Final Report

Internationalisation Evidence Review

Submitted to Scottish Enterprise by

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Summary of Key Points

KP.1 This report provides: an in-depth review of the literature on business internationalisation; a discussion of market failures and the rationale for public sector intervention; a review of SDI internationalisation activities; a consideration of the evidence on the effectiveness of interventions; and lastly a synthesis and identification of evidence gaps

KP.2 The summary of key points concentrates on the main messages from the literature, evidence gaps, and next steps for the Policy Evaluation Framework (PEF) being undertaken; Chapter 1 provides a more detailed, overall summary of the project.

Some key points from the literature

KP.3 When a firm internationalises, it must have sufficient resources and capabilities (intangible assets) through absorbing new knowledge to overcome the initial (sunk) costs of competing in international markets. Both incremental and 'born global' firms are subject to this overarching assumption of the importance of resources and capabilities, as crucial factors determining the process of business internationalisation

KP.4 A strong theme running through all the literature is that firms need to possess productivity advantages so as to serve global markets via exporting; moreover, to engage in foreign production through outward FDI requires an even higher productivity threshold.

KP.5 While there is almost universal evidence substantiating the self-selection proposition – i.e. higher productivity leads to export-market entry – evidence for 'learning-by-exporting' is less well established in the literature. In order to achieve post-entry productivity gains, exporters need to invest in more R&D and human capital to successfully acquire foreign technologies and enhance their absorptive capacity. That is, exporting *per se* does not warranty productivity gains.

Case for intervention

KP.6 There is a clear case for government intervention to help firms overcome barriers to internationalisation; these are mostly linked to information costs that individual firms would (or could) not meet without government assistance.

KP.7 In response to such barriers, EU experts argue that "… successful and sustainable internationalisation will require an internationalisation strategy and the acquisition of a series of capacities, abilities and resources prior or at the first steps of internationalisation". They are making a direct and clear link between internationalisation and competitiveness whereby boosting internationalisation requires integrating policies for competitiveness and growth

KP.8 Thus in relation to government responses to 'market failures', current thinking has moved beyond just considering such 'failures' as mostly information needs, and thus potentially indicative of resource-gaps faced by (especially smaller) firms; rather there are potential capability-gaps that need to be addressed.

SDI interventions

KP.9 SDI offers a wide range of products to help firms internationalise, broader than that offered by most export promotion agencies across the globe. These range from products to help firms increase export volumes to those that also have a stronger element linked to improving productivity. It is recognised that SDI operates within the wider SE Account and Client Managed framework designed to improve productivity.

KP.10 Nearly two-thirds of SDI products between 2005-2008 went to help firms attend exhibitions, go on missions, and obtain market intelligence on overseas locations. Delivery of those products with the greatest likelihood of increasing long-term competitiveness was significantly lower. Similar support was given before the formal introduction of DRM in 2005

KP.11 Thus while the range of products available from SDI is relatively broad, covering firms new to exporting as well as those wishing to become global companies, in practice much of its activities seems to have been concentrated at the lower end of the productivity-enhancing spectrum. To the extent that this is the case, this raises the question of whether SDI is making its full contribution to the overall goals of the GES?

Impact of SDI interventions

KP.12 The review of the evaluations that have been undertaken for SDI and SE suggests that the impact of SDI assistance is positive, more probably as firms engage in activities that increase their scale of exporting.

KP.13 However, there is a general lack of rigorous monitoring and evaluation evidence on an on-going basis of the products available from SDI. In particular, there is a pre-occupation in evaluation studies of measuring economic impacts on Scottish GVA *without any hard evidence of the counterfactual position*. It is therefore difficult to know if the products have indeed improved the productivity and competitiveness of companies, and thus do lead to increases in Scottish GVA that would otherwise not have occurred. That is not to say this is not happening, but the evaluation evidence is not providing information that would allow us to draw conclusions in this area.

KP.14 A caveat to the comments made in the last paragraph comes with the recent Ekogen (2009) assessment of the economic impacts of SE's Account and Client Managed interventions, In general, those products that were more closely associated with having an impact on GVA were exhibitions, missions and learning journeys, and the international strategy workshop. Thus, within the overall portfolio of Account and Client Managed companies assisted by

SE, SDI products seem to be having the largest impact in terms of increasing GVA in Scotland.

Evidence Gaps

KP.15 There would appear to be a lack of demand for those SDI products that enhance productivity and so help to build greater competitiveness. It is unclear the extent to which this is due to Scottish companies not understanding or realising the benefits of such products, and/or whether demand is being constrained by a supply-side under provision of products and programmes such as GCDP, international strategy workshops, and international mentoring.

KP.16 In addition, the current approach to monitoring and evaluation by SDI (as reflected in the material made available to us for this review) provides little hard evidence on the outputs, and more especially the outcomes, of SDI activities. Even the evidence that is obtained through standard evaluations – which is geared more to measuring whether assistance has provided an additional boost to Scottish GVA, rather than increased competitiveness – is limited, both in terms of what products are covered, how regularly evidence is gathered, and most importantly whether it is robust by taking account of the counter-factual. We understand that there have been recent changes in the evaluation methods required by SE.

KP.17 In short, current methodologies do not really provide rigorous analysis of whether those firms who seek help with export promotion are a 'self-selecting' group who (at least in part) already have the necessary means to overcome barriers to entry

KP.18 Therefore we would suggest that much more needs to be done to provide rigorous evidence on what SDI products are seeking to achieve in terms of generating increased activities, outputs, intermediate impacts and outcomes, while taking account of the counter-factual. This suggests that monitoring and evaluation needs to take a more central role within SDI and SE, with the additional benefit that this would also increase the capacity for SDI to gather information that would allow them to 'research' issues surrounding:

- what determines firm-level competitiveness;
- what are the barriers to achieving this;
- what new policy instruments might be devised (or present ones overhauled) to meet the challenges of increased competition from a (ever increasingly) global market-place.

Next steps for current PEF?

KP.19 Analysis of merged data from the Annual Respondents Database (ARD) and the Global Connections Survey (GCS) will provide more evidence on whether exporting/outward FDI has a productivity impact, taking account of the counter-factual

KP.20 There is also a need also to merge in information on those receiving SDI products to test if exporting/outward FDI boosted participation in international markets and/or had further productivity impacts.

KP.21 However GCS data is insufficient to provide the full picture; it needs to be supplemented by primary data collection (survey and case-study) in order to obtain fuller picture of: company needs (e.g. what are the *apparent* and *perceived* competency gaps of Scottish firms, differing by type); and the demand for and likely effectiveness of different policy interventions.

1. Overview and Summary

1.1 The volume of international commerce has surged dramatically within the last two decades, partly encouraged by deregulation, such as the abolition of exchange controls and the erosion of barriers to cross-border investment, and partly by the easing of trade restrictions through both WTO and regional institutions like the European Community. While indigenous firms have traditionally engaged in international markets through exporting goods and services, there is an increasing trend for firms to launch (at an early stage) their international expansion and penetrate foreign markets in the form of outward direct investment (henceforth outward FDI).

1.2 Engagement in exporting and/or outward FDI is generally perceived as being beneficial to individual firms and the economy as a whole. The benefits brought about by 'going international' are varied, as pointed out by Bernard and Jensen (1999), including faster growth of shipments and productivity, diversification of risk, increased innovation, better investment opportunities leading to improved survival prospects and gains for workers in terms of higher pay and better future employment opportunities. Moreover, outward FDI may be associated with additional advantages normally unattainable when merely serving domestic market, such as a relocation of production to lower cost countries, agglomeration economies associated with international locations and scale/scope economies associated with an expanded foreign market size (especially in light of the recent trend towards offshoring in the service sector). Recent evidence documented in a BERR (2009) report indicates that the UK has particularly benefited from increased international competitiveness and openness to international trade and investment. Meanwhile, it also points out that the trend to global value chains in the UK (characterised by vertical disintegration and the globalisation of supply chains) reinforces the importance of existing policies towards the drivers of productivity (viz. investment, innovation, enterprise, skills and competition).

1.3 Given this importance of increased firm internationalisation within a rapidly expanding global economy, Scottish Enterprise (SE) commissioned this review of the existing evidence relevant to the internationalisation activities of Scottish Development International (SDI) that support Scottish-based companies and organisations to do more and better business overseas. The aim of the review is to inform subsequent phases of research (including primary research) and a policy development process, through providing a synthesis of existing evidence and an identification of relevant gaps in knowledge.

1.4 The main objectives of the review set by SE are to provide:

i. An overview of the **strategic rationale** for internationalisation activities, including the contribution to economic growth, other GES and SE objectives, measures and targets, drawing on relevant economic theory/theories

ii. An overview of the **market failures** relevant to internationalisation and the rationale for public sector intervention

iii. A concise **review of internationalisation activities** currently delivered by SDI and comparable organisations (nature, scale, focus)

iv. A synthesis of existing evaluation **evidence on the effectiveness of interventions** (including cost effectiveness) delivered by SDI and comparable organisations. This should include evidence of contribution to economic growth and other Government Economic Strategy (GES) aspirations

v. A synthesis of the main messages from the research (what works well, less well, etc.)

vi. An identification of evidence gaps in the understanding of relevant internationalisation – which can be used to inform subsequent Policy Evaluation Framework (PEF) research and discussion.

1.5 The remainder of this present chapter sets out how we approached these objectives. It initially builds upon previous work we have undertaken for UK Trade & Investment (UKTI) – such as Harris and Li (2005, 2006, 2007a,b,c) and subsequently published research on relevant issues (Harris and Li, 2008a,b,c). However, in addition to updating our earlier surveys of the academic literature, we have also included much more information on outward FDI, which did not feature significantly in the UKTI studies. In addition, there is also a strong focus on SDI activities, to meet the requirements of par. 1.4 (ii)-(vi).

1.6 **Chapter 2** considers the strategic rationale for internationalisation, by bringing together and reviewing a large volume of literature in this area. There are a number of arguments that have been put forward in this international literature on the benefits that can be achieved from internationalisation activities (where these cover outward foreign direct investment – FDI – by Scottish companies, and exporting).[1] Most recently the emphasis has been on the microeconomics benefits from these activities and how these increase firm-level productivity and thus economic growth (cf. Greenaway and Kneller, 2007, for a recent review). New trade theories linked to firm heterogeneity, exporting and outward FDI have been developed and evidence accumulated on the microeconomic importance of internationalisation (e.g. Greenaway and Kneller, op. cit.; while Harris and Li, 2008a,b,c present new evidence for the UK).

1.7 As just stated, a recent literature has developed (primarily with access to new data sources) that shifts the emphasis from aggregate analyses of countries and industries to the impacts on firms of internationalising. With greater globalisation, typified by falling trade costs, there is greater scope for individual businesses to enter export markets, invest directly in overseas activities (such as production facilities and/or collaborative arrangements link to production, distribution and R&D), or increasingly use imported intermediate goods and services. Initially we review the theoretical economic literature on heterogeneity in firms and internationalisation (Roberts and Tybout, 1997; Bernard et. al., 2003, 2004; Melitz, 2003; Head and Ries, 2003, 2004; Helpman et. al. 2004) to provide a rationale for which firms internationalise (both through foreign trade

[1] For the most part we shall limit our discussion to these forms of outward internationalisation although inward FDI (in so far as it may support Scottish companies in becoming international) and inward technology transfer (through imports of mainly capital and intermediate goods and services) will be included when relevant.

and FDI activities[2]). Basically the literature shows that firms with the highest levels of productivity (and thus greatest potential for growth) are able to break down barriers to exporting (such as the sunk costs of entry), and thus there is a general 'sorting' of the most-to-least productive firms that is highly correlated with different forms of internationalisation. We also include the more business and management focussed literature on why certain (smaller, high-tech) firms are more likely to be 'born-global' (i.e. enter international markets from a very early stage following entry into an industry – see for example, Oviatt and McDougall, 1999; Bell et. al., 2003; Harris and Li, 2007b). Both the economic and management strands of the literature have a common link, via more recent resource-based theories, as to which firms are most productive and thus internationalise, that is also linked to the importance of knowledge, learning and absorptive capacity (Rialp et. al., 2005; Harris and Li, 2009).

1.8 We then consider the empirical evidence on who internationalises (e.g. Greenaway and Kneller, 2007; Bernard and Jensen, 1999); as well as whether internationalisation leads to (or pre-dates) higher productivity (i.e., whether higher productivity is necessary as a precondition of overcoming barriers to exporting and/or whether there are learning-by-exporting effects post-entry).[3] The issue of causality between export orientation and productivity, and econometric issues related with how to deal with self-selection, will be an important part of the commentary provided on this area of the literature.[4]

1.9 In addition to the factors determining which firms internationalise (and when), and whether there are productivity impacts associated with such activities, we also review the evidence on export spillovers to local firms.[5] As pointed out in Greenaway and Kneller (2007), this literature is limited.

1.10 The above micro-economic literature mostly concentrates on intra-firm reallocations of resources that is linked to internationalisation; a recent paper by Bernard and Jensen (2004a) goes much further than others since it not only considers whether exporting and productivity are linked at the level of the firm, but it also considers resource reallocations between lower productivity domestic non-export firms and higher productivity firms that export in the US. If the latter gain market share over time, this acts as a further boost to aggregate productivity. There is only a limited literature covering other countries that attempts to link intra-or inter-industry resource reallocation to internationalisation; this literature was considered by Harris and Li (2008a) when conducting their own study of resource reallocations linked to exporting

[2] Much of the recent work has concentrated on the reasons why firms enter export markets, rather than what motivates outward FDI. Thus, we also ensure we cover the latter as well (e.g. Buch et. al., 2005; Faeth, 2009)

[3] That is, export-oriented firms are also assumed to experience an acceleration in productivity growth following entry, under the learning-by-exporting hypothesis. Many of the theoretical models developed in recent years have generally ignored such learning-by-exporting effects, and instead concentrated on the implications of self-selection for overall aggregate productivity growth (cf. Bernard et. al., 2003; Melitz, 2003; Yeaple et. al., 2005; and Bernard et. al., 2007). The major exception is Clerides et. al. (1998) who develop a model that results in lower costs for exporters both as a result of pre-entry selection (to overcome barriers to exporting) and because of learning that occurs when exporting.

[4] Greenaway and Kneller (2007) state "… establishing causality is probably the most challenging issue facing researchers in this area" (p.F148).

[5] Such spillovers are often considered in terms of a positive productivity spillover that then enables domestic firms to also start exporting.

and the impact of this on aggregate UK productivity growth in both manufacturing and services.

1.11 Associated with this area of the impact of resource allocations on aggregate productivity, there are also studies on the link between exporting and the probability of firm closure and/or exiting from export markets. In part we include this literature in order to draw out in some detail the policy implications of international (entry and) exit on productivity levels (cf. Harris and Li, 2007c, 2008c).

1.12 A last major area that is covered in Chapter 2 relates to internationalisation, R&D and innovation. A number of studies have emerged recently that look at the micro-economic evidence on the extent to which firms undertake R&D (and innovate) in order to overcome entry barriers into overseas markets, and/or whether internationalisation stimulates further R&D, leading to further productivity gains. The literature in this area has grown substantially in recent years, including this key issue of causality between export-market entry, outward FDI and R&D.

1.13 The main conclusions from our survey of the (mainly academic) literature, that are most pertinent to any review of the activities of SDI, are set out as follows. When a firm internationalises, it must have sufficient resources and capabilities through absorbing new knowledge to overcome the initial (sunk) costs of competing in international markets. Thus the firm faces the dual challenge of overcoming rigidities and taking on novel knowledge. In this sense, it is to be expected that the development of absorptive capacity will be a necessary condition for the successful exploitation of new knowledge gained in global markets. The speed and ability to accumulate knowledge through exposure to overseas markets will then determine the subsequent pace of internationalisation, as it positively feeds back to decisions to commit resources for future activities in foreign markets.

1.14 The literature also shows that firms that are early to internationalise ('born-global' firms) also must possess distinctive firm-specific assets. Thus both incremental and 'born global' firms are subject to the overarching assumption of the importance of resources and capabilities, as crucial factors determining the process of business internationalisation; a firm's intangible resource base (e.g. organizational, technological, relational and human capital resources) is likely to be of the highest importance in generating a critical level of capability for internationalisation.

1.15 Given that the literature points to firms that go international needing to possess intangible productive assets that give them a competitive advantage, with respect to multinational enterprises (MNEs) it has long been demonstrated that they indeed possess such ownership advantages (e.g. firm-specific intangible assets) which confer the resources needed to overcome additional costs associated with establishing subsidiaries in remote markets. More recently, the seminal work of Melitz (2003) and Bernard et al. (2003) suggests that for exporters too, only the more productive firms are able to overcome sunk costs associated with exporting and thus serve foreign markets via this mode. A strong theme running through all the literature is that firms need to possess productivity advantages so as to serve global markets via exporting (vis-à-vis

serving the indigenous market only); moreover, to engage in foreign production through outward FDI requires an even higher productivity threshold.

1.16 In terms of empirical evidence, both heterogeneity (i.e. productivity differences) and sunk costs are found to be important determinants of firm-level internationalisation. Thus, and in line with the notion of absorptive capacity and the crucial role of R&D in developing such capacity, exporters need to invest in R&D and training to develop internally by absorbing, assimilating and managing technologies and ideas obtained from foreign markets. Innovation facilitates a firm's competency development and brings about scale and scope economies. The resulting greater production efficiency enables firms to penetrate new foreign markets and increase their exports shares.

1.17 For outward FDI, productivity is generally perceived to exert a crucial impact on its decision of going multinational. Higher efficiency achieved in more productive firms helps reduce production costs and thus overcome trade barriers in international markets. In addition increased technological progress, as captured in higher total factor productivity, means that labour productivity can also be expected to be important in facilitating outward investment due to its association with human capital/skills of the workforce. Moreover, and going hand-in-hand with product diversification, the ability to undertake *R&D* and *innovation* reflects important ownership advantages that render innovative firms with first-mover advantages in overseas production. The empirical evidence suggests technology has a highly positive impact on outward FDI at both the industry and firm levels.

1.18 In terms of the impact of exporting at the intra-industry level, studies have shown that as a consequence of increasing exposure to trade, the most productive firms are induced to participate in export markets while less productive firms continue to serve the domestic market only; whereas the least productive firms drop out of the market. It follows that trade-induced reallocations towards more efficient firms will eventually lead to aggregate productivity gains.

1.19 While there is almost universal evidence substantiating the self-selection proposition (i.e. higher productivity leads to export-market entry), the 'learning-by-exporting' hypothesis postulates that export-oriented firms should also experience an acceleration in productivity growth following entry. If this is not true, this has important policy implications: if better firms do self-select into export markets, and exporting does not further boost productivity, then assistance to (potential) exporters could simply be a waste of resources (involving large-scale dead weight and possibly even displacement effects given that firms that export usually sell to domestic markets as well).

1.20 However evidence for 'learning-by-exporting' is less well established in the literature, although Aw et al. (2008) have developed a model of knowledge accumulation and exporting that for the first time has been able to predict positive export-led profitability growth within firms. They further show that this learning effect is reinforced by the endogenous relationship between R&D and exporting.

1.21 Therefore, and based on the (theoretical and empirical) evidence, it is reasonable to argue that benefits from export-market entry may not be

automatic: in order to achieve post-entry productivity gains, exporters need to invest in more R&D and human capital to acquire more foreign technologies and enhance their absorptive capacity. That is, exporting *per se* does not warranty productivity gains; in addition to the need for higher absorptive capacity, studies have shown that productivity only improves significantly when firms are serving, for example, advanced, high-wage export markets; destination is important, with exports to high-income countries more likely to drive 'learning-by-exporting' productivity effects.

1.22 Another important mechanism by which exporters contribute to the economy is through boosting aggregate productivity growth. Studies have shown that trade liberalisation expanded the market shares of the most productive firms by providing them with large export markets, while at the same time such liberalisation forced firms at the lower end of the productive efficiency distribution to quit as international competition intensifies. Thus, increased export opportunities were associated with both intra- and inter- industry reallocations

1.23 In line with this, exporters enjoy better prospects of surviving (i.e. not closing-down) vis-à-vis those having not entered such international markets. Moreover, understanding which factors determine the firm's risk of closure in international markets is important when evaluating the efficacy of export-promotion policies. As pointed out by Alvarez and Lopez (2006), if business survival depends on (sunk) trade costs, public policies might concentrate on reducing these costs. By contrast, if firms' hazard rates of closure in export markets are the result of large differences in productivity between exporters and non-exporters, then polices that concentrate on facilitating entry may not generate lasting increases in export participation if they are not also accompanied by improvements in firm-level productivity.

1.24 Studies have also shown that higher import penetration increases the probability of closure of the least efficient producers, particularly those supplying domestic markets, but lowers the hazard rate for those firms that export (even after controlling for their higher productivity levels).

1.25 Compared with the relative abundance of evidence surrounding the exporting-productivity nexus, there are very few comparable studies directly evaluating the effect that outward FDI has on productivity/performance. Nevertheless, this limited empirical evidence on MNEs does point to higher productivity being experienced in parent companies, although this seems to be rather country and/or industry specific

1.26 There has long been concern that outward FDI/offshoring may lead to a 'hollowing out' of industry, alongside adjustment challenges in labour markets (especially in developed countries) due to the relocation of production abroad. Nevertheless, research evidence also suggests that outward investment may have beneficial economy-wide impacts in that it helps shift the composition of industries in favour of those that are better aligned with the home country's comparative advantages.

1.27 Outward FDI/offshoring may boost productivity growth in the home country for various reasons. Above all, firm investment in global markets can stimulate industrial restructuring in the home country, where the reallocation of

productive resources and change in workforce composition provide additional channels for productivity improvement. Secondly, lower-cost inputs sourced abroad may help free up firms' resources and enable them to invest in adopting advanced technology and building up capacities; and this learning-by-doing effect will also contribute to higher productivity levels. Lastly, through a labour market impact, outward investment is also associated with skill upgrading in the home-country labour force, leading to further gains in (labour) productivity.

1.28 Egger and Egger (2006) in particular have examined the link between international outsourcing and labour productivity (of low skilled workers) and find that in the short run, the productivity of low skilled workers is negatively correlated with cross-border fragmentation in the EU; whereas in the long run, this linkage turns out to be positive. This turnaround is explained by short-run labour market rigidities and long-run factor mobility. Others also provide empirical evidence of positive productivity gains that can be attributed to offshoring.

1.29 However and overall, the academic evidence does not seem to suggest any clear patterns on the nature and/or the extent of the outward FDI/offshoring-productivity relationship, although there seems to be general support that outward FDI can stimulate reallocations of resources and industrial restructuring in the home country by shifting labour-intensive/low-wage processes to overseas markets whilst allowing parent firms to concentrate on developing core competences and moving up the value-added chain with higher wages being paid. In particular, if key factors in the wider business environment - such as infrastructure, taxation and skills availability – are supportive of high value-added activities at home, then the impact of outward FDI flows will lie in the relocation of lower value-added/labour-intensive activities to more cost competitive locations. This should in turn lead to industrial restructuring at home favouring higher value-added activities paying higher wages.

1.30 All in all, the literature shows that a decrease in the costs of offshoring can affect the returns on low- and high-skilled labour rather differently. With respect to low-skilled labour, as long as a positive productivity effect outweighs any negative relative-price and labour-supply effects, low-skilled labour will benefit; otherwise the return on low-skilled labour will decrease. In contrast, the return on high-skilled labour will increase in all cases (they will always benefit from reduced costs of offshoring), since both the relative-price effect and the labour-supply effect are positive. And therefore, from the welfare point of view, the important issue to consider is whether/when the positive effects for low-skilled labour outweigh the negative effects.

1.31 The empirical results documented in the literature present a mixed picture so that overall the evidence gathered using aggregate data seems to indicate that offshore outsourcing has a positive impact on skill intensity. There may be an initial loss of low-skilled jobs in the short run; however, in the long run, this loss would be compensated by the creation of new jobs as a result of cost-reductions from offshoring.

1.32 Turning to international knowledge diffusion and spillovers from trade and investment, the literature in this area suggests that spillover effects are not expected to be automatic but are dependent on the domestic firms' capacity to absorb the knowledge provided through their linkages with international best

practice. It follows that the successful transfer of international knowledge is subject to certain prerequisites being met. Thus the existence of technology gaps is a necessary but not sufficient prerequisite leading to international technology transfers. There is a strong expectation (which is tested in the literature) that industries (and firms in the more disaggregated studies) that lie below the technological frontier are much more likely to benefit from technology transfers that close the gap, if they posses the internal resources and capabilities that allow them to internalise the external knowledge available in the frontier technology. Put another way, they need to have the capacity to adopt the technology.

1.33 Undertaking internal R&D and investing in human capital are direct ways of increasing the level of absorptive capacity needed to acquire this tacit knowledge, while the empirical evidence on whether and how technology transfers take place through trade/investment remains inconclusive.

1.34 The linkage between exports and innovation has been characterised by increasing interdependence in the process of globalisation. There is ample evidence provided at the macroeconomic level regarding the linkage between a country's export performance and its creativity/innovation. A uniformly positive correlation has led to a consensus that a nation's exports are positively associated with its knowledge accumulation/innovative activities

1.35 In contrast, empirical studies at the firm level provide a rather different and unique perspective to disentangle this export-innovation relationship, taking into account the heterogeneity of firm characteristics amongst exporting and non-exporting firms. Various empirical studies have emphasised the role of technology and innovation as one of the major factors contributing to facilitating entry into global markets, and thereafter maintaining competitiveness and boosting export performance. Counterarguments on causality going from exporting to innovativeness also exist: primarily, being exposed to a richer source of knowledge/technology that is often unavailable in the home market, exporting firms could well take advantage of these diverse knowledge inputs and enhance their competency base, and hence in this sense, such learning from global markets can foster increased innovation within firms.

1.36 In addition, and with regard to an outward FDI-innovation relationship, firms belonging to an MNE have been found to have a higher innovation propensity than those that were not part of an MNE. Moreover, a firm's propensity to innovate increased with the degree of multinationality of the parent company. Others have provided support for the more general position that R&D investment and multinational expansion mutually reinforce each other.

1.37 Owning and operating foreign subsidiaries is also expected to bring about knowledge and expertise that is often not available in the domestic market, through transferring resources gained overseas back home. In addition to enhancing the own-innovation capacity in parent firms, outward FDI provides a potential channel for such specialised knowledge to spillover into the home country via interaction with indigenous firms. Although there is a well-established literature considering spillovers brought about by inward FDI, there is a death of evidence on domestic knowledge spillovers associated with outward FDI.

1.38 Outward FDI has also been shown to facilitate knowledge spillovers that impact on the export orientation of domestic firms. These export spillovers take place if there is a transfer of knowledge from foreign markets to domestic firms, which can lower the costs of entry into export markets. In contrast to the case of spillovers from exporting, which is subject to a learning process by exporters, domestic MNEs are automatically assumed to source at least some of their technology from overseas (via their foreign subsidiaries). Overall, the literature on export spillovers generally points towards a complementarity between technological activities undertaken by MNEs at home and innovation in domestic firms. In particular, the existence of competition effects means that in order to compete with MNEs in the same industry (which are often in a more advantageous position due to their access to superior technology), local firms may have to invest more in R&D so as to upgrade the quality of their products and/or achieve cost advantages. Furthermore, the mere presence of MNEs in a foreign country may help familiarize foreign customers with common business practices in the MNEs' home country; however, domestic firms have to undertake a certain amount of innovating activity in order to develop their absorptive capacity to take advantage of these knowledge spillovers from MNEs.

1.39 In **Chapter 3** we consider the case for government invention with regard to business internationalisation. This is mostly predicated on the basis that more internationalisation results in greater productivity improvements (linked to innovation activities and improvements in efficiency), and that there are 'market failures' that prevent the realisation of these gains from entering overseas markets. Rather than take a narrow theoretical of market failure, there is a more general policy orientated usage, which refers simply to circumstances in which there are significant potential economic benefits which the private sector unaided would be unable, or unlikely, to achieve.

1.40 Basically the main 'market failure' usually cited is that there is imperfect information in product markets which impedes internationalisation since potential buyers and sellers need access to the identity and location of potential suppliers and customers, and information about the prices and quality of the goods and services that may be traded. Thus there is a rationale for government intervention, assuming that this leads to a direct increase in economic benefits from more firms gaining information and thus acting on that information (e.g., by internationalising.). Casson (1999) argues that in this situation the government has a comparative advantage in information, and it is on this basis (not any narrow interpretation of market failure) that it can justify intervention.

1.41 Searching for information is costly, and when firms do not engage (fully) they only have a partial knowledge about the market, and thus may underestimate the potential benefits of internationalisation (both private benefits to themselves and the social benefits that greater trade may bring to the wider economy). It is a moot point whether this is a market failure *per se*, but anyway there would appear to a robust case for government intervention because it has a potential advantage in the provision of information that can boost transactions in the market resulting in a net gain to all those involved (i.e., the government helps to 'complete' the market through the provision of relevant information). Research carried out as part of DTI evaluations have "repeatedly shown that without support many firms would fail to undertake important marketing activities –

including participation in trade fairs and missions – even though, having gained experience of these activities, they would undertake them on subsequent occasions without further support" (Booth di Giovanni, 1997). More recent evaluations carried out on a rolling basis for UKTI continue to confirm this additionality effect of intervention, and indeed such additionality is often cited as evidence that there were 'market failures' that needed correction.

1.42 Indeed it would be costly and wasteful of resources for individual firms to undertake sub-optimal, high cost information gathering, when government has a particularly well-placed role to provide such information as a public good. There is therefore a role for government to facilitate access to networks of business contacts in overseas markets (especially for SMEs); while publicly financed expenditure on knowledge-generating export promotion activities is further justified if networks act as an informal barrier to market entry (if they limit the extent to which information is made available to outsiders).

1.43 Overall, it would seem that there is a clear case for government intervention to help firms overcome barriers to internationalisation that are mostly linked to information costs that individual firms would (or could) not meet without government assistance.

1.44 As to the government response to such market failures, a recent review of how governments' intervene in this area stated that the basic role is "… to help (potential) exporters find markets for their products, as well as provide them with a better understanding of products demanded in different export markets" Others have provided a wider description of government intervention (which includes a more general view of internationalisation extending beyond just increasing the volume of exports); there is a recognised need for firms (a) to learn about exporting (which markets, finding customers, advice on business plans, logistics and finance); (b) to grow their international business (those with some experience require assistance to plan entry into new markets, obtain growth finance, networking with new customers, and finding new partners); and (c) to become globally competitive (more experienced firms requiring high-level market and strategic insights and assistance to access partners and use more sophisticated business models involving outward FDI-type activities). Thus the role of government (agencies) in this area should cover more than just firm-based business advice.

1.45 There is a need to ensure that firms have matching capabilities to new and emerging market opportunities; access to relevant information and advice; and better international business and management skills. A recent report by EU experts (EU, 2007) cites the main barriers to greater internationalisation for SME's; as: (1) insufficient managerial time and/or skills required for internationalisation; (2) lack of financial resources; and (3) lack of knowledge of foreign markets, mostly due to points (1) and (2). Hence, in response to such barriers, the experts argue that "… successful and sustainable internationalisation will require an internationalisation strategy and the acquisition of a series of capacities, abilities and resources prior or at the first steps of internationalisation". That is, they are making a direct and clear link between internationalisation (especially exporting) and competitiveness, such that boosting internationalisation requires integrating policies for competitiveness and growth

1.46 Thus in relation to government responses to 'market failures', it would seem that current thinking has moved beyond just considering such 'failures' as mostly information needs, and thus potentially indicative of resource-gaps faced by (especially smaller) firms; rather there are potential capability-gaps that need to be addressed, which are in line with our review of the extant academic literature as set out in Chapter 2.

1.47 Turning to SDI activities to combat market failures, those Designated Relationship Managed (DRM) growth firms assisted in 2006 who were surveyed in the Scottish Government's Global Connections Survey stated that a lack of resources/managerial time is the most important barrier to exporting, followed by factors associated with various aspects related to risk and uncertainty such as exchange rate movements, lack of market information, what prices to set, and cultural/language issues. The type of assistance firms believe they need to overcome these barriers comprised mostly finding (and marketing to) customers and/or finding agents/partners for supplying in the host country. Thus the perceived barriers and associated requirements for assistance from DRM companies would seem to match well with the portfolio of products supplied by SDI, i.e., direct assistance with attending international exhibitions, overseas missions, learning journeys; overseas market support; and preparation for internationalisation (both for inexperienced and more experienced firms operating overseas). Indeed, SDI have other tailored products that link more with the strategic and long-term internationalisation needs of companies.

1.48 However, many policy commentators have begun to argue that assistance to improving productivity, through greater support for R&D and innovation activities, greater access to venture capital for firms wanting to internationalise, and greater support in developing international network relationships, is more relevant and therefore beneficial. There is a need to assist internationalising SMEs to identify, leverage, and harness additional human, financial, and knowledge resources.

1.49 The expert report EU (2007) argues that support needs to consider the key variables (such as availability of finance, company size, stage of internationalisation, sector, location, target markets, etc.) that influence the internationalisation process, and thus "… this strongly supports an approach based on individualised support to each SME". Other writers (e.g. Wright et . al., 2007) also emphasise the skills and resources needed to sustain and/or increase internationalisation activities, noting especially "… the need to develop more informal and tacit knowledge have been identified as major barriers to SME growth in general".

1.50 As to the overall response by government to help firms adjust to globalisation, it has been argued that governments have a twofold role in facilitating business internationalisation: (i) to intervene in areas where there are market failures; and (ii) to ensure that firms face the 'right' incentives to adjust to globalisation. The latter points to the need for credibility of the overall policy stance (i.e. that firms believe in the permanency of the government response to liberalisation) since it impacts significantly on the incentives of firms to incur the costs of adjustment. Therefore, trade liberalization needs to be complimented by measures that facilitate/allow the reallocation of factors of production from low to higher productivity firms. This includes promoting entry, removing exit barriers, and

promoting innovation (R&D) to ensure firms have adequate levels of absorptive capacity. This also includes the need for policies that ensure that labour-market flexibility is complimentary and facilitates such churning, since economies with sluggish labour markets gain least from globalisation as trade barriers are removed.

1.51 Overall, it is argued that the emphasis needs to be on promoting a competitive business environment rather than targeting support on market failures. There is a more general need for policies that help firms to acquire those characteristics that lead to higher productivity, and thus have the ability to overcome sunk entry costs in international markets (i.e., policies that enhance the absorptive capacity and dynamic capabilities of firms would appear to be the key requirement for boosting and maintaining participation rates in export markets).

1.52 **Chapter 4** reviews the products used by SDI to meet the needs of firms facing barriers to (further) entry into international markets. This allows an initial assessment of whether most activity by SDI is geared towards helping (potential) exporters find markets for their products, as well as the extent to which SDI are also engaged in helping firms to become globally more competitive. It is recognised that SDI offers support through Account and Client Managers that is only a part of the overall assistance to improve competitiveness that is provided by SE; however, we continue to make a distinction here between those SDI products that primarily seek to help firms to increase their export volumes, from those that seek to improve productivity and competitiveness and thus long-run sustainability in supplying overseas markets.

1.53 In terms of the range of assistance covered by SDI products, an examination of these shows that different types of companies are catered for, from those new to exporting to those wishing to become truly global. Activities range from providing support to export promotion, by overcoming informational barriers to exporting, through to developing action plans for internationalisation. SDI provides a similar range of products when compared to those offered by UKTI and other countries, although the SDI portfolio is in general more extensive, with more help available to improve overall internationalisation strategies. Whether these products deliver more than a just basic service of helping (potential) exporters find markets for their products, to actually increasing their internal capabilities and knowledge base and thus helping Scottish companies actually become globally competitive, depends on where most emphasis is put and upon an evaluation of the impacts of each product and programme. The latter is considered in the Chapter 5; while Chapter 4 considers the distribution of products both across time and across broad industry groups.

1.54 Nearly two-thirds of SDI products between 2005-2008 went to help firms attend exhibitions, go on missions, and obtain market intelligence on overseas locations. Delivery of those products with the greatest likelihood of increasing long-term competitiveness was low; similar support was given before the formal introduction of DRM in 2005.

1.55 In summary, while the range of products available from SDI is relatively broad (indeed broader than many other similar agencies operating across the globe), covering firms new to exporting as well as those wishing to become global companies, in practice much of its activities seems to have been concentrated at the lower end of the productivity-enhancing spectrum raising the question of

does SDI need to do more in terms of improving productivity in Scottish firms, which will not only increase the probability that they will become (more) international, but will also help to ensure they stay international and that spillovers from such activities are maximised within the indigenous and non-traded sectors within the economy?

1.56 As to the linkages between SDI activities and the Scottish Government's Economic Strategy (GES), the top level outcome in the GES is higher growth in the Scottish economy. Most economic theory in this area acknowledges that the most important long-run driver of growth is productivity, whereby enterprises acquire knowledge assets which are key in determining competitiveness, productivity, and ultimately output growth

1.57 A distinction is made between inputs (products) from SDI that help firms to find overseas markets for their goods and services, and products that concentrate on helping firms to become globally more competitive in the longer-run. In principle, the activities undertaken by SDI are conducive to achieving both, but in Chapter 4 we show that in practice there is reason to believe that proportionately more resources are devoted to products that help firms overcome short-run barriers to entering export markets, but which are not necessarily ideal for enhancing the capabilities of (SME) firms to achieve greater productivity in the medium- to-long term. To the extent that this is the case, the question arises as to whether SDI is making its full contribution to the overall goals of the GES, although it also needs to be recognised that SDI's role in helping to improve overall Scottish productivity is part of the wider role undertaken by Scottish Enterprise.

1.58 In **Chapter 5** we review the existing evidence on the impacts of each SDI product and programme, both in terms of whether these resulted in more activities and outputs, but also in terms of contributions to intermediate impacts and outcomes (e.g., increasing productivity in both firms and in the overall economy, so boosting growth).

1.59 A range of evaluation reports were available for review, and it was apparent at the outset that most evaluation studies use a standard evaluation approach which amounts to surveying usually a small number of recipients to find out if, in their opinion, assistance made a difference. The major problem that arises with this form of evaluation is that it almost never constructs the counterfactual – that is, what would have happened in the absence of assistance. The closest one gets is to presume that respondents to surveys (conducted maybe some time after assistance was provided) really can separate out the specific effect that usually a marginal level of help has had on the whole process of producing goods and services and making profits, and that they can provide a sufficiently accurate and unbiased estimate of this marginal impact.

1.60 Other forms of evaluation, particularly those designed to provide the counterfactual, and thus evaluate how assisted firms performed against a 'control group' of non-assisted firms (which have very similar characteristics), are typically not undertaken by SDI.

1.61 In general our review of the evaluations undertaken for SDI and SE suggests that there is a general lack of rigorous monitoring and evaluation evidence on an on-going basis of the products available from SDI. In particular, there is a pre-

occupation in the evaluation studies of measuring economic impacts on Scottish GVA without any hard evidence of the counterfactual position. It is therefore difficult to know if the products have indeed improved the productivity and competitiveness of companies, and thus do lead to increases in Scottish GVA that would otherwise not have occurred.

1.62 Few evaluations consider whether assisted firms have improved in terms of intermediate impacts (e.g., productivity, innovation, skills), and virtually none of the evaluations consider the role and importance of R&D and innovation as drivers of firm performance.

1.63 In summary, the evaluation studies reviewed in Chapter 5 seem to indicate that SDI has an impact, more probably that firms engage in activities that increase the scale of exporting. But there is little evidence to show whether SDI is helping Scottish companies actually become globally competitive. That is not to say this is not happening, but the evaluation evidence is not providing information that would allow us to draw conclusions in this area. In a similar way, it is also difficult to measure the extent to which SDI is meeting the productivity and growth objectives of the Scottish Government.

1.64 A caveat to the comments made in the last paragraph comes with the recent Ekogen (2009) assessment of the economic impacts of SE's Account and Client Managed interventions, In general, they found that around two-thirds of companies reported that SE support had made no difference to performance (indeed a small number reported it had worsened performance). However, those products that were more closely associated (based on statistical testing) with having an impact on GVA were exhibitions, missions and learning journeys, and the international strategy workshop. Thus, within the overall portfolio of Account and Client Managed companies assisted by SE, the SDI products seem to be having the largest impact in terms of increasing GVA in Scotland.

1.65 Lastly, **Chapter 6** considers a number of issues arising from this review that can be considered under the heading of 'evidence gaps'. Our findings suggest that there would appear to be a lack of demand for those SDI products that enhance productivity and so help to build greater competitiveness. It is unclear the extent to which this is due to Scottish companies not understanding or realising the benefits of such products, or in fact if demand is constrained by a supply-side under provision of products and programmes such as GCDP, international strategy workshops, and international mentoring. This is an obvious evidence gap, which in our view needs to be looked at, and presumably relates to the role played by the SE Account-client manager who works with companies to improve their performance.

1.66 Throughout Chapters 3-6, we have discussed the balance needed between products that increase the volume of international activities, and those that also lead to better quality (potential) exports; this points to a second major evidence gap – which is that the current approach to monitoring and evaluation by SDI provides little hard evidence on the outputs, and more especially the outcomes, of SDI activities. Even the evidence that is obtained through standard evaluations (which is geared more to measuring whether assistance has provided an additional boost to Scottish GVA, rather than increased competitiveness) is limited, both in terms of what products are covered, how regularly evidence is gathered, and most importantly whether it is robust by taking account of the

counter-factual. In short, *current* methodologies do not really provide rigorous analysis of whether those firms who seek help with export promotion are a 'self-selecting' group who (at least in part) already have the necessary means to overcome barriers to entry.

1.67 Therefore, we would suggest that much more needs to be done to provide rigorous evidence on what SDI products are seeking to achieve in terms of generating increased activities, outputs, intermediate impacts and outcomes, taking account of the counter-factual. This suggests that monitoring and evaluation needs to take a more central role within SDI and SE, with the additional benefit that this would also increase the capacity for SDI to gather information that would allow them to 'research' issues surrounding what determines firm-level competitiveness, what are the barriers to achieving this, what new policy instruments might be devised (or present ones overhauled) to meet the challenges of increased competition from a (ever increasingly) global market-place.

1.68 Establishing this greater capacity and role for monitoring and evaluation would very likely require something similar to setting up of a team like the Economics and Evaluation Team (EET) that operates in UKTI. This is discussed in Chapter 6, with a particular emphasis on the need for more research and monitoring information to underpin the activities of SDI.

Internationalisation, Scotland's Balance-of-payments and growth

1.69 Lastly in this chapter we consider the wider, more macro-orientated, argument as to how internationalisation can benefit the Scottish economy through improvements in the balance-of-payments. This is also relevant from the wider perspective of the replacement of declining (export-orientated) industries and the need for Scotland to exploit its comparative/competitive advantages (cf. Universities Scotland, 2009, for an overview of some of the issues involved).

1.70 A major determinant of Scottish growth is the demand for its exports; it is argued by those that support the Kaldorian approach to regional growth (cf. Kaldor, 1970; Dixon and Thirlwall, 1975; and Thirlwall, 1980) that exogenous demand in the export-base is *the* key driver of regional output (based on Harrod's foreign-trade multiplier approach).[6] According to this Kaldor-Dixon-Thirlwall model, as amended by Thirlwall's (1980) balance-of-payments constrained growth approach, regions with a low income elasticity of demand for imports and a high income elasticity of demand for exports will experience a higher growth trajectory, compared to a region dominated by firms producing relatively low income-elasticity exports (e.g. standardised 'mature' products), and at the same time being relatively dependent on imports (e.g. a peripheral region having suffered severe industrial decline and then subsequent employment growth in 'footloose' FDI firms). For the region producing lower

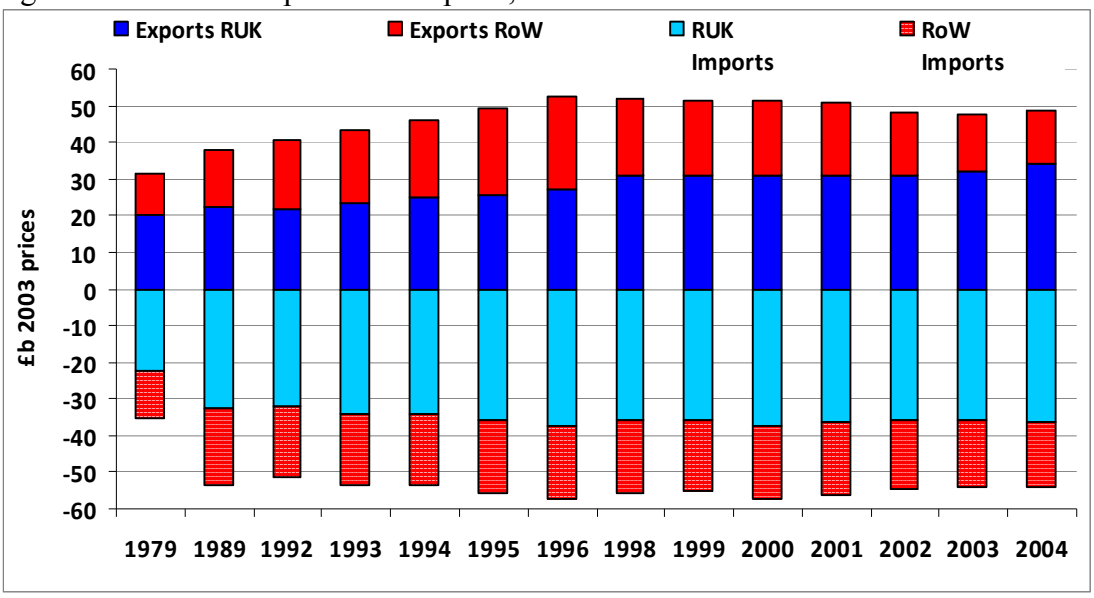
[6] Exports are the only component of demand that are not constrained by imports (i.e., increases in both consumer and investment spending lead to an increase in imports). Put another way, exports are the only element of demand that simultaneously relaxes the balance-of-payments constraint on long-term economic growth (see Harris, 1989, Chapter 2; and Harris, 2008, for more details).

quality exports and dependent on imports, the result can be long-term relative decline (see McCann, 2001, Figure 6.14).

1.71 Of course, in a regional setting there is no necessary long-run binding constraint through the balance of trade (i.e., exports minus imports), as long as the region is either generating a surplus on its capital account and/or receiving a net inward transfer of resources from the government. That is, if a region like Scotland runs a long-run balance of trade deficit (with imports exceeding exports), this has to be 'paid for' either by higher inward government transfer payments (whereby tax receipts from local tax payers are less than government spending – which includes welfare payments); higher inward FDI; borrowing from the banking system; the sale of assets to residents outside the region; or a reduction (running down) of the stock of savings. Note the last three reduce the stock of wealth in the region and so cannot continue indefinitely, and it seems unlikely that firms will be willing to invest into a region if and when it faces a long-term trade deficit which is indicative of long-run competitiveness problems. Therefore, a long-run balance-of-trade deficit needs to be sustained in such circumstances by the region continually receiving a fiscal transfer from the central government.

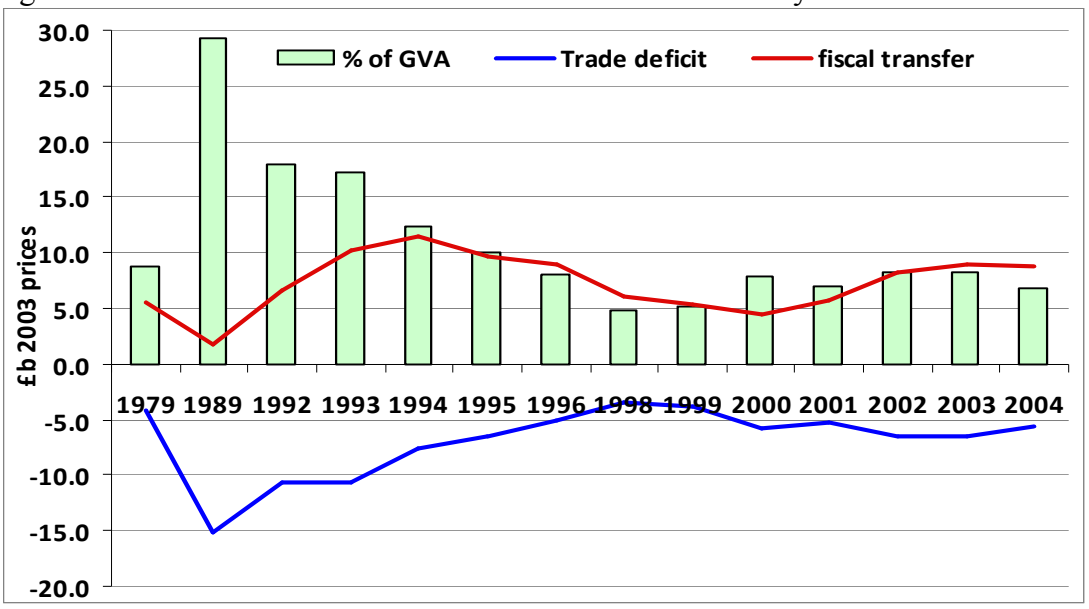
1.72 Since the late 1970's (and probably before this although data are not available for confirmation) Scotland has had a trade deficit; Figure 1.1 shows exports and imports of goods and services both from the rest of the UK and the rest of the world, indicating a trade deficit of some £4.1b in 1979 (2003 prices) when manufacturing production was at (or close to) its post-WWII peak, a deficit of £15.2b in 1989 (following significant deindustrialisation in the 1980's), and an average deficit in 2000-2004 of around £6b p.a. (see Figure 1.2). Exports to the rest of the world increased by around only 31% in real terms between 1979 and 2004 (and after the peak of 1996 declined by some 43% by 2004), while exports to the rest of the UK increased by just over 69%. In addition, while real imports from the rest of the UK increased by over 63%, Scotland increased its imports from the rest of the world by 37% between 1979 and 2004.

Figure 1.1: Scottish exports and imports, 1979-2004



Source: Scottish input-output tables

Figure 1.2: Trade deficit[a] and fiscal transfer[b] from UK Treasury



[a] the trade deficit (exports minus imports) is also represented as a % of GVA
[b] fiscal deficit for 1979 uses data for 1980
Source: Scottish input-output tables and GERS (various issues; McGregor et. al., 1997)

1.73 Figure 1.2 shows that the trade deficit has coincided with a net inward fiscal transfer from the UK Government, necessary to maintain Scottish GVA throughout the period. This confirms that Scotland's private sector has persistently underperformed (since the trade deficit is unlikely to be matched by a surplus on the capital account[7], but rather is more likely to be sustained by higher public spending in Scotland compared to 'better off' regions of the UK).

