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Foreign Aid for Innovation: The Missing Ingredient in Private Sector Development?

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Abstract

Adoption and adaptation of foreign technology is an important catch-up mechanism for developing countries and can contribute towards the achievement of the millennium development goals. Despite this until now very little foreign aid has been specifically targeting innovation in developing countries - more substantial aid has been promoting 'private sector development' (PSD) – or entrepreneurship – so that one can see PSD initiatives to have been the major channel through which donors have been promoting innovation in developing countries. Whether this has been an appropriate channel, with appropriate instruments, is the first of two main questions that will be addressed in this paper. The second main question is how PSD initiatives should be adapted or fine-tuned to provide greater and more effective support for appropriate innovation activities in developing countries – and by implication make foreign aid more effective. In this regard two aspects that will receive particular attention are the entrepreneurship-government relationship, and the innovation policy-stage of development dimension.

Key words: Innovation, entrepreneurship, private sector development, foreign aid

JEL classification codes: O32, O38, F35

1. INTRODUCTION

Innovation means putting inventions into practice (Fagerberg, et al., 2005). In a narrow sense it can take the form of technological innovations resulting in new products and or processes being introduced to markets, whereas more broadly it can also refer to new ways of managing and organizing production, firms and markets (Szirmai et al., 2011:5). The identification of innovation with economic growth and development is firmly entrenched in both theory and practice (Bogliacino et al., 2010; Braunerhjelm et al., 2010; Freeman, 1998; Lerner, 2009; 2010). Adoption and adaptation of foreign technology is an important catch-up mechanism for developing countries (UNCTAD, 2007), and many developing countries are now beginning to rival advanced economies in terms of high-level innovation (Ács and Szerb, 2011:26; Freeman, 1998)[1]. Many technologies have notable pro-poor characteristics, in particular bio-technologies, pharmaceuticals, and ICTs (Lindahl, 2005). Their generation, spread and adoption can therefore contribute towards achievement of the millennium development goals (MDGs)[2] (Juma and Yee-Cheong, 2005; UNDP, 2001; USAID, 2010). In the light of the need to mitigate and adapt to climate change, and in light of the imperative to provide industrial jobs and energy to more than a further almost two billion people mainly in developing countries, the need for innovation-based growth becomes urgent (Brar et al., 2011). The UN, multilateral development organizations, as well as individual donor countries and developing country governments have therefore, not surprisingly, been emphasizing the need for new technological innovation, and the transfer and adaptation of such innovations to poorer countries (e.g. Juma and Yee-Cheong, 2005; Mugabe, 2009; UNCTAD, 2007; UNDP, 2001; USAID, 2010; World Bank, 1998).

But notwithstanding the recognition of the importance of innovation in global development, until now very little foreign aid, especially bilateral aid, has been specifically targeting innovation in developing countries. Of course there are exceptions – innovative activities have

[1] The relationship between catch-up growth and innovation is illustrated well in the case of the East Asian 'Tiger' economies, who between 1977 and 1996 saw their innovation, as measured by the number of patents they registered, increase almost 30-fold over, from 621 to 18,763 (Freeman, 1998.18).

[2] As stated by the UN Millennium Project's task team on science, technology and innovation '*Science, technology, and innovation underpin every one of the Goals. It is inconceivable that gains can be made in health and environmental concerns without a focused science, technology, and innovation policy*' (Juma and Yee-Cheong, 2005:16). And referring to the MDGs, the UNDP's 2001 Human Development Report argues that 'New technology policies can spur progress towards reaching these and other goals' (UNDP, 2001:1).

not been completely missing in donors' PSD where especially agriculture and health have been targeted by donors (see Mugabe, 2009). Also, the World Bank has within its knowledge-focused approach to development given attention to stimulating science, technology and innovation commercialization in developing countries (World Bank, 1998). But nevertheless, within the total perspective of aid-driven PSD, the promotion of innovation has been neglected. Where it does take place it seems to be limited to promotion of science, knowledge creation and R&D – there is however less emphasis on private-sector, entrepreneurial innovation and the commercialization of intellectual property, and limited integration of innovation strategies with national development strategies (Juma and Yee-Cheong, 2005; Mugabe, 2009). Donors are often too risk-averse, too top-down driven, and to focused on large firms and non-profit firms (NGOs) to comfortably promote risky innovation by the small entrepreneurial firms that dominate in developing countries (Mayer-Schönberger, 2007; Whittle, 2010).

Whatever initiatives have been supported in the past, it is not clear that they have had any notable impact (Aubert, 2004; Forss and Schaumburg-Müller, 200). For instance, between1986 and 1991 total bilateral foreign aid jumped significantly from US $ 54 billion to US $ 68 billion, whereas measures of innovation in developing countries remained relatively unchanged – R&D as share of GDP remained flat over the same period at an average of around 0.38 per cent of GDP. Few can argue that, on a macro-level at least, increases in foreign aid have been accompanied by increases in R&D.

While relatively little foreign aid has been invested in directly promoting innovation in developing countries, more substantial aid and other funding has been promoting 'private sector development' (PSD) – or entrepreneurship - in developing countries (Forss and Schaumburg-Müller, 2009; Knorringa and Helmsing, 2008; Kurz and Fröde, 2005; Schulpen and Gibbon, 2002). There are many reasons for PSD initiatives, amongst them the view that by promoting entrepreneurship and the business environment (including property rights) innovation will also be promoted (Kurz and Fröde, 2005). So *de facto* PSD initiatives, and their subset of business development services, have been a major channel through which donors have been promoting innovation in developing countries.

Whether this has been an appropriate channel, with appropriate instruments, is the first of two main questions that will be addressed in this paper. To understand the relationship between foreign aid and innovation it is necessary to understand the nature of PSD, including its impacts, strengths and failures. It has been pointed out that 'the nature and dynamics of the business sector is often not fully understood in development agencies' (Forss and Schaumburg-Müller, 2009:4) and that 'despite the millions of dollars invested in such programs, to date there is little rigorous evidence as to their effectiveness' (McKenzie, 2011.2 – see also Cukier, 2006). This paper will therefore provide an overview of PSD, including a literature review of the main impact evaluations of PSD programs.

The second main question that this paper will address is how PSD initiatives should be adapted or fine-tuned to provide greater and more effective support for appropriate innovation activities in developing countries – and by implication make foreign aid more effective. Here the paper departs from the observation that policy making is hampered by the lack of a 'solid conceptual framework from which appropriate policies can be developed' (Aubert, 2004: 5). Policy making and the establishment of a conceptual framework for innovation support by donor countries requires an understanding on the nature and process of innovation, the relationship between science and technology and entrepreneurship, and the relationship between innovative entrepreneurship and the stages of a country's development. In the latter regard two aspects stand out, and will receive particular attention in this paper, namely the entrepreneurship-government relation and the innovation policy- stage of development dimension.

Regarding the entrepreneurship-government relationship the fact is that entrepreneurial innovation is complex as it requires a high degree of cooperation and coordination between government and the private sector. Without government support many market failures that limit innovative activities and the learning required for countries to benefit from science and technology will not be overcome (Lazonick, 2011). And without entrepreneurs many of the innovations from research and development efforts will never be implemented to the advantage of consumers, households and other firms (Baumol, 2008). Countries that succeed in getting the fit between the private and public sector right have been seen to reap the benefits of innovation driven growth.

Regarding the innovation policy-stage of development dimension, a shortcoming in theory and practice is that innovation driven growth is often seen as the preserve of only middle and upper income countries – countries already on the world's production possibilities frontier (Szirmai et al., 2011). For poorer countries the general prevailing view is been that factor-driven and efficiency-driven growth, through fuller and better employment of existing production factors, are the most straightforward ways of boosting growth and job creation (Ács and Szerb, 2011). Hence most development policies have been aimed at leading countries to reap rather static gains from improving the allocative efficiency in their economy. Much less effort has been made to understand the importance and how of promoting dynamic efficiencies in such economies and how to integrate innovation policies with broader development strategies (Forss and Schaumburg-Müller, 2009).

This has not gone unnoticed, and as a result PSD programs have increasingly been questioned as to their effectiveness, with lessons pointing to the need for a greater focus in such programmes (Aubert, 2004). One such focus has been argued should be on innovative entrepreneurship (Lindahl, 2005) – based on the growing recognition that not all types of entrepreneurship have the same impact on growth and poverty (Bosma et al., 2009; Lerner, 2009; Naudé, 2011). Hence, can, and should PSD aim more at raising levels of innovation in developing countries? What is the rationale and what about the job creation role of innovation in developing countries? And how can it be effectively done? Answers to these frequently asked questions are still lacking so that appropriate innovation promotion is a missing ingredient in PSD.

Accordingly his paper will cast a critical view over the need and opportunities for innovation even in the poorest countries. Given that most PSD initiatives are concerned with aspects such as business environment reform, value chain strengthening and partnerships – valuable efforts for achieving static efficiency gains, but largely unconcerned with innovation-led growth - this paper will conclude with a set of policy recommendations for making PSD programs more appropriate for stimulating entrepreneurial innovation.

The remainder of the paper will proceed as follows. In section 2 the rationale, instruments and impact of PSD is set out. Section 3 discussed the relationships between aid and innovation. In

section 4 the literature on the assessment of the impact of PSD programmes, and specifically on the impact of aid on innovation, is provided. Section 5 sets out various implications for public policy. Section 6 concludes.

2. PRIVATE SECTOR DEVELOPMENT: RATIONALE, INSTRUMENTS AND IMPACT

Private sector development (PSD) is described by the OECD-DAC[3] as cutting across many sectors and involving a wide range of public policies and institutions to promote the private sector in broad terms. PSD instruments includes measures aimed at business environment reform (BER), provision of business development services (BDS), support to value chain development (VCD), training and capacity building of entrepreneurs and managers, provision of credit and improvements in economic infrastructure. These instruments are discussed in greater detail in below. These initiatives are typically provided in a manner to further advance public-private partnerships (PPPs) and/or ethical business practices in developing countries. In recent years a growing interest has also been shown in social entrepreneurship, corporate social responsibility[4] (CSR), venture philanthropy (Knorringa and Helmsing, 2008) and in aligning PSD with 'green growth' (GTZ, 2010).

PSD initiatives are most often aimed at Small and Medium Enterprises[5] (SMEs). Global lending to SMEs, not just from donors, totals around US $ 10 trillion per year, of which 30 per cent goes to developing country firms (Ardic et al, 2011). Just between 2001 and 2006 the World Bank approved more than US$ 10 billion for SME-driven PSD (IRIS, 2006). The extent to which

[3] See http://www.developmentportal.eu/wcm/funding/european-aid-guide-on-thematic-instruments/private-sector-development/key-definitions/private-sector-development-according-to-the-dac-committee-of-the-oecd.html

[4] Criticisms against CSR are contained in Utting 2005; Jenkins 2005; Hamann 2007; Blowfield 2007; Newell and Frynas 2007; Prieto-Carrón *et al.* 2007.

[5] There are plenty of definitions of SMEs. One recent study defined SMEs as registered firms with less than 250 employees (Ardic et al, 2011). It should be noted that the '*concept of firm size varies significantly within the different stages of economic development and structure... countries with large economies like the U.S. and member states of the EU use cut-off points of fewer than 500 workers to describe SMEs. Yet, in developing countries, where both market size and average firm size are much smaller, SME cut-off points are often fewer than 100 workers'* (IRIS, 2006: 27).

entrepreneurial innovation will be fostered by PSD will therefore depend on the nature and determinants of innovation by small firms, to a large extent. More about these will follow in section 3.

There are a number of reasons for the focus on SMEs. They are subject to market failures such as asymmetric and incomplete information, externalities and scale-effects (Castillo et al, 2010). They are also the core of the private sector in developing countries, contributing significantly in terms of the number of firms, their employment and their contribution to GDP[6] (Lopez-Acevedo and Tinajero, 2010; Ardic et al., 2011; Ayyagari et al., 2007; Beck et al., 2005; Nichter and Goldmark, 2005). According to Ayyagari et al. (2011), using data from the World Bank's enterprise surveys covering 99 countries, small firms (with between 5 and 250 employees) provide 67 per cent of employment in the median country. The employment intensity of small firms therefore implies that their potential impact on poverty alleviation may be substantial (Rijkers et al., 2008). Typically, support programmes consist of provision of credit, training, and information, often through business incubators or business development centres (BDS).

2.1 Reasons for the Resurgence of PSD and the Rationale for PSD

From a foreign aid point of view, PSD is a worthy objective for a number of reasons that relates to the motivation for foreign aid. One is that it can facilitate the reduction of poverty. The private sector is important to generate and sustain economic growth, and economic growth is seen as necessary for poverty reduction. As recent put by KEPA (2010:11) 'Building up local production has always been a goal of development cooperation. Poverty cannot be eliminated without the private sector, employment and enterprise'.

Although PSD has been an integral part of foreign aid since the 1950s, it recent years there has been an even greater concentration on PSD for various reasons – a shift noticeable not only in

[6] Despite these reasons, the belief in the potential of SMEs in these programmes have often been criticized (e.g. Altenburg and von Drachenfels, 2006; Hölzl, 2009; Kennedy, 2011) and the effectiveness of BDS to reach SMEs questioned.

donor approaches towards improving aid effectiveness, but also in government's economic development strategies across developing and advanced economies alike.

First, it is no coincidence that PSD has become more popular following the heated debates about aid effectiveness and the impact of aid on growth. Effective and growth-enhancing aid is seen, *inter alia*, as aid that eventually can be phased out – which may be more likely if aid can catalyze self-sustainable business enterprises (Pronk, 2003). Some even see the phasing out of aid, or a re-allocation of aid from social (or 'charitable') spending towards business projects as a prerequisite for private sector development (e.g. Hubbard and Duggan, 2009; Moyo, 2009).

Second, following recent global economic crises, traditional donor governments have become cash-strapped and their economies have been stagnating. As put by Lerner (2009:8) these economies now 'look to entrepreneurial ventures as economic spark plugs that will reignite growth'. In this context PSD can be a tool to support potentially not only sustainable development, but can also stimulate donor countries' economies (Nowak-Lehman et al., 2010). After all, the objectives of aid are multifaceted and are not solely about addressing poverty[7].

Third, the experiences of China and other emerging economies, as well as a growing body of literature on the growth-poverty nexus, have demonstrated a strong association between private sector growth and poverty alleviation (Ravallion, 2001; Dollar and Kraay, 2002; Easterly 2002) and have demonstrated the potential of entrepreneurship in driving growth and development (Mohapatra et al., 2007).

Fourth, industrial policy has become more acceptable in recent years, in particular if it is centered on the private sector and the functional promotion of enterprise competitiveness. Industrial policy has 'like a phoenix, risen from the ashes' (Evenett, 2006:1). In recent years institutions such as the DIE, OECD, World Bank and UNU all hosted conferences on industrial policy. As a result donor countries are becoming more open to investigate means of providing appropriate support for industrial catching-up in the poorest countries (Naudé, 2010a; 2010b).

