Entrepreneurship, Innovation and Firm Performance: An Empirical Study of Micro and Small Enterprises in Nairobi, Kenya

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A thesis submitted to the
University of Birmingham
for the degree of
DOCTOR OF PHILOSOPHY

Birmingham Business School
University of Birmingham
September 2012

ABSTRACT

The spectacular ubiquity of micro and small enterprises (MSEs) in developing countries suggests high levels of entrepreneurship, while the artistic variety of their products implies high creativity and innovation. In spite of such entrepreneurial verve, MSEs in developing countries return low productivity and stunted growth. Towards understanding this paradoxical phenomenon, this thesis proffers the following:

Firstly, given the prodigious nature of the entrepreneurship concept, the small firm is conceptualised as an instance of entrepreneurship. In turn, a more exacting specification of particular elements of small firms, for example, precise productivity and growth determinants, is advocated. Secondly, to elucidate the link between innovation and growth, this thesis avers that innovation inputs, such as investments in research and development, should be conceptually distinguished from observed 'novation'. The later is termed *enovation.* As such, *product enovation,* such as that characterising artisanal firms, may be observed independent of R&D inputs.

Espousing these conceptualisations, this thesis conducts an empirical study of the effect of *product enovation* on firm productivity and employment growth amongst garment-making micro and small firms in Nairobi, Kenya. The findings suggest that while innovation efforts (R&D) is a significant driver of productivity, *product enovation* in itself has no impact on firm performance.

Dedication

To my beloved parents, John Mwaura Mbugua and Margaret Wanjiru Mwaura,

for their sacrifice, dedication and love has taken me to academic heights they never themselves reached,

And to their children and grandchildren,

for any attainment only but raises the bar anew

Acknowledgements

I would like acknowledge with much gratitude the financial assistance I received from the Birmingham Business School and the Overseas Research Students Awards Scheme to undertake this PhD study. In particular, I would like to appreciate the support I received from Prof. Roger Sugden, Dr. Davide Parrilli, Prof. Stan Siebert, Prof. Robert Cressy and Marleen Vanstockem towards securing the funding. I would also like to thank Prof. Robert Cressy separately for his kindness and professionalism in the early stages of my PhD.

Certainly, this PhD would not have taken the shape it has were it not for my supervisor Dr. Lisa De Propris and her exceptional support throughout. I highly appreciate her patience and keenness, availability and encouragement, thoroughness and geniality, critique and counsel. As a doctoral student who sometimes wallowed in ethereality, to have Lisa's steady guidance, professional dedication and scholarly acumen, all expertly balanced with earnest liberty to explore and develop my ideas, was a propitious blessing. I also appreciate that she came along to my fieldwork in Nairobi, Kenya so she could fully understand the context. The numerous research and teaching opportunities she ever so kindly afforded me have also helped broaden my doctoral experience and am grateful for that too.

May I also thank Dr. Randolph Bruno for his timely assistance with the empirical part of my thesis. His valuable pointers, sharp critique, and friendliness were quite instrumental during my data analyses. I have gained a lot from my interactions with Randolph, even the tenacity to hold my own, and I thank him for that. I also appreciate the opportunity to teach on three of his modules and for the involvement in the planning of a research project. I am sure the experience will come in handy in my future career.

Professor Ajit Singh has also had a considerable impact on my PhD and I thank him for the opportunity to interact with him, in Birmingham and in Cambridge, and to draw from his wealth of knowledge and his connections first hand. His enduring enthusiasm, in spite of age and illness, is highly inspirational and his scholarly verve is infectious.

I am also verily grateful to Professor Stan Siebert for he has been an absolute pillar for me here in Birmingham. From being my personal tutor in my masters days to help with solving a miscellany of issues to loads of teaching opportunities. Most of all, I would like to thank Stan for the many Tuesday afternoons I would meet him to bounce some raw ideas off him, being the ultimate sceptic. This gave me the confidence to explore them in earnest and I appreciate his vital contribution.

I would also like to thank the Managerial Economics group and the larger Management Department at the Birmingham Business School. In particular, I would like to thank Prof. Mary O'Mahony, Dr. Fiona Carmichael, Prof. Paul Edwards, Dr. Paolo Di Martino and Dr. Paul Lewis for their valuable comments on my research and the additional insights gained or evoked while tutoring on their modules. Thanks also to Dr. Fei Peng, Dr. Priit Vahter and Dr. Georgios Efthyvoulou for their comments at the department seminar series and other informal interactions.

During my data collection in Nairobi, I had the privilege of obtaining a Research Associate position at the Institute for Development Studies (IDS), University of Nairobi. I would like to thank Prof. Mohamud Jama, the Director of IDS, for that opportunity. I would also like to express my profound appreciation for the assistance I obtained from Prof. Dorothy McCormick, Isabel Munandi, Dr. Paul Kamau and Dr. Mary Kinyanjui in terms of connections and advice on data collection in Kenya. Prof. McCormick also shared with me data and questionnaires from past research which would have been quite arduous on her part to retrieve and prepare. I highly appreciate her contributions. I also learnt a lot from my intellectual interactions with the IDS faculty and the opportunities to attend the department's seminars and symposia. May I also thank Harriet, Josephine, Judy, Mr. Njenga and all the other IDS staff who helped me a lot with administrative and other issues while in Nairobi.

I can never thank enough all my respondents in Nairobi. When many outrightly rebuffed our approaches, I gained a lot of confidence and encouragement from my numerous wonderful respondents who generously took hours out of their businesses to answer my elaborate questionnaire and even volunteer extra information and insights that have really enriched my doctoral study. I hope to be able to share my findings with them so they can also gain from their own contributions. I am also greatly indebted to my research assistants in Nairobi who came in handy when the task almost got overwhelming for me. Dennis Ndirangu, Caroline Gatimu, Tom and Humphrey all contributed immensely in various ways. Many thanks also to Eliud Moyi and Dr. Moses Ikiara of the Kenya Institute for Public Policy Research and Analysis (KIPPRA) for providing me with the RPED data. Mr Francis Rotich at the Exports Processing Zones Authority and Mr. Fred Kariuki of the Kenya Association of Manufacturers also provided vital contacts and pointers. Kimamo Nyawira also helped in countless ways and I thank her.

I would like to also thank all my teachers who have progressively instilled me with knowledge and perhaps also sparked the inquisitive predisposition that drove me to the PhD and sustained my interest and effort in the uphill PhD battle. I also thank my friends and former housemates Jack, Michael, Jesse and David for the numerous insightful debates we have had about our studies. I enjoyed the exchanges and the company and I wish them every success in their own PhDs and other academic pursuits. Prof. Kamaara of Moi University, thank you for a lot more than I could list. Nancy Cariah and Mwamvita Sollo have been hapless witnesses of my endless ramblings and grumbles in the last month of my PhD. My PhD colleagues, many in the same last lap as myself, have also been perpetual wells of encouragement. In particular, I would like to thank my 'cellmate', Qingwei Meng for his camaraderie and kindness, and for answering many random statistics questions. I also thank Rose Narooz, Nora Ramadhan, Katie Park, Maria and Yeshika for their comradeship, especially in departmental presentations and colloquia. Also Gratien, Doga, Vima and Philippe for their sometimes useful distractions. Paul, Eric, Zakeer, Jose and Vaughn from IDD as well.

Many thanks also to Marleen Vanstockem, Beverly Slater-Harris and Tamara Glenn at the PhD admin office. My PhD experience has greatly benefited from having the ever cheerful and caring Marleen and Bev always at hand providing information and helping sort out various issues expeditiously. Many thanks also to Libby Robotham and other Business School members of staff, as well as the IT department and Library staff. My deepest thanks to my parents John and Margaret Mwaura, my sisters Hannah and Beatrice, my brothers Timothy and Muchai, nephews Nicholas and Jimmy, niece Njeri and my grandmas Ruth and Teresia for bearing with my endless absence and for supporting me with love, inspiration and a host of other priceless ways. And of course some pricey ways – like eating away at my parents' bank accounts well beyond my childhood!

And to my beloved Elizabeth, I appreciate all your love and encouragement and care. I thank you for always being there with patience, warm cheerfulness and a hearty welcome, even when I come home late and listless. The prospect of a fuller life beyond the PhD, complete with heavenly bundles, has been a major spring of energy especially in the last lap.

Many thanks too to my viva committee including my examiners Professor Mark Hart and Professor Mary O'Mahony, and Professor Stan Siebert who chaired the session, for a healthy dissection of my thesis and of course for awarding me the PhD qualification.

Anyone else I have missed, I thank you. And lastly, I thank God, not for the residual, but for the whole; always.

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1 INTRODUCTION

Despite the creativity and diligence of many developing-country entrepreneurs, few of their firms will ever experience substantial growth - Simeon Nichter and Lara Goldmark, 2009

1.1 Motivation, objectives and research questions

'Am telling you it's like Walmart', observed, in wonderment, a young American missionary visiting a market in Tanzania, 'if they don't have it here, you don't need it'. (…) 'thousands of items are sold by hundreds of vendors every day. It's insanely busy and there are strange and interesting things at every turn'.[1]

If the variety of ingenious products and the bustling buying and selling is analogous to Walmart, why is the performance of the pertinent firms hardly comparable to that of Walmart? Why don't such entrepreneurial marvels ubiquitous in much of the developing world translate to palpably substantial firm performance and wider economic prosperity? This is the puzzle that provides the personal motivation for this doctoral study. Interest is towards fathoming and unravelling the relationship between entrepreneurship, innovation and firm performance.

Indeed, entrepreneurship theory affirms that 'to study the entrepreneur is to study the central figure in economics' (Cole, 1946, p8), for 'there is hardly any aspect of economic and social behaviour which is not affected by entrepreneurship' (Casson *et al.*, 2006, p28). However, in spite of this undisputed paramountcy, and earnest attention from classical scholars (Blaug, 1985; Hébert and Link, 1982), entrepreneurship studies were for many years largely ignored in business and economics research, only

[1] See, http://www.youtube.com/watch?v=2Xkle7C2OjM (accessed 24/08/2012).

flourishing in the last about 25 years and thus only presently being said to reach ‘a reasonable state of maturity’ (Casson *et al.*, 2006, p1). In this period, ‘…start-ups and entrepreneurs (have become) fashionable again’ (Bhide, 2000, pxiii), and ‘enterprise (has become) the thing to explore, to understand, and to promote’ (Bridge *et al.*, 2003, p13).

Still, in 2001, Murray Low declared that ‘as the field struggles with the challenges of adolescence, it is time for straight talk. Students of entrepreneurship need to make something of this field, or face the reality that we have missed the opportunity’ (Low, 2001, p17). Indeed, in much of the entrepreneurship literature, a common platitude has been ‘laments about the ineffable nature of entrepreneurship’ (Bhide, 2000, p3). It is no surprise then that there are almost as many definitions of entrepreneurship as there are contributors to the subject (van Praag, 1999). This has in effect made entrepreneurship ‘a broad label under which a hodgepodge of research is housed’ (Shane and Venkataraman, 2000, p217). Scholars took to entrepreneurship with so exceptionally curious an industry, that the field ‘has grown at a prodigious rate’. Yet, ‘… unlike its sister fields of accounting, marketing, finance, organisational behaviour and strategic management, entrepreneurship is rather poorly explained by academics’ (Shane, 2003, p1-2).

The lack of a unique conceptual domain, with much of entrepreneurship research concentrating merely on aspects of the setting (e.g. small businesses or new firms, individual entrepreneurs), has thus been argued to undermine the legitimacy of the field (Shane and Venkataraman, 2000). This is in spite of the fact that entrepreneurship attracts inputs from varied research fields including economics, business strategy, organisational behaviour, sociology, psychology, and others (Rocha and Birkinshaw,

2007; Shane, 2003), as well as competing strands and traditions within the various disciplines (Peneder, 2009; Wennekers and Thurik, 1999). All these issues have led entrepreneurship research to be characterised by 'confusion, signs of identity crisis, or widespread frustration' (Davidsson 2003 in Peneder, 2009, p78), leaving entrepreneurship research trapped in a 'lots of interest - little respect' dilemma (Low, 2001).

Still, other scholars have argued that responding to the underlying differences in entrepreneurship research 'in an alarmed and defensive manner (…) overlooks the inherent strengths emanating from a view of entrepreneurship that is specific to different contexts. Rather than being a source of weakness, the diversity and heterogeneity contributes to a rapidly emerging field that is rich and dynamic, and appeals to theory, practice and policy' (Audretsch, 2012, p762).

Indeed, while the valid debate on what actually defines entrepreneurship progresses, especially whether small firms constitute the phenomenon of entrepreneurship or are merely a context of it (Wiklund *et al.*, 2011), empirical studies on the economic performance of small firms and their various contributions to the general economy abound (for example, Thurik *et al.*, 2008; van Praag and Versloot, 2007; van Stel *et al.*, 2005). In fact, attesting to the empirical resourcefulness of research on particular aspects of small firms, it is usually observed that modern entrepreneurship research started in 1979 when David Birch presented evidence that large firms were haemorrhaging jobs and it was the small firms that were first mitigating severe unemployment and second creating new types of jobs (Birch, 1989; Birch, 1987; Bridge *et al.*, 2003; Landström, 2005; Lundström and Stevenson, 2005; Storey, 1994).

In this new economy, ‘many expected the giants to dominate, but their elaborate investment analyses and corporate caution often led to hesitation that opened opportunities for the small and the swift. The entrepreneurs focussed on new and increasingly sophisticated technology’ (Prestowitz, 1988, p31). With these employment creation and innovation credentials, ‘public policy has looked to entrepreneurship to spawn economic growth and foster new jobs. Cities, regions, states and entire countries have turned to entrepreneurship to generate economic development’ (Audretsch *et al.*, 2007, p1).

In developing countries, however, rather than being new drivers of economic dynamism, the link between small firms and general economic performance has remained enigmatic and out of line with trends observed in developed economies (Reynolds *et al.*, 2001; Rosa *et al.*, 2009). Indeed, notwithstanding the sheer incidence of small firms, the high rates of employment attributable to small firms in developing countries is undermined by their meagre contributions to national GDP (Nichter and Goldmark, 2009).

In Kenya, for example, research indicates that micro and small enterprises (MSEs) accounted for from 48.9 percent of total non-agricultural employment in 1993, which rose to 68.2 percent by 1999 (Ronge *et al.*, 2002) and 80% by 2008 (Pollin *et al.*, 2008). In terms of GDP, however, MSEs in Kenya were estimated to contribute 18.4% to national GDP in 1999 (Ronge *et al.*, 2002). Other research suggests a contribution of 13% (Nichter and Goldmark, 2009), while other argue that MSEs in Kenya could actually account for up to 40% of Kenyan GDP if properly evaluated (Davis and Oketch, 2002, cited in Gamser, 2003).

Indeed, researchers in Kenya lament a lack of statistics on micro and small firms (Ronge *et al.*, 2002). Still, from the garage entrepreneur in Palo Alto, California, to start-ups based in places such as La Paz, Bolivia, Nairobi, Kenya or Dhaka, Bangladesh, 'the truth is that we know very little about micro and small enterprise (MSE) growth' (Nichter and Goldmark, 2009, p1453). The situation is however more acute more acute in developing countries. A meta study of entrepreneurship (entry and performance) in developing and transitional countries covering a period of over 20 years only gathered 84 valid studies after searching journal articles, books, book sections, working papares and other unpublished papers (van der Sluis *et al.*, 2005). Lee (2011), Goedhuys (2007b) and Goedhuys *et al.* (2008) also observe that empirical evidence on factors that engender innovation, and the link between innovation and firm performance is very thin in developing countries.

Hitherto, it is clear that there are important conceptual and empirical knowledge gaps that entrepreneurship and innovation research should endeavour to address. To begin with, there is a crucial need to illuminate the ambiguity surrounding the concepts of entrepreneurship and innovation. Such an elaboration should especially lead to a conceptual approach that uphold consistency and construct validity across studies of the pertinent phenomena in both developed and developing country contexts. Simultaneously, empirical research is also required towards not only enabling patterns and generalisations with respect to phenomena associated with entrepreneurship and innovation to emerge, but to also illuminate on these phenomena in a manner that may be instructive to policy. This is especially crucial towards comprehending and remedying the arid myriads of entrepreneurship and infecund artisanal innovation observed widely in developing countries.

In the light of these research problems, this thesis has two main aims. First, the thesis attempts to review and elaborate the extant literature on the concepts of entrepreneurship and innovation towards drawing out conceptual understandings that may enable more consistent empirical investigations of how the two concepts link with small firms and small firm performance and growth to be conducted. Second, an empirical inquiry is carried out, in a developing country context, to investigate the determinants of small firm performance. In particular, the role of innovation is especially examined.

In line with previous studies of this kind (for example, Rocha, 2004a), this thesis observes Whetten's (1989) guidance on the four essential building blocks for theory development. According to Whetten (1989), the first building block is the *what.* This concerns itself with the factors that should logically be considered in a study. Here, a sensitive balance between comprehensiveness and parsimony should be sought. The second building block, *how,* seeks to put forward the relationships between the *what* factors identified in the first stage. In turn, the third building block, *why*, relates to the logical justification of the *whats* and *hows.* Finally the fourth building block, encompassing the *who, where and when,* delineates the contextual limits of the generalisation from the findings thereof (Whetten, 1989). These guidelines advise the formulation of the specific research questions this study attempts to answer (Table 1.1) and the way this thesis structured towards realising the set objectives.

Table 1.1: Research Questions

Conceptual research questions

C1) What is entrepreneurship?

C2) What is innovation?

C3)What is the link between entrepreneurship, innovation and firm performance?

Empirical research questions

RQ1) Why are some firms more productive than others?

RQ2) Why do some firms realize faster employment growth than others?

RQ3) Does product innovation explain firms' productivity and employment growth differences?

RQ4) What factors explain why some firms are more innovative than others?

1.2 Thesis overview

Towards constructing the conceptual basis upon which an empirical study may be carried out, ***Chapter 2*** reviews the extant literature to critically appreciate the *whats* and *hows* of entrepreneurship and innovation. To begin with, the chapter revisits the conceptual pedigree of entrepreneurship from its inception and transition from a metaphor to a concept. In turn, the chapter critically reviews the literature on the common phenomenological conceptualisations of entrepreneurship. The chapter concludes that towards a less vagrant comprehensibility of entrepreneurship and

innovation, both as distinct concepts and in assessing their relationship, a more particular delimiting of the concepts and the phenomena they represent is imperative.

This is the challenge embraced in ***Chapter 3.*** Following the discussion in Chapter 2 and in line with ongoing conceptual deliberations towards a less ambiguous conceptualisation of entrepreneurship (Wiklund *et al.*, 2011), Chapter 3 argues that towards more instructive entrepreneurship research, the small firm may be considered an *instance of entrepreneurship* under the broad rubric of the entrepreneurship concept. In turn, more analytical focus should shift to particular aspects of small firms, such as factors explaining their economic performance and growth.

As pertains innovation, Chapter 3 attempts to reconceptualise the process through which novelty is pursued, implemented and realised as performance enhancement in the firm. The chapter attempts to conceptually account for firm performance growth starting from the ultimate changes in output and progressing backwards to conjecture the causes. This makes it possible to identify unique junctures in the structure of change in the firm. The chapter therefore argues that whilst innovation is often appreciated as knowledge capital, or the research and development efforts towards engendering such knowledge, that capital may or may not be employed in production. In fact, even where employed, research shows that it is not the sole driver of observed changes in output.