1.74 Note, Figure 1.2 also shows that while Scotland had a larger trade deficit in 2004 compared to 1979, the share of the trade deficit as a percent of Scottish GVA actually declined from 8.7% to 6.8%. This is because the non-trade sector has grown more than traded goods and services, even though Figure 1.1 (and par. 1.18 above) shows that the (real) value of exports and imports had grown significantly in the 25 years covered. This is partly the result of a relative decline in the importance of sectors like manufacturing, which has traditionally accounted for a large part of the traded goods sector, and a growth in non-traded goods and services linked to government and personal services.

1.75 Table 1.1 provides more details on how the economy (and the propensity to export and import) has changed over time. In 2004, total imports made up 23.4% of the total value of goods and services supplied in Scotland;[8] while exports made up 21% of goods and services demanded from Scottish producers[9] – with by definition demand being equal to supply. Thus, in 2004, there was a balance of trade deficit as the value of imports exceeded exports by some 2.4% of total Scottish supply (Figure 1.2 indicates that this amounted to a deficit of £5.6b in 2003 prices).

[7] Data is not available to provide an accurate picture of Scotland's capital account.
[8] That is, Scottish producers provided the other 63.4% of all goods and services available to purchasers (whether these purchasers were based in Scotland or elsewhere).
[9] Thus, 79% of output produced in Scotland went to Scottish consumers (either as intermediate demand from industry, or as final demand by consumers, the government or fixed investment).

Table 1.1: Percentage of goods and services supplied in Scotland accounted for by imports and exports[a], 1979 and 2004, by sector

	Supply-side			Demand-side			
2004	Imports RUK	Imports RoW	Total imports	Exports RUK	Exports RoW	Total exports	*Relative importance*[b]
Agriculture, forestry and fishing	12.4	11.0	23.4	22.4	10.9	33.3	*2.0*
Mining	24.9	2.2	27.1	24.2	8.4	32.6	*1.9*
Manufacturing	25.6	15.2	40.8	16.9	12.4	29.3	*35.3*
Energy and water	9.5	0.5	10.0	22.2	0.6	22.7	*3.3*
Construction	7.5	0.1	7.6	9.4	0.7	10.1	*5.9*
Distribution and catering	18.8	12.7	31.5	5.3	0.9	6.2	*4.6*
Transport and communication	16.1	7.7	23.8	12.9	3.1	16.0	*6.8*
Finance and business	11.1	3.4	14.5	19.6	4.7	24.2	*22.5*
Public admin	0.2	0.0	0.2	0.0	0.0	0.0	*5.5*
Education, health and social work	1.5	0.9	2.4	3.5	0.7	4.2	*7.8*
Other services	10.6	6.1	16.7	17.8	1.5	19.3	*4.4*
Total	15.6	7.9	23.4	14.7	6.2	21.0	*100.0*
1979							
Agriculture, forestry and fishing	10.5	19.5	29.9	9.1	1.8	11.0	*4.4*
Mining	11.9	38.9	50.8	15.1	11.2	26.4	*2.4*
Manufacturing	45.0	24.5	69.5	42.2	24.6	66.8	*42.5*
Energy and water	1.1	0.0	1.1	2.3	0.0	2.3	*3.4*
Construction	0.5	0.0	0.5	0.0	0.0	0.0	*9.7*
Distribution and catering	5.1	2.8	7.9	1.3	0.0	1.4	*12.3*
Transport and communication	12.5	13.2	25.7	17.6	7.7	25.2	*7.1*
Finance and business	26.8	1.1	27.9	14.2	2.1	16.3	*3.7*
Public admin, education, health	0.0	0.0	0.0	0.0	0.0	0.0	*8.2*
Other services	5.5	3.2	8.8	2.6	0.1	2.7	*6.3*
Total	22.8	13.7	36.6	20.9	11.4	32.3	*100.0*

[a] Figures are the value of import and exports in each sub-group divided by total supply in that sector (i.e. output produced in Scotland plus imports, in purchaser's prices). Note total supply (output + imports) equals total demand for the products of each sector.
[b] The share of total supply/demand in each sector of total Scottish output.

Source: Scottish Input-Output tables

1.76 The relative importance of trade (exports and imports) declined between 1979 and 2004, since in 1979 imports accounted for 36.6% of supply, while exports were 32.3% (down 11.3% on 1979). In absolute terms, exports and imports increased (as the economy grew), but the growth in trade was lower than the growth in non-traded goods and services.

1.77 As can be seen from Table 1.1, in 1979 manufacturing accounted for some 42.5% of total Scottish goods and services produced; in 2004 this had fallen to 35.3%. In addition to this decline in the sector with the greatest propensity to trade, there was also a decline in the importance of traded goods within manufacturing such that by 2004 only 41% of goods supplied were imported (compared to nearly 70% in 1979), and only just over 29% of goods produced in Scotland were exported (compared to nearly 67% in 1979). It is this larger fall in exporting (to the rest of the UK) that has had the largest impact on the aggregate Scottish trade deficit.

1.78 Other sectors have to some extent begun to replace manufacturing as the primary sector for traded goods and services. Table 1.1 shows that in 1979 finance and business services accounted for some 7.1% of total production, rising to 22.5% by 2004, with a significant increase in the proportion of goods exported over this period (from 16.3% to 24.2%), and a commiserate fall in imports (from 27.9% to 14.5% of total supply). The agriculture, forestry and fishing sector has also increased its reliance on exports (particularly to the rest-of-the-world), although it underwent a relative contraction over the period considered. In other sectors relatively important to the economy, such as transport and communications, there was a significant decline in exporting, exacerbating the problem of the trade deficit over the period.

1.79 In summary, the importance of traded goods and services has declined in relative terms in the last 25 years, and declined absolutely since 1996 by some 43% when exports outside the UK are considered. Scotland continues to have an average trade deficit of nearly 8% p.a. of GVA since 1999. In short, the economy is not benefiting from export-led growth, the latter being arguably the main source of long-term growth in a small, open regional economy like Scotland. Such reliance on exports for growth is not to exclude the importance of supply-side factors (especially innovation and R&D, which lead to higher total factor productivity), since an important facet of the Kaldor-Dixon-Thirlwall model of regional growth is the role played by productivity to increase the quality (and thus income-elasticity of demand) of exports (see Harris, 2008, for an explanation). This has led Universities Scotland (2009) to argue that "… as well as expanding exports, Scotland's best hope of economic growth is through improvements in our productivity." Of course, export industries are (more) susceptible to changes in long-term economic conditions, as they tend to grow and decline on average faster than industries that mostly support the domestic market. This is because competition in international markets is stronger, and firms that trade have to continually adopt 'best practice' in order to maintain growth (and survival).

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2. Business Internationalisation: A Review of the Literature

Models of Internationalisation & the Role of Resources

2.1 In an open economy, we can expect the role of knowledge and absorptive capacity [10] to be particularly crucial in the growth of internationalising firms in that there is a stronger need for them to acquire, apprehend and assimilate new knowledge/information in order to compete and grow in global markets where they have little or no previous experience. Drawing on the literature on internationalisation, this section reviews the process of firms' going international and most importantly, the critical role played by knowledge, resources and capacities.

2.2 From a resource-based perspective[11,12], the pursuit of firm-specific resources provides the principle stimuli of a firm's decision to trade and invest in international markets. For instance, on the international stage, these distinctive firm-specific assets include cost advantages (the ability to acquire factors of production at a lower cost), the control of superior production technology, specialised know-how about international production, technological opportunities, brand names, extensive international contacts and networks, better distribution channels, superior technological and marketing expertise, etc., all of which contribute to the capacity to exploit economics of scale and scope. These advantages conferred by resources and capacities can greatly enhance firms' international competitiveness and consequently bring about a higher rate of return on sales/assets and profitability, particularly in global markets characterised by a variety of market imperfections such as asymmetric information, capital immobility and the like.

2.3 When a firm internationalises, it must have sufficient resources and capabilities through absorbing new knowledge to overcome the initial (sunk) costs of competing in international markets in order to organise for foreign competition, thus facing the dual challenge of overcoming rigidities and taking on novel knowledge (Eriksson et al., 1997). In this sense, we could expect the development of absorptive capacity to be a necessary condition for the successful exploitation of new knowledge gained in global markets. Taking exporting for instance, Lopez Rodriguez and Garcia Rodriguez (2005) propose a conceptual model (see Figure 2.1) to explain how technological resources impact upon a firm's export behaviour through conferring cost/product differentiation advantages. This model can be extended to include the notion of

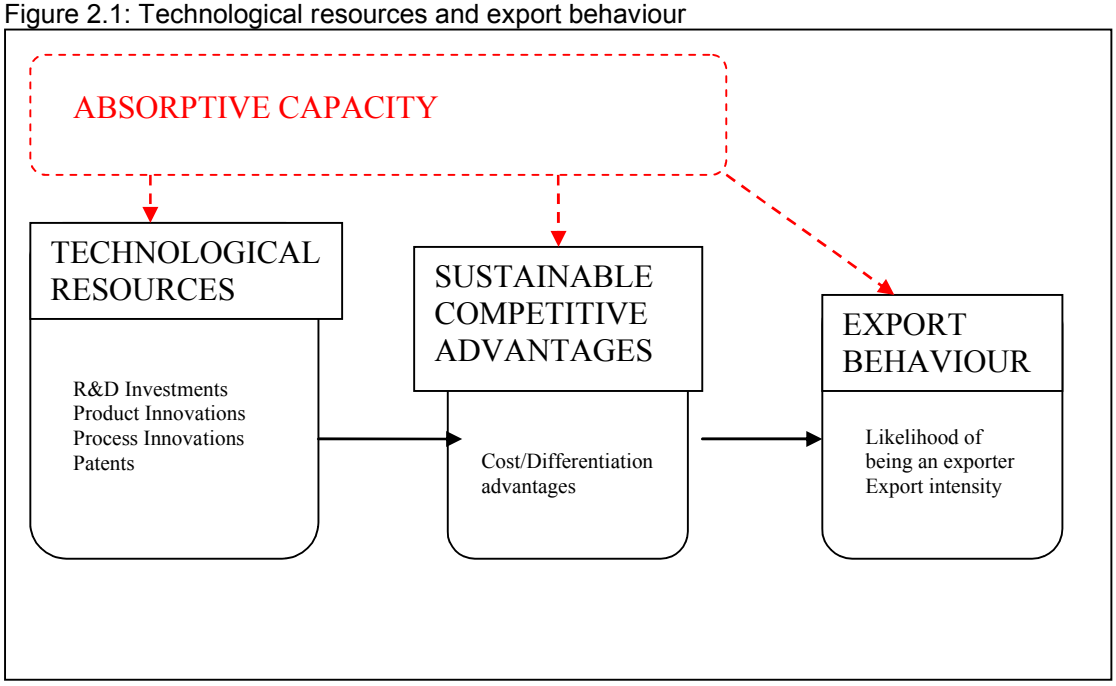
[10] The notion of 'absorptive capacity' was initially put forward by Cohen and Levinthal (1990), who argued that the firm's "prior related knowledge confers an ability to recognize the value of new information, assimilate it and apply it to commercial ends" and "these abilities collectively constitute what we call a firm's 'absorptive capacity' ". Thus, in simple terms, absorptive capacity is the firms' ability to internalise external knowledge.

[11] The resource-based view (RBV) of the firm was initially put forth by Penrose (1959), and subsequently developed by Wernerfelt (1984) and Barney (1991, 2001) etc. The thrust of this viewpoint lies in the established assumption that 'better' firms possess intangible productive assets that they are able to exploit to derive competitive advantages.

[12] For more elaboration on the significance of resources in this literature of international entrepreneurship, see Bloodgood *et al.* (1996) and Bell *et al.* (2003).

absorptive capacity – as it provides the firm with the ability to internalise new knowledge gained in global markets – and the development of absorptive capacity could be expected to be a necessary condition for the materialisation of all these stages depicted in this model.

Figure 2.1: Technological resources and export behaviour



Source: authors' expanded version of Lopez Rodriguez and Garcia Rodriguez (2005).

2.4 The area of international entrepreneurship has been well-researched especially in the recent business and management literature, which offers various conceptual models with intuitive approaches to explaining the phenomenon of internationalisation, from the traditional incremental models to the more recent early-internationalisation models.

Traditional Incremental Models

2.5 Traditional models (e.g. the Uppsala model of the evolutionary development of globalising firms) consider internationalisation as incremental, and crucially determined by the speed and ability to accumulate knowledge through exposure to overseas markets. Additional costs and uncertainties are faced when entering a new foreign environment, although this literature is more concerned with explaining which processes are important in explaining how such potential barriers are overcome. As such, these models offer a less quantitative and more descriptive approach to describing the role of knowledge accumulation in countering barriers to internationalisation.

2.6 The process/stage models of internationalisation is also underpinned by the importance of developing competence and building up the resource base, where experiential knowledge of a foreign market is linked to an increased speed of commitment to the market (Johanson and Vahlne, 1990). Furthermore, it can be

hypothesised that the firm's age at first entry into export markets will affect how quickly it can gain new foreign knowledge and how likely it will be to favour continued international expansion as a growth strategy (Autio *et al.*, 2000). This is consistent with the earlier work of Brush and Vanderwerf (1992) who find that early internationalising firms hold more positive attitudes towards foreign markets than those that internationalise late. In all, these incremental models of internationalisation are in support of the resource- and knowledge-based views of foreign expansion, and especially for the concept of "learning advantages of newness".

2.7 Much of the early research on internationalisation is based on an extensive empirical literature that observes that most firms entering foreign markets do so in an incremental fashion and based on a risk-averse and reluctant adjustment to changes in a firm or its environment, by building up resources before proceeding beyond markets 'close to home' (i.e. 'psychically close' because competitors also operate there and/or 'cultural' barriers are lower) (*c.f.* Johanson and Vahlne, 1977; 1990). Initially firms operate in the vicinity of their existing knowledge and supply only to domestic markets unless provoked, pushed, or pulled by events such as unsolicited export orders or adverse conditions in the home market. Once initiated, internationalisation starts in markets with the lowest uncertainty and risk, with an entry mode that requires relatively few resources (e.g. exporting vis-à-vis outward FDI). The speed and ability to accumulate knowledge through exposure to overseas markets then determine subsequent pace of internationalisation, as it positively feeds back to decisions to commit resources for future activities in foreign markets. So, typically, firms internationalise one market at a time and concentrate on a small number of key markets, adapting their existing goods and services to the needs of each new market (Bell *et al.*, 2003).

2.8 Despite criticisms of the process/stages model (especially in terms of its deterministic aspect), there is plenty of empirical evidence that many firms do indeed internationalise in an incremental fashion (*c.f.* Cavusgil, 1980; Reid, 1981; Lim *et al.*, 1991; Crick, 1995; Bürge and Murray, 2000). Much of the current criticism of this process model comes from recent evidence of 'born-global' firms (see below), which enter foreign markets at a time (and in a manner) that appears inconsistent with the notion of incremental stages of internationalisation.

Early Internationalisation/'Born-Global' Models

2.9 The last three decades have seen rather different globalising behaviour drawing on far more rapid internationalisation at inception, challenging the traditional view of internationalisation developing in incremental stages. Put another way, there is no longer a need for such (often smaller) firms to build a stable domestic position before going onto the international stage; rather, they globalise right from their birth by exporting directly into international markets or forming joint ventures to penetrate foreign markets even without any prior experience (*c.f.* McDougall *et al.*, 1994; Bell, 1995; Roberts and Senturia, 1996; Oviatt and McDougall, 1997; Shrader *et al.*, 2000; Moen and Servais, 2002).

2.10 Nevertheless, a closer look reveals that the underlying fundamentals do not seem to differ between these two types of models of internationalisation: the 'born-global' phenomenon is equally substantiated by the crucial significance of resources and absorptive capacity; for instance, the role of joint-ventures could be perceived as a means of overcoming initial resource and competency gaps (i.e. sunk entry costs), since such firms may not possess prior experience nor have the time to integrate prior knowledge and fully develop their international strategies before implementing them. That is, the process model may simply suggest that those firms that lack the means and the relevant conditions for rapid internationalisation will be best served by proceeding in a more cautious and incremental fashion. It follows that this area of the literature often concentrates on particular sub-groups of firms such as high-tech small and medium enterprises (henceforth SMEs) (Jolly *et al.*, 1992), international new ventures (Oviatt and McDougall, 1994), and attempts to provide alternative (more eclectic) explanations for the development of globalisation of these businesses − the importance and role of networks and the use of inter-personal relationships (Harris and Wheeler, 2005); the importance of individuals in the firm with prior exposure to international markets; the role of 'serendipity' (or 'luck') (Crick and Spence, 2005); and lastly, from a cognitive perspective, the managerial capacity (or human capital) for recognising and exploiting opportunities in international markets (Zahra *et al.*, 2005).

2.11 From an economic perspective, at an aggregate level, early internationalisation of firms have been made possible largely due to the increased importance of globalisation, which can be associated with: 1) new market conditions in many sectors of economic activity (including the increasing importance of niche markets for SMEs worldwide); 2) technological developments in the areas of production, transportation and communication, leading to significant reductions in the costs associated with internationalisation as well as the rising importance of knowledge-based technologies[13]; 3) the increased importance of global networks and alliances, which provide easier and better access to knowledge [14]; and 4) more elaborate capabilities of people, particularly of the founder/entrepreneur (*c.f.* Madsen and Servais, 1997).

2.12 Needless to say, at the micro level, this phenomenon is also driven by heterogeneous firm-level characteristics; that is, 'born-global' firms possess distinctive firm-specific assets, for instance, high degree of previous international experience on behalf of managers; a managerial global vision from inception; management commitment; strong use of personal and business networks (networking); market knowledge and market commitment; unique intangible assets based on knowledge management; high value creation through product differentiation; production of leading-edge technologies; technological innovativeness with a strength in IT use; a niche-focused, proactive international strategy in geographically spread markets; narrowly defined customer groups with strong customer orientation and close customer

[13] Recent advances in modern ICT knowledge can thus be combined with less mobile resources in multiple countries. Thus, knowledge-intensive industries have been globalising quickly, and it becomes easier for new ventures with valuable knowledge to internationalise sooner.

[14] As Hedlund and Kverneland (1985) argue, the increasing homogenisation of many markets in distant countries has made the conduct of international business easier to understand for all involved.

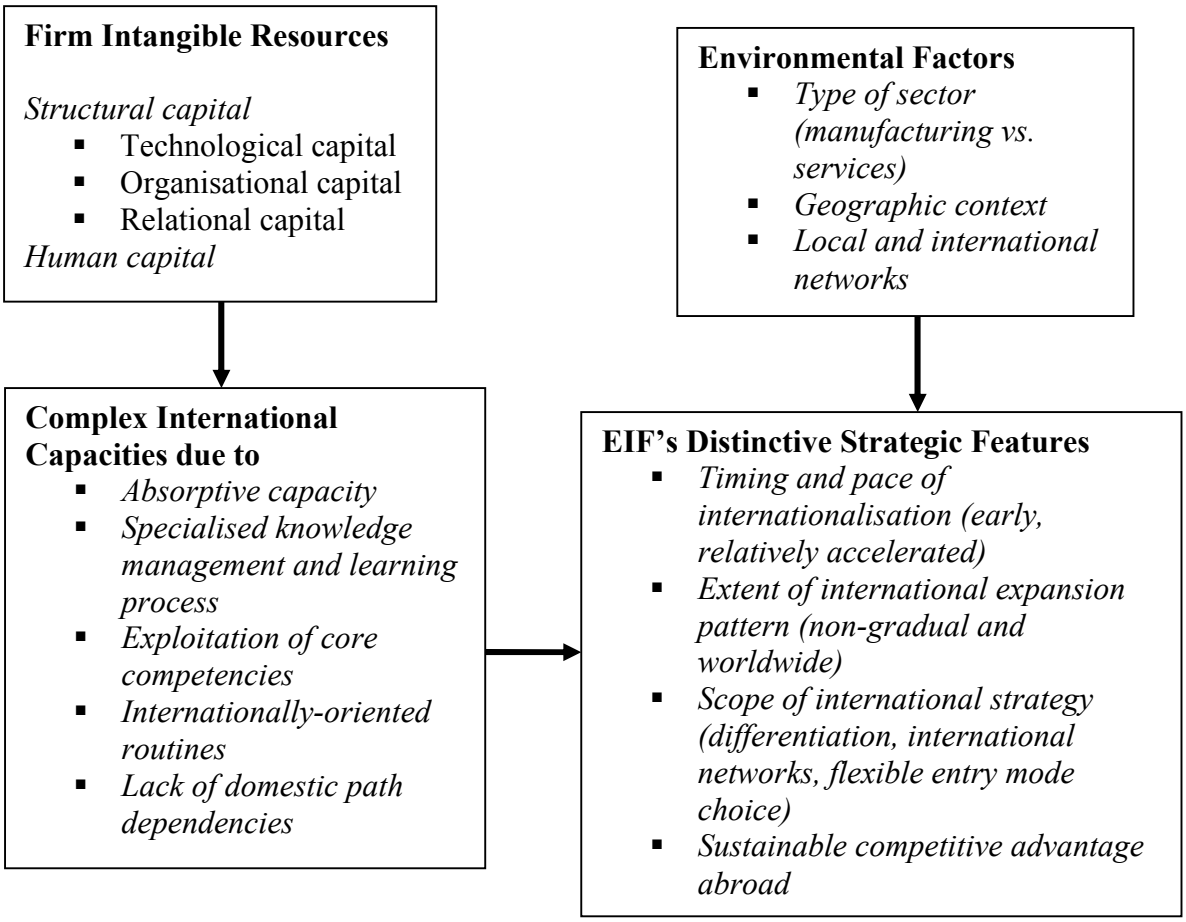
relationships; and, finally, flexibility to adapt to rapidly changing external conditions and circumstances (see Rialp *et al.,* 2005, p. 160, for a summary).

2.13 The empirical evidence on what engenders the process of early internationalisation comprises a number of (mostly) qualitative/case-study based papers and some quantitative/survey-based studies. To summarise, various issues have been flagged up in this strand of literature, such as whether this phenomenon is new and highly sector-specific, with particular implications for public-sector involvement in facilitating internationalisation; and whether it will become more important over time (alongside increasing globalisation). Several authors argue that early internationalisation is better suited to smaller knowledge-intensive firms (where technological intensiveness pervades) (e.g. Autio et al., 2000; Bell *et al.*, 2003; Sharma and Blomstermo, 2003). Nevertheless, others have revealed that this phenomenon is not necessarily limited to just new, high-tech sector firms (e.g. Moen and Servais, 2002). Indeed Bell *et al.* (2003) argue that early internationalising firms can be further classified as being either 'knowledge- and/or service-intensive' or 'knowledge-based'. The latter relates more to the emergence of new technologies (IT, biotechnology, etc.), involving developed proprietary knowledge or acquired knowledge without which they would not exist, and thus is by definition limited to certain high-tech sectors. In contrast, knowledge intensive firms use knowledge to develop new offerings, improve productivity, introduce new methods of production and/or improve service delivery (e.g. CAD/CAM/JIT), and it is argued that such firms are going to continue to become increasingly important across more sectors and in more countries, challenging further the traditional incremental approach to internationalisation.

2.14 All in all, both types of models reviewed above are substantiated by the overarching assumption of the importance of resources and capabilities, as crucial factors determining the process of business internationalisation. We summarise and conclude this section by setting out the conceptual model developed by Rialp *et al.* (2005) based on their own extensive review of the 'early-to-internationalisation' literature (see its adaptation in Figure 2.2 below).

2.15 As argued by the authors, this model shows that a firm's intangible resource base (e.g. organizational, technological, relational and human capital resources) may be of the highest importance in generating a critical level of capability for internationalisation. Secondly, firm-specific international capability can be regarded as an unobservable or 'invisible' strategic asset mostly characterised by scarce home-based path dependencies, with high levels of tacitness and causal ambiguity in its accumulation process. Essentially, it is the result of mixing primarily intangible resources in such a way that generates complex interactions amongst them as well as internationally intensive routines through which all the firm's resources are coordinated (*c.f.* Grant, 1991). Lastly, it is worth noting that the external environmental factors (e.g. industrial sector, geographic setting and interconnected home and international networks) may also play a crucial role in moderating the way in which intangible resources contribute to the development of both the strategic behaviour of early internationalising firms and their sustainable competitive advantages abroad.

Figure 2.2: An adaptation of Rialp *et al.*'s model of the Early Internationalising Firm (EIF)



Source: Rialp *et al.* (2005)

What Determines Firms' Internationalisation Choice?

Background

2.16 The economics literature explaining when and how certain firms internationalise can be linked to early theories of monopolistic advantage (c.f. Kindleberger, 1969; Hymer, 1976; Caves, 1971) and more recently the RBV of the firm and its emphasis on organisational capabilities as a determinant of organisational outcomes (e.g. Barney, 1991; Kogut and Zander, 1996; Teece *el. al.*, 1997). The firm's monopolistic advantage is associated with the generation of higher 'Ricardian' rents[15] exploiting firm-specific assets that cannot be replicated by other firms. In the context of international trade, this implies that despite the fact that local firms nearly always enjoy certain advantages over their foreign competitors (e.g. greater knowledge of the culture and a superior network of

[15] Defined as returns in excess of their opportunity costs, to distinguish them from monopolistic rents when firms restrict output.

local business partners), firms that go international possess intangible productive assets that could be utilised to give them a competitive advantage (Hymer, *op. cit.*) (see the discussion in par. 2.2 for a list of such firm-specific assets).

2.17 This review of the economics literature on the firm's modes of internationalisation will in particular, help motivate the issues to be addressed subsequently given that the determinants of exporting and outward FDI emphasise sunk costs and firm-level heterogeneity. Earlier models explaining FDI originating from the industrial organisation literature, also place an emphasis on the role played by resources and assets in the firm's internationalising process (c.f. Hymer, 1976; Caves, 1971). Building on the assumption of trade barriers, transport costs and market imperfections, these models postulate that such assets, quite often intangible, confer upon the firm a competitive advantage over indigenous firms and help generate higher 'Ricardian' rents as a result of such cross-boarder activities. Given the existence of tariff and non-tariff barriers hindering the free flow of products across national borders, directly producing overseas becomes an attractive strategy of internationalisation (over exporting or licensing assets to a foreign country), when the firm can efficiently exploit its monopolistic advantages conferred by the intangible assets/resources it possesses.

2.18 A firm can expand into international markets either by exporting from home or by replacing external contracts with direct ownership and internal hierarchies. The general explanations put forth in the literature for the firm's switching from one mode to the other include changes in trade costs, market sizes, relative production costs, and/or the importance of scale economies (Head and Ries, 2004).

2.19 Although establishing foreign operations may incur significant set-up and management costs, outward FDI is frequently identified as the optimal channel for international penetration. In essence, the argument of market imperfections holds the key to explaining the advantage of multinationality (c.f. Dunning 1981; Dunning and Rugman, 1985; and Hosseini, 2005). Other factors rendering exporting a less favourable strategy include the following. Above all, and as discussed earlier, multinational enterprises (MNEs) often enjoy ownership advantages (e.g. firm-specific intangible assets) which confer the resources needed to overcome additional costs associated with establishing subsidiaries in remote markets. Technology advantage is a particular important source of such firm-specific assets. For instance, Castellani and Zanfei (2006, 2007) have empirically documented the superior technological knowledge possessed by MNEs which stimulate their expansion abroad. Secondly, associated with the 'tariff-jumping' argument of outward FDI, barriers to trade provide another reason for FDI being preferred. Given the existence of tariff and non-tariff barriers hindering the free flow of products cross borders, exporting to overseas markets is often not feasible. Thus FDI becomes an attractive strategy of internationalisation when the firm could efficiently exploit its monopolistic advantages of the intangible assets/resources it possesses by directly producing overseas.

2.20 In addition, another frequently employed argument relates to trade/transport costs: while home-country comparative advantage (low input cost) and fixed

costs could be conducive to exporting, high trade costs increase the propensity to use FDI but decrease export volumes. Under such circumstances, it is often more feasible for firms to invest in a foreign country so as to target buyers directly. Empirical evidence suggests that firms prefer FDI to exporting when trade costs are high and plant level scale economies are low (e.g. Head and Ries, 2003). Lastly, outward FDI is often superior to exporting in certain industries (especially in the service sector) due to a low degree of tradability. In particular, many services are not internationally tradable, since they are often constrained by physical contact between the service suppliers and their customers.

Theoretical Development and Empirical Evidence

2.21 Set against a background of industrial dynamics (c.f. Hopenhayn, 1992, on market entry and exit), an emerging strand of literature has developed to explain exporting choice at the micro firm-based level. The seminal work of Melitz (2003) and Bernard et al. (2003) suggests that only more productive firms are able to overcome the sunk costs associated with exporting and thus serve foreign markets via this mode. Nevertheless, neither of these models incorporates the option to serve overseas markets through direct investment and thus they do not compare exporting and outward FDI in a unified framework.

2.22 The theoretical modelling of FDI in fact dates back to the early 1990's, when Brainard (1993 and 1997) used representative firms to show how they switched from exporting to direct investment driven by the notion of 'proximity concentration trade-off'[16]. This approach starts off by emphasising that foreign production entails higher fixed costs in establishing facilities in a less familiar environment vis-à-vis exporting; nevertheless, this allows the firm to save on transportation costs. In essence, this approach predicts that FDI becomes a more feasible/profitable choice when transportation costs exceed the joint costs of setting up firms at home and in the foreign market, and when scale economies bring about the advantage of proximity to the host country against concentrating all production at a single domestic site. For instance, Brainard (1997) was able to show that the share of exporters in a given industry is an increasing function of scale economies and a decreasing function of foreign market size and trade costs.

2.23 As a distinctive departure to the Brainard's approach of representative firms, and building on Melitz (2003)'s framework of heterogeneous firms, Helpman et. al. (2004) and Head and Ries (2003) extend this line of research by stressing the role of productivity differences in determining firms' modes of internationalisation. These models demonstrate that firms need to possess productivity advantages so as to serve global markets via exporting (vis-à-vis serving the indigenous market only); moreover, to engage in foreign production through outward FDI requires an even higher productivity threshold. Therefore, these models generate the predictions that the least productive firms survive to serve merely the domestic market; firms with intermediate level of productivity

[16] See par. 2.52ff. below for a discussion of this theory in detail and its application in explaining the formation of horizontal FDI.

globalise through exporting whilst the most productive firms expand into international markets through cross-border investment.

2.24 For instance, Helpman *et al.* (2004) develop a model with similar features to the Bernard-Jensen approach. Assuming monopolistic competition, firms exogenously differ in their levels of productivity (as captured by differences in the marginal costs of production); they produce a differentiated good; consumers have standard Dixit-Stiglitz preferences; and different modes of market entry (exporting versus FDI in foreign markets) have different relative costs (some of which are sunk entry costs while others vary with output such as transport costs and tariffs). Thus this model not only determines which firms internationalise, but also the mode of entry. Firms choose FDI over exporting if the benefits from avoiding transportation costs exceed the fixed costs of establishing capacity in a foreign market (i.e. when transport costs are relatively high and when plant-level returns to scale are relatively weak). Their model is able to show that the least productive firms do not internationalise (and indeed the worst exit the industry), and of those that do only the most productive engage in FDI, while firms with intermediate productivity levels end up exporting. Thus, the extent of intra-industry firm heterogeneity plays a key role in determining the volume of FDI sales relative to the volume of exports, and thus the composition of trade.

2.25 The existence of such a productivity ranking has been tested and confirmed for a few countries, for instance, Girma et al. (2004) for Ireland; Arnold and Hussinger (2005) and Wagner (2006) for Germany; Castellani and Zanfei (2006, 2007) for Italy; Kimura and Kiyota (2006) for Japan; Girma et al. (2005) and most recently, Harris and Li (2007a) for the UK. In testing the ranking of productivity levels associated with various internationalisation modes, these studies commonly conduct non-parametric tests of stochastic dominance and verify that the productivity distribution of MNEs (stochastically) dominates that of exporters, which then dominates that of domestic non-exporting firms.

Exporting vs. Outward FDI: Determinants & Interrelationship

The Theory of Exporting and Its Determinants

The Economic Rationales for Exporting

2.26 Recent (theoretical) developments of economic models of exporting have emphasised firm heterogeneity (i.e. productivity differences) and stressed the importance of sunk (entry) costs as determinants of exporting. These models were motivated to encompass and explain firm-level empirical facts that have been observed in the last two decades (e.g. in the U.S. dating back to the pioneering work of Bernard and Jensen, 1995, 1999): 1) exporting is concentrated amongst a very small number of firms who nevertheless are large and account for the preponderance of trade undertaken (Bernard *et al.*, 2005); 2) compared with non-exporting indigenous firms, such exporters, *cet. par.*, have a greater probability of survival, much higher growth, are more productive, more

capital-intensive, pay higher wages, employ better technology and more skilled personnel[17].

2.27 Following the theoretical literature on sunk costs and exporting[18], Bernard and Jensen (2004b) model the decision to export allowing for firms to have different characteristics (which impact on their profitability)[19] and for them to face (sunk) entry costs into foreign markets[20]. The latter potentially include the cost of information about demand conditions abroad (e.g. market research), or the cost of establishing a distribution system, or the need to modify products for different markets and to comply with institutional arrangements and regulations (including differences in the 'culture' of the way business is carried out). It is also assumed that such non-recoverable entry costs recur in full if the firm exits the export market for any amount of time.

2.28 Ultimately, firms only internationalise if the present value of their profits (affected by their characteristics) exceeds these fixed costs of entry. Moreover, this study also examines whether firm entry into export markets (and continuing to export with/without increasing export intensity) is due to certain plants being more export-orientated because of their attributes and/or because of the presence of sunk costs. In principle, Bernard and Jensen's model can differentiate between these competing determinants of exporting; nevertheless, in practice the proxy used in empirical work for measuring sunk costs is usually less well defined, while unobserved plant heterogeneity has to be accounted for which can also contaminate the empirical proxy used to measure sunk costs. Their results suggest that, in line with expectations, both heterogeneity and sunk costs are found to be important determinants of internationalisation.

2.29 Others have examined the link between tariff reduction and firm-level exporting using similar approaches, which show that only the most productive plants enter export markets to overcome trade barriers (Bernard *et al.* 2003; Melitz, 2003; Baldwin and Gu, 2004). As barriers fall, export intensity rises and (the most productive) non-exporters now internationalise (since production costs fall as imports become cheaper and competitiveness rises with lower tariffs). Evidence is documented in Baldwin and Gu (*op. cit.*) who consider the impact of tariff reductions on Canadian manufacturing between 1984-1996. Their results show that cuts in tariffs both increase the probability of internationalising for all plants and more particularly for those with the highest levels of relative labour productivity. The results also show that larger, younger and more productive plants are more likely to export.

2.30 Further empirical evidence on the factors that determine whether firms export is provided in Bernard and Jensen (2004a) for the US and Greenaway and Kneller (2004) for the UK. Lagged export status (i.e. whether the plant exported in the previous period) is used as a proxy for sunk costs, and is always highly

[17] Nevertheless, Eaton et al. (2008) have also documented some empirical irregularities in terms of patterns of international trade using data from French manufacturing firms.
[18] This literature was initially developed by Dixit (1989), Baldwin (1988) and Baldwin and Krugman (1989); and the existence of sunk costs was confirmed by Roberts and Tybout (1997).
[19] These include size, labour composition, productivity, product mix and ownership structure.
[20] They also recognised that other exogenous factors affect profitability and thus the decision to export or not, such as exchange rate movements, other shocks to demand, indirect and direct subsidies to exporters and potential spillovers from the presence of other nearby exporters. However, it is firm heterogeneity and sunk costs that dominate (especially in empirical applications of this type of model).

significant as a determinant of exporting. Bernard and Jensen (*op. cit.*) for the US also find that spillover effects are not present, and that state export promotion has a slightly positive effect (but statistically insignificant). However, size, wage (representing human-capital intensity) and productivity have important influences on the probability of exporting, with larger, productive plants being much more likely to export. Greenaway and Kneller (*op. cit.*) for the UK find similar results, although the impact of total factor productivity (henceforth TFP) on the probability of exporting is not statistically significant, while industry agglomeration effects (associated with spillovers) are important in the case of the UK[21].

2.31 In addition to the predominant roles of productivity, general empirical findings show that the determinants of a firm's entry decision include trade liberalisation (Baldwin and Gu, 2004), sunk entry costs (Bernard & Jensen 2004b; Girma *et al.*, 2004; Das *et al.*, 2007) and some firm-level characteristics such as size (Aw and Hwang, 1995; Roberts and Tybout, 1997; Bleaney and Wakelin, 2002; Gourley and Seaton, 2004); experience including *ex ante* success (Bernard and Jensen, 1999; Greenaway and Kneller, 2004; Kneller and Pisu, 2007); export spillovers (Aitken *et al.*, 1997; Greenaway *et al.*, 2004); foreign networks (Sjoholm, 2003). In the next sub-section we highlight some of these determinants that have frequently been documented in the literature.

What Determines the Firm's Export Orientation?

Size

2.32 There is well-documented evidence on how the size of a firm affects its export behaviour, as larger firms are expected to have more (technological) resources available to initiate an international expansion (for instance, Aw and Hwang, 1995; Roberts and Tybout, 1997; Wakelin, 1998; Bleaney and Wakelin, 2002; Cassiman and Martinez-Ros, 2003; Gourley and Seaton, 2004; Kneller and Pisu, 2007; and more recently, Harris and Li, 2009). Nevertheless, conditional on having overcome entry barriers, the size effect on export performance could become negative - as firms grow larger (and presumably more productive), they might have an incentive to expand their foreign-market penetration through FDI (rather than exports), which often constitutes an alternative (and more attractive) strategy for international expansion (c.f. Head and Ries, 2004; and Helpman et al., 2004; and Harris and Li, 2009, for recent empirical evidence for the UK). This possibly explains why a non-linear relationship between size and export activities is frequently captured in empirical studies where export propensity and intensity are not estimated separately (e.g. Wagner, 1995; Bernard and Jensen, 1999; and Bleaney and Wakelin, 2002).

[21] Other studies for the UK using panel data provide similar results, confirming the importance of sunk costs and productivity, but also the role of resources, innovation and human-capital factors that all positively impact on the decision to export (*c.f.* Wakelin, 1998; Bleaney and Wakelin, 2002; Roper and Love, 2002; and Gourlay and Seaton, 2004).

Absorptive Capacity

2.33 Following Cohen and Levinthal (1990)'s work, the notion of absorptive capacity is adopted here and defined as the ability to exploit knowledge (obtained both internally and especially externally) that is embodied in intangible assets, which are a critical component of a firm's dynamic capabilities. Knowledge and learning can be expected to have a fundamental impact on growth in that firms must apprehend, share, and assimilate new knowledge in order to compete and grow in markets in which they have little or no previous experience (Autio *et. al.*, 2000).

2.34 Using UK Community Innovation Survey data, Harris and Li (2009) have constructed the most comprehensive empirical measures of such capacity, capturing five distinct dimensions; namely, exploiting external sources of knowledge; networking with external bodies at the national level; implementing new organisational structures and HRM strategies; building up partnerships with other enterprises or institutions at the international level; and acquiring and absorbing codified scientific knowledge from research partners. Our results empirically confirm that having greater absorptive capacity (for appropriating scientific knowledge, for internalising knowledge gained in international co-operation, and for implementing changes in organisational structure and HRM practice) significantly reduce entry barriers into export markets, having controlled for self-selectivity into exporting.

Innovation

2.35 Innovation is generally perceived as the major driving force behind exporting in conventional trade theories, from the product life cycle models (c.f. Vernon, 1966) to the new trade models (c.f. Krugman, 1979). In line with the notion of absorptive capacity and the crucial role of R&D in developing such capacity (Cohen and Levinthal, 1989, 1990), exporters need to invest in R&D and training to develop internally by absorbing, assimilating and managing technologies and ideas obtained from foreign markets. Innovation facilitates a firm's competency development and brings about scale and scope economies. The resulting greater production efficiency enables firms to penetrate new foreign markets and increase their exports shares.

2.36 Empirically, a variety of innovation-related variables have been conventionally included in the modelling of export behaviour, such as R&D dummies indicating whether or not a firm is an innovator; R&D intensity; patents; formal R&D expenditures; the value of the licensing fees and royalties abroad; dummies that distinguish between the producers of capital goods and other types of goods; skills and the capital intensity of operations; imports of technology; number of innovation used/generated either in the firm or industry to which the firm belongs and the like.

2.37 In terms of findings, Bleaney and Wakelin (2002) and Roper and Love (2002) have reported significant differences in terms of R&D expenditures at plant level between exporters and non-exporters in the UK manufacturing, and thus the moderating effect of innovation on the export-productivity nexus; similar findings are also suggested for Canada (Baldwin and Gu, 2004). More recently, Harris and Li (2009) use establishment-level data from UK manufacturing to

estimate what determines the two export decisions; i.e. the propensity to export and export performance (as measured by export volume per unit of total output). Our findings show that R&D plays an important role in helping establishments overcome barriers to internationalisation; but conditional on having entered global markets, R&D does not further boost export intensity when such R&D is treated as endogenous to exporting.[22]

Sector Effect

2.38 As industries are not homogeneous in their exporting patterns, the sector effect (reflecting technological opportunity and product cycle differences) is usually expected to be significant. A general approach often employed in the literature is to categorise firms into different sectors according to levels of technology intensity, which is often measured by the ratio of R&D expenditure to total sales. Numerous empirical studies show that significant differentiated industrial patterns condition a firm's strategy of internationalisation (for instance, Hirsch and Bijaoui, 1985; Hughes, 1986; Soete, 1987; Bleaney and Wakelin, 2002; Gourlay and Seaton, 2004 and Lopez Rodriguez and Garcia Rodriguez, 2005).

2.39 As far as the UK is concerned, Bleaney and Wakelin (2002) find that firms are much more likely to export if they are located in a sector with a high level of R&D intensity. Gourlay and Seaton (2004) point out that more research intensive and diversified firms with a larger resource base and more skilled workers are more likely to export; however, this pattern varies across industries as some industries might compete on labour costs rather than product quality and design. As such, there are important implications for policy, calling for the recognition of distinctions between policies designed to increase the export penetration of domestic firms into new markets and those formulated to extend existing foreign-market penetration. In particular, such policies for export promotion need to be industry-specific, given the known sectoral differences between entering new and existing markets.

Industrial/Spatial Agglomeration

2.40 Certain structural factors have also been argued to have an effect on the probability of export-market entry. For instance, the importance of geographic factors is captured in Overman *et al.*'s (2003) survey of the literature on the economic geography of trade flows and the location of production. If information on foreign-market opportunities and costs is asymmetric, then it is reasonable to expect firms to cluster within the same industry/region so as to achieve information sharing and therefore minimise entry costs. Co-location may help improve information about foreign markets and tastes so as to provide better channels through which firms distribute their goods (Aitken *et al.*, 1997). There are usually two dimensions to these agglomeration effects – an industrial effect and a regional effect. The former stems from the fact that exporting firms from the same industry co-locate; whereas the latter comprises the spatial concentration of exporters (from various industries). Empirically, Greenaway

[22] That is, R&D establishes a new product which is then eventually exploited later on in the life-cycle through relatively higher levels of export intensity, and this latter exploitation of the mature product does not require further R&D.

and Kneller (2004) provide empirical evidence that shows the industrial dimension of agglomeration would appear to be more important for the UK, while Bernard and Jensen (2004b) find it to be insignificant in explaining the probability of exporting in the US. On the other hand, in terms of the regional impact, the benefits brought about by the co-location of firms on the export decision have also been documented in various empirical studies, such as Aitken *et al.* (1997) for Mexico.

2.41 Notably, Harris and Li (2009) have also found that localisation has a different role in determining whether an establishment exports vis-à-vis how much is exported in the UK; several regional dummies (viz. London, South West, Wales) were not significant in determining whether to enter export markets but became significant in determining how much to export, post entry. We interpret this as follows: being in a particular region does not guarantee the internal resources an establishment needs to expand into foreign markets (thus location does not matter so much at this initial stage). However, once it has established itself successfully as an international player, being in particular regions is likely to intensify its export performance on this international stage, due to (agglomeration) spillovers and externalities associated with different spatial locations. As a result of this process, the enhanced competence base will bring about increased competitiveness, which will then positively impact on export intensity in turn.

2.42 Likewise, market concentration is also expected to positively impact upon a firm's propensity to export and its performance post entry. Above all, a more concentrated market implies that higher profits are available, suggesting that more firms will be able to meet the costs of participating in international markets. Furthermore, a high level of concentration of exporters within an industry may improve the underlying infrastructure that is necessary to facilitate access to international markets or to access information on the demand characteristics of foreign consumers. Therefore, non-participants might be expected to have a higher propensity to go international in a market with a higher degree of concentration of export activity. Evidence for UK manufacturing covering the 1988-2002 period is provided in Greenaway and Kneller (2008).

Exchange Rates

2.43 In line with the prediction of 'stock option' theories on export behaviour, exchange rates have generally been found to affect a firm's exporting behaviour. The impact of exchange rate variability on the decision to export is ambiguous a *priori*. Uncertainty about profits from export sales in a foreign currency could increase as a result of a more variable exchange rate, and therefore, more risk-averse firms may be put off from entering new markets. Conversely, firms may judge entry into foreign markets in the same way as a financial or 'stock option' decision that is only exercised in favourable conditions; therefore the variability of the exchange rate could result in more value of the option (Sercu and Vanhulle, 1992). In this sense, exporting becomes more profitable when the exchange rate becomes more variable. Empirically, in the context of the Sterling-Dollar exchange rate, Gourlay and Seaton (2004) demonstrate that the relative level of sterling has a significant

impact on both the market-entry and expansion decisions of exporters, although the impact of Sterling volatility varies substantially across industries[23]. For Italian firms, Basile (2001) is able to show that a devaluation in the exchange rate reduces the importance of technological competitiveness in its impact on exports, as it allows the non-innovating firms to enter foreign markets.

The Theory of Outward FDI and Its Determinants

2.44 FDI has become an increasingly important source of international trade, particularly since the 1980s. The past two decades have seen a substantial rise in cross-border investment, with the sales by subsidiaries of FDI firms now exceeding global exports of goods and services (UNCTAD, 2004). The orthodox theory explaining the motive of FDI derives from Dunning (1988)'s "eclectic paradigm", which indicates that if a firm has some competitive advantages (or monopolistic advantages) over its rivals, and if protection licensing is not a safe option (due to property rights), the firm will choose to set up production subsidiaries in an overseas countries via FDI, and thereby these unique firm-specific resources can be exploited by venturing abroad. If there are specific advantages in the host country, FDI becomes a more attractive choice relative to exporting.

2.45 As to which entry mode into international markets is undertaken, outward FDI can be categorised as being greenfield or brownfield, with the former being located in an area with no previous facilities and the latter one often associated with mergers and acquisitions (i.e. M&As). Greenfield investment and cross-border M&As can be similar in that they both initiate subsequent investment flows. Nevertheless, brownfield FDI merely leads to ownership change without directly adding to employment or productive capacity in the foreign country; whilst greenfield FDI immediately contributes to the capital stock of the host country. From the perspective of the MNE, brownfield investment is often the optimal choice when entry barriers to new markets are high, there is an excess of capacity in the host industry; speedy establishment is required; or when the target firms have valuable proprietary assets to generate a competitive advantage immediately.

What Determines Outward FDI?

2.46 Various firm-specific characteristics have been recognised to exert a critical impact on the firm's decision to invest abroad. To start with, similar to the role of productivity in fostering the firm's export-market entry, *productivity* is generally perceived to exert a crucial impact on its decision of going multinational (e.g. Lecraw, 1977). Higher efficiency achieved in more productive firms helps reduce production costs and thus overcome trade barriers in international markets. In addition increased technological progress, as

[23] In the context of UK trade performance, Anderton (1999) shows that the substantial, but temporary appreciation of sterling in the early 1980s caused permanent damage to both the UK's trade performance and industrial base.

captured in higher total factor productivity, means that labour productivity can also be expected to be important in facilitating outward investment due to its association with human capital/skills of the workforce.[24]

2.47 Secondly, *size* provides an important incentive for the firm to expand its production into overseas markets, since the return to its investment starts to decline as the firm's domestic market share increases (c.f. Swedenborg, 1979; Caves, 2007). The size advantage is often mirroring various underlying resources/capacities crucial to setting-up/managing overseas operations, such as the competence base, risk-diversification strategy, preferential access to capital markets, specialised knowledge of foreign production, and the like. A number of empirical studies have found the size-outward-FDI relationship to be significant, for example, Blomstrom and Lipsey, 1991; Pan and Li, 2000; and Pradhan, 2004. As with the case of exporting, empirical evidence further suggests that this relationship may not be linear; in other words, such monopolistic advantage conferred by size may be limited up to a certain optimal level of size (i.e. a threshold effect).

2.48 Moreover, and going hand-in-hand with product diversification, the ability to undertake *R&D* and *innovation* reflects important ownership advantages that render innovative firms with first-mover advantages in overseas production. The empirical evidence suggests technology has a highly positive impact on outward FDI at both the industry and firm levels (e.g. Lall, 1980; Sleuwaegen, 1985).

2.49 Lastly in the context of firm-specific assets, the literature of export-platform FDI has long recognised the impact that a firm's *export-orientation* has on its multinationality. This is particularly true in light of the traditional strategies of internationalisation adopted by manufacturing firms: given perceived market risks and information asymmetry, firms may start exporting final goods to a foreign market in the first instance, which subsequently induce direct investment, once distribution channels and marketing networks are successfully established in the host country. Additional core knowledge about foreign markets from exports can inform outward FDI, including consumer preferences, market size and the growth rate, government policy and other legal and institutional aspects, etc. Therefore, firms with initial international experience associated with exports have a higher propensity to expand further through direct investment; and this proposition has been empirically confirmed in the export-platform FDI literature, such as Lipsey and Weiss (1984), Pfaffermayr (1996) and Lipsey et al. (2000).

2.50 At the aggregate level, the extent of outward FDI also seems to depend on the industrial/market structure of the host country, in particular *agglomeration economies*. This argument is consistent with a motive of MNEs widely discussed in the literature - to search for agglomeration advantages. Due to the imitative nature of outward FDI in pursuing high profitability, FDI is often motivated by high oligopolistic inter-dependence in a market; that is, there are more profit opportunities as a result of firms clustering together thanks to

[24] Higher TFP comprises both better efficiency and increased technical progress (the former moving the firm towards the current 'best-practice' technology frontier; the latter shifting outwards the 'best-practice' frontier). Increased labour productivity is due to higher TFP, as well as increased capital (and/or intermediate inputs) usage, and/or reductions in employment levels (see Harris, 2005, for an explanation).

various informational, pecuniary or technological externalities within close proximity (e.g. the classical case of high-tech firms clustering in Silicon Valley). Therefore, from the perspective of a potential MNE, its entry into a foreign market could simply be induced by the large number of firms co-locating there, providing the perception of high profitability as a result of the abundance of industry-specific information on production and intense forward/backward linkages (Gao, 1999). Empirically, evidence has been shown to support such agglomeration effects for a number of countries (although mostly limited to the manufacturing sector); for instance, for Japanese firms investing in the US (Head et al., 1995) and Europe (Head and Mayer, 2004); for UK and US firms investing in Ireland (Barry et al., 2003); and for FDI in France (Crozet et al., 2004).