[7] Foreign aid can have three objectives: to support donor country firms' exports, to promote the political influence of the donor country abroad, and/or to reduce poverty and inequality in poor countries (Morrisey, 1990).

Finally the private sector had become increasingly active in the provision of public goods, previously the almost exclusive function of government (Lindahl, 2005).

According to Collier (2011)[8] this shift towards PSD is to be welcomed:

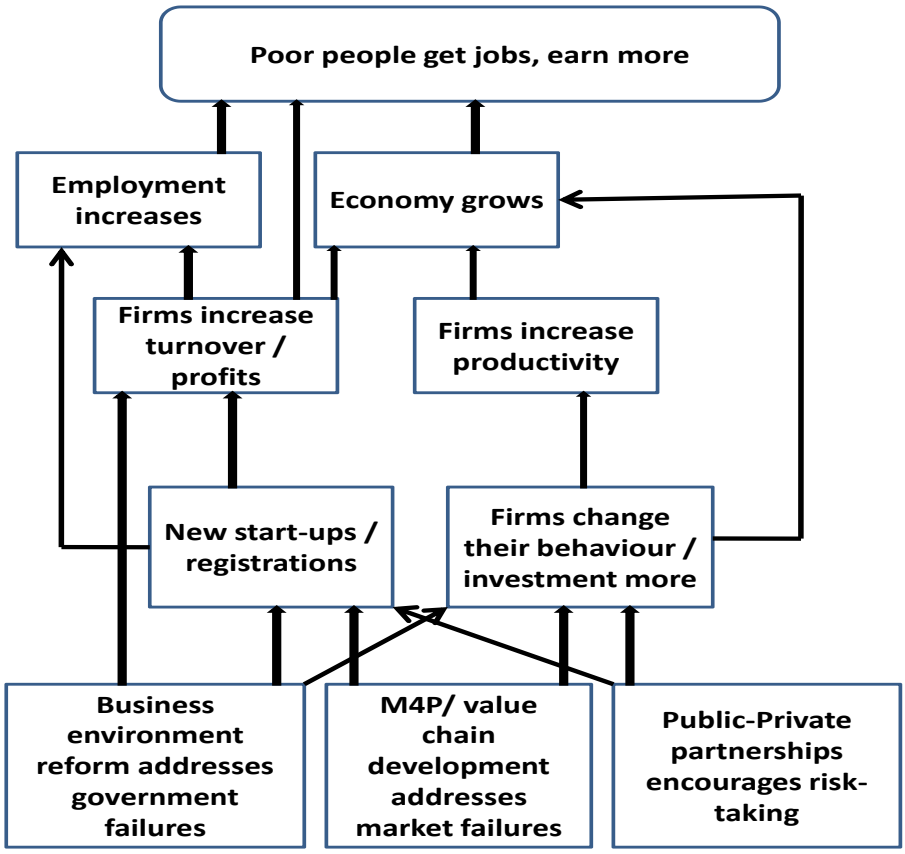
"Greater concentration on the private sector is long overdue: DFID's concerns have been too narrowly focused on the public sector. An agency whose purpose is to help the economies of poor societies to develop should have a substantial proportion of staff whose core expertise is the promotion of private enterprise. Above all else the poorest societies need jobs, and jobs in sufficient numbers can only be generated by the private sector."

Apart from these immediate reasons making PSD more popular in recent years, there are more fundamental arguments to link PSD with worthy goals such as poverty alleviation and job creation. These arguments are summarized with the help of Diagram 1. It illustrates the key rationale and elements of underpinning PSD. It indicates that the main objective is to alleviate poverty by providing more jobs and delivering higher incomes. This requires increases in employment (including self-employment) and a dynamic, competitive and growing economy.

Increasing employment and the competitiveness of the economy in turn requires higher productivity on the level of firms and higher firm profitability. The latter two requirements are seen to be significantly dependent on better entrepreneurship – more start-ups of new firms, more formalization of existing firms, and improved management / investment behavior in existing firms with higher firm survival and growth rates as a result

[8] See Paul Collier's blog at http://blogs.dfid.gov.uk/2011/03/what-should-we-make-of-the-new-uk-aid/

Diagram 1: The Rationale and Elements of PSD



Source: Donor Committee for Enterprise Development, 2011

The bottom portion of Diagram 1 links the key instruments of PSD to these outcomes: business environment reform (BER), addressing of market failures (business development and value chain development) and encouragement of risk-taking (entrepreneurship) in the context of partnerships (including capacity building, infrastructure and finance provision.

These instruments will be discussed in the next section.

2.2 Instruments of PSD

The generic instruments of PSD include[9]

- **Business environment reform (BER)**

BER refer to the measures undertaken to improve the legal, institutional, and cultural framework in which individuals and firms pursue commercial activities (see also Channell, 2010:2). The business environment affects both the rate of return on investment, and the cost of finance (Carlin and Seabright, 2009) - and hence innovation. According to Aubert (2004:21) many of the most serious obstacles to entrepreneurial innovation are due to the business environment. Reforming the business environment will thus contribute to innovation growth through these. In the words of the OECD-DAC BER is about creating a 'propitious enabling environment for private initiative and risk-taking'.

BER measures will thus aim at establishing and strengthening property rights, in particular land titling[10] (Kennedy, 2011), promoting deregulation and the reduction in business 'red-tape', promoting financial sector reform including provision of micro-credit, and providing policy advocacy for good policies and good governance. Importantly from an innovation point of view is that BER also aims to stimulate the development of competitive markets – for instance through initiatives such as 'making markets work for the poor' (M4P) and promotion of competition policy. Competition policy has become quite widespread, with more than a hundred countries having adopted such policies (Evenett, 2005). It is widely taken as accepted wisdom that more competition is good for firm level productivity, despite both theoretical and empirical ambiguities (e.g. Sekkat, 2009).

[9] See also the www.Developmentportal.eu for further examples and discussions-

[10] Property rights are, following North (1990) and De Soto (2000) and others recognized as being important in economic development; however as Kennedy (2011) discusses, their design is complex and their relationship with development not straightforward, indeed as he argues property rights can slow growth, lead to market efficiencies and contribute to financial crises.

- **Business development services (BDS)**

BDS can be described as 'non-financial services provided by public and private suppliers to entrepreneurs to help them operate efficiently and to grow their business with the broader purpose of contributing to economic growth, employment generation and poverty alleviation' (Otieno, et al., 2009 :1). Examples of such non-financial services include export promotion (for instance through matching grants and/or export training), promotion of foreign direct investment, business network strengthening, cluster and incubator development, promotion of quality and standards, promotion of business infrastructure, business advisory services, provision of loan guarantee schemes, development of equity finance, and delivering and brokering technical assistance and provision of auditing, accounting, marketing and management support services (Lindahl, 2005; McKenzie, 2011).

In the past, donors tended to provide these services directly, often free of charge and/or as subsidized services. However, today the general approach is that these services have to be provided on a commercial basis so as to minimize or avoid any distortions it may have on the business service sector in developing countries (Lindahl, 2005).

- **Value chain development (VCD).**

The value chain refers to the range of firms' activities in innovation, production and distribution of a product or service, and includes 'design, production, marketing, distribution and support to the final customer (OECD, 2011:5). Today value chain activities are typically dispersed internationally and are controlled by large multinational enterprises (MNEs) in production and buyer-lead networks organized by retail firms (ul-Haque, 2007; Park and Saggi, 2006). Lead firms in these global supply chains sets private minimum requirement for product quality from developing country firms that wish to break into these supply chains (Altenburg, 2009; Gereffi et al., 2005).

The way in which global value chains have developed means that labour cost advantages may not be as useful anymore to developing countries (ul-Haque, 2007). Hence the promotion of developing countries firms in these chains through foreign aid programmes aimed at innovation, imitation, technology transfers to improve product quality and carve out new

product market niches, could make a potentially important contribution to PSD. The basic fact today is that if developing countries are going to generate more benefits from global value chains – capture more of the value added – they will need to produce goods and services that increasingly depend on intangible assets – very much the result of innovation (OECD, 2011).

Despite many and growing support for value chains, and the positive results from impact evaluations (Forss and Schaumburg-Müller, 2009) until fairly recently less than 4 per cent of total aid is aimed at improving entrepreneurs in developing countries' position in global value chains (Prowse, 2005).

- **Capacity building**

Capacity building initiatives aims at improving the business and management skills of potential and existing entrepreneurs. It includes business and vocational training, building of management skills, facilitation of mentoring schemes, and entrepreneurship awareness programmes. Capacity building is important both for low-income and middle to higher income countries. In the former, poor management practices has been found to be a significant explanation for low firm productivity (Bloom et al., 2010). In the latter, training and education becomes even more important for firms to be able to absorb foreign technology, and to innovate in adapting these as these countries enter more knowledge-intensive activities (Klinger and Schündeln, 2010).

- **Provision of credit**

The provision of credit, especially to SMEs, is based on the view that financial markets in developing countries are under-developed, and that one of the most serious constraints to entrepreneurship and firm growth is lack of access to finance (Bloom et al., 2010; Freel, 2007). Influential theoretical models links credit constraints and private sector development. Beck et al. (2004; 2005) provides cross-country empirical evidence that SMEs are indeed financially constrained and hat they depend relatively more on external finance than larger firms. Availability of finance is generally seen as indispensable for innovation (Braunerhjelm, 2010), particularly innovation by small firms (Freel, 2007).

De Mel et al (2008) and Banerjee and Duflo (2008) provide experimental evidence that credit matters for small firm performance, although Forss and Schaumburg-Müller (2009) draw a negative conclusion on the usefulness of micro-credit from a meta-analysis of the impact evaluation literature. The arguments of De Soto (2000) on land titling and legal protection of property rights as a contributing factor to credit constraints in developing countries has also been influential in donor thinking. The implication is therefore that provision of finance (or financial development) and property rights will have a disproportionate impact on SME development, hence the prominence of these measures in PSD programmes.

For innovative, high-tech entrepreneurs, the question of finance - and the type of finance – has not yet generated sufficient consideration within donor supported PSD programmes. This is reflected in a neglect of support to develop venture capital and other equity forms of financing in developing countries. Mostly, entrepreneurs in developing countries have to reply on internal funding or debt to fund high-risk innovation activities, whereas in more advanced countries venture capital has been seen to be vital for entrepreneurial innovation – where ' a single dollar of venture capital generates as much innovation as three dollars of traditional corporate research and development' (Lerner, 2009:9).

- **Infrastructure development**

Public social and economic infrastructure such as schools, clinics, roads, ports, telecommunications and energy grids play an important role in human development and in supporting and enabling economic growth. A large number of empirical studies have quantified the positive impact of infrastructure development (e.g. Calderón and Servén, 2005; Estache, et al, 2002; Estache, 2003; Esfahani and Ramirez, 2002; Hulten, 1996; and López, 2003). Hence support for public infrastructure has been a key ingredient of PSD initiatives, particularly of the World Bank and various regional development banks. They are characterised by positive externalities and market failures, and are thus recognised to be in need of public sector finance and coordination, although the private sector has played an increasing role, through for instance public-private partnerships (PPPs) and build-operate transfer schemes (BOT) in the provision of infrastructure in developing countries (Calderón and Servén, 2004).

Infrastructure – broadly defined - is a crucial requirement for innovation and technological progress, although this role is often not acknowledged or taken into account in PSD programmes. More specifically, technological progress and innovation also requires very specific infrastructure such as sufficient bandwidth, laboratories, libraries and reliable electricity (Mugabe, 2009). As such calls have been made for infrastructure development programmes to 'promote technological development' through promoting the 'interoperability of infrastructure systems, not only nationally but also regionally and internationally. Standards should be designed and implemented so that they do not create barriers to innovation...infrastructure development provides a foundation for technological learning because it involves the use of a wide range of technologies and complex institutional arrangements '(Juma and Yee-Cheong, 2005:2).

- **Public Procurement**

Public procurement policies have been estimated to account on average for around 70 per cent of public spending in developing countries (Eurodad ,2009). In aid dependent countries a large proportion of this is funded by foreign aid – particularly through general budget support which some argue is more effective and transparent than project aid KEPA (2010). Buy-local policies of recipient countries' governments can thus be supported by donors in this way. This can increase the incentives and the capacity to innovate – but it can also influence the incentives for innovation to the extent that it affects local competition, and as such can distort local markets, as potential aspect of PSD that is often highly criticized (Lindahl, 2005).

In more advanced countries, public procurement has often been used as a deliberate instrument to stimulate innovation. This however has not yet been a major instrument for innovation in developing countries – one reason being that innovation strategies (including science and technology policies) are often weakly linked and integrated into national development plans (Mugabe, 2009; Juma and Yee-Cheong, 2005).

3. INNOVATION AND AID

3.1 Defining Innovation

Innovation has already been defined in the introduction as 'putting inventions into practice' (Fagerberg, et al., 2005). In a narrow sense it can take the form of technological innovations resulting in new products and or processes being introduced to markets, whereas in a broader sense it also can take the form of new ways of organizing production, firms and markets, including new management or marketing techniques and the adoption of new supply chain arrangements (Aubert, 2004:6). Innovation follows a process or cycle consisting of exploration and exploitation: from idea generation (the 'research' process), development, demonstration, commercialization, market penetration, diffusion, to consolidation and differentiation (McDaniel, 2000; Stam and Nooteboom, 2010:6). Most of economic growth is due to improvements in productivity, made possible by innovations (Lerner, 2010).

Innovation can occur at the level of new processes or new products; these can be new to the market (imitation) or new to the world. In developing countries, innovations often consist of introduction of process or products that are new to a particular market, but not to the world (Koellinger, 2008; Naudé, 2011a). A distinction can also be made between incremental (or neck-to-neck) innovations and radical (or leapfrogging) innovations that creates new markets (Szirmai, et al., 2011).

The motivation for innovation is important as it provides a link with entrepreneurship. Hence innovation can also be defined with reference to uncertainty and profit, as 'an unrehearsed combination of economic resources instigated by the uncertain prospect of temporary monopoly profit' (Binks and Vale, 1990:20). It is the uncertainty and profit potential that is closely associates innovation with entrepreneurship. Innovation is essentially risky and takes place under uncertainty and lack of market information (Braunerhjelm, 2010; Koellinger, 2008).

Entrepreneurs are the economic agents who assumes risks and exploit gaps in market information to introduce 'new economic activity' with the aim of earning profits (Koellinger, 2008) or create 'rents' for themselves (Henrekson, 2008) and that leads to 'change in the marketplace' (Stam and Nooteboom, 2010:4). These new activities can include (but does not

always) 'putting inventions into practice'. It is indeed the latter type of innovative entrepreneurship that has been seen as most desirable from Schumpeter (2011) onwards through the more recent insights of endogenous growth theory (Oosterbeek et al., 2010). According to Braunerhjelm et al., 2010:107) this type of entrepreneurship often 'facilitates the spillover of knowledge in the form of starting a new firm'.