For conceptual clarity, therefore, especially one that is able to accommodate small artisanal firms with unobservable innovation inputs but observable output novelty, the effect-cause conceptualisation approach allows the chapter to introduce a new concept, *enovation*, which captures palpable changes in actual output terms. Thus, *aggregate enovation* is tantamount to productivity growth since, following Schumpeter

(1934), changes in productivity are necessarily the result of changes *in kind* on the inputs side of the production function. In turn, *sub-enovations* such as *product enovation* and *process enovation* should account for *aggregate enovation* and these *sub-enovations* may themselves be explained by innovation factors such as knowledge capital which itself derives from research and development efforts and other sources. This conceptualisation of the link between innovation and firm performance constitutes the principle hypothesis to be empirically tested in the present study.

Chapter 4 builds on this conceptual elaboration towards formulating explicit empirical hypotheses and specifying the requisite variables for empirical analysis. With small firms designated as an instance of entrepreneurship, productivity and employment growth were elected as the particular entrepreneurial aspects to seek to explain. *Product enovation* is also chosen to be the main *enovation* variable to empirically investigate. Chapter 4 therefore reviews the empirical literature on firm level innovation, productivity and employment growth, especially in developing countries, and models the conceptual framework to be applied in the empirical analysis conducted in the present work.

Chapter 5 outlines the methodology employed towards data collection. The chapter discusses choices of research methods, how the variables identified in Chapter 4 were operationalized, features of the population of small garments firms in Nairobi, Kenya that were surveyed, and the procedures followed during sampling and data collection.

Chapter 6 conducts the empirical analysis, presents the results and offers an interpretation of the findings thereof. In this chapter, econometric regression techniques are employed to estimate firm productivity, employment growth rates and product

innovation outputs. The findings offer a combination of conventional and thought-provoking results, both with respect to our key hypotheses on innovation and *product enovation*, as well as on issues to do with labour composition, returns to human capital and portfolio entrepreneurship.

Chapter 7 concludes the present thesis by summarising the doctoral study, highlighting the research contributions advanced herein, suggesting the implications for policy and practice thereof, and yielding the limitations of the present work that may engender opportunities for future research.

2 UNDERSTANDING THE CONCEPT OF ENTREPRENEURSHIP

'The entrepreneur is at the same time one of the most intriguing and one of the most elusive characters' – William Baumol, 1968

2.1 Introduction

The prodigious increase in research and researchers of entrepreneurship attests to the fact that an abundance of diversity characterises the field of entrepreneurship (Audretsch, 2012), with some scholars seeing entrepreneurship as an 'elixir', others a 'mutagen' (Lundmark and Westelius, 2013). Thus, a 'harmonisation' in terms of the 'fundamental process issues of entrepreneurship - what goes in, what comes out, and how the transformation takes place' has been called for without which 'it is a delusion to think that entrepreneurship qualifies as a research field with genuine philosophical integrity' (Moroz and Hindle, 2012, p812). Others however celebrate the heterogeneity, conceding especially that entrepreneurship belongs in the disciplines and therefore that the multiplicity of entrepreneurship theory is inherent (Audretsch, 2012; Wiklund *et al.*, 2011).

Nevertheless, recent conceptual deliberations on the subject of entrepreneurship have argued that the disparate entrepreneurship strands may be unified by a focus on the 'phenomenon' of entrepreneurship: the 'emergence of new economic activity' (Wiklund *et al.*, 2011, p5). Thus, given there has been less agreement on 'contexts' such as small, young and/or owner-managed firms being the predominant definitions of entrepreneurship, a focus on the phenomenon would embrace such contexts under 'the rubric of entrepreneurship' while allowing other economic, rather than merely

'commercial', phenomena within entrepreneurship research as well (Wiklund *et al.*, 2011, p5).

Still, whilst such 'looking forward' is useful towards establishing entrepreneurship as a distinctive domain, a 'looking back' to the pedigree of the subject might also help in the grounding of entrepreneurship research in line with its origins. Thus, the object of this Chapter is to appreciate both contemporary approaches and the traditional views. Section 2.2 reviews how the terms 'entrepreneur' and 'entrepreneurship' have developed over time signifying different concepts and phenomena. In turn, Section 2.3 critically appraises the common phenomenological dimensions of entrepreneurship that scholars have put forward in modern entrepreneurship research.

2.2 The conceptual history of the entrepreneur, enterprise and entrepreneurship

The word 'entrepreneur'... has lost any real meaning
- Humberto Barreto, 1989

Towards inferring the meaning of a compound suffixed word like entrepreneur+ship, focus has been on the term entrepreneur, especially towards defining what the entrepreneur does. The Concise Oxford English Dictionary (Pearsall, 2002, Revised tenth edition) defines 'entrepreneur' as 'a person who sets up a business or businesses, taking on greater than normal financial risks in order to do so'. The received definition of the 'entrepreneur', thus, is a 'businessman'.

With this broad view, entrepreneurship can be traced back at least to ancient merchants and adventurers who risked their money, reputation and indeed life as they established trade routes to the Orient (Hébert and Link, 1982). Indeed, it is thought that the merchant entrepreneur is the only entrepreneur to have remained in the picture throughout history (Bolton and Thompson, 2004; Bridge *et al.*, 2003). Yet, the intellectual prehistory of economics hardly said anything on the entrepreneur or the nature of entrepreneurship (Hébert and Link, 1982).

For example, historical analyses of economic scholarship in England have argued that classical economists, including Adam Smith, hardly sufficiently tackled the entrepreneur or entrepreneurship (Blaug, 1985; Hébert and Link, 1982; Koolman, 1971; Ricketts, 2006). Put rather bluntly, there was a 'lack of an entrepreneurial tradition in England' (Barreto, 1989, p7); '…the term 'entrepreneur' or any of its English equivalents is totally absent in the writings of Ricardo and so is the concept of the businessman as the principal agent of economic change' (Blaug, 1985, p44). Plausibly, this oversight in the theory would create a problem for the terminology 'entrepreneur' itself, or its equivalent in meaning.

It is generally accepted, however, that the term entrepreneur has its roots in the French verb 'entreprendre' which in the English language translates to 'to undertake' or 'to commence' and was introduced into economic thought by the French financier Richard Cantillon in his famous 'essays on the nature of commerce' (Barreto, 1989; Bolton and Thompson, 2004; Bridge *et al.*, 2003; Hébert and Link, 1982; Landström, 2005; van Praag, 1999). Bolton and Thompson (2004) also present an alternative but related origin. They note that the term entrepreneur 'derives from the French words *entre* meaning 'between' and *prendre* being the verb 'to take'. This would imply that it

was another name for a merchant who acts as a go-between for parties in the trading process' (p14).

Historical studies have however uncovered that the term may have a history dating before Cantillon 'master builders' (Hebert and Link 1982) and even clerics in charge of great architectural works as opposed to commercial undertakings (Hoselitz 1960), were the typical entrepreneurs. Indeed, Hoselitz (1960) indicates that an earlier version, 'entreprendeur', existed more than a quarter of a millennium before Cantillon. Thus, Cantillon only 'infused the term with precise economic content. Imprecise usage of the term 'entrepreneur' existed before Cantillon' (van Praag, 1999, p313). Indeed, following Cantillon's risk-taking arbitrageur concept, the term entrepreneur was used by other French commentators emphasizing varying combinations of planning and co-ordinating, innovation, capital supplying and judgement or decision-making role (see also: Barreto, 1989; Hébert and Link, 1982; van Praag, 1999).

It can be seen thus that absolute particularity is absent even in the French term entrepreneur as used by pioneering French scholars. However, linguistic strains have pestered the importation of 'entrepreneur' into the English language even more. This is epitomised by Say himself in choosing to use the term 'adventurer' for the French 'entrepreneur' while translating his seminal treatise from French to English. Say (his translator) lamented that to represent his 'entrepreneur' concept in the English language 'the corresponding word, *undertaker,* being already appropriated to a limited sense', (i.e. capitalist), he had to employ the word 'adventurer', for want of a better word (Say, [1821] 1971, p78).

That 'difficult to render' (Koolman, 1971) term would later find an English home in its raw French form as 'entrepreneur' following John Stuart Mill and Francis

Edgeworth (Hébert and Link, 1982; Ricketts, 2006). However, both Mill and Edgeworth have been criticised for not developing exacting contributions to the theory of the entrepreneur; they saw the entrepreneur merely as a business person (Hébert and Link, 1982).

Shackle (1966) may however have recognised this terminology problem in his apparent preference for ‘enterpriser’, in place of the rather ambiguous ‘entrepreneur’, in describing his decision-making uncertainty bearing enterprise man (See also Hébert and Link, 1982). Yet, ‘enterpriser’, overt though it seems with its intuitive meaning easily derived from ‘enterprise’, did not emerge as the favoured counterpart to the French ‘entrepreneur’. In fact in his seminal risk theory of profits, Frederick B. Hawley had also favoured ‘enterpriser’ for its direct link with risk-taking (Hawley, 1900).

Schumpeter also famously defined enterprise as the carrying of new combinations, and entrepreneur as the person that carries out these new combinations (Schumpeter, 1934). Metcalfe (2006) also sees enterprise as ‘a pervasive activity that changes the rules within which economic activities are made’ and the entrepreneur as the agency that generates and implements such changes (p61). Still, Bridge et al. (2003) caution that ‘many things have been described as enterprise... it appears sometimes to have been applied more for the cachet it brings with it than for the appropriateness of its application’ (p22-23).

The entrepreneur, on their own or through enterprise, thus continues to mystify and tracing the pedigree of the term ‘entrepreneur’ only partially elucidates the concept thereof. In 1989, Barreto observed that ‘the word ‘entrepreneur’ may still occasionally be used, but it has lost any real meaning’ (Barreto, 1989, p1). We have however seen that the word ‘entrepreneur’ as a conceptual designation was always an enigma, more so

in English. For Barreto, however, the entrepreneur's disappearance coincides with the emergence of neoclassical theory. Blaug (1997, p447) also affirms that 'the theory of entrepreneurship begins where marginal productivity leaves off'.

Others observe that it is the emergence and disappearance of the large-scale firm that coincides with the disappearance and re-emergence of the entrepreneur, both academically and in the popular sense (Bridge *et al.*, 2003; Ricketts, 2006). Appreciably, '… the prevalent form of business ownership in the heyday of the Industrial Revolution was the small- to medium-sized family firm, the capital funds being provided by the owner, his relatives or his friends. No wonder then that the classical economists failed to highlight the distinctive character of the entrepreneurial function' (Blaug, 1985, p442).

Nevertheless, the 'cult of the entrepreneur' receded with the advent of large scale organisations in the 20th century. Here, it was thought that 'professional scientists, technicians and managers would be able to maintain (the technological economic advancement) momentum' that the 'heroic entrepreneurs' of the Industrial Revolution had set in motion (Ricketts, 2006, p37 - 38). Thenceforth, in the ensuing 'bureaucracies of highly industrialised economies (...) innovation occupies a decreasing proportion of entrepreneurial activity and, as a function, is shared throughout management and other groups' (Hartmann, 1959, p429).

Since the demise of the large firm with 'a job for life no longer either the norm or a realistic aspiration… There will be an increase in the number of people, either from want or necessity, who will be thinking and acting to establish their own smaller work units. That process has also been called 'enterprise' (Bridge *et al.*, 2003, p12). Yet, '...in colloquial speech many terms like entrepreneurs, self-employed and businessmen are

used indiscriminately' (Wennekers and Thurik, 1999, p47). 'The small-scale trader and peddler, the self-employed craftsman, the 'bucaneering' chancer, the innovator and the improver as well as the founder of entirely new technologies are all seen as entrepreneurs' (Ricketts, 2006, p38).

In all these situations where the entrepreneurship concept is evoked, the apparent dilemma is whether entrepreneurship is fundamentally about a certain function that inheres in the firm or a specific person that carries out a given unique function. Thus, with regard to the simultaneous re-emergence of entrepreneurship and small firms, do large firms merely disperse the entrepreneurial function amongst many actors such that it is not perceptibly as compact as in small firms, and therefore not readily designated, or do large firms altogether supersede entrepreneurship? Hoselitz's (1952) observes that in fact, the entrepreneur designation may have been allocated variously across the different epochs to what was viewed as the 'socially most significant function'.

There is thus no long standing clear definition of the role in question except that it is a latent function inhering in all firms but one that is expediently designated in small firms where the person and the function are inherently conjoined thereby affording a certainty of entrepreneurship. Others argue that entrepreneurship entails responding to any disequilibria and therefore characterises every one (Schultz, 1975). Indeed, with 'opportunity' has also been argued to be a fundamental 'method of human problem solving' (Sarasvathy and Venkataraman, 2011).

Beyond these palpable designational dilemmas, however, towards systematically appreciating the pertinence and utility of entrepreneurship to society, academic concepts and constructs have been employed. In the absence of any theoretical consensus on what uniquely constitutes pure entrepreneurship, the debate has sought to instead pursue

compromises on the phenomena that may be generally considered to embody entrepreneurship and therefore afford entrepreneurship research some common ground (Audretsch, 2012; Low and MacMillan, 1988; Low and MacMillan, 2007; Rocha and Birkinshaw, 2007; Wiklund *et al.*, 2011).

2.3 Conceptualisations of entrepreneurship

The phenomenon of entrepreneurship is intertwined with a complex set of contiguous and overlapping constructs
– Murray Low and Ian MacMillan, 1988

It is usually observed that there are three intellectual traditions that have guided the development of the concept of entrepreneurship (Audretsch, 2012; Hébert and Link, 1982; Wennekers and Thurik, 1999). The first one is the German tradition which emphasizes equilibrium disturbing creations. The second tradition is the Austrian School which highlights the ability to perceive and exploit profit opportunities through gap-filling and efficiency-enhancing economic activities. Last, entrepreneurship within the Neoclassical tradition maintains the vintage static equilibrium stance, and therefore sees entrepreneurs merely as those gaining a windfall profit for bearing uncertainty – different from risk in that risk could be rationally estimated (see also, Blaug, 1985; Casson, [1982] 2003). Fitting variously with these three traditions, Hébert and Link (1989) identify at least thirteen economic roles and conceptualisations associated with the entrepreneur in the extant literature since inception (see also, Wennekers and Thurik, 1999).

Table 2.1: Roles of the entrepreneur

1. The person who assumes the risk associated with uncertainty.
2. The supplier of financial capital.
3. An innovator.
4. A decision-maker.
5. An industrial leader.
6. A manager or a superintendent.
7. An organizer and coordinator of economic resources.
8. The owner of an enterprise.
9. An employer of factors of production.
10. A contractor.
11. An arbitrageur.
12. An allocator of resources among alternative uses.
13. The person who realizes a start-up of a new business.

(Source: Wennekers and Thurik 1999, p31)

Towards the construction of a more simplified and general conceptualisation, following Hébert and Link (1989), Wennekers and Thurik (1999) categorise these thirteen entrepreneurial roles under two categories: dynamic and undynamic. The distinctive dynamic roles of an entrepreneur are thus identified as: Uncertainty/risk bearing, innovation, decision-making, leadership, co-ordination, contractor, arbitration, resource allocation, and business founding. Presumably, all these partake of the residual entrepreneurial profits.

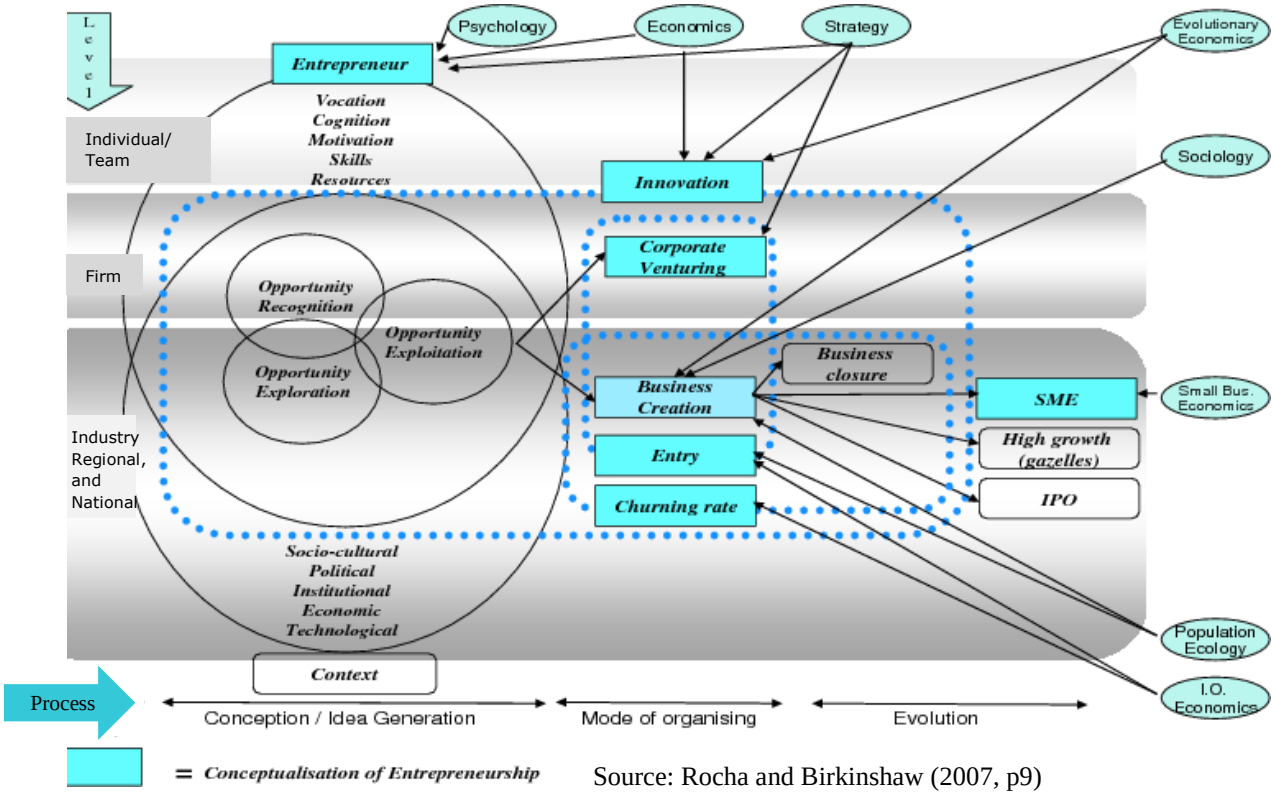
On the other hand, non-dynamic roles include: supply of financial capital, management or superintendence, ownership of an enterprise, and, employment of factors of production. Wennekers and Thurik (1999) affirm that these non-dynamic roles do not strictly relate to the entrepreneur because they earn traditional factor rewards, i.e. land - rent, capital - interest and labour - wages. It is possible, however, to

make the same argument about some of the dynamic roles. For example, in the modern firm, decision-making is a managerial role that is rewarded in wages (Casson, [1982] 2003).

The pursuit of a general understanding of entrepreneurship while maintaining analytical specificity is also embraced by Rocha and Birkinshaw (2007). Here, the different entrepreneurship-related phenomena are integrated and a framework that depicts the potential underlying connections between the various phenomena and perspectives is developed as depicted in Figure 2.1 below. Since it is an analytical consensus that is pursued, Rocha and Birkinshaw (2007, p2-3) maintain that 'this need for integration is at the ontological level - i.e., integration of entrepreneurship related phenomena, rather than at the epistemological level – i.e., the building of a unique entrepreneurship theory that could encompass the variety of entrepreneurship perspectives that reflect the current state of the field'.

Given, however, that the different fields whose perspectives are integrated, including strategy, psychology, sociology, population ecology and variant strands of economics, embrace different empirical assumptions, the coherence of the resultant eclectic framework may be questioned. Indeed, 'sometimes, even in a field that values diversity, there can be simply too much polyphony and its discords can contain more noise than wisdom' (Moroz and Hindle, 2012, p812).

