Group, Aston Business School, Aston University, Birmingham B4 7ET, United Kingdom

<sup>b</sup> Birmingham Business School, University of Birmingham, Birmingham B15 2TT, United Kingdom

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### ABSTRACT

We investigate the learning by exporting hypothesis by examining the effect of exporting on the subsequent innovation performance of a sample of high-technology SMEs based in the UK. We find evidence of learning by exporting, but the pattern of this effect is complex. Exporting helps high-tech SMEs innovate subsequently, but does not make them more innovation intensive. There is evidence that consistent exposure to export markets helps firms overcome the innovation hurdle, but that there is a positive scale effect of exposure to export markets which allows innovative firms to sell more of their new-to-market products on entering export markets. Service sector firms are able to reap the benefits of exposure to export markets at an earlier (entry) stage of the internationalization process than are manufacturing firms. Innovation-intensive firms exhibit a different pattern of entry to and exit from export markets from low-intensity innovators, and this is reflected in different effects of exporting.

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### 1. Introduction

International trade benefits the trading parties both in static terms through comparative advantage, and in dynamic terms through exposing countries to the knowledge stocks of their trading partners (Grossman & Helpman, 1991a, 1991b). In practical terms, this 'learning by exporting' effect may be important at both the country level and at the level of the individual exporting firm. Many Western economies provide support to exporters partly in the understanding – or hope – that the productivity of these and other domestic firms will improve as a result of exposure to international markets. For example, in Britain the government department UK Trade & Investment (UKTI) actively promotes the exporting activities of UK-based firms through advice and support including trade missions and gathering market intelligence.

Here we look for evidence of learning by exporting amongst high-tech SMEs in the UK. As suggested by Salomon and Shaver (2005) we look for the learning by exporting effect on that part of the firm's activity where learning is most likely to have a direct effect – innovation activity. We carefully allow for the (lagged) effect of exporting, but also for other potential sources of external knowledge and learning which may influence innovation. We also allow for changes in exporting status during the time of study, to examine what effect entering and exiting export markets may have on learning and thus on innovation performance, and check for the possible effects of sample selection bias and endogeneity between exporting and innovation.

Detecting learning by exporting effects at the firm level is not straightforward. Firm performance, especially productivity and profitability, is extremely heterogeneous even between firms operating in similar sectors (Bartelsman & Doms, 2000; Goddard, Tavakoli, & Wilson, 2006) and is subject to many influences unrelated to exporting. In addition, firms learn from many external as well as internal sources which may have nothing to do with exposure to export markets, and thus it is not

\* Corresponding author.

E-mail addresses: [j.h.love@bham.ac.uk](mailto:j.h.love@bham.ac.uk) (J.H. Love), [p.ganotakis@bham.ac.uk](mailto:p.ganotakis@bham.ac.uk) (P. Ganotakis).

always easy to identify the learning by exporting effect. As a result, empirical studies of the effects of learning by exporting on (productivity) performance have very mixed results (Wagner, 2007). As Salomon and Jin (2008) point out, we still know relatively little about how exporting affects performance at the firm level. More specifically, Salomon and Jin (2010) argue that little is still known about how different groups of firms learn from exporting, and whether any differences exist between them in the effects of learning by exporting.

This is especially true for small and medium-sized enterprises (SMEs). A recent strand of literature has highlighted the importance of understanding the effects of the internationalization process undertaken by those technologically driven SMEs which tend to internationalize relatively early in their lifecycle (Autio, Sapienza, & Almeida, 2000; Filatotchev, Liu, Buck, & Wright, 2009; Zahra, Ireland, & Hitt, 2000). Whilst there is some evidence that the internationalization of such firms is associated with improved performance in terms of profitability and growth (Bloodgood, Sapienza, & Almeida, 1996; Burgel, Fier, Licht, & Murray, 2001), there is little direct evidence on the extent to which such firms are able to benefit from learning by exporting, often the initial stage in the internationalization process for SMEs (Jones, 2001).