Although imitative entrepreneurs dominate in all countries (Shane, 2009) -and may fulfil an important survival function in developing countries, it is innovative entrepreneurs have the most significant impact on job creation and growth, as it they that 'ensure that invention is put to effective use. Without innovative entrepreneurs, the innovations that promise rapid economic growth have been left to languish' (Baumol, 2008:3). Innovative entrepreneurship is sometimes also seen as synonymous with high-impact or high-growth entrepreneurship (HGE) (Lerner, 2009; Shane, 2009; Wong et al., 2005), and their firms described as 'gazelles' (Stam, 2009; Teruel and De Wit, 2011). These HGE firms are disproportionately important for economic growth and development – as put by Shane (2009:145) 'a tiny sliver of companies accounts for the vast majority of the contribution to job creation and economic growth'. Understanding the determinants of innovation by these entrepreneurs, and the obstacles they face in this regard in developing countries are essential for informing an appropriate innovation policy, and hence will be taken up in greater detail in section 3.-x of this paper.

Innovation can be measured both from the input side and well as the output side – bearing in mind that measuring innovation is fraught with conceptual and practical difficulties (Braunerhjelm, 2010). Most widely used input side indicators include R&D (research and development) spending and number of patents registered (Bhattacharya and Bloch, 2004). Popular output measures include 'surrogate measures' such as productivity growth (Schramm, 2008) as well as measures such as royalties received or number of scientific journal publications (Braunerhjelm, 2010). The quality of innovation is sometimes measured by the number of patent citations (Van Praag and Versloot, 2007).

Table 1 list a number of typical measures of innovation. In addition to these measures there are a growing number of composite innovation indexes in use to compare and rank innovation performance across countries. These include the *Technological Activity Index (*TAI) of UNCTAD,

the *Industrial-cum-Technological- Advance Index* (ITA) of UNIDO (UNIDO, 2005), the World Bank's *Knowledge Index* (KI), the World Economic Forum's *Global Competitiveness Index* (GloCI) that includes as a sub-index a *Technological Readiness Index* (TRI) and a *Technological Innovation Index* (TII) , and the *Global Summary Innovation Index* (GSII) of the European Commission (for a discussion and evaluation of these see Archibugi et al, 2009).

Table 1. Typical Measures and Indexes of Innovation

Measure	**Indexes**
• Patent applications granted by the USPTO per million • Royalty and license fee payments • Scientific and technical journal articles published • Scientific and technical journal articles per million • R&D as % GDP • Number of researchers in R&D • Researchers in R&D per million population • Science and engineering enrollment ratio • Number of SET graduates per million population • UNDP 2001 Technology Achievement Index (TAI) • High technology exports as % of manufactured exports • % Imported technologies used in domestic market • Firm level technology absorption • Number of institutions providing technical training • FDI as % of GDP • Productivity growth	• Technological Activity Index (TAI) • Industrial-cum-Technological- Advance Index (ITA) • Knowledge Index (KI) • Technological Readiness Index (TRI) • Technological Innovation Index (TII) • Global Summary Innovation Index (GSII)

(Source: Authors compilation)

Entrepreneurship is most often measured either statically (as the percentage or number of business firm ownership, businesses registered or the rate of self-employment) (e.g. as measured by the World Bank or ILO) or dynamically, as the rate of new firm start-ups. In the latter the motivation for doing so is often important. For instance the Global Entrepreneurship Monitor (GEM) makes a distinction between opportunity-entrepreneurship and necessity entrepreneurship, and also define HGE as entrepreneurship where the entrepreneur aims to create at least twenty new jobs within the next five years. Static measures may provide little link with innovation, and amongst dynamic measures HE are most likely to be associated with innovation.

As in the case of the concept of innovation, a number of indexes of entrepreneurship, aiming to measure, compare and rank entrepreneurship across countries, have in recent years been forwarded. These include the Global Entrepreneurship Index (GEI) by Ács and Szerb (2011) and the Composite Entrepreneurship Index (CEI) by Avanzini (2011).

3.2 Questions in Innovation Research: A Selected Literature Survey

In the literature on innovation and development, the main questions asked are what determine how innovative a firm is? What are the impacts of innovation on a firm level for the firm and the region/country? And how does innovation differ in developing countries?

- **Determinants of Innovation**

Theoretical contributions on the determinants of innovation include the seminal work of Schumpeter (1911; 1950) wherein entrepreneurial innovation results famously in 'creative destruction' – the ultimate driver of economic development. For Schumpeter the extent of innovation is determined by the characteristics of the individual entrepreneur, firm-level characteristics, and the structure of the market.

On the individual level Schumpeter noted that innovative entrepreneurs are distinct from capitalists (financiers) and managers and that they are the ones who comes up with new products, new markets, new sources of supply, and new processes for producing and for organising business (McDaniel, 2000). In initial theoretical models entrepreneurial ability of

capability were exogenous,; however entrepreneur capabilities are indeed now widely seen as vital for innovation, as well as the diffusion of innovation, and are endogenous (Miller and Garnsey, 2000).

On a firm level Schumpeter initiated an intense debate on the relationship between firm size and innovation by arguing the larger firms will find it easier to be innovative and that small firms face many significant obstacles in doing for instance R&D.

With respect to market structure Schumpeter also initiated a substantial discussion on how market structure – the level of competition – affects innovation (Bhattacharya and Bloch, 2004). This has in recent years broadened to focus on the institutional (environmental) factors shaping innovation, including importantly property rights and a culture that does not stigmatize business failure (Braunerhjelm, 2010; Stam and Nooteboom, 2010; Williams and McGuire, 2010).

From the empirical perspective, a number of firm-level studies have investigated the determinants of innovation, generally focusing on the Schumpeterian factors of individual, firm-level and market structure, and tried to explain the significant firm heterogeneity in terms of innovation.

For instance as far as individual characteristics of entrepreneurs are concerned Koellinger (2008) (using data across 30 countries involving 9,549 entrepreneurs) found that innovation is likely to be higher amongst former unemployed individuals, self-confident entrepreneurs, more educated entrepreneurs, and in more developed countries where production generally takes place closer to the production possibilities frontier. He finds evidence that entrepreneurs in developing countries are more likely to be imitative and replicative entrepreneurs rather than innovative entrepreneurs. Robson et al. (2009) bears this out for the case of Ghana, finding that education as well as clustering and an export-orientation are important determinants of innovation amongst Ghanaian entrepreneurs.

Innovative firms tend to be high-growth firms (HGFs) and vice versa (Hölzl, 2009). Profitability may raise the tendency of firms to innovative. Hence the determinants of HGFs are often overlapping with the determinants of firm-level innovation. In this regard Teruel and de Wit

(2011) study the determinants of HGFs in 17 countries over the period 1999-2005. They find that entrepreneurial ability and motivation, flexible labour markets, less administrative burdens, and access to markets to be the significant determinants of HGFs and hence of innovative entrepreneurship. Very often the most innovative entrepreneurs are to be found in particular industrial sectors, particularly so-called high-tech industries such as industrial and commercial machinery, electronics, transport equipment, medical and optical goods, and pharmaceuticals (Bhattacharya and Bloch, 2004; Coad and Rao, 2008).

The relationship between firm size and innovation has resulted in a large empirical literature which according to Lerner (2009:46) is 'inconclusive' and offering 'little support that large firms are more innovative'.. Argument and evidence seem to indicate that larger firms possess more resources to facilitate technological innovation (e.g. Acs et al., 1997; Beck, et al, 2003; Biggs, 2004; Kumar et al, 1999). However, many argue that 'small firms are more innovative, particularly when they follow "niche strategies," using high product quality, flexibility, and responsiveness to customer needs as means of competing with large-scale mass producers' (IRIS, 2005:9; see also Snodgrass and Biggs, 1996). Small firms also tend to under-measure their innovation as much of it tend to be informal, or through difficult to measure activities such as adaption of new machinery, etc (Coad and Rao, 2008). Lerner (2009) also refers to Ács and Audretsch's (1988) finding that almost half of all the major innovations of the 20th century were contributed by small firms.

Notwithstanding these arguments, recent research do tend to suggest that at least in developing countries, smaller firms may face more serious obstacles to innovation, and may innovate less than larger firms – due to higher degree of market failures in developing countries which results in high risks in adopting new technologies and in a lack of venture capital (Robson et al., 2009; Stam et al, 2009).

Market structure and business conditions (the business environment) are widely acknowledged to be important determinants of innovation, and many empirical studies provide support, although often from different angles. Herein, three findings or aspects of the empirical literature stand out – relating to the ease with which new firms can be established, the ease with which firms can finance innovation and the security of property rights over the

appropriation of benefits from innovation. Market failures are seen to affect each of these, implying a role for public policy.

New firms have received considerable attention as they are seen to be in many instances more innovative – especially with respect to introducing radical innovations, from which existing firms tend to shy away due to vested interests and sunk costs (Braunerhjelm, 2010). According to Bosma et al (2009) new firms are in many ways more suited to stimulate innovation as they face lower agency costs, and can engage more readily in the experimental stages of innovation. These experimental stages make the exploration of new technologies and markets – critical for development – possible. In their words 'innovation is more likely to occur in societies open to the formation of new enterprises than societies that relies on existing organisations for innovation' (Bosma et al, 2009:62).Hence an important determinant of innovation is the ease with which new firms can be established.

There is a complex relationship between innovation and competition. Both too little and too much competition can be bad for innovation (Evenett, 2005, Singh, 2002). Djankov and Morrel (2002) and Sekkat (2009) have found for instance that higher levels of competition can increase innovation and productivity. Evenett (2005) and Amsden and Singh (1994) argue and find however that too much competition can stifle productivity growth and innovation, and Geroski (1990) finds empirical evidence from the UK that a higher degree of competition is detrimental to innovation, but also warns that monopolies may be slow to introduce new technologies that disrupt their current activities or where they are locked into a particular technology.

Finance is important for entrepreneurship - in theory as well as in empirical work. But for innovative, HGE, the type of finance is also vital. Entrepreneurs backed by venture capital tend to be more innovative. Lerner (2009:50-51) discuss the reasons. First, venture capitalists use a very thorough screening and evaluation process before providing support, so that the selected firms tend to be those more suitable to undertake and shoulder the risks of innovation. Second, venture capitalists provide advice, monitoring and control services which allows entrepreneurs to deal better with the uncertainty surrounding innovative activities. And third, venture capitalists tend to distribute finance in stages, where a new stage's finance often depend on certain milestones having been reached.

- **Impacts of Innovation**

It has been noted that the motivation for innovation is profits and firm growth. Hence one should expect, if entrepreneurs are rational, that their investments in innovation 'pay off' in terms of higher profitability and firm growth. What does the empirical literature have to say about this?

Generally, the empirical literature seems to bear this out. Hall et al. (2009) using data from a panel of Italian manufacturing firms over the period 1995-2003 find that innovative firms (especially firms that engage in process innovations) have as a result higher levels of productivity, and that this effect is stronger for firms in a high-tech sector and firms exposed to international competition. Freel (2000) and Koski and Pajarinen (2010) finds that innovating firms tend especially to do better in terms of employment growth. Stam and Wennberg (2009) however qualifies these results by finding that innovation tend to drive growth only in high-tech firms and Rochina-Barrachina et al. (2010) finds from Spanish manufacturing firms that innovation increases productivity, but to a lesser degree in small firms, while Koski and Pajarinen (2010) finds from Finland that subsidies for innovation has only a short-term impact (of about 3 years) on firms' employment.

Where the literature does tend to find mixed results of the impact of innovation on firm performance, it seems to be due to the fact that high firm heterogeneity causes standard regression methods to focus on the average firm. Correcting for this Coad and Rao (2008. 635) find that innovation is 'of crucial importance for the superstar high-growth firm'. Thus, innovation is important for firm performance, but not so much for the average firm, as for the small number of HE firms. As will be discussed below, this constitutes a case for the targeting of innovation policy on these firms where the impacts of innovation will be the best.

A recent study from an emerging economy, Brazil, with the focus on a panel of manufacturing firms over the period 1996-2002 and that uses propensity score matching techniques finds that firms who engaged in technological innovation experienced a 10.8 to 12.5 percent higher growth in employment, a 18.1 to 21.7 percent higher growth in net revenue, a 10.8 to 11.9 percent higher growth in labour productivity and a 19.9 percent higher growth in market share (Kannebley et al., 2010).

Even if not all firms benefit immediately or directly from innovation, Wong et al (2008) has found interesting further spillover effects of firm-level innovation. They found that employees in firms where many product innovations are introduced, are later more likely to start out with their own firm, i.e. become entrepreneurs themselves.

- **Characteristics of Innovation in Developing Countries**

There are a number of characteristics of innovation in developing countries:

One is that R&D is substantially done by governments, if done at all. Private sector R&D only accounts for a small percentage of R&D in these countries – in contrast to the EU for example where 67 per cent of R&D is expected to come from the private sector by 2012 (Ortega-Argiles et al., 2009). And most private R&D is done by foreign firms. In a country such as Uganda for example, only 8 per cent of researchers are in the private sector, while 53 percent are in government and 36 per cent in higher education (Brar et al, 2011).

Second, most private firms' innovation tends to be incremental innovation in terms of adoption of or adapting existing technologies. Very often this takes place by firms' importing of new technology embed in machinery or other inputs (Brar et al., 2011).

Third, developing countries' economies are often dominated by small and informal firms, who find it more expensive and more difficult to innovate, facing absorption difficulties not only due to size and informality but also lack of skills (Aubert, 2004).

Innovation and putting innovations to use is now recognized as essential for economic growth and development. But it is not the only contributor. Growth is also driven by factor accumulation and improvements in the allocation of resources (Braunerhjelm, 2010). Hence innovation may not be the major source of growth in developing economies characterised by high unemployment of production factors and inefficient resource allocation.

Porter et al. (2007) and Ácz and Szerb (2009) have therefore suggested that economic development goes through various stages where innovation makes a different contribution to growth across the different stages. A factor-driven stage, efficiency-driven stage and innovation-driven stage of development are posited.

In the factor-driven stage high rates of unemployment results in a large informal sector and high rate of small business start-ups; low-cost and resource based production dominates. Ácz and Szerb (2009) report that innovation may account for only 5 per cent of economic activity in factor-based economies. According to Aubert (2004) there are less opportunities for new technology creation in the least developed countries – i.e. for countries in the factor-driven stage of growth – and more so in medium and higher income countries.

In the efficiency stage the rate of start-ups will start to decline as capital and other production factors are used more efficiently, raising their rate of return. As a result firms also become larger, and start to exploit economies of scale. Innovation becomes more important and could contribute to around 10 per cent of economic activity (Ácz and Szerb, 2009).

Finally in the innovation stage knowledge becomes the driver of growth as countries already on the production possibility curve tries to shift the curve out. Innovation can contribute to more than 30 per cent of economic activity (Ácz and Szerb, 2009).