Table 2.1: Models of the Multinational Firm

	Motive for internationalization	
	Lower production costs Factor proportion model	Easier market access Proximity-concentration model
Model structure	Perfect competition model, negligible trade costs	Imperfect competition model, positive trade costs
Determinants of internationalization	Differences in factor endowments	High trade costs. Similarity of countries in absolute and relative factor endowments. Scale economics at the firm level
Firm structure	Vertical	Horizontal
Product	Different goods and services produced in different countries, production fragmented into different stages	Same goods and services produced in different countries
Production for . . .	Home country demand	Local (host country) demand
Activities	One-directional	Two-directional
Trade and affiliate sales	Complements	Substitutes
Welfare effects	Internationalization increases welfare in both countries	Internationalization increases welfare in both countries.
Effect on the income distribution	Affects factor prices and income distribution in favour of (human) capital in the home country and in favour of labour in the host country	Negligible effect

Source: Buch et al. (2005)

Models of Outward FDI

2.51 Various theoretical models have been developed in this well-established literature explaining the formation and determinants of FDI (see Markusen, 1995, 2002; Barba-Navaretti and Venables, 2004, and most recently, Faeth, 2009, for surveys). In particular, Faeth (2009) provides an extensive survey of the literature to date, reviewing nine theoretical models: 1) early studies of determinants of FDI; 2) determinants of FDI according to the neoclassical trade

theory; 3) ownership advantages as determinants of FDI; 4) aggregate variables as determinants of FDI; 5) determinants of FDI in the ownership, location and internalization advantage (OLI) framework; 6) determinants of horizontal and vertical FDI; 7) determinants of FDI according to the knowledge-capital model; 8) determinants of FDI according to diversified FDI and risk diversification models and 9) policy variables as determinants of FDI. More intuitively, Buch et al. (2005) provide a summary of the conceptual models of the MNEs (see Table 2.1 below). Here we discuss some of the most influential models and highlight some issues where relevant.

Proximity-Concentration/Horizontal Models

2.52 Based on the *motives for outward FDI* or *the subsidiary's position in the parent value chain*, investment is often characterised as being either horizontal or vertical FDI. Under *horizontal FDI*, the motive for relocating production to foreign markets is regarded as demand-driven or to gain better access; this gave rise to so-called 'proximity-concentration models'[25]. These models have been developed to explain the horizontally integrated MNEs, which involve two-way international activities in firms between developed economies. This form of FDI emerges when the home market is relatively small and/or saturated; whereas the hosting country reveals a secure and adequate demand surplus, coupled with significant barriers to exporting. Therefore foreign production becomes a more feasible choice than producing at home or exporting final products to a foreign market. It typically involves the duplication of the home production in overseas locations so as to better supply foreign buyers and evade trade costs, therefore improving the firm's competitive position abroad. In this horizontal case, foreign market size, trade barriers and transport costs jointly hold the key to the firm's decision to go international.

Factor-Proportion/Vertical FDI Models

2.53 A second motive for outward investment relates to the supply side e.g., to access lower-cost inputs; this identifies vertically *integrated MNEs* and is associated with the so-called 'factor-proportion model'[26]. In order to minimise the overall costs of production, MNEs choose to relocate certain stages of production in a lower-cost foreign market and produce goods/services that are often different to those produced at home. Firms find it profitable to fragment their production if the relative factor endowments differ greatly between countries. According to traditional trade theory, these vertical FDI flows between dissimilar countries occur when the less relative abundance of a production factor - say (human) capital - leads to higher relative returns in the foreign country. Traditionally wage differentials cross countries are argued to be a major determinant of vertical FDI: firms located in advanced high-cost

[25] See for instance, Krugman (1983), Markusen (1984, 2002) and Markusen and Venables (1998, 2000).
[26] These models were initially put forth by Helpman (1984), Helpman and Krugman (1985); and see Markusen and Markus (2002) for a recent contribution.

countries have a tendency to engage in FDI vertically so as to establish their labour-intensive operations in less developed lower-wage countries to reduce costs. Recent years have also seen FDI being motivated by the pursuit of new technologies and expertise that enhance the parent firm's future competitiveness.

2.54 These theories further predict that such vertical movement of FDI is uni-directional: firms from countries relatively abundant in capital tend to relocate in countries relatively richly endowed with labour, but not the other way round. Another major difference between these two types of FDI models can be summarised by the well-known 'convergence hypothesis' put forward by Markusen and Venables (1998). Whilst the proximity-concentration/horizontal models predict that internationalisation of production is increasing in the degree of similarity between the home and foreign country, the factor-proportion/vertical models postulate this to be increasing in differences in relative factor endowments.

2.55 In practice, there is no clear-cut line between horizontal and vertical FDI, since such investment sometimes could be both supply-driven and market-seeking. It would seem the characteristics of the host country hold the key to attracting such FDI: the location and/or the political economy of the trade regime governing the host country could render it an ideal export platform as far as the host country and its neighbouring markets are concerned.

Knowledge-Capital FDI Models

2.56 More recently, in an effort to reconcile the differences between the proximity-concentration and factor-proportion models, Markusen and associates have developed the so-called 'knowledge-capital model' to integrate the literature of both horizontal and vertical FDI (c.f. Markusen et al., 1996; Markusen, 2002). In this knowledge-capital framework, firms choose to serve international markets through exporting final products or direct investment in either horizontal or vertical mode, where building multiple plants in a foreign market and having separate divisions for production and headquarter services all become special cases in this all-encompassing model. This KC model generates the prediction that horizontal FDI becomes increasingly important over time due to countries growing more similar (i.e. the convergence hypothesis); furthermore, vertical FDI tends to concentrate in small countries richly endowed with (human) capital, whilst certain stages of production get relocated to countries richly endowed with labour.

2.57 These models could be extended to explain other forms of outward FDI such as wholesale FDI, outsourcing and export-platform FDI (e.g. Chen et al., 2008, for a recent development). This KC model consequently stimulates further empirical evaluation of the importance of various FDI models. In seeking to find the model that best characterises the overall pattern of FDI, Markusen and Maskus (2002) compared all of the three models (viz. the horizontal, vertical and knowledge-capital model) in a unified framework. Their findings show that the horizontal FDI and knowledge-capital models were generally better equipped to describe actual patterns (although they were largely

indistinguishable). The vertical FDI model failed to explain aggregate world FDI, given its low explanatory power, although they acknowledged that vertical models were important for particular sectors or in some host countries. This confirms other studies which empirically test models of outward FDI using sector/country-level data; overall the literature has lent more support to horizontally integrated MNEs (e.g. Brainard, 1997; Carr et al., 2001; and Blonigen et al., 2003). The supply-driven motive and the relocation of production to countries richly endowed with 'cheap' labour seem to be less important, and thus the validity of this vertical form of FDI continues to be disputed. This is despite the limited evidence to substantiate any of these models (e.g. Hanson et al., 2001). A caveat of this empirical literature lies in its heavy reliance on aggregated data and very limited microeconomic evidence to explain how individual firms choose their FDI strategy.

2.58 As with the literature on exporting, firm-specific factors that have been frequently documented in empirical studies to influence the firm's FDI decision include size, belonging to multi-plant enterprises, expenditure on R&D, innovation, technology or advertising, skills and human capital, all of which are linked to the monopolistic advantage possessed by the MNE (e.g. Pradhan, 2004). Other aggregate factors have also been found to be significant, such as trade barriers, market size, policy influence (e.g. infrastructure quality, political regime, tax rates, tariffs, fiscal incentives, etc.), and lastly, risk factors (e.g. exchange rate, interest rate, market risk, etc.) (e.g. Ray, 1989; Wheeler and Mody, 1992).

2.59 To summarise, following the review of nine types of FDI models, Faeth (2009) concluded that various models are not necessarily alternatives; rather, they depict distinct aspects of the same phenomenon. Therefore, the analysis of the determinants of FDI should not be based on an isolated theoretical model; instead, a combination of factors should be utilised, drawing on a variety of theoretical models, ranging from cost factors, transport costs, ownership advantages, agglomeration economics, market size and characteristics, protection, risk factors to policy variables.

Exporting vs. Outward FDI: Substitutes or Complements?

2.60 The interaction that exists between international trade and investment is an important issue, as it reflects the extent to which outward FDI affects the competitiveness of the home economy. Indeed, the nature of such a relationship has been at the centre of numerous controversies. At the theoretical level, traditional trade theories highlight the trade-substituting nature of outward FDI, when a firm shifts from exporting from its home country to producing directly in a foreign operation (c.f. Mundell, 1957). On the other hand, the more recent theoretical literature tends to stress the role of outward FDI as being trade-creating in that the expansion of a firm's production into international markets eventually results in increased demand for intermediates goods and services from the parent firm which remains located in the domestic country (c.f. Kojima, 1978; Markusen, 1983, 1984; Helpman, 1984, 1985; and Helpman and Krugman, 1985). The empirical evidence does not seem to be conclusive either; some studies highlight the replacement of trade flows by outward FDI while

others the similarities and complementarities between outgoing trade and investment patterns. We review these competing arguments, the empirical findings[27] to substantiate them, along with some explanations for such observed differences.

2.61 First of all, a *substituting relationship* between outward FDI and home-country exports was predicted in earlier work by Mundell (1957). According to traditional trade theories (assuming perfect competition and perfect capital mobility cross borders), the movement of capital associated with FDI flows will arrive at an equilibrium where factor and product prices have the same characteristics as in a free trade equilibrium. This means that perfectly mobile FDI flows will eventually eliminate the factor proportions basis for higher returns to capital and hence displace the movement of goods associated with higher capital intensity. Moreover, recent theoretical contributions predicting modes of internationalisation, based on firms' self-sorting of productivity, also seem to point to the idea that firms going international have to make an exclusive choice between exporting and FDI (c.f. Head and Ries, 2003 and Helpman et al., 2004; see par. 2.23ff. for a discussion of these models in more detail).

2.62 Empirically, Mundell (1957) and Svensson (1996) reported a negative impact of outward FDI on the volume of domestic exports; later on, Bayoumi and Lipworth (1998) and Ma et al. (2000) have found similar substitutability using data for Japan, and Liu and Graham (1998) for the US. In addition to evidence obtained from the traditional trade framework, such a substituting relationship is also indirectly predicted and tested in more recent micro trade models which assume exporting and outward FDI are mutually exclusive alternatives in business strategy of internationalisation. In particular, following Helpman (2004)'s seminal piece (c.f. par. 2.23-2.24) on the role of productivity in distinguishing MNEs from exporters and domestic producers, a number of firm/plant-level empirical studies have used data for various countries to confirm the validity of the predictions generated in this framework; for instance, Girma et al. (2004) for Ireland, Girma et al. (2005) for the UK, and Wagner (2006) for Germany. All three studies employ a non-parametric test for stochastic dominance between the productivity distributions of various types of firms and find support for the Helpman et al.'s hypothesis. That is, the overall findings show that the productivity distribution of MNEs dominates that of exporters, which in turn dominates that of national market suppliers. Meanwhile, in a different setting, Head and Ries (2003) also used data from Japanese firms to demonstrate the pronounced differences between MNEs, exporters and domestic producers.

2.63 Despite exports and outward FDI being alternative modes of internationalisation, empirical evidence often suggests that global markets are served by both modes, and that markets with high levels of export penetration also tend to receive a substantial amount of FDI, thus pointing to a *complementary relationship*. The process/stage model of internationalisation reviewed earlier (c.f. par.2.5-2.8) indicates that firms increase their commitment

[27] Head and Ries (2004) provide a useful summary of three commonly used methods in the empirical testing of such a relationship, coupled with a discussion of the empirical evidence uncovered in this stream of the literature.

to international markets on an incremental basis, increasing in their knowledge of new foreign markets and decreasing in the perceived risk and uncertainty (Johanson and Vahlne, 1977). Ample evidence has been revealed to support such a process of internationalisation where internationalising firms export to the target market prior to their direct investment, and thus exports complement outward FDI (e.g. Dunning and Archer, 1987; Johanson and Vahlne, 1993). Similarly, the monopolistic-advantage argument discussed earlier (c.f. par. 2.16) also implies that international investment could be deployed by those in possession of ownership advantages as a means of expanding their domestic control/sales over other more distant markets. Therefore, outward FDI may ultimately bring about a higher level of exports from the parent firm to foreign markets.

2.64 From a theoretical perspective, this trade-complementing effect of FDI is especially more pronounced in the case of horizontal/proximity-concentration FDI. For instance, Helpman and Krugman (1985) used a general equilibrium model to suggest that horizontal FDI under monopolistic competition can arise with the asymmetry of factor endowments. Outward investment emerges from a country richly endowed with (human) capital; FDI firms then export headquarters services or intermediate products through intra-firm trade. They were able to further show that the gains in intra-firm trade more than compensated for any reduction in inter-industry trade; and therefore outward FDI complements exports. In general, this trade-creating effect of FDI flows may take place via the direct channel of MNE subsidiaries' purchasing intermediate/complementary products from domestic companies, and/or the indirect channel of FDI affiliates' expanding the demand in foreign markets for other home country products (Lipsey and Weiss, 1981; 1984).

2.65 The empirical literature has documented significant evidence to suggest a broadly complementary relationship[28] between outward investment and trade, particularly for the countries with quality historic data and/or experiencing high levels of outward FDI flows, such as the US, Japan, Germany, UK, Sweden, etc.. For instance, Swedenborg (1979) used Swedish firm-level data to show that MNE sales complemented exports at the micro level. Another subsequent Swedish study by Blomström et al. (1988) utilised industry-level data on US and Swedish MNEs and confirmed the complementarity between exports and foreign production. Also Lipsey and Weiss (1981) employed a gravity model to show that production in US affiliates abroad was positively related to US exports from the same industry to the area in which the production took place. In a follow-up study, Lipsey and Weiss (1984) used more disaggregated firm data with information on location of FDI and export destination, reinforcing their earlier results.

2.66 More recently, using industry-level data from Austrian manufacturing, Pfaffermayr (1996) tested the postulated common determinants of investment and exporting such as capital, labour, skills and R&D intensities using a system of simultaneous equations. His findings indicated a significant complementary

[28] Although evidence has also been suggested to support the presence of both a substitute and complementary relationship, such as Goldberg and Kein (1999) and Blonigen (2001). For instance, using product-level data for trade in Japanese automobile parts between the US and Japan, Blonigen (2001) reported significant substitution effects in nearly all product lines examined whilst finding vertical complementarity effects from Japanese automobiles in the majority of product lines.

relationship between FDI and exports in the 1980's and early 1990's. In a comparative study of 51 countries from 1982 to 1994, Hejazi and Safarian (2001) used a gravity model to show that increases in outward FDI stimulated exports (more than imports) and their conclusions held at both sectoral and more aggregate levels. Most recently, Alguacil and Orts (2002) studied the temporal Granger causality between real exports and outward FDI in Spain, from the 1970s to early 1990s. Despite uncovering a short-run negative (substitution) relationship, they were able to show a positive long-run (complementary) causal relationship running from outward FDI to exports, which more than offset any initial negative effect[29].

2.67 Notably, in one of the very few UK studies in this context, Nuchum et al. (2001) performed an in-depth analysis of exports and outward ODI. Their findings suggest that during most of the last century, outward FDI and exports moved parallel to each other in the UK, indicating a complementary, rather than substitution, relationship between them. In addition, they argued that the persistently high performance of UK MNEs (at a time where world FDI increased very rapidly) could not have been achieved without strong ownership advantages possessed by UK firms, allowing them to compete successfully against domestic firms and other rivals in global markets. They further concluded that these UK firms preferred to utilise their advantages overseas rather than at home; and highlighted the implication that policies designed to promote outward FDI should not discourage exports and vice versa.

2.68 To summarise, from the individual firm's perspective, assuming the firm sells a single product to a particular international market, the theoretical models developed usually predict that modes of exporting and outward FDI substitute each other. However, empirical evidence (mostly at the sector/industry level) tends to suggest that outward FDI complements exports through directly stimulating the export of intermediate goods for use by foreign affiliates, or by indirectly expanding the demand in foreign markets for other home country products (especially in vertically integrated firms with downstream FDI and upstream exports, or in horizontally integrated firms). However, as suggested by Pfaffermayr (1996), the relationship is not easily predictable since the trade impact of FDI can be conditioned by various other factors ranging from firm strategies, types and/or motives of FDI to government policies. Hence sorting out the relationship between FDI and trade is still subject to further empirical investigation.

2.69 Despite this last conclusion, there are various explanations offered in the literature for such predicted and observed inconsistencies regarding the effect of outward FDI on trade. This first has to do with the level of aggregation at which such (empirical) studies are undertaken; namely, linking FDI and trade at the product, firm, industry, sector or even economy-wide level. For instance, once we allow for multiple products and cross-product dependence of demand (Lipsey and Weiss, 1984) or strategic motives in the location decision of firms (Choi and Davidson, 2004), complementarity could be found even at the most

[29] Other studies that have revealed a positive effect of outward FDI on exports include Grossman and Helpman (1989), Pearce (1990), Lin (1995), Brainard (1997), Co (1997), Clausing (2000), Lipsey et al. (2000), Liu et al. (2001) and Lewer and Terry (2003).

disaggregated firm level. Thus the evidence would appear to depend on the level of aggregation used. As Girma et al. (2005) put it, in the single-product-single-firm setting, exports and FDI were substitute strategies for serving foreign markets. Complementarity between them could be generated as they moved to higher levels of aggregation. Therefore, to reconcile this gap in the literature, calls have been made for the need for disaggregating FDI data in order to identify the multiple effects of foreign production on trade (e.g. Pfaffermayr, 1996); and for the theory of MNEs to be extended to study multi-stage production, covering vertical relations within and between firms (Head and Ries, 2004).

2.70 Lastly, the nature of the FDI-export nexus is also dependent on whether the analysis is conducted from a static or dynamic perspective. The trade-substituting effect of FDI is intuitively appealing as the relocation of production to the foreign country will initially replace the home country's overall exports. Nevertheless, as Blomström (1990) and more recently Herzer (2008) pointed out, FDI had a dynamic market/knowledge-creating effect on the host economy through marketing knowledge, product development, technology transfer, etc., resulting in expanded market/industry size in the host industry; also outward FDI allowed firms to combine home and foreign production to reduce costs and increase their competitiveness both domestically and internationally [30] . Therefore following the expansion of the industry, home country's exports to the host country will increase in terms of intermediate products and parts; and this dynamically induced trade-creating effect may offset the initial reduction in overall exports. Thus, in the long run, outward FDI complements a home country's exports (as mentioned earlier, such dynamic effect of FDI has been empirically confirmed in Alguacil and Orts, 2002).

Microeconomic Impact of Internationalisation

Productivity Impact of Exporting

2.71 Exporting is believed to bring about significant benefits to a firm for several reasons. Above all, increasing exposure to international markets leads to economies of scale and diversification of risks, given the expansion in production, firm size and the diversification of products across countries. Secondly, as a public good, knowledge spillovers constitute a positive externality. Operating in global markets, firms that export are in a better position to exploit foreign knowledge spillovers and outperform their domestic counterparts. Moreover, there may well be positive spillover effects from exporting on indigenous non-participants, who can achieve higher technological standards more easily. Lastly, it is widely believed that international exposure will improve organisational efficiency in globalised firms due to international competition and the exploitation of external knowledge.

[30] Also refer to Herzer and Schrooten (2008) and Driffield et al. (2009) for recent evidence on the positive (dynamic) effect of outward FDI on domestic output and productivity for the US and UK respectively.

2.72 Amongst various benefits brought about by exporting, productivity issues are central to analysing economic welfare and have a clear policy context; therefore the relationship between international trade and productivity growth is crucial to understanding a firm's export orientation. The linkage between exporting and productivity has been extensively researched and well established in the macroeconomic literature, from the Heckscher-Ohlin type models based on comparative cost theory, to the new trade models (e.g. Krugman, 1980) emphasising scale economies, product differentiation and imperfect competition. More recently, and mostly evolving hand-in-hand with the RBV approach, a rapidly growing strand of the trade literature has focused on globalisation and its impacts on firms, exploiting the heterogeneity of individual firms. This section reviews this emerging literature on the relationship between export activity and productivity growth in light of firm-level heterogeneity, paying special emphasis to the importance of resources/capacities.

2.73 The macroeconomics-oriented models, arguably, only provide a limited understanding of how individual firms behave in an increasingly globalised market, and thus their role in informing policy appears rather limited, which is largely targeted at firms at the micro level. Recently there has been a surge of interest in studying the microeconomic evidence such that there is now a rapidly growing literature seeking to understand how exporting impacts upon the firm's behaviour and growth trajectory, taking into account the importance of heterogeneity among plants/firms. This emphasis on micro evidence has been partly triggered by the availability of quality data at the plant/firm level, as well as recent developments in the use of theoretical modelling and econometric techniques to exploit these inherently more intricate micro data.

2.74 In addition to offering new insights into firm-level exporting-productivity linkages, more recent micro studies also provide substantial theoretical underpinnings for a causal link between trade and productivity growth at the aggregate level[31]. For instance, Bernard *et al.* (2003) provide an extension of Ricardian theory incorporating the importance of geographic (trade) barriers and imperfect competition in several countries. They find evidence for several basic facts about the US economy that cannot be justified by conventional trade theory: the much larger size and higher productivity of exporters; the rather small fraction of firms that actually export and of those that do export, the rather small fraction of their revenues that come from exporting.

2.75 In a seminal article, Melitz (2003) extends Krugman's (1980) model to accommodate firm-level differences in productivity in order to analyse the intra-industry effects of trade. It is shown that as a consequence of increasing exposure to trade, the most productive firms are induced to participate in export markets while less productive firms continue to serve the domestic market only; whereas the least productive firms drop out of the market. It follows that trade-induced reallocations towards more efficient firms will eventually lead to aggregate productivity gains. Other most recent international trade models incorporating firm-level heterogeneity also include Bernard *et al.* (2003) based on Ricardian differences in technological efficiency; Helpman *et al.* (2004)

[31] The macroeconomic literature on such a link between trade and aggregate productivity growth had been established earlier; see for instance, Grossman and Helpman (1991), Sachs and Warner (1995), Ben-David and Loewy (1998), Edwards (1998) and Rodríguez and Rodrik (2000).

explicitly comparing exporting and outward FDI as alternative modes of entry; Yeaple (2005) focusing on heterogeneous competing technologies, trade costs and labour skills; Bernard *et al.* (2007) drawing on heterogeneous productivity; and Aw et al. (2007, 2008, 2009) adding a new dimension of R&D to the export-productivity debate.

2.76 Research on this exporting-productivity relationship (see Table 2.2) was initially empirically driven as it is universally found in the literature that exporting is positively associated with firm performance (see Greenaway and Kneller, 2005 and 2007; López, 2005; and Wagner, 2007, for comprehensive surveys and evidence). The causal direction of this link is an important issue – whether causality runs from exporting to productivity, from productivity to exporting, or in both directions (i.e. a feedback relationship). These issues are often examined empirically by testing two competing (but not mutually exclusive) hypotheses, viz. self-selection and learning-by-exporting. Given that there is almost universal evidence substantiating the self-selection proposition (i.e. higher productivity leads to export-market entry)[32], and our interest here lies in the impact of exporting (instead of its causes), we shall focus here on the learning effect of exporting (i.e. the second hypothesis).

Exporting & Intra-firm Productivity Growth: the Learning-by-Exporting Debate Revisited

2.77 The 'learning-by-exporting' hypothesis postulates that export-oriented firms experience an acceleration in productivity growth following entry. If this is not true, this has important policy implications: if better firms do self-select into export markets, and exporting does not further boost productivity, then export subsidies could simply be a waste of resources (involving large-scale dead weight and possibly even displacement effects given that firms that export usually sell to domestic markets as well[33]).

2.78 This 'learning-by-exporting' proposition has, generally, received less support in the literature. Many early empirical studies raised doubts about the causality running from exporting to productivity, since they find that productivity growth does not increase post entry, notwithstanding that exporting firms on average experience significantly higher growth in terms of employment and wages (Aw and Hwang, 1995, for Taiwan; Bernard and Jensen, 1995, for the US; Bernard and Wagner, 1997, for Germany; Clerides *et al.*, 1998, for Columbia, Mexico and Morocco; Delgado *et al.*, 2002, for Spain). For example, applying a novel non-parametric analysis of productivity distributions for Spanish firms, Delgado *et al.* (2002) fail to find significant differences between new exporters and continuing exporters, when analysing productivity growth post-entry. Analogically, exporters are found to be no different from non-exporters, although limited learning effects could be found among younger exporters.

[32] The supporting evidence on productivity-led-export-market-entry has been reviewed at the beginning of this sub-section.

[33] Robust empirical evidence shows that exporters tend to sell very small fractions of their output abroad (Roberts *et al.*, 1995).

Table 2.2: Evidence on the Exporting-Productivity Nexus

Authors	Sample	Methodology	Pre-entry difference	Post-entry difference
Self-Selection versus Learning				
Aw *et al.* (2000)	Korea, 1983–93 and Taiwan (China), 1981–91	New Exporters vs. non-exporters	5+% TFP Taiwan ? TFP Korea	6+% Δ TFP Taiwan ? Δ TFP Korea
Baldwin and Gu (2003)	Canada, 1974–96	New Exporters vs. non-exporters	3% ΔLP, 0% ΔTFP	6%ΔLP, 2%ΔTFP
Bernard and Jensen (1999)	US, 1984–92	New Exporters vs. non-exporters	6% TFP, 7–8% LP	3% ΔTFP, 3% ΔLP–short run 1% ΔTFP, 1–2% ΔLP–medium run 1% ΔTFP, 1–2% ΔLP–long run
Bernard and Jensen, (2004*b*)	US, 1983–92	New Exporters vs. non-exporters	3% TFP	6% TFP, 2% ΔTFP
Bernard and Wagner (1997)	Germany, 1978–92	New Exporters vs. non-exporters	5% LP, 0% ΔLP	5% ΔLP
Castellani (2002)	Italy, 1989–94	Exporters vs. non-exporters	+ TFP, 0 ΔTFP	
Damijan *et al.* (2006)	Slovenia, 1994–2002	Exporters vs. non-exporters	0% TFP	0% TFP t_0 0% TFP when export to non-OECD countries t_1 11+% TFP when export to OECD countries t_1
Delgado *et al.* (2002)	Spain, 1991–96	New Exporters vs. non-exporters Stochastic dominance	+ TFP	0 ΔTFP
Greenaway and Yu (2004)	UK chemicals industry, 1990–2000	Dynamic panel		10% increase in exports = 1% TFP, 6% LP
Hahn (2004)	Korea, 1990–98	New Exporters vs. non-exporters	4% TFP	7% TFP
Hansson and Lundin (2004)	Sweden, 1990–99	New Exporters vs. non-exporters	0% ΔTFP, 0% ΔLP	0% ΔTFP, 5% ΔLP
Isgut (2001)	Colombia, 1981–91	New Exporters vs. non-exporters	20% LP, 4%ΔLP	5%ΔLP[1]
Kraay (1999)	China, 1988–92	Dynamic panel		1s.d. increase in exports = 2% TFP, 13% LP
Liu *et al.* (1999)	Taiwan, 1989–93	New Exporters vs. non-exporters	0% ΔLP, 6% ΔTFP	7% ΔLP, 0% ΔTFP
Self-Selection with Endogenous Productivity Change				
Post-entry effects				
Arnold and Hussinger (2005*a*)	Germany, 1992–00	Matched D-i-D	+ ΔTFP non-matched sample	0% ΔTFP matched sample
Baldwin and Gu (2003)	Canada, 1974–96	GMM	3.4% LP, 0% TFP non-matched sample	5.5%LP, 1.7%TFP non-matched sample 11%LP, 1%TFP GMM results

Evidence on the Exporting-Productivity Nexus (cont'd)

Authors	Sample	Methodology	Pre-entry difference	Post-entry difference
Bigsten *et al.* (2000)	4 African countries 1992–95	Dynamic system		+ ΔTechnical efficiency
Blalock and Gertler (2004)	Indonesian firms, 1990–95	1.Fixed effects 2. IV–OP & LP 3. timing	 3. 0% ΔTFP	1. 5% TFP 2. 2–5% TFP 3. 4% ΔTFP
Clerides *et al.* (1998)	Colombia 1981–91, Mexico, 1986–90 and Morocco 1984–91	GMM	Colombia + LP Mexico 0 LP Morocco + LP	Colombia +LP Mexico 0 LP Morocco + LP
De Loecker (2004)	Slovenia, 1994–2000	Matched D-i-D		22%TFP t_0
Girma *et al.* 2003)	UK, 1988–98	Matched D-i-D	0% ΔTFP, 0% ΔLP in matched sample 1% ΔTFP, 0% ΔLP in unmatched sample	ΔTFP:2% ΔLP:2% in matched sample ΔTFP:2% ΔLP:1% in unmatched sample
Greenaway and Kneller (2003)	UK, 1989–2002	Matched D-i-D	0% ΔTFP, 0% ΔLP in matched sample	ΔTFP:3% ΔLP:5.5% Effect stronger when interacted with export share
Greenaway, Gullstrand and Knellar(2005)	Sweden, 1980–97	Matched D-i-D	0% ΔLP 0% ΔTFP	0% ΔLP 0% ΔTFP
Van Biesebroeck (2005)	9 African countries, 1992–96	GMM		35%TFP
Wagner (2002)	Germany, 1978–89	matching	0% LP	0% ΔLP
Self-Selection with Endogenous Productivity Change				
Pre-entry effects				
Alvarez and López (2005)	Chile, 1990–96	Matched D-i-D	+ ΔINV, + ΔSKILL + TFP, + LP non-matched results	0% ΔTFP, ?%ΔLP matched sample
López (2004)	Chile, 1990–96	New Exporters vs. non-exporters	+ ΔINV, 0% ΔDOMSALE + ΔTFP	

Notes: Where possible the results refer to a comparison of new exporters versus non-exporters.
TFP = total factor productivity, LP = labour productivity, Δ = growth
+ the difference relative to the control group is positive and significant, – the difference relative to the control group is negative and significant, 0 the difference relative to the control group is insignificant, ? the difference relative to the control group changes sign and/or significance through the paper.
These results refer to firms that survive in export markets, as reported in Table 10 and for value added per worker.
Castellani (2002) compares exporters versus non-exporters.

Source: Greenaway and Kneller (2007)

2.79 Consequently, many of the theoretical models developed in recent years have generally ignored any 'learning-by-exporting' effect, and instead concentrated on the implications of self-selection for overall aggregate productivity growth (*c.f.* see earlier discussion on the theoretical development, par. 2.74)[34]. One exception is Clerides *et al.* (1998) who developed a model that resulted in lower costs for exporters both as a result of pre-entry selection (to overcome barriers to exporting) and of learning that occurred during exporting. Nevertheless, their empirical evidence failed to support the presence of learning effects post-entry. Most recently though, as a breakthrough in the theoretical modelling of the learning effect of exporting, Aw et al. (2008) developed a model of knowledge accumulation and exporting and for the first time their model was able to predict positive export-led profitability growth within firms. They further went on to show that this learning effect was reinforced by the endogenous relationship between R&D and exporting. These results were subsequently validated by their data for electronics producers in Taiwan.

2.80 Therefore, it is reasonable to argue that benefits from export-market entry may not be automatic: in order to achieve post-entry productivity gains, exporters need to invest in more R&D and human capital to acquire more foreign technologies and enhance their absorptive capacity. Indeed, the existence of such productivity gains associated with exporting accords with the stage/process model of internationalisation reviewed earlier; exporting is perceived as a sequence of stages in the firm's growth trajectory, which involves substantial learning (and innovating) through internal and external channels, so as to enhance its competence base and improve its performance. Other empirical evidence from various studies for several countries is summarised by Greenaway and Kneller (2007, Table 3), which is reproduced below

2.81 Despite the early empirical studies (mentioned above) that found little empirical evidence of a learning-by-exporting effect, positive learning effects for firms engaged in exporting have been identified, particularly where different econometric methodologies are adopted that principally take account of selectivity effects (e.g. Kraay, 1999; Castellani, 2002; Hallward-Driemeier *et al.,* 2002; Pavcnik, 2002; Baldwin and Gu, 2003; Girma *et al.*, 2004; van Biesebroeck, 2005; Lileeva and Trefler, 2007; Fernandes and Isgut, 2007; De Loecker, 2007; and Harris and Li, 2007a). Additionally, Crespi *et al.* (2008) have found that exporters in the UK engage in relatively more learning from clients, and that this subsequently leads to higher productivity growth[35]. More recent empirical testing of the leaning-by-exporting theory has adapted the model by Olley and Pakes (1996) to obtain firm-level estimates of productivity using a production function approach, with productivity (in part) determined by past exporting experience leading to learning effects (*c.f.* Pavcnik, 2002; van Biesebroeck, 2005; Fernandes and Isgut, 2007; De Loecker, 2007). These studies show a strong 'learning-by-exporting' effect for countries like Columbia, Slovenia and several sub-Saharan countries. In addition, there is also

[34] For example, Bernard *et al.* (2007) state in their Footnote 10 that they assume away any 'learning-by-exporting' effect since this matches previous empirical findings.

[35] As Crespi *et al.* (*op. cit.*) state "… a possible explanation of why our results in favour of the 'learning-by-exporting' hypothesis might be stronger than those found in most of the previous exporting-productivity studies is that the impact of learning effects might have been hidden by the noise in productivity measures when directly learning measures are not available" (p. 621).

a strand of literature documenting evidence on the co-existence of selection and learning effects; for instance, Baldwin and Gu (2003) for Canadian manufacturing, Kraay (1999) for Chinese firms; Greenaway and Yu (2004) for the UK chemical industry; and finally, Girma *et al.* (2004) for UK manufacturing firms.

2.82 Arguably the evidence still remains inconclusive as to whether the 'learning-by-exporting' hypothesis holds. Nevertheless, there may be several explanations to account for such discrepancies in the empirical literature in this area. To begin with, there are pronounced differences amongst these studies in terms of country-, industry- or firm-specific characteristics. For instance, Baldwin and Gu (2004) argued that learning from international best practices was more important for productivity growth in Canadian exporters vis-à-vis US ones, whose principal source of raising productivity was technology developed domestically. In addition, a smaller market size with relatively low-level of competition in Canada was also more likely to induce export participants to become more productive and competitive over time. Similar mechanisms of raising productivity may also apply in the UK. For instance, learning benefits are likely to be more pronounced in UK firms that export vis-à-vis US firms, since the UK firms are overall likely to be more distant to the technological frontier (which is set by the US), and they are also exposed to a less competitive domestic market (Girma *et al.*, 2004; Harris and Li, 2007a).

2.83 Secondly, the heterogeneity of export markets may also play a role in determining the extent to which participants will gain higher productivity from exporting. For instance, Damijan *et al.* (2005) suggest that learning from exporting is crucially dependent on the degree of competitive pressures facing firms in different foreign markets – exporting *per se* does not warranty productivity gains; rather, productivity only improves significantly when firms are serving advanced, high-wage export markets. Also, De Loecker (2007) confirms that in Slovenia destination is important, with exports to high-income countries driving 'learning-by-exporting' productivity effects.

2.84 Finally, there are also certain methodological issues involved when testing for the productivity effect of exporting. For instance, there are structural differences between the various databases used when testing for learning effects (e.g. how representative the data are of the underlying population of firms). Secondly, potential econometric problems may arise since most empirical studies tend to pool information across all firms with heterogeneous export histories to examine the learning effects of exporting. In fact, distinct learning effects are uncovered amid firms of different age (Kraay, 1999; Delgado *et al.*, 2002; Baldwin and Gu, 2003; Greenaway and Yu, 2004) [36]. Lastly and most importantly, sample selectivity is the problem usually encountered in micro-econometric evaluation studies. This problem arises when making comparisons between a 'treatment group' (e.g. export-market entrants) and the rest of the population, when it is suspected that the treatment group are not drawn randomly from the whole population. In particular, the significance and size of a 'learning-by-exporting' effect seem particularly sensitive to whether any (or

[36] For instance, Krray (1999) allows export history to have an effect on learning effects (by allowing the coefficient on lagged export to vary with the export history of the plant), and finds significant positive effects of exporting merely in more established Chinese firms.

what) approach is used to combat the selection problem. This issue is of paramount importance when interpreting the results obtained from comparing exporters and non-exporters, and upon which policy conclusions are then based.

Exporting & Intra-industry Productivity Growth

2.85 Another important mechanism by which exporters contribute to the economy is through boosting aggregate productivity growth. This is an emerging strand of literature that focuses on the impact of firm-level exporting on inter- or intra-industry reallocations of resources and therefore aggregate productivity growth. This approach provides a holistic view of the interaction of plants, industries and the aggregate economy as a whole.

2.86 Export-market dynamics have been modelled in recent studies by incorporating intra-industry heterogeneity. Bernard *et al.* (2003) showed that trade liberalisation expanded the market shares of the most productive firms by providing them with large export markets, while at the same time such liberalisation forced firms at the lower end of the productive efficiency distribution to quit as international competition intensifies. In a slightly different setting, Melitz (2003) demonstrated that freer trade induced aggregate productivity gains, as 'better' firms expanded their market shares and the 'worst' firms contracted or exited[37]. Empirically, the effect of transitions into and out of export markets on firm performance is often captured by its export premium, which measures how much a firm's performance changes when its export status changes (Bernard and Jensen, 1999, for the US; Aw *et al.*, 2000, for Korea and Taiwan; Silvente, 2005, for the UK). These studies showed that there were symmetric effects on the export premium between entrants and exiters – new exporters enjoyed considerable gains while exitors from overseas markets suffered significant losses in terms of employment, wages, sales and productivity growth rates. Furthermore, Baldwin and Gu (2003) also pointed out that the 'ebb and flow' induced by international competition culled some participants from export markets. Productivity growth was lower for quitters than continuers, and substantially lower when compared to new entrants to export markets[38].

2.87 The next question to answer is how does this export-market restructuring impact on aggregate productivity growth? Before addressing this issue, it is important to consider the interaction of firms, industries and aggregate productivity growth. A rapidly growing body of research has sought to provide micro evidence on the role of resource reallocations for productivity growth (*c.f.* Bartelsman and Doms, 2000, for a survey of the literature)[39]. Here resource reallocations can comprise intra-firm reallocations (as firms become more

[37] Another recent development in the theoretical modelling in this literature can be found in Bernard *et al.* (2005).
[38] In addition, the negative impact of exit on firm efficiency was also captured in Bernard and Wagner (1997) and Clerides *et al.* (1998).
[39] Some of the representative studies in this literature include Baily et al. (1992), Olley and Pakes (1996), Haltiwanger (1997), Bartelsman and Dhrymes (1998) and Foster et al. (2001) for the US; Disney et al. (2003) for the UK.

efficient over time), inter-firm reallocations (as less efficient firms lose market shares) and entry and exit (assuming that new firms are more productive than those that exit).

2.88 Nevertheless, the above-mentioned literature does not cover the specific effect of exporting on industrial restructuring and thus aggregate productivity, although there have been developments in this direction. For example, in the United States Bernard and Jensen (2004a) provided an empirical study of trade-induced aggregate productivity growth, utilising micro data from US manufacturing. It was shown that foreign exposure indeed fostered productivity growth for firms, industries and manufacturing as a whole. In particular, increased export opportunities were associated with both intra- and inter-industry reallocations (from less efficient plants to more efficient ones), accounting for 40% of TFP growth in the manufacturing sector, half of which was explained by an intra-industry reallocation of economic activities. In the UK context, Harris and Li (2008) have for the first time for the UK used firm-level data to decompose aggregate productivity growth, finding that exporters (in terms of their dynamic competition effects, entry and exit and within firm productivity growth) contributed significantly to higher national productivity. Finally, a limited amount of micro evidence on trade-induced productivity growth is available for some other countries; for example, Baldwin and Gu (2003) using Canadian manufacturing data; and Falvey *et al.* (2004) based on Swedish manufacturing data.

Exporting & the Probability of Closure

2.89 In considering the impact of exporting, recent literature has considered if (new) exporters enjoy better survival prospects vis-à-vis those having not entered such international markets, where risk, uncertainty and competition are all likely to be higher. Understanding which factors determine the firm's risk of closure in international markets is important when evaluating the efficacy of export-promotion policies. As pointed out by Alvarez and Lopez (2006), if business survival depends on (sunk) trade costs, public policies might concentrate on reducing these costs. By contrast, if firms' hazard rates of closure in export markets are the result of large differences in productivity between exporters and non exporters, then polices that concentrate on facilitating entry may not generate lasting increases in export participation if they are not also accompanied by improvements in firm-level productivity.

2.90 From a global perspective, firms can also acquire (external) knowledge through participating in export markets, so those operating in overseas markets are expected to have better (*cet. par.*) survival prospects. Exporting can also signal positive information about the firm, beyond measured productivity, so exporters should have a lower probability of failure. In contrast, research evidence generally shows that higher import penetration increases the probability of closure of the least efficient producers, particularly those supplying domestic markets, but lowers the hazard rate for those firms that export (even after controlling for their higher productivity levels).

2.91 There are a number of theoretical and empirical models of the decision of the firm to shutdown some or all of its capacity. In all the decision depends fundamentally on the firm's prospects for profits, and this in turn is dependent on its productivity and whether this is above a certain shut-down threshold (defined as the lowest level of productivity that would enable the firm to have positive discounted expected profits greater than its liquidation value over future periods). Such a framework leads to productivity and also sunk costs having a major role in explaining closure decisions[40], and thus the role that internal and external factors (linked to the firm and the industry in which it operates) have in determining productivity and overcoming sunk costs.

2.92 The decision to close exporting firms is shown to depend mainly on the level of sunk costs, and the minimum productivity or efficiency needed to secure non-negative profits (Bernard and Jensen, 2004b; Das *et. al.*, 2007). For example, Hopenhayn's (1992) model with sunk costs has been adapted and extended to include trade (e.g. Melitz, 2003) and to allow for the impact of market size on firm turnover (e.g. Asplund and Nocke, 2006). Thus, Bernard and Jensen (2002) noted that "… to the extent that exporting signals positive information about the plant, beyond measured productivity, we would expect current period exporters to have a lower probability of failure" (p.8).

2.93 Evidence on whether exporting firms have lower probabilities of closure, conditional on controlling for other factors linked to productivity, is beginning to emerge. Bernard and Jensen (2002) found that exporting reduced plant closure in the U.S. by as much as 15% (after accounting for the impacts of size, productivity, factor intensity, and ownership structure). Hölzl (2005) confirmed that exporting reduced closure for Austrian manufacturing, while exporting firms in Spain experienced a 28% lower probability of failure when compared to non-exporters (Esteve Pérez *et. al.*, 2004). Kimura and Fujii (2003) and Sabuhoro *et. al.* (2006) also confirmed the positive relationship between exporting and survival for Japanese and Canadian manufacturing and service sector firms, respectively.

2.94 As well as exporting impacting on the probability of closure, globalisation and liberalisation of markets has resulted in greater levels of import penetration. It is likely (based on the technology transfer literature and also anticipating our empirical results later on), that firms that export in these differentiated markets (with potentially higher levels of import penetration) may actually benefit from increased imports of (intermediate) goods and services (which presumably brings with it potentially higher levels of technology transfer through access to a wider stock of knowledge – c.f. Ethier, 1982; Grossman and Helpman, 1991; and Eaton and Kortum, 2001, 2002). High import penetration may therefore increase the probability of closure for domestic producers, but lower the hazard rate for those firms that export (even after controlling for their higher productivity levels)[41].

[40] In addition, other determinants of firm closure tested in the literature include the age of the enterprise; its size (initial and current); sunk costs (including intangible costs); productivity; ownership; the displacement effects of new entry; and the state of the business cycle.

[41] See, for instance, von der Fehr (1991), Angostaki and Louri (1995), Bernard and Jenson (2002), Baggs (2005), Gullstrand (2005) and Asplund and Nocke (2006).

2.95 As can be seen, there is a distinctive lack of research on the impact of changing exporting status on the firm' rate of survival, Harris and Li (2007a) presented the first micro-based investigation in this regard using comprehensive and nationally representative data for the UK firms, covering all market-based sectors. Our results suggested that exporting firms had lower probabilities of closure, conditional on controlling for other factors linked to productivity. In addition, higher import penetration increased the probability of closure for domestic producers, but lowered the hazard rate for those firms that exported (even after controlling for their higher productivity levels).

Home-Country Impact of Outward FDI/Offshoring

2.96 In this section we consider the literature on the home-country impact of outward investment[42]. Compared with the relative abundance of evidence surrounding the exporting-productivity nexus, there are very few comparable studies directly evaluating the effect that outward FDI has on productivity/performance. Nevertheless, the limited empirical evidence on MNEs does point to a higher productivity experienced in parent companies, although this seems to be rather country and/or industry specific (e.g. Blomström and Kokko, 1998; Vahter and Masso, 2006).

2.97 Most analyses of FDI flows merely take into account the acquisition/merge or establishment of foreign subsidiaries using so-called "FDI funds". [43] Nevertheless, in order to consider the full effect of such direct foreign engagement on the home economy, we also incorporate into our review in this section the mode of offshoring[44] which has attracted rapidly increasing attention and thus has been far more extensively investigated in the literature (vis-à-vis the dearth of evidence on the impact of outward FDI per se). This literature focuses on both the direct impact on productivity/performance and the indirect impact through affects in the labour market (e.g. skills upgrading and employment), which will in turn influence firm performance.

2.98 There has long been concern that outward FDI/offshoring may lead to a 'hollowing out' of industry, alongside adjustment challenges in labour markets (especially in developed countries) due to the relocation of production abroad. Nevertheless, research evidence also suggests that outward investment may have beneficial economy-wide impacts in that it helps shift the composition of industries in favour of those that are better aligned with the home country's comparative advantages. Profits from such overseas investment could also be

[42] Note there is a stream of well-established literature studying the impact of FDI on the host (foreign) country (e.g. Aitken and Harrison, 1999; Blomström and Kokko, 2003). Nevertheless, this is not the focus of this review.

[43] These funds normally consist of equity, re-invested earnings, intra-company loans etc.

[44] Offshoring or offshore outsourcing is commonly referred to as the phenomenon of production relocation across national boundaries. This is sometimes an optimal choice of internationalisation (relative to direct investment) since the foreign ownership and management of an overseas facility entails substantial costs (with respect to initial set-up and ongoing management); at the same time, offshoring also allows the internationalising firm to retain a focus on its core competencies. Moreover, this is often more favoured in certain sectors; for instance, service offshoring has become increasingly feasible recently, largely thanks to the advances in the ICT sector (van Welsum and Vickery, 2005).

gradually repatriated from foreign affiliates to the parent company and thus the home country's balance of payments position should be enhanced in the long run.

Table 2.3: Examples of Beneficial Direct Effects of Outward FDI (or ODI)

	Potential impact	Benefit to the investing company	Role of ODI in creating the benefit
Direct economic effects	High	Increased revenues from market expansion	ODI gives access to new consumer markets for existing products. Production can take place both in Ireland (typically knowledge-intensive products), or abroad (typically low level assembly).
		Strengthened relations with key clients	Some Irish firms invest overseas following the footsteps of their clients. Stronger relations to the client may trigger the development of new products and services via innovation. Furthermore, going abroad can be the only option for Irish suppliers when a large international customer leaves Ireland. In such cases, going abroad helps sustain Irish operations, partially at least.
		Cost savings on labour and input costs	ODI gives expanded access to markets for both productive resources and labour. Better access can improve productivity or profitability of indigenous Irish operations, improving international competitiveness. Cost savings from international investments have been crucial for sustaining the Irish operations of a number of indigenous in the medium to long run.
		Source new talent and technologies	ODI can be undertaken solely for the purpose of accessing specific knowledge or technology not available in Ireland. If such knowledge or technology is successfully repatriated, it can improve employment, productivity and profitability.
	Medium	Repatriated profits	Profits generated abroad can be repatriated home and used for investment or distributed as dividends. While most of the interviewed companies have stated profit repatriation is their goal[11], it takes time for foreign operations to become profitable. Profits earned may be used to finance organic growth of the foreign operations.

Source: Copenhagen Economics

Note The effects have been ranked according to their 'potential impact' on the firm, which represents an assessment of the significance and probability of occurrence of each effect.

Source: Forfás (2007)

2.99 Meanwhile, lowered import prices achieved in MNEs could also improve the purchasing power of consumers at home and such foreign earnings could also be used to finance more investments by the parent company and further strengthen its competitive advantages. Lastly and especially in the context of recent economic downturns, foreign investment contributes to reducing the exposure of parent firms (and thus the home country) to exchange rates fluctuations, as well as hedging the risk of regional market downturns (by diversifying investment portfolios across more than one country), which offsets the cyclical nature of an industry in any single country. For instance, in an Irish

context, the more detailed costs and benefits are summarised in a report by Forfás (2007), which are reproduced in Tables 2.3 and 2.4.

2.100 The most recent theoretical development in this strand of literature is presented in a study by Grossmann and Rossi-Hansberg (2008), who derived a trade-in-tasks model of offshoring to show that offshoring occurs when the joint costs of foreign factor input and transaction costs are less than the domestic costs of factor input. Given this predicted reduction in transaction costs (through a decline in the costs of tasks being moved abroad), their model further points to a positive productivity effect of such offshoring activity. Since more tasks can be performed offshore less costly, these lower costs drive up the demand for domestic factor inputs, and hence increase the return to domestic factors.

