

Barriers to innovation in smes in africa economics essay



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In today's changing environment, where competition is increasing in almost all areas of business, the need for change and innovations has probably never been greater (Tidd, Bessant & Pavitt, 2005). Although innovation is a risky and uncertain process which could make it seem reasonable not to innovate, an approach of doing nothing is seldom an option. In reality, if firms are not ready to continuously renew their products and processes, their chances of survival are seriously threatened (Tidd et al., 2005).

Survival is of course not the only incentive to innovate. Research confirms that innovative firms, i. e. firms that are able to use an innovation process within the organization to improve their processes, or to differentiate their products and services, outperform their competitors in regards to market share, profitability and growth (Tidd et al., 2005). Geroski, Machin and Van Reenen (1993) and Geroski and Machin (1993) conducted research on innovation, profitability and growth and found that innovative firms report higher profits and growth compared to non-innovative firms. While the reported profits and growth figures are not substantially higher than the figures of non-innovative firms, they found that innovation has spill-over effects granting firms which buy the innovations, higher growth rates as well (Geroski et al., 1993). Similar results have been confirmed by Vincent, Bharadwaj and Challagalla (2004), whose overall findings indicated that innovation is both significantly and positively related to "superior performance". Comparable studies have been conducted on SMEs, where Hoogstraaten (2005), among others, could confirm that innovative firms grow faster and have higher turnover compared to non-innovative firms.

Research shows that innovation can offer great advantages. Furthermore, innovation is not limited to a specific group of companies, such as large, high-tech manufacturing companies. On the contrary, the need to innovate is universal, no matter size, sector or technological sophistication (Cobbenhagen, 2000). The change in the economy, from a manufacturing-driven towards a more service, design and information driven economy, requires SMEs to increase their flexibility, adaptability and innovative ability (Jones & Tilley, 2003).

1. 2 Research Problem

Several statistical studies have highlighted competence and financial barriers which impede innovation activities in SMEs. A large amount of SMEs face certain limitations to engage in innovations, as they for instance either lack sufficiently qualified personnel in-house or experience a shortage of marketing capabilities to efficiently market new products and processes (Vinnova, 2007; Tiwari & Buse, 2007). A report by the Shannon Development Company in Ireland in 2009 stated that “ Lack of both finance and internal expertise are critical barriers to innovation”.

At the same time there are many studies indicating the importance of qualified personnel, skills, competence and HRM for the success of innovations. Baldwin (1999) later found that successful, innovative firms have developed competencies in wide areas of their respective businesses and that they place high emphasis on formal training in order to acquire new skills. The last result is supported by Freel (2004); “ More innovative firms, train more staff”.

In the light of the above mentioned researches, the author of this paper found these particular problems of finance and competence very interesting. As innovation is a necessary part of today's business, firms need to actively adapt and change in order to survive (Trott, 2008). Thus, it is the author's hope that by analyzing different financial and competence barriers which limit or impede innovation activities in SMEs in Africa, a better understanding and insight of this problem and its consequences could be provided.

1. 3 Research Questions

How are competence barriers in innovation experienced by SMEs in Africa?

In what ways do SMEs in Africa experience financial barriers to innovation?

What consequences do these SMEs encounter as a result of facing competence and financial barriers to innovation?

1. 4 Research Objectives

The purpose of this research paper is to examine the financial and competence barriers to innovation within SMEs in Africa and the consequences these barriers may result in.

2. 0 LITERATURE REVIEW

2. 1 Connecting SMEs to Innovations

Small and medium-sized enterprises (SMEs): the definition divided SMEs into three different sizes; micro, small and medium. A micro enterprise consists of less than ten employees with an annual turnover less than €2 million, a small enterprise has less than 50 employees and an annual turnover of less than €10 million and a medium-sized enterprise conduct their business with less

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than 250 employees and an annual turnover less than €50 million. An enterprise was here defined as “ any entity engaged in an economic activity, irrespective of its legal form” (The European Commission, 2005). Vahs and Burmester (1999) defines innovation as the purposeful implementation of new technical, economical, organizational and social problem solutions, that are oriented to achieve the company objectives in a new way (cited in Sauber & Tschirky, 2006).