Figure 2.1: Linking conceptualisations, disciplines, levels of analysis and stage of the entrepreneurial process



Source: Rocha and Birkinshaw (2007, p9)

An alternative approach is towards an integrated meaning of entrepreneurship is offered by Peneder (2009) who seeks to preserve essential broad distinctions while allowing the specificity necessary for analytical purposes. Peneder (2009) thus anatomises the various disjointed contributions to the theory of entrepreneurship and then distinguishes the behavioural, occupational and functional dimensions of entrepreneurship towards linking them in a modular fashion.

The behavioural dimension, popular in strategy and management studies, concerns itself with 'how to act entrepreneurially' towards realising a profit and is argued to entail: taking judgemental decisions as championed by Knight ([1921] 2006), Casson ([1982] 2003) and Hébert and Link (1989); creating new means, ends, or means-

ends relationships (for example, Shane, 2003); and cognitive leadership (Witt, 1998; Witt, 1999). This behavioural dimension, defining entrepreneurship as '*the pursuit and exploitation of profit opportunities'* is argued to be the constitutive phenomenon of entrepreneurship (Peneder, 2009, p89).

In turn, towards understanding how such entrepreneurial behaviour functionally contributes to the economic process, Peneder (2009) adds a functional dimension of entrepreneurship. Here, entrepreneurs are identified as either equilibrating (or adaptive), where the exploitation of profit opportunities engenders market co-ordination and technological diffusion, or disequilibrating (creative), where profit opportunities are created through Schumpeterian innovation which creates new opportunities for equilibrative entrepreneurship. Building on these economic functions, Peneder (2009) further identifies occupational categories that may help identify the locus of entrepreneurial activity. These are independent entrepreneurs (owner-managers) and corporate entrepreneurs who are salaried managers pursuing new opportunities within the context of a firm they do not own.

Conceptualising entrepreneurship by differentiating the various entrepreneurial dimensions to be added to an analytic structure based on a core behavioural definition has thus been argued to avert the 'complexity trap' where the piling up of the manifold entrepreneurial attributes has failed to realize the dual objective of specificity and generality in entrepreneurship scholarship (Peneder, 2009). Still, a consensus on the foundational element of entrepreneurship to build upon remains elusive in spite of periodic concerted efforts by prominent entrepreneurship scholars to develop one (Davidsson *et al.*, 2001; Low and MacMillan, 1988; Wiklund *et al.*, 2011).

Indeed, Audretsch (2012) has argued that entrepreneurship scholars that respond to ‘underlying differences and approach to entrepreneurship research in an alarmed and defensive manner (…) overlook the inherent strengths emanating from a view of entrepreneurship that is specific to different contexts. Rather than being a source of weakness, the diversity and heterogeneity contributes to a rapidly emerging field that is rich and dynamic, and appeals to theory, practice and policy’ (p762).

Audretsch (2012) thus identifies three main approaches used in the literature to identify entrepreneurship: the organisational context including age, size, ownership status and legal status; performance criteria where firms are considered entrepreneurial if they are innovative or report high growth rates; and entrepreneurial behaviour of individuals or organisations the cognitive process of discerning opportunities and the revealed intent to actualise the opportunity serve as the criteria for entrepreneurial behaviour.

Integrating the various approaches discussed above, the four common constructs of entrepreneurship may be identified as the individual entrepreneur, innovation, new ventures and small firms. In what follows, we review the different constructs individually.

2.3.1 Entrepreneurship and the individual person

Entrepreneurship research frequents errs towards a ‘strong tendency to identify entrepreneurship with a dominant organizational personality, generally an independent-minded owner-manager who makes the strategic decisions for his firm’ (Miller, 1983, p770) or the individual associated with the realisation of technological or other breakthroughs (Blackford and Kerr, 1986; Blaug, 1985; Ricketts, 2006). In his 1961

book, ‘The Achieving Society’, David McClelland asserts that the forces that that drive economic development ‘lie largely in man himself – in his fundamental motives and in the way he organises his relationships to his fellow man’ (McClelland, 1961, p3) and identifies the ‘need for achievement’ as a fundamental driver of economic performance. McClelland’s approach is widely emulated in entrepreneurship research (Beugelsdijk and Noorderhaven, 2005; Beugelsdijk and Smeets, 2008; Shane *et al.*, 2003).

However, as the entrepreneurship debate progressed, scholars came to observe that ‘who is an entrepreneur is the wrong question’ (Gartner, 1988), advocating instead for a move away from personality and traits approaches towards more functional and behavioural understandings of entrepreneurship (Gartner, 1988; Low and MacMillan, 2007; Shaver, 2007; Shaver and Scott, 1991) with the social context an important consideration (Thornton, 1999). Indeed, McClelland’s hypothesis was ‘falsified’ by Beugelsdijk and Smeets (2008) who concluded that, as empirical evidence did not support McClelland’s thesis, it is likely that the relationship between culture and growth is not as direct.

Still, while methodological complexities associated with intricate psychological and other measures have been a fundamental impediment to traits research (Shaver and Scott, 1991), more recent research finds that certain traits including the need for achievement, generalized self-efficacy, innovativeness, stress tolerance, need for autonomy, and proactive personality, correlate so strongly with business creation and business success that ignoring them would lead to misspecification of the respective models (Rauch and Frese, 2007).

Notwithstanding the debate whether certain trans-situational personality profiles engender actual entrepreneurial performance (Carland *et al.*, 1988; Gartner, 1988),

scholars affirm that person-situation interactions must be accorded a place in entrepreneurship theory (Shane, 2003; Shaver and Scott, 1991; Thornton, 1999). In Shane's (2003) approach, opportunities are said to be objective and thus not created but merely discovered. The key is that objective opportunities lack agency and thus require entrepreneurial individuals to exploit them. Thus, 'the entrepreneurial process begins when alert individuals discover (...) opportunities, and formulate conjectures about how to pursue them, including the development of the product or service that will be provided to customers' (Shane, 2003, p250).

For Shane (2003), however, the undertaking of an entrepreneurial effort need not be carried out by a single entrepreneur. In fact, other scholars argue that it may be absurd to not consider 'entrepreneurial' activities carried out by teams, especially those working within existing enterprises (Metcalfe, 2006; Redlich, 1949). Moreover, because the entrepreneurial role, be it innovation or management, has been increasingly shared within the firm and even with external consultants over the years, there is 'little reason to personify this function in certain select individuals called entrepreneurs' (Hartmann, 1959, p435).

Besides the dispersion of the function undertaken, Miller (1983, p786) also adds that in the most dynamic of firms (organic firms) 'the personality of the leader does not have a significant impact upon entrepreneurship which is performed by many individuals at many levels of the organisation'. This can be likened to 'flaternalism' where the differences between the owner/manager and workers are minimal (Goss 1991, in Storey, 1994). However, when looking at the entrepreneurial activity in large and small firms, key individuals are still found to be uniquely influential (Miller, 1983), especially in creating organisations and organisational cultures (Schein, 1995).

Indeed, the cognitive entrepreneurial discovery that precedes execution and exploitation is not a collective act but an idiosyncratic reaction by individuals with certain qualities (Shane, 2003). Moreover, 'groups or organisations do not form accidentally or spontaneously. They are usually created because someone takes a leadership role in seeing how the concerted action of a number of people could accomplish something that would be impossible through individual action alone' (Schein, 1995, p225). It would appear, therefore, that there are, undoubtedly, certain exceptional personal properties that contribute to entrepreneurial success (Bolton and Thompson, 2004; Shane, 2003), and that certain key individuals in the firm may hold significant sway in the conduct and outcomes of the firm.

Indeed, entrepreneurs generally have been found to be different from the broader population in terms of personality characteristics (Beugelsdijk and Noorderhaven, 2005), and motivations and aspirations (Hessels *et al.*, 2008). However, such differences have also been said to be attributable to network advantages (Saxenian, 1994; Saxenian, 2006), as well as factors such as socio-cultural heritage (Bauernschuster *et al.*, 2012; Wyrwich, 2012), marital and familial situations (Borooah and Hart, 1999), or other environmental factors that may actually dominate entrepreneurial personality attributes (Köllinger and Minniti, 2006).

Nevertheless, insights from Heider's (1958) 'attribution theory' paramount in social-psychology that attribution factors, namely, ability, intention, effort, task difficulty and luck, can explain successes and failure in business: 'successful performance depends on the combination of the two internal elements (ability and effort) with the two external factors (task difficulty and luck)' (Shaver and Scott, 1991, p34). It can be seen, therefore, that the entrepreneurship situation is complex and clearly

beyond the single idiosyncratic and assiduous individual, his personal resourcefulness notwithstanding. It may thus be ‘a fundamental attribution error’ to accredit entrepreneurial success to an individual person (Dimov, 2007).

2.3.2 Entrepreneurship as new ventures

Beyond the concept of the entrepreneur as an individual, the phenomena that is perhaps most prevalently regarded as entrepreneurship is new ventures. According to Schumpeter (1934, p78) ‘one is an entrepreneur only when he actually “carries out new combinations” and loses that character as soon as he has built up his business’ (p78). Indeed, at the heart of the entrepreneurship and profits concept from its inception was the idea that it is ephemeral. Thus, scholars submit that entrepreneurship is ‘episodic’ (Carroll and Mosakowski, 1987; Shane and Venkataraman, 2000; Shane, 2003).

However, whilst the concept of a new episodic venture is widely accepted, the specific phenomena that is referred to has been subject to general discretion and therefore an item that is frequently revisited in concerted efforts to clearly define the domain of entrepreneurship going forward. In a recent effort towards this, however, the ‘emergence of new economic activity’ was proposed to be the phenomenon that lies at the ‘heart of entrepreneurship’. Thus, entrepreneurship is a phenomenon characterized by change, newness, and development and since ‘economic’ has a much wider meaning than ‘commercial’, such a phenomenon transcends organizational contexts and is instead prevalent across ‘a multitude of situations and events’ (Wiklund *et al.*, 2011, p5-6).

In a similar proclamation in 1988, Low and MacMillan (1988) defined entrepreneurship as ‘the creation of new enterprise’ - not limited to enterprises.

Koellinger sees entrepreneurship as 'the introduction of new economic activity' (Koellinger, 2008, p22). Cunningham and Lischeron (1991) view entrepreneurship as 'a reiterative process of personal evaluating, planning, acting and reassessing which encourages people to take on the responsibility for creation and innovation' (p57). For Miller, entrepreneurship is 'a process by which organizations renew themselves and their markets' (Miller, 1983, p770), which has also been conceptualised separately as intrapreneurship to accommodate such changes in large incumbent firms (Antoncic and Hisrich, 2003). Indeed, an enduring problem in entrepreneurship theory has been the conceptualisation of entrepreneurship in a way that also accommodates corporate entrepreneurship (Casson, [1982] 2003; Peneder, 2009; Rocha and Birkinshaw, 2007).

Yet, the generality of new ventures and or mere newness per se may even go beyond commercial activities (see also, Wiklund *et al.*, 2011). Schultz (1975), for example, argues that any resource re-allocation under changing economic conditions constitutes entrepreneurship, and as such, even housewives and students as entrepreneurs. In fact, a recent postulate also affirms that entrepreneurship is 'a method of human action, comparable to social forces such democracy and the scientific method, namely, a powerful way of tackling large and abiding problems at the heart of advancing our species' (Sarasvathy and Venkataraman, 2011, p130).

In most business and economics applications, however, the 'episodic' phenomenon of entrepreneurship as a new venture is said to materialise as the founding of a new business (Shane, 2003). Thus, nascent or early stage entrepreneurship is the key phenomena studied in recent international entrepreneurship research (Audretsch, 2012; Xavier *et al.*, 2013). Other research combines entrepreneurial individuals, new

ventures and innovation to estimate the impact of this sophisticated entrepreneurial phenomenon to economic growth (Acs *et al.*, 2009; Braunerhjelm *et al.*, 2010).

Whilst the empirical rationale for these approaches is appreciable and the results instructive, it is evident still that underlying conceptual issues, even within the narrower phenomenon of new ventures, leave the entrepreneurship so general, heterogeneous and obscure, that perhaps referring to the specific phenomena studied without invoking the vague entrepreneurship construct would be more elucidating.

2.3.3 Entrepreneurship as innovation

Perhaps the most illustrious conceptualisation of entrepreneurship is innovation, following maverick expositions by Joseph Schumpeter (Schumpeter, 1934; Schumpeter, 1939; Schumpeter, 1943). However, earlier conceptual associations between innovation and entrepreneurship go back to the pioneer of entrepreneurship theory Cantillon himself (Cantillon, [1755] 2001; Hébert and Link, 2006) and was alluded to by Smith ([1776] 1976), Say ([1821] 1971), and many other early scholars (Blaug, 1985; Blaug, 2000; Hébert and Link, 2006). Its origins notwithstanding, innovation is perhaps still the most attractive of all the phenomena associated with entrepreneurship. In fact, Kirchhoff sees firms that are highly innovative as ‘glamorous firms’ in part due to the sheer attention they get in the media (Kirchhoff, 1994).

Indeed, it is argued that it is from the association with revolutionary innovations at the height of the Industrial Revolution that the notion of the heroic entrepreneur hatched. This is because major breakthroughs in technology and discoveries and advances of all sorts that would contribute immensely to the wider economy were

associated with particular personalities (Blackford and Kerr, 1986; Ricketts, 2006).[2] However, the innovation function may be dispersed across many agents thereby dispelling this intuitive connection between an individual entrepreneur and innovation (Hartmann, 1959; Ricketts, 2006), something Schumpeter (Mark II) himself attests (Breschi *et al.*, 2000; Schumpeter, 1939; Schumpeter, 1943; van Stel *et al.*, 2005).

Indeed, while contemporary empirical research shows that innovative firms create more jobs in the long-term than low innovation firms (Kirchhoff, 1994; Thurik *et al.*, 2008) and are able to secure the venture capital that enables them to become fast growing 'gazelles' (Audretsch, 2012), what counts as innovation and therefore entrepreneurial, and in turn how to measure it remains a big problem empirically (Crepon *et al.*, 1998; Mairesse and Mohnen, 2002). Indeed, while new products are the conventional way of viewing innovation, Schumpeter himself defined innovation as *'any 'doing things differently' in the realm of economic life...*' (Schumpeter, 1939, p59; emphasis added). Clearly, this makes the concept of innovation very general.

Other approaches dichotomise innovation into two: radical innovations and incremental innovations (see, for example, Dosi, 1982). Where the boundary lies between the two, however, is undefined. Thus 'innovation is a subjective concept and whether some activity qualifies as innovative or not depends on the perspective of the observer' (Koellinger, 2008, p22). Accordingly, it is plausible that large scale process innovations by large firms may be overlooked as not entrepreneurial.

[2] In Britain, for example 'the Duke of Bridgewater in the construction of canals, Richard Arkwright in the transformation of the cotton industry and the evolution of the factory system, Mathew Bolton, John Roebuck and James Watt in the development of steam power, George Hudson in the promotion of railways (Rickets 2006: 37); In America, 'in 1793, Eli Whitney's invention of the cotton gin and in the 1830s, Cyrus McCormick's production of a successful mechanical grain reaper gave American farmers the ability to vastly enlarge their production of cotton and wheat'(Blackford and Kerr 1986:7). Further, seemingly concurring with Honeyman's study of the social origins of revolutionary industrialists, Blackford and Kerr observe that contrary to popular 'rags to riches' myths, more than 65% of successful entrepreneurs were well-educated middle-class or upper-class persons with a business family background.

Yet, innovation was elevated in mainstream economic thought following Romer (1986; 1990; 1994) remaining in the entrepreneurless neoclassical tradition with the knowledge considered as a capital. Thus, the innovation phenomenon may be appreciated independent of the entrepreneur. However, emphasis has recently shifted from the mere stocks of innovative knowledge to the exploitation of such knowledge by economic agents, who mostly have to found new firms to allow the appropriation of this new knowledge as incumbents are usually unable or unwilling to change (Acs *et al.*, 2009; Audretsch, 2009; Michelacci, 2003). Thus, innovation and entrepreneurship have become intertwined concepts anew, encompassing the innovation, the entrepreneur, and the new firm.

Indeed, scholars have argued that the type and impact of the innovations that firms perform depends on the individual entrepreneur's characteristics and decisions (Koellinger, 2008), as well as the size of the firm (Acs and Audretsch, 1987; Acs and Audretsch, 1988; Anderson and Tushman, 1990; Rocha and Birkinshaw, 2007; Spencer and Kirchhoff, 2006; Tushman and Anderson, 1986). As such, while large firms conduct most of the research and development that produces most innovation in the economy (Acs *et al.*, 2009), due to the routinisation of invention and innovation (Nelson and Winter, 1982; Schumpeter, 1939; Schumpeter, 1943), such large firms mostly engage in incremental innovation mainly efficiency enhancing process innovation (Dosi, 1982; Scherer, 1986; Spencer and Kirchhoff, 2006; Tushman and Anderson, 1986).

It is new small firms that mostly bring radical innovations to the market (Acs *et al.*, 2009; Anderson and Tushman, 1990; Audretsch, 2009; Rocha and Birkinshaw, 2007). Indeed, to initiate divergent innovations, large firms usually 'mimic smallness'

(Wennekers and Thurik, 1999). It is plausible that the risks involved necessitate the invocation of entrepreneurship. As Knight observes, ‘it goes without saying that making innovations usually involves substantial cost, and that the innovator himself cannot predict the results in advance, or even be sure that the innovation will not be a failure, and consequently the activity is connected with "risk-taking"’. Thus, ‘adaptive change is to be added to innovation as a second function of the entrepreneur’ (Knight, 1942, p128-9). This coalescence of risk, innovation, an individual and the small new firm arguably provides a palpable eclectic conceptualisation of entrepreneurship that has a high empirical capacity and is conceptually grounded.

The potency of such a conceptualisation is enhanced further by the fact that innovation is generally accepted as the fundamental driver of growth both at the firm level (Audretsch, 2012; Crepon *et al.*, 1998; Hall, 2011; Penrose, 2009 [1959]) and the macroeconomic growth (Romer, 1990; Solow, 1957). Recent research has also emphasized the ‘linking’ role of innovative new firms in economic growth (Acs *et al.*, 2009; Braunerhjelm, 2008; Braunerhjelm *et al.*, 2010). Thus, the role of innovation in generating growth is incontrovertible. Yet, innovation may also be appreciated independent of entrepreneurship, whether small firms, new firms, or individuals. In fact, given the vagaries of innovation itself, is perhaps the further elucidation of the innovation concept that should precede an elaboration of the link between innovation and entrepreneurship.

2.3.4 Entrepreneurship and small firms

Whilst many modern entrepreneurship scholars eschew undynamic roles associated with entrepreneurship in pursuit of more 'entrepreneurial' conceptualisations (Wennekers and Thurik, 1999), the small owner-manager and their small firm remains the resolute archetype of entrepreneurship. As van Praag and Versloot (2007, p354) observe, 'though most entrepreneurial firms are small, small firms are not always entrepreneurial and identifying small firms as entrepreneurs is therefore less straightforward, though a common practice among entrepreneurship policy makers and academics'.

A possible reason for this is not only that small firms have gained a lot of attention due to their empirical job creation, innovation fruitfulness and competitive pressure (Birch, 1987; Bridge *et al.*, 2003; Fritsch and Noseleit, 2012; Kirchhoff, 1996; Storey, 1994), but also because, epistemically, within the small firm, the link between the entrepreneur (a person), the firm and the economic activities of the firm, including innovation, are facilitated by the compactness of the business entity (Hartmann, 1959). Thus, despite the difficulties with the entrepreneurship concept, small firms will yet embody most of the dimensions of entrepreneurship so much that a study of small firms is guaranteed to study entrepreneurship, its definition notwithstanding. As Miller (1983, p783) observes, unlike the complexities found in other firm types, 'entrepreneurship can be the domain of one man'.

