Final Report

FIRM LEVEL EMPIRICAL STUDY OF THE CONTRIBUTION OF EXPORTING TO UK PRODUCTIVITY GROWTH

Submitted to the *UKTI* by

Professor Richard Harris &

Q. Cher Li

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Executive Summary

E.1 DTI (2006) considered the rationale for government intervention to help firms develop their exporting activities, given that there is substantial evidence of the benefits from international trade (see especially Chapter 3 of the DTI report). The benefits are largely linked to the higher productivity of exporters, which then contribute to higher overall UK productivity growth through:

- existing exporters having relatively higher productivity growth which can lead to these firms becoming both more productive over time *and* to intra-industry (i.e. inter-firm) resource reallocations to higher productivity exporters;
- the entry of higher productivity exporters i.e. new firm start-ups that immediately or very soon sell to international markets (what have been called 'born global' companies in the literature – see Oviatt and McDougal, 1995, and the review of this literature in Harris and Li, 2005a);
- the shutdown of lower productivity firms (which may be exporters but are more likely to be non-exporters who have the lowest levels of productivity of all, causing them to exit first).

However, as the DTI study shows, there has to date been little evidence *for the UK* that substantiates the benefits from international trade, and therefore quantifies its importance and contribution to overall UK productivity growth.

E.2 This study is a substantial addition to the evidence-base on the importance of exporters to the UK economy, and in particular provides estimates for the whole of the market-based economy (not just manufacturing) on:

1. the extent to which exporters have higher total factor productivity (TFP), when compared to non-exporters (and also when compared to foreign-owned subsidiaries operating in the UK);
2. whether exporters are more productive prior to entry into overseas markets and/or whether post-entry there is a 'learning-by-exporting' effect;
3. the contribution of exporters to aggregate UK productivity growth;
4. whether exporting lowers the likelihood of firm closure (primarily through their having both higher productivity and other attributes that lead to a lower hazard rate of closure, conditional on having controlled for productivity effects).

E.3 This new evidence is obtained from analysing the FAME database, but with two major differences to previous studies that have used this data for the UK. Firstly, as is shown in Stage I of this report, the FAME database is unrepresentative of small- to medium-sized enterprises and therefore cannot produce results that can be generalised to the UK level. Efforts to merge FAME into the ONS Annual Respondents Database (ARD) – which is representative of the actual distribution of firms operating in the UK – are largely unsuccessful; however, weighting the FAME data using weights complied from the ARD (at the 3-digit SIC by 5 size-bands level) does result in a distribution that is a good representation for the UK. Secondly, are able to consider all the market-based sectors of the economy, whereas most previous studies have concentrated on manufacturing.

E.4 Turning to the main results obtained, we are able to confirm (using univariate statistical testing) that in general exporters have higher productivity when compared to non-exporters, and that foreign-owned firms operating in the UK usually have the highest levels of productivity. More specifically, in every industry examined firms that export have a TFP distribution that lies significantly to the right of non-exporters, and the largest difference between the two distributions is often substantial.

E.5 More sophisticated modelling is required to establish whether exporting firms are 'better'. Our first set of results for 16 separate UK industry groups (covering all the main marketed output sectors of the economy during 1996-2004) confirm what most all other similar studies have

reported in the literature on self-selectivity: in the year prior to selling in overseas markets firms that export

- have higher (labour) productivity;
- have non-zero intangible assets (indicating investment in highly productive resources that lead to a greater ability to internalise external knowledge in order to overcome barriers to exporting);
- are older (with associated higher levels of internal assets associated with the age of the firm).

E.6 Having found that there is strong self-selection by UK firms during 1996-2004, we then test (using three different approaches to combating self-selectivity) whether there is a 'learning-by-exporting' effect associated with post-entry sales to overseas markets. The results show that generally all three approaches to controlling for selectivity effects produced broadly similar results, and that 'learning-by-exporting' is present but it is by no means universal (even within industry groups there are differences for entrants into exporting, firms that leave exporting, and those that experienced both entry and exit into overseas markets). However, in terms of the overall estimate for the UK economy the results show that there is a fairly substantial post-entry productivity effect; based on our preferred model we find:

- for firms that are new to exporting, there is a 34% long-run increase in TFP in the year of entry, and only a small effect of around 5% in the year following entry;
- firms exiting overseas markets overall experience negative productivity effects in the year they stop exporting and subsequently (around a 7-8% for all the sectors covered);
- firms that enter and exit experience large productivity gains when they are exporting (some 19% in the year of entry, but with a 5% decline the following year).