3.3 Innovation and Foreign Aid

Should foreign aid aim to stimulate innovation? And if so, how can it stimulate innovation? A good case in favor of foreign aid support for innovation can be made. By focusing on raising innovation in developing countries, foreign aid can not only contribute to a robust source of productivity growth, but moreover it could contribute to the general effectiveness of aid by (i) being consistent with local needs, conditions and abilities,(ii) filling the real need for innovation in developing countries, particularly in health, agriculture and energy (Aubert, 2004); (iii) laying better conditions for adaptation and to and mitigation of climate change, (iv) supporting countries to benefit from 'green growth', (v) improving the dynamic efficiency of markets in developing countries (Evenett, 2005)and (vi) putting developing country entrepreneurs in a better driving seat role in their countries' development (see also KEPA, 2010). It may also (vii) be argued that if more aid is committed to stimulating technological innovation in the private sector of developing countries, that due to the need for consistent longer-term support for innovative activities and support structures, that this would make foreign aid less volatile and unpredictable –a major weakness of foreign aid (Lensink and Morrissey, 2000; Bulir et al., 2008;

Killick and Foster, 2007). Finally (viii) focusing on innovation can sharpen the focus of PSD programmes, contributing to their efficiency.

The requirements of adaptation and mitigation of climate change, and of promoting and benefiting from green growth provides an important new rationale for aid to support innovative activities in developing countries. 'Green growth' can be defined as 'growth in GDP that maintains or restores environmental quality and ecological integrity, while meeting the needs of all people with the lowest possible environmental impacts' (GTZ, 2010). Innovation is crucial for achieving green growth (Prins et al., 2010; IEA, 2009).

Very little work has been done on the relationship between aid and the innovative behaviour of private sector firms in developing countries. Much more work – a 'massive research effort ' (Bulir et al, 2008) has however focused on foreign aid and economic growth. From the endogenous growth literature is known that differences in growth between countries are largely due to differences in productivity growth (Loayza and Soto, 2002). The question therefore is, if aid affects growth, through which channels it may or may not raise productivity growth? One such potential channel is technological innovation – an important contributor to productivity growth.

A first channel whereby foreign aid can raise innovation (and investment in innovation) is through creating a more conducive general environment for investment. This is the rationale underpinning BER. As described by Killick and Foster (2007:179)

'Aid can help raise private producer productivity…by permitting more state spending on improving infrastructure and other economic services…and by lowering and raising profitability'.

Dalgaard and Erikson (2009) estimates that Sub-Saharan Africa (SSA) will require between US $ 80 bn and US $ 140 bn in aid per year in order to achieve the first Millennium Development Goal (MDG) by 2015. These estimates are crucially dependent on certain assumptions on the productivity growth and rates of domestic resource mobilization in SSA. Improvements herein could reduce the amount of aid required to achieve MDG number 1. By improving productivity growth, and generating more tax income for governments, PSD is therefore potentially

important in increasing the effectiveness of aid – it raises the poverty elasticity[11] of economic growth (see also Killick and Foster, 2007).

A second channel whereby foreign aid can raise innovation is by support industrial catch-up in poor countries by allowing them greater leeway to run balance of payments deficits. All industrial catch-up countries have at some stage of their past run balances of payments deficits – an important source of foreign savings and obtaining imported foreign technology. Fischer (2009) gives the example of South Korea, where its early industrialization was assisted by aid inflows which alleviated the constraints from its high trade deficits during the 1960s, and states that in the 1950s and 1960s an explicit – even main aim of foreign aid was to allow developing countries this leeway. Hence one should expect a positive relationship between innovation and balance of payments deficits in aid-dependent developing countries if this is indeed a relevant channel.

A third channel whereby foreign aid can raise innovation is through the influence of BER initiatives on market structure and competition. It is well established in the theoretical literature that market structure is important for innovation (Dasgupta and Stiglitz, 1980). It is a question however of getting the balance right in developing countries: in both situations of high competition or monopoly, the incentive for innovation may be lower than the socially desirable level (Fazio, 2010, Aghion et al, 1997). There may be an inverse U-shaped relationship between competition and innovation (Aghion and Griffith, 2005). Hence promoting competition, through for instance competition policy, may not always be optimal for innovation. The relationship between market structure and innovation may however be even more complex, since the effect of market structure may have different impacts on whether innovation is of a neck-to-neck type, or leapfrogging innovation, whether the nature of competition in a particular place is within a market or for a market, and whether innovations are product or process innovations (Fazio, 2010). These considerations will have important implications for innovation policy and hence BER programmes and BDS funded by foreign aid. For instance if the predominant for of

[11] The poverty elasticity of growth refers to a 1 % impact on per capita growth on the poverty headcount ratio. According to Ravallion (2001) the poverty elasticity is 2 per cent, and according to Besley and Burgess (2003) it is 0.74 per cent. In the most aid-dependent region, the poverty elasticity is only 0.49 per cent (Dalgaard and Erikson, 2009). Hence, PSD can make a potentially important contribution by raising the poverty elasticity of growth in SSA.

innovation to be promoted is neck-to-neck, then greater competition may be needed; if however leapfrogging innovation is desired, then stimulating high growth entrepreneurship (HE) is needed, which in turn will require protection of intellectual property rights (to exploit a new innovation) to be more important that stimulating competition (Fazio, 2010).

KEPA (2010) suggests that foreign aid (development cooperation) may facilitate technological innovation but mainly in middle income, and not low-income, countries. Also, entrepreneurship education seems to be more effective in higher income, and not low-income countries.

One should not expect a linear relationship between aid levels and innovation and economic growth. Diminishing returns will need to be taken into account. Feeny and McGillivray (2006) find for instance that the maximum impact is achieved at aid to GDP ratio's of around 21 per cent).

4. THE IMPACT OF FOREIGN AID ON PSD AND INNOVATION

The rationale and instruments of PSD shows that stimulation of innovation has not been paramount. Generally it has been to improve the general business environment (a prerequisite for innovation) and to argue for patent protection and to a lesser extent basic research (Lindahl, 2005).

However, most PSD initiatives do not focus on this segment of entrepreneurs. And even when they do they do not often aim at raising their innovative behaviour. As such PSD, and specifically BER, seems more concerned with improving static and allocative efficiencies in developing country markets, and not dynamic efficiencies. It may however, be the latter that is most important from a job creation and growth point of view (Evenett, 2005).

Taking aim at improving dynamic market efficiency through raising innovation may have implications for policy that runs counter to many current PSD initiatives. For instance many aim to improve static and allocative efficiencies in markets through increasing competition (competition policy). However, this misses the fact that with underdeveloped financial markets in developing countries, raising competition might not improve dynamic efficiency, because in

the absence of financial markets firms can only finance innovation through profits. If too much competition erodes their profits, it will also erode their innovative activities.

How successful has foreign aid been to stimulate PSD/entrepreneurship? To answer this question proper impact evaluations are needed[12]. But, as remarked by Lerner (2009:vii) 'programs to promote entrepreneurship have received little scrutiny by economists…empirical studies are much fewer in number and generally less sophisticated'. Referring to the impact of SME support programmes – key in donor PSD programmes as well as of developing country governments – Lopez-Acevedo and Tinajero (2010:2) recently pointed out that 'impact evaluations of SME programmes are rare'. They mention that most existing evaluations of PSD initiatives typically do not consider biases due to unobserved firm heterogeneity or self-selection, tend to be qualitative rather than quantitative, and cannot keep track with continual changes in programmes over time. Many 'impact' studies also do not attempt to attribute impacts or outcomes to interventions (White, 2009). Villanger and Morten Jerve (2009:171) found from a survey of impact evaluations of Norwegian aid that generally 'the methodological approaches to identify impact are either poorly developed or applied superficially'. Lack of reliable SME-data makes evaluation and cross-country comparisons of programmes difficult (Ardic et al., 2011). Chen et a.l (2009) discusses some of the difficulties to measure impacts on a project level, including the need for high quality survey data, the need for a counterfactual, dealing with various sources of bias, and dealing with violations of the stable unit treatment value assumption. There is thus a need for much more rigorous empirical evidence as to what works and why, with respect to PSD – and even more so with respect to the impact of innovation policies (Braunerhjelm, 2010; McKenzie, 2011).

A search of the *International Initiative for Impact Evaluation's* website (www.3ieimpact.org) found only 10 impact evaluation studies of *PSD programmes* in developing countries from a growing list of over 200 evaluations – and most of these focused on microcredit interventions. These and other studies are summarised in Table 2 and will be discussed in the remainder of this section.

[12] Impact evaluation (or attribution analysis) is according to White (2011:3) 'a with versus without analysis: what happened with the programme (a factual record) compared to what would have happened in the absence of the programme (which requires a counterfactual, either implicit or explicit'. White (2009) contains a discussion of various definitions and approaches to impact evaluation.

Table 2: Impact evaluations of PSD programmes, including studies cited by the International Initiative for Impact Evaluation (May 2011)

Study	Focus	Findings
Altenburg and von Drachenfels (2006)	Overview of literature on business development services (BDSs) in developing countries.	'…there is almost no empirical evidence of sustainable BDS programmes' (p.404).
Banerjee and Duflo (2010)	Directed credit to Indian firms.	Recipients of directed credit had higher sales and profit growths. Credit constraints are significant for these firms.
Banerjee et al (2009)	Household impacts of microcredit programmes in Hyderabad, India	Access to microcredit did not increase total household consumption expenditure, but shifted it towards more durable expenditures.
Beck et al. (2003)	Impact of SME support on economic growth and poverty alleviation on macro level.	No evidence that SME support programmes lead to growth and poverty alleviation on macro-level.
Benson et al. (2011)	Impact of PSD in a Native American Indian Reservation.	Positive impact on community development as measured in per capita income.
Biggs (1999)	Donor matching grants for export promotion activities.	Mixed impact on exports and little public benefits found.
Bourguignon and Sepulvada (2009)	Impact of privatisation of SOEs across developing countries.	Find evidence of improved efficiency and productivity but also of increase in inequality and some popular resistance against privatization.
Brun and Zia (2011)	Impact of business and financial literacy programme on young firm performance in Bosnia and Herzegovina	No significant impact on firm survival, but did improve investment, loan conditions and business practices.
Castillo et al (2010)	Technical assistance to SMEs in Argentina.	Firms that participated in the programme experienced increased employment, real wages and likelihood of exporting.
de Mel et al (2009)	Credit to female micro-entrepreneurs in Sri Lanka	Lower returns to capital were found in female-owned firms. Male-owned firms increased profits by 6.5 - 14 percent of the

		grant amount. Female owned firms invested only larger grants, with no returns
Ferro and Wilson (2011)	Whether foreign aid supported PSD programmes have addressed obstacles faced by entrepreneurs.	Mixed results. Aid generally go to areas where entrepreneurs perceive obstacles, but low levels of aid flows towards improving labour market constraints.
Forss and Schaumburg-Müller (2009)	Meta-evaluation of evaluations of PSD carried out by donor agencies – they survey 60 evaluations from a sample of 240.	Mixed results. Micro-credit interventions not find to be significant for business performance. For value chain support some positive impacts found. Direct firm support not sustainable, little spill-over effects and sustainability on non-financial BDS questioned.
Joeveer et al (2009)	European Bank for Reconstruction and Development (EBRD) credit programs for SMEs.	They find a significant positive effect of EBRD credit programmes – cash loans - on the performance of SMEs. EBRD loans lead to an increase of 8% in profits.
Kannebley et al. (2010)	The impact of innovation on firm performance on Brazilian manufacturing firms.	Innovation impacts positively and significantly on firm performance.
Karlan and Valdivia (2010)	Teaching of business skills to female micro-entrepreneurs in Peru.	They find evidence that the treatment (business skills teaching) improved client retention for micro-credit lenders, but did not significantly improve firms performance.
Karlan and Zinman (2010)	Impact of micro-credit on firm performance in the Philippines.	No significant impact on business performance.
Killick and Foster (2007)	Study the impact of aid surges on private sector development in Ethiopia, Ghana, Uganda, Mauritania, Sierra Leone, Mozambique and Tanzania.	Aid surges /volatility can has a negative impact on PSD through Dutch Disease effects and through changing relative prices in favor of non-tradable production.
Klinger and Schündeln (2010)	Evaluate the impact of a business training programme in El Salvador, Guatamala and Nicaragua.	Participating in a business training programme significantly increases the likelihood that a person will start a new firm or grow an existing firm.
Knorringa and	Review literature on	Point to only few available impact

Helmsing (2008)	impacts of Corporate Social Responsibility (CSR) and social entrepreneurship.	evaluations that offers little evidence of significant development impact of CSR and social entrepreneurship.
Kondo et al (2008)	Micro-credit provision to rural households in the Philippines.	A micro-loan of 100 Philippine Pesos resulted in an average increase in household income of PhP 47 (US$ 1.00) and an average increase in per capita expenditure on food increased of PhP 12 (US$ 28). The impact was regressive.
Koski and Pajarinen (2010)	Impact of business subsidies of firm performance in Finland.	Short-term positive impact on firm performance.
Lopez-Acevedo and Tinajero (2010)	SME support in Mexico	Firms who participated in certain programmes had higher value added, sales, exports and employment.
Lundahl (2005)	Report on evaluations of the International Trade Centre's direct training assistance to firm who want to export.	The overall impact on the export sector was limited (p.149).
Michaelides and Benus (2011)	Evaluate the Growing America Through Entrepreneurship (GATE) programme that provides free training to existing and prospective entrepreneurs.	Only short-term positive impacts on helping unemployed start a business. No significant impact on firm performance or for participants already employed.
Chen et al. (2009)	Credit provision to rural commercial farming activities in China.	They cannot reject the null hypothesis that the longer-term average impact was zero.
Oosterbeek et al. (2010)	Main entrepreneurship education programmes in the EU and USA evaluated.	Lack of significant positive impacts, even negative impacts observed.
Rijkers et al. (2008)	SME support in Ethiopia for raising labour intensity in firms in the construction sector.	Participating firms did not become more labour-intensive than non-participants.
Tan (2009)	SME support programme in Chile.	Positive impacts found on sales, production, employment, labour productivity and wages.

Tan and Lopez-Acevedo (2007)	Training and technical assistance to SMEs in Mexico.	Participating firms invested more in training and quality control, and experienced more rapid productivity growth.
Torero and Pasco-Font (2001)	Consumption and welfare benefits of Peru's privatization of utilities in 1990s.	Increased access, but no net improvements in household welfare.
Van Praag and Versloot (2007;2008).	A meta-study evaluating the impact of entrepreneurship on employment, innovation and productivity.	Mixed results. Entrepreneurs contribute to these outcomes, but often less than non-entrepreneurs.
Wallsten et al (2004)	Privatization of water provision in Argentina, Bolivia, and Brazil	Connections to water and sanitation improved, but this cannot only be ascribed to private sector participation in its provision.