One may argue, however, that the simplicity of small firms may be veiling important subtleties that may be crucial for entrepreneurship theory. Indeed, there are obvious contradictions within the small firm that afflict entrepreneurship theory since for example, many small firms are old, may not have been founded by their present

owner and may not carry out any innovations at all (Audretsch, 2012). Scott and Rosa (1996) argue that a study of small firms obscures the real wealth creation activities which actually operate across all scale boundaries.

Thus, rather than taking this nature of small firms to then conceptualise entrepreneurship as small firms, the small firm domain may be dissected to unearth specific qualities, features and other phenomena inhering in small firms that may be more instructive theoretically and empirically. For example, going back to the success and failure attribution factors namely, intention, ability, effort, task difficulty and luck (Shaver and Scott, 1991), one would argue that there would be more effort, hence more likelihood of success, if one's own money was on the line and the results attributable in full to the entrepreneur himself. Thus, with fewer people to share the output with, there is less scope for attribution errors. Large firms with their complex structure will not have this advantage and attribution errors may thus be high. Indeed, 'a quick look around will confirm that many current entrepreneurs were once dissatisfied intrapreneurs who left their firms to launch their own businesses' (Carrier, 1994, p58).

Moreover, 'it appears to be easier in SMEs to define the kinds of rewards to be offered to intrapreneurs than is the case in large firms' (Carrier, 1994, p57). Thus, researchers find that SMEs report higher individual responsibility and effort (Beugelsdijk and Noorderhaven, 2005) and higher job satisfaction (Blanchflower, 2000; Blanchflower and Oswald, 1998; van Praag and Versloot, 2007), and that small firm employees see their wages as fair in spite of the fact that they are relatively lower than those paid by large firms (Storey, 1994; van Praag and Versloot, 2007). In fact, wages in small firms may be more variable than those of large firms suggesting that less risk-

averse employees will self-select into small firms perhaps in turn nurturing further entrepreneurship (Parker, 2009).

It appears therefore that under the ostensible conceptual blanket that is the small firm is a cache of other concepts such as employee and entrepreneur risk attitudes (Kihlstrom and Laffont, 1979), dissatisfaction (Block and Koellinger, 2009; Noorderhaven *et al.*, 2004), and expansive knowledge transmission and proximate role modelling (Parker, 2009), that are perhaps more imperative to entrepreneurship theory. Thus, rather than merely conceptualising small firms as entrepreneurship, dissecting small firms may help elucidate a richer understanding of various specific phenomena and their impact on firm performance. Therefore, given the mystery, ubiquity and heterogeneity of entrepreneurship, the small firm, as with all firms, may only be an instance of entrepreneurship; it is the particular aspects and qualities of the firm that may be lucidly instructive on the drivers of firm performance and growth, irrespective of the entrepreneurship label.

2.4 Summary

This Chapter has sought to critically understand the origins and evolution of the concept of entrepreneurship. The chapter finds that our understanding of entrepreneurship has been stymied by the ubiquitous conceptual multifariousness. Indeed, whilst entrepreneurship and small firms have gained a lot of popular and policy attention in the modern economy, the confusing plethora of conceptualisations of entrepreneurship may not afford a coherent and substantive understanding of

entrepreneurship, and therefore robust policy prescriptions on how entrepreneurship can be harnessed towards societal progress.

As such, rather than contriving a definition that fits the various phenomena associated capriciously with entrepreneurship, a more useful approach may be to appreciate and analyse such phenomena discretely. Thus, small firms may be considered mere instances of entrepreneurship with more particular emphasis shifting to the specification of particular variables and a robust assessment of their relationships. Accordingly, interest in the economic performance of small firms would seek to investigate the drivers of the same.

Such an approach thereby upholds the traditional view of factor accumulation and innovation as the fundamental factors of economic performance with the new research challenges identified as follows. Firstly, a more inquisitive specification of the pertinent factors ensconced elusively under the rubric of entrepreneurship, and secondly, an elaboration of the concept of innovation. In this vein, Chapter 3 attempts to reconceptualise innovation in a way that enables its impact on firm performance and growth to be more lucidly appreciated. In turn, Chapter 4 reviews the extant empirical literature towards drawing out precise factors cached variously under the different entrepreneurship themes. This will enable the formulation of specific hypotheses on the drivers of firm performance and growth that form the basis for the empirical inquiry conducted in Chapters 5 and 6.

3 RE-CONCEPTUALISING INNOVATION AND THE LINK TO FIRM GROWTH

To understand how economic growth is generated, we must know more about the way innovations occur and how they become generally accepted - Edwin Mansfield, 1961

3.1 Introduction

As discussed in Chapter 2, in the extant literature, entrepreneurship is associated with many behavioural and contextual phenomena including firm founding, ownership and management, risk, entrepreneurial personalities, innovation or merely small firms (Audretsch, 2012; Hébert and Link, 1982; Hébert and Link, 1989; Rocha and Birkinshaw, 2007; Wennekers and Thurik, 1999; Wiklund *et al.*, 2011). In turn, the heterogeneity makes the phenomenon of entrepreneurship to be characterised by 'a complex set of contiguous and overlapping constructs' (Low and MacMillan, 1988). As such Low and MacMillan (1988, p141) called for 'an overall common purpose that will forge some unity among entrepreneurship researchers' a feat that is yet to be realised despite periodic efforts towards refocusing the entrepreneurship field (Davidsson *et al.*, 2001; Wiklund *et al.*, 2011).

Indeed, without a clear statement yet of the fundamental issues that entrepreneurship scholarship seeks to address, Gartner laments that 'scholars in entrepreneurship will continue to be a collection of diaspora from other fields of organization science that use "entrepreneurship" as a label to study whatever they want' (Gartner, 2007, p238). Given this problem, a helpful comprise offered by Davidsson, Low and Wright (2001) is to accept that the prodigious entrepreneurship research

studies loosely interconnected empirical phenomena including, predominantly, emergence of new enterprise and new organizations, innovation, venture capital, small business, and family firms.

Thus, ‘"Entrepreneurship" could be used as an admittedly fuzzy meta-concept whereas titles of articles and labels for empirical variables would be more precise’ (Davidsson *et al.*, 2001, p13). As such, ‘anything related to small, young and/or owner-managed firms can be found under the rubric of entrepreneurship’ (Wiklund *et al.*, 2011, p5). In this vein, the small firm may be conceptualised as a mere *instance of entrepreneurship.* In turn, in line with conventional theory, the small firm may be appreciated as a bundle of resources (Penrose, 2009 [1959]). Accordingly, the specific resources and factors may be analysed discretely to assess their relationships with firm performance and growth analysed.

One of the factors incontrovertibly recognised as the most fundamental driver of growth at both the macro-level (Romer, 1986; 1990; 1994; Solow, 1956; 1957) and at the firm and industry levels (Griliches, 1998; Nelson and Winter, 1982) is innovation. Following Schumpeter (1934), innovation is strongly associated with entrepreneurship, with the growth engendered by innovation considered as the entrepreneurial factor in contemporary discourse (Audretsch, 2012). As discussed in Chapter 2, however, while Schumpeter (1934; Schumpeter, 1939; Schumpeter, 1943) highly elevated the role of innovation as entrepreneurial driver of growth, conceptualising the innovation phenomenon as ‘any doing things differently in the realm of economic life’ left the concept too general.

This not only contributed to the vagueness in entrepreneurship but innovation itself has separately remained an elusive construct. Towards better comprehensibility of

both innovation and entrepreneurship, innovation may be regarded as an element of the fuzzy meta-concept of entrepreneurship but analysed discretely to help investigate particular phenomena that would be more precisely instructive (Davidsson *et al.*, 2001; Wiklund *et al.*, 2011).

The object of this chapter is therefore to reconceptualise innovation in a way that allows the broad innovation phenomenon to not only be more comprehensible conceptually, but also more discretely captured and analysed empirically. Section 3.2 below discusses the role of innovation as a driver of productivity growth and suggests a conceptual separation between the pursuit of novelty as against materialised novelty towards a more elaborate analysis of the various aspects of technical change. Section 3.3 develops a typology of firms classified by the level of manifest newness characterising the various firms, and postulates the dynamics through which such differences amongst firms engender and sustain wider economic growth. Section 3.4 discusses the distortionary differences amongst firms that may have implications for productivity growth in the wider economy. Section 3.5 summarises the present chapter.

3.2 Innovation, enovation and productivity growth

According to Schumpeter, innovation entails the realisation of novelties such as: 'the introduction of new commodities which may even serve as the standard case. Technological change in the production of commodities already in use, the opening up of new markets or of new sources of supply, Taylorization of work, improved handling of material, the setting up of new business organizations such as department stores—in short, *any 'doing things differently' in the realm of economic life...*' (Schumpeter 1939, p59; emphasis added). Following Schumpeter's evidently very open conceptualisation

of innovation, descriptive theory notwithstanding, an enduring problem has been the construction of more formal theories of innovation (Romer, 1994; Scherer, 1986).

Indeed, for purposes of empirical economic performance and growth accounting, innovation has been conceptualised as knowledge capital, and therefore an input in production. Empirically, this is captured as innovation efforts in investments in research and development (R&D) (Griliches, 1979; Griliches, 1998), the patent counts thereof (Crépon and Duguet, 1997), or the shares of innovative products (Crepon *et al.*, 1998). While these efforts towards formal theories and analyses of innovation have advanced innovation research greatly, these conceptualisations and proxies of innovation as knowledge capital are encumbered by many problems that may undermine their robustness.

To begin with, the uncertainty befalling innovation calls for a critical discerning of the knowledge thereof. Given, for example, that Edison tested 1,600 different filament materials before finding his carbon filament solution (Scherer, 1986), it is plausible that much of the research costs entail knowledge of the nature of 'ruling out' what does not work. Thus, only a small part of the knowledge emanating from research and development efforts ends up in actual production and is thus embodied in the products sold and the actual revenue-product of the firm. In fact, many research efforts may even prove fruitless. Second, the secretive nature of innovation, or competition through innovation, means that there are many sub-optimal innovation investments as competing firms unwittingly incur duplicated costs that merely obtain the same knowledge (Dasgupta and Stiglitz, 1980; Loury, 1979). Thus, R&D investments may overestimate the actual knowledge capital.

Indeed, third, while firms may secure patents to prevent imitation following research and development efforts, they may only keep the patents as anti-competitive tools or earmark the innovations as 'real options' for possible future development without actually employing that knowledge capital in production (Bloom and Van Reenen, 2002). Such knowledge may thus remain a reserve (tacit) resource that can be harnessed by the firm for further growth (Penrose, 2009 [1959]), but have no link with present performance. Indeed, as Acs et al (2009) note, in the US very few inventions, especially those developed by universities, are actually commercialised. In fact, only about 1-2% of all inventions reach the market. Of the patented innovations, constituting half of all patent applications which in turn represent half of all disclosed university inventions, only a third are licensed of which only 10-20% actually yield significant incomes in the market (see also, Carlsson and Fridh, 2002).

Fourth, the foregoing notwithstanding, the complex system of patenting the new knowledge emanating from research is said to encourage a shrewd 'waiting game' where the pioneering innovator may be outperformed in terms of exploitation of the new knowledge by an expeditious imitator who did not invest in the pursuit and development of the knowledge (Dasgupta, 1988). As such, the relationship between in-house R&D investments and actual firm performance is not straightforward. In fact, Roper, Du and Love (2008) argue that considering R&D as the only source of knowledge is taking a narrow perspective of knowledge sourcing. Roper, Du and Love (2008) thus identify four further sources of knowledge: forward linkages to customers, backward links to either suppliers or external consultants, horizontal linkages to either competitors or through joint ventures, and linkages to universities or other public research centres.

Indeed, fifth, Mairesse and Mohnen (2002) observe that just like a production function, a knowledge accounting framework may not ascribe such innovation output from known innovation input factors (such as in-house R&D). As such, they observe a residual similar to the Total Factor Productivity residual in their knowledge production function. That many firms, especially small service firms, regard new product development as something that 'just happens' (Vermeulen *et al.*, 2005), and therefore that the pertinent determinants are largely unspecified, may explain the presence of this residual.

Moreover, sixth, since markets may take longer than the life of an innovative firm to embrace a new product (Glazer, 1985), a firm that turns over a high percentage of new products may only be returning low sales overall which may in fact be fatally detrimental to firm. Thus, while high sales of new products may suggest high novel technological knowledge of some sort, they may also indicate high levels of ignorance, riskiness or failures of another kind. Similarly, a firm reporting low sales of new products may be in possession of technical knowledge but also have the market intelligence to discern the right time to exploit the new knowledge by bringing new products to the market.

With such a complex structure, it is unclear what knowledge capital may be captured by such a convoluted output variable as the share of new products in sales. Indeed, there is no obvious predominance of R&D efforts on the share of sales of new products unless other factors such as marketing research and advertising are included in the R&D variable. All these suggest that the knowledge capital approach to innovation may be fraught with errors, ambiguities and empirical uncertainties.

In fact, these problems are not helped by the terminology used to describe them. Whilst Schumpeter distinguished inventions as scientific discoveries and innovations as commercial novelties, the term innovation has been employed to describe all the phenomena associated with commercially viable novelty – the inputs, the process and the output. Further, while innovation is, or produces, only a viable prospect in the market, it is yet described simply as knowledge capital without specifying if it is technological knowledge, market knowledge, consumer knowledge or if it is indeed aggregate knowledge pertaining to a new commercial undertaking.

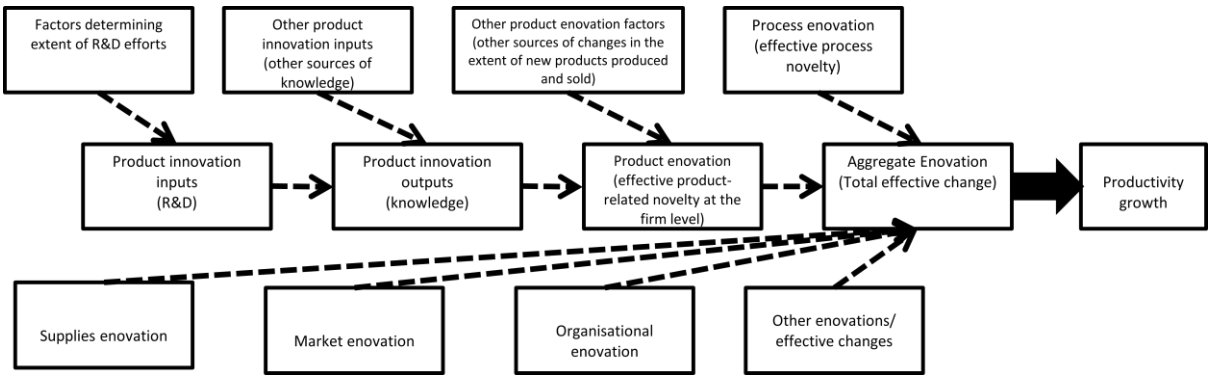
Moreover, even where innovation inputs and innovation outputs distinction is employed, the outputs side remains obscure. Whether the output is the knowledge produced through the innovation processes as is the case with studies following (Crepon *et al.*, 1998), or it is the novelty actually realised as a result of the employment of such knowledge (for example, Roper *et al.*, 2008), is not readily apparent in the innovation literature. Plausibly, in fact, using the knowledge (innovation output) as an input in the exploitation process properly results in innovation outputs' outputs, notwithstanding that there are other factors in addition to new knowledge that affect the final output thereof.

Indeed, while the inputs aspects are important especially in empirical evaluations, Schumpeter originally emphasized novelty (change) *effective* in the production function as his phenomena of interest. Thus, Dosi (1982) observes that Schumpeter's distinction between an invention and an innovation is that the innovation '*is not only potentially marketable but actually marketed*' (p148; emphasis added). As such, a conceptual separation between the two elements of novelty, i.e. marketable and marketed, is warranted towards ameliorating terminological and conceptual confusion.

Since, strictly speaking, interest is in newness and change, then the base term ‘novation’ should offer conceptual guidance. One may propose therefore that novation that is *effective* in ultimate economic output is captured by the term *enovation* as the ‘e-’ prefix denotes ‘out’ or ‘out of’. Innovation would hence capture efforts towards actual novation as ‘in-’ connotes. Thus, innovation outputs, knowledge, are different from *enovation* in that as discussed above, the knowledge may not necessarily be the sole or significant driver the actual novation of the ultimate economic output of the firm, nor may it even be implemented in production. As such, invention may be taken to refer to scientific novelty, innovation pertains to practicable novelty, while *enovation* substantiates effective novelty.

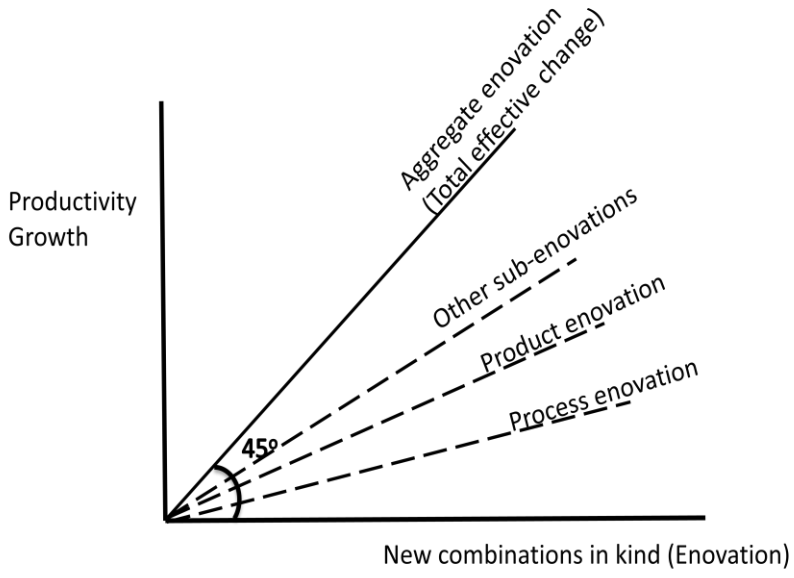
In light of the above, it must necessarily follow then that firms, and indeed economies, realise growth in the Schumpeterian sense by *actualising* new combinations of factors of production through the many routes that Schumpeter indicated rather than merely pursuing, or possessing knowledge. Accordingly, given the multifariousness of the types of novelty that afford productivity growth, recent developments indicate that productivity growth is a reasonable measure of successful innovation of all kinds at multiple levels of aggregation (Hall, 2011). In the language adopted herein, firm productivity growth is tantamount to *aggregate firm enovation* or *total effective change* which itself derives variously from *product enovation (*shares of sales of new products), *process enovation (*employment of new processes), and any other ‘*doing* things differently’. Figure 3.1 below illustrates this enovation pedigree.

Figure 3.1: Enovation pedigree



Logically, therefore, as Figure 3.2 further elaborates, there is necessary and complete causation of firm productivity growth by *aggregate firm enovation;* something has to change in the production function for a change in productivity to happen. In turn, there is partial causation of *aggregate firm enovation*, and therefore productivity growth, by the various *sub-enovations* that may transpire in the firm. Thus, individually, *product enovation* or *process enovation* will have a partial effect on *aggregate firm enovation,* and therefore productivity growth.

Figure 3.2: Enovation and productivity growth



Further, still, every *sub-enovation* its own sub-pedigree like the *product enovation* background given in Figure 3.1. Each *sub-enovation* may be partially caused by the pertinent new knowledge available to the firm, which may itself partially derive from the corresponding innovation efforts. Thus, innovation efforts (inputs) may or may not generate new commercially viable knowledge (innovation outputs). Such innovation outputs (knowledge) may or may not engender *a sub-enovation;* the *sub-enovation* may or may not itself have an effect on *aggregate enovation* that manifests as productivity growth.