Table 2.4: Examples of Costly Direct Effects of Outward FDI (or ODI)

	Potential impact	Cost to the investing company	Role of ODI in creating the cost
Direct economic effects	High	Increased risk exposure	Operating abroad subjects the company to new sources of country-specific risk. If not managed, it may increase the volatility of earnings.
	Medium	Technology poaching	Core competencies of Irish companies may be stolen by foreign competitors. Foreign competitors can then challenge the Irish company both in the foreign but also the home market. This cost has been reported as relevant for both manufacturing and IT companies.
	Low	Start-up costs abroad	Start-up costs abroad are large and foreign establishment is risky. The emergence of new business risks can be costly for Irish companies without prior experience with ODI.
		Higher HQ overheads	Foreign establishment in almost all cases increases headquarter overheads. If not controlled, higher costs of doing business at home can jeopardise the viability of foreign operations.
		More demand for intermediation	Going abroad may increase the demand for downstream and/or upstream intermediation services, such as supply or distribution. Furthermore, operating abroad may be linked to a change of the existing supply or distribution networks.
		Transportation costs	Foreign investment increases transportation costs. Where this is an issue (e.g. countries with poor transport connections to Ireland), the parent company stands to lose.
		Loss of local networks and creation of new ones	ODI involves discontinuing relations with existing networks, such as suppliers and distributors. Concurrently, new networks must be created, which is costly and risky, in terms of contracting.

Source: Copenhagen Economics

Note: The effects have been ranked according to their 'potential impact' on the firm, which represents an assessment of the significance and probability of occurrence of each effect.

Source: Forfás (2007)

2.101 Overall, available research findings suggest that the evidence is not conclusive at the macroeconomic level in terms of the net effect of outward FDI. This is to

some extent due to the fact that such analysis is very dependent on firm- or industry-level characteristics. This conclusion was reinforced in a recent extensive review of the literature on the effects of outward FDI (and offshoring in particular) by Olsen (2006). In addition to finding the benefits of offshoring to be subject to diminishing returns, the author further suggested that the productivity gains from offshore manufacturing were found to be generally small, while the gains from offshoring services were much more significant. This might be explained by the fact that services offshoring is a relatively new phenomenon and thus there are more potential benefits to reap; whereas offshoring of manufacturing may have reached its point of diminishing returns, with additional investments being increasingly less profitable.

Direct Productivity/Performance Effect

2.102 Outward FDI/offshoring may boost productivity growth in the home country for various reasons. Above all, firm investment in global markets can stimulate industrial restructuring in the home country, where the reallocation of productive resources and change in workforce composition provide additional channels for productivity improvement. Secondly, the lower-cost inputs sourced abroad may help free up firms' resources and enable them to invest in adopting advanced technology and building up capacities; and this learning-by-doing effect will also contribute to higher productivity levels. Lastly, as will become evident in the next sub-section, through a labour market impact outward investment is also associated with skill upgrading in the home-country labour force, leading to further gains in (labour) productivity.

2.103 As with the case of exporting, there are two primary channels for such productivity impacts to take place. Firstly, within firm productivity growth can be achieved if the MNE experiences higher productivity than other indigenous firms that do not engage in outward FDI activities (Lipsey, 2002; Görg *et al.,* 2004). In particular, Görg *et al.* (2004) pointed out that in the short run domestic plants that are engaged in offshoring may have greater access to internationally traded inputs at lower costs/higher quality than is available domestically; in the long run, such outsourcing activity may also bring about a reallocation of factor shares, and consequently a further impact upon productivity. Therefore the increasing use of internationally traded inputs might be expected to boost productivity in these 'extroverted' firms. Secondly, there may also be positive productivity spillovers from the presence of MNEs both in terms of horizontal and vertical linkages, which improve the performance of other nationally-oriented firms (Globerman et al., 1996; Vahter and Masso, 2007). The empirical evidence documented in a number of studies in this regard is summarised in Table 2.5; here we just highlight some of the findings and point out where the issues are.

2.104 At the aggregate level, Egger and Egger (2006) investigated the offshoring-productivity relationship based on data from twelve EU countries. They showed that increases in offshoring intensity would lead to a slight decline in labour productivity of low-skilled workers in the short run; nevertheless, in the long run, this effect became positive and more significant. They further explained

Table 2.5: Empirical Evidence on Impacts of ODI/offshoring

	Study	Sample/Data	Findings	Impact
Productivity				
Aggregate/ industry-level	Egger et al (2001)	Austria, degree of openness	Offshoring production had a larger impact on a smaller economy like Austria	+ve
	Amiti & Wei (2005)	US, 96 Manufacturing Industries (2 digit Bureau of Labour Statistics) 1992-2001	A small but positive productivity effect of Offshoring of the production of materials inputs	+ve
	Egger and Egger (2006)	12 EU countries, 22 Manufacturing Industries (NACE level 2), 1992-1997	There was a positive LR impact of Offshoring production.	+ve LR
Firm/ plant-level	Gorg & Hanley (2003)	Ireland, 652 establishments, 1990-1995, 12 sub sectors of Electronics industry	Irish electronics manufacturing industry was found to have a positive impact on productivity, though no benefit was detected from goods offshoring	no clear impact +ve, -ve
	Gorg & Hanley (2005)	Ireland, electronics sector, data as 2004 study but focus on TFP	Focus on TFP instead of labour productivity and control for differences in export intensities across plants. To do this they introduce a dummy that takes the value 1 if the plant's export intensity is higher than the median	+ve
	Gorg et al. (2004)	Ireland, 1990-1998, manufacturing industry	Productivity effects of good Offshoring are of similar magnitude regardless of whether the plant is foreign or domestically owned.	no overall impact +ve, -ve
	Girma and Gorg (2004)	UK manufacturing	foreign ownership re-enforces the positive effects of outsourcing on productivity	+ve
	Criscuolo and Leaver (2005)	UK, 37000 establishments (2000-2003), measured against 39 different activities	A positive productivity effect is only significant for domestically owned firms	+ve, weak (domestic only)

	Liu and Tung (2005)	Taiwan (Taipei), 1336 manufacturing Industries, 2000-2001 (two different sources)	Outward FDI and export outsourcing. Export outsourcing refers to the non-affiliate offshore production of company exports.	-ve (US associated is +ve)
Skills				
Aggregate/ industry-level	Feenstra and Hanson (1999)	US Industry (knowledge intensive), manufacturing industries 1979-1990	Outsourcing has positive and significant effects on the increase in the non production workers' wage share	+ve
	Hijzen et al. (2003)	UK, 53 industries (Services and Manufacturing), 1982-1998	Outsourcing accounts for around half the increase in the skilled cost share relative to the total wage bill in UK manufacturing industries. Skill levels estimated using SOC codes rather than manual/non manual indicators.	+ve
	Strauss-Kahn (2002)	France, 1977-1996 (60 Manufacturing sectors)	Employment inequality in France using disaggregated industry data for the 1977-1996 period (60 manufacturing sectors). Outsourcing has a significant negative effect on the share of unskilled employment, and that such activities account for 11% to 15% of the within-industry shifts towards skilled employment over 1977-1985, and for 25% over 1985-1993.	-ve (skills associated is +ve)
	Helg and Tajoli (2004)	Germany (20 manufacturing industries), Italy (13 manufacturing industries), employment data (2 digit ISIC)	Ratio of managers and white-collar workers to labourers and apprentices on outward processing. Effects negative for Germany but positive for Italy.	-ve Germany (but insignificant), +ve Italy
	Egger and Egger (2006)	1995-1997 EU, manufacturing industries	Growth rate in high-skilled labour relative to low-skilled labour was about 1.8%, and that outsourcing explains about 4% of this change. For import-competing industries, however, outsourcing could account for about 18% of the change.	+ve
Firm/ plant-level	Geishecker and Görg (2005)	Germany (1991-2000) employment data, manufacturing firms	Employment data from German manufacturing industries over 1991-2000 to estimate a wage equation. Measure is calculated at the industry level (2-digit NACE) and not at the plant where the person is employed. The authors distinguish between high- and low-skill intensive industries, and between high- and low-skilled individuals.	+ve

	Head and Ries (2002)	Japan, 1000 firms (MNCs, 1965-1990)	Additional foreign affiliate employment in low-income countries raises skill intensity at home.	+ve only for high skilled individuals, -ve for low skilled
	Blomström et al. (1997)	Sweden	ODI by Swedish MNEs in developed countries increases blue-collar employment at home but not white-collar. Swedish MNEs FDI in developing countries increases both kinds of employment at home.	+ve
	Slaughter (2000)	US	U.S. MNE transfers of production from the US parents to foreign affiliates have only a small and insignificant impact on the U.S. relative labour demand.	+ve, -ve
Wages	Feenstra & Hanson (1996) Feenstra & Hanson (1999)	US (1970-1990)	US outsourcing (the import of intermediate inputs by domestic firms – alternatively viewed as non-equity FDI) can account for about one third of the increase in the relative wage of non-production workers at home.	+ve
Employment	Blomström et al. (1997)	US	For U.S. firms, larger foreign production is associated with smaller parent employment.	-ve
	Brainard and Riker (1997)	US	Foreign affiliate employment, only modestly, substitutes for U.S. parent employment.	-ve
	Görg et al. (2001)	UK	Find weak evidence of a positive relationship between outsourcing and wage inequality at home.	-ve
	Cuyvers et al. (2005)	EU	Manufacturing sectors experience a negative effect of foreign affiliate production in Central and Eastern Europe on parent country labour demand.	-ve
	Blomström et al. (1997)	Sweden	Swedish parent firms employ more labour at home when production abroad increases and the effects are especially due to the operations in the developing countries.	+ve
	Lipsey et al. (2000)	Japan and Sweden	Japanese MNEs are similar to Swedish firms in the respect that, foreign affiliate production complements parent employment.	+ve
	Konings and Murphy (2001)	EU	Foreign employment substitutes for parent employment. Substitution mainly takes place between parents and their EU-based subsidiaries.	-ve

this dynamic inconsistency as being caused by short run rigidities in labour adjustment. Expanding the focus from low-skilled labour to the general workforce, Amiti and Wei (2005) used US industry-level data to show that there was insignificant productivity effects associated with manufacturing offshoring; however, substantial productivity gains were revealed in the services sector. Notably, in a more recent follow-up study by Amiti and Wei (2006), they took into account the issue of endogeneity neglected earlier, and found that material offshoring did actually have a positive, albeit small, productivity impact in manufacturing.

2.105 At the firm/plant level, using data on Irish electronics firms, Görg and Hanley (2003) found no clear productivity impact of offshoring in either materials or the services sector; nevertheless, they did suggest that services offshoring had a largely positive effect on labour productivity for plants operating in downstreamsectors. In a follow-up study, the same authors (Görg and Hanley, 2005) extended their analysis to cover TFP and found a significant and positive impact on TFP in general, which seemed to be driven by a substantial positive effect from materials outsourcing since this effect turned out to be insignificant in the service sector. More recently, motivated by the theoretical model developed by Grossman and Helpman (2005), several empirical studies have emerged to test its implications. For instance, Egger and Egger (2006) examine the link between international outsourcing and labour productivity (of low skilled workers) and find that in the short run, the productivity of low skilled workers is negatively correlated with cross-border fragmentation in the EU; whereas in the long run, this linkage turns out to be positive. This turnaround is explained by short-run labour market rigidities and long-run factor mobility. Based on panel data from Irish manufacturing, Görg *et al.* (2005) also provide empirical evidence of positive productivity gains attributed to offshoring in Irish firms[45].

2.106 A weak or insignificant impact of outward FDI on productivity growth in parent MNE firms has also been reported, especially for certain small, atypical economies. For instance, the evidence for Swedish MNEs shows an insignificant relationship between outward investment and labour productivity. This could probably be explained by the fact that the majority of large Swedish MNEs' activities are located outside Sweden (Andersson et al., 1996; Braconier et al., 1999).

2.107 Overall, the academic evidence does not seem to suggest any clear patterns on the nature and/or the extent of the outward FDI/offshoring-productivity relationship. The ambiguity remaining in the literature could be due to several issues. Above all, the nature of such a relationship depends on the level of aggregation at which the analysis is being undertaken. Outward FDI can enhance economy-wide productivity growth through the effects of industrial restructuring, resource reallocations and skills-upgrading; whereas microeconomic evidence tends to be more mixed due to heterogeneity in the datasets and methodologies adopted. Besides data issues, another related theme

[45] In addition to productivity measures, various studies have also suggested evidence pointing to a significant boost from outward FDI to corporate performance, in terms of sales growth, rate of return on sales and/or assets (see Globerman, 1994, for a review of this stream of more business/management-oriented literature). For instance, Ries and Head (1994) for Japanese MNEs and Rao et al. (1994) for Canadian MNEs.

relates to which sector(s) is analysed, i.e. manufacturing versus the service sector. Various studies that are reviewed in Table 2.5 tend to suggest that the marginal benefit of material offshoring has been on the decline substantially, as firms have already realised many of the advantages associated with manufacturing, given its long history. Services offshoring, on the other hand, is still on the rise and thus could (potentially) stimulate increasingly significant gains in productivity, owing largely to advances in ICT in the last two decades.

2.108 Analogous to the case of exporting, the econometric modelling of such a productivity impact is similarly subject to issues of endogeneity and selectivity bias (c.f. the discussion of exporting above). For instance, firms with productivity advantages may also have higher skill intensity, and thus a higher propensity to engage in the offshoring of low-skill intensive operations so as to focus on core competences. This potential endogeneity between productivity and outward FDI/offshoring could lead to biased and inconsistent estimates of the relationship. Lastly, the issue of sample selection also arises as those engaged in outward FDI/offshoring do not constitute a random group; in other words, firms that possess certain characteristics often self-select themselves into international engagement, with potential productivity gains being correlated with their decision to go multinational. This will mean that standard estimation techniques lead to biased results. These characteristics may include superior managerial capability, organisational skills, absorptive capacity, etc. They are associated with both the objective of achieving higher productivity and the decision to invest in global markets. This is also related to the causality issue between outward FDI and productivity, which has a clear policy context (i.e. in order to direct support to outward investment, it is important to understand if internationalisation results in higher productivity or vice versa). Therefore, any estimation of the productivity impact of multinationality needs to control for the self-selection of MNEs, so as not to overestimate such effects on productivity (e.g. Barba–Navaretti and Venables, 2004).

Indirect Effect from Labour Market

2.109 Despite the importance of productivity growth, it is the labour-market effect that dominates most of the public discussion on the costs/benefits of outward FDI/offshoring; this offers an additional (indirect) channel for influencing productivity/performance and has clear policy implications. Based on the predictions of traditional trade theory, there are legitimate grounds for concern (mostly arising in developed/high-wage countries with high levels of outward investment): labour demand and wages in the import-competing industries of the home country decline due to the rising share of imported inputs from low-wage countries. The fear is that when labour demand is shifted from home to overseas, unemployment rises at home and such excessive labour supply will eventually depress wages.

2.110 However, the counter-argument here is that labour demand in a country is dynamic and adaptive, instead of being static. In particular, when outward FDI moves jobs into foreign affiliates, this may also result in an increase in the number of management/coordination jobs being created in the home-based

headquarters. Furthermore, as a result of increased openness, domestic MNEs may themselves shift jobs abroad. In addition, as suggested by Feenstra and Hanson (1999), whilst offshoring has been found to have a large impact on both labour shares and wages, on balance, there is a positive impact on technological progress which is more pronounced. In addition, outward FDI (particularly in the vertical form) can stimulate reallocations of resources and industrial restructuring in the home country by shifting labour-intensive/low-wage processes to overseas markets whilst allowing the parent firms to concentrate on developing its core competences and moving up the value-added chain with higher wages being paid.

2.111 As pointed out in Forfás (2007), Irish evidence shows that the most crucial issue in assessing the home-country impact of outward FDI is whether these are high or low value-added activities with jobs being located/relocated outwith the home country. If key factors in the wider business environment - such as infrastructure, taxation and skills availability – are supportive of high value-added activities at home, then the impact of outward FDI flows will lie in the relocation of lower value-added/labour-intensive activities to more cost competitive locations. This should in turn lead to industrial restructuring at home favouring higher value-added activities paying higher wages.

2.112 The theoretical literature of international trade and investment offers two standard channels for assessing the labour-market effect of outward investment, viz. the relative-price effect and labour-supply effects. When these labour market effects are substantial they may outweigh the positive productivity impact. The most recent (and indeed influential) theoretical contribution, the trade-in-tasks model of offshoring developed by Grossmann and Rossi-Hansberg (2008) generates predictions regarding these two effects (besides the productivity effect as reviewed earlier). This shows that the relative-price effect occurs through a change in the terms-of-trade of a country, which is likely to influence the return on low-skilled labour adversely. That is, an improvement in the terms-of-trade will increase profitability in the exporting, high-skill industry and draw resources from the import-competing sector, and this will consequently put downward pressure on low-skill wages. In addition, a labour-supply effect takes place via the release of domestic labour, due to labour demand being shifted abroad; this is also likely to depress low-skill wages. When these (often negative) effects are large they may outweigh the positive productivity effect.

2.113 All in all, the Grossmann and Rossi-Hansberg model suggests that a decrease in the costs of offshoring can affect the returns on low- and high-skilled labour rather differently. With respect to low-skilled labour, as long as the positive productivity effect outweighs the negative relative-price and labour-supply effects, low-skilled labour will benefit; otherwise the return on low-skilled labour will decrease. In contrast, the return on high-skilled labour will increase in all cases (they will always benefit from reducing the costs of offshoring), since both the relative-price effect and the labour-supply effect are positive. And therefore, from the welfare point of view, the important issue to consider is whether/when the positive effects for low-skilled labour outweigh the negative effects.

2.114 The empirical results documented in the literature present a mixed picture, with a substitution relationship generally found for employment between foreign affiliates and parent plants for the US, UK and EU (e.g. Brainard and Riker, 1997; Görg et al., 2001; Cuyvers et al., 2005; Konings and Murphy, 2001); and a complementary relationship found for Japan and Sweden (e.g. Blomström et al., 1997; Lipsey et al., 2000)[46].

2.115 To reconcile the differences in various effects, another important labour-market perspective comes from the impact of outward FDI/offshoring on skill intensity in the labour force. Skill intensity is often measured as the costs of high-skilled labour relative to the total wage bill (or sometimes the ratio between white- and blue-collar employment). Notably if marginal products are higher for high-skilled workers relative to low-skilled workers, there is likely to be a positive productivity effect (see Head and Ries, 2002, for example, for empirical evidence). Particularly, Feenstra and Hanson (1996) demonstrated that to the extent that low-skilled activities were increasingly being offshored to low-wage countries, labour demand at home would be shifted towards high-skilled activities within industries, resulting in higher skill premium for wages. Admittedly, this effect could be difficult to disentangle from that of technological advances and more generic trade expansion.

2.116 There is ample empirical evidence for various countries on the interaction between skill intensity and outward FDI (offshoring in particular), which is summarised in Table 2.5. For instance, for the UK (Hijzen, 2003; and Hijzen et al., 2003); for the US (Feenstra and Hanson, 1999); for Germany and Italy (Helg and Tajoli, 2004); for the EU (Egger and Egger, 2006); and lastly, for Japan (Head and Ries, 2002). Overall, the evidence gathered using aggregate data seems to indicate that offshore outsourcing has a positive impact on skill intensity. There may be an initial loss of low-skilled jobs in the short run; however, in the long run, this loss would be compensated by the creation of new jobs as a result of cost-reductions from offshoring (Bhagwati et al, 2004). Moreover, evidence also seems to suggest a decrease in demand for high-skilled labour is temporary when suitable processes are offshored; this is the case if the importing of skill-intensive inputs typically leads to technological spillovers that eventually stimulate more demand for skills in the home country. Admittedly, the labour market development and its interaction with outward investment at the economy-wide level can mask any adjustment costs incurred in the short run, such as job displacement or wage losses especially for low-skilled workers.

Internationalisation, Innovation and Knowledge Spillovers

International Knowledge Diffusion & Spillovers from Trade and Investment

2.117 International trade and investment are argued to be a conduit for the transfer of knowledge and thus conducive to productivity growth (Grossman and Helpman,

[46] Again more detailed findings from these studies can be found in Table 2.5 in the Appendix.

1991). From a firm's perspective, participation in international markets brings it into contact with international best practices and facilitates its activities of learning and competency development.[47] Following Coe and Helpman's (1995) seminal piece on international spillovers (mostly in the form of R&D spillovers), there has been an increasing interest on the impact of international technology spillovers (e.g. Jaffe and Trajtenberg, 1998; Eaton and Kortum, 1999; Frantzen, 2000). It is widely felt that such spillovers provide positive information externalities (Aitken *et al.*, 1997), and as public goods, these knowledge spillovers can help domestic recipients to achieve higher technological standards with less effort. Nevertheless, these spillover effects are not expected to be automatic but are dependent on the domestic firms' capacity to absorb the knowledge provided through their linkages with international best practice (Cohen and Levinthal, 1990). It follows that the successful transfer of international knowledge is subject to certain prerequisites being met.

Technology gaps

2.118 The potential for international technology transfer must first exist, through the existence of a hierarchy of firms with different levels of technology (i.e. technology leaders who set the technological frontier through their innovativeness, and other firms who can gain from 'catching-up' with these leaders). Differences in technology between firms are usually measured as differences in total factor productivity levels. While technology leaders are not all concentrated in one country, it has generally been found that a small number of countries (e.g. the US) contain a majority of the firms that operate on the technological frontier for their particular industry (or product group). Thus, generally there exists a frontier country, suggesting that location has an important impact on the rate of advance of technologies (through various factors including agglomeration effects linked to the importance of increasing returns to scale – e.g. Krugman, 1991), and also pointing to the benefits that are available from international technology transfers that exploit such technology 'gaps'.

2.119 As pointed out by Sanyal (2004), this relationship between technology and international competitiveness dates back to the neo-technological trade theories of the 1960s (e.g. Posner, 1961 and Vernon, 1966). The "technology gap" approach emphasised inter-country differences in innovativeness as the *basis* for international trade flows. Since knowledge is a public good, it will flow to other non-frontier economies. In particular, the "product cycle" model (c.f. Vernon, 1966) states that innovation in leader countries generates new products which pass through different stages of maturity with initially the new product being produced only in the innovator country; once the good reaches a particular phase of technological maturity, diffusion of knowledge occurs through international technology transfers (see also Grossman and Helpman, 1995, for theoretical development in this 'product cycle' literature; and Saggi, 2000, for a useful summary).

[47] Such 'participation' or exposure covers at least 3 different ways in which technology transfer can occur: firstly, firms that internationalise can gain through a learning-by-exporting effect; domestic firms can benefit through imports which incorporate better technology (whether they export or not); and domestic firms can benefit from spillovers from firms who experience productivity improvements through technology transfers.

Absorptive capacity

2.120 The existence of technology gaps is necessary but not sufficient to result in international technology transfers. While earlier studies generally assumed that 'autonomous' transfers would take place, dependent on the size of the technology gap, recent studies (e.g. Griffith *et. al*. 2004; Cameron *et. al*., 2005; Kneller, 2005) extend the role of the gap by also interacting it directly with measures of absorptive capacity. That is, 'autonomous' transfers are allowed but there is a strong expectation (which is tested) that industries (and firms in the more disaggregated studies) that lie below the frontier are much more likely to benefit from technology transfers that close the gap if they posses the internal resources and capabilities that allow them to internalise the external knowledge available in the frontier technology. Put another way, they need to have the capacity to adopt the technology.

2.121 What constitutes absorptive capacity and how it can be measured or proxied is generally not well-developed in the existing literature on international technology transfers. It is recognised that acquiring technology or knowledge from others involves acquiring tacit knowledge, and that undertaking internal R&D and investing in human capital are direct ways of increasing the level of absorptive capacity needed to acquire this tacit knowledge. A rationale for this is generally provided by reference to previous work in the economics literature stemming from Arrow (1969). For example, in Cohen and Levinthal (1990), Fagerberg (1994) and Verspagen (1991) domestic innovation and/or expenditure on R&D improves the capacity to absorb foreign country technology.

2.122 In addition to technology gap and absorptive capacity, other prerequisites for technology transfer to take place across national borders have also been put forth in the literature, including openness (c.f. Ben-David and Loewy, 1998; Frankel and Romer, 1999; and León-Ledesma, 2005), distance (c.f. Eaton and Kortum, 1995; and Kneller, 2005), and lastly, the compatibility of the culture of the countries involved in technology transfer (c.f. Rose, 2005).

2.123 The recent empirical literature on the impact of such international knowledge transfers has emphasised the role of R&D in allowing lagging countries to 'catch-up' with technological leaders, such as the US (c.f. Griffith *et al.*, 2004; Cameron *et al.*, 2005; Girma, 2005; and Kneller, 2005). This emerging literature focus on the 'two faces of R&D' concept introduced by Cohen and Levinthal (1989), whereby R&D has a direct impact on TFP through innovative efforts, together with an indirect channel whereby R&D provides the firm with the absorptive capacity to internalise the benefits gained from technology transfer.

2.124 Thus, the larger the gap between TFP in the *frontier* plant/firm/country and TFP in some *other* plant/firm/country, the greater the opportunity for 'catch-up' and thus for technology transfer. The latter may take place autonomously or, more realistically, technology transfer may 'need' the firm to have absorptive capacity (as proxied by R&D intensity) in order for the plant/firm/country to be able to internalise the external technical knowledge potentially available from those on the frontier. Put another way, the 'second-face' of R&D spurs faster adoption of new technologies. Such models determining changes in TFP have also been supplemented by including human capital and international

trade/investment as additional channels through which innovation and technology transfers occur.

2.125 In terms of the most recent results obtained, Griffith *et. al*. (2004) found that R&D positively impacted on TFP directly (it generated innovations) and indirectly through the technology transfer gap with the U.S. They also found that human capital stimulated innovation and absorptive capacity, although they could find no role for international trade as a conduit through which technology is transferred. In contrast, Cameron *et. al*. (2005), found that there was no significant role for the 'second face' of R&D but international trade-based technology transfer was significant in determining UK productivity growth. Kneller (2005) also found no significant impact of the 'second face' of R&D, but greater physical distance from the frontier firms does have the expected negative impact on technology transfer. In addition, Girma (2005) incorporated FDI as a determinant of technology transfer; however his results with respect to the spillover impacts of FDI were rather mixed.

2.126 Therefore, the empirical evidence on whether and how technology transfers take place through trade/investment remains inconclusive. It is likely that this inability to agree on what is (most) important stems from the lack of direct evidence on when and how firms source foreign technology; most studies assume that when the conditions for technology transfers exist (e.g. having access to new products from abroad), such transfers then take place. Many of the results in the literature are based on correlations between variables (measuring technology gaps, trade flows, R&D, and productivity) constructed at too high a level of aggregation to establish causality. The construction and/or use of micro panel datasets (based at the firm level rather than industry level) should provide more direct information on the sourcing of knowledge (at various spatial levels, including international), allowing researchers to sort out the channels through which technology transfers occur, as well as issues of causality.

Exporting & Innovation

2.127 The linkage between exports and innovation has been characterised by increasing interdependence in the process of globalisation. The macroeconomic literature offers at least two mainstream theoretical models to account for this relationship: neo-endowment models which concentrate on specialisation on the basis of factor endowments, such as materials, skilled/unskilled labour, capital and technology (Davis, 1995); and also neo-technology models which predict innovative industries will be net exporters instead of importers (Greenhalgh, 1990; Greenhalgh and Taylor, 1994). The latter type of model provides an extension to the conventional technology-based models based on, for example, the product life cycle theory (Vernon, 1966) and technology-gap theory of trade (Posner, 1961).

2.128 From the perspective of firms, several earlier theoretical studies in the microeconomic literature maintain that innovating firms have incentives to expand into other markets so as to earn higher returns from their investment, as the appropriability regime is improved when the product market widens (e.g.

Teece, 1986). The resource-based approach has been explicitly employed in two recent studies (viz. Dhanaraj and Beamish, 2003; and Lopez Rodriguez and Garcia Rodriguez, 2005), offering new insights into this export-innovation relationship, in light of the development of a firm's technological capacity.

2.129 Ample evidence has been provided at the macroeconomic level, regarding the linkage between a country's export performance and its creativity/innovation. A uniformly positive correlation has led to a consensus that a nation's exports are positively associated with its knowledge accumulation/innovative activities (Fagerberg, 1988; Greenhalgh, 1990; Verspagen and Wakelin, 1997; Narula and Wakelin, 1998; Leon-Ledesma, 2005; DiPietro and Anoruo, 2006; and Salim and Bloch, 2009). For instance, using data for Australia, Salim and Bloch (op. cit.) have recently applied causality analysis to show that business expenditure on R&D Granger causes exports.

2.130 In contrast, empirical studies at the firm level provide a rather different and unique perspective to disentangle this export-innovation relationship, taking into account the heterogeneity of firm characteristics amongst exporting and non-exporting firms. Various empirical studies have emphasised the role of technology and innovation as one of the major factors contributing to facilitating entry into global markets, and thereafter maintaining competitiveness and boosting export performance. For instance, studies covering UK firms include: Wakelin (1998), Anderton (1999), Bishop and Wiseman (1999), Bleaney and Wakelin (2002), Gourlay and Seaton (2004), Hanley (2004) and recently Harris and Li (2009); for Canadian manufacturing firms, Bagchi-Sen (2001), Lefebvre and Lefebvre (2001) and Baldwin and Gu (2004); for Italian manufacturing firms, Sterlacchini (1999) and Basile (2001); for Spanish manufacturing, Cassiman and Martinez-Ros (2003) and Lopez Rodriguez and Garcia Rodriguez (2005); for German services, Blind and Jungmittag (2004); in comparative studies, Roper and Love (2002), for both UK and German manufacturing plants and Dhanaraj and Beamish (2003) for US and Canadian firms; in the context of the rest of the world, Hirsch and Bijaoui (1985) for Israel; Alvarez (2001) for Chilean manufacturing firms; Guan and Ma (2003) for China and lastly, Ozcelik and Taymaz (2004) for Turkish Manufacturing firms.

2.131 Given that most of the empirical evidence confirms that there exists a correlation between innovation activities and export orientation at the firm level, the next issue to address is the causal direction of this relationship. The early consensus in the literature is that causality runs from undertaking innovation activities to internationalisation. The intuition behind this causal chain is straightforward: product differentiation/innovation translates into a competitive advantage that allows the firm to compete in international markets. There is well-documented evidence on how R&D inputs/innovation-related variables are expected to directly raise export probability and/or intensity (e.g. Lefebvre *et al.*, 1998; Bleaney and Wakelin, 2002; Barrios *et al.*, 2003; Cassiman and Martinez-Ros, 2003; Harris and Li, 2009), or alternatively, to indirectly affect firm-level export behaviour through the intensive use of skilled/technical staff (e.g. Starlacchini, 2001).

2.132 Counterarguments on causality going from exporting to innovativeness also exist: primarily, being exposed to a richer source of knowledge/technology that

is often unavailable in the home market, exporting firms could well take advantage of these diverse knowledge inputs and enhance their competency base, and hence in this sense, such learning from global markets can foster increased innovation within firms. The existence of this 'learning-by-exporting' effect is in accordance with the theoretical predictions of global economy models of endogenous innovation and growth, such as in Romer (1990), Grossman and Helpman (1991), Young (1991) and Aghion and Howitt (1998), and it is also consistent with the notion of absorptive capacity and the RBV.

2.133 The conventional approach to testing this 'learning-by-exporting' hypothesis is to analyse performance-related variables (such as labour productivity, TFP, average variable costs and the like) as proxies of a firm's learning behaviour. In particular, Salomon and Shaver (2005) advocate that using innovation as a measure of learning provides a "more direct appraisal of the phenomenon", and that firms can strategically access foreign knowledge bases and enhance innovation capabilities through engaging in exporting activities. For instance, this positive impact of exporting on learning/knowledge accumulation is also documented in Cassiman and Veugelers (1999). Comparing two waves of the UK Community Innovation Surveys (i.e. 2001 and 2005), Harris and Li (2006a) found that strong export orientation or exporting in general had a positive impact in determining whether R&D took place in UK establishments, and conditional on this, a even stronger effect on how much was spent on R&D (per unit of total sales). More recently, using data on Italian manufacturing firms, Hall et al. (2008) found that international competition fostered R&D intensity, which was especially true in high-tech firms.

2.134 Given that causality can run in both directions, a two-way linkage between a firm's exporting and innovating activities has also been proposed and tested empirically (e.g. Cassiman and Martinez-Ros, 2004)[48]. Evidence of a two-way causation seems to be more frequently captured in studies on emerging economies. This might be because such countries are particularly heterogeneous in both their technology stock and export status, and therefore they tend to gain more from trade vis-à-vis their developed counterparts (where learning effects are likely to be less pronounced) (*c.f.* Alvarez, 2001, for Chile; and Zhao and Li, 1997 and Guan and Ma, 2003, for China).

Outward FDI, Innovation & Spillovers

Outward FDI & the MNE's Innovation Capacity

2.135 According to the orthodox theory of outward FDI, MNEs set up foreign operations in order to exploit their own monopolistic advantages, triggered by 'technology exploitation' or alternatively, 'market seeking' motives (c.f. Dunning, 1988). Nevertheless, this knowledge-exploitation perspective of outward FDI fails to acknowledge the technological characteristics of the recipient countries of the FDI as an important source of knowledge. Rather, it is

[48] The paucity of evidence on this hypothesis of a feedback relationship may be partly explained by the limitations of data as well as the econometric methods available to explore this causality issue.

reasonable to maintain that the MNE may appraise the knowledge base of any target recipient firm, in terms of both their tacit knowledge and explicit knowledge elements[49]. Therefore, we could expect domestic MNEs to enhance their competitive advantages by acquiring and integrating complementary resources existing in firms in the host country[50]. For instance, in line with this technology-sourcing hypothesis, Cantwell et al. (2004) provide a thorough discussion on the transatlantic technological relationship, which sets out evolution from a market to a technology-seeking motivation for internationalising innovation, and also an evaluation of the recent technological globalisation of US MNEs in the UK in particular, and Europe as a whole[51].

2.136 From the perspectives of product-cycle and endogenous-growth models, a positive relationship between a MNE's innovation activity and international expansion is intuitively appealing. Indeed, a positive association between these two phenomena has been captured (and even a two-way casual chain predicted) in several theoretical models (e.g. Petit and Sanna-Randaccio, 1998, 2000; Petit *et. al.*, 2000). As documented in Forfás (2007), several US and Swedish studies have concluded that outward FDI has a positive impact on the R&D capabilities of the parent companies in the home economy. According to these studies, MNEs are found to be larger and more R&D intensive than domestic firms and tend to have a more highly skilled workforce. At the macro level, countries with high levels of outward FDI are also associated with higher levels of R&D expenditure.

2.137 The empirical evidence available provides support for these models (most recently, Blind and Jungmittag, 2004; Veugelers and Cassiman, 2004; and Frenz and Ietto-Gillies, 2007). For instance, Frenz and Ietto-Gillies (2007) used UK CIS data (merged with 'Who Owns Who') to show that firms belonging to an MNE had a higher innovation propensity than those that were not part of an MNE. Moreover, a firm's propensity to innovate increased with the degree of multinationality of the parent company.

2.138 With respect to the direction of causation, early studies suggested that R&D activities had a significant positive impact on the MNE's decision to set up affiliates abroad. Then Mansfield *et. al.* (1979) pointed to a reverse causal link by showing that for large US companies, overseas sales opportunities could increase the firm's R&D effort. Others have provided support for the more general position that R&D investment and multinational expansion mutually reinforce each other (Hirschey, 1981; Petit and Sanna-Randaccio, 1998). For instance, a two-way link is found by Petit and Sanna-Randaccio (op.cit.), who argue that with low costs of technology transfer, the presence of innovative activities makes a FDI choice more likely, which will in turn generate a higher level of R&D.

[49] Studies of the determinants of FDI also indicate that FDI is often drawn to clusters of innovating firms in a foreign country (Barrell and Pain, 1999).

[50] For instance, Fosfuri and Motta (1999) developed a theoretical model of FDI to show that MNEs expand into overseas markets not to exploit their existing competitive advantages, but to access better technology abroad (therefore to further develop these competitive advantages) and transfer it from the host economy via spillover effects.

[51] Similar results have also been found in other studies confirming knowledge/technology sourcing as a motive of outward FDI, e.g. Almeida (1996), Florida (1997), Serapio and Dalton (1999), Pearce (1999) and Branstetter (2000).

Outward FDI & Spillovers to the Home Country

2.139 Owning and operating foreign subsidiaries is also expected to bring about knowledge and expertise that is often not available in the domestic market, through transferring resources gained overseas back home (e.g. Dunning, 1993). In addition to enhancing the own-innovation capacity in parent firms, outward FDI provides a potential channel for such specialised knowledge to spillover into the home country via interaction with indigenous firms. This argument accords with the predictions of various endogenous growth models pointing to further spillovers-led expansion in the knowledge stock through subsequent innovation (c.f. Aw et al., 2007, 2008, 2009).

2.140 Although there is a well-established literature considering spillovers brought about by inward FDI[52], there is a death of evidence on domestic knowledge spillovers associated with outward FDI. Nevertheless, the rationale for spillover effects from outward FDI mostly parallels the channels often identified for inward FDI to create spillovers in the domestic economy (c.f. Blomström and Kokko, 1998).

2.141 Firstly outward FDI can lead to externalities in the home country (mostly in the same industry group) through horizontal/intra-industry spillovers. Above all, the presence of MNEs, which are often 'better', may exert some pressure on indigenous firms to improve their production techniques and invest more in innovation so as to achieve better efficiency in order to survive competition. In addition to competition effects, the existence of demonstration effects also mean that domestic firms could have a productivity boost through the imitation of MNE's technologies or the recruitment of skilled workers previously trained in MNEs.

2.142 In addition, spillovers may also occur via vertical/inter-industry linkages, when domestic firms improve their productivity as a result of their interactions with MNEs through the supply chain (including both forward and backward linkages). For instance, a parent company may share the lessons it has learnt from overseas investments in order to instruct its suppliers in meeting higher quality standards. As pointed out in OECD (2001), 'backward vertical linkages' from MNEs are a particular potent source of spillovers, as domestic suppliers upgrade their production processes, quality and delivery methods in response to the demands from MNE clients.

2.143 Outward FDI also facilitates knowledge spillovers that impact on the export orientation of domestic firms. These export spillovers take place if there is a transfer of knowledge from foreign markets to domestic firms, which can lower the costs of entry into export markets. In contrast to the case of spillovers from exporting, which is subject to a learning process by exporters[53]; domestic

[52] See Blomstrom and Kokko (1997) and Gorg and Greenaway (2004) for reviews of the literature of the impact of inward FDI; for more recent evidence, refer to Greenaway et al. (2004), Girma (2005), Kneller and Pisu (2007), Girma et al. (2008), and Harris (2009).

[53] Also refer to Aitken et. al. (1997), Clerides et. al. (1998) and Bernard and Jensen (2004), for discussions of export spillovers from other domestic exporters.

MNEs, on the other hand, are automatically assumed to source at least some of their technology from overseas (via their foreign subsidiaries)[54].

2.144 The literature on export spillovers generally points towards the complementarity between technological activities undertaken by MNEs at home and innovation in domestic firms. Above all, the existence of competition effects means that in order to compete with MNEs in the same industry (which are often in a more advantageous position due to their access to superior technology), local firms may have to invest more in R&D so as to upgrade the quality of their products and/or achieve cost advantages. Furthermore, the mere presence of MNEs in a foreign country may help familiarize foreign customers with common business practices in the MNEs' home country; this may in turn lead to a demand pull to induce more domestic firms to engage in export activities (c.f. Nagel, 2003). More importantly, given the importance of technology gaps and absorptive capacity as discussed earlier, the existence of such technology spillovers also imply that domestic firms have to undertake a certain amount of innovating activity in order to develop their absorptive capacity to take advantage of these knowledge spillovers from MNEs.

Summary and conclusions

2.145 The main conclusions from our survey of the (mainly academic) literature, that are most pertinent to any review of the activities of SDI, emphasise the importance of intangible assets, knowledge, absorptive capacity, and thus overall productivity enhancements, as being necessary not only to overcome barriers to entering overseas markets, but also to ensure that the benefits to the home economy are sustainable and thus long-standing.

2.146 When a firm internationalises, it must have sufficient resources and capabilities through absorbing new knowledge to overcome the initial (sunk) costs of competing in international markets. It is to be expected that the development of absorptive capacity will be a necessary condition for the successful exploitation of new knowledge gained in global markets. The speed and ability to accumulate knowledge through exposure to overseas markets will then determine the subsequent pace of internationalisation, as it positively feeds back to decisions to commit resources for future activities in foreign markets.

2.147 The literature also shows that firms that are early to internationalise ('born-global' firms) also must possess distinctive firm-specific assets. Thus both incremental and 'born global' firms are subject to the overarching assumption of the importance of resources and capabilities, as crucial factors determining the process of business internationalisation; a firm's intangible resource base (e.g. organizational, technological, relational and human capital resources) is likely

[54] In 1995, over eighty percent of global royalty payments for international transfer of technology were made from subsidiaries to their parent firms (UNCTAD, 1997). However, these payments only record the explicit sale of technology and do not tell us about the importance of technology transfer via FDI relative to technology transfer via imitation, trade in goods etc. Nevertheless, what makes outward FDI especially important is that unlike trade in goods, FDI involves explicit trade in technology.

to be of the highest importance in generating a critical level of capability for internationalisation.

2.148 Multinational enterprises (MNEs) engaging in outward FDI also possess ownership advantages (e.g. firm-specific intangible assets) which confer the resources needed to overcome additional costs associated with establishing subsidiaries in remote markets. A strong theme running through all the literature is that firms need to possess productivity advantages so as to serve global markets via exporting (vis-à-vis serving the indigenous market only); moreover, to engage in foreign production through outward FDI requires an even higher productivity threshold. Thus, there the expected distribution of productivity in an economy like Scotland would be from outward FDI companies (occupying the top of the distribution), through exporters, to non-exporters (who occupy the bottom of the productivity distribution).

2.149 In terms of empirical evidence, both heterogeneity (i.e. productivity differences) and sunk costs are found to be important determinants of firm-level internationalisation. Thus, and in line with the notion of absorptive capacity and the crucial role of R&D in developing such capacity, exporters need to invest in R&D and training to develop internally by absorbing, assimilating and managing technologies and ideas obtained from foreign markets. Innovation facilitates a firm's competency development and brings about scale and scope economies. The resulting greater production efficiency enables firms to penetrate new foreign markets and increase their exports shares.

2.150 For outward FDI, productivity is generally perceived to exert a crucial impact on its decision of going multinational. Higher efficiency achieved in more productive firms helps reduce production costs and thus overcome trade barriers in international markets. In addition increased technological progress, as captured in higher total factor productivity, means that labour productivity can also be expected to be important in facilitating outward investment due to its association with human capital/skills of the workforce. Moreover, and going hand-in-hand with product diversification, the ability to undertake *R&D* and *innovation* reflects important ownership advantages that render innovative firms with first-mover advantages in overseas production. The empirical evidence suggests technology has a highly positive impact on outward FDI at both the industry and firm levels.

2.151 While there is almost universal evidence substantiating the self-selection proposition (i.e. higher productivity leads to export-market entry), the 'learning-by-exporting' hypothesis postulates that export-oriented firms should also experience an acceleration in productivity growth following entry. If this is not true, this has important policy implications: if better firms do self-select into export markets, and exporting does not further boost productivity, then assistance to (potential) exporters could simply be a waste of resources (involving large-scale dead weight and possibly even displacement effects given that firms that export usually sell to domestic markets as well).

2.152 However evidence for 'learning-by-exporting' is less well established in the literature, although Aw et al. (2008) have developed a model of knowledge accumulation and exporting that for the first time has been able to predict positive export-led profitability growth within firms. They further show that this

learning effect is reinforced by the endogenous relationship between R&D and exporting.

2.153 Therefore, and based on the (theoretical and empirical) evidence, it is reasonable to argue that benefits from export-market entry may not be automatic: in order to achieve post-entry productivity gains, exporters need to invest in more R&D and human capital to acquire more foreign technologies and enhance their absorptive capacity. That is, exporting *per se* does not warranty productivity gains; in addition to the need for higher absorptive capacity, studies have shown that productivity only improves significantly when firms are serving, for example, advanced, high-wage export markets; destination is important, with exports to high-income countries more likely to drive 'learning-by-exporting' productivity effects.

2.154 Another important mechanism by which exporters contribute to the economy is through boosting aggregate productivity growth. Studies have shown that trade liberalisation expanded the market shares of the most productive firms by providing them with large export markets, while at the same time such liberalisation forced firms at the lower end of the productive efficiency distribution to quit as international competition intensifies. Thus, increased export opportunities were associated with both intra- and inter- industry reallocations

2.155 In line with this, exporters enjoy better prospects of surviving (i.e. not closing-down) vis-à-vis those having not entered such international markets. Moreover, understanding which factors determine the firm's risk of closure in international markets is important when evaluating the efficacy of export-promotion policies. As pointed out by Alvarez and Lopez (2006), if business survival depends on (sunk) trade costs, public policies might concentrate on reducing these costs. By contrast, if firms' hazard rates of closure in export markets are the result of large differences in productivity between exporters and non-exporters, then polices that concentrate on facilitating entry may not generate lasting increases in export participation if they are not also accompanied by improvements in firm-level productivity.

2.156 Studies have also shown that higher import penetration increases the probability of closure of the least efficient producers, particularly those supplying domestic markets, but lowers the hazard rate for those firms that export (even after controlling for their higher productivity levels).

2.157 Compared with the relative abundance of evidence surrounding the exporting-productivity nexus, there are very few comparable studies directly evaluating the effect that outward FDI has on productivity/performance. Nevertheless, this limited empirical evidence on MNEs does point to higher productivity being experienced in parent companies, although this seems to be rather country and/or industry specific

2.158 There has long been concern that outward FDI/offshoring may lead to a 'hollowing out' of industry, alongside adjustment challenges in labour markets (especially in developed countries) due to the relocation of production abroad. Nevertheless, research evidence also suggests that outward investment may have beneficial economy-wide impacts in that it helps shift the composition of

industries in favour of those that are better aligned with the home country's comparative advantages.

2.159 Outward FDI/offshoring may boost productivity growth in the home country for various reasons. Above all, firm investment in global markets can stimulate industrial restructuring in the home country, where the reallocation of productive resources and change in workforce composition provide additional channels for productivity improvement. Secondly, lower-cost inputs sourced abroad may help free up firms' resources and enable them to invest in adopting advanced technology and building up capacities; and this learning-by-doing effect will also contribute to higher productivity levels. Lastly, through a labour market impact, outward investment is also associated with skill upgrading in the home-country labour force, leading to further gains in (labour) productivity.

2.160 Egger and Egger (2006) in particular have examined the link between international outsourcing and labour productivity (of low skilled workers) and find that in the short run, the productivity of low skilled workers is negatively correlated with cross-border fragmentation in the EU; whereas in the long run, this linkage turns out to be positive. This turnaround is explained by short-run labour market rigidities and long-run factor mobility. Others also provide empirical evidence of positive productivity gains that can be attributed to offshoring. In general, if key factors in the wider business environment - such as infrastructure, taxation and skills availability – are supportive of high value-added activities at home, then the impact of outward FDI flows will lie in the relocation of lower value-added/labour-intensive activities to more cost competitive locations. This should in turn lead to industrial restructuring at home favouring higher value-added activities paying higher wages.

2.161 Turning to international knowledge diffusion and spillovers from trade and investment, the literature in this area suggests that spillover effects are not expected to be automatic but are dependent on the domestic firms' capacity to absorb the knowledge provided through their linkages with international best practice. It follows that the successful transfer of international knowledge is subject to certain prerequisites being met. Thus the existence of technology gaps is a necessary but not sufficient prerequisite leading to international technology transfers. There is a strong expectation (which is tested in the literature) that industries (and firms in the more disaggregated studies) that lie below the technological frontier are much more likely to benefit from technology transfers that close the gap, if they posses the internal resources and capabilities that allow them to internalise the external knowledge available in the frontier technology. Put another way, they need to have the capacity to adopt the technology.

2.162 Undertaking internal R&D and investing in human capital are direct ways of increasing the level of absorptive capacity needed to acquire this tacit knowledge, while the empirical evidence on whether and how technology transfers take place through trade/investment remains inconclusive.

2.163 The linkage between exports and innovation has been characterised by increasing interdependence in the process of globalisation. There is ample evidence provided at the macroeconomic level regarding the linkage between a country's export performance and its creativity/innovation. A uniformly positive

correlation has led to a consensus that a nation's exports are positively associated with its knowledge accumulation/innovative activities

2.164 In contrast, empirical studies at the firm level provide a rather different and unique perspective to disentangle this export-innovation relationship, taking into account the heterogeneity of firm characteristics amongst exporting and non-exporting firms. Various empirical studies have emphasised the role of technology and innovation as one of the major factors contributing to facilitating entry into global markets, and thereafter maintaining competitiveness and boosting export performance. In addition, and with regard to an outward FDI-innovation relationship, firms belonging to an MNE have been found to have a higher innovation propensity than those that were not part of an MNE. Moreover, a firm's propensity to innovate increased with the degree of multinationality of the parent company. Others have provided support for the more general position that R&D investment and multinational expansion mutually reinforce each other.

2.165 Owning and operating foreign subsidiaries is also expected to bring about knowledge and expertise that is often not available in the domestic market, through transferring resources gained overseas back home. In addition to enhancing the own-innovation capacity in parent firms, outward FDI provides a potential channel for such specialised knowledge to spillover into the home country via interaction with indigenous firms. Although there is a well-established literature considering spillovers brought about by inward FDI, there is a death of evidence on domestic knowledge spillovers associated with outward FDI.

2.166 Outward FDI has also been shown to facilitate knowledge spillovers that impact on the export orientation of domestic firms. These export spillovers take place if there is a transfer of knowledge from foreign markets to domestic firms, which can lower the costs of entry into export markets. In contrast to the case of spillovers from exporting, which is subject to a learning process by exporters, domestic MNEs are automatically assumed to source at least some of their technology from overseas (via their foreign subsidiaries). Overall, the literature on export spillovers generally points towards a complementarity between technological activities undertaken by MNEs at home and innovation in domestic firms. In particular, the existence of competition effects means that in order to compete with MNEs in the same industry (which are often in a more advantageous position due to their access to superior technology), local firms may have to invest more in R&D so as to upgrade the quality of their products and/or achieve cost advantages. Furthermore, the mere presence of MNEs in a foreign country may help familiarize foreign customers with common business practices in the MNEs' home country; however, domestic firms have to undertake a certain amount of innovating activity in order to develop their absorptive capacity to take advantage of these knowledge spillovers from MNEs.