(Source: Author's compilation from http://www.3ieimpact.org/ and an own literature survey)

The bulk of PSD funding goes into training (capacity building), finance (including micro-finance) and business development services (including technical advice). As such most impact evaluations and assessment studies have focused on these aspects. Before discussing a selection of the studies summarized in Table 2 that deals with these, a few remarks are in order one a few meta-analysis of sorts in the past, where the focus has been on evaluating the successes or failures of donor projects .

- **Meta-evaluations**

First, in a recent meta-analysis of impact evaluations of PSD programmes by donor agencies, Forss and Schaumburg-Müller (2009) review 60 such studies drawn from a sample of 240. They find mixed results: for instance micro-credit programmes do not seem to be backed up by many significant successful outcomes in terms of business performance. Value chain support is found to have resulted in more successes and seems to be more sustainable than many other interventions; however the authors point out that there are still too few impact analyses of these available. They find that training programmes have positive impacts but 'only when

trained skills are relevant and demand oriented and labour market stakeholders are involved with effective providers' (p.3). Direct business support is found not to be sustainable and with 'no clear evidence that they have broader development effects' (p.3).

Whilst not performing any original impact evaluations, Altenburg and von Drachenfels (2006) surveys the broader empirical literature on the effectiveness of PSD. They argue that much of the ideological basis for current PSD (such as the belief in SMEs, in deregulation, micro-credit and competitive markets) do not have sufficient empirical backing.

Altenburg and von Drachenfels (2006) conclude that PSD aimed at SMEs do not adequately promote innovation. They argue that more effort is needed to strengthen governments-business linkages in developing countries in order to encourage innovation, R&D and technology diffusion. In their view, attention to larger firms are important, as these are more likely to be innovative firms – and that they can transfer this to smaller firms if sufficient linkages are established.

- **Entrepreneurship Training**

Karlan and Valdivia (2010) used a random control trail to evaluate the impact of a business training programme on Peruvian female entrepreneurs who borrowed money from a micro-credit lender. The training programme is found to add no significant value to entrepreneurial performance as measured in terms of revenue, profits or employment. The programmes did however improve entrepreneurs' business knowledge and client retention rates for the micro-credit lenders. Roughly similar results are found by Bruhn and Zia (2011) who, using a random control trail to evaluate a business training programme in Bosnia and Herzegovina finds that the training did not improve business survival but did improve business practices and loan conditions.

Klinger and Schündeln (2010) use a quasi-experimental research design to investigate the short-term impact of the NGO *Technoserve*'s entrepreneurship training programmes in Central America – programmes aimed at both prospective as well as existing entrepreneurs. Their results show that the programme is successful is leading to a greater number of individuals starting a new business or expanding a business as a result of receiving the training. Specifically,

they establish that individuals who undergo the 'treatment' (training) have a 4 – 9 percent higher probability of starting a new business, a 25 – 56 percent probability of expanding an existing business.

The results from impact evaluations from advanced economies are also mixed. Oosterbeek et al (2010) uses a difference-in-differences approach to evaluate the impact of entrepreneurship education programmes in Europe and the USA. The programme they focus on is the Junior Achievement Young Enterprise student mini-company (SMC) programme. They find that the programme has no positive impact: it does not enhance students' self-assessed entrepreneurial skills, and moreover 'the effect on the intention to become an entrepreneur is even significantly negative' (p.443).

And Michaelides and Benus (2011) evaluates the impact of the USA's GATE programme (Growing America Through Entrepreneurship) that provides free entrepreneurship training to both unemployed and employed persons. They establish that the programme only has limited positive impacts – over the short-term in helping unemployed participants start their own firm. The programme did not have any longer-term impacts; neither did it significantly affect the entrepreneurial behavior of participants that were already employed.

- **Financial Support**

An important component of PSD is provision of credit – mostly micro-credit to SMEs. Evaluating the impacts of such micro-credit for SMEs has returned mixed results. Karlan and Zinman (2010) using a randomized field trial could not find a significant impact of micro-credit on business performance in the Philippines. Indeed, the authors found the impacts of micro-credit to be 'diffuse, heterogeneous and surprising' (Ibid, p.1), even finding that micro-credit lead to a reduction in investment in targeted firms. On the other hand de Mel et al (2009) and Banerjee and Duflo (2010) found positive impacts of micro-credit on firm performance, in respectively Sri Lanka and India.

- **Other Business Development Services and Business Environment Reform**

Using non-experimental panel data to control for selection biases and to compare PSD programme participants with non-participants Lopez-Acevedo and Tinajero (2010) evaluated

the impact of SME support in Mexico, a country where more than US$ 80 bn was spent on support to more than 3 million SMEs between 2001 and 2006. They find that firms who participated in certain programmes had higher value added, sales, exports and employment. They found the impacts of fiscal support and technical innovation programmes to be most significant – SMEs participating in the latter experienced on average a 14 per cent increase in value added and a 10 per cent increase in employment. Results were typically seen after three or four years of support. They conclude that technical innovation programmes may be more successful because they reach firms that already possess a certain level of technological sophistication.

Castillo et al (2010) evaluates the impact of a SME programme that provided technical assistance to over 1,200 SMEs in Argentina between 1999 and 2007. They use panel data and quasi-experimental methods such as Propensity Score Matching (PSM) and Difference in Differences (DID) to control for biases. The found that firms that participated in the programme increased their employment, real wages and their likelihood of exporting by 14.3, 1.4 and 1.8 per cent as against firms that did not participate. The beneficial impact on exporting was found one year after beginning participation and on employment one to three years.

Carlin and Seabright (2009) using survey data to assess business environment reform (BER) initiatives. They draw from these four lessons. The first is that physical infrastructure is seldom ranked high as a constraint by entrepreneurs in developing countries. The second is that licensing and customs constraints are not serious except in former East European Communist countries. The third is that crime and corruption are important constraints in all developing countries. And fourth, the seven most severe dimensions of BER that need focus are (i) anti-competitive practices by firms, (ii) high tax rates, (iii) burdensome and intricate tax administration procedures, (iv) lack of access to finance, (v) high cost of finance, (vi) policy uncertainty and (vii) macro-economic instability.

Ferro and Wilson (2011) analyze the impact of foreign aid on PSD by studying the perceptions of entrepreneurs of the extent to which foreign aid supported PSD has addressed the obstacles that they face in doing business. They investigate whether foreign aid does in fact go into areas which entrepreneurs identified as being problematic, and also ask whether entrepreneurial

perceptions of aid is better in areas that have received more aid. They find that aid in general do go to areas where entrepreneurs perceive obstacles, especially with respect to trade related obstacles. However, less goes into targeting access to finance where it is most seen as an obstacle – i.e. 'there is more aid flowing to fund access to finance related projects in countries where very few firms identified access to finance as an obstacle', and that 'there are very low levels of aid that flow into any country with the objective of educating and training the workforce and/or to improve labour regulations' (p.2).

In conclusion more rigorous impact assessments of PSD have been important in putting these programmes in perspective and generating information for policy guidance. In a recent review of the literature on the relationship between aid and economic growth (see also section xx below) Arndt et al. (2010:1) state that 'an increasing number of rigorous microeconomic impact evaluations have demonstrated the potential for well-designed project interventions to generate positive results'. From Table 2 can be seen that this optimistic conclusion does not wholly hold for the use of foreign aid in PSD. While there are interventions with positive results, there are also clearly many instances where little or no impact is made. An almost nothing is known about the direct impact of foreign aid in innovation. One area where the difference with the broader micro-economic evaluation of foreign is perhaps most clear, is with respect to the impact of micro-credit. Whereas many impact evaluations find a positive impact of micro-credit on household consumption, the evidence on its impact on entrepreneurship is less significant and more mixed

Some of the weaknesses or blind spots of impact evaluations need to be kept in mind. The first is that they often achieve high internal validity but low external validity (Oosterbeek et al., 2010). Other weaknesses are that evaluations tend to point to shortcomings of projects rather than successes, that evaluations are done towards the end of projects, and little consideration is given to the time lag involved before interventions may have an effect (Forss and Schaumburg-Müller, 2009). These shortcomings makes it difficult to generalize lessons for other settings, and means that further and more carefully designed evaluations, as well as other types of studies will continue to be needed to improve innovation policies and PSD programmes. The next

section deals with some of the public policy implications for innovation-oriented PSD that can be derived from the discussion so far.

5. PUBLIC POLICY IMPLICATIONS

5.1 Objectives

From the preceding discussion it may be argued that donor support for innovation by entrepreneurs should have at least three aims.

- The first is to assist countries' firms to absorb, adopt and adapt foreign technology. This should include efforts to stimulate investments in assimilating new science and technology through building capacity and facilitating technological learning.
- The second is to aim for entrepreneurs to commercialize new innovations by improving the position of the entrepreneur within the broader innovation system. In addition to BER initiatives this will include efforts to build entrepreneurial capacity so as to raise private sector innovation activities (such as R&D), to commercialize new inventions and to improve competition so as to provide a further impetus or incentive to innovation. As recognized by Brar et al (2011: xvi) 'science and technology cannot cause development or create innovation on their own'. Knowledge does not automatically result in benefits – its needs the entrepreneur as conduit to 'spill over'. This is reflected in the fact that only around 1 to 2 percent of inventions are generally reckoned to reach the market and generate commercial benefits (Braunerhjelm et al., 2010:107).
- The third is to put more emphasis on raising the supply of venture capital to innovative entrepreneur in developing countries. Lerner (2009) suggests that the first two aims (raising absorption abilities and strengthening the entrepreneur/business environment) amounts to raising the demand for venture capital – and that this is often the only thrust of donor funded PSD programmes. The third – crucial specifically for innovative entrepreneurs – are often lacking.

These three broad aims are mutual reinforcing. Supporting the rise of high-growth, innovative entrepreneurs will support educational capacity building (which facilitates the adoption of new technology) because entrepreneurs' demand for skilled labour will make individual investments in education more worthwhile.

The need to focus on both scientific and technological knowledge and entrepreneurship, and to consider venture capital, has caused an increasing number of countries to combine these in the establishment and development of national innovation systems (NIS). These include the 'set of institutions, organizations (e.g. universities, professional societies, industry and business associations, government services as well as donor funded programmes) and policies that interact in the pursuit of common social and economic goals and that use the introduction of innovations as the key promoter of change' (Brar et al, 2011: xvii). Aubert (2004:9) defines an national innovation system as 'the set of organizations (firms, universities, public laboratories) and their linkages through which innovation processes develop'. A NIS can also be described as the 'broad set of factors shaping the innovation and imitation ability of countries' (Castellacci and Natera, 2011:3). A NIS needs to be supported by a robust financial system (including venture capital), skilled labour, and sufficient markets. The support of innovation through foreign aid should thus ultimately aim towards contributing to the establishment and promotion of national innovation systems.

5.2 Approach

There is no 'one size fits all' as far as innovation policy is concerned (Aubert, 2004). The discussion in this paper leads to the conclusion that innovation policy needs to be tailored to take into account heterogeneity on the national/country level (stage of development), regional level (clustering/agglomeration level) and on the firm level.

- **Stages of development and support for innovation**

It is well-recognized, also from the discussion in section 2, that 'innovation ambitions and policies have to be adapted to levels of development' (Aubert, 2004.14). Table 3 summarizes the approach with regard to country heterogeneity in terms of stage of development, and contains a broad list of some instruments that may be most appropriate in a particular context.

Thus for instance as suggested in column 4, row 2, IP protection is often not seen as being of such great importance in earlier stages of development, become more important only when a country has already entered a rather more advanced stage of development (Aubert, 2004). As is illustrated in table 3, in the efficiency-driven stage of development, public R&D may play a more important role than in the first stage. Impact evaluations have found that public R&D can stimulate total investment in R&D and can thus crowd-in private R&D (Taymaz and Ucdogruk, 2009). For innovation policy the stage of development has also implications for the type of data that needs to be gathered and tracked. Thus for the least developed countries, where factor driven growth dominate) it may be less urgent and useful to track R&D (as in the EU)[13] and more relevant to obtain data on 'know how and local indigenous knowledge' (Aubert, 2004:31).

Table 3: Stages of Country Development, Entrepreneurship and Innovation Policies

Stage of Country Development	**Private Sector Mode**	**Innovation System Characteristics**	**State / Innovation Policy Orientation**
Factor-driven: Production most intensive in unskilled labour and natural resources	Traditional economy: Dominance of primary sectors. Specialization in cash crops, mineral extraction. Spatially dispersed production. Small entrepreneurial base. Largely small, informal and low and minimal technology SMEs.	Low Science and Technology Capabilities Innovation may account for only 5 per cent of economic activity. Adoption of existing technology to local conditions main challenge. 'Brain drain' and outflow of skills. Low technology absorption capability.	Fragile or Facilitating: Establishing authority, capacity and/or legitimacy important to move from fragile to facilitating. Facilitating state aims at establishing conducive business environment (property rights, stability, rule of law, accessibility). Demonstration of 'basic innovations' that can contribute to development. Basic investment in technology infrastructure. Start addressing broader environment for innovation (education, trade, finance). Gather data on local indigenous

[13] The EU is targeting R&D spending to exceed 3 per cent of GDP by 2012 (Ortega-Argiles et al., 2009).

		Little private sector R&D. Little incentive for indigenous knowledge commercialization.	knowledge. Promote positive attitudes towards entrepreneurship.
Efficiency-driven: Production more efficient, and movement towards technology frontier starts.	Managerial economy: Manufacturing sector grows. Greater product diversification. Larger firms, SOE and MNEs start to dominate. 'Fordist' production by obtaining productivity growth through economies of scale. Growing spatial clustering and urbanization. More technologically competent enterprises.	Medium Science and Technology Capabilities Innovation becomes more important and could contribute to around 10 per cent of economic activity. Growth in private and public sector R&D. IPR protection becomes more important.	Developmental or Facilitating: Developmental state to use policies to encourage domestic technological capability formation. Use of government procurement for innovation capability building. Attract appropriate FDI. Develop autonomous innovation promotion institutions / Improve the science base. Policies aimed at high-technological innovation. Promote entrepreneurial activities broadly. Public R&D to compliment and crowd-in private R&D Trade liberalization, openness, international research collaboration. Use of Diaspora's (and reverse the brain drain). Indigenous knowledge utilize, protect.
Innovation-driven: Production of high-tech goods and innovative to expand the technological	Entrepreneurial economy: Rise in services sector share in GDP. High value added manufacturing activities dominate with greater	High Science and Technology Capabilities Knowledge becomes the main driver of growth. Innovation can contribute to more	Facilitating The state promotes basic framework conditions. Substantial focus on innovation, technology, also regional focus. Strengthen research base. Promote entrepreneurial aspirations.

frontier	specialization. High tech clusters stabilize and R& D rich firms to be found. Re-emergence of (advanced) small businesses on both national and international markets.	than 30 per cent of economic activity.	Market competition, market development through entry of new entrepreneurial firms important.

(Source: author's compilation based on the discussions in Altenburg, 2009; Acs and Szerb, 2009; Aubert, 2004, and Porter, 2004)

In earlier phases of development, the adoption and eventual adaptation of technologies are important to encourage. Policies that can do this include those improving skills, organizational learning, and attitudes and culture (Lindahl, 2005).