Accordingly, each output variable will have its own residual. Knowledge production will have a residual since innovation inputs, such as R&D efforts may not account for all the knowledge (Mairesse and Mohnen, 2002). Also, there will be residuals in the respective *sub-enovations* (total factor sub-enovation) and residuals in the accounting for ultimate *aggregate enovation* (productivity growth) which is the standard total factor productivity growth, that, in line with the exposition herein, is tantamount to total factor enovation.

3.3 A typology of levels of enovation and diffusion dynamics

In distinguishing growth from development, Schumpeter (1934) observed that growth was the result of merely increasing the factors of production without changing the production function. As such, development is not 'the mere growth of the economy (…) which calls forth no qualitatively new phenomena, but only processes of adaption of the same kind as the changes in the natural data' (Schumpeter, 1934, p63). Rather, 'development consists primarily in employing existing resources in a different way, in doing new things with them, irrespective of whether those resources increase or not'

(p68). For Schumpeter therefore, it was new combinations '*in kind'* rather than merely *'in degree'* that generated development. Whilst the conceptualisation of development has evolved to mean different things (see for example, Jahan, 2000; Sen, 1999; Todaro and Smith, 2011), it is clear that unless there was a qualitative change in the combinations of factors of production, there would be no growth in productivity (per unit of input) terms.

As such, given that all economic activity is new *stricto sensu*, even where exactly repeated in which case it would be new only in degree, same degree, it is possible in theory to view all firms' new combinations of factors of production as ranging from new combinations '*in degree'* to new combinations '*in kind'.* Thus, new combinations *'in degree'* would represent a purely quantitative change in the combinations of production factors, and therefore no novelty at all in the production function, while at the *'new in kind'* end would be an altogether newly specified production function.

One may therefore envisage four broad levels of enovation dispersed along a *'new in kind'* to *'new in degree'* continuum characterising the effective novelties in the nature of production activities carried out by firms in a given economy. The proposed four enovation levels are:

1) Transformative enovation

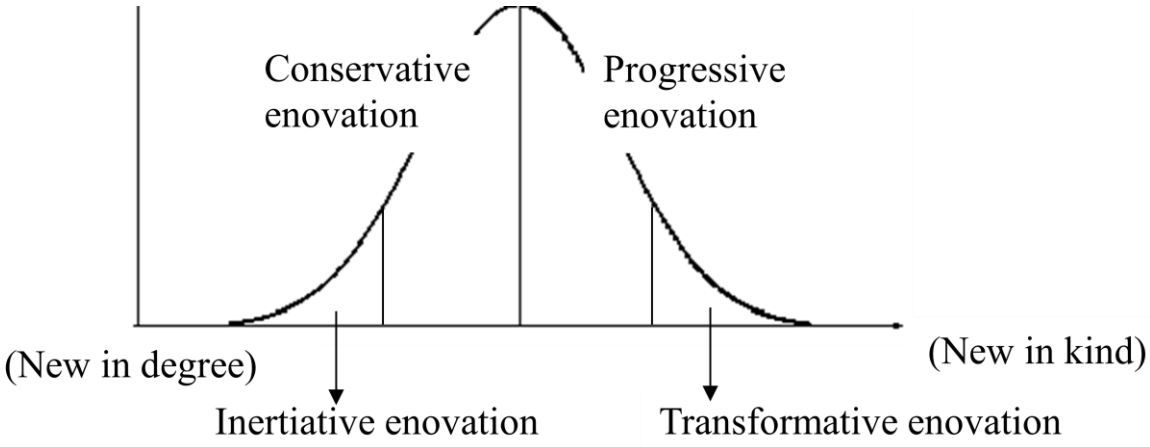
2) Progressive enovation

3) Conservative enovation

4) Inertiative enovation

As with most natural continuous phenomena, therefore, at any one point in time, the (*aggregate) enovation* variable may be thought to assume a normal distribution, such that the majority of firm's combinations of factors of production may be said to be either tending to conserve existing characteristics with some changes, or tending to advance to new forms, with those tending to remain inert and those transforming completely found at the fringes (Figure 3.3). A similar spread was famously proposed by Everett Rogers whose classification is based on innovativeness defined as 'the degree to which an individual or other unit of adoption is relative earlier in adopting new ideas than the other members of a system' (Rogers, [1962] 1995, p22).

Figure 3.3: Different levels of enovation



Rather than adopter categories, however, our proposed typology classifies firms' *effective enovation,* i.e the magnitude of novelty actually operational in production, and therefore reflects in output terms. Ours are thus mutation categories classifying the magnitude of change observed at a given point in time. It is possible therefore that at the

time of observation, a laggard in terms of adoption is classified under transformative enovation with high productivity growth.

Indeed, in line with the diffusion dynamics proposed by Rogers ([1962] 1995) and widely corroborated by applied studies in business and economics (Anderson and Tushman, 1990; Gort and Klepper, 1982; Mansfield, 1961; Mansfield, 1963; Silverberg *et al.*, 1988), the distribution of firms and their observed levels of enovation may also help in the understanding of the dynamics of wider economic growth. According to Brozen (1951, p239) the process of interest is how a new production function is transformed from a mere expression of 'what is technologically possible', to a representation of 'what is occurring in the economy as a whole'; how the scientific knowledge (invention) is transformed to commercially viable knowledge (innovation) and then actually materialises in production (enovation) in the whole economy.

As diffusion research conventionally observes, a process of diffusion will ensue as imitators adopt the innovation and therefore also enovate. As alluded to above, it is plausible that at a given time of observation, the initiating enovator (innovator in Roger's ([1962] 1995) adopter categories) appears inertiative as they may not be carrying out any new changes at the time in question and will therefore not report growth with respect to the pertinent technology even as their static performance may be high owing to erstwhile use of the technology. Rather, it may be the imitators who are now in the process of adopting the innovation and actualising enovation that report growth.

However, imitation and the subsequent enovation of the whole effectively erodes the novelty, and any rents thereof, and thus only but creates a new platform for further enovation, first by initiators innovators (Roger's ([1962] 1995) innovator category) and

later wholesale following imitation and diffusion anew. These simple diffusion processes can be thought of as movements between graduating long-term equilibrium positions (Silverberg *et al.*, 1988). It can thus be seen that there are two forces in constant play: initiative enovators are *pulling* imitative enovators, imitative enovators are *pushing* new initiative enovators. Indeed, as already described, firms will change positions in terms of the magnitude of enovation realised at a given time.

There is thus a dynamic *propulsive procession* of firms. Indeed, given the diffusive, rather than instantaneous, nature of the process, one may characterise the dynamics at play as '*procreative exhaustion'*, as opposed to Schumpeter's (1943) radical 'creative destruction' (see also, Kirzner, 1999). This is because enovation is spearheaded by initiators and then gradually diffused through imitation and it is upon this exhaustion that a new innovation is pursued and developed, and implemented through a new enovation process.

Given that the proposed description focuses on enovation, observed changes in outputs, the old technology-push demand-pull controversy (Nemet, 2009), is sidestepped as both forces are input factors in the present consideration. Still, with both views strong theoretically, the technology-push and demand-pull effects are crucial empirical questions. As discussed above, high shares of sales of new innovative products may yet be undermined by cases of low total sales overall. This would be a case of technology-push that is not met by a materialisation of some anticipated 'latent demand' (Schmookler, 1962).

Indeed, the demand for such a *marketable* innovation may even be virtually absent ending in it not being actually *marketed* (Dosi, 1982). Here, there would be a case of technological invention (scientific discovery) and innovation (adaptions towards

commercial viability) having a large impact on a sub-enovation – shares of sales of new products, but no impact at all or indeed a negative effect on aggregate enovation – productivity growth. This is because the later captures not only that new products are produced and sold but more importantly the overall economic contribution of the firm to society. Indeed, the predominance of the later stipulates complementarities and interactions between the technology-push and demand-pull approaches (Nemet, 2009), for a new technology for which there is no demand bears no return.

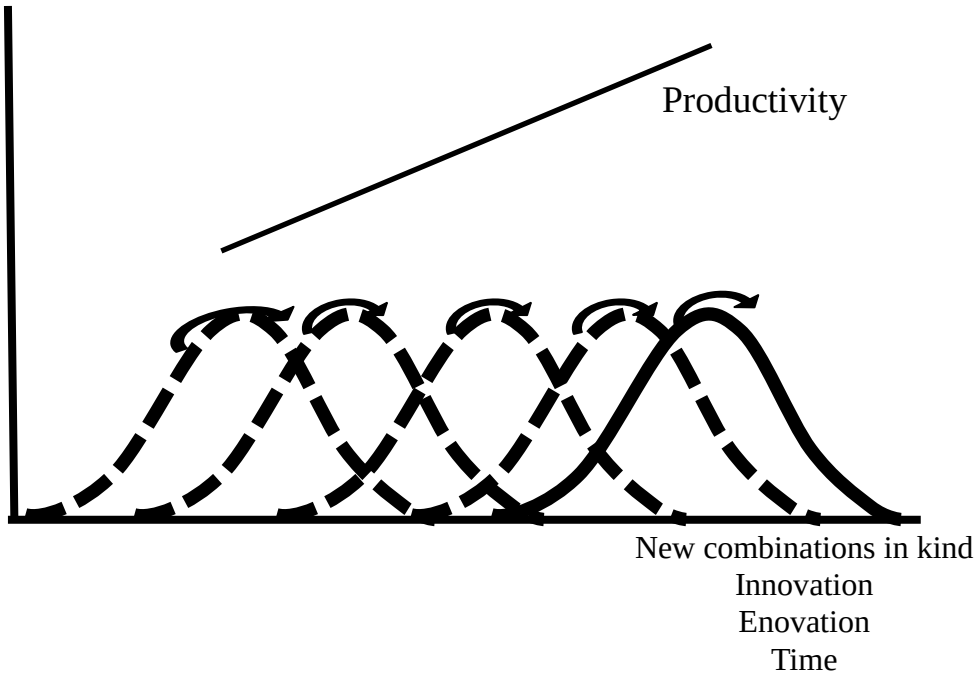
Nevertheless, there are many other costs, risks and other factors associated with the entire process of technological change that firms will consider. On the part of the innovator, these might include the costs involved in the lengthy and untidy process of invention (Arthur, 2007), as well as the risks of rapid imitation and uncertainty of returns (Scherer, 1986). Further, in their decisions whether to commit resources to innovation or to instead wait and imitate (Dasgupta, 1988), firms will also consider the costs and time taken to imitate (Mansfield *et al.*, 1981) and the competitive or monopoly structure of their industry (Dasgupta and Stiglitz, 1980; Loury, 1979), to determine whether the payoffs from innovation are worthwhile.

Indeed, even after obtaining the knowledge, firms will yet decide whether carrying out the innovation, enovating, is the most optimal strategy at the time (Bloom and Van Reenen, 2002). Government policies, including tax credits for innovators and consumers of specific products, research funding, government procurement, and patents and other intellectual property regulations will also play a role (Nemet, 2009). Tacit and other experiential knowledge, as well the presence of spare and versatile resources in the firm will also play a role not only in the decision to change but also in the fruition of that change and the payoffs thereof (Nemet, 2009; Penrose, 2009 [1959]).

In all, for the different firms in the economy, there are many factors, some internal to the firm, others external, that create a complex structural model determining the decision to innovate, the extent of resources devoted to innovation, the amount of knowledge thereof, the decision to actually employ that knowledge by enovating, the type of sub-enovation to pursue, the extent of sub-enovation pursued, the sub-enovation realised, and finally the aggregate enovation achieved that manifests as productivity growth (cf. Crepon *et al.*, 1998).

Still, it is such a variety of firms and the pertinent innovation and enovation variables that sustains the *propulsive procession* dynamics of initiative enovators pulling imitative enovators and the imitative enovators pushing new initiative enovators. It can be seen from Figure 3.3 below that the resultant *procreative exhaustion* propels the entire procession of firms forwards as the *enovation* scale in the economy rises overtime with combinations of factors of production changing in kind in turn increasing overall productivity in the economy. These dynamics are metaphorical to a 'crawling caterpillar'.

Figure 3.4: The 'crawling caterpillar' and productivity growth



3.4 Distortionary enovation

Whilst the *procreative exhaustion* dynamics of innovation, enovation and diffusion described above appear orderly and efficient, in practice, this may not be the case. Indeed, as already indicated, the economic landscape is teeming with innovation efforts and many residual unspecified factors that affect *aggregate enovation*. Thus, crucially, what may ostensibly look like an organised procession of firms may actually be a constant flurry of economic activity awash with mutually ignorant innovations, minor differentiations, and market tussles of sorts as well as reactions to and adaptions of serendipitous outcomes.

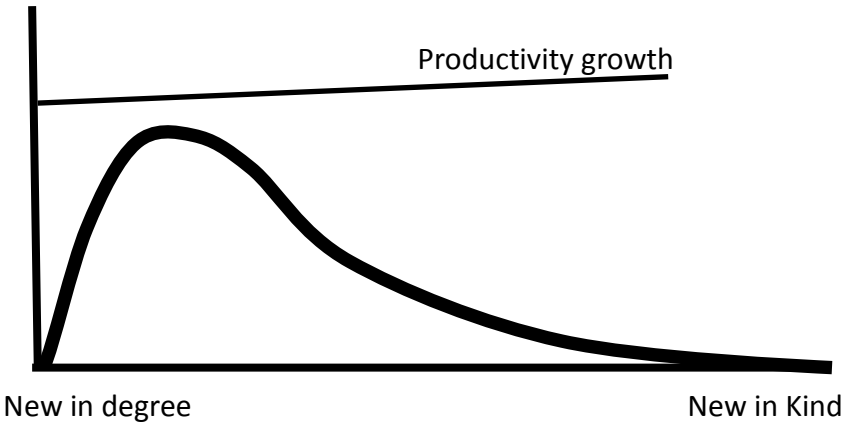
Dosi (1982) may yet argue that all these are minor undulations within a given technological paradigm. It would thus be the shift between paradigms that would be discontinuous, in the Schumpeterean (1943) *creative destruction* fashion. Still, the discontinuities may not always be destructive. According to Tushman and Anderson (1986), punctuating periods of incremental innovations are technological discontinuities that significantly increase both munificence and uncertainty, but these discontinuities may either be 'competence-destroying' or 'competence-enhancing'.

Competence-enhancing discontinuities build on existing know-how while competence-destroying innovations render existing capabilities obsolete and therefore fit within *creative destruction* proper*;* this would especially be the case where dominant designs reign. Yet, while competence-enhancing discontinuities do not result in environmental turbulence, they are usually spearheaded by the successful incumbents and thus tend to reinforce and advance existing market power. 'The rich get richer as liabilities of newness plague new entrants' (Tushman and Anderson, 1986, p445).

In both cases, however, it is clear that the distribution of the realisability of advancement is skewed. On the one hand, competence-enhancing *enovation* reinforces entry barriers, thereby forestalling imitation. On the other hand, competence-destroying *enovation*, by making incumbent competencies obsolete, results in the exclusion of incumbents from the new combinations until when they are able to gain the requisite competencies to participate in the new economy.

Thus, even when considering the plethora of innovations and *enovations* present in an industry, the distribution of enovativeness and growth amongst firms may not be even and this will in turn affect the nature of economic procession, and therefore the growth and development path, an economy may assume. Where enovation is low for a majority of firms such that there is an over representation of inertiative and conservative firms in the economy, then we may have an *encumbered procession* of firms which appears like a *lugging caterpillar* (Figure 3.4). Rather than being procreative, the exhaustion process here will be sterile and productivity growth will be stunted, on average, as the growth curve indicates. In such an economy, it would be of interest to understand and enhance factors that may boost innovation and *enovation* towards new growth opportunities.

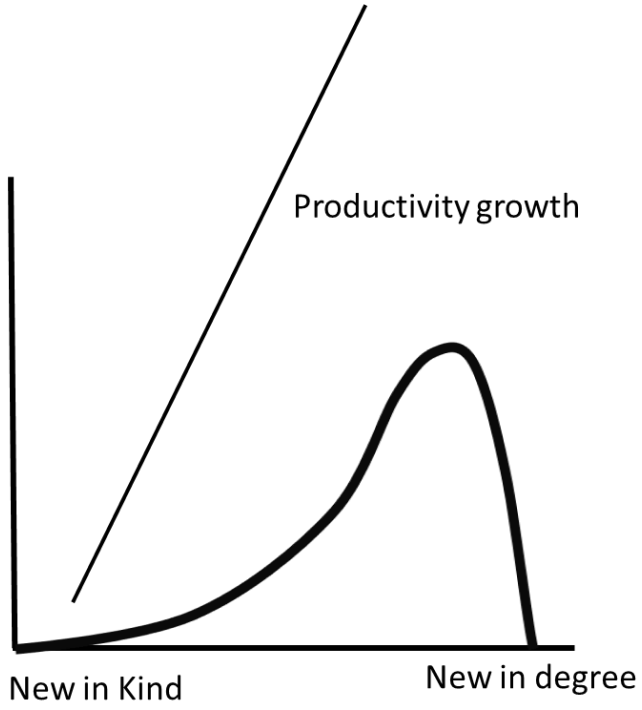
Figure 3.5: The lugging caterpillar



In contrast, there may yet be a situation with an over-representation of overzealous *enovators*. The convoy of firms here will be a *hurtling procession*, graphically appearing like a *lurching caterpillar*. In this situation, revolutionary qualitative changes may be taking place too quickly and too often, leaving insufficient time for a progressively exhaustive diffusion. This situation suggests misguided enovation incentives and perceptions may be abnormally high at the systemic level.

As already argued, *enovation* comes with a residual of unknowns which pose significant risks and pitfalls. Besides, the innovations that part engender *enovation* are themselves capital investments whose interest rewards may take time to materialise. Thus, hurtling towards new combinations of factors of productions may be riddled with many productive and allocative inefficiencies. Such an economy would therefore need to be tamed towards encouraging optimal utilisation of existing capacities rather than prodigal deployment of new ones.

Figure 3.6: The lurching caterpillar

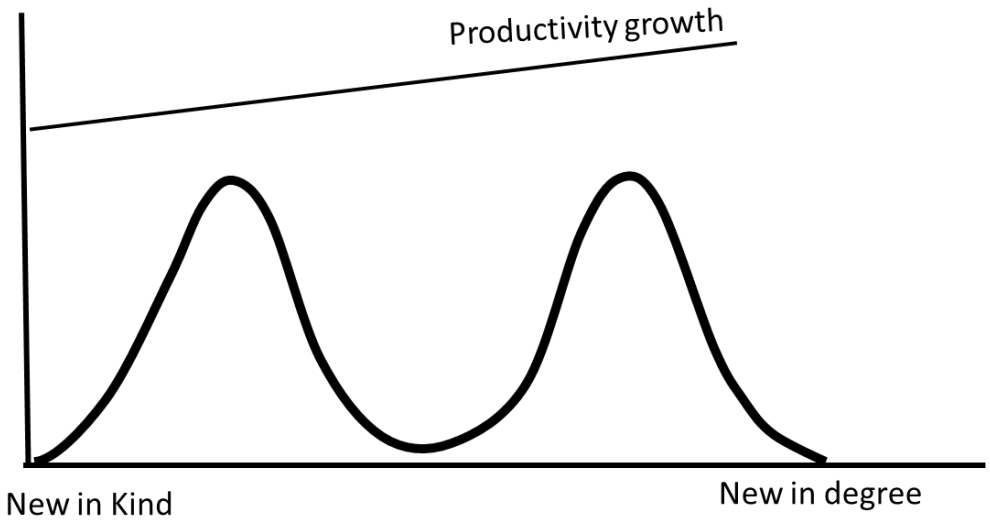


Given the difficulties of a rapid exodus of firms to new combinations of factors of production, the more likely situation is where part of an economic system is biased towards transformation while the other is rather inert. This is clearly a system blotted with inefficiencies and adriftness at both ends. The *dissevered procession* of firms represents a system sustaining both barrenness and prodigality. This is analogous to a *squirming caterpillar* (Figure 3.5).