3. Market Failures and the Rationale for Public Sector Intervention

Introduction

3.1 In this chapter we consider the case for government invention with regard to business internationalisation.[55] This is mostly predicated on the basis that more internationalisation results in greater productivity improvements (linked to innovation activities and improvements in efficiency)[56], and that there are 'market failures' that prevent the realisation of these gains from entering overseas markets. Thus traditional 'market failure' arguments are examined first (including asymmetries in information – cf. DTI, 2006a; Seringhaus and Rosson, 1990; Ulltveit-Moe, 2008), together with an overview of the type of market inventions typically undertaken by government (e.g. helping to reduce the search costs of firms attempting to, or engaged in, internationalisation – cf. Besedes and Prusa, 2004). The discussion builds on the work of Harris and Li (2005, Chapter 4), which covered the type of market failure arguments typically identified in the literature as they related to the operation of UKTI. However, we also review the specific rationales for intervention provided by SDI in relation to the products they use to support exporting and outward FDI in Scotland, in order to consider any major differences in the rationales are provided.

3.2 Following this discussion of 'market failures', we then consider some of the extant literature that argues for a wider response to business internationalisation by government (cf. Boocock and Anderson, 2003; Dana et. al., 2004; Korhonen et. al, 1996; Wright et. al., 2007). This includes both the needs of early to internationalisation (or 'born-global') companies, and the need to ensure that all firms face the 'right' incentives when undertaking necessary adjustments to changes in the business environment due to trade and investment liberalisation and other aspects of globalisation. We shall also review the wider literature that relates to internationalisation and policy interventions (e.g., Forslid *et.al*., 2005), taking into account that encouraging innovation and R&D activities overlaps with more general interventions that encourage exporting and firms to go global.

Market Failure

3.3 We start with a brief overview of the standard neoclassical Arrow-Debreu model (cf. Geanakoplos, 1987) of the perfectly competitive, general equilibrium economy, since it is this idealised view of the economy that sets the benchmark

[55] Note, in line with the rest of this literature review, we largely ignore the role of both inward FDI, and the role of importing. This is not because these are not important, but rather because this review is focused more on firm-level internationalization and adjustment to globalisation

[56] The Scottish Government's GES focuses on productivity, population growth and increased labour market participation, as the key drivers of growth. It has been argued that it is the first that 'matters most' (see CPPR, 2008), and as such the case for supporting internationalisation is overwhelmingly linked to productivity improvements.

for deciding if and when market failures exist. The Arrow-Debreu model states that the market, consisting of individuals motivated by self-interest (i.e. seeking to maximise profitability and utility) who engage in the production, exchange and consumption of goods or services, provides an allocation of the economy's resources which is socially beneficial. Such an efficient allocation of resources combines the utility maximizing choices of consumers with the profit maximising choices of producers. Market forces determine the *optimal* quantity of a good or a service (such as exports) that will be supplied and consumed by individuals or firms in order to maximise social welfare. At this point no individual can be better off without at the same time making another individual worse off. This is the First Theorem of Welfare Economics: in such a system the allocation of resources is Pareto-efficient. However, in reality, markets are unlikely to be perfectly competitive and may fail to produce an efficient allocation of resources. In this standard approach, such deviations from optimality are called market failures and arise due to the characteristics of goods or services, such as the presence of externalities or public goods, and the characteristics of markets, such as monopoly, oligopoly and inadequate information.

3.4 This narrow theoretical interpretation of the economy has its limitations when setting out the case for government interventions, and it useful to state at the outset of this discussion that there is "a more general policy orientated usage, which refers simply to circumstances in which there are significant potential economic benefits which the private sector unaided would be unable, or unlikely, to achieve unaided" (DTI, 2006a, par. 4.4).

3.5 Table 3.1 contains a list of market failures as identified in the literature (cf. Harris and Li, 2005, Table 4.1). We shall take each in turn, and relate them specifically to how they hinder internationalisation. A common rationale for government intervention is on the grounds that there has been a market failure due to inaccurate or incomplete information, and to the costs of acquiring information. Imperfect information in product markets impedes internationalisation since potential buyers and sellers need access to the identity and location of potential suppliers and customers, and about the prices and quality of the goods and services that may be traded. Connections between buyers and sellers of differentiated products have to be made through a process of search, resulting mostly in small-valued, short-lived transactions because of the uncertainty about the reliability of buyers and sellers. As Besedes and Prusa (2005) argue: "…by starting small the buyer can efficiently ascertain the supplier's type. A good match will result in a deepening of the relationship. A poor match will lead to the termination of the relationship. In effect, even though they are modest in value, small orders play a large role in creating trade flows" (p. 1). A major reason for this pattern of trade (for which they present robust US evidence) is that entry into foreign markets involve large sunk costs (see Chapter 2 and below), and therefore before undertaking costly (irreversible) investment to overcome entry barriers trade takes place with a small order over the short run, in order to reveal if the buyer-seller relationship is mutually beneficial and sustainable.[57]

[57] Note, Besedes and Prusa (*op. cit*.) test their search model using US data and find strong support for its predictions: "many trade relationships start small but those that start large have longer duration. The more reliable the supplier, the greater the fraction of trade that start large. Relationships involving more reliable suppliers have longer duration. The data indicate the chance of a trade relationship ending is

Table 3.1: Taxonomy of market failures impeding internationalisation

Type	Description
Market failure due to imperfect markets	
(1) Imperfect information	firms using inaccurate or incomplete information to assess costs and benefits of international production
(2) Asymmetric information	costs of acquiring information make it more available to some more than others leading to adverse selection and/or moral hazard
(3) Financial barriers	firms without sufficient collateral or track record have less access to finance
(4) Missing markets	there is no market for externalities; public good elements; extreme cases of asymmetric and imperfect information
(5) Appropriability failure	problems with the enforceability of property rights, especially over knowledge and technology.
Barriers to entry and exit	
Sunk costs	irreversible fixed costs of internationalisation result in entry and exit being costly undertakings.
Institutional failure: government	
public good argument	In situations where the government has a comparative advantage in supplying a good or service (usually information)
Institutional failure: networks	
Group formation	networks may not possess the right portfolio of skills, information and knowledge and membership rules may exclude some firms
Systemic failure	
Bounded rationality and path dependency	lead firms to make sub-optimal choices of technology to which they may become locked in.

Source: Harris and Li (2005, Table 4.1)

3.6 Note, such search models do not inform policy regarding the existence or otherwise of market failures since the fact that businesses may lack relevant information, and the existence of uncertainty, does not, by itself, imply that

highest during the first few years (i.e. the learning phase) and a small fraction of relationships end even after the supplier has proven to be successful" (pp. 25-26). See also Besedes (2006).

market processes are inefficient but rather that information is costly. The question then arises as to whether the cost of acquiring such information (say for overseas market entry) reflects (i) the true economic cost, or whether costs are sub-optimally high as a result of market failures (as in the Arrow-Debreu model); or (ii) in alternative, more dynamic, views of the market, information costs leading to asymmetric outcomes are one of the features of the market, and they are in part necessary as a selection device (for promoting the fittest firms) and in providing incentives for learning and discovery, which is crucial to the process of variety creation upon which, for example, an evolutionary view of markets is based.[58] In both approaches (the traditional 'market-failures' model and the dynamic approach) there is still a rationale for government intervention, assuming that this leads to a direct increase in economic benefits from more firms gaining information and thus acting on that information (e.g., by internationalising.). Casson (1999) argues that in this situation the government has a comparative advantage in information, and it is on this basis (not market failure) that it can justify intervention.[59]

3.7 Indeed in a dynamic market a certain proportion of poorly informed decisions leading to business venture failures are likely to be consistent with optimal search behaviour. Thus, search model analysis suggests that in general businesses should invest more resources in (prior) information gathering when risk is higher, as it is likely to be in international markets, and that there is a role for government intervention to help firms in obtaining these (necessary) resources.

3.8 In summary, searching for information is costly, and when firms do not engage (fully) they only have a partial knowledge about the market, and thus may underestimate the potential benefits of internationalisation (both private benefits to themselves and the social benefits that greater trade may bring to the wider economy[60]). It is a moot point whether this is a market failure *per se*,[61] but anyway there would appear to a robust case for government intervention because it has a potential advantage in the provision of information that can boost transactions in the market resulting in a net gain to all those involved (i.e., the government helps to 'complete' the market through the provision of relevant information). Research carried out as part of DTI evaluations of trade promotion activities show that activities such as trade fairs bring together niche market buyers and sellers in diversified technological goods and thus such evaluations have "repeatedly shown that without support many firms would fail to undertake important marketing activities – including participation in trade fairs and missions – even though, having gained experience of these activities, they would undertake them on subsequent occasions without further support" (Booth di Giovanni, 1997, par. 17(c)). More recent evaluations carried out on a rolling

[58] As Metcalfe and Georgiou (1997) point out: "a profit opportunity known to everybody is a profit opportunity for nobody".

[59] Although he argues that in such a situation there is little in the way of a case for government to pass on that information through subsidising the activity from the public fund. Rather he argues that government can and should pass on the information available but be prepared to charge for this activity.

[60] Such benefits include technology transfer (in its widest sense, including access to better sources of knowledge and expertise), and demonstration effects leading to spillovers (externalities).

[61] Clearly, such communication costs, that inhibit perfect and instantaneous distribution of information, result in a market failure within the static model perfectly competitive (Arrow-Debreu) general equilibrium model, assuming one believes that such an economy could and should exist.

basis for UKTI by OMB (e.g. UKTI, 2009) continue to confirm this additionality effect of intervention, and indeed such additionality is often cited as evidence that there were 'market failures' that needed correction (e.g. additionality provides "evidence on the extent to which businesses change behaviour as a direct result of learning caused by advice, and about the extent to which changes have led to real business performance improvements which would not otherwise have occurred" – DTI, 2006b, par. 4.30).

3.9 As to asymmetric information costs, access to efficient, and appropriately priced information and advisory services is especially important for smaller firms for whom the costs of information access and absorption are relatively larger. However, information asymmetry potentially exists for firms of all sizes before parties enter into a contract for buying/supplying goods and services. For example, firms that need to 'prove' the quality of a new niche product have information that other (more risk adverse) parties do not share, leading to a case of 'adverse selection' where trade at an agreed price cannot be (easily) found. Moral hazard problems occur after a (trade) contract is signed. Here both parties cannot perfectly verify that the contract is being properly fulfilled, leading to an opportunity for shirking by one of the parties. Contracts may be designed to try to transfer the higher risks from one party to the other, but the costs of arranging, monitoring and enforcing often lead to inefficiencies occurring (the notion of the 'incomplete contract dilemma' – Klein *et. al*., 1978 – holds that it is unrealistic to specify a situation entirely). As such, asymmetric information 'failures' are probably not especially important to separate from imperfect information in general, and where smaller firms face relatively higher costs (due to their size), it may be better to deal with these under the third form of market failue listed in Table 3.1.

3.10 Financial barriers are usually deemed to be a market failure when (particularly) SME's find it difficult to convince potential lenders or equity providers to support them because they have insufficient collateral and/or a track record to reduce the risk associated with the activity under consideration. And given the information requirements of internationalisation, and problems discussed above of imperfect and asymmetric information, risk and uncertainty is generally a major feature of such markets. Thus, for example, the Export Credits Guarantee Department (ECGD)[62] is justified on the grounds that high entry costs (and corresponding difficulties in obtaining finance) is associated with the high risks of failure of this activity, and thus small firms in particular cannot proceed. To the extent that the problem is due to financial institutions and the owners of firms taking a short-termist approach (leading in part to problems of corporate governance, adverse selection, moral hazard and principal-agent issues), this barrier may be deemed an institutional failure. Thus, there would appear to be good grounds for government intervention (e.g. the ECGD[63]), or in attempting

[62] The role of the ECDG is to help UK manufacturers (principally those providing expensive and specialised capital goods) and investors trade overseas by providing them with insurance and/or backing for finance to protect against non-payment. Insurance is particularly necessary for companies who are looking to win contracts in the developing world or with buyers that they might be unfamiliar with.

[63] Note, ECGD complements the insurance that is available from the private market. Private sector insurance tends only to be available for contracts with buyers in the developed world and for orders that involve relatively short delivery/credit periods and where contract values are reasonably small.

to provide a 'missing market' such as the encouragement (perhaps through tax concessions) of suppliers of (venture and/or finance) capital.

3.11 We have just mentioned missing markets as an example of market failure. In extreme cases of imperfect information and/or asymmetric information, the outcome may be that both buyers and sellers cannot be found (to agree a price for trade). Moreover, some types of information have the nature of public goods, which markets alone cannot supply – these include unique, reliable and impartial access to information, such as through the global embassy network and other Government channels and contacts, which become available through the Government's very long-term, and non-commercial attachment, to overseas markets. It would be costly and wasteful of resources for individual firms to undertake sub-optimal, high cost information gathering, when government has a particularly well-placed role to provide such information as a public good. In addition, since increased globalisation exposes firms to trends in international product and process development and business developments, as well as customer preferences and needs, there are likely to be beneficial spillovers (externalities) through demonstration effects that lead to changes in domestic firms own business practices. Such externalities (and public good aspects) would not be paid for by the private sector, and this in part would constitute a missing market.

3.12 Appropriability failure occurs when investments in innovative (or similar type) activities (which often are a prerequisite for entering foreign markets) do not yield the necessary property rights which can be reserved for the exclusive use of the investor. Information (once released or pirated) becomes public knowledge and is easily diffused and thus property rights are often difficult to enforce. In this instance the problem is partly one of coordination: the seller of know-how (incorporated into a new niche product) may have to disclose (or cannot prevent disclosure) of the object of the exchange (i.e. the product).[64] The purchaser and vendor therefore cannot coordinate effectively and at the same time allow the exporter to extract the full private rent from the innovation. This therefore leads to a disincentive to internationalise, and cannot usually be corrected through institutions (such as patenting and licensing bodies with jurisdiction in only one territory) that grant perfect property rights that are enforceable. Thus, there is a rationale for government intervention. The government (according to Casson, 1999) cannot grant itself full property rights either, but it can appropriate by another means – taxation – and therefore there is a direct link between government subsidies of trade provision activities that are financed out of taxation.

3.13 Barriers to entry and exit are mostly the consequence of the significant sunk costs associated with internationalisation (such as export market entry). These costs have already been discussed above (and in Chapter 2); to recap, they potentially include the cost of information about demand conditions abroad (i.e. market research), or the costs of establishing a distribution system, or the need to modify products for different markets and to comply with institutional arrangements and regulations (including differences in the 'culture' of the way business is carried out). It is also assumed that such non-recoverable entry costs recur in full if the firm exits the export market for any amount of time. Too few

[64] This is the Arrow paradox (1962). If a full description of a technology must be communicated prior to any transaction this obviates the need to buy and so the seller has good reasons not to disclose their full knowledge.

buyers and sellers in any market can lower competition, and thus have a detrimental impact on (dynamic) efficiency (and consumer welfare).

3.14 The grounds for government entry are therefore to lower such barriers through (mostly) the provision of information services and (possibly) through subsidising the sunk cost element involved in entry/exit. However, there is also the possibility that government – through assisting certain sub-groups in the industry – might create barriers to entry and/or exit of their own. For instance, if they subside inefficient plants, or if government help leads to displacement (see Wren, 2005, for an explanation of the terms 'additionality', 'deadweight', and 'displacement').

3.15 Government failure as a hindrance to firms and markets arises when the government has a comparative advantage in supplying a good or service (often knowledge), but fails to do this. The classic examples are public goods (those whose consumption by one firm does not preclude their use by others), where because of the free-rider problem the private sector would produce too low a level of demand and thus consumption and production, to the detriment of society. Information about quality standards (and the extent to which they are met by particular goods and services), as well as regulation by efficient institutional and legal systems, all have public good elements that are important in facilitating trade. In addition, the export sale potential of any (new, niche) product may depend on establishing a brand image for a company, which unless it is large (and established already internationally) may be difficult to achieve. Government therefore can have a role in raising the profile of the UK, with this acting to help with establishing a brand image for a company. It can also seek to improve overseas perceptions of the UK to overcome any distorted perceptions of UK capabilities among overseas customers. In addition, through its overseas embassies, the Government can acquire and maintain knowledge about particular countries and sectors, including factors that influence business opportunities and performance.

3.16 Searching for information is often pre-conditioned on proximity and existing business and personal contacts (networks). Chapter 2 discussed the increased importance of global networks and alliances (that provide increased access to knowledge); it was noted that networks are expected to be more important to SMEs when they begin to internationalise, as the acquisition of experiential knowledge about overseas markets is crucial when selecting which markets to entry and/or expand into. Access to, and encounters with, potential partners and clients allow firms to familiarise themselves with the 'culture' of business in overseas markets, and to build up trust as relationships/joint activities are established. There is therefore a role for government to facilitate access to networks of business contacts in overseas markets (especially for SMEs); while publicly financed expenditure on knowledge-generating export promotion activities is further justified if networks act as an informal barrier to market entry (if they limit the extent to which information is made available to outsiders).

3.17 More generally, network failures arise because technological know-how (broadly defined) is partly tacit and therefore cannot be diffused easily. This is argued to be especially important in the internationalisation process where transfer depends on inter-personal contacts. Here networks can be important for the transfer of such tacit knowledge, and they can also partly overcome the problems associated with firms experiencing bounded rationality and

consequently bounded vision. However, it has been argued by Teece and Pisano (1998) that even where networks assist in providing information, replication and imitation are not easy especially if productive knowledge (or its absence) is embodied in the dynamic capabilities of a firm. This needs to be set alongside the arguments put forward by Carlsson and Jacobsson (1997) that networks (i) may improve the resource base of the firm (shaping the internal capabilities of firms), thus making it more receptive, and (ii) that "…the character of the networks to which the firm belongs has a bearing on the type of information and knowledge to which the firm has access… (so) innovation and diffusion turns… into a collective activity, in addition to being an individual one.. (and thus) networks are central to the innovation process" (p. 301). Network failures arise when firms are not well connected to other firms with an overlapping technology base or when the network goes in the wrong direction and takes firms with it. Government assistance, through providing information to networks, may therefore be important.

3.18 Indeed, government organisations like UKTI have been found to fulfil the role of a trusted intermediary "which brokers relationships between businesses and potential partners or sources of knowledge, through its network of consulates and embassies overseas, and its network of contacts within the UK" (DTI, 2006b, Box 4.3). when transactions involve considerable uncertaintly (as they usually do when operating internationally), there is a need to establish trust between business partners, and here institutions like UKTI and SDI (e.g. through Scotland Europa and other overseas offices) have a potentially significant role to play.

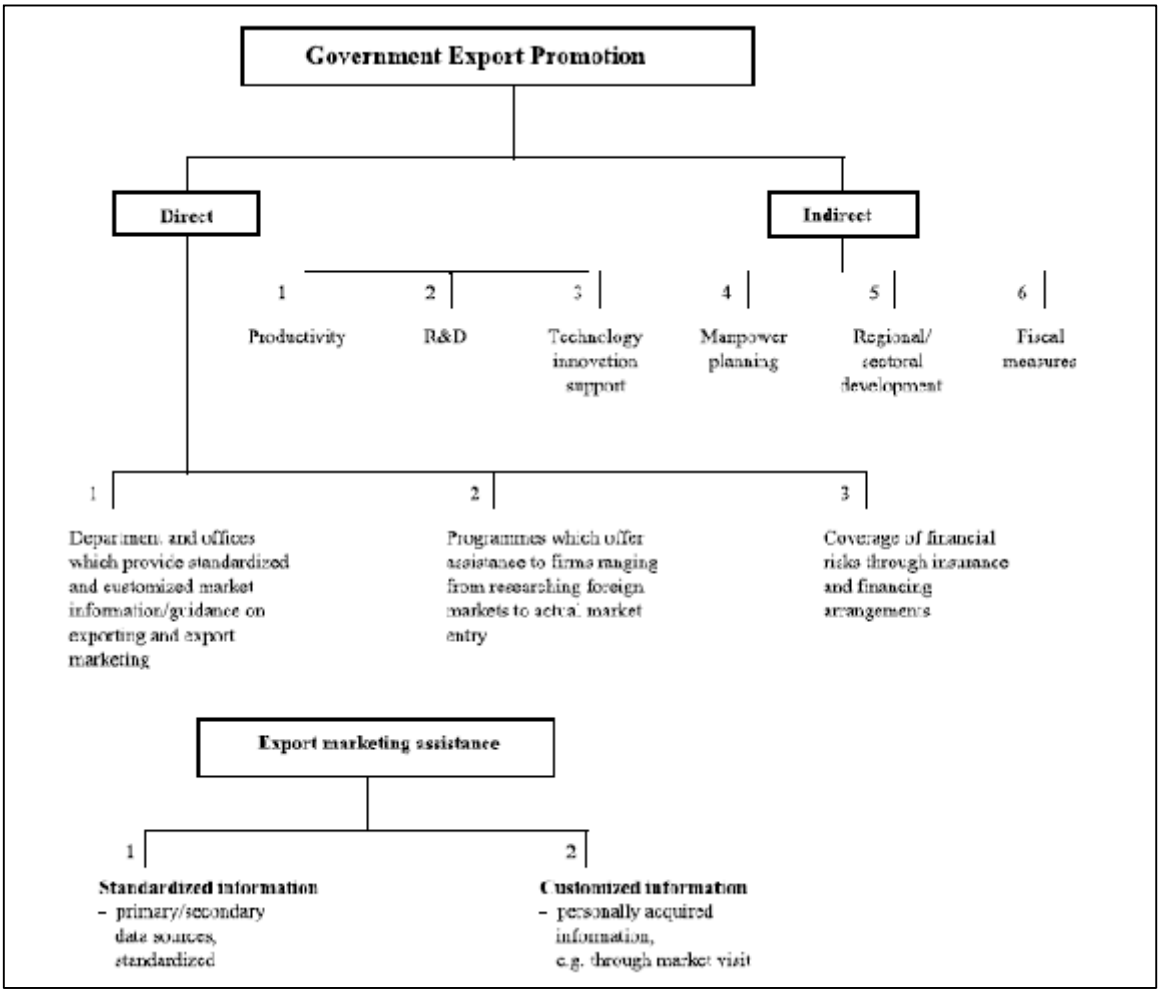
3.19 Finally, there is the issue of systemic failure at the level of the entire technological system. "Thus while individual firm competence is the central basis of innovative performance, firms operate within 'systems of innovation' which intermesh their activities with those of other organizations." (Dodgson and Bessant, 1996, p.20). This has far reaching policy conclusions, which we return to later when discussing the government's role in providing the 'right' incentives to adjust in the face of increased globalisation; but for now we need to briefly look at this system and the links between all its participants. Various writers (e.g. Freeman, 1987; Dosi *et. al.*, 1988; Freeman and Soete, 1997; Patel and Pavitt, 1997; and especially Cooke, 1997) stress that firms are located within specific regional (or national) technological systems that contain specific and unique competencies, networks and institutions that define the context in which the firm operates.[65] These systems are also on an increasing returns, path dependency trajectory that results in different, uneven and divergent outcomes across regions and nations. There are elements here of the 'cumulative causation' models that date from Mydral (1957) and Hirshmann (1958) and which have been formalised in a regional context by Dixon and Thirlwall (1975). Such models operate under increasing returns with virtuous circles of spread and backwash (feedback), but which can also fail if: firms, institutions and networks become locked-in to 'old' technologies; or if they hinder the

[65] Carlsson (1995) also adds technology systems that are similar but are not necessary confined to geographical boundaries, but can be international as well. It is also possible to identify 'clusters' which relate closely to the notion of industrial districts, and the idea that firms in a cluster share external agglomeration economies that provide specific benefits (e.g., specialised labour markets; business services, educational support). Complexes are another variation, with again the importance of networks and institutions at the core of what defines the system.

process of diversity creation (e.g., preventing the emergence of newer branches of industries). Systems are highly complex, involving the financial, educational and science and technology institutions in the region or nation, all of which impact directly on the operating environment of the firm, but these systems also involve more difficult to measure elements such as culture, and the legal and statutory framework which may help or hinder development. In terms of government interventions to overcome systemic failures, the common theme in the literature is the need to create variety and to increase connectivity in these technological systems (e.g., Metcalfe, 1998).

3.20 Overall, it would seem that there is a clear case for government intervention to help firms overcome barriers to internationalisation that are mostly linked to information costs that individual firms would (or could) not meet without government assistance. We will later on look at the evidence put forward by firms themselves as to the extent and nature of perceived barriers to entry (to see if these overlap with the 'market failures' described here), but first we turn to a more general look at the way in which government (agencies) intervene to promote exporting and outward FDI.

Figure 3.1: The scope of government export promotion



Source: Diamantopoulos *et. al*. (1993)

Government response to market failures

3.21 Having discussed the rationale for government intervention on the basis of market failures (or a more general argument that where there are overall greater net economic benefits which the private sector would be unable, or unlikely to achieve unaided), we begin with a general overview of the type of activities that are generally undertaken by government agencies involved in internationalisation activities, since this provides us with an opportunity to then consider the rationale put forward by SDI (and SE more generally) for assisting firms to internationalise. It will also allow us to put SDI interventions within a broader context.

3.22 We have undertaken an extensive search of sources of information on what different export promotion agencies (EPAs) do, and this shows that in general most EPAs provide similar products, but the information that is available rarely provides detailed analysis of these products which would then allow us to discern more clearly their specific content and therefore how exactly they impact on firms and their exporting activities.

3.23 Finland was the first country to set up an export promotion agency in 1919. A recent review of what EPA's continue to do has been undertaken by Lederman et. al. (2006). They state that the basic role is "… to help (potential) exporters find markets for their products, as well as provide them with a better understanding of products demanded in different export markets" (pp. 1-2). Thus, Lederman et. al. (op. cit.) divide activities into four broad areas covering: (1) country image building (such as advertising, promotional events, and advocacy); (2) export support services (e.g., training for exporting, technical assistance, capacity building, information on finance, logistics, and pricing, and regulatory requirements); (3) marketing (trade fairs, missions, embassy services); and (4) market research and publications (including market surveys, on-line information, contact databases).[66] Daniel Lederman has kindly provided us with his database on the 79 EPAs in different countries that responded to a 2005 questionnaire underpinning the Lederman et. al. (2006) study. Table 3.2 shows that generally relatively more of EPA budgets were spent on marketing (trade fairs, missions, embassy services) by all sub-groups except the rest of Europe. The next highest categories of spending were generally export support services or market research (such as market surveys), with image building or other activities related to export promotion coming next. Other activities not related to export promotion (such as export finance) were of more relevance to countries belonging to the 'rest of Europe' or 'rest of the World' sub-groups. In fact there is little statistical difference in the means across the four regional sub-groups used,[67] except with respect to marketing (where the emerging economies on average spend more, while the rest of Europe spends less) and other activities

[66] Based on econometric analysis using country data from a number of OECD member states, they found that "… on average EPAs have a positive and statistically significant impact on national exports… there is also evidence that there are important decreasing returns to scale in resources devoted to export promotion, and even negative marginal returns above a certain level" (p. 3).

[67] We tested for statistical differences across sub-groups using the Kruskall-Wallis nonparametric test. Note part of the lack of statistical differences across sub-groups is the wide variation in values within each sub-group and activity, as shown by the high values for the standard deviations surrounding each mean.

not related to export promotion (where the rest of Europe and the rest of the World have higher levels of relative spending).

Table 3.2 Percentage of total budget spent on EPA activities

	Country image building	Export support services	Marketing	Research & publications	Other related to EP	Other not related to EP
Developed economies						
Mean	13.8	16.8	26.3	19.3	16.9	6.7
Median	6.4	6.6	25.7	6.8	0.0	0.0
Std. Deviation	15.4	16.4	18.7	22.2	20.9	14.5
Emerging economies						
Mean	5.0	8.9	54.6	17.8	8.3	5.0
Median	5.7	6.4	55.1	22.7	0.0	0.0
Std. Deviation	2.9	9.5	22.2	11.1	18.6	11.2
Rest of Europe						
Mean	13.3	12.6	16.5	16.6	5.2	35.3
Median	6.8	5.7	19.0	6.8	0.0	42.6
Std. Deviation	11.1	12.6	7.4	13.8	8.0	23.8
Rest of the World						
Mean	11.9	19.6	30.0	14.9	3.7	19.6
Median	6.8	14.3	29.4	14.3	0.0	7.9
Std. Deviation	12.3	19.1	19.3	10.7	6.8	23.1
All respondents						
Mean	12.0	17.4	29.0	16.1	6.5	18.6
Median	6.8	7.4	25.0	14.0	0.0	6.8
Std. Deviation	12.3	17.5	19.7	13.6	12.3	22.8

Source: World Bank data (see Lederman et. al., 2006)

3.24 The activities in Table 3.2 are not dissimilar to that set out in Diamantopoulos, et. al., (1993) – see Figure 3.1 – although the latter is a little dated. A more general description of government intervention (which includes a more general view of internationalisation extending beyond just increasing the volume of exports) is provided in the Mortimer Report (2008) covering Australia; there is a recognised need for firms (a) to learn about exporting (which markets, finding customers, advice on business plans, logistics and finance); (b) to grow their international business (those with some experience require assistance to plan entry into new markets, obtain growth finance, networking with new customers, and finding new partners); and (c) to become globally competitive (more experienced firms requiring high-level market and strategic insights and assistance to access partners and use more sophisticated business models involving outward FDI-type activities). Thus they see the role of government (agencies) in this area as covering more than just firm-based business advice (see Table 3.3)

3.25 In looking to strengthen export and investment programmes and services in Australia, the Mortimer Report points to a need to ensure that firms have matching capabilities to new and emerging market opportunities (e.g. through helping Australian industry to form clusters, linked to global supply chains and with the abilities to bid collectively for work on major international projects); access to relevant information and advice (e.g., trade-related data, research and

analysis, provided through a credible, ongoing research and analytical capability); and better international business and management skills (e.g., "the need to expose business leaders to international business opportunities with a view to increasing their international culture awareness and understanding of different business regimes, particularly in difficult markets … (and) to provide hands-on, experienced-based management development opportunities in difficult and emerging markets" p. 120).

Table 3.3 Scope of export and investment development activities

Market–sectoral level	Firm-specific level	Community level
Identify new and emerging opportunities in difficult markets, match to Australian industry capability and position businesses to take advantage of them Support high-level trade missions in target markets Develop integrated industry export plans with clear targets and joint government and business roles	Address information gaps and provide advice on overseas markets, market selection and access to market intelligence—especially in more challenging markets and to small and medium-sized enterprises Facilitate business connections and introductions, including matching Australian exporters and investors with potential buyers, partners, decision makers and advisers overseas Encourage consortia-led approaches to major projects Enhance international business capabilities through exporter development initiatives, training and advice Support mentoring of firms with high growth potential	Build awareness of Australia and Australian capability overseas Build community awareness of the benefits of trade and investment in Australia Stimulate an international business culture

Source: Mortimer Report (2008, Table 7.1)

3.26 The resulting recommendations from the Mortimer Report (linked to the needs outlined in the last paragraph) are taken even further in similar reviews of how to support the internationalisation of firms (particularly SME's). EC (2007) is the final report of a group of experts in this area, and it links the needs of companies into a much wider requirement to improve capabilities (and not just provide information for potential exporters). Firstly, there is a general view expressed that "… internationalisation is not to be considered as a separate part of the company or as a strategy to be enacted only in times of reduced local demand, but fully integrated into the SME as a core part of the company's long-term strategy" (p.4). The report cites recent analysis for the OECD on the main barriers to greater internationalisation for SME's; these can be grouped into: (1) insufficient managerial time and/or skills required for internationalisation; (2)

lack of financial resources; and (3) lack of knowledge of foreign markets, mostly due to points (1) and (2). Hence, in response to such barriers, the experts argue that "… successful and sustainable internationalisation will require an internationalisation strategy and the acquisition of a series of capacities, abilities and resources prior or at the first steps of internationalisation" (p. 11). That is, they are making a direct and clear link between internationalisation (especially exporting) and competitiveness. They go on to restate our earlier findings (that empirical research shows successful small firms have better organisational learning and strategy development), and then emphasise the importance of support "… in the area of managerial competences for those SMEs considering internationalisation… (linked to) the severe SME lack of international strategy". We take up below some of their other specific recommendations on how to encourage SME internationalisation, but for now note their general (and overriding) point that boosting internationalisation requires integrating policies for competitiveness and growth, noting that "Enterprise Ireland integrates all competitiveness and growth policies under one umbrella: innovation, IP, internationalisation management training and human resource audits" (p.20). Indeed, Forfás (2007) points out the "necessity to implement new managerial knowledge in consequence of undertaking foreign expansion, which requires the strengthening of in-house 'managerial capabilities'… such skills form a 'dynamic knowledge base' embedded in the organisation … successful companies are quick to build up this knowledge base" (p. 10).

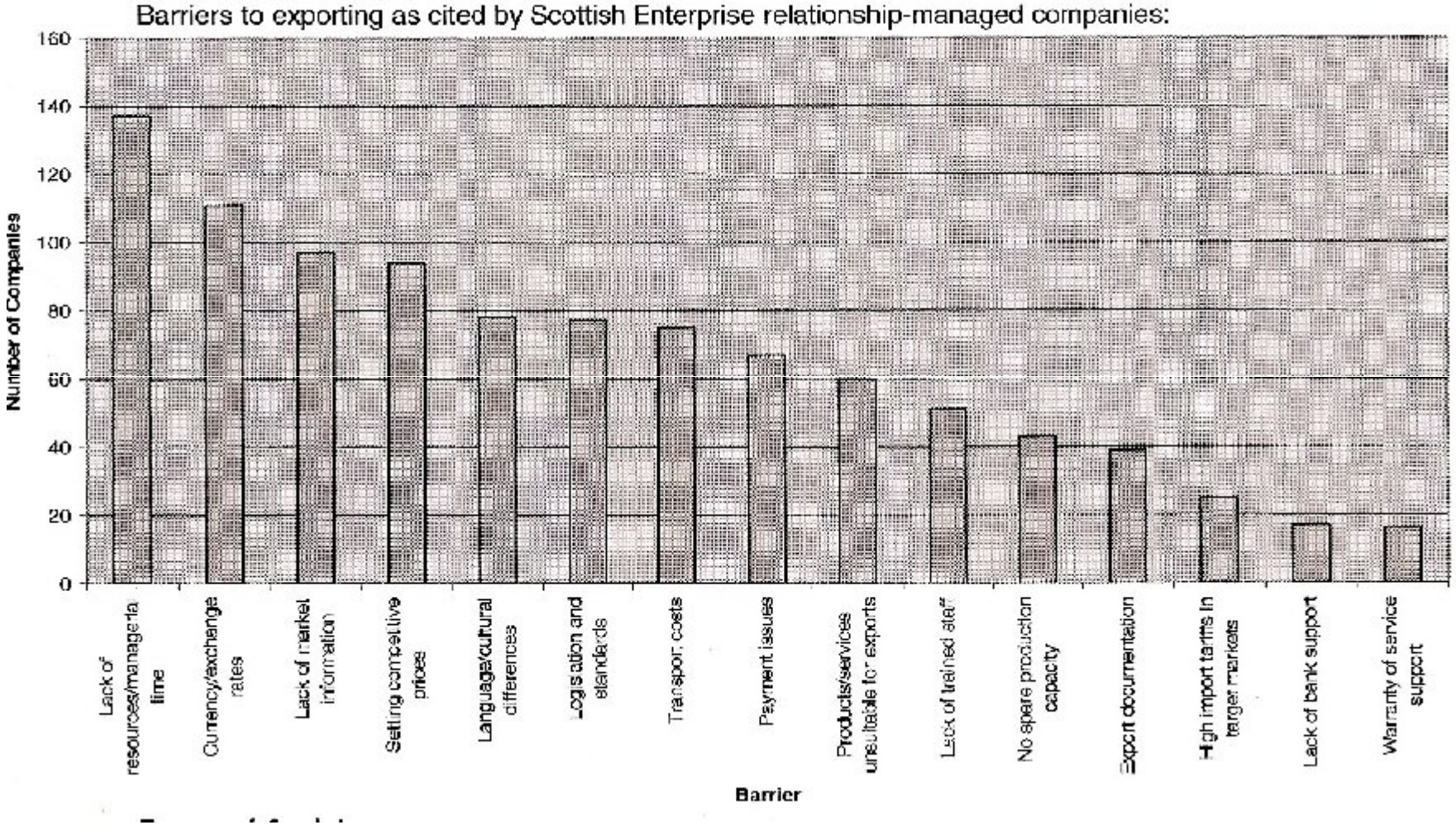
3.27 Thus in relation to government responses to 'market failures', it would seem that current thinking has moved beyond just considering such 'failures' as mostly information needs, and thus potentially indicative of resource-gaps faced by (especially smaller) firms; rather there are potential capability-gaps that need to be addressed, which are in line with our review of the extant academic literature as set out in Chapter 2.

SDI activities and Market Failure

3.28 Having reviewed the general literature on market failures and the case for government intervention, and the broad response by government (agencies) for the need to assist firms, we now turn to information specifically related to SDI activities in Scotland. We begin with outlining the reasons put forward by firms that are Designated Relationship Managed (DRM) in Scotland as to the barriers to exporting that they face. The data is taken from the 2006 Global Connections Survey (GCS), and SDI have undertaken a separate in-house exercise to identify all the respondents to the GCS who were Account or Client Managed. The latter sub-group are those firms that since 2005 have been the main recipients of assistance from SDI (given that these are the companies with high growth potential) and thus information on barriers from this sub-group is particularly appropriate.

3.29 Figure 3.2 covers the responses of some 432 DRM firms in 2006; since there were about 1400 DRM companies in 2006 (see Harris, 2009, Table 2.4), Figure 3.2 only covers about one-third of all the relevant firms and might therefore not be fully representative of such companies in Scotland. However, the responses obtained are in line with prior expectations and the type of market failures

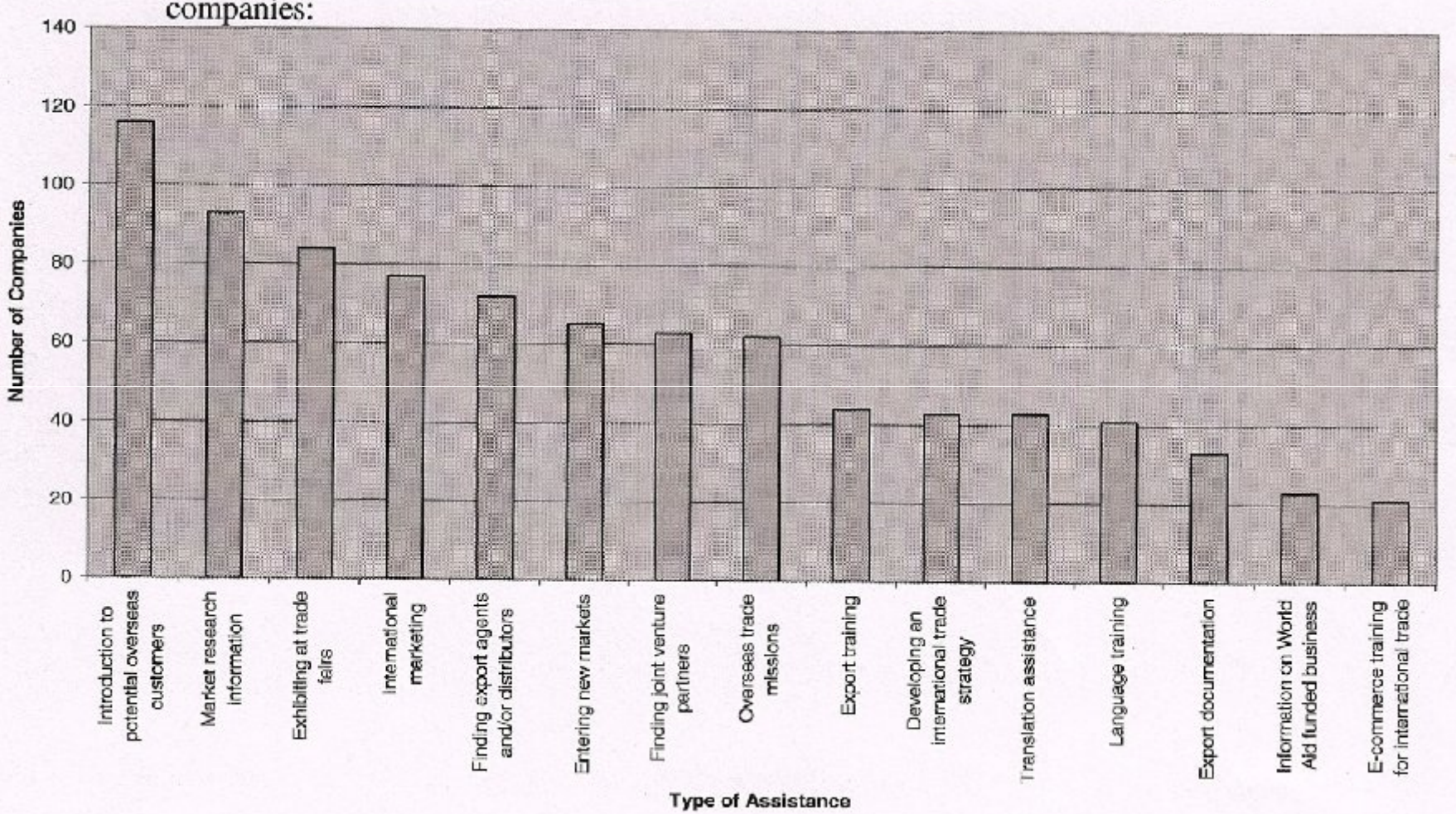
Figure 3.2 **Barriers to Exporting**



Source: SDI (internal document) using data from GCS, 2006

Figure 3.3 **Forms of Assistance**:

Most commonly cited forms of Assistance required by designated relationship-managed companies:



Source: SDI (internal document) using data from GCS, 2006

discussed above: lack of resources/managerial time is the most important barrier to exporting, followed by factors associated with various aspects related to risk and uncertainty such as exchange rate movements, lack of market information, what prices to set, and cultural/language issues.[68] The type of assistance firms believe they need to overcome these barriers are set out in Figure 3.3, comprising mostly finding (and marketing to) customers and/or finding agents/partners for supplying in the host country.

3.30 Thus the perceived barriers and associated requirements for assistance from DRM companies would seem to match well with the portfolio of products supplied by SDI. We shall review these in detail in the next Chapter, but here it is sufficient to recognise that many of the services provided by SDI are linked to direct assistance with attending international exhibitions, overseas missions, learning journeys; overseas market support (much of this is via the national programmes run by UKTI – such as OMIS and EMRS[69]); and preparation for internationalisation (both for inexperienced and more experienced firms operating overseas). Indeed, SDI have other tailored products that link more with the strategic and long-term internationalisation needs of companies (such as the International Strategy Workshop and Mentoring, and the 'flagship' Global Companies Development Programme - GCDP).

3.31 As to the market failure rationales put forward by SDI in their product manuals (and associated documentation), we have not been able to find any specific reference to market failures in the product user guides supplied to us for: (1) Exhibitions, Missions, & Learning Journeys; (2) Overseas Market Support; (3) International Preparedness Programme[70]; (4) Flexible Financial Products; (5) International Strategy Workshop; (6) International Market Presence; (7) International Business Opportunities; and (8) International Mentoring. In contrast, project Gateway papers for GCDP note the following market failures: "… access to information (e.g., markets, sectors, competitors, partners, R&D, IP); knowledge of how to speed and scale up internationally to access opportunities; learning from others who have faced the same or similar issues; and developing and exploiting international networks in Scotland and abroad". A recent review of the GCDP (SQW, 2009) also had access to an internal 1999 SE internal paper relating to the setting up of the GCDP in 2000, and they note that the main market failures put forward by SE were information deficiencies (particularly related to finance but also international markets), and risk aversion (suggesting that Scottish SME's do not perceive the full benefits from internationalising). In the 2005 review of the Learning Journey product undertaken for Scottish Enterprise Lanarkshire, the reviewers (GEN Consulting,

[68] Note, these barriers are similar to what is found for other surveys in other countries. For example, OECD (2006) list 7 main barriers to internationalisation: (1) shortage of working capital to finance exports; (2) indentifying foreign business opportunities; (3) limited information to locate/analyse markets; (4) inability to contact potential overseas customers; (5) obtaining reliable foreign representation; (6) lack of managerial time to deal with internationalisation; and (7) inadequate quantity of and/or untrained personnel for internationalisation. For Australia, the main barriers are: (a) lack of local business and market knowledge; (b) finance; (c) exchange rates; (d) economic conditions abroad; (e) protection of IP; (f) labour and skills shortages; (g) political conditions abroad; and (h) cultural differences. For the England and Wales, a recent PIMS survey (PIMS 2008) found that by far the most important were fixed cost barriers, followed by contacts, and legal & regulatory barriers.

[69] I.e., Overseas Market Introduction Service and Export Market Research Scheme.

[70] We have equated this to 'Readiness to Internationalise' but we need to confirm this is correct.

2005) refer to the Approval Papers for this product as stating that it was set up to overcome a lack of resources, risk aversion and informational deficiencies. An evaluation of internationalisation activities carried out in SE Renfrewshire between 2003-2006 (covering mostly support to attend exhibitions, mission support, and overseas market support) refers to risk aversion and information deficiencies as market failures (Ekos, 2007); Internal 2008 SDI Approval Papers for TalentScotland states that the project is "… aimed at mitigating information deficiencies and risk aversion amongst globally mobile individuals" in the sectors covered by the project (e.g., electronics, and life sciences). Moreover "… in addressing the market failure of information deficiencies the role of Talentscotland is that of a "public good" which is non-excludable and is available equally to everyone". Thus, in practice, there is a recognition that individual companies will not spend on overcoming such information asymmetries, and therefore government must. Lastly, with respect to GlobalScot, the review by Frontline (2007) notes that market failures addressed relate to risk aversion and information deficiencies. They consider the issue of whether such failures reflect the lack of experience by Scottish businesses in accessing global networks, or whether it is a more deep-seated cultural problem (the latter requiring a major shift in mindsets and behaviours).

3.32 To summarise, SDI generally put forward risk aversion and information deficiencies as overall market failures that justify their intervention. However, the arguments made are often very general, not well-linked to the list of failures set out in Table 3.1, and are often absent from documents (as used by Client Managers), suggesting that there is an implicit assumption that such (generalised) arguments are sufficient to SDI's needs.

3.33 Reviews of UKTI products and programmes usually have more details on the market failure rationale for government support; for example, the recent review by London Economics (2008) of UKTI's Tradeshow Access Programme (TAP) justifies intervention through overcoming information asymmetries and raising the perception and profile of UK industry internationally (a public good element). The Mortimer Report (2008) for Australia recognises that a strong reason for intervention is that firms may have specific technical expertise, but lack the international management skills, experience and network connections needed to achieve desired outcomes. Other take a different approach; for example in EC (2007) it is argued that "many SMEs would not consider internationalisation if it were not because of support. This "additionality" effect fully justifies government intervention".

Is there a need for a wider response to business internationalisation?

3.34 In more recent literature, there have been questions raised as to whether the usual approach to helping (particularly smaller) firms to internationalise – as set out in Figure 3.1 and par. 3.44 above – is still appropriate. Bell *et. al*. (2003) argue that this approach is usually geared towards offering support and assistance to firms pursuing the traditional incremental pathway to internationalisation (the so-called Uppsala model – see Harris and Li, 2005, Chapter 2 for a discussion). They argue that: "although such an emphasis is consistent with the prevailing views on internationalisation during the 1980s, it is debatable if it is of any real value to 'born global' firms, or indeed to rapidly

internationalising 'born-again globals'. These firms are highly motivated to internationalise and recognise the benefits of doing so. Further attempts to stimulate export activity are akin to preaching to the converted and an inefficient use of scare EPO resources" (p. 354).

3.35 This criticism of the traditional approach to export promotion is substantiated by noting that 'born global' firms, targeting global niches, are more likely to have better market knowledge than firms that internationalise incrementally, and as players in knowledge-based sectors, they are also more likely to have better access to the shared intellectual capital embedded in the global industry. What such firms face is the problems surrounding developing new products for multiple markets (often entering these concurrently), with such activities incurring substantial up-front product and market development costs. They also face shorter life-cycles, and thus with their more complex offerings, they are high-risk ventures.

3.36 Bell *et. al*. (op cit.) therefore argue that assistance from EPA's that come under the "indirect" promotion activities listed in Figure 3.1 are likely to be of more relevance and therefore beneficial. Moreover, their informational needs are specific (not general) and it is argued that EPA's should seek to be come repositories of 'hard' market intelligence. There is also a call for greater support for R&D and innovation activities, greater access to venture capital for these type of firms, and greater support in developing international network relationships. In all, it is argued that EPA's need to adopt a more holistic approach to SMEs that recognises that firm internationalisation is much broader than exporting; there is a need to assist internationalising SMEs to identify, leverage, and harness additional human, financial, and knowledge resources. This is fully consistent with the arguments surrounding the resource-based approach to internationalisation set out in Chapter 2.

3.37 Lastly, Bell *et. al*. (*op. cit*.) also comment on the need to recognise that internationalisation may result (at least in part) from contacts in the domestic market (rather than overseas), and so there is a need to help develop such domestic networks as well. This echoes the points made by Harris and Wheeler (2005), who considered the importance of inter-personal relationships in the internationalisation process for SMEs. What they found is that many of the relationships formed are more likely to be at home than abroad.

3.38 Others have also called for a more flexible, and pragmatic approach, from government. EU (2007) states that a successful approach to intervention must consider the barriers that impede or restrain internationalisation (of SME's) *and* the drivers that move firms to go global. They argue for "a fluid, integrative and consultative process between all stakeholders (Government, support agencies and SMEs) is possibly the best key for successful policy development" (p.18). They also argue that support needs to consider the key variables (such as availability of finance, company size, stage of internationalisation, sector, location, target markets, etc.) that influence the internationalisation process, and thus "… this strongly supports an approach based on individualised support to each SME".

3.39 Other writers (e.g. Wright et . al., 2007) continue along similar lines. They note that internationalisation is a dynamic activity, and that firms may therefore experience 'epochs' of overseas activities, requiring assistance that recognises that internationalisation is not necessarily a one-off activity. Harris and Li (2006), using data from FAME, show that a large proportion of UK firms enter

and exit export markets, and it also known that export intensity varies over the life-cycle of products. Wright et. al. (op. cit.) also emphasise the skills and resources needed to sustain and/or increase internationalisation activities, noting especially "… the need to develop more informal and tacit knowledge have been identified as major barriers to SME growth in general" p.1024).

Table 3.4: Classification of Knowledge-based sector on the basis of observed motivations for exporting

Segment Label	Characteristics
TINA	There is no alternative (to internationalisation). Characterised by the belief that the domestic market is simply too small for a viable business and hence international trading is essential rather than simply desirable.
Gung Ho	Characterised by a belief that international markets are attractive and that barriers to internationalisation are relatively trivial.
Networker	Characterised by involvement in a global value chain in which trading is between other (international) companies in the value chain.
Incubator	Characterised by early life cycle, pre-production, stage. Heavily R&D focused and seeking commercialisation via sales and marketing partners.
Aspirant Responder	Characterised by accidental or coincidental international activity in response to customer enquiries but also by a positive attitude to the benefits of internationalisation
Passive Responder	Characterised by accidental or coincidental international activity in response to customer enquiries but also by a negative attitude to the benefits of internationalisation and a fear of the difficulties associated with it.
Reluctant Virgin	Characterised by little or no international activity, a sceptical attitude to its benefits and a deeply help fear of its risks.