E.7 Having obtained new and extensive evidence supporting both the self-selection and learning-by-exporting hypotheses for the UK economy, we then go on to consider whether there has been inter-firm reallocation of resources towards more productive exporting firms. Our initial results are as follows:

- we are able to show that exporting firms contribute a significant amount to the total output of the UK economy (partly because there are a significant number of exporters, but also because of their relative size and productivity);
- firms that close tend to have the lowest productivity levels for both exporters and non-exporters, and new firms that enter exhibit relatively high productivity (particularly for exporters). Firms that are taken-over/merge during the period also have relatively high productivity (especially if they are also exporting). Exporting firms that were in operation throughout 1996-2004 not only have relatively high productivity in 1996, but experience a large growth in productivity, much higher than the average for all continuing firms. Overall, our initial results confirm that exporting firms are more likely to have higher productivity than non-exporters, whichever sub-category of firm ('continuers', entrants, those that exited, those taken-over/merged) we consider.

E.8 Based on a decomposition of productivity growth we then show that:

- in aggregate exporting firms experience faster productivity growth than non-exporting firms (during 1996-2004 1.27% p.a. compared to 0.8% p.a., based on the TFP measure) and therefore contribute more to overall productivity growth;
- aggregate productivity for exporters benefits from a large contribution from 'continuing' firms improving their productivity, while there is little redistribution of resources across exporters that remain open throughout. Exporters that are either taken-over/merge or start-up as new firms also contribute about 38% each of the overall (1.27% p.a.) increase in aggregate productivity;
- in contrast, most of the TFP improvement for non-exporters (around 91% of the total) is attributable to lower productivity firms exiting, rather than from internal improvements or the impact of new firms (or takeovers/mergers) having raised the average growth rate.

E.9 In conclusion, the main results obtained from the modelling of self-selectivity, 'learning-by-exporting' and our productivity decomposition analysis confirm that the productivity differential between exporters and non-exporters is mainly as a result of firms increasing their productivity pre-entry (to overcome entry barriers), but we also find important post-entry 'learning-by-exporting' effects in some UK industries during 1996-2004. In addition to these 'within' firm impacts, we are also able to show that exporters contribute significantly to aggregate UK productivity growth, with much of this resulting from these firms having higher productivity growth based on them 'being better'.

E.10 Lastly we turn to a consideration of the determinants of firm closure. Weighted *FAME* panel data for 1997 to 2003 is used to estimate a Cox proportional hazard model of firm closure. Our major findings are:

- the majority of firms engaged in continuous exporting have a lower probability of closure while other exporting sub-groups have unambiguously (even) lower hazard rates of closure;
- foreign-owned subsidiaries are less likely to close, while having positive intangible assets has no significant impact on the hazard rate.;
- unexpectedly, displacement effects (through relatively high rates of entry of firms in each industry) decrease the probability of closure rather than leading to displacement of existing firms;
- having controlled for other attributes associated with productivity (such a size and export status), firms with higher total factor productivity are less likely to exit;
- output growth at the industry level increases the hazard rate of closure, but at a much higher rate for the oldest firms who are more vulnerable to an expansion of the market;
- increases in capital intensity (a proxy here for sunk costs and thus barriers to entry and exit) reduces the hazard rate;
- conditional on having controlled for other covariates associated with productivity (such as size and TFP), we find that the oldest UK firms (over 22 years old) are often more vulnerable to closure. However, our results are consistent with theoretical models showing that the efficiency level attached to the exit threshold that firms must exceed to survive increases with age;
- the initial employment size of a firm when it starts-up has a negative impact and assuming that the firm grows from this initial level over time there is an additional negative impact on the probability of closure.

E.11 In conclusion, our most important result is that we are able to add to the small but growing body of evidence that shows exporting firms have lower probabilities of closure, conditional on controlling for other factors linked to productivity.

E.12 As to the policy implications arising from the above results, we can confirm the general conclusion that is reached by the DTI that since exporting leads to higher productivity, it is clearly beneficial for (more) firms to sell to overseas markets to obtain both the private and public benefits from doing so. In section 4 we discuss the more specific issues of what are the sources of barriers to (more) exporting, and therefore which policy initiatives have the greatest potential impact, and whether new or existing firms should be targeted. We also discuss the issue of whether barriers are due to 'market failures' or whether they are a (natural) consequence arsing from the way dynamic market-based economies operate, since government usually justifies interventions solely on the grounds of failures .

E.13 Our conclusion is that policies that enhance the absorptive capacity and dynamic capabilities of firms appear to be the key requirement for boosting participation rates in export markets. This then benefits aggregate productivity through a reallocation of resources (i.e. market shares) to higher productivity exporters, and the forcing out of the industry/economy of the least efficient firms.