SMEs have since the Bolton Report in 1971 been widely recognized for their contribution to the economic growth and job creation (Jones & Tilley, 2003). In 2005, roughly 23 million SMEs existed, providing 75 million jobs and represented 99% of all enterprises within the European Union (The European Commission, 2005). Although SMEs represent a major share in GDP, it is believed that many of these smaller organizations lack managerial and technical skills, which inhibit their effectiveness. Improving these skills within SMEs is therefore very important, not only for the enterprises but for an economy as a whole (Jones & Tilley, 2003). Research has shown that innovation, just as in large firms, is very important in SMEs (Cobbenhagen, 2000). Tidd et al. (2005) argued that SMEs share similarities with large firms concerning innovation; however, there are also differences. Although SMEs and large firms often have the same objectives, such as to develop and combine technological and other competencies to supply goods and services that are superior to competition, there are also differences concerning their respective organizations and technology. SMEs often have structural advantages including ease of communication and speed of decision-making. However, they also experience technological weaknesses, such as inability to

develop and manage complex systems and to fund long-term and risky programs (Tidd et al., 2005). When reviewing innovation activities among SMEs in Sweden, a recent study from Vinnova (2007) showed that among small enterprises with 10 to 49 employees in the metal manufacturing industry, 39% of the firms engaged in innovation activities and 31% conducted R&D. Among this group of companies, 20% reported a shortage of qualified personnel as a high impediment to innovation.

2. 2 Barriers to Innovations in SMEs

Relatively large volumes of previous research have taken a closer look at the problems of innovation in SMEs. These were done by different researchers around the world at different times; this research paper explores a few of them which have been summarized in Table 1 below;

Table 1: Barriers to Innovations in Small and Medium-sized Enterprises

Barriers to Innovations in SMEs

Authors

Competence barriers

Shortage of qualified personnel for innovation projects.

Lack of marketing capability to market new or significantly improved products.

Lack of information on technology relevant for innovation projects.

Kleinknecht, 1989

Ylinenpää, 1997

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Mohnen & Rosa, 1999

Freel, 1999

Kaufmann & Tödtling, 2002

Tourigny & Le, 2004

SCB, 2006

Vinnova, 2007

Tiwari & Buse, 2007

Financial barriers

High costs of innovation projects.

Lack of internal and external financing for innovation projects.

Difficulty of predicting the costs of innovation.

Organizational barriers

Internal resistance to innovation.

Organizational rigidities which impede innovation projects.

Risk barriers

High risk related to the feasibility of innovation projects.

High risk related to successful marketing of the innovation.

Innovation is easily copied by others.

Legal barriers

Legislation and regulation having an impact on innovation projects.

Source: Author's compilations

The four most frequently reported innovation barriers stated by SMEs are related to financing, high costs, time and shortage of qualified personnel for innovation projects (SCB, 2006; Vinnova, 2007; Statistics Canada, cited in Tourigny & Le, 2004). A number of studies which have provided more detailed analysis in the subject have also been reviewed. Among others; Kaufmann and Tödtling (2002), Kleinknecht (1989) and Freel (1999) found that the two most common barriers to innovation are the financial aspect; i. e. lack of capital and too high risk associated with innovation projects, and the lack of manpower; i. e. shortage of qualified personnel and lack of time for innovation activities. While the financial aspect is common in both large and small firms, it is the lack of manpower that is more frequent in SMEs (Kaufmann & Tödtling, 2002).

2. 3 Competence barriers to Innovation in SMEs

Numerous statistical studies have highlighted competence barriers to innovation which impede innovation activities in SMEs. A large amount of SMEs experience a certain limitation to engage in innovation, as they for instance either lack sufficiently qualified personnel in house or lack marketing capabilities to efficiently market new products and processes (Vinnova, 2007; SCB, 2006; and Tourigny & Le, 2004). SCB (2006) provided descriptive statistics on innovation barriers in Sweden between 2004 and 2006. They separated the answers into two groups, firms that engage in