Our research therefore makes three contributions to the literature. First, although there are numerous studies of early-internationalization or 'born-global' firms (e.g. Autio et al., 2000; Knight & Cavusgil, 2004), there is little systematic evidence specifically on learning by exporting amongst high-tech SMEs. High-tech SMEs are a particularly interesting group to consider in terms of the innovation-exporting relationship. These are firms that operate mainly in highly innovative sectors, and tend to be high-growth firms which internationalize relatively early, and for which overseas markets play an important role (Acs & Audretsch, 1987; Lynskey, 2004; Zucchella, Palamare, & Denicolai, 2007). Such firms are therefore fertile ground for identifying the learning by exporting effect.

Second, we are able to identify the differential effects of learning by exporting on innovation in manufacturing and (knowledge intensive) service firms. Certain attributes of services such as intangibility and inseparability may have implications for the ease with which such firms enter and acquire knowledge from export markets, and hence for the learning by exporting effect. Previous research suggests, and finds empirically, that the barriers to internationalization are lower for service firms, and especially for knowledge-intensive service firms, than for manufacturing enterprises (Contractor, Kumar, & Kundu, 2007; Contractor, Kundu, & Hsu, 2003). If service firms can indeed enter export markets more easily than manufacturing firms, this in turn may imply that learning by exporting occurs more readily for service firms, with less need for persistence in exporting. We test this hypothesis.

Third, we examine the effects of learning by exporting separately for high-intensity and low-intensity innovators. Whilst high-intensity innovators tend to be those with high-quality internal resources (Love, Roper, & Hewitt-Dundas, 2010; Roper, Du, & Love, 2008), low-level innovators may lack some of the internal resources which would allow them to become more successful in marketing new products. Low-intensity innovators will have more to gain from the exposure to foreign markets and the associated learning-by-exporting effects than their high innovation-intensity counterparts, but may also lack the absorptive capacity to take advantage of these effects. We determine the net effects of these influences on relative innovation performance.

We find evidence of learning by exporting, but also that the pattern of this effect is relatively complex. Exporting helps high-tech SMEs innovate subsequently, but does not make them more innovation intensive. There is also evidence that it is consistent exposure to export markets that helps firms overcome the innovation hurdle, but that there is a positive scale effect of exposure to export markets which allows innovative firms to sell more of their new-to-market products on entering export markets. Our results also suggest that service sector firms are able to reap the benefits of exposure to export markets at an earlier (entry) stage of the internationalization process than are manufacturing firms. Firms producing a rapidly changing portfolio of innovative products exhibit differences in terms of entry to and exit from export markets from low-intensity innovators, and this is reflected in the benefits they gain from entry and exit into and out of such markets.

## 2. Learning by exporting: literature review and hypotheses

The theoretical basis for positive link between exporting and performance has its basis in macroeconomic models of the benefits from trade and openness. For example, endogenous growth models in the tradition of Grossman and Helpman (1991a, 1991b) recognize that trade exposes each country to the knowledge stocks of its trading partners. As this knowledge is transferred internationally, both embodied in the flow of traded goods and services and disembodied through technology transfer, the domestic productivity frontier shifts outwards and higher economic growth ensues. This is 'learning by exporting'.

But how does learning by exporting occur at the level of the individual firm? In the context of organizational learning theory, trade is viewed as a process of knowledge and learning accumulation that takes place within the firm (Barkema & Vermeulen, 1998; Yeoh, 2004). More specifically organizational learning studies argue that exposure to foreign markets leads to higher level or double-looped learning that allows firms to carry out both within-paradigm (improvements to existing products) but also across paradigm (radically new product development) improvements. Exposure to foreign markets enhances a firm's technological (but also marketing) knowledge, which in turn forms the basis for the development of further innovations (Yeoh, 2004).

Exporting thus provides firms with (at least) two types of knowledge, both of which can help improve performance – knowledge about markets and knowledge about technology (Salomon & Shaver, 2005). Since firms gain a lot of market knowledge via customers, exposure to export markets helps them to alter and customise their product range to the needs of different international markets (Clerides, Lach, & Tybout, 1998). Foreign customers may have different tastes and

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