In this kind of economy, policy would have the discreet role of bolstering enterprise upgrading by capitalising on existing knowledge and enovation opportunities on the inert end, while taming the careering enovation surge on the transformational front. This is not only because of the political economic dilemmas of high inequality (Wilkinson and Pickett, 2010), but as the growth curve shows, the average effect may indicate slow growth overall as transformative enovation on the part of selection of firms is undermined by inert stragglers.

It may yet be the case, however, that the high enovators are connected with other firms internationally rather than locally and may thus be importing or exporting the knowledge associated with their high mutation. It would thus be in the interest of policy to support local linkages, and the adoption of innovations towards engendering enovation and growth amongst the inert and conservative firms. Beyond access to the knowledge upon which enovation is realised, however, such important factors such as absorptive capacity will be of significant import.

Figure 3.7: The squirming caterpillar



3.5 Summary

Recent developments in entrepreneurship research have suggested that the inherent fuzziness of the entrepreneurship concept should be embraced with analytical emphasis shifting to more exacting investigations of particular phenomena that may be housed under the rubric of entrepreneurship (Audretsch, 2012; Wiklund *et al.*, 2011). In this vein, this chapter has attempted to reconceptualise innovation towards elaborating the link between innovation and firm productivity growth that in turn contributes to wider economic progress.

The chapter has argued that *enovation* may be conceptualised separately from innovation as while the later has come to be appreciated as knowledge capital, which may or may not be employed in production and is not the sole driver of change even where employed, the former focuses on the phenomenon of effective change itself given, especially, that productivity growth is necessarily that effective change. In turn, it

is appreciable that the *aggregate enovation* that is tantamount to productivity growth is itself a compound of *sub-enovations.*

It should be interesting, therefore, to empirically investigate whether a *sub-enovation* such as *product enovation* has a significant influence on productivity growth. In a cross-sectional study of firms, therefore, the effect of *product enovation* and other *sub-enovations* may be investigated alongside other factors that may also explain productivity performance and growth variability amongst firms. In turn, the factors that stimulate *product enovation* or may explain differences in *product enovation* levels amongst firms should also be of significant empirical interest.

Towards meeting these empirical objectives, the following chapter reviews the empirical literature on firm-level productivity and firm-level innovation towards formulating specific empirical hypotheses and specifying control variables that past studies have found to explain performance and growth variability amongst firms. In turn, these will guide the present study's data collection (Chapter 5), empirical analysis (Chapter 6) and the postulation of implications for innovation and development research and policy (Chapter 7).

4 CONCEPTUAL FRAMEWORK

'We must make sure that what is passing as good theory includes a plausible, cogent explanation for why we should expect certain relationships in our data' – David Whetten, 1989

4.1 Specification and justification of the phenomena of interest

This chapter espouses the argument advanced in Chapters 2 that rather than wallowing in entrepreneurship's conceptual muddle, it is a more exacting specification of the particular factors that affect given entrepreneurial phenomena, such as small firm performance, that would be more instructive. In this vein, building on the conceptual elaboration in Chapter 3 on the link between innovation, *enovation* and firm growth, the object of this chapter is to generate a conceptual framework and formulate the specific hypotheses to be investigated in the empirical study carried out in the present research.

Following Low and MacMillan's (1988) call that entrepreneurship research should seek to explain how entrepreneurship contributes to furthering economic progress, this study considers the small firm as an instance of entrepreneurship and elects to study two main indicators of firm performance that have an impact on economic progress and are especially critical in a developing country context. Firstly, given that firms constitute the main units of economic activity, economic progress at the societal level is dependent on performance of the constituent firms. Thus, high productivity and productivity growth at the firm level engenders high productivity and productivity growth at the societal level.

A second highly important aspect of economic progress is the creation of jobs since unemployment is one of the indicators of poor economic performance and full

employment a highly desired economic objective. Thus, with firms being the main vehicles of economic activity, the rate of employment creation at the firm level is also an important phenomenon for empirical inquiry, especially in a developing country context where unemployment is a critical issue.

In the preceding chapter, *enovation* was argued to be the principal driver of productivity growth. The primary reason is that a change in output in per unit of inputs terms must necessary be as a result of an effective change *in kind* in the combination of factors of production thereof. Since the *aggregate enovation* that necessarily engenders productivity growth in part constitutes of certain palpable *sub-enovations* such as *product enovation,* an investigation of the impact of *product enovation* on firm performance may be instructive. In turn, a further investigation of the determinants of such *product enovation* is warranted.

The fundamental research questions that the empirical analysis that follows therefore attempts to address are summarised as follows:

i) Why are some firms more productive than others?

ii) Why do some firms realize faster employment growth than others?

iii) Does product enovation explain firms' productivity and employment growth differences?

iv) What factors explain why some firms are more product enovative *than others?*

Having specified and justified the phenomena we seek to understand, we must then progress to the identification of the factors that we posit should explain these phenomena. The present study benefits from the fact that the phenomena of interest

have been subjects of vast empirical research, that the pertinent variables may have been conceptualised differently notwithstanding. Thus, in keeping with Whetten (1989), this study is able to employ a comprehensive approach and therefore draw out as many relevant explanatory factors as possible. Indeed, Capon, Farley and Hoenig's (1990) comprehensive meta-analysis of financial performance found a large number of significant effects and therefore observed that a fairly broad base of explanatory variables is required.

In this vein, the sections that follow review the expansive empirical literature on firm level productivity, employment growth and product *enovation*, with a bias on developing countries, towards outlining the specific empirical whats, hows and whys (Whetten, 1989) of the present research. Given the particular roles of innovation and *product enovation* postulated in the present study, Sections 4.2 and 4.3 review the empirical literature on their impact on firm productivity and growth respectively. Section 4.4 presents the broader conceptual framework in line with our research questions. Section 4.5 summaries the present chapter.

4.2 The effect of innovation and product enovation on firm productivity levels

Since Schumpeter (1934), one of the factors frequently associated with entrepreneurship is innovation often leading to persistent conceptual and terminological confusions in both popular and academic circles (Brazeal and Herbert, 1999; Gartner, 1990; Hébert and Link, 1982; Johnson, 2001). In Chapter 3, we argued, following Schumpeter (1934), that when there is a qualitative change in the combinations of

factors of production, there will be a corresponding change in the product (value-added) in the sense that the same factors are now able to produce more, or the same output now requires fewer factors of production. As such, firms that change their combinations of factors of production should perform better than firms that do not.

Until about the late twentieth century, this line of thinking was largely unexplored with innovation inadequately analysed. For small and medium enterprises, in particular, the analytical treatment of innovation was argued to be 'underwhelming, both theoretically and methodologically' (Hoffman *et al.*, 1998, p42). However, a new generation of empirical research investigating how various dimensions of innovation and *enovation,* especially *product enovation,* affect productivity has since started to grow with the Crepon, Duguet, and Mairesse (1998) study providing a seminal departure point, at least methodologically, in what has come to be known as the CDM methodology.

The impact of innovation on performance may take several routes. In a recent meta-analysis, Rosenbusch *et al.* (2011) found that an innovation orientation had a higher impact on firm performance than innovation inputs and *product enovation*. As Cohen and Levinthal (1989; 1990) argue, it is intelligible that firms with a strong innovation orientation may have other characteristics and resources like high human capital levels and other efficiency drivers that may not always end up in overt *enovation* like new products offered to the market. In fact, a 'written strategy' was also found to be the second most important discriminating variable in an investigation of firm innovativeness in Cyprus suggesting that a strategic focus purposefully harnesses other forms of productive factors towards realising the set strategy (Hadjimanolis, 2000).

An appreciation of these dynamics has led researchers to investigate the determinants of innovation decisions, the relationship between innovation inputs, innovation outputs (knowledge), outputs of such knowledge (*product enovation)*, and ultimately the impact on firm performance. As indicated above, most studies employ what has been termed the CDM methodology (Crepon *et al.*, 1998). As theory would suggest, many of these studies find that *product enovation* has a positive relationship with firm productivity levels (see also, Cainelli *et al.*, 2004; Griffith *et al.*, 2006; Hall *et al.*, 2009; Janz *et al.*, 2003; Lööf and Heshmati, 2006; Parisi *et al.*, 2006).

Indeed, while many studies focused on manufacturing, an interest in the services industry has also grown (for example, Cainelli *et al.*, 2006). In Europe, data from the Community Innovation Surveys has been said to greatly enhance empirical inquiry in this area (Cainelli *et al.*, 2004; Mansury and Love, 2008). Studies comparing manufacturing and services have found that both manufacturing and services show similar positive signs on the whole but with coefficient weights and levels at which statistical significance is found differ (Lööf and Heshmati, 2006).

On the whole, however, studies of the link between *enovations* like *product enovation* and *process enovation* and firm performance have found contradictory results. The contribution of these overt *sub-enovations* to firm performance is not always consistent or immediate, and in some cases not existent at all or even negative (see for example, Li and Atuahene-Gima, 2001; Quince and Whittaker, 2002; Rosenbusch *et al.*, 2011). For example, in their study of France, Germany, Spain and the UK, Griffith *et al.* (2006) find that only France shows a significant relationship between process *enovation* and productivity. In fact, Germany's productivity showed no relationship at all with product *enovation*. Mansury and Love's (2008) study of product

enovation in services in the US also finds that though product *enovation* had a positive effect on growth, it had no relationship with productivity differences amongst firms.

In developing countries, this mixed story also largely holds. Chudnovsky *et al.'s* (2006) study on Argentina found that firms that carried out product *enovation* and process *enovation* had significantly higher labour productivity than those that had not. Crespi and Zuniga (2012) also found that the introduction of new products and processes (which they termed 'technological innovation', product and process *enovations* in our case) has a positive relationship with productivity amongst firms in Argentina, Chile, Colombia, Panama and Uryguay. Indeed, they also found that with such technical innovation accounted for, the size of the firm in terms of number of employees was not related to productivity in Argentina, Chile, Panama or Uruguay suggesting that to enhance productivity in these countries, implementing product and process changes is superior to mere expansion of the workforce.

Moreover, in Costa Rica, where new products and new processes had no significant relationship with productivity, a higher number of workers appeared to significantly lower productivity, while in Colombia a significantly positive relationship between productivity and both new products and new processes and size was found. Further, when accounting for technological *enovations* (new products and new processes), non-technological *enovations* (captured as a dummy if the firm introduced marketing and organisational changes) enhanced productivity in Argentina and Colombia but had no impact in Chile, Costa Rica, Panama or Uruguay. In an earlier study of Chilean firms, however, Benavente (2006) found no relationship at all between innovation efforts and the share of sales of enovative products, and both innovation intensity and product *enovation* were not found to have a relationship with productivity

levels. This suggests that the intervening lags betweening sowing the seeds and reaping the benefits of innovation are crucial considerations, or that other factors may render the innovation efforts unfruitful.

Generally, studies of the relationship between innovation, and *enovations (*mostly product and process *enovations)* and productivity in developing countries have been said to be 'sparse and ambiguous' (Lee, 2011). Indeed, Lee's own study of Malaysian firm finds that while product *enovation* ostensibly shows a positive relationship with prodictivity levels, process *enovation* appears to have a negative relationship. Both of these relationships were however not statistically significant.

Similar mixed findings have been reported by studies in other Asian countries (Fernandes, 2008; Waheed, 2011). Waheed (2011) reports that the role of product *enovation* is unimportant in explaining productivity variance in both Bangladesh and Pakistan, but finds that process *enovation* is a significant determinant of labour productivity for Bangladesh firms but not Pakistani businesses. Also studying Bangladeshi firms, Fernades (2008) found that R&D activities yielded no productivity gains. Indeed, firms with newer machinery had lower TFP levels than other firms but higher shares of computerised machinery is associated with higher TFP.

In a study of Chinese firms, Li and Atuahene-Gima (2001) found that new product development strategy is positively associated with new technology venture performance. That relationship is however significantly moderated by government support and environmental turbulence which enhance the effectiveness of the innovation strategy, and strategic alliances for product development which undermines the positive effect product development has on peformance. They argue that difficulties in managing relationships in, for example, licensing and joint venture agreements may explain this.

Li and Atuahene-Gima (2001) also find that political networking, a factor thought to be important in developing countries, has no influence on performance nor does it moderate the relationship between innovation strategy and firm performance.

Whilst research into the relationship between innovation, specified *enovations* and productivity at the firm level in Africa is scarce, some studies have found results that corroborate the variegated story above (Goedhuys *et al.*, 2008; Goedhuys and Sleuwaegen, 1999). Goedhuys and Sleuwaegen (1999) found no significant impact of R&D activity on labour productivity in Burundi. Similarly, a recent study on Tanzanian firms found that investments in R&D had no measurable impact on productivity nor did both product and process *enovation* (Goedhuys *et al.*, 2008).

That empirical findings continue to disconcert the understanding of the relationship between firm level innovation, observed *enovations* and productivity is be an issue that researchers must endeavour to untangle. Of course, a ready remedy for the sparsity problem Lee (2011) identifies is to increase the number of studies of these phenomena. Our study would unpretensiously contribute to that effort.

Regarding the prevalent ambiguity, a putative explanation is that it takes time for innovations and *enovations* like product and process changes to have an observable effect on firm performance. Firms may take time to learn, implement and master an innovation, such that the conversion of an innovation to an effective *enovation* is not straightforward. This is in part due to the costly investments in production equipment and new capabilities as well as difficult changes in production procedures and routines required to be able to appropriate the benefits of a promising innovation in practice (Coad and Rao, 2008; Rosenbusch *et al.*, 2011). Moreover, as argued in Chapter 3, like entrepreneurship, the realisation of *enovation* is a result of innovation inputs and many

unknown factors, and some of these unknowns may be detrimental rather than productive. It is possible, therefore, that product *enovation* may actually undermine the final product of the firm.

Indeed, due to such considerations, following research and development efforts, firms may only identify certain 'real options' for *enovation* and even secure patents for them but merely earmark them for possible future development as marketable products (Bloom and Van Reenen, 2002). In any case, markets may themselves take time to embrace a new product or to recognise its enhanced utility; markets may indeed not grow to the necessary critical size in time to avert the failure of the enovative firm (Glazer, 1985).

Drawing on all of the above, the first hypothesis to be tested empirically in this thesis can be formulated as follows:

> *Hypothesis 1: Product enovation is positively associated with levels of firm productivity, i.e. firms that turnover higher shares of new products have higher levels of productivity*

4.3 Innovation, product enovation and growth

In theory, whilst the innovation – *enovation* – productivity link may not always hold in cross-sectional analyses because low enovators may yet harbour static sources of high performance (e.g. high levels of capital stock), the innovation – *enovation* – productivity growth link would be expected to be more direct as the growth is necessarily a consequence of an *in kind* rather than *in degree* change in the input combinations. Researchers have thus observed that, 'innovation of any kind fosters growth' (Heunks, 1998, p270), regardless of whether the industry in which the firm

operates is high tech or low tech (Thornhill, 2006). Still, in the midst of an ongoing debate on the contribution of innovation to growth outcomes such as employment (Vivarelli, 2012), it may yet be interesting to find out if high product enovators outperform their non-enovating counterparts (Geroski and Machin, 1992).

In 1962, Edwin Mansfield, a pioneer in the study of innovation, found that 'successful innovators grew more rapidly than the others; and in some cases, their average rate of growth was more than twice that of the others' with smaller firms growing faster in line with intuitive expectations (Mansfield, 1962, p1036). Many studies in developed economies appear to largely confirm this thesis (Audretsch, 1995; Cainelli *et al.*, 2004; Cainelli *et al.*, 2006; Coad and Rao, 2008; Cozza *et al.*, 2011; Freel, 2000; Heunks, 1998; Lentz and Mortensen, 2008; Mansury and Love, 2008; Rosenbusch *et al.*, 2011; Storey, 1994; Vermeulen *et al.*, 2005).

On product *enovation* specifically, alongside other complex displacement and compensation dynamics, it is thought that new products expand sales to existing customers and also attract new customers. This should therefore generate sales growth and consequently, perhaps, employment growth not least to be able meet the enhanced market demand (Hall *et al.*, 2008; Vivarelli, 2012). Indeed, a study of small firms in Midwestern America found that new products and product improvements were positively related to sales growth (Wolff and Pett, 2006). Roper's (1997) study of German, British and Irish firms also found that product enovative small firms saw their output grow faster than that of the respecive non-enovators in the three countires.

Unlike their British and Irish counterparts, nevertheless, German product enovators suffered reductions in employment. A Spanish study, however, found a more intuitive link between product *enovation* and employment growth (Calvo, 2006). Firms

undertaking product related R&D also experienced above average employment growth rates in the Netherlands (Brouwer *et al.*, 1993). Freel and Robson's (2004) study in Scotland and the North of England also highlighted a positive relationship between product *enovation* and employment growth overall. However, a negative relationship, 'at least in the short term', between product *enovation* and growth in sales or productivity in manufacturing was also found, suggesting that with the returns to manufacturing innovation appearing to be lagged, the expectation of longer term rewards may lead firms to be prepared to sacrifice short-term performance (Freel and Robson, 2004).

An obvious short-term effect of product *enovation* is the displacement of incumbents. Here, the Schumpeterean *creative destruction* is seemingly at first more destructive than creative. Still, proposing a new methodology that accounts for the displacement and compensation effects of *enovation*, Harrison *et al.* (2008) studying France, Germany, Spain and the UK found that product *enovation* usually contributes to employment growth, the cannibalisation of old products and markets notwithstanding. Employing this methodology in Italy, product *enovation* was not found to contribute to employment growth any more than increases in the sales of existing products (Hall *et al.*, 2008). One notes, however, that the discovery of new markets is yet one of the five Schumpeterian types of innovations (Schumpeter, 1934; 1939).

Be that as it may, empirical evidence attempting to untangle these phenomena in developing countries is scant (Goedhuys and Sleuwaegen, 2010), despite employment growth being a highly critical development issue. Nevertheless, studies on Latin American firms appear to confirm Harrison *et al.*'s (2008) European findings. Crespi and Tacsir's (2011) investigation of *enovation* impacts on employment in Argentina,

Chile, Costa Rica, and Uruguay found that product *enovation* is associated with firm-level employment growth.

Indeed, looking at the same four countries, a 'make' product *enovation* strategy, rather than 'buy' strategy, was found to engender more employment growth (Crespi and Zuniga, 2012a), suggesting that it was not just new products that engendered growth but also the efforts at creating such new products. They argue, thus, that these findings confirm that in addition to generating new products, there are absorptive capacity and other efficiency gains from innovation efforts (Cohen and Levinthal, 1989; Cohen and Levinthal, 1990). Individual country studies on Chile (Benavente and Lauterbach, 2008), Costa Rica (Monge-González *et al.*, 2011) and Colombia (Caballero *et al.*, 2011) confirm these findings. A study on Brazilian firms also found that the intensity of innovation efforts was important in accounting for sales growth differences amongst firms (Goedhuys, 2007a).

Outside Latin America, a study of Taiwanese firms concluded that although the introduction of new processing technologies had different effects in different industries, product *enovation* had a positive association with employment growth in all industries regardless of their technological sophistication (Yang and Lin, 2008). Waheed (2012) also found that product *enovation* enhanced employment growth in Pakistani and Bangladesh.

The only African study on these issues found in the literature is by Goedhuys and Sleuwaegen (2010) which confirms the general trend of findings elsewhere. Employing a quantile regression technique on firm level data from 11 African countries, they find that while firms introducing new products grew faster by 2% on average, the quantile regression method suggested that product *enovation* raised employment growth

by 6% at the 90 percentile suggesting that higher average employment growth rates are driven by a few firms with higher product *enovation* levels (see also, Goedhuys *et al.*, 2008; Nichter and Goldmark, 2009).