innovation and firms that do not. Out of the small enterprises within the manufacturing industry with 10- 49 employees which engaged in innovation, 16% reported a scarcity of competent personnel as a high barrier to their innovation activities. Among the same group of firms which did not engage in innovation, 11% experienced a shortage of qualified personnel as a high barrier to innovation activities. Lack of information about technology and lack of information about the market were also reported by the two groups, however, the percentage of firms indicating these barriers were smaller, with 5% and 4% respectively for innovative firms, and 2% respectively for non-innovative firms (SCB, 2006). A similar survey carried out in South Africa shows that, more than a quarter (26%) of all enterprises indicated that the development of innovative activities within their enterprises were hampered or restrained because the market was already dominated by established enterprises. Lack of qualified personnel was seen as a highly important factor by 17 % of enterprises (South African Innovation Survey, 2005).

Vinnova (2007) conducted a similar survey and found that 20% of Swedish SMEs, that believed R&D to be crucial for the future of the firm, considered a shortage of qualified personnel as a high barrier to innovation. When the answers were aggregated with another group of firms that consider a shortage of qualified personnel as a moderate barrier to innovation, that percentage increased to 61% (Vinnova, 2007). While Vinnova (2007) and SCB (2006) are descriptive statistics, other researchers have delved deeper into the problem of competence barriers to innovation and tried to explain the variables behind SMEs' perceptions. Ylinenpää (1997) conducted research on 212 Swedish SMEs, investigating the perceived barriers to

innovation. He found that there was a difference regarding perceived barriers depending on firm performance and innovativeness. In general, less innovative and low-performing firms perceived higher barriers to innovation compared to high-performing and more innovative firms. What is slightly surprising, however, is that Ylinenpää's findings deviate from SCB's (2006) statistics where non-innovative firms in general did not perceive barriers as strong compared to innovative firms. The theory that innovative firms face higher barriers to innovation are also supported by Mohnen and Rosa (1999) and Tourigny and Le (2004). Ylinenpää (1997) only found one innovation barrier related to competence to be a strong barrier to innovation. All other barriers relating to competence were still considered moderate barriers, ranging between 2.9 to 3.3 on a 5 graded scale. He identified seven innovation barriers related to competence, the list follows in a descending order of seriousness; (1) cost of utilizing external competence, (2) insufficient own marketing competence, (3) difficulties to find external competence, (4) lack of market research, (5) insufficient own technical competence, (6) lack of information about technical development, and (7) inadequate knowledge of EU regulations.

Mohnen and Rosa (1999) also studied innovation barriers; however, the study was conducted in Canada and did not exclusively focus on SMEs. Still, more than 80% of the researched firms were SMEs. They carried out a statistical analysis on secondary data which were originally collected by Statistics Canada in 1999. The study focused on service companies from the financial, technical and communication sector. They found that the perception of innovation barriers is dependent on several factors. The

variables which they investigated were; “ industry affiliation, the size of firms, the perceived competitive environment and whether or not firms engaged in R&D”. Since Mohnen and Rosa’s (1999) study focused exclusively on firms defined as innovative, they included R&D as an independent variable to make further distinctions in their populations. Among the different innovation barriers perceived by SMEs, one can be linked to competence, shortage of qualified staff for innovation projects. This particular impediment was perceived the highest in the technical sector, however, the significance of this barrier also dropped as the firm size increased. They also discovered that the innovation barrier, a shortage of qualified staff for innovation projects, in general was perceived higher by firms that conducted R&D. This was also the case for firms facing a higher degree of competition. The more competitive the environment, the stronger the innovation barriers were perceived. Another Canadian study on innovation barriers was conducted by Tourigny and Le (2004). They also based their research on secondary data acquired by Statistics Canada, where the majority of the surveyed firms were of small and medium size. The innovation barriers analyzed in their study were, in a descending order of seriousness; (1) lack of skilled personnel to develop or introduce new or significantly improved products or processes (39%), (2) lack of marketing capability to market new or significantly improved products (18%), (3) lack of information on technology relevant to the development or introduction of new or significantly improved products or processes (15%), (4) lack of access to expertise in universities that could assist in developing or introducing new or significantly improved products or processes (5%), and (5) lack of access to expertise in government laboratories that could assist in developing or