Source: Pragmedic (2003)

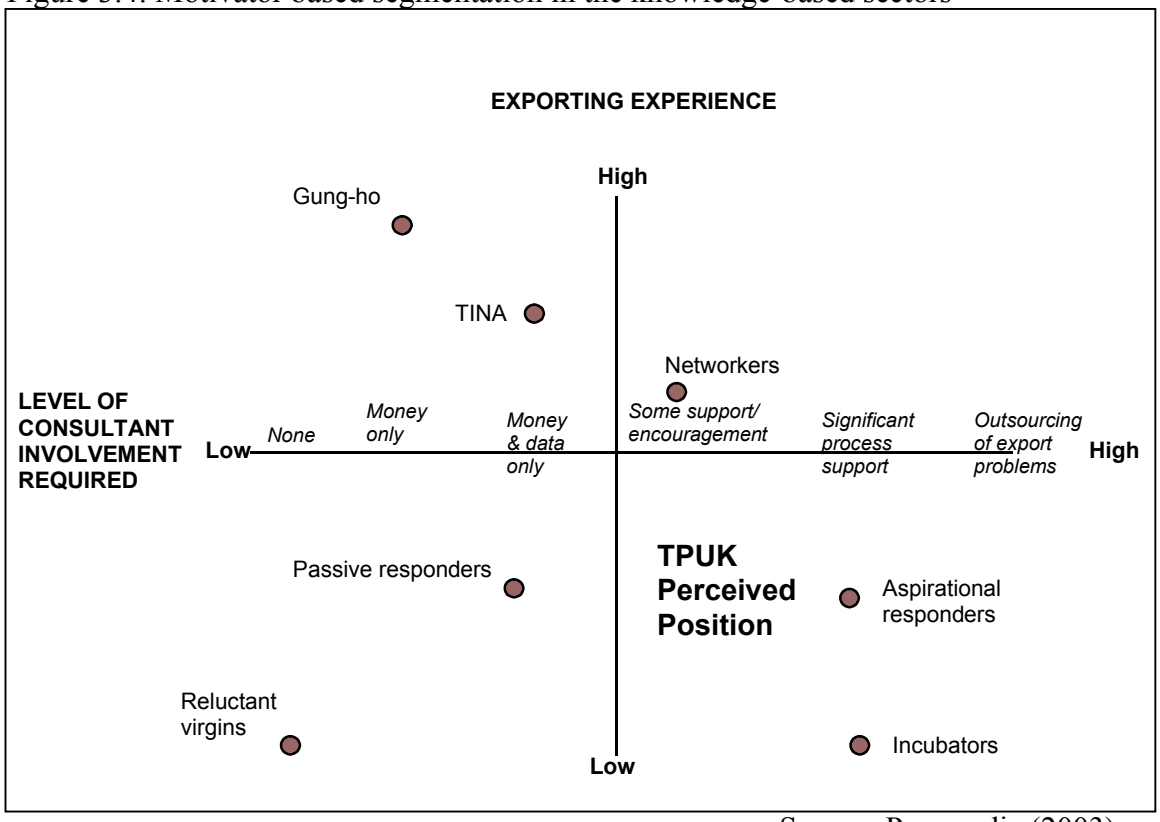
3.40 Lastly, several studies for the East of England (involving collecting primary data in the region from exporters, as well as in depth interviews, and conducting workshops) culminated in the classification of exporters in the knowledge-based economy into segments, based on their motivations for exporting (Pragmedic, 2003). Table 3.4 and Figure 3.4 classify firms into 7 sub-groups (ranging from those for whom internationalisation is necessary – such as 'born global' firms – to those who have little or no international activity and a sceptical attitude to its benefits, and fear of the risks involved).[71] They then cross-classified those 7

[71] Note, the sub-groups identified in Table 3.2 could not be linked in any straight-forward way to standard descriptors like size, industry sector (or even the level of export activity). This suggests that

sub-groups by exporting experience and the likely level of support needed (labelled as 'level of consultant involvement required' in Figure 3.4).

3.41 The authors of the study argued that the support offered by UKTI's predecessor in 2003 (TPUK) straddled the needs of the segments and did not meet the needs of any segment with great specificity (cf. Figure 3.4); government offers a moderate amount of support which is too little for some and too much for others, as well as being perceived as aimed mostly at inexperienced exporters and biased towards low technology products[72].

Figure 3.4: Motivator based segmentation in the knowledge-based sectors



Source: Pragmedic (2003)

3.42 Thus, a more focused approach was called for based on the needs of the 7 sub-groups identified in Table 3.4, but recognising that since it might not be feasible to have such a purely segmented approach, a three mega-segments approach might be more practical. They put (see Table 3.4) the Gung-ho, TINA (there is no alternative), and networking sub-groups into a 'confident' meta-segment; aspiration responders and incubators go into an 'aspirants' sub-group; and passive responders and reluctant virgins comprise a 'reluctants' sub-group. Table 3.5 summarises the policy response that is recommended for each meta-segment.

government provision of support designed around such simple descriptors would result in sub-optimal support packages as they would not recognise the role of motivation explicitly.

[72] Note, the current UKTI web-site (see https://www.uktradeinvest.gov.uk) clearly distinguishes information into the following export sub-groups: support for new investors, support for current investors, and global partnerships

Table 3.5: Proposed meta-segment approach to promoting internationalisation

Meta-Segment	Confidents	Aspirants	Reluctants
Proposition summary	Internationalisation Support Menu – "You know what you want, we've got it"	Internationalisation Support Partnership – "We have the solution to your aspirations"	Internationalisation Awareness Programme – "Internationalisation without fear"
Communication	Known clients: 'Customer Relationship Management,. Narrowcast, problem specific direct communications to advertise availability of specific services & business opportunities. Many communications initiated by client. Unknown clients: make aware of offering to counter perception that TP is for novices & time-consuming	Key issue is identifying aspirants. Broadcast: techniques can include networking seminars designed to attract aspirants, and awards, such as an award for a product with international potential Narrowcast: salesperson + support.	Needs to take account of limited resources available. - Broadcast media, e.g. PR in specialist journals: "a survey by TP has said…" to generate interest - Educational resources: seminars, white papers
Package	Present all services (including Selection and Management of Overseas Partners) as a 'buffet' for client to dip into as required	Passport to Export, plus: - Improved selling to address control issues - Not assuming non-exporters – many are aspirant responders - Rewording of collateral	Package up services as an easy guide to exporting to encourage successful fulfilment of accidental orders.
Channel	Largely self-help using Web and telephone (inc. Gateway/country desks) – ideally single 'contact centre' appearance to client. ITA brokering of services	General business adviser to screen, then specialist. For buffet services: as Confidents.	Largely remote: - Web: self-help guide, frequently asked questions, online diagnostics etc - Telephone: for access to buffet - Shading to general business advisers
Involvement	Much of relationship is remote, transactional; some personal brokering	High, personal. Graduated general to specialist to cross-brokering	Mostly remote, low involvement

Source: Pragmedic (2003)

Government response to firm adjustment to globalisation

3.43 Hoekman and Javorcik (2004) argued that governments have a twofold role in facilitating business internationalisation: (i) to intervene in areas where there are market failures; and (ii) to ensure that firms face the 'right' incentives to adjust to globalisation.[73] The authors argue that governments often fail in the latter role e.g. through pursuing inappropriate macroeconomic policies (such as overvaluation of the exchange rate following trade liberalisation, and trade policies that attempt to mitigate against the short-run impacts of liberalisation but which create perverse incentives not to adjust), or inappropriate microeconomic policies (hindering firm entry and exit, operating inflexible labour markets, and other policies that slow down adjustment to liberalisation). In summary, they point to the need for credibility of the overall policy stance (i.e. that firms believe in the permanency of the government response to liberalisation) since it impacts significantly on the incentives of firms to incur the costs of adjustment.

3.44 In terms of the effects of globalisation on indigenous firms, they highlight the importance of the following effects:

(a) Competition effects

Due to increased imports and inward FDI, there is increased competition in domestic markets. It is argued that since a significant body of evidence points to 'churning' (entry and exit) as a significant source of productivity enhancement, with such churning related to import penetration (cf. Criscuolo, *et al*, 2004, for the UK; and Bernard and Jensen, 2004a, for the US), then trade liberalization needs to be complimented by measures that facilitate/allow the reallocation of factors of production from low to higher productivity firms. This includes promoting entry, removing exit barriers, and promoting innovation (R&D) to ensure firms have adequate levels of absorptive capacity. This also includes the need for policies that ensure that labour-market flexibility is complimentary and facilitates such churning, since economies with sluggish labour markets gain least from globalisation as trade barriers are removed.

(b) Technology transfer

Trade liberalisation results in access to new technologies, thus potentially upgrading indigenous firms. However, this also requires absorptive capacity to adapt such new technology, and such capacity is related to human capital endowments and investment in R&D (see chapter 2). FDI can also bring about transfers through demonstration effects and a range of other potential spillover impacts (Harris and Robinson, 2004, Table 1, provide a typology of such spillovers and evidence on whether they are positive or not in the UK; others – such as Gorg and Greenaway, 2004 – also provide similar evidence). Hoekman and Javorcik (*op. cit*.) argue that all this suggests that a 'one size fits all' approach to policy in this area is inappropriate.

[73] They acknowledge that in practice intervention by governments may be driven by a combination of ensuring there are incentives to adjust and addressing market failure.

(c) Access to new markets

Globalisation also creates new opportunities for domestic firms to make improvements that are necessary to sell in export markets. If firms that do not export have unfavourable characteristics (such as low capabilities and absorptive capacity), and such characteristics are a pre-requisite for entry into export markets, then Hoekman and Javorcik (*op. cit*.) argue that policy intervention to encourage such firms to export may be a waste of resources. However, if the choice not to export is due to imperfect information associated with the uncertainty about the (sunk) costs and profitability of entry, then there is a case for intervention to overcome such market failure.

3.45 This leads onto the issue that was raised in Chapter 3 as to whether there is a 'learning-by-exporting' effect or not. If there is no post-entry improvement in productivity (but rather entry requires firms in advance to have those characteristics that lead to higher productivity, thus self-selecting into export markets), then it suggests that government promotional policies to increase business internationalisation may be largely ineffective (thus involving deadweight and possibly displacement effects).[74] This is not to suggest that there is no room for policy; but rather the emphasis needs to be on promoting a competitive business environment rather than targeting support on market failures.[75] This comprises both the macroeconomic environment (see par. 3.43 above, but also covering macroeconomic stability, helping to maintain fair and open international markets, providing a conducive legal and regulatory framework for business, minimising burdens on trade through bureaucracy, and ensuring overall that business conditions are favourable to growth) and industrial policy. That is, there is a more general need for policies that help firms to acquire those characteristics that lead to higher productivity, and thus have the ability to overcome sunk entry costs in international markets.

3.46 Therefore, policies that enhance the absorptive capacity and dynamic capabilities of firms would 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 (as various models, most notably that analysed by Melitz, 2003, show). Moreover, it is not particularly crucial that there be any 'learning-by-exporting' effect; as Melitz (*op. cit*., p. 1719) points out "… trade-induced reallocations towards more efficient firms explain why trade may generate aggregate productivity gains *without necessarily improving the productive efficiency of individual firms*" (emphasis added to original). He also points out that "of course… policies that hinder the reallocation process or otherwise interfere with the flexibility of the factor markets may delay or even prevent a country from reaping the full benefits from trade" (p. 1719).

[74] There is little econometric evidence to show whether combating market failure has a significant effect on firm entry into international markets; what there is (e.g. Bernard and Jensen, 2004) provides little evidence that government promotional activities are effective.

[75] In an ideal world with unlimited resources, government might do both. Moreover, in many situations, both areas are covered simultaneously.

Conclusions

3.47 This chapter has considered the 'market failure' arguments for government intervention with regard to business internationalisation, primarily to encourage firms to enter such markets (rather than subsidising export revenues). Undoubtedly there are certain features of international markets (such as the relatively high cost of information, leading to higher risk and uncertainty and important sunk entry/exit costs) that provide a rationale for government to act (not least because it has an advantage in providing information).

3.48 However, because of the differing needs of (potential) exporters, government assistance needs to be flexible, reflecting the heterogeneous nature of firms. Criticisms that policy is not sufficiently geared to 'born-global' firms, and not sufficiently flexible to cover different sub-groups of firms with different motivations for exporting, were presented. To a large extent the changes in policy advocated as a result of these criticisms reflect differing resources that are available to different firms.

3.49 When the rationale for policy is expanded to include the need to ensure that firms face the 'right' incentives to adjust to globalisation, and not just to cover 'market failure' arguments, this enforces the need for policies that help firms to acquire those characteristics (i.e., absorptive capacity and dynamic capabilities) that lead to higher productivity, and thus the ability to overcome sunk entry costs in international markets. This then benefits aggregate productivity through a reallocation of resources to higher productivity exporters.

Appendix

Table A3.1: Country sub-groups used in Table 3.2

Developed Economies: Australia, Denmark, Finland, France , Germany, Iceland, Ireland, Norway, Portugal, South Africa, Spain, Sweden, Switzerland, United Kingdom
Emerging Economies: Brazil, Hong Kong, China, Malaysia, Mexico, Taiwan.
Rest of Europe: Czech Republic, Estonia, Hungary, Israel, Latvia, Lithuania, Malta, Moldova, Slovak Republic, Slovenia, Turkey
Rest of World: Albania , Algeria, Armenia , Bangladesh, Belize, Bolivia, Botswana, Burkina Faso, Burundi, Chile, Colombia, Costa Rica, Cote d'Ivoire, Dominica, Dominican Republic, Ecuador, Egypt, Arab Rep. ,El Salvador, Fiji , Ghana, Grenada, Guatemala, Guyana, Honduras, Jamaica, Jordan, Lebanon, Lesotho, Malawi, Mauritius, Morocco , Mozambique, Nicaragua, Niger, Panama, Paraguay, Puerto Rico, Rwanda, Serbia and Montenegro, Tanzania, Thailand, Trinidad and Tobago, Tunisia, Uganda , Uruguay, Venezuela RB, Vietnam, Zambia

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4. Review of SDI Internationalisation Activities

Introduction

4.1 We begin this chapter by reviewing the products used by SDI to meet the needs of firms facing barriers to (further) entry into international markets. As well as considering each product in turn, looking at its rationale and intended outcomes, information on the extent to which products have been provided to DRM companies since 2005 will also be presented. This will allow an initial assessment of whether most activity by SDI is geared towards helping (potential) exporters find markets for their products (cf. par. 3.22), as well as the extent to which SDI are also engaged in helping firms to become globally more competitive. Put another way, we will try to gauge the extent to which the portfolio of products available through SDI is able to go beyond the standard approach of increasing the number (and intensity) of exporters, towards meeting the wider response to business internationalisation as discussed in the last chapter.

4.2 However, we begin with some background information on the extent to which Scottish firms are engaged in exporting and outward FDI. Published information in this area is limited, and as part of this review we provide some new estimates based on the data from the 2005 Global Connection Survey (GCS).[76] As well as showing how important exporting and outward FDI is to Scotland, the GCS can also be used to undertake an in-depth analysis of which firms operate in overseas markets (and why), as well as the outcomes (and in particular productivity impacts) of such activities. Such analyses are beyond the scope of a review of what is presently available, but it will allow us to make some suggestions both in this chapter and the next on the type of work that SDI might wish to see done to expand their evidence-base.

4.3 Lastly, we take a first step towards considering the links between what SDI does and the Scottish Government's economic strategy. That is we compare the type (and purpose) of products delivered by SDI to the overall goals set in the GES.

Overseas activities of Scottish firms

4.4 The GCS is undertaken each year to gather information on the internationalisation activities of Scottish firms. A postal survey is administered by Scottish Government statisticians, with questionnaires sent to a stratified sample of market-based firms operating in Scotland.[77] Data from respondents

[76] Aggregate data on the amount that Scottish firms export (and to which countries) is available from the analysis undertaken by Scottish Government statisticians using the GCS. Our interest here, however, is in being able to assess what proportion of Scottish firms engage in internationalisation activities; information that is not presently available.

[77] The survey sample was extracted from the Inter Departmental Business Register (IDBR) and

(typically about 35% of those asked to complete a questionnaire) are then grossed-up to give statistically reliable estimates for the entire Scottish population of relevant firms.[78]

4.5 As part of an ongoing study with SDI and the Scottish Government, we have access to the 'raw' GCS completed questionnaires.[79] The data for 2005 has been merged into the Annual Respondents Database (ARD) for 2005[80], which comprises the equivalent to the population of firms in the IDBR that are available for sampling by the ONS as part of the Annual Business Inquiry conducted by Government each year. Using employment data available for each Scottish reporting unit in the ARD (covering some 126 thousands enterprises), we were able to weight the 3,478 respondents to the 2005 GCS by employment-size and industry to provide population estimates.[81] This is a similar approach to that used by the Scottish Government statisticians.

4.6 Using the weighted GCS data for 2005, it is possible to estimate the proportion of Scottish firms engaged in exporting and in outward FDI activities. Table 4.1 shows that some 29% of firms in the market-sector were exporters, while only 2.7% were involved in some form of outward FDI[82,83]. Of those engaged in

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included all industries with the exception of public administration, private households with employed persons and extra-territorial organisations. Sampling took place at reporting unit level and reporting units were asked to provide information on the combined Scottish activity of all their local units. The sample was stratified by industry (4 digit SIC) and 5 employment size-bands (Scottish employment). There were almost 3,000 known and potential exporters identified using information provided by Highland's & Islands Enterprise (HIE), participating Local Enterprise Companies (LECs) and previous survey data. Known and potential exporters were weighted in order to have a greater chance of being sampled than non-exporters or companies whose export status was unknown. Companies were then selected at random from the strata. Those with 100 or more employees were automatically sampled regardless of their export status and all known/potential exporting companies were sampled regardless of their size. This resulted in a sample of 8,778 reporting units. In 2007, a total of around 3,100 survey responses were received (including nil responses) to give a response rate of 35 per cent.(in 2005, the year we analyse, there were 3,478 replies).

[78] The methods used by Scottish Government statisticians are provided on their website (see http://www.scotland.gov.uk/Topics/Statistics/Browse/Economy/Exports/GCS2004Grossing).

[79] Note, we do not have information that allows us to identify respondents, and the data are held in the secure ONS Virtual Microdata Laboratory (VML), which has strict rules concerning access to the data and what type of information can be extracted (in particular the results of any analysis based on the GCS must pass stringent disclosure tests administered by the ONS).

[80] For information on the ARD see, for example, Harris (2005).

[81] Five employment size-bands were used (1-4; 5-12; 13-27; 28-82; 83+ employees) and 12 industry groups. The latter were constructed to ensure that every employment size-band × industry group contained at least 10 reporting units, to ensure we did not construct weights based on too little information.

[82] The definitions used are: Subsidiary: wholly or partly owned by a parent company, i.e. the parent company would hold a controlling interest (i.e. more than 50% of the stock, shares or other equity). Sales Office: the representative's or agents working address. Joint venture: the establishment of a new independent enterprise, with or without equity share. Typically a joint venture has its own distinct identity and separate operation procedures. Strategic Alliances and Franchises should be included in this category. Other: for example: technology licensing (a contract between independent firms to transfer novel technologies, rights or resources); R&D Alliances (agreements to undertake specific tasks which are generally terminated at the completion of these tasks); Outsourcing (generally involves a firm(s) agreeing that other firm(s) should carry out the production of its innovative goods or services); Value Chain Partnerships (are generally long term contracts, transfer of skills, managerial techniques & joint R&D).

outward FDI, over half of these were just sales offices rather than subsidiaries or joint-ventures. Joint-ventures are more prevalent in the computer (software) sector and other business services, while the latter is also more likely to engage in other forms of outward FDI (probably licensing). Table 4.2 presents a similar picture, although the figures here are based on employment shares. The major difference is that the production sector has a larger share of employment engaged in internationalisation (especially subsidiaries and joint-ventures), reflecting the fact that it is the larger firms in this sector that are more likely to engage in these type of activities.

Table 4.1: Percentage of Scottish firms engaged in internationalisation, 2005

Industry group (SIC92)	Exporters	Outward FDI				
		Subsidiary	Sales office	Joint Venture	Other	Total
Production (1-45)	19.8	0.4	1.1	0.3	0.6	2.1
Distribution & hotel/catering (50-55)	29.4	0.6	2.2	0.6	0.2	2.4
Transport, storage, communications finance (60-67)	34.0	0.0	1.5	0.6	0.0	2.0
Real estate, renting, computing (70-73)	31.2	0.0	2.9	2.7	0.1	5.8
Other business services (74)	38.2	0.2	0.7	1.6	1.5	3.8
Other services (80-93)	24.9	0.8	0.4	0.1	0.1	1.4
Total	28.6	0.4	1.5	0.8	0.5	2.7

Source weighted GCS

Table 4.2: Percentage of employment in Scottish firms engaged in internationalisation, 2005

Industry group (SIC92)	Exporters	Outward FDI				
		Subsidiary	Sales office	Joint Venture	Other	Total
Production (1-45)	45.4	1.4	2.8	0.6	0.7	4.0
Distribution & hotel/catering (50-55)	22.8	0.4	1.1	0.4	1.6	2.7
Transport, storage, communications finance (60-67)	31.9	0.0	2.1	1.3	0.0	2.4
Real estate, renting, computing (70-73)	18.9	0.0	1.4	0.9	0.6	2.9
Other business services (74)	24.2	2.4	2.9	2.6	0.9	4.3
Other services (80-93)	52.6	0.0	0.9	1.5	0.3	1.8
Total	37.4	0.7	1.7	1.3	0.7	2.8

Source weighted GCS

[83] Note, internal SDI documents relating to the Global Companies Development Programme state that the GCS identified that 12.5% of reporting Scottish companies had overseas branches or relationships. Clearly weighting the data to make it representative lowers the unadjusted GCS figure significantly.

Table 4.3: SDI projects

Product	Description
Exhibitions, Missions & Learning Journeys	Encompasses SDI exhibitions, missions and learning journeys; other such activities organised by Scottish-based international trade support organisations (e.g., Chambers of Commerce); Tradeshow Access (TAP) support[a]; TAP (SOLO) support[a]; and SDI funding. Most of the activities supported are designed to allow firms to attend overseas trade events in order to make contacts, sell products, look for partners. The main exception is Learning Journeys, which assists senior managers to visit (for usually a week) world leading companies to gain knowledge on best-practice in these companies
Overseas Market Support	Comprises SDI funding (for companies to undertake research, market entry activities, designing new promotional material for overseas market); Overseas Market Support (customised market research, design of promotional materials); Overseas Market Introduction Service – OMIS[a] (bespoke research by British Embassy staff covering market sector analysis, identifying contacts, assisting with visits, including appointments and promotional events, and providing one-to-one advice where appropriate); Export Market Research Scheme – EMRS[a] (delivered by British Chambers of Commerce providing support and training for firms to show them how to undertake their own overseas research); Export Communications Review - ECR[a] (delivered by British Chambers of Commerce providing support and training for firms to show them how to develop an effective communications strategy); Market Selection Service Review – MSSR (quick reaction from overseas British Embassy staff on suitability of company product); and High Growth Markets programme – HGMP[a] (provides strategic advice to medium-size companies on entering/expanding in specific list of high growth markets)
Readiness to Internationalise	Targeted at companies inexperienced in international trade (12 modules covering theory and practice of such areas as: market identification & research, production and financing issues, advertising & distribution, sales negotiation, and producing an International Action Plan); and more experienced firms wanting deeper internationalisation (6-8 modules in-depth covering such areas as: finance, distribution, communication/marketing skills, licensing/franchising/joint ventures, acquisitions, presenting an International Market Development Plan). Modules are delivered by set of approved companies (including Chambers of Commerce).
International Business Opportunities	Provide information to companies on projects available through UN, World Bank, EU, DfID, Regional Development Banks, PERA (covering inward FDI inquiries from firms needing local suppliers, etc.), Enterprise Europe Scotland, and London 2012 Olympic Games. Most of the first set of organisations are involved in overseas development activities.
Flexible Financial products	Available as last resort when no other product fits. Covers such areas as strategic planning for internationalisation, innovation activity which assist with new product & process development. Generally companies can get assistance in hiring consultants, temporary specialist staff, covering training costs, or obtaining innovation advice. Note, this is a joint product covering all DRM products.
International Strategy Workshop	Workshop delivered by an approved consultant to senior management, to help develop a coherent international strategy and associated action plan, there are three elements comprising: pre-workshop 'brainstorming' to agree key issues and objectives; one-day interactive workshop; post-workshop to commit to action plan.

International Mentoring	Two key components (1. international business manager for hire; 2. access to Scottish Networks International). Aims to address knowledge, skills and funding gaps to overcome barriers to growth. The first product sees the hiring of a highly qualified international business professional from within or outwith Scotland to help with 'trouble-shooting' activities, market research, product customisation, etc. The SNI product links a high calibre, overseas-based, young business person to the firm, to utilise their experience.
Global Companies Development Programme	Purpose is to increase number of global companies in Scotland (defined as company >£5m turnover, operating on at least 2 continents, 5 years turnover growth, controlled from Scotland) through employing external consultant for up to 20 days to delivery in-depth programme over 6-9 month period covering: individual management team interviews (to cover strategy & planning, international operations, marketing & service, operations & technology, R&D, organisation & HRM management, governance & responsibility, and finance) leading to Action Plan, leading to Implementation Plan.
International Market Presence	Temporary office facilities available in SDI key locations in 3 US cities, and access to office space consultants Regus covering 950 worldwide centres (including virtual offices).
TalentScotland	Covering design electronics, life sciences, financial services and the energy sector, the TalentScotland initiative is a website that provides information to students, entrepreneurs looking to start up businesses in Scotland, Scottish businesses who want to recruit overseas workers, and immigrants and returning Scots who want to live and work in Scotland. It sets out to counter negative perceptions of Scotland as a place to live and work, and thus to provide the economy with a larger pool of skilled workers than would otherwise be the case. For SDI the emphasis is on helping companies in the target industries recruit those with more than 2 years experience in areas like senior management and expertise, including business development, sales and marketing.
GlobalScot[b]	Comprising a network of some 950 global Scottish entrepreneurs and businesspeople, located primarily in the USA (42%), Scotland (13%), England (9%) and then a range of other countries (none with more than 4% of the total), Scottish companies are referred to a GlobalScot to mainly help the company improve its capability in networking overseas, in supporting the company plan its internationalisation strategy, and helping the company to make direct sales contacts in its target market.
Scotland Europa	Set up in 1992 to provide an informed base in Brussels for Scottish organisations, the main objectives are to bring influence to bear on EU policy and funding in support of Scottish economic growth; to support Scottish organisations to develop capacity in European activities (e.g. FP7) and gain maximum advantage from EU opportunities; to provide an effective hub connecting Scottish organisations to Brussels networks through Scotland House (located in central Brussels).

[a] delivered through UKTI

[b] this is not administered through SDI but is included as an internationalisation product available to firms

4.7 It is difficult to estimate whether internationalisation activities are relatively low or close to that which would be expected of a nation the size of Scotland, since comparable data is generally not available. Data from the Community Innovation Survey for 2004 suggests that the percentage of firms exporting is similar across most regions of the UK, and therefore Scotland is not out-of-line (see Harris and Li, 2006). Information collected in the UKTI PIMS survey (OMB, 2008) presents information on models of internationalisation for those firms surveyed. Most all the respondents (by survey design) were involved in internationalisation, with 98% selling overseas (i.e. exporting); however, only 3% were involved in licensing, 3% in other partnerships and joint ventures, 2% with an overseas production site, and 6% with a sales office through which exports were distributed. Given these figures, the data for Scotland (Table 4.1) look fairly similar. However, overall it does show that internationalisation is only important to a minority of Scottish firms, with outward FDI a very specialised activity despite the benefits that this can bring to the Scottish economy, in terms of productivity and growth.

SDI products

4.8 The main products offered by SDI are listed in Table 4.3, alongside a brief description of each. Note, since 2005 these products have been targeted at mostly Designated Relationship Managed (DRM) firms with high growth potential, made available to firms through their Account Managers. Before 2005, a significant proportion of the products were provided through Business Gateways in conjunction with the LEC's, especially grants to companies for overseas visits.[84]

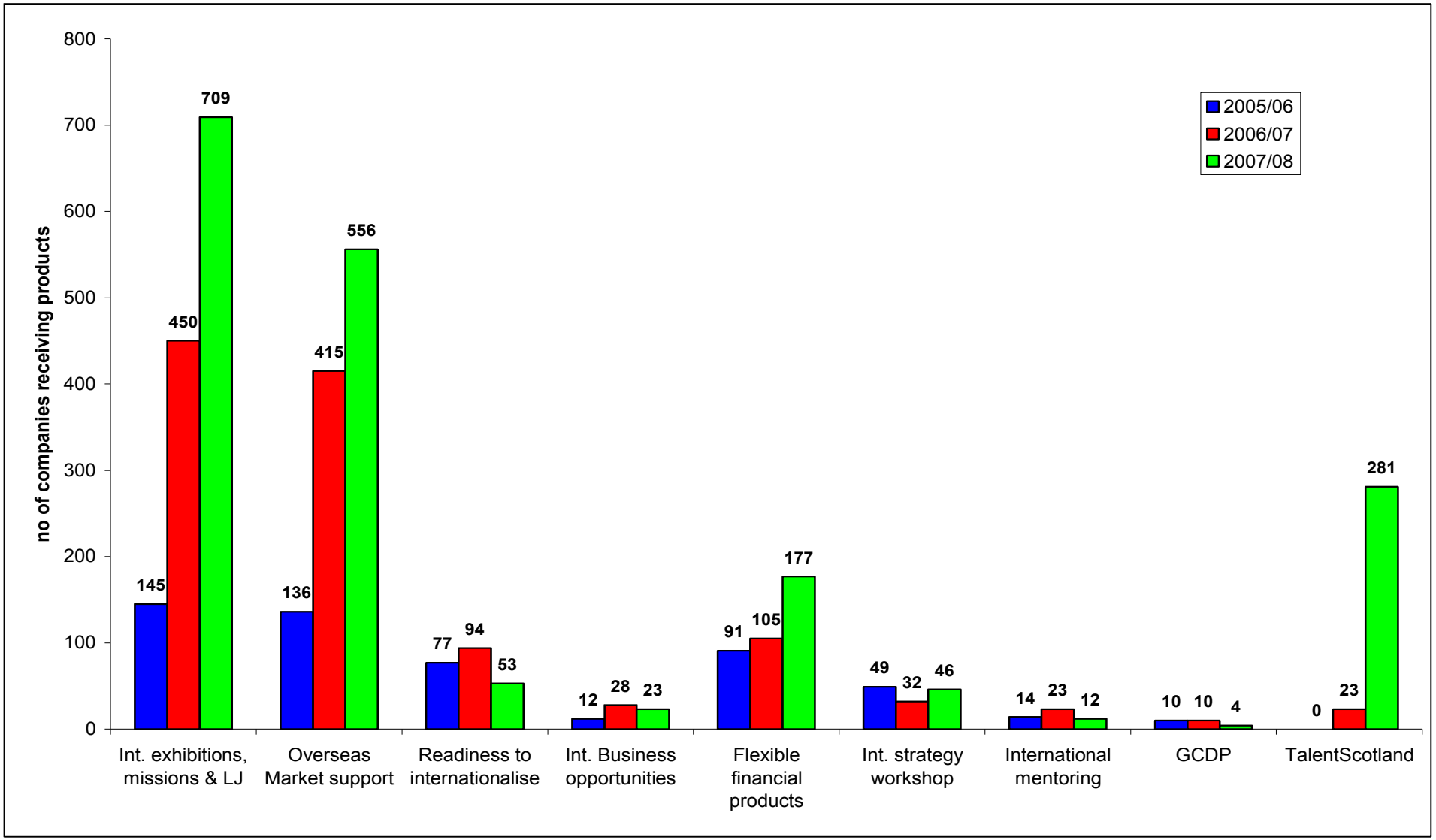
4.9 In addition to theses products, businesses in Scotland benefit from UKTI activities (through Embassy staff and more general activities) designed to build awareness of UK industrial capabilities.

4.10 In terms of the range of assistance covered by SDI products, Table 4.3 shows that different types of companies are catered for, from those new to exporting to those wishing to become truly global. Activities range from providing support to export promotion, by overcoming informational barriers to exporting, through to developing action plans for internationalisation. Whether these products deliver more than a just basic service of helping (potential) exporters find markets for their products, to actually increasing their internal capabilities and knowledge base and thus helping Scottish companies actually become globally competitive, depends on where most emphasis is put and upon an evaluation of the impacts of each product and programme. The latter is considered in the next chapter; here we consider the distribution both across time and across broad industry groups.

4.11 Figure 4.1 shows that nearly two-thirds of SDI products went to help firms attend exhibitions, go on missions, and obtain market intelligence on overseas locations.[85] Delivery of those products with the greatest likelihood of increasing

[84] Even after 2004, data on SE products (discussed below) shows that nearly one-quarter of SDI products were going to non-DRM firms (although the proportion has fallen over time).
[85] Most countries with export promotion agencies offer similar type products.

Figure 4.1: Products associated with SDI activities, 2005/06 to 2007/08*



* only includes products actually delivered, and is limited to one product per company per year. For companies receiving more than one product in a year, products from right-to-left (starting with GCDP) were assumed to be the most important. SDI products listed accounted for some 13.2% of all DRM products during 2005/06-2007/08. Source: DRM and NRM database

Table 4.4: Products associated with SDI activities, 2005/06 to 2007/08*

Industry (SIC92)	Int. exhibitions, missions & LJ	Overseas Market support	Readiness to internationalise	Int. Business opportunities	Flexible financial products	Int. strategy workshop	International mentoring	GCDP	TalentScotland	Total
Agriculture, Fishing (1-5)	12	6	2	0	12	0	0	1	0	33
Mining, Quarrying (10-14)	66	47	12	4	5	2	3	1	2	142
Food, drink, textiles, paper (15-22)	141	149	32	8	92	17	4	3	0	446
Chemicals, metals, furniture (23-28, 36-37)	93	116	***39***	3	37	13	***7***	1	25	334
Machinery, electrical, transport equip. (29-35)	114	131	35	4	30	10	***10***	3	58	395
Utilities, construction (40-45)	9	10	2	0	11	0	1	0	2	35
Distribution & hotels (50-55)	72	57	16	1	35	9	2	2	10	204
Transport & communication (63-64)	26	18	1	0	6	1	1	0	1	54
Finance & renting (65-71)	12	15	2	1	4	3	0	0	18	55
Computers (72)	142	130	17	***18***	17	***20***	***8***	0	13	365
R&D (73)	68	30	4	2	4	1	3	0	22	134
Other business services (74)	96	80	15	3	28	***18***	2	***4***	20	266
Education & health (75-85)	44	25	4	0	9	4	1	2	3	92
Other services (90-93)	65	37	3	6	15	5	1	0	3	135
SIC code not available	353	266	40	13	72	26	7	7	127	911
Total	1313	1117	224	63	377	129	50	24	304	3601

* see Figure 4.1

Source: DRM and NRM database

long-term competitiveness (e.g. through building the management capabilities required for internationalisation) was low.[86] Note, the DRM/NRM data available to us does not distinguish whether the number of companies receiving flexible financial products was linked to internationalisation or not; however, it is highly likely that much of what is recorded in Figure 4.1 is not linked to overseas activities.

4.12 This data for 2005/06 to 2007/08 is similar to the types of internationalisation support given before the formal introduction of DRM in 2005; the evaluation of support in Lanarkshire (GEN, 2005) showed that some 60% of internationalisation assistance went to Business Gateway assisted firms (as opposed to Account or Client managed), and of these just under 85% of support was on overseas market advice (38%) and exhibitions and missions (46%). Ekos (2007) reviewed the internationalisation activities of Business Gateway Renfrewshire finding that 29% of support went on exhibitions, 22% on overseas market assistance, and 18% on mission support.

4.13 The panel of experts report EU(2007), when discussing support for SME's to internationalise, states: "… these programmes usually start by screening the "internationalisation readiness" and are usually followed by long term consultancy support to help companies build the management capabilities required for internationalisation." It is not clear whether in Scotland the low take-up of such longer-term policies is because of a demand- or supply-side constraint.

4.14 Table 4.4 shows the distribution of SDI products delivered between 2005/06 and 2007/08 by industry sub-groups. The food, drink, textiles, clothing and paper industries (more traditional sectors) received most assistance, although more high-tech manufacturing (involving electronics), computer software, other business services and the R&D sector were also major recipients of SDI help. Those sectors where there is some evidence that they had relatively larger shares of products designed more to increase internationalisation capabilities included chemicals, electronics, other business services and especially the R&D sector.[87] However, the numbers involved (the blue, italicised figures in Table 4.4) are small.

4.15 In summary, while the range of products available from SDI is relatively broad, covering firms new to exporting as well as those wishing to become global companies, in practice much of its activities seems to have been concentrated at the lower end of the productivity-enhancing spectrum. With this in mind, we now consider the linkages between SDI activities and the Scottish Government's Economic Strategy (GES).

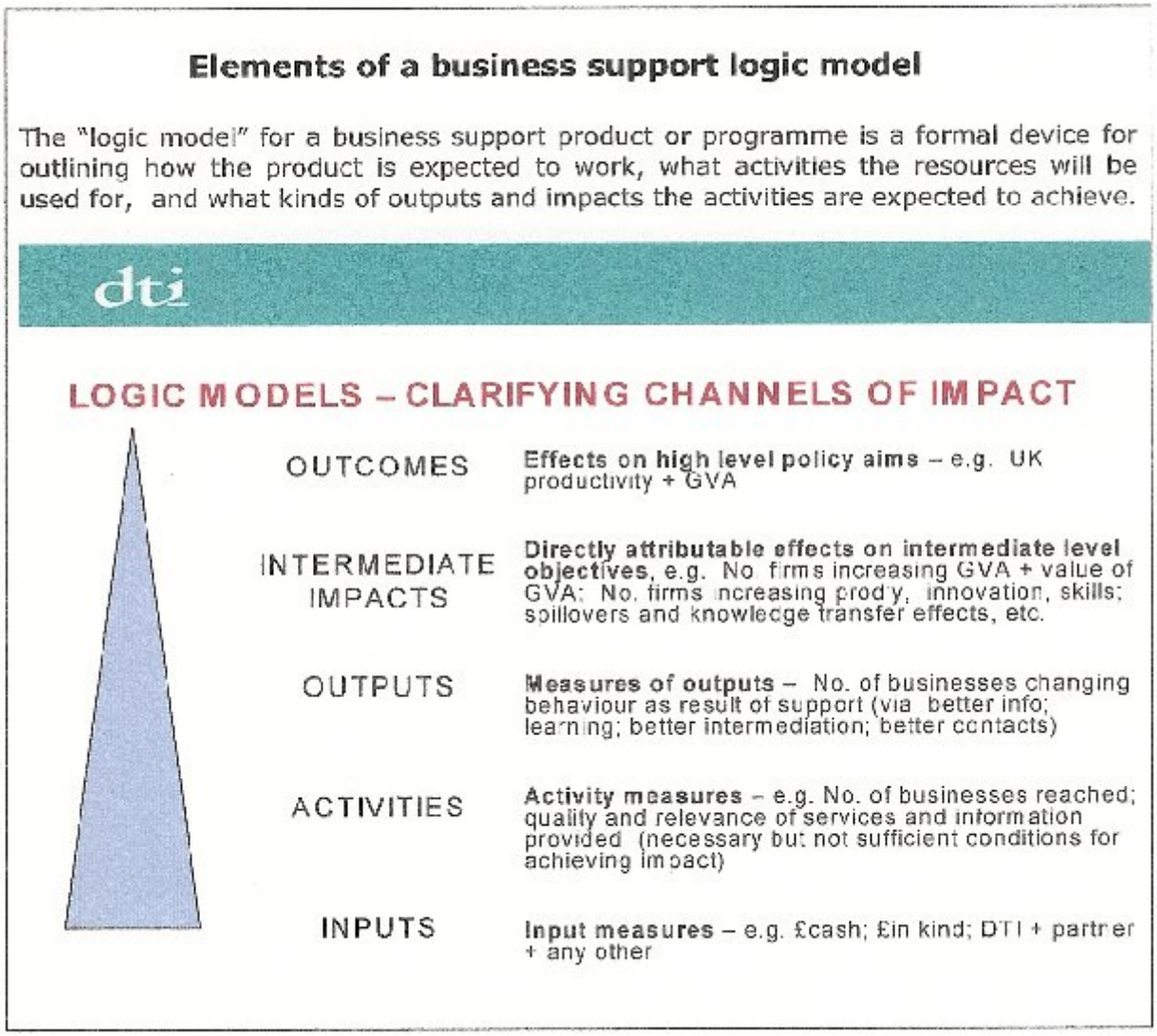
[86] Comparable information with UKTI activities for England is not readily available; however, the PIMS surveys covering 2007 and some of 2008 did show that 15,901 firms were supported under the 'getting into new overseas markets' support product, while 6,665 were to 'increase internationalisation capabilities'. Note also, UKTI now explicitly considers increasing innovativeness as a key aspect of all its activities; this seems to feature little in SDI products (see Chapter 6 for more discussion of this point)

[87] That is, they had relatively larger shares of such products as 'readiness to internationalise', international business opportunities, international strategy workshops, and GDCP (see the blue, italicised figures in Table 4.4)

SDI activities and the GES

4.16 SDI activities (or products) can be thought of in terms of the business support logic model (see Figure 4.2). Through various inputs (e.g. financial aid to firms to defray the costs of attending an overseas mission) there are activities (such the number of businesses reached). Measuring internationalisation through activities is still the way SDI sets current goals (SDI Business Plan 08/09, section 6.1). Such activities if they are effective will achieve outputs (e.g. firms change their behaviour as a result of receiving support), and outputs contribute to intermediate level impacts (such as firms increase their productivity, innovativeness, etc., which results in higher gross value-added). Lastly, these intermediate impacts have outcomes, which are the higher level policy aims that government typically sets an agency like SDI.

Figure 4.2: Logic model for business support

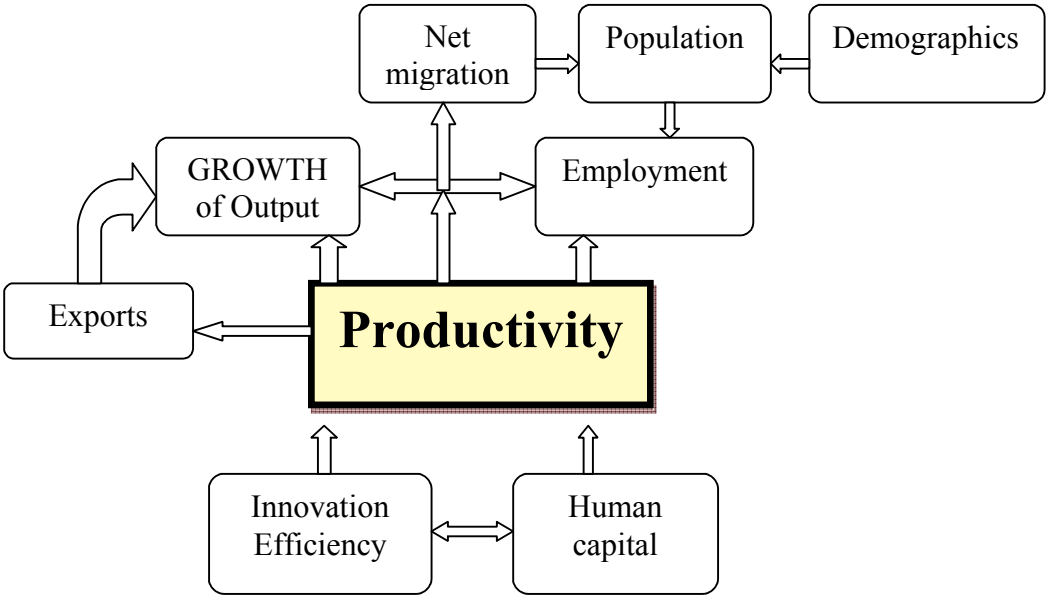


Source: DTI (2006b, Box 3.2)

4.17 In terms of the Scottish Governments' economic strategy (GES – published in November 2007), the top level outcome in the GES is higher growth in the Scottish economy. There are a number of subsidiary outcomes (such as higher productivity, higher employment participation, increasing population), which link with (and play a part in achieving) the main goal of higher growth. The GES has been discussed in some detail in CPPR (2008), but the main argument put forward there is that increasing productivity is the key to achieving growth.

4.18 Most economic theory in this area acknowledges that the most important long-run driver of growth is productivity [88], which itself is determined by technological progress (i.e. innovation whereby new products and processes are produced – see e.g. HM Treasury, 2001) and increases in efficiency (e.g. technology transfer allowing 'catch-up' to occur, increased quality of labour and capital used in produced and better management techniques). [89] In all, enterprises acquire knowledge assets which are key in determining competitiveness, productivity, and ultimately output growth (see Harris, 2008, for a recent overview of the literature on regional economic growth). Figure 4.3 is a simple attempt to map-out the linkages between productivity and other key variables in the economy (taking specifically into account the GES), showing how economic targets are inter-related but more importantly that productivity is ultimately the (long-run) driver of a higher growth rate.

Figure 4.3: Productivity and growth



Source: CPPR (2008)

[88] As Paul Krugman notes in his book *The Age of Diminished Expectations*, "Productivity isn't everything, but in the long run it is almost everything" and US economist William Baumol similarly states that "without exaggeration in the long run probably nothing is as important for economic welfare as the rate of productivity growth" (Baumol, 1984).

[89] Economists refer to innovation as the 'pushing' outward of the technology frontier of the economy; whereas improving efficiency moves an economy closer to the existing 'best practice' technology frontier.

4.19 As recognised in SDI's Business Plan, "… through developing international participation of Scottish companies, SDI… supports the exposure to, and adoption of, best-practice techniques and processes often increasing productivity. International presence also stimulates skill development and the capacity of the management team. The same arguments apply to stimulating innovation and R&D" (pp. 4-5). The evidence we have presented in Chapter 2 follows supports this statement.

4.20 However, in this (and the previous) chapter the distinction has been made between inputs (products) that help firms to find overseas markets for their goods and services, and products that concentrate on helping firms to become globally more competitive in the longer-run. In principle, the activities undertaken by SDI are conducive to achieving both, but in this chapter we have shown that in practice there is reason to believe that proportionately more resources are devoted to products that help firms overcome short-run barriers to entering export markets, but which are not necessarily ideal for enhancing the capabilities of (SME) firms to achieve greater productivity in the medium- to-long term.

4.21 To the extent that this is the case, the question arises as to whether SDI is making its full contribution to the overall goals of the GES, although it also needs to be recognised that SDI's role in helping to improve overall Scottish productivity is part of the wider role undertaken by Scottish Enterprise.

Summary

4.22 In this chapter, we have reviewed the products used by SDI to meet the needs of firms facing barriers to (further) entry into international markets. In terms of the range of assistance covered by SDI products, an examination of these shows that different types of companies are catered for, from those new to exporting to those wishing to become truly global. Whether these products deliver more than a just basic service of helping (potential) exporters find markets for their products, to actually increasing their internal capabilities and knowledge base and thus helping Scottish companies actually become globally competitive, partly depends on where most emphasis is put.

4.23 We find that nearly two-thirds of SDI products between 2005-2008 went to help firms attend exhibitions, go on missions, and obtain market intelligence on overseas locations. Delivery of those products with the greatest likelihood of increasing long-term competitiveness was low; similar support was given before the formal introduction of DRM in 2005. Thus, while the range of products available from SDI is relatively broad, covering firms new to exporting as well as those wishing to become global companies, in practice much of its activities seems to have been concentrated at the lower end of the productivity-enhancing spectrum.

4.24 As to the linkages between SDI activities and the Scottish Government's Economic Strategy (GES), the top level outcome in the GES is higher growth in

the Scottish economy with the most important long-run driver of growth being productivity.

4.25 Thus the question arises that since proportionately more resources are devoted to products that help firms overcome short-run barriers to entering export markets, rather than enhancing the capabilities of (SME) firms to achieve greater productivity in the medium- to-long term, then to this extent is SDI making its full contribution to the overall goals of the GES?

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5. Evidence of the Effectiveness of Interventions

Introduction

5.1 The last chapter reviewed the products used by SDI to assist firms in Scotland to internationalise. It was noted that activities range from providing support to export promotion, by overcoming short-run informational barriers to exporting, through to developing long-run action plans for internationalisation. Whether these products deliver more than a just a basic service of helping (potential) exporters find markets for their products, to actually increasing their internal capabilities and knowledge base, and thus helping Scottish companies actually become globally competitive, depends on where most emphasis is put and upon an evaluation of the impacts of each product and programme. The last chapter concluded that with respect to the products provided, in practice much of the activities of SDI seem to concentrate at the lower end of the productivity-enhancing spectrum (that is overcoming short-run barriers rather than concentrating on longer-run productivity enhancement). This chapter goes further and reviews the existing evidence on the impacts of each SDI product and programme, both in terms of whether these resulted in more activities and outputs, but also in terms of contributions to intermediate impacts and outcomes (see Figure 4.2 in the last chapter).

5.2 We have been provided with a range of evaluation reports (see the list attached in the Appendix) and where useful we include material from these. It is apparent at the outset that most evaluation studies use the standard evaluation approach (as set out by Scottish Enterprise) which amounts to surveying usually a small number of recipients to find out if, in their opinion, assistance made a difference. The latter usually covers whether assistance was necessary to make them undertake the form of internationalisation – usually exporting - that they were considering (i.e. whether assistance was additional as opposed to 'deadweight'); whether it changed their behaviour in some way (e.g. increased their productivity or some other move towards 'best-practice'); and finally there is an attempt to measure the net additional turnover (or gross value-added) that arose from the intervention. The latter involves netting out any deadweight and displacement (i.e. other Scottish firms reducing activities as assisted firms expand theirs), but trying to include the spillover effects due to the greater activity of assisted firms (e.g., multiplier impacts due to forward- and backward-linked firms respond to this higher activity, and indeed the higher spending occurring in the economy as income and expenditure increase).