Aubert (2004) focuses on the obstacles to entrepreneurial innovation in developing countries in earlier stages of development. He recommends a two-pronged approach for donors. The first prong should consist of measures and reforms to address broad or 'functional' obstacles, such as business environment constraints. This is indeed what typical PSD initiatives attempt to improve. The second prong should then be to have for each country or region a unique innovation policy that will take into account its level of development, context, history and existing resources and capabilities.

In the GEINDEX various measures of the entrepreneurial status of a country is measured, based on sub-indices measuring entrepreneurial attitudes, activities and aspirations. Ács and Autio (2011) argue that in factor-driven (the least developed) economies it is most appropriate for policy to emphasize entrepreneurial attitudes. Here it is instructive to note that in India, entrepreneurship has been resurgent since the early 1990s. It has made strong contributions to growth through innovation – as has been witnessed by the country's vibrantly growing ICT sector. A number of policy initiatives have been important in facilitating this growth. Das (2009) identifies in this regard most importantly a change in culture and attitudes towards entrepreneurs.

In the efficiency driven stages Ács and Autio (2011) argue for an emphasis on entrepreneurial activities. Here it is also important that entrepreneurs started to be more socially responsible – making increasing contributions to health, education and welfare, so that 'the business community sees development issues as their problem, too'(Das, 2009:3), and that governments start to provide more supported entrepreneurship and innovation through creation of venture capital funds as they did for instance in India (Mani, 2011).

Finally, in the innovation driven stage of development they argue that a premium should be places on fostering entrepreneurial aspirations. These policy recommendations are reflected in column 4 of Table x. It is important to note that there is a bi-directional causality between innovation and stages of development. At a high level of per capita GDP, governments spend more on R&D, universities, and creating an environment conducive for creative pursuits, including technological innovation.

The distinction made between various stages of development is of course one that should be made carefully, as a watertight demarcation or classification of countries is difficult. As the OECD (2011:39) remarks 'development has become more compressed, not only in terms of a higher pace but also because different development stages are pursued concurrently by emerging economies'. This means that care has to be taken to understand the way in which a particular economy is characterized in terms of these stages, where its industries and sectors are in terms of sources of growth, and how to ensure a policy differentiation. The demarcation of stage is thus still useful as it provides a basis for this demarcation of policy which would otherwise have been difficult. It allows various stages of development and firm growth to be considered in the fine-tuning of policy.

- **Firm heterogeneity**

Generally there are good theoretical and empirical reasons to be sceptical about the impact of PSD in 'unleashing' entrepreneurship as section 4 has suggested. A major reason is due to firm heterogeneity. It is now well-established that not all entrepreneurship is equally beneficial for economic growth and development (Acz and Szerb, 2011; Baumol, 1990; Bosma et al., 2009; Wong et al., 2005).

Van Praag and Versloot (2007; 2008) consider the literature on the impact of entrepreneurship (according to various definitions) on employment, innovation and productivity growth. They find that (i) entrepreneurs do not spend more on R&D than their counterparts, although the quality and efficiency of their innovation is higher; that (ii) their contribution to productivity growth is low; that (iii) the majority of entrepreneurs would earn higher incomes as wage employees, and (iv) that entrepreneurs create more jobs relative to non-entrepreneurs but that the quality of jobs they create is lower. These are the average entrepreneurial impacts-suggesting that focusing on the average entrepreneur is not optimal public policy and that policy should focus on the small subset of entrepreneurs that do make a difference. These are in particular entrepreneurs that are highly innovative.

Promoting only entrepreneurship in general, as most PSD does, will not necessarily promote growth and poverty reduction. Refining the focus of PSD is therefore a first prerequisite if these programmes are to have a more substantial impact on growth.

It has been argued in this paper that the focus of innovation policies should be on so-called high-growth entrepreneurship (HGE) (Coad and Rao, 2008; Hölzl, 2009) or 'gazelles' (Hölzl, 2009; Stam, 2009; Stam et al, 2009; Teruel and De Wit, 2011). In HGE innovation play an important role in firm competitiveness, survival and growth. The value of entrepreneurial innovation can off course also spill-over beyond the firm, generating positive externalities that are acknowledged to be an important part of explaining aggregate growth and convergence. The implication is that if PSD aims to generate development through the innovative activities of SMEs, the focus need to be on high-growth firms (HGFs) or high-growth entrepreneurs (HGE) and on the innovation of these firms.

Within the category of high-growth firms, firm heterogeneity with respect to innovation needs to be taken into account. There are in countries, across the stages of development, four types of innovation capabilities on a firm level (Aubert, 2004:19) – corresponding in a sense also to different phases on firm organisational development:

- Low technology SMEs and micro-enterprises
- Minimal technology SMEs

- Technologically competent enterprises
- R&D rich enterprises

For each of these types of firm, different types of innovation policy instruments are needed. These are summarized in table 4.

Table 4: Stages of a Firm's Development / Firm Heterogeneity and Innovation Policies

Stage of Firm Development	**Policy Objectives**	**Innovation Policy Instruments**
Low technology SMEs and micro-enterprises	<u>Entrepreneurship:</u> Encourage new start-ups Stabilize businesses (firm survival) Build competitive capabilities (firm growth) <u>Innovation:</u> Build awareness of scope and benefits of innovation.	• Business development services (BDS). • Finance (including micro-finance) • Management and skills development • Innovation awareness and understanding • Productivity enhancement services • Cluster-based approaches to stimulating innovation and knowledge-spillovers.
Minimal technology SMEs	<u>Entrepreneurship:</u> Development firm level competitiveness <u>Innovation:</u> Introduce basic innovation skills. Encourage adoption and application of new ideas.	• Business development services (BDS). • Finance (including micro-finance) • Management and skills development • Product diversification and quality improvements • Internet-based information services • Technology awareness and marketing

		• Support for technology adoption and adaptation projects. • Graduate intern and placement programs.
Technology competent enterprises	<u>Entrepreneurship:</u> Support market development, internationalization of firms. <u>Innovation:</u> Build in-house innovation capabilities.	• Business development services (BDS). • Global value chain integration / exporting • Innovation and technology support. • Technology transfer support. • Linkages with universities. • Incubators and techparks. • Innovation Relay Centres • Laboratory services and metrology. • IPR, licensing, patenting services. • Technology joint ventures.
R&D rich enterprises	<u>Entrepreneurship:</u> Develop international markets and collaboration. Greater value from global supply chain. <u>Innovation:</u> Encourage R&D, international networking, technology transfer, diffusion and commercialization. Encourage international technology leaders.	• Global value chain integration / exporting • Technology support • International collaboration • University-industry collaboration • University spin-offs.

(Source: Adapted from Aubert, 2004:19)

With respect to firm heterogeneity a major public policy issue with respect to promotion of innovation in PSD programmes is to what degree innovation policy and innovation support should be selective. How much should and could innovation policy target specific entrepreneurs and/or firms? Just as in the debate on industrial policies there is no firm agreement on this in the literature. And empirical evidence is not very useful to decide the matter.

While in principle there is agreement that in an ideal world policy should aim to target high-growth potential firms (the firms where innovation is more likely, where it is also more likely to improve business performance and where the impact is more substantial) the practice is seen as been problematic. How can high-growth potential firms be identified *ex ante*? (Hölzl, 2009). Thus a targeted approach to innovation promotion in developing countries that focus on high-growth firms or high-growth potential firms runs the typical risks of industrial policy, including encouraging rent-seeking, regulatory capture or corruption, as well as distorting markets (Stam et al, 2009). As a result of this, and also of the highly uncertain nature of the outcome of innovation, which makes it akin to a lottery, many argue against too much of a selective approach, in favour of an broad approach supporting many firms in many different ways (Coad and Rao, 2008).

However selectivity and targeting do entail benefits, in overcoming shortcomings of past efforts, raising the effectiveness and sustainability of PSD, and conserving resources (Stam et al, 2009).

Shane (2009) also cautions against targeting potentially HE, but point out that these types of firms very often – at least in advanced economies – tend to be financed disproportionately by venture capital. He refers to data that show that in the USA in 2003 firms that were supported by venture capital employed almost 10 per cent of all the private sector. Of course the difficulty is that venture capital funding is still very underdeveloped in developing and emerging economies, where innovative entrepreneurs rely more on internal funding, and where many donor and other PSD programmes have aimed to expand debt financing to firms. This implies that if in future the benefits of selectivity are to be gained, that perhaps support for the emergence of venture capital across the developing world should be approaches a priority from the point of view of stimulating innovation.

Another way of targeting could be based on existing / ex ante levels of productivity in firms, with high productivity firms being targeted (this precludes however support of potentially more innovative new firms). Rochina-Barrachina et al. (2010) finds from a panel of Spanish manufacturing firms that causality runs from prior productivity to R&D and innovation, suggesting then that targeting of already productive firms could generate higher R&D.

If the emphasis is on HGE, then policy support should address some of the requirements of such firms. Here, the empirical basis for action is however thin as relatively little is known how to support the creation of such HE firms (Ács and Autio, 2011). It would seem however that there is some consensus that at a minimum HE firms thrives mostly in an environment with at least access to qualified labour, finance, and experienced managers.

If specific firms are difficult to target due to informational problems, some have argued a second best option is to target not firms but clusters or agglomerations of firms, noting that knowledge generation, learning, innovation and economic activity tend to be localized processes (Braunerhjelm, 2010.6).

6. CONCLUDING REMARKS

Adoption and adaptation of foreign technology is an important catch-up mechanism for developing countries and can contribute towards the achievement of the millennium development goals. Despite this until now very little foreign aid has been specifically targeting innovation in developing countries - more substantial aid has been promoting 'private sector development' (PSD) – or entrepreneurship – so that one can see PSD initiatives to have been the major channel through which donors have been promoting innovation in developing countries.

Whether this has been an appropriate channel, with appropriate instruments, was the first of two main questions that this paper addressed. It was established, from an overview of the literature on PSD, innovation and impact evaluations, that (i) relatively little is still known about innovation in developing countries and the channels through which aid can affect innovation,

that (ii) PSD programmes have mixed impacts – so components seems to be more effective than others, but relatively little is still known on the impact of these programmes or why some work and others not. The danger this poses is that valuable foreign aid and government resources may be fruitlessly spent, especially given the popularity of PSD and entrepreneurship in recent times. As put by Cukier (2006:37) 'For years, a notable obstacle to innovative entrepreneurship was the reluctance of governments to assist it, now the problem may be that they want to do too much, or do the wrong things'.

It is therefore be necessary to reduce the high ambitions or expectations that governments and donors place on entrepreneurship. Not all entrepreneurs drive economic growth, not all innovates. 'The typical start-up is not innovative, creates few jobs, and generate little wealth' (Shane, 2009:141). And 'the majority of new firms neither innovate nor grow, nor intend to do so' (Stam and Wennberg, 2009:79).

It is in this light also necessary to rethink PSD, and specifically to the missing ingredient of innovation. Although PSD is in the ascendency, there have been doubts expressed about aid-funded PSD even before the mixed results from impact evaluations become available (e.g. Schulpen and Gibbon, 2002). PSD efforts are also often are criticized as being too optimistic with respect to SMEs and the informal sector, too negative towards governments (Altenburg and von Drachenfels, 2006) and too optimistic as to the benefits of strong property rights (Kennedy, 2011). One the one hand PSD is criticized as being a 'neoliberal' model of development (Tan-Mullins, et al, 2010) and on the other criticized as being too much poverty-oriented and being disguised welfare programmes (Audretsch and Thurik , 2004; Schramm, 2004). It is not clear how and if PSD is consistent with other development goals such as the MDGs or with promotion of human rights or good governance (Tan-Mullins, et al., 2010).

There is therefore no 'one size fits all' as far as innovation policy is concerned. Donors' innovation policies needs to be tailored to take into account heterogeneity on the national/country level (stage of development), regional level (clustering/agglomeration level) and on the firm level. This tailoring implies a certain level of targeting or selectivity, although care should be taken, with selectivity more important at higher levels of economic development. This paper made some policy suggestions in each of these areas.

Finally, the policy prescriptions that were made in section 5 towards informing donor PSD programmes, should in itself been seen as subject to the ability and willingness of donors to engage with the nature of entrepreneurial innovation. It should be kept in mind that 'an innovation strategy is even more uncertain than playing a lottery, because it is a game of chance in which neither the probability nor the prize can be known for sure in advance' (Coad and Rao, 2008:646). In practice this means that donors need to approach PSD differently. 'Risk-averse, reactive policymaking based on perfect knowledge is ill-suited to foster and facilitate entrepreneurial activity' (Mayer-Schönberger, 2007). Such risk-averseness and need for certainty in terms of PSD support has however characterized donor programmes. Cukier (2006:11) calls for public policy to be more like 'the very thing it hopes to promote- and embrace risk, experimentation and diversity'. In addition to being less risk-averse and open to uncertainty and ambiguity, donors would also need to keep in mind that promotion of the private sector, and specifically or innovative entrepreneurship, requires persistence, and a long-term commitment. It often takes considerable time to adjust a countries attitudes and institutions that shapes innovative activities (Lerner, 2010).

To conclude: by giving more prominence to entrepreneurial innovation, foreign had will indeed have come 'full circle', as Pronk (2003:384) suggested, given that boosting investment and transfer of technologies for industrialization in poor countries were a major objective of foreign aid in the 1950s and 1960s (Fischer, 2009).

REFERENCES

Ács, Z. and Audretsch, D.B. (1988). 'Innovation in Large and Small Firms: An Empirical Analysis', *American Economic Review*, 78: 678-690.

Ács, Z. and Autio, E. (2011). 'The Global Entrepreneurship and Development Index: A Brief Explanation', Presented at the Victoria and Albert Museum, London.

Ács, Z. and Szerb, L. (2009). 'The Global Entrepreneurship Index (GEINDEX)', *Foundations and Trends in Entrepreneurship*, 5 (5). 341-435.

Ács, Z. and Szerb, L. (2011). *Global Entrepreneurship and Development Index 2011*. Cheltenham: Edward Elgar.

Ács, Z., Morck, R., Shaver, J. M., and Yeung, B. (1997). 'The internationalization of small and medium-sized enterprises: A policy perspective', *Small Business Economics*, 9(1): 7-20.

ADB (Asian Development Bank). (2000). *Private Sector Development Strategy*. Manila: Asian Development Bank.

Aghion, P. and Griffith, R. (2005). *Competition and Growth: Reconciling Theory and Evidence*. Cambridge MA. MIT Press.

Aghion, P., Dewatripont, M. and Rey, P. (1997). 'Corporate Governance, Competition Policy and Industrial Policy', *European Economic Review*, 41: 797-805.

Alesina, A- and Dollar, D. (2000). 'Who Gives Foreign Aid to Whom and Why?', *Journal of Economic Growth*, 5: 33-63.