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introducing new or significantly improved products or processes (5%). The percentage numbers in the brackets represent the number of firms which indicated that particular barrier as a high impediment to innovation. In their analysis, Tourigny and Le (2004) tested six groups of variables influencing the perception of innovation barriers. The groups for the variables were; technology intensity, novelty of innovation, location, impact of government support programs, competitive environment, and firm size. Their findings are consistent with Mohnen and Rosa (1999) and Ylinenpää (1997) that impediments to innovation vary depending on different firm characteristics. Firms that operate in high technology industries and firms that experience higher competition also perceive higher barriers to innovation. The perception of innovation barriers also vary depending on the location of firms, whether or not firms are novel innovators, if firms apply for government support and also which government support packages they apply for. The impediments to innovation also differ depending on firm size. Tourigny and Le (2004) conclude that innovation barriers, although perceived strong by many firms, can still be overcome.

2. 4 Financial barriers to Innovation in SMEs

Financing innovation and small and medium businesses requires a funding system that sustains entrepreneurship and drives job creation. Venture capital is an important part of such a framework, but not the only one, as it finances only a very small fraction of businesses. It will remain the preserve of companies that have the potential to grow into large firms and provide investors with adequate returns. A Euro-barometer Survey of 2005 shows that 79% of small- and medium-sized enterprises (SMEs) use bank loans to

finance their operations, while only 2% use venture capital (European Commission, 2005). In fact the most familiar form of external financing to startup a business remains bank financing. Clearly, a well performing financing system provides both types (i. e. risk capital and bank financing) and would include an efficient loan guarantee system to complement bank lending. Young innovative companies play a crucial role in bringing new technologies to the market in sectors such as biotechnology and information technology. They account for a large part of European innovation and growth. Since innovation involves risk, this has to be reflected in the potential rewards for financiers. Venture capital is the most appropriate form of financing innovation, as it can provide investors with the potential profits that they deem are required to assume the risks involved. In an economic recession it is generally more difficult to find the appropriate financing as lenders and investors reassess potential risks. In particular, venture capital is a cyclical form of financing and can suffer in an economic downturn. A recent study mandated by the Commission shows that venture capital has the longest cyclicity of the various forms of SME financing (European Commission, 2009).

An important problem in the managing of technology is the financing of technological development and innovation. Even in large firms, technology managers or supervisors often state that they have more projects they would like to embark on than funds to spend on them (Peeters and van Pottelsberghe, 2003). There are a number of reasons for this phenomenon: low expected returns caused by the inability to capture all the profits from an invention, the uncertainty and risk associated with the project, and over-

optimism on the side of managers. Economists have long held the view that innovative activities are difficult to finance in a freely competitive market place. A study carried out by (Lim and Shyamala, 2007) on Malaysian manufacturing firms show that ‘Lack of appropriate sources of finance’ was cited as being of high importance by about 29 per cent of the firms and not relevant by about 23 per cent of them. Consistent with other two obstacles, ‘lack of appropriate sources of finance’ was of greater relevance to Innovators than Non-Innovators. The proportion of firms citing this obstacle as ‘not relevant’ was lower among Innovators (17.3%) than Non-Innovators (29.5%). It was nevertheless of greater importance to Non-Innovators than Innovators. About 43 per cent of Non-Innovators cited this obstacle as being of ‘high’ importance compared to about 19 per cent of Innovators. Clearly, the cost of financing is a major issue. Indeed more than 75 per cent of all firms found costs of innovation to be of ‘high’ or of ‘medium’ importance. Firms that face high costs of innovation may not be able to complete their innovation project within the original budget allocation (Lim and Shyamala, 2007). On the other hand, a study in Canada reveals that set up costs, rather than the running costs, are of greater concern for those that intend to engage in innovation activities (CSLS, 2005). Both economic risks and lack of financing were next most often cited as being of ‘high’ and of ‘medium’ importance. Of the 40 firms that reported lack of financing as a highly important obstacle, over 98 per cent were of small- and medium-sized firms. These findings are consistent with the findings of Baldwin and Lin (2001) who in their study of impediments to advance technology adoption found cost-related problems being the most frequently reported by the Canadian manufacturing firms. It is also interesting to note that the proportions of

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Innovator firms which found these obstacles irrelevant were lower than that for Non-Innovator firms, but that the proportions of Non-Innovators which cited these as being of ' high' importance were higher than those for Innovators. That is, more Non-Innovators perceived innovation activities exert higher economic risks and faced more financing issues than Innovators. This may be one reason why the majority of Non-Innovators did not initiate their innovation projects.