5.3 The major problem that arises with this form of evaluation (besides the often small sample base from which information is collected and a lack of information on economy-wide impacts outside of the firm) is that it almost never constructs the counterfactual – that is, what would have happened in the absence of assistance. The closest one gets is to presume that respondents to surveys (conducted maybe some time after assistance was provided) really can separate out the specific effect that usually a marginal level of help has had on the whole process of producing goods and services and making profits, and that

they can provide a sufficiently accurate and unbiased estimate[90] of this marginal impact.

5.4 Other forms of evaluation, particularly those designed to provide the counterfactual, and thus evaluate how assisted firms performed against a 'control group' of non-assisted firms (which have very similar characteristics), are typically not undertaken by SDI. We comment further on this in Chapter 6 (where we identify gaps in the evidence base).

5.5 A further issue at the outset is that most (although not all) of the evaluation studies available refer to the range of SDI products (see Table 4.3) as they were delivered – usually by Business Gateways and LEC's in particular regions – prior to the 2005 change to the system of Designated Relationship Management of SE client firms. That is, we are not aware of other (internal) evaluations of SDI's internationalisation portfolio that have occurred since 2005.[91] Thus information on specifically how, for example, the International Strategy Workshop or Readiness to Internationalise have performed is not available.

The evaluation evidence

5.6 We begin with the Global Companies Development Programme (GCDP), which in many respects might be considered the 'flagship' programme for SDI,[92] given the intensity of the programme and since its main purpose is to increase the number of global companies in Scotland (see Table 4.3). SQW (2009) have recently evaluated GDCP, and in terms of its overall economic impact they have estimated that the total population of 85 GCDP companies have contributed a net additional boost to the Scottish economy of £7 million (£14.2 million once the additional induced multiplier activity in the Scottish economy is added in). Note, of the increased turnover that companies who have been on the programme stated they had achieved, only 12% of this was attributed directly to GCDP participation itself.

5.7 The SQW evaluation noted the decline in company participation since 2005-6 in the programme, and attributed this to a large extent to a lack of clarity within SE as to where the programme fits (vis-à-vis other DRM products); thus they recommend that the best way to increase company take-up of GCDP is through increasing referrals from Account and Client Managers, and this requires GCDP to have a higher profile within SE.

5.8 The main internal evaluation of GCDP would seem to be whether targets are met on the number of companies that enter the programme (and subsequently how many produce company Action Plans followed by Implementation), leading to new Global Companies (defined as companies with >£5m turnover,

[90] For example, the respondent is the right person to provide the information needed, and that they do not inflate the impact of assistance because they (presumably) have a vested interest in SE continuing to provide such assistance to Scottish firms.

[91] As discussed below, the 2009 report by Ekogen on the "Economic Impact Evaluation of Scottish Enterprise's Interventions with Account and Client Managed Companies" provides some limited information on the impact of SDI products.

[92] Although since 2005 it has not been directly managed or delivered by SDI staff.

operating on at least 2 continents, experiencing 5 years turnover growth, and controlled from Scotland). Seta against such targets, SQW (2009, Table 3.4) show that there has been a shortfall in performance, while the number of global companies itself is apparently not monitored by SE.

5.9 However, the GCDP is more than just numbers of companies involved, since the main aim of the programme is to assist senior executives in companies to develop (over a 9 month period) an Action Plan that impacts fundamentally on the capabilities and capacities of the business to engage in successful internationalisation. However, these impacts are not monitored by SE, and it is therefore not clear if the knowledge and competitiveness of the company has increased following participation. Clearly if it manages to successfully become global, this suggests an impact (but given the lack of a counterfactual, this is not necessarily the case – despite participation in GCDP, the company may have had the necessary attributes to make it as a global company). What is available from the programme are Action Plans and Implementation support for these plans, and information contained in these would likely provide evaluators with information on which to assess (at least part of) the impact of GCDP participation.

5.10 Next we consider the evaluations of internationalisation support delivered in areas like Lanarkshire, South-East Renfrewshire, and the Borders region. The evaluations covered all the support delivered, but generally the majority of this covered exhibitions, missions, and overseas market support. Dempster (2004) reviewed the 'New Market Development Project' (which was mostly advisory support from an International Trade Advisor – ITA – on export development alongside grant-aid for implementation), which was available to companies in the SE Borders region between 2002-2004. A significant proportion of the 95 companies assisted were already engaged in exporting, and the evaluation found that there was 'deadweight' associated with assistance of around 80%. Hence, it was estimated that net new additional GDP was only £1.27 million for participating companies. Only 28% of responding companies thought they had learned a great deal from the ITA, and most benefits were thought to be associated with the provision of grants to cover exporting costs.

5.11 The GEN (2005a) evaluation of support in SE Lanarkshire covered support to some 188 companies[93] between 2002/3 and 2004/5. The products available to firs covered internationalisation strategy guidance and awareness (which we presume equates to Readiness to Internationalise in the current SDI portfolio); exhibitions and missions attendance; international mentoring; international market presence; and overseas market support (OMS). The evaluation (based on interviews with 29 firms) suggests that 85% of firms received just help with exhibitions and missions attendance, and overseas market support. It was found that additionality was about 46% for exhibitions and missions attendance, but much lower for OMS where only one-third of companies produced an action plan. It was estimated the overall new impact of assistance was £35.8 million, or about 66% of the actual target set.

5.12 The evaluation of internationalisation activities in SE Renfrewshire (Ekos, 2007) between 2003-2006 again mainly covered assistance via exhibitions and

[93] Some 61% were 'Business Gateway' clients, suggesting that only a minority were Account or Client Managed.

missions attendance and overseas market support (69% of all assistance). 151 companies were involved receiving 399 products. However, 5.8% of the 399 products delivered comprised an International Strategy Workshop, and 1% were involved in Learning Journeys. Some 10% of all products that were delivered covered 22 named products, suggesting that the reduction in products available (that has subsequently taken place) was necessary, as product proliferation caused confusion for many companies. Ekos (2007) estimated that about 50% of additional sales could be attributed to assistance, and that when displacement effects were taken away the GVA contribution to the Scottish economy was around £9.8 million.[94] With respect to individual projects, the evaluation found that additionality was high for both exhibitions and missions attendance *and* overseas market support (the latter being low in the SE Lanarkshire evaluation[95]). The evaluation also considered (briefly) the wider impacts of assistance on business performance, with about one-third stating that their medium-term competitiveness had improved; given that most companies were already exporting (and therefore had achieved a certain level of competitiveness to overcome barriers to export markets), this suggests that the overall impact of the longer-term effects of assistance was generally low. Much of the assistance was likely successful at expanding the volume of exporting activity, rather than increasing its scope (which is related more to quality aspects). Evidence to support this was provided in the evaluation, which found the major benefits identified by recipients were: greater networking/development of existing contacts; increased profile of firm; and increased knowledge of market opportunities.[96]

5.13 The Liddell (2005) evaluation of SE Ayrshire 2002-2003 overseas trade missions was not able to provide estimates of the quantitative impact of assistance, and noted some of the reasons for this. These included companies "… may have trouble attributing outputs directly to trade mission participation". However, it was possible to show that companies with already some international experience "… were more likely to achieve significant quantitative outputs on the trade missions" (p.8), which suggests that the prior availability of appropriate intangible assets is important.

5.14 Lastly with regard to the more general evaluations, Ekogen (2009) have assessed the economic impacts of SE's Account and Client Managed interventions, In general, they found that around two-thirds of companies reported that SE support had made no difference to performance (indeed a small number reported it had worsened performance). However, those products that were more closely associated (based on statistical testing) with having an impact on GVA were exhibitions, missions and learning journeys, and the international strategy workshop.[97] Thus, within the overall portfolio of Account and Client

[94] Note, this is based on a small number of companies providing relevant information, and the use of industry-level conversions of sales to GVA.
[95] Since some 80% of the Renfrewshire companies were Account or Client Managed (not BG clients), this may account for the difference in additionality.
[96] The Fordyce (2007) evaluation of trade missions for Lothian during 2004/5 to 2005/6 also shows that most of those assisted said that meeting other exporters and opening up dialogue with overseas traders was most important as benefits from taking part – not improving competitiveness.
[97] Of the non-internationalisation products, only Leadership for Growth, E-Business Advisers, Graduate for Business and Flexible Financial Products had significant positive impacts on GVA.

Managed companies assisted by SE, the SDI products seem to be having the largest impact in terms of increasing GVA in Scotland.

5.15 Learning Journey support delivered by SE Lanarkshire from 2002/03 to 2004/05 has been evaluated by GEN (2005b). This is one of the few evaluations that notes the importance of innovation to businesses (presumably reflecting the type of product being delivered – see Table 4.3 – and thus the type of businesses involved). The companies taking part recognised "… the need to encourage and sustain innovation … as an important business issue" and setting as a key learning objective "… developing an innovation culture." (p.iii). The evaluation was more qualitative in nature, but noted a number of changes in business operations and impacts on business performance as a result of companies taking part. These included improvements to management and leadership, increased training and development of staff, encouragement of innovation, and the support of business growth. Table 5.1 summarises firms' responses, showing how benefits were firmly linked to areas which impact on competitiveness. In total, the evaluators concluded that additionality from the Learning Journeys was likely to be high, and the displacement effect likely to be low. However, it was not clear as to the extent the impacts of LJ's were derived from exporting/outward FDI activities or just improvements in the competitiveness of the companies in their home markets.

Table 5.1: How well business objectives were addressed by Learning Journeys

Business learning objective	Very well	Well
Learning how to manage growth plans		√
Developing an innovation culture	√	
Identifying exporting opportunities		√
Introducing a culture of service excellence	√	
Exploring new markets	√	
Identifying lessons for effective leadership	√	
Personal development and confidence	√	
Identifying applications for technology in business operations		√
Generating new ideas		√
Identifying an appropriate scale of growth	√	
Strengthening the management team	√	
Improving financial management	√	
Influencing our move to a new factory		√
Using web tools to encourage innovation from staff	√	
Communication, staff morale and engagement	√	

Source: GEN (2005)

5.16 Turning now to the evaluations of TalentScotland, carried out by Frontline (2008), a survey of companies that had engaged with the product between September 2007 and January 2008 found that 52 companies stated they filled posts directly through TalentScotland (accounting for 101 jobs), and " … of these 22 companies described the jobs as 'crucial' to the company's

development, 18 as 'highly important' and 9 as 'important' ". The net impact (after taking account of deadweight) was between 30-61 jobs attributable to TalentScotland, and the net GVA impact somewhere between £1.3 – 2.5 million.[98] In addition, respondents in the evaluation pointed to a wide range of benefits, including: increased productivity, new skills/areas of expertise, ability to meet milestones, generation of new ideas, ability to increase commercialisation potential, wider background experience/knowledge base, and increased profitability. Note, however, these addition benefits are based on around 1 new recruit per company (attributable to TalentScotland), and therefore the scale of the benefits received overall must be somewhat questionable. An internal SDI document of 2008 has stated that robust monitoring data will be collected for TalentScotland to measure activity *and* output targets, as well as achievements against outcome and impact goals. The framework is set out in Table 5.2, but it is not clear if this has been implemented (no outputs were available to us for this review).

Table 5.2: TalentScotland Measurement Framework

Measuring Framework							
Inputs	Theme	Market Failures	Activity Examples	Activity Measures	Output Measure	Outcome	Impact
£988,000 Resources Core Team 5FTEs	Global Connections More People Choosing to Live and Work in Scotland	Information Deficiencies Risk Aversion	Direct e-mail Attendance at events, PR Company and Intermediary engagement Targeted Marketing at scarce skills	300,000 unique visitors to web site 750 jobs posted, no. of communications company participation Number of new registrations from these groups	16,000 new registrations achieved Increase in organisations recruiting internationally Increase in the proportion of those skills on the database of registrants	70 - 80% of individuals improved view of Scotland as a career destination 25% - 30% of attracted or returned to Scotland recruits Companies report less difficulty in finding key skills	Increase in net migration – 300 jobs filled Company Growth

Source: SDI internal document (2008)

5.17 GlobalScot was evaluated by Frontline (2007). Based on only 8 respondents, there was an attempt to calculate the GVA attributable to the product (based on applying industry ratios to the data available), resulting in an estimated increase of £28.7 million in Scottish GVA directly due to GlobalScot (net of deadweight and displacement). It is difficult to draw any conclusions from such a figure, both in terms of its accuracy, or indeed whether this represents good value for public spending. The latter seems almost certainly the case, but probably the greatest value of a product like GlobalScot is if it encourages more companies to use global networks to support their knowledge base. Table 5.3 shows how respondents to the evaluation rated GlobalScot on achieving its objectives; the relatively lower scores attached to raising aspirations and encouraging managers to build networks (compared to helping companies access global markets) suggests that the product is still not reaching its full potential.[99]

[98] GVA calculations were based on limited information.

[99] Frontline also found that usage of GlobalScot was low, especially among companies (who typically only access the system once). SE personnel were also noted as having a low use of GlobalScot.

Figure 5.3: Extent to which GlobalScot network fulfils its objectives (% response)

Rating	Not at all (rating 1)	To some extent (rating 2/3)	To a great extent (rating 4/5)	Fully
Leveraging Scottish expertise from around the world to influence economic development policy in Scotland (base=64)	2	40	49	9
Helping Scottish companies access global markets (base=64)	0	18	67	15
Helping Scottish Development International deliver its core objectives (base=64)	0	33	60	33
Raising aspiration amongst Scottish businesses (base=63)	2	36	48	14
Encouraging managers in Scottish companies to build networks (base=64)	2	37	58	4
Raising awareness internationally of Scotland as a place to do business (base=64)	2	23	62	15

Source: Frontline (2007)

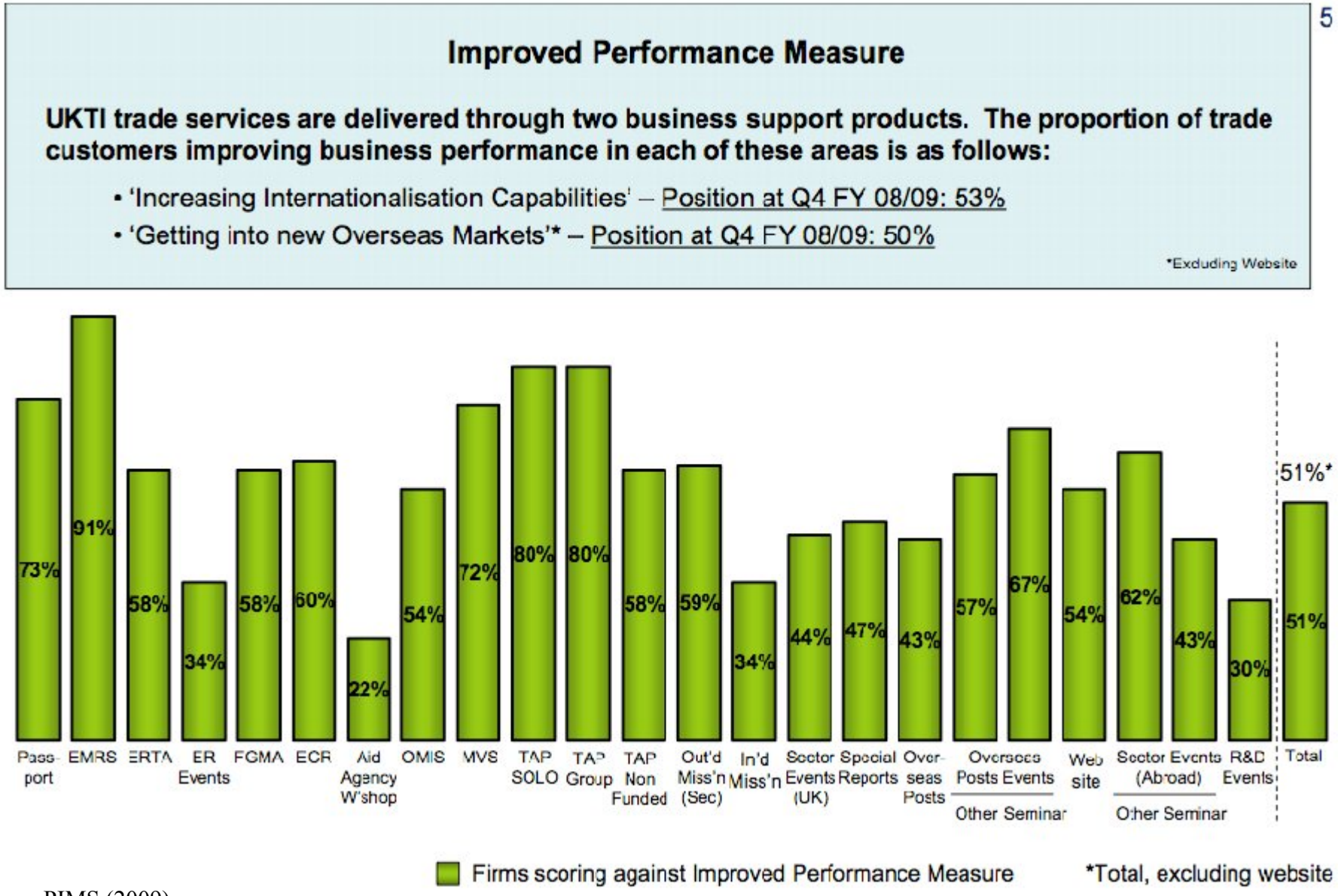
5.18 Lastly, the interim report by ECOTEC (2007) regarding the impact of Scotland Europa. No hard data arises from this report, perhaps understandable given the nature of the product being assessed. It was noted that the intelligence and analysis work of Scotland Europa was well regarded but not unique, while facilitation and networking was the most highly regarded area of activity. The main caveat to operations was that staff in the organisation tend to operate on a reactive basis.

UKTI evidence

5.19 UK Trade & Investment also carry out evaluation studies of the programmes and products they provide to prospective and current exporters, but in more recent years they have monitored their impact via the PIMS survey carried out each quarter by OMB (the latest study available is for 4th quarter of the 2008/09 financial year – see PIMS 2009). Table A5.1 summarises the products provided by UKTI, indicating a significant overlap with SDI products (Table 4.3) although SDI offers a wider range of programmes such as the GCDP International Strategy Workshops and International Mentoring.

5.20 Figure 5.3 shows that overall 51% of those helped by UKTI had improved their business performance, through increasing their internationalisation capabilities or getting into new overseas markets (or both). Figure 5.4 indicates what recipients thought were the strongest impacts of UKTI products – with access to customers/partners and information scoring strongly.

Figure 5.3: PIMS results for 4th quarter 2008/09 for UKTI interventions



Source: PIMS (2009)

Figure 5.4: Key impacts of UKTI programmes (PIMS results for 4th quarter 2008/09 for UKTI interventions)

Strengths – Top Impacts For Firms Scoring Against Improved Performance Measure

Sample Group	Firms Scoring Against Improved Performance Measure	
	Strongest Impact	2nd Strongest Impact
Overseas Posts Events - Seminars	Improved knowledge of competitive env. – A81 (100%)	New ideas about products, services, etc – A81 (100%)
R&D Events	Access to customers/business partners – A92 (100%)	Access to info otherwise unable to come by – A92 (100%)
Ad Agency Workshops	Access to info otherwise unable to come by – A92 (100%)	Improved way do business in overseas market – A83 (100%)
TAP (Group)	Improved profile or credibility overseas – A92 (89%)	Access to customers/business partners – A92 (82%)
TAP (SOLO)	Improved profile or credibility overseas – A92 (86%)	Access to customers/business partners – A92 (80%)
FGMA	Access to customers/business partners – A92 (78%)	Improved profile or credibility overseas – A92 (68%)
Outward Missions (Sector Teams)	Access to customers/business partners – A92 (73%)	Improved profile or credibility overseas – A92 (73%)
Sector Events Abroad - Other	Access to customers/business partners – A92 (73%)	Improved profile or credibility overseas – A92 (64%)
EMRS	Improved overseas marketing strategy – A81/A83 (72%)	Improved profile or credibility overseas – A92 (70%)
Passport	Confidence to explore/expand overseas mkts – A83 (72%)	Access to info otherwise unable to come by – A92 (69%)
Overseas Posts Events - Other	Access to customers/business partners – A92 (72%)	Confidence to explore/expand overseas mkts – A83 (66%)
MVS	Access to customers/business partners – A92 (72%)	Improved profile or credibility overseas – A92 (65%)
OMIS	Access to customers/business partners – A92 (70%)	Access to info otherwise unable to come by – A92 (56%)
ECR	Improved overseas marketing strategy – A81/A83 (69%)	Improved profile or credibility overseas – A92 (66%)
Website	Access to customers/business partners – A92 (68%)	Access to info otherwise unable to come by – A92 (68%)
ERTA	Access to customers/business partners – A92 (68%)	Access to info otherwise unable to come by – A92 (65%)
Overseas Posts	Access to customers/business partners – A92 (63%)	Improved profile or credibility overseas – A92 (60%)
Sector Events in the UK	Access to customers/business partners – A92 (63%)	Access to info otherwise unable to come by – A92 (58%)
English Regions' Events	Access to info otherwise unable to come by – A92 (61%)	Improved way do business in overseas market – A83 (61%)
Special Reports	Access to info otherwise unable to come by – A92 (61%)	Improved overseas marketing strategy – A81/A83 (52%)
Inward Missions	Access to customers/business partners – A92 (61%)	Improved profile or credibility overseas – A92 (51%)
Sector Events Abroad - Seminars	Access to customers/business partners – A92 (60%)	Improved knowledge of competitive env. – A81 (60%)
TAP (Non Funded)	Improved profile or credibility overseas – A92 (58%)	Access to customers/business partners – A92 (53%)

Figure 5.5: Key results (PIMS results for 4th quarter 2008/09 for UKTI interventions)

	Increased Internationalisation Capabilities	Getting into New Overseas Markets (Excl. Web)
A01 – Firms Supported (PIMS 11-14)	7,442	16,937
- % records complete (PIMS 14)	*95%*	*92%*
- % records with contact details incorrect (PIMS 14)	*16%*	*16%*
Improved Performance Measure	**53%**	**50%**
A09 – Quality Rating	**84%**	73%
B10 – Overall Satisfaction	**82%**	73%
A83 – Changed Behaviour	60%	50%
Increased R&D	9%	10%
A92 – Barriers Overcome	64%	62%
A06 – Improved Productivity & Competitiveness	72%	68%
A49 – £ Estimated Benefit	£183,000	£173,000
B09 – Clear Information Rating (OMIS only)	-	78%
'Innovative' Firms	82%	84%
'Innovative' Firms – Tighter Definition	64%	67%

Traffic Light Key			
Traffic Light	Improved Performance Measure	A09 - Quality Rating	B10 - Overall Satisfaction
Green	50%+	80%+	80%+
Amber Green	48-49%	75-79%	75-79%
Amber Red	45-47%	70-74%	70-74%
Red	<45%	<70%	<70%

Base: All respondents exc. Website (Base, Signposted only)

Increased Internationalisation Capabilities (Total) (1045, 0%),
Getting into New Overseas Markets (Excl. website) (2914, 0%)

5.21 Lastly, Figure 5.5 shows the key results for the approximately 24,000 firms supported: as stated overall some 51% stated that they had improved their performance, and a similar proportion stated that they had changed their behavior as a result of assistance. Only a small proportion though had increased their R&D, but around 63% had overcome barriers to exporting, while around 69% stated that they had improved their productivity and competitiveness. Some 66% of firms assisted were defined as 'innovative' firms based on a fairly tight definition of whether they undertook R&D and/or had recently innovated.

5.22 Of course the UKTI data is based on firms' self-evaluation, and does not control for the counterfactual of what would have happened to these firms if they had not received assistance. Nevertheless, the UKTI approach does suggest that UKTI makes a difference to some 50% of the firms they help, especially when considering their productivity and competitiveness.

Some conclusions

5.23 The above review of SDI suggests that there is a general lack of rigorous monitoring and evaluation evidence on an on-going basis of the products available from SDI. In particular, there is a pre-occupation in the evaluation studies of measuring economic impacts on Scottish GVA without any hard evidence of the counterfactual position. It is therefore difficult to know if the products have indeed improved the productivity and competitiveness of companies, and thus do lead to increases in Scottish GVA that would otherwise not have occurred.

5.24 Few evaluations consider whether assisted firms have improved in terms of intermediate impacts (see Figure 4.2), and virtually none of the evaluations consider the role and importance of R&D and innovation as drivers of firm performance, and yet organisations like Enterprise Ireland now integrate "… all competitiveness and growth polices under one umbrella: (covering) innovation, IP, internationalisation management training and human resource audits" (EU, 2007). In contrast UKTI evaluation data centres more on competitiveness and growth.

5.25 The evaluation studies reviewed in this chapter seem to indicate that SDI has an impact, more probably that firms engage in activities that increase the scale of exporting. But there is little evidence to show whether SDI is helping Scottish companies actually become globally competitive. That is not to say this is not happening (indeed given UKTI evidence it is likely that this *is* happening), but the evaluation evidence is not providing information that would allow us to draw conclusions in this area. In a similar way, it is also difficult to measure the extent to which SDI is meeting the productivity and growth objectives of the Scottish Government.

Appendix

Reports made available by SDI

An Interim Evaluation of Scotland Europa. Ecotec, June 2007
Asia Pacific Initiative: Evaluation Study Final Report. Tayside Economic Research Centre. December 2002
Ayrshire Internationalisation Programme Evaluation 2001-2003. Hall Aitken, October 2003
Development of International Strategy for the Scottish Chemical Sector. Optimat 2007
Economic Impact Evaluation of Scottish Enterprise's Interventions with Account and Client Managed Companies. Ekogen, January 2009
Evaluation of Internationalisation Support (SEL). GEN consulting et. al., November 2005
Evaluation of Ayrshire Overseas Trade Missions 2002 – 5. Maureen Liddell, October 2005 (for Scottish Enterprise Ayrshire).
Evaluation of Cashmere Made in Scotland Promotion, 2001-2003. BDA Ltd., 2003 (for Scottish Enterprise Borders).
Evaluation of eLearninternational. GEN Consulting June 2004
Evaluation of Globalscot. Frontline, 2007
Evaluation of New Market Development Project. Dempster. November 2004
Evaluation of SE Renfrewshire's Internationalisation Activities. Ekos, March 2007
Evaluation of TalentScotland. Frontline, 2008
Evaluation of the Global Companies Development Programme. SQW February 2009
Evaluation of the Learning Industry Learning Journey. Matrix, 2007
Evaluation of the New Market Development Programme. Fazakerley Associates, April 2001
Evaluation of the Scottish Export Assistance Scheme. DTZ Pieda, August 2001
Glasgow Exports Evaluation 2001 to 2003. Ekos, October 2003.
Growing Business Strategic Evaluation Study Brief, December 2006 (for Scottish Enterprise Lanarkshire).
Impact Assessment of the Trade Missions and Business Seminars to Central European Markets and Israel. Robb Fordyce, January 2007
International Trade Evaluation Renfrewshire Inverclyde Exports. Ekos April 2003
Learning Journey Evaluation. GEN consulting, November 2005
Macro Evidence Base. SCDI, latest
Review of Growing Business Evaluation Evidence 2001-2006. Malcolm Watson, July 2007
Scotland: Making International Connections. SE, 2003
SDI Business Plan 08/09
Strategic Locations in Scotland for International Resort Development. Tourism Resources Company, January 2005
Survey of International Activity in the Oil and Gas sector 2004/5
Understanding the metrics used by international development agencies and government departments to assess the impact of international economic development support. Wren, March 2005

Table A5.1: List of UKTI products*

Overseas Posts	Similar activities to OMIS (see below)
ERTA	English Regions Trade Advisors
TAP	Included in Exhibition & Missions for SDI – see Table 4.3
OMIS	Included in Overseas Market Support for SDI – see Table 4.3
Passport to export	Provides new and inexperienced exporters with free capability assessments, support in visiting potential markets, mentoring from a local export professional, free action plans, customised and subsidised training, and ongoing support. Similar but not as extensive as 'Readiness to Internationalise' in SDI products – see Table 4.3
ER events	English Regions events
Sectoral Events (UK)	Sector events organized in UK providing overseas market information
Sector Events (Abroad)	Sector events organized in overseas country providing overseas market information
Inward Missions	Inward visits of firms (usually sectoral) organized by UKTI
MVS	Market Visit Support (MVS) is a business support mechanism aimed at SMEs who are new to export (as defined by UKTI) or new to the markets of India, China, Hong Kong and Taiwan (new to market as defined by UKTI) and who wish to visit an overseas market as part of their trade development strategy.
Outward Mission Sector Teams	Similar to Learning Journeys for SDI – see Table 4.3
EMRS	Included in Overseas Market Support for SDI – see Table 4.3
FGMA	Access to Fast Growth Market Advisors
ECR	Included in Overseas Market Support for SDI – see Table 4.3
Special Reports	Similar to Overseas Market Support for SDI – see Table 4.3
Aid Agency Workshop	Similar to International Business Opportunities – see Table 4.3

* listed from most 'popular' to least based on 2008/09 4th quarter results.

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6. Synthesis and Identification of Evidence gaps

6.1 There are a number of issues arising from this review that can be considered under the heading of 'evidence gaps'. The academic (and to a growing extent the policy orientated) literature covering the internationalisation of firms points away from the need for government intervention to meet 'resource-gaps' and more towards the need to meet 'competency-gaps'. That is, while there are clearly issues surrounding the (sunk) cost of acquiring information to enter overseas markets, and this acts as a potential entry barrier to internationalisation, which government and its agencies can and do in part offset, the main factor determining who exports and/or engages in outward FDI is productivity. The latter needs to be relatively high to overcomes barriers to entry, and it needs to remain high to sustain long-term engagements (and derive long-term benefits) in international markets.

6.2 To increase firm-level productivity requires that the firm has the necessary intangible assets (which can be defined as knowledge embodied in intellectual assets), since as Eustace (2000) argues:

> Intangibles such as R&D and proprietary know-how, intellectual property, workforce skills, world-class supply networks and brands are now *the* key drivers of wealth production, while physical and financial assets are increasingly regarded as commodities. … Today, a firm's intangible assets are often *the* key element in its competitiveness. Increasingly, the capacity to combine external and internal sources of knowledge to exploit commercial opportunities has become a distinctive competency.

6.3 Building intangible assets requires that firms understand how to create new knowledge from the resources they possess. That is, in addition to their tangible assets, which operate through relatively clearly defined markets, it is the use by the firm of their intangible assets (Griliches, 1981), or firm-specific capabilities (Teece and Pisano, 1998; Pavitt, 1984) which largely define the dynamic competencies and capabilities that provide a firm with a competitive advantage.

6.4 Helping a firm overcome 'resource-gaps' has been linked in this review to helping firms to increase their volume of exports, through mainly providing assistance to find markets and therefore customers; helping firms to overcome 'competency/capability gaps' is about a wider (more holistic) policy to help firms to improve their productivity through improving absorptive capacity, which essentially comes down to increasing intangible assets – and thereby building global competitiveness.

6.5 That is not to say that overcoming information barriers to entry is not relevant or important; firms clearly state that they require assistance to overcome such barriers, comprising mostly finding (and marketing to) customers and/or finding agents/partners for supplying in an overseas country. But do the products offered by SDI need to do more in terms of improving productivity in Scottish firms, which will not only increase the probability that they will become (more) international, but will also help to ensure they stay international and that

spillovers from such activities are maximised within the indigenous and non-traded sectors within the economy?

6.6 At the moment, there would appear to be a lack of demand for those SDI products that enhance productivity and so help to build greater competitiveness. It is unclear the extent to which this is due to Scottish companies not understanding or realising the benefits of such products, or in fact if demand is constrained by a supply-side under provision of products and programmes such as GCDP, international strategy workshops, and international mentoring.[100] This is an obvious evidence gap, which in our view needs to be looked at, and presumably relates to the role played by the SE Account-client manager who works with companies to improve their performance.

6.7 The above discussion of the balance needed between products that increase the volume of international activities, and those that also lead to better quality (potential) exports, points to a second major evidence gap – which is that the current approach to monitoring and evaluation by SDI (as reflected in the material made available to us for this review) provides little hard evidence on the outputs, and more especially the outcomes, of SDI activities. Even the evidence that is obtained through standard evaluations (which is geared more to measuring whether assistance has provided an additional boost to Scottish GVA, rather than increased competitiveness) is limited, both in terms of what products are covered, how regularly evidence is gathered, and most importantly whether it is robust by taking account of the counter-factual. In short, current methodologies do not really provide rigorous analysis of whether those firms who seek help with export promotion are a 'self-selecting' group who (at least in part) already have the necessary means to overcome barriers to entry. While many evaluations attempt to measure additionality, by asking firms would they have undertaken the activity (e.g. gone on a trade mission) without help, and while these studies often find that answers to this question indeed does suggest there is evidence of additional activity beyond what the firm would do if unassisted, there is clearly a need for more to be done to substantiate the actual impact on firm performance of SDI activities.[101]

6.8 Therefore, we would suggest that based on the evidence made available for this review, it would seem that much more needs to be done to provide rigorous evidence on what SDI products are seeking to achieve in terms of generating increased activities, outputs, intermediate impacts and outcomes (Figure 4.2), taking account of the counter-factual. This suggests that monitoring and evaluation needs to take a more central role within SDI and SE, with the additional benefit that this would also increase the capacity for SDI to gather information that would allow them to 'research' issues surrounding what determines firm-level competitiveness, what are the barriers to achieving this, what new policy instruments might be devised (or present ones overhauled) to

[100] Such demand and supply issues also relate to the internal methods used by SE (through its Account and Client Managers approach to helping firms); do such managers under-demand such SDI products, perhaps because they do not see how they fit within the current portfolio of SE products, or because they do not appreciate the nature of such SDI products in terms of what they aim to achieve?

[101] There have been recent changes in the evaluation methods required by SE (see http://www.scottish-enterprise.com/publications/se2009_se_appraisal_guidance.pdf) although guidance on taking account of the counter-factual still seems to be lacking.

meet the challenges of increased competition from a (ever increasingly) global market-place.[102]

6.9 Establishing this greater capacity and role for monitoring and evaluation would very likely require something similar to setting up of a team like the Economics and Evaluation Team (EET) that operates in UKTI. Its role is to provide UKTI with "… the economic evidence and analysis which underpin the economic rationale for UKTI policy… to inform UKTI strategic planning, resource allocation and performance management" (UKTI Corporate Plan, 2008, p. 49). It is useful to quote verbatim from their Corporate Plan what is the main focus of the EET, as this can then be contrasted with what happens in SDI:

- Research and analysis to strengthen understanding of how international trade and investment contribute to the performance of businesses and of the UK economy; what are the main barriers and market failures which could prevent the UK from exploiting international trade and investment opportunities effectively; and where is UKTI action most needed.
- Monitoring performance against UKTI's spending review targets and other key measures, and drawing out insights which help UKTI managers and delivery teams know where they need to focus in order to drive up corporate performance and overall tax payer value for money.
- Evaluation of the economic impact of UKTI services. The team develops and manages a rolling annual programme of independent evaluation studies which look in depth at the economic rationales for particular areas of UKTI's work, and seek to assess the value for money achieved for the UK taxpayer. Evaluation findings are reviewed by UKTI's resources and evaluation panel, which reports to the Executive Board, and provide a key source of evidence and insight to inform UKTI strategic planning and resource allocation.

6.10 With reference to the last point, SDI currently does commission evaluation studies, although Chapter 5 suggests that recent ongoing analysis of SDI products (especially since 2005) is at best underdeveloped (and we have also stated above our concerns with what these studies are able to achieve with regard to the counter-factual position). However, there seems to be much less evidence if SDI action covering the first two bullet points in par. 6.9. UKTI achieve this through their rolling Performance and Impact Monitoring Survey (PIMS), and through commissioning mainly (academic) research to fill in gaps in the evidence available.

Next steps for current PEF?

6.11 Analysis of merged data from the Scottish component of the Annual Respondents Database (ARD) and the Global Connections Survey (GCS) can

[102] The Appraisal and Evaluation team at SE works with SDI on building the evidence base, and the current Policy Evaluation Framework being used (of which this review is a part) is seeking to put in place a more robust approach of undertaking research and analysis, monitoring performance and a rolling programme of evaluation.

provide more evidence on whether exporting/outward FDI has a productivity impact, taking account of the counter-factual.

6.12 There is also a need also to merge in information on those receiving SDI products to test if exporting/outward FDI boosted participation in international markets and/or had further productivity impacts.

6.13 However GCS data is insufficient to provide the full picture; it needs to be supplemented by primary data collection (survey and case-study) in order to obtain fuller picture of: company needs (e.g. what are the *apparent* and *perceived* competency gaps of Scottish firms, differing by type); and the demand for and likely effectiveness of different policy interventions.

References

Aghion, P. and Howitt, P.(1998) *Endogenous Growth Theory,* Cambridge and London: MIT Press.

Aitken, B., Hanson, G.H., and Harrison, A.E. (1997) Spillovers, Foreign Investment, and Export Behaviour. *Journal of International Economics*, 43, 103-132.

Aitken, B.J. and Harrison, A.E. (1999) Do Domestic Firms Benefit from Direct Foreign Investment? *American Economic Review*, 89(3), 605-618.

Alguacil, M.T. and Orts, V. (2002) A Multivariate Cointegrated Model Testing for Temporal Causality between Exports and Outward FDI: The Spanish Case. *Applied Economics*, 34, 119-132.

Almeida, P. (1996) Knowledge Sourcing by Foreign Multinationals: Patent Citation Analysis in the U.S. Semiconductor Industry. *Strategic Management Journal*, 17, 155-165.

Alvarez, R. (2001) External Sources of Technological Innovation in Chilean Manufacturing Industry. *Estudios de Economia*, 28(1), 53-68.

Alvarez, R. and López, R. (2006) Entry and Exit in International Markets: Evidence from Chilean Data. Center for Applied Economics and Policy Research, Indiana University Bloomington, Working Paper 2006-014.

Amiti, M. and Wei, S. (2005) Service Offshoring, Productivity, and Employment: Evidence from the United States. IMF Working Paper No. 05/238 .

Amiti, M. and Wei, S. (2006) Service Offshoring and Productivity: Evidence from the United States. NBER Working Papers No. 11926. National Bureau of Economic Research Inc.

Anderton, B. (1999) UK Trade Performance and the Role of Product Quality, Innovation and Hysteresis: Some Preliminary Results. *Scottish Journal of Political Economy*, 46(5), 570-594.

Angostaki, V. and Louri, H. (1995) Entry and Exit from Greek Manufacturing Industry: A Test of the Symmetry Hypothesis. *International Review of Applied Economics*, 9, 86-95.

Arnold, J.M. and Hussinger, K. (2005) Exports Versus FDI in German Manufacturing: Firm Performance and Participation in International Markets. ZEW - Centre for European Economic Research Discussion Paper No. 05-073.

Arrow, K. (1969) The Organisation of Economic Activity: Issues Pertinent to the Choice of Market vs Nonmarket Allocation. *The Analysis and Evaluation of Public Expenditures: The PPB System, I.*, 59-73-Washington, DC.: U.S. Joint Economic Committee, 91st Session. U.S. Government Printing Office.

Asplund, M. and Nocke, V. (2006) Firm Turnover in Imperfectly Competitive Markets. *Review of Economic Studies*, 73, 295-327.

Autio, E., Sapienza, H., and Almeida, J. (2000) Effect of Age at Entry, Knowledge Intensity, and Imitability on International Growth. *Academy of Management Journal*, 43, 909-924.

Aw, B.Y. and Hwang, A.R. (1995) Productivity and the Export Market: A Firm-Level Analysis. *Journal of Development Economics*, 47(2), 313-332.

Aw, B.Y., Chung, S., and Roberts, M.J. (2000) Productivity and Turnover in the Export Market: Micro-level Evidence from the Republic of Korea and Taiwan (China). *The World Bank Economic Review*, 14, 65-90.

Aw, B.Y., Roberts, M.J., and Winston, T. (2007) Export Market Participation, Investments in R&D and Worker Training, and the Evolution of Firm Productivity. *World Economy*, 30, 83-104.

Aw, B.Y., Roberts, M.J., and Xu, D.Y. (2008) R&D Investments, Exporting, and the Evolution of Firm Productivity. *American Economic Review*, 98, 451-456.

Aw, B.Y., Roberts, M.J., and Xu, D.Y. (2009) R&D Investment, Exporting, and Productivity Dynamics. NBER Working Paper No. 14670. National Bureau of Economic Research Inc.

Bagchi-Sen, S. (2001) Product Innovation and Competitive Advantage in an Area of Industrial Decline: the Niagara Region of Canada. *Technovation*, 21(1), 45-54.

Baggs, J. (2005) Firm Survival and Exit in Response to Trade Liberalisation. *Canadian Journal of Economics*, 38(4), 1364-1383.

Baily, M.N., Hulten, C., and Campbell, D. (1992) The Distribution of Productivity in Manufacturing Plants. *Brookings Papers on Economic Activity, Microeconomics*, 187-249.

Baldwin, J.R. and Gu, W. (2003) Export-Market Participation and Productivity Performance in Canadian Manufacturing. *Canadian Journal of Economics*, 36(3), 634-657.

Baldwin, J.R. and Gu, W. (2004) Trade Liberalization: Export-Market Participation, Productivity Growth, and Innovation. *Oxford Review of Economic Policy*, 20(3), 372-392.

Baldwin, R. (1988) Hysteresis and the Beachhead Effect. *American Economic Review*, 78, 773-785.

Baldwin, R. and Krugman, P. (1989) Persistent Trade Effects of Large Exchange Rate Shocks. *Quarterly Journal of Economics*, 104, 635-654.

Barba-Navaretti, G. and Venables, A.J.(2004) *Multinational Firms in the World Economy,* Princeton: Princeton University Press.

Barney, J. (1991) Firm Resources and Sustained Competitive Advantage. *Journal of Management*, 17(1), 99-120.

Barney, J. (2001) Resource-Based Theories of Competitive Advantage: A Ten-Year Retrospective of the Resource-Based View. *Journal of Management*, 27, 643-650.

Barrell, R. and Pain, N. (1999) Domestic Institutions, Agglomerations and Foreign Direct Investment in Europe. *European Economic Review*, 43(4-6), 925-934.

Barrios, S., Gorg, H., and Strobl, E. (2003) Explaining firms' Export Behaviour: R&D, Spillovers and the Destination Market. *Oxford Bulletin of Economics and Statistics*, 65(4), 475-496.

Barry, F., Gorg, H., and Strobl, E. (2003) Foreign Direct Investment, Agglomerations, and Demonstration Effects: An Empirical Investigation. *Review of World Economics*, 139, 583-600.

Bartelsman, E.J. and Dhrymes, P.J. (1998) Productivity Dynamics: U.S. Manufacturing Plants, 1972-1986. *Journal of Productivity Analysis*, 9, 5-34 .

Bartelsman, E.J. and Doms, M. (2000) Understanding Productivity: Lessons from Longitudinal Microdata. *Journal of Economic Literature*, 38(3), 569-594.

Basile, R. (2001) Export Behaviour of Italian Manufacturing Firms over the Nineties: the Role of Innovation. *Research Policy* , 30(8), 1185-1200.

Baumol, W.J. (1984) On Productivity Growth in the Long Run, *Atlantic Economic Journal*, 12, 4-10.

Bayoumi, T. and Lipworth, G. (1998) Japanese Foreign Direct Investment and Regional Trade. *Journal of Asian Economics*, 9, 581-607.

Bell, J. (1995) The Internationalism of Small Computer Software Firms: a Further Challenge to Stage Theory. *European Journal of Marketing*, 29, 60-75.

Bell, J., McNaughton, R., Young, S., and Crick, D. (2003) Towards an Integrative Model of Small Firm Internationalisation. *Journal of International Entrepreneurship*, 1, 339-362.

Ben-David, D. and Loewy, M. (1998) Free Trade, Growth, and Convergence. *Journal of Economic Growth*, 3, 143-170.

Benfratello, L. and T. Razzolini (2008) Firms' Productivity and Internationalisation Choices: Evidence for a Large Sample of Italian Firms, Centro Studi Luca D'Agliano Working paper 236.

Bernard, A.B. and Jensen, J.B. (1995) Exporters, Jobs and Wages in US Manufacturing: 1976-1987. *Brookings Papers on Economic Activity, Microeconomics*, 1995, 67-119.

Bernard, A.B. and Jensen, J.B. (1999) Exceptional Exporter Performance: Cause, Effect, or Both? *Journal of International Economics*, 47(1), 1-25.

Bernard, A.B. and Jensen, J.B. (2002) The Deaths of Manufacturing Plants. Tuck School of Business Working Paper No. 02-14.

Bernard, A.B. and Jensen, J.B. (2004a) Exporting and Productivity in the USA. *Oxford Review of Economic Policy*, 20, 343-357.

Bernard, A.B. and Jensen, J.B. (2004b) Why Some Firms Export. *Review of Economics and Statistics*, 86(2), 561-569.

Bernard, A.B. and Wagner, J. (1997) Exports and Success in German Manufacturing. *Review of World Economics*, 133(1), 134-157.

Bernard, A.B., Eaton, J., Jensen, J.B., and Kortum, S. (2003) Plants and Productivity in International Trade. *American Economic Review*, 93, 1268-1290.

Bernard, A.B., Jensen, J.B., and Schott, P.K. (2005) Importers, Exporters, and Multinationals: a Portrait of Firms in the U.S. That Trade Goods. NBER Working Paper 11404.

Bernard, A.B., Redding, S., and Schott, P.K. (2007) Comparative Advantage and Heterogeneous Firms. *Review of Economic Studies*, 74(1), 31-66.

BERR (2009) The Globalisation of Value Chains and Industrial Transformation in the UK. Department for Business, Enterprise & Regulatory Reform Economics Paper No. 6. Available at www.berr.gov.uk/files/file50584.pdf<http://www.berr.gov.uk/files/file50584.pdf

Besedes, T. (2006) A Search Cost Perspective on Duration of Trade, Available at SSRN: http://ssrn.com/abstract=659081.

Besedes, T. and T.J. Prusa (2004) Surviving the U.S. Import Market: The Role of Product Differentiation, NBER Working Paper No. 10319, February 2004 .

Besedes, T. and T.J. Prusa (2005) A Search Cost Perspective on Duration of Trade, mimeo

Bhagwati, J., Panagariya, A., and Srinivasan, T. (2004) The Muddles over Outsourcing. *Journal of Economic Perspectives*, 18, 93-114.

Bishop, P. and Wiseman, N. (1999) External Ownership and Innovation in the United Kingdom. *Applied Economics*, 31(4), 443-450.

Bleaney, M. and Wakelin, K. (2002) Efficiency, Innovation and Exports. *Oxford Bulletin of Economics and Statistics*, 64(1), 3-15.

Blind, K. and Jungmittag, A. (2004) Foreign Direct Investment, Imports and Innovations in the Service Industry. *Review of Industrial Organization*, 25(2), 205-227.

Blomström, M. and Kokko, A. (1997) How Foreign Investment Affects Host Countries. World Bank International Economics Dept., International Trade Division, Washington.

Blomström, M. and Kokko, A. (1998) Multinational Corporations and Spillovers. *Journal of Economic Surveys*, 12(3), 247-277.

Blomström, M. and Kokko, A. (2003) Human Capital and Inward FDI. EIJS Working Paper Series No. 167. The European Institute of Japanese Studies.

Blomstrom, M. and Kulchycky, K. (1988) U.S. and Swedish direct investment and exports. In: Baldwin, R.E.(eds.) *Trade Policy Issues and Empirical Analysis*, Chicago: The University of Chicago Press.

Blomstrom, M. and Lipsey, R.E. (1991) Firm Size and Foreign Operation of Multinationals. *Scandinavian Journal of Economics*, 93, 101-107.

Blomström, M., Fors, G., and Lipsey, R.E. (1997) Foreign Direct Investment and Employment: Home Country Experience in the United States and Sweden. *The Economic Journal*, 107, 1787-1797.

Blomström, M.(1990) *Transnational Corporations and Manufacturing Export From Developing Countries,* New York: UN Centre on Transnational Corporations.

Blonigen, B. (2001) In Search of Substitution Between Foreign Production and Exports. *Journal of International Economics*, 53, 81-104.

Blonigen, B.A., Davies, R.B., and Head, K. (2003) Estimating the Knowledge-Capital Model of the Multinational Enterprise: Comment. *American Economic Review*, 93, 980-994.

Bloodgood, J.M., Sapienza, H.J., and Almeida, J.G. (1996) The Internationalisation of New, High-Potential US Ventures: Antecedents and Outcomes. *Entrepreneurship Theory and Practice*, 20, 61-76.

Boocock, G. and V. Anderson (2003) International Business and UK SMEs – Rationale, Routes, Readiness, Role of Government Support, and Reflections, *International Journal of Entrepreneurship & Innovation*, 4(2), 97-112.

Booth di Giovanni, H. (1997;) Export Forum Paper 1: The Role of Government in Export Promotion, unpublished DTI paper, mimeo.

Brainard, S. and Riker, D. (1997) Are US Multinational s Exporting Jobs? NBER Working Paper No. 5958.

Brainard, S.L. (1993) A Simple Theory of Multinational Corporations and Trade with a Trade-Off Between Proximity and Concentration. NBER Working Papers No. 4269, National Bureau of Economic Research, Inc.

Brainard, S.L. (1997) An Empirical Assessment of the Proximity-Concentration Trade-off Between Multinational Sales and Trade. *The American Economic Review*, 87, 520-544.

Branstetter, L. (2000) Is Foreign Direct Investment a Channel of Knowledge Spillovers? Evidence from Japan's FDI in the United States. available at http://search.epnet.com/login.aspx?direct=true&db=ecn&an=0716135

Brush, C.G. and Vanderwerf, P.A. (1992) A Comparison of Methods and Sources for Obtaining Estimates of New Venture Performance. *Journal of Business Venturing*, 7, 157-170.

Buch, C.M., Kleinert, J., Lipponer, A., and Toubal, F. (2005) Determinants and Effects of Foreign Direct Investment: Evidence from German Firm-Level Data. *Economic Policy*, 20, 52-110.

Bürgel, O. and Murray, G. (2000) The international market entry choices of start-up companies in high-technology industries. *Journal of International Marketing*, 8, 33-62.

Cameron, G., Proudman, J., and Redding, S. (2005) Technological Convergence, R&D, Trade and Productivity Growth. *European Economic Review*, 79, 775-807.

Cantwell, J.A., Dunning, J.H., and Janne, O.E. (2004) Towards a technology-seeking explanation of U.S. direct investment in the United Kingdom. *Journal of International Management*, 10(1), 5-20.

Carlsson, B. and Jacobson, S. (1997) In Search of Useful Public Policies - Key Lessons and Issues for Policy Makers. In: Carlsson, B. (eds.) *Technological Systems and Industrial Dynamics*, 299-315. London: Kluwer.