Altenburg, T. and Von Drachenfels, C. (2006). 'The New Minimalist Approach to Private Sector Development: A Critical Assessment', *Development Policy Review*, 24 (4): 387-411.

Amsden, A. and Singh, A. (1994). 'The Optimal Degree of Competition and Dynamic Efficiency in Japan and Korea', *European Economic Review*, 38:941-951.

Ardic, O.P., Mylenko, N. And Sultane, V. (2011). 'Small and Medium Enterprises: A Cross-Country Analysis with a New Data Set', *Policy Research Working Paper 5538*, The World Bank.

Archibugi, P., Derni, M. and Filippetti, A. (2009). 'The Technological Capabilities of Nations: The State of the Art of Synthetic Indicators', *Technological Forecasting and Social Change*, article in press.

Arndt, C., Jones, S. and Tarp, F. (2010). 'Aid, Growth, and Development: Have We Come Full Circle?,' *Journal of Globalization and Development*, 1 (2): Article 5.

Aubert, J.E. (2004). *Promoting Innovation in Developing Countries: A Conceptual Framework*. Washington DC: The World Bank Institute. July.

Audretsch, D. and Thurik, R. (2004). 'A Model of the Entrepreneurial Economy', *Discussion Paper on Entrepreneurship, Growth and Public Policy,* Jena: Max Planck Institute.

Ayyagari, M., Beck, T. and Demirguc-Kunt, A. (2007). 'Small and Medium Enterprises Across the Globe', *Small Business Economics*, 29:415-434.

Ayyagari, M., Demirguc-Kunt, A. and Maksimovic, V. (2011). 'Small vs Young Firms across the World: Contribution to Employment, Job Creation and Growth', *Policy Research Working Paper 5631*. Washington DC: The World Bank.

Bandyopadhyay, S., Sandler, T. and Younas, J. (2011). 'Foreign Direct Investment, Aid and Terrorism: An Analysis of Developing Countries', *Working Paper 2011-004A*, Federal Reserve bank of St. Louis.

Banerjee, A.V. and Duflo, E. (2008). 'Do Firms Want to Borrow More? Testing Credit Constraints Using a Directed Lending Program'. *Working Paper 02-25*, MIT.

Barrett, S. (2009). 'The Coming Global Climate-Technology Revolution', *Journal of Economic Perspectives*, 23 (2): 53-75.

Baumol, W.J. (2008). 'Entrepreneurs, Inventors and the Growth of the Economy', *Economics Program Working Paper Series no. 08-12*. New York: The Conference Board.

Beck, T., Demirguc-Kunt, A., and Levine, R. (2004). 'Finance, Inequality, and Poverty: Cross-Country Evidence', *Working Paper No. 10979*. National Bureau of Economic Research (NBER).

Beck, T. Demirguc-Kunt, A., and Levine, R. (2005). 'SMEs, Growth and Poverty: Cross-Country Evidence', *Journal of Economic Growth*, 10: 199-229.

Beck, T., Demirguc-Kunt, A. and Levine, R. (2003). 'SMEs, Growth and Poverty: Cross-Country Evidence', Washington DC: *World Bank Policy Research Working Paper*.

Benson, D.A., Lies, A.K. and Okunade, A.A. (2011). 'Economic Impact of a Private-Sector Micro-Financing Scheme in South Dekota', *Small Business Economics*, 36 (2): 157-169.

Besley, T. and Burgess, R. (2003). 'Halving Global Poverty', *Journal of Economic Perspectives*, 17: 3-22.

Bhattacharya, M. and Bloch, H. (2004). 'Determinants of Innovation', *Small Business Economics*, 22:155-162.

Biggs, T. (1999). A Microeconometric Evaluation of the Mauritius Technology Diffusion Scheme. Washington DC: The World Bank.

Biggs,T. (2002). 'Is Small Beautiful and Worthy of Subsidy?', *IFC Working Paper*.

Binks, M. and Vale, P. (1990). *Entrepreneurship and Economic Change*. London. McGraw-Hill.

Bloom, N., Mahajan, A., McKenzie, D. and Roberts, J. (2010). 'Why Do Firms in Developing Countries Have Low Productivity?', *American Economic Review: Papers and Proceedings*, 100 (2): 619-623.

Blowfield, M. (2007) 'Reasons to be cheerful? What we know about CSR's impact', *Third World Quarterly*, 28(4):683-695.

Bogliacino, F., Perani, G., Pianta, M. And Supino, S. (2010). 'Innovation and Development: The Evidence from Innovation Surveys', BETA: *Document de Travail no 2010 – 13*, Université de Strasbourg.

Boschini, A. and Olofsgard, A. (2007). 'Foreign Aid: An Instrument for Fighting Communism?', *Journal of Development Studies*, 43 (4). 622 – 648.

Bosma, N., Schutjens, V. and Stam, E. (2009). 'Entrepreneurship in European Regions: Implications for Public Policy'(In Leitao, J. and Baptista, R. eds. Public Policies for Fostering Entrepreneurship. International Studies in Entrepreneurship, 22, Springer. Pp. 59-87).

Bourguignon, F, and Sepulveda, C. (2009). 'Privatization in Development: Some Lessons from Experience', *Policy Research Working Paper no 5131*, The World Bank, Washington DC.

Bourguignon, F. and Sundberg, M. (2007). 'Aid Effectiveness: Opening the Black Box', *American Economic Review*, 97: 316-321.

Brar, S., Farley, S.E., Hawkins, R. and Wagner, C.S. (2011). 'Science, Technology and Innovation in Uganda', A World Bank Study. Washington DC: The World Bank.

Braunerhjelm, P. (2010). 'Entrepreneurship, Innovation and Economic Growth – Past Experience, Current Knowledge and Policy Implications', *Working Paper no. 224*, Centre of Excellence for Science and Innovation Studies (CESIS).

Braunerhjelm, P., Ács, Z.J. and Audretsch, D.B. (2010). 'The Missing Link: Knowledge Diffusion and Entrepreneurship', *Small Business Economics*, 34: 105-125.

Brückner, M. (2011). 'On the Simultaneity Problem in the Aid and Growth Debate', *Research Paper no 2011-01*, University of Adelaide.

Bruhn, M. and Zia, B. (2011). 'Stimulating Managerial Capital in Emerging Markets: The Impact of Business and Financial Literacy for Young Entrepreneurs', *Policy Research Working Paper no. 5642*. Washington DC. The World Bank.

Bulir, A., Gelb, A. and Mosley, P. (2008). 'Introduction: The Volatility of Overseas Aid', *World Development,* 36 (10): 2045-2047.

Burnside, C. And Dollar, D. (2000). 'Aid, Policies, and Growth', *American Economic Review*, 90: 847-868.

Calderon, C. and Serven, L. (2006). 'The Effects of Infrastructure Development on Growth and Income Distribution', *World Bank Working Paper WPS 3400*. Washington DC.

Carlin, W. and Seabright, P. (2009). 'Bring me Sunshine: Which Parts of the Business Climate Should Public Policy Try to Fix?', (In In Lin, J.Y. and Pleskovic, B. eds. *Private Sector and Development*. Washington DC: The World Bank. Pp. 99-146).

Castellacci, F. and J. M. Natera (2011). 'A new panel dataset for cross-country analyses of national systems, growth and development (CANA)', *Innovation and Developmen*t, 1 (2), April 2011.

Castellacci, F. and Natera, J.M. (2011). 'A New Panel Dataset for Cross-Country Analysis of National Systems, Growth and Development'*, MPRA Paper no. 28376*.

Castillo, V., Maffioli, A., Monsalvo, A.P., Rojo, S, and Stucchi, R. (2010). 'Can SME Policies Improve Firm Performance? Evidence from an Impact Evaluation in Argentina', *Working Paper OVE/WP-07/10*. Office of Evaluation and Oversight, Inter-American Development Bank.

Channell, W. (2010). 'Business Environment Reforms in Conflict-Affected Countries', International Alert Practice Note.

Chen, S., Mu, R. and Ravallion, M. (2009). 'Are there Lasting Impacts of Aid to Poor Areas?', *Journal of Public Economics*, 93: 512-528.

Coad, A. and Rao, R. (2008). 'Innovation and Firm Growth in High-Tech Sectors: A Quantile Regression Approach', *Research Policy*, 37: 633-648.

Creamer, T. (2010). 'Yearly Green Investments of $440 bn Needed to Meet Climate Target', *Engineering News*, 23 July.

Cukier, K. (2006). *Innovative Entrepreneurship and Public Policy: Hero with a Thousand Faces*. Swiss Re.

Dalgaard, C., and Erikson, L. (2009). 'Reasonable Expectations and the First Millennium Development Goal: How Much Can Aid Achieve?', *World Development*, 37 (7): 1170-1181.

Dalgaard, C., Hansen, H. and Tarp, F. (2004). 'On the Empirics of Foreign Aid and Growth', *Economic Journal*, 114:191-216.

Das, T. (2009). 'Keynote address' (In Lin, J.Y. and Pleskovic, B. eds. *Private Sector and Development*. Washington DC: The World Bank. Pp. 19-24).

Dasgupta, P. and Stiglitz, J. (1980). 'Industrial Structure and the Nature of Innovative Activity', *The Economic Journal*, 90 (358): 266-293.

De Mel, S., McKenzie, D. and Woodruff, C. (2008). 'Returns to Capital in Microenterprises: Evidence from a Field Experiment', *Quarterly Journal of Economics*, 123 (4): 1329-72.

De Soto, H. (2000). *The Mystery of Capital: Why Capitalism Triumphs in the West and Fails Everywhere Else*. New York: Basic Books.

Deaton, A. (2010). 'Instruments, Development, and Learning about Randomization', *Journal of Economic Literature*, 48: 424-455.

DFID (2008). *Competition Policy Reform, Growth and Poverty Reduction*. January. Department of International Development, London.

Djankov, S. and Murrel, P. (2002). 'Enterprise Restructuring in Transition: A Quantitative Survey', *Journal of Economic Literature*,

Djankov, S., Montalvo, J. And Reynal-Querol, M. (2008). 'The Curse of Aid', *Journal of Economic Growth*, 13: 169-194.

Dollar, D. and Kraay, A. (2002). 'Growth is Good for the Poor', *Journal of Economic Growth*, 7:195-225.

Dutz, M. and Hayri, A. (2000). 'Does more Intense Competition Lead to Higher Growth?' *Policy Research Working Paper no. 2320*, Washington DC: The World Bank.

Easterly, W. (2003). 'Can Foreign Aid Buy Growth?', *Journal of Economic Perspectives*, 17: 23-48.

Easterly, W., Levine, R. and Roodman, D. (2004). 'Aid, Policies and Growth: A Comment', *American Economic Review*, 94: 774-778.

Eurodad (2009). Procurement and Development Effectiveness: A Literature Review. *European Network on Debt and Development*. December.

Evenett, S.J. (2005). 'What is the Relationship between Competition Law and Policy and Economic Development?' (In

Evenett, S.J. (2006). 'Does the Return of Industrial Policy Pose Threat to Competition Law?', Mimeo, University of St. Gallen.

Fagerberg, J. and Srholec, M. (2008). 'National Innovation Systems, Capabilities and Economic Development', *Research Policy*, 37: 1417 – 1435.

Fagerberg, J., Srholec, M. and Knell, M. (2007). 'The Competitiveness of Nations: Why Some Countries Prosper While others Fall Behind', *World Development*, 35 (10): 1595-1620.

Faini, R. (2006). 'Foreign Aid and Fiscal Policy', *CEPR Discussion papers no. 5721*, London.

Fazio, G. (2010). *Competition and Entrepreneurship as Engines of Growth*. Ph.D Thesis, University College London.

Feeny, S. and McGillivray, M. (2006). 'Scaling-up Foreign Aid and Recipient Country Absorptive Capacity Constraints: Implications for Growth and Poverty Reductions', UNU WIDER Research Paper. Helsinki.

Felicitas Nowak-Lehmann D., Martinez-Zarzoso I., Cardozo A., Herzer, D. and Klasen, S. (2010). 'Foreign Aid and Recipient Countries' Exports: Does Aid Promote Bilateral Trade?, *Discussion Paper 206*, Ibero-America Institute for Economic Research.

Ferro, E. and Wilson, J.S. (2011). 'Foreign Aid and Business Bottlenecks: A Study of Aid Effectiveness', *Policy Research Working Paper 5546*, The World Bank.

Fischer, A.M. (2009). 'Putting Aid in its Place: Insights from Early Structuralists on Aid and Balance of Payments, and Lessons for Contemporary Debates', *Journal of International Development*, 21: 856-867.

Forss, K. and Schaumburg-Müller, H. (2009). *Synthesis of Evaluations on Support to Business Development*. Evaluation Study 2009/5. Ministry of Foreign Affairs of Denmark: Danida. October.

Freel, M.S. (2000). 'Do Small Innovating Firms Outperform Non-Innovators?', *Small Business Economics,* 14 (3): 195-209.

Freel, M.S. (2007). 'Are Small Innovators Credit Constrained?', *Small Business Economics*, 28: 23-35.

Freeman, C. (1998). 'Innovation Systems: City-State, National, Continental and Subnational', *Nota Tecnica 02/*98. IE/UFRJ. Rio de Janeiro.

Frot, E. and Santiso, J. (2010). 'Crushed Aid: Fragmentation in Sectoral Aid', *OECD Development Centre Working Paper no. 284*. Paris. OECD.

Gereffi, G., Humphrey, J. and Sturgeon, T. (2005). 'The Governance of Global Value Chains', *Review of International Political Economy*, 12 (1): 78-104.

Geroski, P. (1990). 'Innovation, Technological Opportunity, and Market Structure', *Oxford Economic Papers*, 42 (3): 586-602.

Geroski, P. A. (1990). 'Innovation, Technological Opportunity, and Market Structure', *Oxford Economic Papers,* 42 (3): 586-602.

GTZ (German Technical Cooperation) (2010). *Green Growth*. Discussion Paper. Berlin, GTZ.

Hall, B., Lotti, F. and Mairesse, J. (2009). 'Innovation and Productivity in SMEs: Empirical Evidence from Italy', *Small Business Economics*, 13 (1): 13-34.

Hall, B. and Maffioli, A. (2008). 'Evaluating the Impact of Technology Development Funds in Emerging Economies: Evidence from Latin America', *European Journal of Development Research*, 20 (2): 172-198.

Hamann, R. (2007) 'Is corporate citizenship making a difference?', *The Journal of Corporate Citizenship*, 28:15-29.

Hansen, H. and Tarp, F. (2001). 'Aid and Growth Regressions', *Journal of Development Economics*, 64: 547-570.

Hölzl, W. (2009). 'Is the R&D Behaviour of Fast-Growing SMEs Different? Evidence from CIS III Data for 16 Countries', *Small Business Economics*, 33: 59-75.

Hubbard, R.G. and Duggan, W. (2009). *The Aid Trap: Hard Truths About Ending Poverty*. New York: Columbia Business School.

IEA (International Energy Agency) (2009a). *World Energy Outlook 2009*. Paris: IEA.