The lack of financial resources hinders many SMEs from initiating or – even worse – completing their innovative ideas. Financial constraints as a barrier to innovation in German SMEs were just confirmed by DIHK in 2007. They found out that SMEs have problems to acquire loans because financial institutions are often reluctant to (co-) finance risky innovation projects (DIHK, 2007). Another financial constraint refers to the already stated problem of getting access to public funding for innovative ideas. According to DIHK (2007) German SMES complained about non-transparency caused by a large number of local, national and EU programs and the bureaucratic application procedures associated with them. Further, it was pointed out that innovation projects must be delayed owing to regulatory reasons until the application has been approved. However bureaucracy is not the only problem while seeking access to public financial support. German SMEs complained about the need for lobbying especially in high technology industries to get any realistic chance of funding. However due to limited resources SMEs, in contrast to larger ones, rarely have the chance to establish the relationships “ needed”; see DIHK (2007).

3. 0 INNOVATION BARRIERS IN AFRICAN SMEs

Many companies in Africa though have challenges; they have growth in recent years to face even more challenges in the face of globalization where firms from advanced countries have developed more innovative ways of production, packaging, providing services and distribution channels all powered by the spirit and engine of “ innovation”. Africa on the other hand, is relatively said to be lacking behind in innovation. This paper specifically discusses the challenges of Africa’s innovation relating to competence and financing.

3. 1 Competence challenges in African SMEs

Small and Medium-sized enterprises in Africa are not able to innovate because they lack the necessary qualified employees or staff who will lead the innovation process and its management. Lack of competence picks the form of scarcity of executive know-how to effectively and efficiently manage innovation processes within the companies. Qualified marketing personnel who will market the innovative ideas and capacity are difficult to find if there are any. One strong reason is attributed to the educational systems in most African countries, which are more theoretical oriented than practical, meaning there is a great gap between educational institutions’ curriculum and the practical know-how required by industry and the SMEs. Students graduate from universities (tertiary-level) but have little if not any technical skills required for the jobs they are applying for. The worse part of the issue is the students in the science and technology field in Africa are the poorly trained or educated students due to lack of infrastructure, qualified teachers, inadequate laboratories and no appropriate industry for attachments or

internships. This is confirmed by a remark made by a Ghanaian government spokesman who said that “ quality of education in many Ghanaian schools is insufficient to impart sustainable literacy and knowledge, skills and habits required for full social and economic participation in society” (Quarcoo 1997, p. 71). For example in Ghana, students from the Junior High School and Senior High School who could not make it to the next level that is Senior High School and the Universities respectively due to their “ low grades” are sent to the Vocational and Technical Institutes, except a few. The few African science students who find themselves in the technologically oriented universities such Kwame Nkrumah University of Science & Technology in Ghana, Federal University of Technology-Akure in Nigeria, Jomo Kenyatta University of Agriculture & Technology in Kenya just to mention a few, finds it difficult to be absorbed into the industrial sector related to their field of study. Many of them find themselves in the banking sector which has become a phenomenon in recent years in Africa predominantly Sub-Saharan West Africa. This is literally to say that, you enter a bank only to find out that the Chemistry or Biochemistry trained graduate is the one behind the counting machine.

Another way by which SMEs experience competence barrier is the inexperience staff in charge of innovation and R&D. Most innovations around the world are as a result of the fact that the staffs have acquired tacit knowledge due to long-term services at their workplaces especially, incremental innovations. Africa in this case is different in the sense that either the technical employees do not work long in enough to acquire this skill or the companies do not last long in enough for employees to get this

experience. Besides, business entities lack the marketing competence, lack of market research and the inability to find external competence in order to innovate. Finally on competence, “ One of the barriers to Africa’s engagement with wider applications of biotechnology is the inadequate number of African scientists and technicians with skills in such specialized areas as molecular biology, biochemistry and bioinformatics. African countries have not invested adequately in the creation and/or mobilization of scientific and technical skills in the new biosciences. Most of Africa has recorded declining enrolments in science, engineering and technical courses at universities and higher education institutions. Participation of women in science and engineering is even lower. While women should play a major role in the development and application of modern biotechnology for Africa’s socio-economic transformation, they constitute a relatively small number of the total population of scientists and engineers” (NEPAD, 2006, p. 44).