In the light of these studies, the second hypothesis tested in the present work is formulated as follows:

Hypothesis 2: Product enovation is positively associated with higher levels of firm employment growth.

4.4 Other determinants of small firm productivity, employment growth and product enovation

In a review of empirical research on the economic performance of entrepreneurial firms, defined in the study as new independently-owned businesses, Westhead and Birley (1995) gleaned as many as 88 variables that had been found to have a significant impact. Such a profusion of variables is known to pose severe empirical challenges in the field of economics more generally (see for example, Sala-i-Martin *et al.*, 2004; Sala-i-Martin, 1997).[3] At the same time, this thesis has argued that for entrepreneurship research to be analytically instructive, it is a more inquisitive specification of the pertinent factors ensconced elusively under the veil of entrepreneurship that is required.

Typically, as Miller (1983) observes, in 'simple firms' like Micro and Small Enterprises (MSEs), it is expected that there would be a 'leadership imperative'

[3] Advised by a wide variety of reasoned theoretical and empirical advances, the World Economic Forum for example identifies over one hundred factors that are important determinants of productivity and growth, compressing them into twelve 'pillars' that determine competitiveness. See http://www.weforum.org/reports/global-competitiveness-report-2011-2012 for the latest report.

suggesting that the 'the personality, the power, and the store of knowledge of the leader' predominantly influences the undertakings of the firm (p773). In this light, in arraying the different factors to investigate in the present work, in line with the research questions and the hypotheses formulated above, we find it useful to highlight specifiable owner-manager factors, alongside other firm characteristics and environmental influences. In turn, we review the empirical literature on the respective factors, drawing in particular, on research in developing countries.

4.4.1 Owner-Manager factors

4.4.1.1 Gender

Unlike in developed economies where gender has been found to have no statistically significant impact on neither the probability of product *enovation* (Copus *et al.*, 2008), nor small business performance and growth (Chell and Baines, 1998; Johnsen and McMahon, 2005), gender is a critical issue in analysing the performance of small firms in Africa. A statistic that readily legitimises the gender factor is that 48% MSEs in Southern and Eastern Africa are owned by women and with a perceptible gender divide towards low growth firms for women (McDade and Spring, 2005; Mead, 1999).

Some of the problems inhibiting female business success include limited institutional impediments, for example, women's rights to property and education, as well as tethered mobility and disproportionate household tasks which limit women to their homes or immediate neighbourhoods (Nichter and Goldmark, 2009). An implication therefrom is that women are likely to be 'invisible entrepreneurs' who are

overlooked (Mead and Liedholm, 1998) or downright discriminated against (Liedholm, 2002), thereby worsening their firms' performance and overall growth prospects.

Indeed, female-led firms were found to have grown at a slower rate than their male counterparts in South Africa, Swaziland and Botswana (McPherson, 1996). In a study of micro and small firms in Sub-Saharan Africa and Latin America, Liedholm (2002) also found that female-led firms were more likely to fail. Upon closer investigation, however, most closures were found to have been caused by personal and non-business factors. Where only pure business related factors were considered, gender was no longer a significant determinant of failure. In fact, female-led textile MSEs were found to have higher levels of labour productivity in the Dominican Republic than those owned by men (Downing and Daniels, 1992 in Nichter and Goldmark, 2009).

4.4.1.2 Education

It is often argued that owners and workers of many Micro and Small Enterprises (MSEs) in developing countries have low levels of education, in part because more educated Africans establish themselves in full time positions in larger firms (Nichter and Goldmark, 2009; van der Sluis *et al.*, 2005) where higher wages have indeed been found to reflect higher productivity (Bigsten and Söderbom, 2006; Jones, 2001). In general, however, higher education is usually in particular specialisations. As such, graduates are likely to pursue employment in established firms where their careers would closely match their qualifications. For such reasons, researchers suggest that most MSE owner-managers in developing countries resort to self-employment due to lack of alternative employment opportunities (Nichter and Goldmark, 2009; Reynolds *et al.*, 2001).

Generalising from such views may be challenged in the light of emerging evidence of 'the new generation of African entrepreneurs' who are have been found to be highly educated professionals employing modern management methods and information technology (McDade and Spring, 2005), factors that have been said to characterise modern professionally run high-growth firms in Latin America and East Asia (Kantis *et al.*, 2002). Indeed, when developing economies experience a growth dynamic, like the one sparked by recent information and communication technology advances in Africa (Hughes and Lonie, 2007), more entrepreneurial opportunities for more educated individuals emerge (van der Sluis *et al.*, 2005). Thus, while the necessity entrepreneurship arguments may yet be valid regarding entry, evidence suggests that education is particularly key for post entry performance (Bates, 1990; Vivarelli, 2012), in part because high levels of education are associated with high growth motivations (Delmar and Wiklund, 2008).

The importance of education can thus not be overemphasized where it is performance, rather than mere entry, that is of interest. Recent empirical evidence from Kenya, Zambia, Zimbabwe and Tanzania suggests that graduate entrepreneurs found firms that are 50% larger than entrepreneurs who only managed to complete primary school (Biggs and Shah, 2006) and there is compelling evidence that firm size matters for productivity and growth in Africa (Sleuwaegen and Goedhuys, 2002; Van Biesebroeck, 2005).

Indeed, a meta-study on the impact of the owner-managers education on firm performance, including growth, in developing countries found that a marginal year of schooling raised performance by 5.5%, with education gains for women entrepreneurs higher still (van der Sluis *et al.*, 2005). Recent evidence from Tanzania also confirms

the significance of the owner manager's education for firm productivity (Aggrey *et al.*, 2010; Goedhuys *et al.*, 2008). In particular, secondary school completion and formal business training were to be important determinants of employment growth amongst Southern African firms (McPherson, 1996). Biggs and Shah (2006) also find that firms in Kenya, Tanzania, Zambia and Zimbabwe whose owner-managers had completed secondary school or obtained a university degree grew at a rate about 5% faster than those without such qualifications. Goedhuys and Sleuwaegen's (2010) study comprising 11 Sub-Saharan African countries found university degrees to raise firm employment growth by 2%.

4.4.1.3 Managerial experience

Intuitively, having some managerial experience before setting up a business may be conjectured as a positive. This relationship is however not without qualifications as longer experience is sometimes associated with slow growth firms (Nichter and Goldmark, 2009; Storey, 1994). A potential reason is that 'indoctrination effects' may engender resistance to change.

Still, emerging empirical evidence from Africa suggests that managerial experience enhances productivity and growth. In his study of firms in Southern African countries, McPherson (1996) found a positive relationship between employment growth and years of experience in similar activities. Nevertheless, threshold effects of experience were highlighted by Parker (1995) who found that at least 7 years of experience led to faster growth than that found amongst those with lower (cited in Nichter and Goldmark, 2009).

Indeed, qualitative evidence suggests that high growth firms in Africa tend to have been founded by owner-managers with a global outlook and professional experience in formal firms in Africa and abroad (McDade and Spring, 2005). This suggests an interaction between technical managerial experience itself and other human capital and social capital factors. In fact, researchers have found that networks established in previous occupations are usually resourcefully harnessed later by persons who leave employment to set up their own firms (Kantis *et al.*, 2002).

4.4.1.4 Focus on one business

In highly uncertain and underdeveloped business environments in developing countries, it is reasonable that entrepreneurs will attenuate their exposure to risk by having several businesses in different sectors. Indeed, this phenomenon is said to have characterised merchant behaviour in colonial America, with the markets then too small and sparsely distributed, restrictive colonial metropolis regulations encumbering business, and financial infrastructure underdeveloped; all rendering specialisation imprudent given the business environment (Blackford and Kerr, 1986).

Notwithstanding the foregone specialisation gains, there may be other benefits to this furcated approach to entrepreneurship. A ready benefit is that the straddling owner-manager may gain from the wider-ranging knowledge, broader networks, and an enhanced reputation (Ucbasaran *et al.*, 2003). Moreover, due to the problem of underdeveloped financial and other markets for resources, businessmen may use finances across their business portfolio to avert cash flow and credit problems that may afflict any of the businesses within the 'business family'. Such a system of interlocking businesses enhances information flows, broader skill pools and access to other

resources in a manner similar to the dynamics that led to the development of the highly successful *kieretsus* and *chaebols* of Japan and Korea (Lingelbach *et al.*, 2005).

Indeed, McPherson (1996) found that in Lesotho firms whose proprietors ran more than one business grew more rapidly than firms whose owners were focussed on one firm. Recent evidence however suggests that most of the new crop of modern African entrepreneurs tend to focus on one business. Nevertheless, those that expand are found to employ more systematic expansion strategies, including innovation, and the augmentation of the main business with their other firms' related activities (McDade and Spring, 2005).

4.4.1.5 Age of the owner-manager

Age is frequently found to be a significant determinant of entrepreneurial entry (Delmar and Davidsson, 2000; Stewart Jr *et al.*, 1999; Storey, 1994). In the modern era of globalisation and a dynamic world undulating with new technology, it has been observed that there is a global tendency for young educated professionals to become entrepreneurs rather than employees (McDade and Spring, 2005), in part to participate in the labour market while reserving independence (Martinez *et al.*, 2007). Nevertheless, whether the enthusiasm for entry translates to performance attributable to age is a different question.

A recent survey of Swedish small business managers found age to be negatively associated with both growth motivations and actual growth in employment and sales (Delmar and Wiklund, 2008). In Southern Africa, McPherson (1996) found the notion that firms with older entrepreneurs grew slowly to only receive very limited support empirically. Indeed, other research shows that older African entrepreneurs start larger

firms (Biggs and Shah, 2006), and larger African firms perform better (Van Biesebroeck, 2005). Elsewhere, a European study found that the age of the owner-manager's has no impact on the probability of *product enovation* (Copus *et al.*, 2008).

4.4.1.6 Enterprising Spirit

Perhaps one of the most controversial areas in entrepreneurship research is the psychology of the entrepreneur (Baum *et al.*, 2007; Gartner, 1988; Shane *et al.*, 2003; Shaver and Scott, 1991). Indeed, whether entrepreneurs are different from other members of society has been a complex research question (Beugelsdijk and Noorderhaven, 2005; Mueller and Thomas, 2001). Scholars have argued that a social-psychological interest in entrepreneurship 'seems too subjective and too beholden to some idealised view of the heroic nature of the owner-entrepreneur to be of much use in policy terms' (Hoffman *et al.*, 1998, p45). The rejoinder from enthusiasts, however, is that if human agency has a role in the entrepreneurial process, then attributes of these decision-making agents do have an impact; the more important questions regards the identification and measurement of these factors (Shane *et al.*, 2003).

Many problems in this area emanate from the very definition of the entrepreneur. Even within the so-called serial entrepreneurs that are usually highly esteemed, qualitative research has unearthed distinctions related to their actual roles in the firm with 'habitual starters' differing from 'habitual acquirers' in a variety of ways (Ucbasaran *et al.*, 2003). This variety of what counts as entrepreneurial makes it impossible to determine the entrepreneurial act on which the psychological factors have an impact. Nevertheless, that an enterprising spirit influences entry decisions has been

widely researched and found to be significant (see for example, Delmar and Davidsson, 2000; Stewart Jr *et al.*, 1999).

Further, on specific factors like firm employment and sales growth, Delmar and Wiklund (2008) recently found the owner/manager's growth motivations to have a significant causal effect. Qualitative evidence from Africa also suggests that factors like enthusiasm, optimism, empowerment and confidence mattered to the new generation of growth-oriented African entrepreneurs (McDade and Spring, 2005). In the light of such insights, further investigations of the innate abilities and motivations that may explain entrepreneurial selection and performance, especially in developing countries where growth is urgently needed, have been called for (van der Sluis *et al.*, 2005).

4.4.2 Firm-level factors

4.4.2.1 Presence of other innovation and enovation activities

Given the multifariousness of the definition of innovation as we saw earlier, it is unlikely that firms will engage in only one type of innovation and *enovation*. In fact, Hewitt-Dundas (2006) observes that product *enovation* is more likely to occur where the firm also carried out organisational *enovations*. Indeed, this complementarity may even happen at the strategic level. Golovko and Valentini (2011) find that the adoption of exporting as an expansion strategy enhances the adoption of product *enovation* at the strategic level as well.

In an African study, higher investments in new machinery and equipment, which may represent process *enovation*, was also found to be associated with a higher probability of product *enovation* in Tanzania (Goedhuys, 2007b). Internet access was

also found to have a positive and significant impact on the propensity for product *enovation* (Goedhuys, 2007b). But access may itself not do enough; the intensity of use may be more important. For example, a UK study found that the mere use of e-commerce does nothing to boost entry into export markets, but the intensity of its use is associated with increased export intensity (Ganotakis and Love, 2011). To capture the effect of product *enovation* on firm performance therefore, it is important to account for other innovations and *enovations* that may moderate the effect of product *enovation* on firm performance or act as rival determinants of firm performance.

4.4.2.2 Firm age and size

The relationship between firm age and size, and growth of the firm has for a long time interested economic and business scholars. This is anchored in the debate surrounding Gibrat's Law of proportionate effect (Mansfield, 1962) and Jovanovic's (1982) learning model that suggests that young and small firms initially grow rapidly (Audretsch *et al.*, 2004; Lotti *et al.*, 2003). This debate is relevant for development policy for 'if young firm's grow quickly, policy measures aimed at encouraging entry may have significant growth effects in the short and medium term' (Bigsten and Söderbom, 2006, p253).

In many African countries, however, it has been observed that only a handful of small firms ever grow to become large firms (Bigsten and Söderbom, 2006; Van Biesebroeck, 2005). Indeed, the proportion of positive investment has been found to be lower than 0.5 across all firm sizes; suggesting that in a typical year, a vast majority of African firms do not make any investments (Bigsten and Söderbom, 2006). This is in

spite of considerably high rates of return on investment, although this also implies high capital costs (Bigsten *et al.*, 2000; Bigsten and Söderbom, 2006).

Researchers have thus found that in Africa 'investment is "lumpy"; whenever firms do invest, they invest a lot' (Bigsten and Söderbom, 2006, p257). A further implication, thus, is that firms entering large may grow slowly at first then speed up the growth process as they learn and consolidate their position suggesting that high growth may be experienced by young and small firms, and old and large firms alike (Bigsten and Söderbom, 2006). Indeed, Sleuwaegen and Goedhuys (2002) found that young firms in Cote D'Ivoire grow faster than old ones, but noted that start-up size significantly determined subsequent growth.

Larger entrants 'enjoy a better reputation from the start and face growth opportunities that improve over time despite that they quickly attain an efficient scale of operations, an effect that dampens their need to grow' (Sleuwaegen and Goedhuys, 2002, p126). Findings from other research in Africa are however more emphatically on the side of larger firms. In Van Biesebroeck's (2005) study of firms of all sizes in nine African countries, large firms were found to be more productive, more likely to survive, and to grow larger and enhance productivity faster.

Elsewhere in Africa, an inverse relationship between age and growth is found for firms in South Africa, Swaziland, Lesotho and Zimbabwe (McPherson, 1996). Biggs and Shah (2006) find similar results for firms in Kenya, Tanzania, Zambia and Zimbabwe. Testing age effects on technical efficiency, Lundvall and Battese (2000) found that while there were no significant age effects on efficiency for all sectors, small firms in textiles reported a negative effect. This suggests that the impact of detrimental

ageing factors, like depreciation of capital equipment, may outweigh the gains from learning as the firm grows.

Still, other productivity outcomes related to learning and age effects suggest that even if older firms did enjoy productivity gains from learning, younger and smaller firms, which are less firmly specialised and therefore more agile, may be able to deploy new innovations more and therefore obtain higher productivity gains and growth opportunities from *enovation* than mature firms (Rosenbusch *et al.*, 2011). Therefore, the debate on firm age and size on the one hand, and productivity and growth on the other needs to also consider the role of innovation and *enovation*, not least because there may be various moderating effects at play.

In a recent Latin American study, larger firms tended to have more technical *enovation* (the introduction of product or process innovation) perhaps due to economies of scale and scope in the production of knowledge (Crespi and Zuniga, 2012). Firm size was also found to be a significant determinant of product *enovation* in a study of European countries. In their comparative study of SMEs in six European Union member countries, Copus *et al.* (2008) found that while regional heterogeneity was observed, larger firms *enovated* more and older firms *enovated* less in all regions.

In Africa, a recent Tanzanian study found that while firm age had no influence on the probability of product *enovation* on average, for foreign firms age had a positive and significant relationship (Goedhuys, 2007b). This may be because foreign firms in African markets are often large multinationals. Indeed, unlike a Moroccan study that found a positive relationship between size and product *enovation* (Rahmouni *et al.*, 2010), Goedhuys' (2007) study found that the size of the firm has a non-linear relationship with the propensity product *enovation*. Compared to micro-firms, being a

medium sized firm (30-99 employees) was found to increase the probability of being a product *enovator* by 39%. Large firms (100+ employees) had 26% more probability of being product enovators than micro firms, with small firms (10-29 workers) also 22% better off (Goedhuys, 2007b). Micro firms were argued to have been the lowest enovators perhaps because they also had the lowest indicators in terms of linkage, learning and investment.

4.4.2.3 Financing

Access to finance is a problem that small firms across the world frequently encounter (Nichter and Goldmark, 2009). This poses a significant impediment to productivity and growth because start-ups are not able to secure efficiency enhancing capital equipment or labour services (Hernández-Trillo *et al.*, 2005), much less invest in product innovation. In developed countries with efficient financial markets, start-up firms may seek financing from banks or other financial providers. In contrast, many start-ups in developing countries often do not even make an effort to seek credit from banks because they expect their applications to fail (Bigsten and Söderbom, 2006).

This is an important development issue as recent findings from Mexico (Hernández-Trillo *et al.*, 2005) and Tanzania (Goedhuys *et al.*, 2008), have found that access to external financing other than own (and family or friends) funds are associated with higher productivity. However, Daniels and Meads' (1998) study of Kenyan MSEs found no significant differences in performance between firms that obtained credit financing and those did not.

Indeed, as Hernández-Trillo *et al.* (2005) argue, the fact that money is fungible requires a cautious understanding of the link between access to financing and economic

performance as changing the source of the money does not change the nature of money itself. Thus, it is not barely the obtaining of the money from the bank that engenders performance. Instead, it is the *ex ante* due diligence by banks that sees to it that finances are afforded to businesses with decent efficiency and growth prospects (Hernández-Trillo *et al.*, 2005). As such, while many *enovators* lament about the availability of financing as a constraint, 'only a very small number of those seeking finance actually failed to find it!' (Hoffman *et al.*, 1998, p46). Even in Africa, researchers finds that most applicants do actually obtain financing (Bigsten and Söderbom, 2006).

Nevertheless, most small firms may not satisfy the pre-requisites for bank financing, such as detailed evaluations of predicted returns to investments and a proven track record, and will therefore not secure the funds (Bigsten and Söderbom, 2006; Hewitt-Dundas, 2006). This suggests that the ability to secure external financing is indicative of other efficiency enhancing features of the firm. Indeed, Biggs and Shah's (2006) study of firms in East and Southern Africa found that access to bank loans was associated with larger start-ups while informal loans had no influence on start-up size.

Similarly, a recent study of firms in of garment firms in Kenya reported that access to bank credit depended on observed firm characteristics such as firm age, established brands, and size – indicators financial stability. Nevertheless, with factors like personal reputation, family relations and place of birth also determining access to credit, the formal efficiency enhancing features may be undermined resulting in no productivity gains from access to credit (Akoten *et al.*, 2006). This confirms that 'a loan does not create a viable business opportunity' (Nichter and Goldmark, 2009, p1457).