Carr, D.L., Markusen, J.R., and Maskus, K.E. (2001) Estimating the Knowledge Capital Model of the Multinational Enterprise. *American Economic Review*, 91, 693-708.

Cassiman, B. and Martinez-Ros, E. (2003) Innovation Driving Export Performance: Evidence form Spanish Manufacturing. Proceedings of the XIX Jornadas de Economía Industrial.

Cassiman, B. and Martinez-Ros, E. (2004) Innovation and Exports: Evidence from Spanish Manufacturing. Working Paper.

Cassiman, B. and Veugelers, R. (1999) Complementarity between Technology Make and Buy in Innovation Strategies: Evidence from Belgium Manufacturing Firms. *Research Policy*, 28, 63-80.

Casson, M. (1999). A theory of international operation. In Buckley, PJ (ed.) *The internationalization of the firm.* (pp. 55-60).

Casson, M. (1999). A theory of international operation. In Buckley, PJ (ed.) *The internationalization of the firm.* (pp. 55-60).

Castellani, D. (2002) Export Behavior and Productivity Growth: Evidence from Italian Manufacturing Firms. *Review of World Economics*, 138(4), 605-628.

Castellani, D. and Zanfei, A. (2007) Internationalisation, Innovation and Productivity: How Do Firms Differ in Italy? *World Economy*, 30, 156-176.

Castellani, D. and Zanfei, A.(2006) *Multinational Firms, Innovation and Productivity,* Cheltenham: Edward Elgar.

Caves, R. (2007) *Multinational Enterprise and Economic Analysis,* (3 edn). Cambridge University Press.

Caves, R.E. (1971) International Corporations: The Industrial Economics of Foreign Investment. *Economica*, 38(149), 1-27.

Cavusgil, S.T. (1980) On the Internationalisation Process of the Firm. *European Research*, 9, 273-281.

Chen, Y., Horstmann, I.J., and Markusen, J.R. (2008) Physical Capital, Knowledge Capital and the Choice Between FDI and Outsourcing. NBER Working Paper No. 14515. National Bureau of Economic Research, Inc.

Choi, J.P. and Davidson, C. (2004) Strategic Second Sourcing by Multinationals. *International Economic Review*, 45, 579-600.

Clausing, K. (2000) Does Multinational Activity Displaces Trade? *Economic Inquiry*, 38, 190-205.

Clerides, S.K., Lach, S., and Tybout, J.R. (1998) Is Learning by Exporting Important? Micro-Dynamic Evidence from Colombia, Mexico and Morocco. *Quarterly Journal of Economics*, 113, 903-948.

Co, C. (1997) Japanese FDI into the US Automobile Industry: An Empirical Investigation. *Japan and the World Economy*, 9, 93-108.

Coe, D.T. and Helpman, E. (1995) International R&D Spillovers. *European Economic Review*, 39(5), 859-887.

Cohen, W.M. and Levinthal, D.A. (1989) Innovation and Learning: the Two Faces of R&D. *The Economic Journal*, 99, 569-596.

Cohen, W.M. and Levinthal, D.A. (1990) Absorptive Capacity: A New Perspective on Learning and Innovation. *Administrative Science Quarterly*, 35, 128-152.

Cooke, P. (1997) Regions in a Global Market: the Experience of Wales and Baden-Wurttemberg, *Review of International Political Economy*, 4, 349-381.

CPPR (2008) CPPR Analysis of Scottish Government Targets. http://www.cppr.ac.uk/media/media_99256_en.pdf

Crespi, G., Criscuolo, C., and Haskel, J. (2008) Productivity, Exporting, and the Learning-by-Exporting Hypothesis: Direct Evidence from UK Firms. *Canadian Journal of Economics*, 41(2), 619-638.

Crick, D. (1995) An Investigation into the Targeting of UK Export Assistance. *European Journal of Marketing*, 29, 76-94.

Crick, D. and Spence, M. (2005) The Internationalism of 'High-Performing' UK High-Tech SME's: A Study of Planned and Unplanned Strategies. *International Business Review*, 14, 167-185.

Criscuolo, C. and Leaver, M. (2005) Offshore Outsourcing and Productivity. Paper presented at. OECD Conference on Globalisation of Production.

Criscuolo, C. et al (2004) Import Competition, Productivity, and Restructuring in UK Manufacturing", *Oxford Review of Economic Policy* 20(3), 393-408.

Crozet, M., Mayer, T., and Mucchielli, J.L. (2004) How Do Firms Agglomerate? A Study of FDI in France. *Regional Science and Urban Economics*, 34, 27-54.

Cuyvers, L., Dumont, M., Rayp, G., and Stevens, K. (2005) Home Employment Effects of EU Firms' Activities in Central and Eastern European Countries. *Open Economies Review*, 16, 153-174.

Damijan, P.J., Polanec, S., and Prašnikar, J. (2005) Does Exporting Increase Productivity? Firm Level Evidence From Slovenia. Paper presented at conference on 'Globalisation and Firm Level Adjustment', University of Nottingham.

Dana, L.P. et. al. (2004) Public Policy and International Expansion of High-technology SMEs: A Research Agenda, *International Journal of Entrepreneurship & Innovation Management*, 4,1.

Das, S., Roberts, M.J., and Tybout, J.R. (2007) Market Entry Costs, Producer Heterogeneity, and Export Dynamics. *Econometrica*, 75(3), 837-873.

Davis, D.R. (1995) Intra-industry Trade: A Heckscher-Ohlin-Ricardo Approach. *Journal of International Economics*, 39(3), 201-226.

De Loecker, J. (2007) Do Exports Generate Higher Productivity? Evidence from Slovenia. *Journal of International Economics*, 73, 69-98.

Delgado, M.A., Fariñas, J.C., and Ruano, S. (2002) Firm Productivity and Export Markets: A Nonparametric Approach. *Journal of International Economics*, 57, 397-422.

Dhanaraj, C. and Beamish, P.W. (2003) A Resource-Based Approach to the Study of Export Performance. *Journal of Small Business Management*, 41(3), 242-261.

Diamantopoulos, A. et. al. (1993) Understanding the Role of Export Marketing Assistance: Empirical Evidence and Research Needs**,** *European Journal of Marketing*, 27, 5-18.

DiPietro, W.R. and Anoruo, E. (2006) Creativity, Innovation, and Export Performance. *Journal of Policy Modeling*, 28(2), 133-139.

Disney, R., Haskel, J., and Heden, Y. (2003) Restructuring and Productivity Growth in UK Manufacturing. *Economic Journal*, 113, 666-694.

Dixit, A. (1989) Entry and Exit Decisions under Uncertainty. *Journal of Political Economy*, 97, 620-638.

Dixon, R. and Thirlwall, A.P. (1975) A model of regional growth rate differences on Kaldorian lines, *Oxford Economic Papers*, 27(2), pp. 201-214.

Dodgson, M., and J. Bessant (1996), *Effective Innovation Policy*, International Thomson Business Press, London

Dosi, G. *et. al.* (1988) *Technological change and economic theory*. London: Pinter.

Driffield, N., Love, J.H., and Taylor, K. (2009) Productivity and Labour Demand Effects Of Inward And Outward Foreign Direct Investment On UK Industry. *The Manchester School*, 77, 171-203.

DTI (2006a) International Trade and Investment–the Economic Rationale for Government Support, DTI Economics Paper No.18

DTI (2006b) 2004 – 2005 Study of the Relative Economic Benefits of UK Trade & Investment Support for Trade and Inward: Final Synthesis Report. DTI Evaluation Report Series No. 9.

Dunning, J.H. (1988) The Eclectic Paradigm of International Production: A Restatement and Some Possible Extensions. *Journal of International Business Studies*, 19(1), 1-31.

Dunning, J.H. and Archer, H. (1987) The Eclectic Paradigm and the Growth of UK Multinational Enterprise 1870-1983. *Business and Economic History*, 16, 19-49.

Dunning, J.H. and Rugman, A.M. (1985) The Influence of Hymer's Dissertation on the Theory of Foreign Direct Investment. *The American Economic Review*, 75, 228-232.

Dunning, J.H.(1981) *International Production and the Multinational Enterprise,* London: Allen & Unwin.

Eaton, J. and Kortum, S. (1999) International Technology Diffusion: Theory and Measurement. *International Economic Review*, 40, 537-570.

Eaton, J. and Kortum, S. (2001) Technology, Trade, and Growth: A Unified Framework. *European Economic Review*, 45(4-6), 742-755.

Eaton, J. and Kortum, S. (2002) Technology, Geography, and Trade. *Econometrica*, 70(5), 1741-1779.

Eaton, J., Kortum, S., and Kramarz, F. (2008) An Anatomy of International Trade: Evidence from French Firms. NBER Working Papers 14610, National Bureau of Economic Research, Inc.

Edwards, S. (1998) Openness, Productivity and Growth: What Do We Really Know? *Economic Journal*, 108, 383-398.

Egger, H. and Egger, P. (2006) International Outsourcing and the Productivity of Low-Skilled Labour in the EU. *Economic Inquiry*, 44, 98-108.

Egger, P., Pfaffermaryr, M., and Wolfmayr-Schnitzer, Y. (2001) The International Fragmentation of Austrian Manufacturing: The Effects of Outsourcing on Productivity and Wages . *The North American Journal of Economics and Finance*, 12, 257-272.

Ekos (2007) Evaluation of SE Renfrewshire's Internationalisation Activities. Report to SE.

Eriksson, K., Johanson, J., Majkgård, A., and Sharma, D. (1997) Experimental Knowledge and Costs in the Internationalization Process. *Journal of International Business Studies*, 28, 337-360.

Esteve Pérez, S., Sanchis LLopis, A., and Sanchos LLops, J.A. (2004) The Determinants of Survival of Spanish Manufacturing Firms. *Review of Industrial Organisation*, 25(3), 251-273.

Ethier, W.J. (1982) National and International Returns to Scale in the Modern Theory of International Trade. *American Economic Review*, 72(3), 389-405.

EU (2007) Supporting the Internationalisation of SMEs. Final Report to the Expert Group. EC Enterprise and Industry Directorate.

Eustace (2000)The Intangible Economy Impact and Policy Issues . Report of the European High Level Expert Group on the Intangible Economy. Enterprise Directorate.
http://ec.europa.eu/internal_market/services/docs/brs/competitiveness/2000-report-intangeconomy_en.pdf

Faeth, I. (2009) Determinants of Foreign Direct Investment a Tale of Nine Theoretical Models. *Journal of Economic Surveys*, 23, 165-196.

Fagerberg, J. (1988) International Competitiveness. *Economic Journal*, 98(391), 355-374.

Fagerberg, J. (1994) Technology and International Differences in Growth Rates. *Journal of Economic Literature*, 32(3), 1147-1175.

Falvey, R., Greenaway, D., Yu, Z., and Gullstrand, J. (2004) Exports, Restructuring and Industry Productivity Growth. GEP Research Paper 2004/40.

Feenstra, R. and Hanson, G. (1996) Globalization, Outsourcing, and Wage Inequality. *American Economic Review*, 86, 240-246.

Feenstra, R.C. and Hanson, G.H. (1999) The Impact of Outsourcing and High-Technology Capital on Wages: Estimates for the United States, 1979-1990. *Quarterly Journal of Economics*, 114, 907-940.

Fernandes, A.M. and Isgut, A.E. (2007) Learning-by-Exporting Effects: Are They for Real? MPRA Paper No. 3121. Available at http://mpra.ub.uni-muenchen.de/3121/.

Forfás (2007) Outward Direct Investment and the Irish Economy. Forfás Report. Available at www.forfas.ie/media/forfas071103_outward_direct_investment.pdf.

Forslid, R. and K.H. Midelfart (2005) Internationalisation, Industrial Policy and Clusters, *Journal of International Economic*s, 66, 197-213.

Fosfuri, A. and Motta, M. (1999) Multinationals Without Advantages. *Scandinavian Journal of Economics*, 101, 617-630.

Foster, L., Haltiwanger, J., and Krizan, C. (2001) Aggregate Productivity Growth: Lessons from Microeconomic Evidence. In: Hulten, C.R., Dean, E.R., and Harper, M.J.(eds.) *New Developments in Productivity Analysis*, Chicago: University of Chicago Press.

Frankel, J.A. and Romer, D. (1999) Does Trade Cause Growth? *American Economic Review*, 89(3), 379-399.

Frantzen, D. (2000) R&D, Human Capital and International Technology Spillovers: A Cross-country Analysis. *Scandinavian Journal of Economics*, 102, 57-75.

Freeman C. and L. L. G. Soete, 1997, *The economics of industrial innovation*, Third edition. Cambridge: MIT Press,

Freeman, C. (1987) Technology and Economic Performance: Lessons from Japan, Pinter Publishers, London and New York.

Frenz, M. and Ietto-Gillies, G. (2007) Does multinationality affect the propensity to innovate? An analysis of the third UK Community Innovation Survey. *International Review of Applied Economics*, 21, 99-117.

Gao, T. (1999) Economic Geography and the Department of Vertical Multinational Production. *Journal of International Economics*, 48, 301-320.

Geanakoplos, J. (1987). Arrow-Debreu model of general equilibrium. In *The new palgrave: A dictionary of economics.* (pp. 116-24).

Geishecker, I. and Görg, H. (2005) Do Unskilled Workers Always Lose from Fragmentation? *The North American Journal of Economics and FinanceVolume*, 16, 81-92.

Girma, S. (2005) Absorptive Capacity and Productivity Spillovers from FDI: A threshold Regression Analysis. *Oxford Bulletin of Economics and Statistics*, 67, 281-306.

Girma, S. and Görg, H. (2004) Outsourcing, Foreign Ownership, and Productivity: Evidence from UK Establishment-level Data. *Review of International Economics*, 12, 817-832.

Girma, S., Gorg, H., and Strobl, E. (2004) Exports, International Investment, and Plant Performance: Evidence from a Non-Parametric Test. *Economics Letters*, 83, 317-324.

Girma, S., Greenaway, D. & Kneller, R. (2002) Exporting and Business Performance: A Report for Trade Partners UK, Department of Trade and Industry.

Girma, S., Greenaway, D., and Kneller, R. (2004) Does Exporting Increase Productivity? A Microeconometric Analysis of Matched Firms. *Review of International Economics*, 12(5), 855-866.

Girma, S., Kneller, R., and Pisu, M. (2005) Exports versus FDI: An Empirical Test. *Review of World Economics*, 141(2), 193-218.

Globerman, S., Kokko, A., and Sjoholm, F. (1996) Technology Sourcing in Swedish MNEs and SMEs: Evidence from Patent Data. Working Paper Series in Economics and Finance No. 125. Stockholm School of Economics.

Globerman, S.(1994) *Canadian-Based Multinationals,* University of Calgary Press.

Goldberg, L.S. and Klein, M. (1999) International Trade and Factor Mobility: An Empirical Investigation. NBER Working Papers No. 7196. National Bureau of Economic Research Inc.

Görg, H. and Greenaway, D. (2004) Much Ado about Nothing? Do Domestic Firms Really Benefit from Foreign Direct Investment? *World Bank Research Observer*, 19(2), 171-197.

Görg, H. and Hanley, A. (2003) International Outsourcing and Productivity: Evidence from Plant Level Data. Globalization, Productivity and Technology Working Paper. University of Nottingham.

Görg, H. and Hanley, A. (2005) International Outsourcing and Productivity: Evidence from the Irish Electronics Industry. *The North American Journal of Economics and Finance*, 16, 255-269.

Görg, H., Hanley, A., and Strobl, E. (2004) Outsourcing, Foreign Ownership, Exporting and Productivity: An Empirical Investigation with Plant Level Data. Globalisation, Productivity and Technology Research Paper No. 2004/08.

Gourlay, A. and Seaton, J. (2004) Explaining the Decision to Export: Evidence from UK Firms. *Applied Economics Letters*, 11, 153-158.

Gourlay, A.R. and Seaton, J. (2004) UK Export Behaviour at the Firm Level. *Economic Issues*, 9(2), 3-20.

Grant, R.M. (1991) The Resource-Based Theory of Competitive Advantage: Implications for Strategy Formulation. *California Management Review*, 33(3), 114-135.

Greenaway, D. and Kneller, R. (2004) Exporting and Productivity in the United Kingdom. *Oxford Review of Economic Policy*, 20, 358-371.

Greenaway, D. and Kneller, R. (2004). 'Exporting productivity in the United Kingdom', *Oxford Review of Economic Policy*, Vol. 20, pp. 358-371.

Greenaway, D. and Kneller, R. (2005) Exporting and Productivity: Theory, Evidence and Future Research. *The Singapore Economic Review*, 50, 303-312.

Greenaway, D. and Kneller, R. (2007) Firm Heterogeneity, Exporting and Foreign Direct Investment. *The Economic Journal*, 117, F134-F161.

Greenaway, D. and Kneller, R. (2008) Exporting, Productivity and Agglomeration. *European Economic Review*, 52, 919-939.

Greenaway, D. and Yu, Z. (2004) Firm Level Interactions between Exporting and Productivity: Industry-Specific Evidence. *Review of World Economics*, 140, 376-392.

Greenaway, D., Sousa, N., and Wakelin, K. (2004) Do Domestic Firms Learn to Export from Multinationals? *European Journal of Political Economy*, 20(4), 1027-1043.

Greenhalgh, C. (1990) Innovation and Trade Performance in the United Kingdom. *Economic Journal*, 100(400), 105-118.

Greenhalgh, C. and Taylor, P. (1994) Innovation and Export Volumes and Prices-A Disaggregated Study. *Oxford Economic Papers*, 46(1), 102-124.

Griffith, R., Redding, S., and van Reenen, J. (2004) Mapping the Two Faces of R&D: Productivity Growth in a Panel of OECD Industries. *Review of Economics and Statistics*, 86, 883-895.

Grossman, G.M. and Helpman, E. (1989) Product Development and International Trade. *Journal of Political Economy*, 97, 1261-1283.

Grossman, G.M. and Helpman, E. (1995) Technology and Trade. In: Grossman, G.M. and Rogoff, K.(eds.) 1279-1337. Amsterdam: Elsevier.

Grossman, G.M. and Helpman, E. (2005) Outsourcing in a Global Economy. *Review of Economic Studies*, 72, 135-159.

Grossman, G.M. and Helpman, E.(1991) *Innovation and Growth in the Global Economy,* Cambridge, Mass. and London: MIT Press.

Grossman, G.M. and Rossi-Hansberg, E. (2008) Trading Tasks: A Simple Theory of Offshoring. *American Economic Review*, 98, 1978-1997.

Guan, J. and Ma, N. (2003) Innovative Capability and Export Performance of Chinese Firms. *Technovation*, 23(9), 737-747.

Gullstrand, J. (2005) Industry Dynamics in the Swedish Textile and Wearing Apparel Sector. *Review of Industrial Organisation* , 26, 349-370.

Hall, B.H., Lotti, F., and Mairesse, J. (2008) Innovation and Productivity in SMEs: Empirical Evidence for Italy. NBER Working Paper No. 14594.

Hallward-Driemeier, M., Iarossi, G., and Sokoloff, K.L. (2002) Exports and Manufacturing Productivity in East Asia: A Comparative Analysis with Firm-Level Data. NBER Working Papers No. 8894. Available at http://www.nber.org/papers/w8894.pdf.

Haltiwanger, J. (1997) Measuring and Analysing Aggregate Fluctuations: the Importance of Building from Microeconomic Evidence. Federal Reserve Bank of St. Louis Review, 1997, 55-78.

Hanley, A. (2004) Export, Linkages and Innovation. Occasional Paper Series, University of Nottingham.

Hanson, G.H., Mataloni Jr., R.J., and Slaughter, M.J. (2001) Expansion Strategies of U.S. Multinational Firms. NBER Working Paper No. 8433. National Bureau of Economic Research, Inc.

Harris, R.I.D. (1989) *The Structure and Growth of the UK Regional Economy, 1963-85*, Gower

Harris, R.I.D. (2005) Economics of the Workplace: Special Issue Editorial. *Scottish Journal of Political Economy*, 52(3), 323-343.

Harris, R.I.D. (2008) Models of Regional Growth: Past, Present and Future, CPPR Discussion Paper (http://www.cppr.ac.uk/media/media_77715_en.pdf)

Harris, R.I.D. (2009) Growing Business Strategy Review. Merging of 'Designated Relationship Managed' (DRM) Companies into the ONS Annual Respondents Database and Econometric Analysis. Report to Scottish Enterprise, May.

Harris, R.I.D and Q.C. Li (2005) Review of the Literature: The Role of International Trade and Investment in Business Growth and Development. Report to UKTI.

Harris, R.I.D and Q.C. Li (2006a) Establishment Level Empirical Study of Links between Exporting, Innovation and Productivity – CIS4. Report to UKTI.

Harris, R.I.D and Q.C. Li (2006b) Review of the Literature: Causal Links between Innovation and International Trade and Investment. Report to UKTI. https://www.uktradeinvest.gov.uk/ukti/fileDownload/ukti_literature_review_2006.pdf?cid=386218.

Harris, R.I.D and Q.C. Li (2007a) Firm Level Empirical Study of the Contribution of Exporting to UK Productivity Growth. Report to UKTI.https://www.uktradeinvest.gov.uk/ukti/fileDownload/FameFinalReport2007v2.pdf?cid=401169

Harris, R.I.D and Q.C. Li (2007b) 'Born Global' Companies: Evidence from FAME and CIS. Report to UKTI.

Harris, R.I.D and Q.C. Li (2007c) The Determinants of Firm Exit from Exporting: Evidence for the UK. Report to UKTI.

Harris, R.I.D and Q.C. Li (2008a) Evaluating the Contribution of Exporting to UK Productivity Growth: Some Microeconomic Evidence, *The World Economy*, 31(2), 212-235.

Harris, R.I.D and Q.C. Li (2008b) Export-Market Entry and the Role of R&D in Britain: Establishment-Level Evidence from the Community Innovation Survey 2005, *Applied Economics*, 2009, forthcoming

Harris, R.I.D and Q.C. Li (2008c) Exporting and the Probability of Firm Closure: Evidence for the UK, *Scottish Journal of Political Economy*, forthcoming

Harris, R.I.D. and Li, Q. (2009) Exporting, R&D and Absorptive Capacity in UK Establishments. *Oxford Economic Papers*, 61, 74-103.

Harris, S. and Wheeler, C. (2005) Entrepreneurs' Relationships for Internationalization: Functions, Origins and Strategies. *International Business Review*, 14, 187-207.

Head, K. and Mayer, T. (2004) Market Potential and the Location of Japanese Investment in the European Union. *Review of Economics and Statistics*, 86, 959-972.

Head, K. and Ries, J. (2002) Offshore Production and Skill Upgrading by Japanese Manufacturing Firms. *Journal of International Economics*, 58, 81-105.

Head, K. and Ries, J. (2003) Heterogeneity and the FDI versus Export Decision of Japanese Manufactures. *Journal of the Japanese and International Economies*, 17, 448-467.

Head, K. and Ries, J. (2004) Exporting and FDI as Alternative Strategies. *Oxford Review of Economic Policy*, 20, 409-423.

Head, K., Ries, J., and Swenson, D. (1995) Agglomeration Benefits and Location Choice: Evidence from Japanese Manufacturing Investments in the United States. *Journal of International Economics*, 38, 223-247.

Hedlund, G. and Kverneland, A. (1985) Are Strategies for Foreign Markets Changing? The Case of Swedish Investment in Japan. *International Studies of Management and Organisation*, 15, 41-59.

Hejazi, W. and Safarian, A.E. (2006) The Complementarity Between U.S. ForeignDirect Investment Stock and Trade. *Atlantic Economic Journal*, 29, 420-437.

Helg, R. and Tajoli, L. (2005) Patterns of International Fragmentation of Production and Implications for the Labour Markets. *The North American Journal of Economics and Finance*, 16, 233-254.

Helpman, E. (1984) A Simple Theory of International Trade with Multinational Corporations. *Journal of Political Economy*, 92, 451-471.

Helpman, E. and Krugman, P.(1985) *Market Structure and Foreign Trade,* MIT Press.

Helpman, E., Melitz, M.J., and Yeaple, S.R. (2004) Export versus FDI with Heterogeneous Firms. *American Economic Review*, 94, 300-316.

Herzer, D. (2008) The Long-Run Relationship between Outward FDI and Domestic Output: Evidence from Panel Data. *Economics Letters*, 100, 146-149.

Herzer, D. and Schrooten, M. (2008) Outward FDI and Domestic Investment in Two Industrialized Countries. *Economics Letters*, 99, 139-143.

Hijzen, A. (2003) Fragmentation, Productivity and Relative Wages in the UK: A General Equilibrium Approach. Royal Economic Society Annual Conference No. 108. Royal Economic Society.

Hijzen, A., Görg, H., and Hine, R.C. (2003) International Fragmentation and Relative Wages in the UK. IZA Discussion Papers No. 717. Institute for the Study of Labour (IZA).

Hirsch, S. and Bijaoui, I. (1985) R&D Intensity and Export Performance: A Micro View. *Review of World Economics*, 121(2), 238-251.

Hirschman, A.O. 1958, *The Strategy of Economic Development*. Yale University press, New Haven, CT.

Hoekman, B. and B.S. Javorcik (2004) Policies Facilitating Firm Adjustment to Globalization, *Oxford Review of Economic Policy*, 20, 457-473.

Hölzl, W. (2005) Tangible and Intangible Sunk Costs and the Entry and Exit of Firms in a Small Open Economy: the Case of Austria. *Applied Economics*, 37, 2429-2443.

Hopenhayn, H. (1992) Entry, Exit and Firm Dynamics in Long-Run Equilibrium. *Econometrica*, 60, 1127-1150.

Hosseini, H. (2005) An Economic Theory of FDI: A Behavioral Economics and Historical Approach. *Journal of Socio-Economics*, 34, 528-541.

Hughes, K.(1986) *Exports and technology,* Cambridge; New York and Sydney: Cambridge University Press.

Hymer, S.H.(1976) *The International Operations of National Firms: a Study of Foreign Direct Investment,* Cambridge: MA.

Jaffe, A.B. and Trajtenberg, M. (1998) International Knowledge Flows: Evidence from Patent Citations. NBER Working Papers 6507, National Bureau of Economic Research.

Johanson, J. and Vahlne, J.E. (1977) The Internationalization Process of the Firm - A model of Knowledge Development and Increasing Foreign Market Commitment. *Journal of International Business Studies*, 8, 23-32.

Johanson, J. and Vahlne, J.E. (1990) The Mechanism of Internationalisation. *International Marketing Review*, 7(4), 11-24.

Johanson, J. and Vahlne, J.E. (1993) The Internationalisation of the Firm - Four Swedish Cases. In: Buckley, P.J. and Ghauri, P.(eds.) *The Internationalisation of the Firm*, London: Academic Press.

Jolly, V.K., Alahuta, M., and Jeannet, J. (1992) Challenging the incumbents: How high technology Start-ups compete globally. *Journal of Strategic Change*, 1, 71-82.

Kaldor, N. (1970) The case for regional policies, *Scottish Journal of Political Economy*, 17(4) pp.337-348.

Kimura, F. and Fujii, T. (2003) Globalising Activities and the Rate of Survival: Panel Data Analysis on Japanese Firms. NBER Working Paper Series No.10067, Cambridge.

Kimura, F. and Kiyota, K. (2006) Exports, FDI, and Productivity: Dynamic Evidence from Japanese Firms. *Review of World Economics*, 142, 695-719.

Kindleberger, C.P.(1969) *American Business Abroad,* New Haven: Yale University Press.

Klein, B. et. al., (1978) Vertical Integration, Appropriable Rents, and the Competitive Contracting Process, *Journal of Law and Economics*, 21, 297-326.

Kneller, R. (2005) Frontier Technology, Absorptive Capacity and Distance. *Oxford Bulletin of Economics and Statistics*, 67(1), 1-23.

Kneller, R. and Pisu, M. (2007) Industrial Linkages and Export Spillovers from FDI. *The World Economy*, 30, 105-134.

Kogut, B. and Zander, U. (1996) What Do Firms Do? Coordination, Identity, and Learning. *Organization Science*, 7(5), 502-523.

Kojima, K.(1978) *Direct Foreign Investment: A Japanese Model of Multinational Business Operations,* Cromm-Helm.

Konings, J. and Murphy, A. (2001) Do Multinational Enterprises Substitute Parent Jobs for Foreign Ones? Evidence from Firm Level Panel Data. William Davidson Institute Working Paper No. 371 .

Korhonen, H. et. al. (1996) Internationalization of SMEs: Inward – Outward Patterns and Government Policy, *Management International Review*, 36(4), 315-329.

Korhonen, H. et. al. (1996) Internationalization of SMEs: Inward – Outward Patterns and Government Policy, *Management International Review*, 36(4), 315-329.

Kraay, A. (1999) Exports and Economic Performance: Evidence from a Panel of Chinese Enterprises. *Revue d'Economie du Developpement*, 0(1-2), 183-207.

Krugman, P. (1979) A Model of Innovation, Technology Transfer, and the World Distribution of Income. *Journal of Political Economy*, 87(2), 253-266.

Krugman, P. (1980) Scale Economies, Product Differentiation, and the Pattern of Trade. *American Economic Review*, 70, 950-959.

Krugman, P. (1983) The New Theories of International Trade and the Multinational Enterprise. In: Audretsch, D. and Kindleberger, C.(eds.) *The Multinational Corporation in the 1980s*, Cambridge, MA: MIT Press.

Krugman, P.(1991) *Geography and Trade,* Cambridge M.A.: MIT Press.

Lall, S. (1980) Monopolistic Advantages and Foreign Involvement by U.S. Manufacturing Industry. *Oxford Economic Papers*, 32, 102-122.

Lecraw, D.J. (1977) Direct Investment by Firms from Less Developed Countries. *Oxford Economic Papers*, 29, 442-457.

Lederman, D. et. al. (2006) Export Promotion Agencies: What Works and What Doesn't. CEPR Discussion Paper No. 5810

Lefebvre, E. and Lefebvre, L. (2001) Innovative Capabilities as Determinants of Export Behaviour and Performance: A Longitudinal Study of Manufacturing SMEs. In: Kleinknecht, A. and Mohnen, P.(eds.) *Innovation and Firm Performance, Econometric Exploration of Survey data*, London: Palgrave.

Lefebvre, E., Lefebvre, L.A., and Bourgault, M. (1998) R&D-Related Capabilities as Determinants of Export Performance. *Small Business Economics*, 10(4), 365-377.

Leon-Ledesma, M.A. (2005) Exports, Product Differentiation and Knowledge Spillovers. *Open Economies Review*, 16(4), 363-379.

Lewer, J.J. and Terry, N. (2003) Capital Account and Foreign Direct Investment Policies in the Late Nineties: What Effect On Trade? *ASEAN Economic Bulletin*, 20, 256-271.

Lileeva, A. and Trefler, D. (2007) Improved Access to Foreign Markets Raises Plant-Level Productivity ... for Some Plants. NBER Working Paper 13297. Available at http://www.nber.org/papers/w13297.

Lim, J.S., Sharkey, T.W., and Kim, K.I. (1991) An Empirical Test of an Export Model. *Management International Review*, 31, 51-62.

Lin, A. (1995) Trade Effects of Foreign Direct Investment: Evidence for Taiwan with Four ASEAN Countries. *Review of World Economics*, 131(737), 747-

Lipsey, R.E. (2002) Home and Host Country Effects of Foreign Direct Investment. Lidingo, Sweden: Conference on "Challenges to Globalisation".

Lipsey, R.E. and Weiss, M.Y. (1981) Foreign Production and Exports in Manufacturing Industries. *Review of Economics and Statistics*, 63(488), 494-

Lipsey, R.E. and Weiss, M.Y. (1984) Foreign Production and Exports of Individual Firms. *Review of Economics and Statistics*, 66, 304-308.

Lipsey, R.E., Ramstetter, E., and Blomström, M. (2000) Outward FDI and Home Country Exports: Japan, the United States, and Sweden. Working Paper Series in Economics and Finance No. 369, Stockholm School of Economics.

Liu, B.J. and Tung, A.C. (2005) Export Outsourcing and Foreign Direct Investment: Evidence from Taiwanese Exporting Firms. DEGIT Conference Papers No. c010_047. DEGIT, Dynamics, Economic Growth, and International Trade.

Liu, L. and Graham, E.M. (1998) The Relationship Between Trade and Foreign Investment: Empirical Results for Taiwan and South Korea. The Peterson Institute for International Economics Working Paper 98-7.

Liu, X., Wang, C., and Wei, Y. (2001) Casual Links between Foreign Direct Investments and Trade in China. *China Economic Review*, 12, 190-202.

London Economics (2008) Evaluation of UKTI Tradeshow Access Programme, report to UKTI, September.

Lopez Rodriguez, J. and Garcia Rodriguez, R. (2005) Technology and Export Behaviour: A Resource-Based View Approach. *International Business Review*, 14(5), 539-557.

López, R.A. (2005) Trade and Growth: Reconciling the Macroeconomic and Microeconomic Evidence. *Journal of Economic Surveys*, 19, 623-648.

Ma, Y., Morikawa, K., and Shone, R. (2000) A Macroeconomic Model of Direct Investment in Foreign Affiliates of Japanese Firms. *Japan and the World Economy*, 12, 953-973.

Madsen, T.K. and Servais, P. (1997) The Internationalization of Born Globals: An Evolutionary Process? *International Business Review*, 6, 561-583.

Markusen, J.R. (1983) Factor Movements and Commodity Trade as Complements. *Journal of International Economics*, 13, 341-356.

Markusen, J.R. (1984) Multinationals, Multi-Plant Economies, and the Gains from Trade. *Journal of International Economics*, 16, 205-226.

Markusen, J.R. (1995) The Boundary of Multinational Enterprises and the Theories of International Trade. *Journal of Economic Perspectives*, 9, 169-189.

Markusen, J.R. and Maskus, K.E. (2002) Discriminating among Alternative Theories of the Multinational Enterprise. *Review of International Economics*, 10, 694-707.

Markusen, J.R. and Venables, A.J. (1998) Multinational Firms and the New Trade Theory. *Journalof International Economics*, 46, 183-203.

Markusen, J.R. and Venables, A.J. (2000) The Theory of Endowment, Intra-Industry, and Multinational Trade. *Journal of International Economics*, 52, 209-234.

Markusen, J.R., Venables, A.J., Konan, D.E., and Zhang, K.H. (1996) A Unified Treatment of Horizontal Direct Investment, Vertical Direct Investment, and the Pattern of Trade in Goods and Services. NBER Working Paper 5696. National Bureau of Economic Research, Inc.

Markusen, J.R.(2002) *Multinational Firms and the Theory of International Trade,* Cambridge, MA: MIT Press.

McCann, P. (2001) *Urban and Regional Economics*, OUP.

McDougall, P.P., Shane, S., and Oviatt, B.M. (1994) Explaining the Formation of International New Ventures: the Limits of Theories From International Business Research. *Journal of Business Venturing*, 9, 469-487.

McGregor P. et. al. (1997) Some Simple Macroeconomics of Scottish Devolution, in Danson, M. (ed.) *Regional Governance and Economic Development*, Pion, London.

Melitz, M.J. (2003) The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity. *Econometrica*, 71(6), 1695-1725.

Metcalfe S. and L. Georghiou, 1997, 'Equilibrium and Evolutionary Foundations of Technology Policy', CRIC Discussion Paper 3, University of Manchester.

Metcalfe, J. S. 1998, '*Evolutionary Economics and Creative Destruction*', Routledge, London.

Moen, O. and Servais, P. (2002) Born Global or Gradual Global? Examining the Export Behaviour of Small and Medium-Sized Enterprises. *Journal of International Marketing*, 10, 49-72.

Mortimer Report (2008) Winning in World Markets - Meeting the competitive challenge of the new global economy. Department of Foreign Affairs and Trade, Australia (http://www.dfat.gov.au/publications/mortimer_report/)

Mundell, R.A. (1957) International Trade and the Factor Mobility. *American Economic Review*, 47, 321-335.

Myrdal, G. (1957) *Economic Theory and the Underdeveloped Regions*, London:

Nachum, L., Jones, G.G., and Dunning, J.H. (2001) The International Competitiveness of the UK and Its Multinational Enterprises. *Structural Change and Economic Dynamics*, 12, 277-294.

Narula, R. and Wakelin, K. (1998) Technological Competitiveness, Trade and Foreign Direct Investment. *Structural Change and Economic Dynamics*, 9(3), 373-387.

OECD (2001) Innovative People. Mobility of Skilled Personnel in National Innovation Systems. OECD Report, Paris.

OECD (2006) Removing Barriers to SME Access to International Markets, OECD-APEC Global Conference, November, Athens, Greece.

OECD (2008) The Internationalisation of Business R&D: Evidence, Impacts and Implications, OECD, Paris

Olley, G.S. and Pakes, A. (1996) The Dynamics of Productivity in the Telecommunications Equipment Industry. *Econometrica*, 64(6), 1263-1297.

Olsen, K.B. (2006) Productivity Impacts of Offshoringand Outsourcing: A Review. OECD Science, Technologyand Industry Working Papers, 2006/1, OECD Publishing.doi:10.1787/685237388034.

OMB (2008) UKTI International Business Strategies, Barriers & Awareness Monitoring Survey. Research Report, October, OMB Research

Overman, H.G., Redding, S., and Venables, A.J. (2003) The Economic Geography of Trade, Production and Income: a Survey of Empirics. In: Choi, K. and Harrigan, J.(eds.) *Handbook of International Trade*, Oxford: Blackwell.

Oviatt, B. and McDougall, P. (1994) Toward a Theory of International New Ventures. *Journal of International Business Studies* , 25, 45-64.

Oviatt, B. and McDougall, P. (1997) Challenges for Internationalization Process Theory: The Case of International New Ventures. *Management International Review*, 37, 85-99.

Oviatt, B. and Mcdougall, P. (1999) A framework for understanding accelerated international entrepreneurship. In A. M. Rugman & R.W.Wright (eds), *Research in global strategic management: International entrepreneurship* (pp23-40). Stamford, CT:JAI Press.

Ozcelik, E. and Taymaz, E. (2004) Does Innovativeness Matter for International Competitiveness in Developing Countries? The Case of Turkish Manufacturing Industries. *Research Policy*, 33(3), 409-424.

Pan, Y. and Li, X. (2000) Joint Venture Formation of Very Large Multinational Firms. *Journal of International Business Studies*, 31, 179-192.

Patel P. and K. Pavitt, 1997, 'The technological competencies of the world's largest firms: complex and path dependent, but not much variety', *Research Policy*, **26**, pp.141-156.

Pavcnik, N. (2002) Trade Liberalisation, Exit, and Productivity Improvements: Evidence from Chilean Plants. *The Review of Economic Studies*, 69(1), 245-276.

Pavitt, K., 1984, 'Sectoral patterns of technical change: Towards a taxonomy and a theory', *Research Policy*, **13**, pp.343-373.

Pearce, R.D.(1990) *The Internationalisation of Research and Development,* London: MacMillan.

Penrose, E.(1959) *The Theory of the Growth of the Firm,* Oxford: OUP.

Petit, M.L. and Sanna-Randaccio, F. (1998) Technological Innovation and Multinational Expansion: a Two-way Link? *Journal of Economics*, 68(1), 1-26.

Petit, M.L. and Sanna-Randaccio, F. (2000) Endogenous R&D and Foreign Direct Investment in International Oligopolies. *International Journal of Industrial Organization*, 18(2), 339-367.

Petit, M.L., Sanna-Randaccio, F., and Tolwinski, B. (2000) Innovation and Foreign Investment in a Dynamic Oligopoly. *International Game Theory Review*, 2(1), 1-

Pfaffermayr, M. (1996) Foreign outward direct investment and exports in Austrian manufacturing: Substitutes or complements? *Review of World Economics*, 132, 501-521.

PIMS (2009) UKTI Performance And Impact Monitoring Surveys –PIMS 11-14. https://www.uktradeinvest.gov.uk/ukti/fileDownload/PIMS14Summary2009.pdf?cid=430226.

Posner, M. (1961) International Trade and Technical Change. *Oxford Economic Papers*, 13, 323-341.

Pradhan, J.P. (2004) The Determinants of Outward Foreign DirectInvestment: A Firm-level Analysis of Indian Manufacturing. *Oxford Development Studies*, 32, 619-639.

Pragmedic (2003) Fulfilling Promise: Final Report to Trade Partners East of England Regarding Internationalisation Support for the Knowledge Based Industry Sectors, mimeo.

Raines, P. and R. Brown (2001) From 'International' to 'Global': The Scottish Enterprise Global Companies Strategy and New Approaches to Overseas Expansion, *Regional Studies*, 35(7), 657-668.

Raines, P. et. al. (2001) Growing Global: Foreign Direct Investment and the Internationalization of Local Suppliers in Scotland, *European Planning Studies*, 9 (8).

Rao, S., Legault, M., and Ahmad, A. (1994) Canadian-Based Multinationals: an Analysis of Activities and Performance. In: Globerman, S.(eds.) *Canadian-Based Multinationals*, University of Calgary Press.

Ray, E.J. (1989) The Determinants of Foreign Direct Investment in the United States: 1979-85. In: Feenstra, R.(eds.) *Trade Policies for International Competitiveness*, Chicago,IL: University of Chicago Press.

Reid, S.D. (1981) The Decision-Maker and Export Entry and Expansion. *Journal of International Business Studies*, 12, 101-112.

Rialp, A., Rialp, J. and G.A. Knight (2005) The phenomenon of early internationalizing firms: what do we know after a decade (1993-2003) of scientific inquiry, *International Business Review*, 14: 147-166.

Rialp, A., Rialp, J., and Knight, G. (2005) The Phenomenon of Early Internationalizing Firms: What Do We Know After A Decade (1993-2003) of Scientific Inquiry. *International Business Review*, 14, 147-166.

Ries, J. and Head, K. (1994) Causes and Consequences of Japanese Direct Investment Abroad. In: Globerman, S.(eds.) *Canadian-Based Multinationals*, University of Calgary Press.

Roberts, E.B. and Senturia, T.A. (1996) Globalizing the Emerging High-Technology Company. *Industrial Marketing Management*, 25, 491-506.

Roberts, M. & Tybout, J.R. (1997) The Decision to Export in Colombia: An empirical Model of Entry with Sunk Costs, *American Economic Review*, 87: 545-564.

Roberts, M., Sullivan, T., and Tybout, J. (1995) Micro Foundations of Export Boom. Pennsylvania State University, Department of Economics Working Paper.

Rodríguez, F. and Rodrik, D. (2000) Trade Policy and Economic Growth: A Skeptics Guide to the Cross-National Evidence. In: Bernanke, B. and Rogoff, K.S.(eds.) *Macroeconomics Annual 2000*, Cambridge, MA: MIT Press for National Bureau of Economic Research.

Romer, P.M. (1990) Endogenous Technical Change. *Journal of Political Economy*, 98, 71-102.

Roper, S. and Love, J.H. (2002) Innovation and Export Performance: Evidence from the UK and German Manufacturing Plants. *Research Policy*, 31, 1087-1102.

Rose, A.K. (2005) The Foreign Service and Foreign Trade: Embassies as Export Promotion. available at http://search.epnet.com/login.aspx?direct=true&db=ecn&an=0763122

Sabuhoro, J.B., Larue, B., and Gervais, Y. (2006) Factors Determining the Success or Failure of Canadian Establishments on Foreign Markets: A Survival Analysis Approach. *The International Trade Journal*, 20, 33-73.

Sachs, J.D. and Warner, A. (1995) Economic Reform and the Process of Global Integration. *Brookings Papers on Economic Activity*, 26, 1-118.

Saggi, K. (2000) Trade, Foreign Direct Investment, and International Technology Transfer: A Survey. Papers 2349, World Bank.

Salim, R.A. and Bloch, H. (2009) Business Expenditures on R&D and Trade Performances in Australia: Is There a Link? *Applied Economics*, 41, 351-361.

Salomon, R.M. and Shaver, J.M. (2005) Learning by Exporting: New Insights from Examining Firm Innovation. *Journal of Economics and Management Strategy*, 14(2), 431-460.

Sanyal, P. (2004) The Role of Innovation and Opportunity in Bilateral OECD Trade Performance. *Review of World Economics*, 140(4), 634-664.

Sercu, P. and Vanhulle, C. (1992) Exchange Rate Volatility, International Trade, and the Value of Exporting Firms. *Journal of Banking & Finance*, 16(1), 155-182.

Seringhaus, F. and P. Rosson (1990) *Government Export Promotion: A Global Perspective,* Routledge, London.

Sharma, D.D. and Blomstermo, A. (2003) The Internationalisation Process of Born Globals: A Network View. *International Business Review*, 12, 739-753.

Shrader, R.C., Oviatt, B.M., and McDougall, P.P. (2000) How New Ventures Exploit Trade-Offs Among International Risk Factors: Lessons for the Accelerated Internationalization of the 21st Century. *Academy of Management Journal*, 43, 1227-1247.

Silvente, F.R. (2005) Changing Export Status and Firm Performance: Evidence from UK Small Firms. *Applied Economics Letters*, 12, 567-571.

Sjoholm, F. (2003) Which Indonesian Firms Export? The Importance of Foreign Networks. *Papers in Regional Science*, 82, 333-350.

Slaughter, M.J. (2000) Production Transfer within Multinational Enterprises and American Wages. *Journal of International Economics*, 50, 449-472.

Sleuwaegen, L. (1985) Monopolistic Advantages and the International Operations of Firms: Disaggregated Evidence from U. S.-Based Multinationals. *Journal of International Business Studies*, 16, 125-133.

Soete, L. (1987) The impact of technological innovation on international trade patterns: the evidence reconsidered. *Research Policy*, 16, 101-130.

Sterlacchini, A. (1999) Do Innovative Activities Matter to Small Firms in Non-R&D-Intensive Industries? An Application to Export Performance. *Research Policy*, 28(8), 819-832.

Strauss-Kahn, V. (2002) The Impact of Globalization Through Vertical Specialization on the Labour Market: the French Case. In: Baldwin, R.E. and Winters, L.A.(eds.) *Challenges to Globalization*, NBER, University of Chicago Press.

Svensson, R. (1996) Effects of Overseas Production on Home Country Exports: Evidence Based on Swedish Multinationals. *Review of World Economics*, 132, 304-329.

Swedenborg, B.(1979) *The Multinational Operation of Swedish Firms - An Analysis of Determinants and Effects,* Stockholm: The Industrial Institute for Economic and Social Research.

Teece, D J, and G Pisano, 1998, 'The Dynamic Capabilities of Firms: an Introduction', in *Technology, Organization and Competitiveness*. *Perspectives on Industrial and Corporate Change*. Eds. G. Dosi, D. J. Teece and J. Chytry, Oxford University Press, Oxford, pp.193-214.

Teece, D.J. (1986) Profiting from Technological Innovation: Implications for Integration, Collaboration, Licensing and Public Policy. *Ricerche Economiche*, 40(4), 607-643.

Teece, D.J., Pisano, G., and Shuen, A. (1997) Dynamic Capabilities and Strategic Management. *Strategic Management Journal*, 18(7), 509-533.

Thirlwall, A.P. (1980) Regional Problems are 'Balance-of-Payments' Problems. *Regional Studies*, 14, 419-25.

UKTI (2009) PIMS Research Reports, available from the UKTI website (https://www.uktradeinvest.gov.uk)

UKTI Corporate Plan (2008), UKTI, London

Ulltveit-Moe, K.H. (2008) Live and Let Die – Industrial Policy in a Globalised World. Expert Report No. 22 to Sweden's Globalisation Council.

UNCTAD (1997) World Investment Report. New York: United Nations.

UNCTAD (2004) World Investment Report 2004. New York and Geneva.

Universities Scotland (2009) What Was/What Next: What the Evidence Tells Us About the Next Steps for Scotland's Economics Strategy.

Vahter, P. and Masso, J. (2006) Home versus Host Country Effects of FDI: Searching for New Evidence of Productivity Spillovers. William Davidson Institute Working Paper No. 820 .

Van Biesebroeck, J. (2005) Exporting Raises Productivity in sub-Saharan African Manufacturing Firms. *Journal of International Economics*, 67(2), 373-391.

van Welsum, D. and Vickery, G. (2005) Potential Offshoring of ICT-Intensive Using Occupations. OECD Report.

Vernon, R. (1966) International Investment and International Trade in the Product Cycle. *Quarterly Journal of Economics*, 80(2), 190-207.

Verspagen, B. (1991) A New Empirical Approach to Catching up or Falling Behind. *Structural Change and Economic Dynamics*, 2(2), 359-380.

Verspagen, B. and Wakelin, K. (1997) International Competitiveness and Its Determinants. *International Journal of Applied Economics*, 11(2), 177-190.

von der Fehr, N.H. (1991) Domestic Entry in Norwegian Manufacturing Industry. In: Geroski, P. and Schwalback, J.(eds.) *Entry and Market Contestability: An International Comparison*, London: Blackwell.

Wagner, J. (1995) Exports, Firm Size and Firm Dynamics. *Small Business Economics*, 7, 29-39.

Wagner, J. (2006) Exports, Foreign Direct Investment, and Productivity: Evidence from German Firm Level Data. *Applied Economics Letters*, 13, 347-349.

Wagner, J. (2007) Exports and Productivity: a Survey of the Evidence from Firm Level Data. *The World Economy*, 30, 60-82.

Wakelin, K. (1998) Innovation and Export Behaviour at the Firm Level. *Research Policy*, 26(7/8), 829-841.

Wernerfelt, B. (1984) A Resource-Based View of the Firm. *Strategic Management Journal*, 16, 171-180.

Wheeler, D. and Mody, A. (1992) International Investment Location Decisions: the Case of US Firms. *Journal of International Economics*, 33, 57-76.

Wright, M. et. al. (2007) Internationalization of Small and Medium-sized Enterprises (SMEs) and International Entrepreneurship: A Critique and Policy Implications, *Regional Studies*, 41(7), 1013-1029.

Yeaple, S.R. (2005) A Simple Model of Firm Heterogeneity, International Trade, and Wages. *Journal of International Economics* , 65, 1-20.

Young, A. (1991) Learning by Doing and the Dynamic Effects of International Trade. *Quarterly Journal of Economics*, 106(2), 369-405.

Zahra, S.A., Korri, J.S., and Yu, J. (2005) Cognition and International Entrepreneurship: Implications for Research on International Opportunity Recognition and Exploitation. *International Business Review* , 14, 129-146.

Zhao, H. and Li, H. (1997) R&D and Export: An Empirical Analysis of Chinese Manufacturing Firms. *Journal of High Technology Management Research*, 8(1), 89-105.