3. 2 Financial challenges in African SMEs

The author also took a closer look at the ways by which SMEs in Africa face financial barriers in innovations. With respect to finance, the high cost of innovation projects is one of the major barriers to innovations in Africa. The relatively low annual turnover of SMEs compared to large firms, makes it almost impossible for SMEs to consider innovation as they find it extremely costly. Another factor is the lack of internally generated finance for innovation as well as external sourcing of funds to support projects on innovation. “ The lack of financing for technological innovation is a real challenge that confronts developing countries. A large part of the problem is the absence of convincing innovation policies that can be used to leverage

donor assistance. But even where such policies exist, faulty though they may be, donors have generally paid little attention to the role of technological innovation in development. Developing countries have had to accept questionable approaches, such as “appropriate technology,” that have tended to focus more on the scale of the technology and less on the dynamics of the challenges developing countries face” (UN Millennium Project, 2005, p. 72).

Another serious point is what most researchers refer to as the underdeveloped financial systems of Africa. UN report puts it this way “Banks and financial institutions can play an important role in fostering technological innovation. However, their record in this field in developing countries has been poor. There is a need to reform some of the banking and financial institutions in these countries so that they can play a role in promoting technological innovation. Such reforms should be part of a larger set of policies, incentives, and strategies aimed at funding innovation” (UN Millennium Project, 2005, p. 107). As innovation well executed leads to the betterment of a firm in terms of profitability, growth and so on, in like manner, when a firm cannot innovate at all or as required due to financial and competence as stated in this write-up, then it is bound to face some consequences as a result.

Studies such as SARUA (2008) generated estimates of public expenditure on R&D of some SADC countries. These show that none of the countries expends at least 1 percent of its GDP on R&D. According UNESCO (2007), R&D intensity in Sub-Saharan Africa (excluding South Africa) is less than 0.3 percent.

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Table 2 below provides an overview of public R&D expenditure in some Sub-Saharan African countries. It is based on different sources and different years.

Table 2: Public Expenditure on R&D as a percentage of GDP

Countries

Percentage of GDP on R&D

Botswana

DRC

Ghana

Lesotho

Madagascar

Mauritius

Mozambique

Seychelles

South Africa

Tanzania

Uganda

Zambia

0. 4% (2005)

0. 5% (2005)

0. 3% (2007)

0. 1% (2004)

0. 2% (2005)

0. 5% (2005)

0. 2% (2002)

0. 4% (2005)

0. 9% (2005)

0. 35% (2005)

0. 2% (2005)

0. 0% (2005)

Sources: SARUA (2008), UNESCO (2007) Ghana's Science and Technology Profile; and UNESCO

Institute for Statistics <http://stats.uis.unesco.org/>

It is important to note that for most African countries data on public expenditure on R&D is not disaggregated enough to tell us much about the relevance, quality and effectiveness of research projects or activities that get

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funded. It is also too aggregated and it is not easy to discern how resources are allocated across R&D areas. However, there is a general observation that the limited expenditure on R&D to a large extent is on small research projects and staff salaries in the institutes. In many countries a very small portion of the R&D expenditure is directed to building or improving infrastructure such as laboratories and buying international journals for libraries. Institutional arrangements for funding public R&D in the Sub-Saharan countries vary from one country to another. Most of the Sub-Saharan countries do not have active funding agencies and tend to allocate R&D funding in the operational budgets of sectoral ministries and departments. Countries that have dedicated R&D funding agencies or are in the process of establishing such institutions include South Africa (the National Research Foundation), Ghana (Science, Technology and Research Endowment Fund established in 2008), Zambia (Science and Technology Development Fund established