Jenkins, R. (2005) 'Globalization, Corporate Social Responsibility and Poverty', *International Affairs*, 81(3):525-540.

Juma, C. and Yee-Cheong, L. (2005). *Innovation: Applying Knowledge in Development*. UN Millennium Project, Task Force on Science, Technology and Innovation. London. Earthscan.

Kannebley, S., Sekkel, J.V. and Araujo, B.C. (2010). 'Economic Performance of Brazilian Manufacturing Firms: A Counterfactual Analysis of Innovation Impacts', *Small Business Economics*, 34 (3): 339-354.

Karlan, D. and Valdivia, M. (2010). 'Teaching Entrepreneurship: Impact of Business Training on Microfinance Clients and Institutions' Mimeo, Yale University.

Kennedy, D. (2011). 'Some Caution Against Property Rights as a Recipe for Economic Development', *Accounting, Economics and Law*, 1 (1): Article 3.

KEPA (2010). *Development Cooperation Today*. Helsinki: The Finnish Service Centre for Development Cooperation. Report Series no. 112.

Killick, T. and Foster, M. (2007). 'The Macroeconomics of Doubling Aid to Africa and the Centrality of the Supply Side', *Development Policy Review*, 25 (2). 167- 192.

Klinger, B. and Schündeln, M. (2010). 'Can Entrepreneurial Activity be Taught? Quasi-Experimental Evidence from Central America', Mimeo Harvard University.

Knorringa, P. and Helmsing, A.H.J. (2008). 'Beyond an Enemy Perception: Unpacking and Engaging the Private Sector', *Development and Change*, 39 (6): 1053 – 1062.

Koellinger, P. (2008). 'Why Are Some Entrepreneurs More Innovative Than Others?', *Small Business Economics*, 31: 21-37.

Koski, H. and Pajarinen, M. (2011). 'Do Business Subsidies Facilitate Employment Growth?', *ETLA Discussion Paper 1235*, Helsinki.

Kumar, K.B., Rajan, R.G., and Zingales, L. (1999). 'What Determines Firm Size?' *Working Paper No. 7208*: NBER.

Kürz, S. and Fröde, A. eds. (2005). *Promoting the Business and Investment Climate: Experiences of German Technical Assistance*. GTZ: German Agency for Technical Cooperation.

Lensink, R. and Morrissey, O. (2000). 'Aid Instability as a Measure of Uncertainty and the Positive Impact of Aid on Growth', *Journal of Development Studies*, 36: 31-49.

Lerner, J. (2009). *Boulevard of Broken Dreams*. Princeton: Princeton University Press.

Lerner, J. (2010). 'The Future of Public Efforts to Boost Entrepreneurship and Venture Capital', *Small Business Economics*, 35: 255-264.

Lindahl, C. (2005). *Wealth of the Poor: Eliminating Poverty through Market and Private Sector Development*. Sida Studies no. 14. Stockholm.

Loayza, N. and Soto, R. (2002). *Economic Growth: Sources, Trends, and Cycles. S*antiago, Chile: Central Bank of Chile.

Lopez-Acevedo, G. And Tinajero, M. (2010). 'Mexico: Impact Evaluation of SME Programs Using Panel Firm Data', *Policy Research Working Paper 5186*, The World Bank.

Lundvall, B.A., Chaminade, J.K. and Vang, J. (2009). *Handbook on Innovation Systems and Developing Countries: Building Domestic Capabilities in a Global Setting*. Cheltenham: Edward Elgar.

Mayer-Schönberger, V. (2007). 'Schumpeterian Policy-Makers: Pro-Active Policies for Innovative Entrepreneurship' , *Hudson Institute Seminar Series, no. 07-04*.

McDaniel, B.A. (2000). 'A Survey on Entrepreneurship and Innovation', *The Social Science Journa*l, 37 (2): 277-284.

McKenzie, D. (2011). 'How Can We Learn Whether Firm Policies are Working in Africa?', *Policy Research Working Paper no. 5632*, Washington DC:The World Bank.

Michaelides, M. and Benus, J. (2011). 'Are Self-Employment Training Programmes Effective? Evidence from Project GATE', *MPRA paper no. 20883*. March.

Miller, D. and Garnsey, E. (2000). 'Entrepreneurs and Technology Diffusion: How Diffusion Research Can Benefit from a Greater Understanding of Entrepreneurship', *Technology in Society,* 22: 445-465.

Mohapatra, S., Rozelle, S. and Goodhue, R. (2007). 'The Rise of Self-employment in Rural China: Development or Distress?', *World Development*, 35(1): 163-181.

Morrissey, O. (1990). 'The Commercialization of Aid: Business Interests and the UK Aid Budget 1978-1988', *Development Policy Review*, 8 (3): 301-322.

Mugabe, J. (2009). *Knowledge and Innovation for Africa's Development: Priorities, Policies and Programmes*. Washington DC: The World Bank Institute. March.

Naudé, W.A. (2011a). *Entrepreneurship and Economic Development*. Basingstoke: Palgrave Macmillan.

Naudé, W.A. (2011b).'Entrepreneurship is not a binding constraint on economic growth and development in the poorest countries', *World Development*, 39 (1), 33-44.

Naudé, W.A., McGillivray, M. and Santos-Paulino, A.U. (2011). *Fragile States: Causes, Costs and Responses.* Oxford: Oxford University Press.

Newell, P. and Frynas, J.G. (2007) 'Beyond CSR? Business, poverty and social justice: an introduction', *Third World Quarterly* ,28(4):669-681.

North, D. (1990). *Institutional Change and Economic Performance*. New York: Cambridge University Press.

Nowak-Lehmann F. D., Martínez-Zarzoso, I., Cardozo, A., Herzer, D. and Klasen, S. (2010). Linking Foreign Aid and Recipient Countries 'Exports: Are there Differences between Regions of the Developing World? Mimeo.

OECD (2011). 'Global Value Chains: Preliminary Evidence and Policy Issues', *Discussion Paper DSTI/IND (2011)3*, Paris: Organisation for Economic Co-operation and Development.

Ojha, V.P. (2008). 'Carbon Emissions Reduction Strategies and Poverty Alleviation in India', *Environment and Development Economics*, 14:323-348.

Oosterbeek, H., Van Praag, M. and Ijsselstein, A. (2010). 'The Impact of Entrepreneurship Education on Entrepreneurship Skills and Motivation', *European Economic Review*, 54: 442-454.

Ortega-Argiles, R., Vivarelli, M. and Voigt, P. (2009). 'R&D in SMEs: A Paradox?', *Small Business Economics*, 33: 3-11.

Otieno, H., Donath, O.R. and Kiraka, R. (2009). 'Building Sustainable Business Development Services: Empirical Evidence from Kenya', *Paper presented at the Annual Conference of the International Academy of African Business and Development*.

Pflüger, M. and Russek, S. (2011). Business Conditions and Default Risks Across Countries. *IZA Discussion Paper no. 5541.*

Prieto-Carrón, M, Lund-Thomsen, P., Chan, A., Muro, A. And Bhushan C. (2006) 'Critical perspectives on CSR and development: what we know, what we don't know, and what we need to know', *International Affairs* , 82(5):977-987.

Prins, G. et al. (2010). 'The Hartwell Paper: A New Direction for Climate Policy After the Crash of 2009', *University of Oxford and London School of Economics*. Available at: http://www.lse.ac.uk/collections/mackinderProgramme/theHartwellPaper/ (accessed 6 August 2010).

Pronk, J.P. (2003). 'Aid as a Catalyst: A Rejoinder', *Development and Change*, 34 (3): 383-400.

Prowse, M. (2005). 'Aid for Trade: Enhancing Trade Capacity in Poor Countries', *ID21 Insight no. 59*. Brighton. IDS.

Rajan, R. and Subramanian, A. (2008). 'Aid and Growth: What does the Cross-Country Evidence Really Show?, *Review of Economics and Statistics*, 90: 643-665.

Rajan, R. and Subramanian, A. (2011). 'Aid, Dutch Disease and Manufacturing Growth', *Journal of Development Economics*, 94(1): 106-118.

Ravallion, M. (2001). 'Growth, Inequality and Poverty: Looking Beyond Averages', *World Development,* 29: 1803-1815.

Rijkers, B., Laderchi, C.R. and Teal, F. (2008). 'Who Benefits from Promoting Small and Medium Scale Enterprises? Some Empirical Evidence from Ethiopia', *Policy Research Working Paper no. 4629*, The World Bank.

Robson, P.J.A., Haugh, H.M. and Obeng, B.A. (2009). 'Entrepreneurship and innovation in Ghana: Enterprising Africa', *Small Business Economics*, 32 (3): 331-351.

Rochina-Barrachina, M.E., Manez, J.A. and Sanchis-Llopis, J.A. (2010). 'Process Innovations and Firm Productivity Growth', *Small Business Economics*, 34. 147-166.

Sala-I-Martin, X., Blanke, J., Hanouz, M., Geiger, T., Mia, I. And Paua, F. (2007). 'The Global Competitiveness Index: Measuring the Productive Potential of Nations' (In WEF*. The Global Competitiveness Report 2007-2008*. Palgrave McMillan, pp.3-40).

Sayer, J. (2005). 'Do More Good, Do Less Harm: Development and the Private Sector', *Development in Practice*, 15 (3): 251-268.

Schramm, C.J. (2004). 'Building Entrepreneurial Economies', *Foreign Affairs*, 83(4): 104-115.

Schramm, C.J. (2008). 'Toward an Entrepreneurial Society: Why Measurement Matters', *Innovations*, 3 – 10.

Sekkat, K. (2009). 'Does Competition Improve Productivity in Developing Countries?', *Journal of Economic Policy Reform*, 12 (2): 145-162.

Singh, A. (2002). 'Competition and Competition Policy in Emerging Markets: International and Developmental Dimensions', *G-24 Discussion Paper Series no. 18*, United Nations.

Snodgrass, D. and Biggs, T. (1996).' Industrialization and the Small Firm: Patterns and Policies'. *International Center for Economic Growth*.

Stam, E. and Nooteboom, B. (2010). 'Entrepreneurship, Innovation and institutions', *Tjalling C. Koopmans Research Institute Discussion Papers Series no. 11-03.* Utrecht School of Economics.

Stam, E. and Wennberg, K. (2010). 'The Roles of R&D in New Firm Growth', *Small Business Economics*, 33:77-89.

Stam, E., Suddle, K., Hessels, J. and Van Stel, A. (2009). 'High-Growth Entrepreneurs, Public Policies, and Economic Growth', (In Leitao, J. and Baptista, R. eds. *Public Policies for Fostering Entrepreneurship*. International Studies in Entrepreneurship, 22, Springer. Pp. 91-103).

Stam, E., Suddle, K., Hessels, J. and Van Stel, A. (2009). 'Public Policies for Fostering Entrepreneurship', *International Studies in Entrepreneurship*, 22: 91-110.

Shane, S. (2009). 'Why Encouraging More People to Become Entrepreneurs is Bad Public Policy', *Small Business Economics*, 33.141-149.

Szirmai, A., Naudé, W.A. and Goedhuys, M. (2011). *Entrepreneurship, Innovation, and Economic Development*. Oxford: Oxford University Press.

Tan-Mullins, M., Mohan, G. And Power, M. (2010). 'Redefining Aid in the China-Africa context', *Development and Change*, 41 (5): 857-881.

Taymaz, E. and Ocdogruk, Y. (2009). 'Overcoming The Double Hurdles to Investing in Technology: R&D activities of Small Firms in Developing Countries', *Small Business Economics*, 33: 109-128.

Temple, J. (2010). 'Aid and Conditionality' (In *Handbook of Development Economics*, Vol V. Pp. 4416-4522).

Teruel, M. and de Wit, G. (2011). 'Determinants of High-Growth Firms: Why Have Some Countries More High-Growth Firms than Others?', *EIM Research Report H201107*, Zoetermeer.

UNCTAD (United Nations Conference on Trade and Development) (2007). *The Least Developed Countries Report 2007*. Geneva: UNCTAD.

UNDP (United Nations Development Programme) (2001). *Making New Technologies Work for Human Development*. Human Development Report 2001. New York: Oxford University Press.

UNDP (United Nations Development Programme) (2004). *Unleashing Entrepreneurship: Making Business Work for the Poor*. Commission on the Private-Sector and Development. New York: UNDP.

USAID (2010). *Celebrate, Innovate and Sustain: Toward 2015 and Beyond*. The United States' Strategy for Meeting the Millennium Development Goals.

Utting, P. (2005) 'Corporate responsibility and the movement of business', *Development in Practice,* 15(3):375-388.

Van Praag, M.C. and Versloot, P.H. (2007). 'What is the Value of Entrepreneurship? A Review of Recent Research', *Small Business Economics*, 29: 351-382.

Van Praag, M.C. and Versloot, P.H. (2008). 'The Economic Benefits and Costs of Entrepreneurship: A Review of the Research', *Foundations and Trends in Entrepreneurship Research,* 4: 65-154.

Villanger; E. and Morten-Jerve A. (2009). 'Assessing aid impact: a review of Norwegian evaluation practice', *Journal of Development Effectiveness*, 1 (2): 171 – 194.

Volpe, C. and Caballo, J. (2008). 'Is Export Promotion Effective in Developing Countries? Firm-Level Evidence on the Intensive and Extensive Margin of Exports', *Journal of International Economics*, 76: 86-106.

WBCSD (World Business Council for Sustainable Development) (2010). *Adaptation: an Issue brief for Business*.

Williams, L.K. and McGuire, S.J. (2010). 'Economic Creativity and Innovation Implementation: The Entrepreneurial Drivers of Growth?', *Small Business Economics*, 3 (4): 391-409.

White, H. (2011). 'An Introduction to the Use of Randomized Control Trails to Evaluate Development Interventions', *Working Paper no.* 9, International Initiative for Impact Evaluation.

Whittle, D. (2010). 'Innovation and Foreign Aid', *The Huffington Post*, 9 February. Accessed at http://www.huffingtonpost.com/dennis-whittle/innovation-and-foreign-ai_b_455300.html?view=print

Wong, P.K., Ho, Y.P. and Autio, E. (2005). 'Entrepreneurship, Innovation and Economic Growth. Evidence from GEM Data', *Small Business Economics*, 24: 335-50.

Wong, P.K., Lee, L. and Foo, M.D. (2008). 'Occupational Choice: The Influence of Product vs Process Innovation', *Small Business Economics*, 30 (3): 267-282.

World Bank (2002). *Private Sector Development Strategy: Directions for the World Bank Group*. Washington DC: The World Bank.

World Bank (1998). *Knowledge for Development: World Development Report 1998/99*. New York. Oxford University Press.

Zandniapour, L., Sebstad, J- and Snodgrass, D. (2004). 'Review of Impact Assessments of Selected Enterprise Development Projects. *USAID/EGAT Accelerated Microenterprise Advancement Project. Micro-report no. 3*. Washington DC: USAID.