Indeed, according to Hewitt-Dundas (2006), firms may have to become creative to generate promising business prospects. Thus, financial constraints may actually

stimulate product innovation amongst small firms in the short-term. This may however be in an effort to 'impress' potential financiers, a feat that may not be sustained for long. As such, the persistence of financial constraints may hurt innovation realisation for the small firm (Hewitt-Dundas, 2006).

The futility of financial pursuits may however be assuaged by access to more considerate investors. Indeed, a recent European study found that firms that were able to raise more capital from local institutions or investors were higher *enovators* (Copus *et al.*, 2008) perhaps because they would still be vetted and the feasibility of their business plans assessed even as they would be treated with supportive 'neighbourliness'. Seemingly, therefore, the ability to secure formal external finances may embody important characteristics of the firm that may enhance firm *enovativeness*, productivity and ultimately growth.

4.4.2.4 Human capital

Although rapid education expansion in Africa has been found to not enhance economic returns to education generally due to increased competition for jobs, marginal returns to education have been found to be higher at higher levels of education in Kenya and Tanzania (Söderbom *et al.*, 2006). Indeed, a study of Ghanaian manufacturing firms found that higher levels of education qualifications progressively enhanced firm productivity and correspondingly obtained progressively higher pay (Jones, 2001). However, vocational training was more productive than secondary school qualifications in spite of the longer schooling years in the later (Jones, 2001).

This suggests that specialised applied skills may be more useful than generic intermediate education. Still, the proportion of skilled workers[4] was found to be a significant determinant of labour productivity in a sample of Ugandan and Tanzanian firms (Aggrey *et al.*, 2010). Similar results were found in Chile (Benavente, 2006). In Tanzania, however, the average education of permanent workers has been found to have no measurable impact on productivity (Aggrey *et al.*, 2010; Goedhuys *et al.*, 2008), although positive and significant in Kenya and Uganda (Aggrey *et al.*, 2010). It may be the case that depending on the industry in question, it may not be average education of the entire workforce that matters for productivity but that of a strategic section of the firm. For example, in a firm employing large-scale production, a few process engineers may have their education impact on productivity greatly diluted where their education is captured as part of the firm's average.

Indeed, human capital is especially key for innovation and *enovation* given the centrality of new knowledge, in both pursuit and application, in these processes. Research indicates that a high share of internal highly qualified personnel is an established driver of product *enovation* (Hewitt-Dundas, 2006; Hoffman *et al.*, 1998). Even where innovations are obtained from external sources, a recent study in Morocco argued that firms must be able to benefit from such sources of new knowledge to enhance their *enovation* propensities through training and other technical assistance that enhance absorptive capacity (Rahmouni *et al.*, 2010). Depending on the sector in question, higher proportions of skilled workers as well as the age of the workers may have important implications for absorptive capacity and firm innovativeness and *enovativeness* (Vinding, 2006).

[4] Including managers, proprietors, engineers, physical scientists, accountants, economists, technicians, foremen, supervisors, and specifically skilled production workers (Aggrey *et al.*, 2010).

In her Tanzanian study, however, Goedhuys (2007b), while accounting for sectoral differences, found that formal in-house training had the expected positive sign, but was not a significant driver of product *enovation*. A higher proportion of skilled and professional workers on the other hand appeared to significantly increase the propensity for product *enovation* a phenomenon found to hold for foreign firms especially.

4.4.2.5 Formality

Informality is rampant in many developing economies 'where economic activity lacks recognition and protection under formal legal or regulatory frameworks' (International Labour Office, 2004, p60). A basement survey in Kenyan found a very high degree of informality, with over 88% of the MSE firms operating without registration and 61% without any licence at all (Ronge *et al.*, 2002). Still, informal firms account for almost 80% of all employment in Kenya (Pollin *et al.*, 2008).

A major implication of informality is that firms are excluded from full participation in the new global market and the opportunities thereof as they are confined to restricted, local and informal, markets (International Labour Office, 2004). Indeed, because of their nonentity status, informal firms may also fail to secure credit, lucrative formal sector contracts or protection by the judicial or regulatory system (Nichter and Goldmark, 2009). In fact, with one of the reasons for informality being to 'hide' from the government to avert formalisation costs and burdens (Nelson and De Bruijn, 2005), informal firms do not seek to grow as growth would make them visible (Nichter and Goldmark, 2009).

The wisdom of such decisions is questionable, however, as growth would grant firms a position that may allow them to actually gain influential inputs in policy-making

in addition to being able to employ a broader range of production factors that may yield higher efficiencies and growth (Sleuwaegen and Goedhuys, 2002). Yet, informal firms may not have such productive capacities anyway, in which case statutory compliance would only add to the costs with no productivity enhancements. Thus, formality may be an indicator of other resourceful competences.

The positive and significant effect of a formal status on both firm employment growth and sales growth found in Ivory Coast may attest to this conjecture. In fact, formal firms had about 28% faster employment growth and around 60% faster sales growth than informal firms (Sleuwaegen and Goedhuys, 2002). A Mexican study also found formal firms to be more efficient than informal firms (Hernández-Trillo *et al.*, 2005). However, a study of Kenyan firms by Bigsten *et al.* (2004) found no statistically significant productivity differences between formal and informal micro and small enterprises. This may suggest that factor paucity may yet undermine the realisation of productivity enhancing opportunities, in spite of the official sanction.

4.4.2.6 Sales type and sales trend

In their expansive meta-analysis on the determinants of financial performance, Capon *et al.* (1990) found that while it did not matter for performance whether the firm made its sales to consumers directly or to other firms, the growth of sales generally was positively associated with performance. Whilst the latter may be readily intuitive, the type of market the small firm serves may have certain implications for the small firm in Africa. With no standardisation or other scale economies, small firms may target miscellaneous consumers of really inferior but differentiated goods where production entails *ad hoc* improvisations.

In contrast, industrial customers may on the other hand not only accord some certainty regarding sales volumes and prices, thereby allowing less risky investments towards higher scale economies, but they may also demand certain standards regarding both the product and the firm itself, for example bookkeeping or employee training, that may all enhance productivity and growth of the firm. Indeed, in Tanzania, selling to foreign firms was found to increase the probability of product *enovation* (Goedhuys, 2007b).

Nevertheless, further inquiry discovered that foreign firms in Tanzania mostly traded with each other and thus did not avail learning opportunities to indigenous African firms (Goedhuys, 2007b). Still, given that most foreign firms are large, this may indicate that small indigenous firms are unable to meet the requisite scale levels or other capacities necessary to enter into mutually enhancing contractual arrangements that may afford certainty to *enovation* pursuits. Indeed, a recent study in Kenya, firms that produced tourism merchandise and corporate uniforms, and therefore engage in formal business to business commercial exchanges, were found to be more *enovative* than those serving ordinary garment markets (Kamau and Munandi, 2009).

4.4.2.7 Market Reach

Regardless of who they sell to, participation in broader markets provides learning opportunities that contribute to firm productivity, more so for developing countries than developed economies, even as the debate on whether it is firms that are already highly productive that self-select into exporting continues (Martins and Yang, 2009). Indeed, for African firms, in spite of the high infrastructural impediments,

casting a wider market net is reported to be important for growth (Bigsten and Söderbom, 2006).

Still, the relationship between market reach, innovation, product *enovation* and productivity is not straightforward due to the direction of causality. For example, complementarities are found between product *enovation* and exporting in a recent Spanish study where the impact of product *enovation* on growth was found to be higher for exporting firms thereby suggesting a dynamic virtuous cycle of mutual reinforcement (Golovko and Valentini, 2011). In a UK study of high-technology firms, however, while exporting is found to help firms introduce new products following entry, the intensity of product *enovation* is slowed down by the fact that larger markets may entail selling more of the same product which may in turn mean larger and less nimble production structures (Love and Ganotakis, 2012).

In their study of firms in six Latin American countries, Crespi and Zuniga (2012) found that exporting increased the chances of introducing new products or processes by 4% in Costa Rica, but actually reduced the chances of product and process *enovation* by 15% and 14% in Chile and Colombia respectively. In Malaysia, exporting was also found to have no relationship with productivity differentials amongst firms, although product *enovation* increases the likelihood of exporting (Lee, 2011). Besides the possibility that product *enovation* makes firms productive and productive firms may in turn self-select into broader markets, it may yet be the case that firms introduce a variety of products in line with the different needs of the various markets they serve.

Confirming the self-selection hypothesis, however, a study of firms in Colombia, Mexico and Morocco found that entering foreign markets does not enhance the productivity of an already efficient exporter on average (Clerides *et al.*, 1998).

Nevertheless, learning by exporting was found amongst apparel and leather producers in Morocco which suggests that in industries with little scope for technological learning, exporting may yet afford productivity enhancing lessons such as new markets or just allow further capacity for economies of scale and economies of scope. Bearing in mind that many small African firms only serve small local markets (Bigsten and Söderbom, 2006), it may be interesting to study if intra-country market expansion impacts product *enovation* and firm performance for small local firms.

4.4.3 Environmental factors

4.4.3.1 Networks

Networks of various kinds have been argued to play an important role in the modern highly connected economy (Grandori and Soda, 1995), with firms now seen as 'relational' rather than merely 'transactional' (Belussi and Arcangeli, 1998). Networks may be classified as exchange networks, communication networks or social networks (Mitchell, 1973). Exchange networks entail commercial transactions while communications networks are formal but non-trading related associations. Social networks may be rather informal and encompassing all other types of relations (Szarka, 1990).

In the African socio-economic landscape, whilst exchange networks may perhaps be purely commercial, there are considerable overlaps between business networks and social networks in terms of their objectives and activities which straddle between welfare and formal (McCormick *et al.*, 2003), thereby blurring their distinction. Generally, however, collaborations amongst African firms have been said to

help small businesses to save on transaction costs (Fafchamps, 2001), and grant access to a host of useful resources including information, credit and new business leads (Nichter and Goldmark, 2009). Moreover, in the absence of a strong regulatory environment, business networks also provide a mechanism for the governance of business contracts (Biggs and Shah, 2006).

Indeed, Biggs and Shah's (2006) study of firms in four African countries found that membership in Asian and European networks allowed firms to start at twice the size of indigenous-African firms who were argued to generally lack strong business networks. This is an important finding especially juxtaposed against the fact that larger African firms are usually more productive (Bigsten and Söderbom, 2006; Van Biesebroeck, 2005). Indeed, networking amongst Asian businesses accounted for 37% higher productivity than indigenous African firms and 8% faster growth. Firms with networked European managers in the four African countries also reported 51% more valued-added on average, with about 12% faster growth (Biggs and Shah, 2006).

The importance of networks is also highlighted by a study of Tanzanian firms where, while other variables impacted firms' productivity differently according to different categorisations of firms, membership in business associations was found to enhance productivity for all types of firms (Goedhuys *et al.*, 2008). Similarly, in Madagascar, better connected traders, in terms of higher numbers of personally known traders and potential lenders as opposed to familial connections, were also found to return significantly higher value-added than traders with less networks (Fafchamps and Minten, 2002).

Be that as it may, many of these associations are yet linked to ethnicity or minority status for foreigners, thereby forging fairly close but also closed networks

(Eifert *et al.*, 2006; Goedhuys *et al.*, 2008; Murphy, 2002). Indeed, in much of Africa, the relative atomization of societies following hasty post-independence urbanization has meant that voluntary social associations outside of kinship have been slow to form (Fukuyama, 1995). Confirming this view, McCormick (1997) observes that shallow and narrow kinship and ethnicity ties are so prevalent that many apprenticeships, business information sharing, and even customers can all be traced along kinship and ethnicity lines.

Biggs and Shah (2006) also confirm this tendency, especially amongst Indian-Asians in East Africa. They find that the probability of accessing trade credit was higher amongst firms in these ethnic networks, corroborating Fafchamps (2000). A zoning of business activity by ethnicity was also highlighted signifying a harbouring of inefficiencies of sorts due to anti-competitive effects, and therefore allocative inefficiency, as human and financial capital is distributed along narrow network lines rather than by the competitive market (Biggs and Shah, 2006).

Indeed, for firms outside these ethnic networks, only the large ones would manage to obtain credit suggesting limited prospects for small firms, especially new ones (Biggs and Shah, 2006). Moreover, extra-commercial socialising between firms and their suppliers, through for example sporting events, community gatherings, and religious celebrations, was found to significantly enhance trade credit in Kenya, even when controlling for firm size (Fafchamps, 2000).

Still, in a study of Ghanaian firms, whilst similar ‘solidarity networks’ were found to marginally enhance productivity, dynamic networks with diverse membership generated even significantly higher returns (Barr, 1998). One heralded advantage of dynamic networks of small firms is that they enhance innovation (Camagni, 1991;

Crevoisier, 2004). Indeed, Hewitt-Dundas (2006) asserts that 'for small plants the most important barrier to undertaking product innovation is a lack of external partners' (Hewitt-Dundas, 2006, p273). The advantages of co-operation have been found to be so munificent that even firms that do not invest in R&D are more likely to be innovators if they co-operated with other firms along their production value-chain (De Propris, 2002). In a recent survey in the UK, Tomlinson (2011) found that higher innovative SMEs tend to have closer co-operative ties.

In developing countries, social networks were also found to support innovation in Tanzania (Murphy, 2002). A study of product *enovation* in Morocco also found that collaboration, especially where small firms collaborated with international organisations, enhanced the propensity of product *enovation* (Rahmouni *et al.*, 2010). Such collaboration was argued to make up for small firm's size disadvantages compared to large firms. Goedhuys (2007b) also finds that in Tanzania, the probability of carrying out product *enovation* increased where local firms had more intense collaborations with other firms. Nevertheless, product *enovation* amongst foreign firms was not driven by collaborations, but by having more skilled workers, more investments in new machinery and equipment, and ability to sell to fellow foreign firms in Tanzania. Thus, small local firms without these capabilities made up for their individual inadequacies through networks (Goedhuys, 2007b).

In line with the various forms of networking (Belussi and Arcangeli, 1998; Grandori and Soda, 1995), there may yet be some subtle networking effects in the large firm case if the firms 'talked to' their customers about new products. Indeed, in a recent European study, maintaining formal relations with customers was found to be associated with product *enovation* but overt networking in and of itself, whether

informal or formal, had no impact on the introduction of new products. Moreover, firms that were founded by locals, suggesting strong local ties, had a significantly lower chance of *enovating* new products while firms that had relocated into the region from elsewhere *enovated* more (Copus *et al.*, 2008). In a German study, R&D cooperation only had a minor contribution as a medium for knowledge spill-over (Fritsch and Franke, 2004).

Indeed, the effectiveness of networks, including with local research institutions and universities, in enhancing innovation has been questioned (Hoffman *et al.*, 1998). Co-ordination and governance issues have been raised as key problem areas hindering the sustainable drawing of the innovation and *enovation* benefits from networks (De Propris, 2002; Rosenbusch *et al.*, 2011). Jack and Anderson (2002) have thus highlighted the importance of structures and embeddedness as the factors that create an environment where the benefits of networks can be harnessed.

Embeddedness can thus be seen to be as important as the external sources of knowledge, which in turn demands a delicate balancing act for firms. Indeed, a study of SMEs in 12 UK regions found that high *enovators* not only tend to forge closer ties but also make greater use of non-local networks (Cooke *et al.*, 2005). With the presence of a 'set' emphasized as crucial to networks (Szarka, 1990), and external sources of knowledge and other resources also crucial, a possible 'best of both worlds' setup whose impact on firm performance may be interesting to investigate is where strong networks also enlist new members, a situation that affords high embeddedness and new sources of knowledge.

4.4.3.2 Competition

Intuitively, an environment characterised by intense competition should engender both innovation and *enovation*. However, the relationship between competition, innovation and *enovation* is complex. Of crucial implication is that more competition may actually reduce individual firm investment incentives, though competition increases the probability that *enovation* will eventually be pursued (Loury, 1979). The role of statutory instruments (patent laws) designed to moderate this in unclear (Dasgupta, 1988; Loury, 1979), as patents may sometimes be employed as defensive tools with the innovations not realised in actual marketed products (Bloom and Van Reenen, 2002).

Recognising this problem, Castellacci (2011) empirically investigates the innovation and *enovation* behaviour of firms in competitive and oligopolistic environments. He finds that, on average, firms in oligopolistic markets tend to innovate more than firms in competitive markets who have a lower incentive to invest in innovation efforts. The reverse however applies when it comes to product *enovation*. Oligopolistic firms, with their large incumbent markets, do not actually turnover high shares of new products, and therefore do not convert the high innovation investments into productivity enhancements (Castellacci, 2011).

On the other hand, since there is a lower share of innovators in the competitive industry, because of the competition disincentive, firms that do innovate are able to turnover higher shares of new products and return higher gains from such high *enovation* than their non-enovating peers, at least in the short-run (Castellacci, 2011). Still, in highly competitive industries, it is firms that are farther away from the productivity frontier that are found to *enovate* more (Castellacci, 2011).

This suggests ‘caterpillar crawl’ type (Figure 3.4) catching-up dynamics which enhance productivity overall. As such, competitive markets become more productive than concentrated ones as firms with lower productivity find it imperative *enovate* which may enable them to catch up or even outperform the erstwhile high productivity firms which will now find themselves having to *enovate*. In a concentrated market, these dynamics will not obtain. In fact, in the oligopolistic market, Castellacci (2011) found a cumulative mechanism where it was firms that were already high performing that continued to *enovate*, thereby reinforcing their market position while possible productivity gains remained unexploited (Castellacci, 2011).

Similar dynamics have been used to explain ‘profit persistence’ in oligopolistic industries. Firms may uphold their profitability by continually *enovating* or by using their market power to avoid competition (Roberts, 1999). Other theories suggest that the nature of competition determines if firms pursue product or process innovations. ‘Bertrand competition’ favours product innovation as there is intense competition on the prices of products. In contrast, in ‘Cournot competition’ regimes, there is less intense competition in the product market and firms elect process innovations (Bonanno and Haworth, 1998).

There may yet be other life-cycle based links between product and process innovation and *enovation* on the one hand and competition on the other. The *enovation* of a new product is followed by scores of entrants with many product differentiations. Eventually, however, a dominant design emerges and this leads to the establishment of a few large firms. These now large incumbents only engage in process innovations and *enovations* which reinforce their market position, not least due to size related entry barriers erected by the process *enovations*. Such entry barriers forestall new entry, but

only until a highly *enovative* entrant with competence-destroying capabilities kick-starts a new cycle (Anderson and Tushman, 1990; Klepper, 1996; Tushman and Anderson, 1986; Utterback and Suárez, 1993). In all, the intensity of competition has an impact on the firm's product innovation efforts and *enovative* behaviour, which in turn affects the firm's productivity and growth.

4.4.3.3 Other environmental factors

'The business environment may be defined as the nexus of policies, institutions, physical infrastructure, human resources, and geographic features that influence the efficiency with which firms and industries operate' (Eifert *et al.*, 2006, p197). A disenabling business environment is believed to the 'the prime suspect for poor enterprise performance in Africa' (Bigsten and Söderbom, 2006, p244). Indeed, political, business and other risk factors have been argued to foment 'Afro-pessimism' with regards to foreign direct investment (Senbet and Otchere, 2006). Recent research suggests that indirect costs, including bribes, private security, transportation inefficiencies, and other non factory-floor costs relating to drawbacks in the business environment, constitute a significant drag on firm productivity. For example, 75% of Zambia's net TFP underperformance relative to China is attributable to indirect costs (Eifert *et al.*, 2006).

Nevertheless, Senbet and Otchere (2006) observe that given the on-going reforms in much of Africa, the perceptions of risk may be different from the changing fundamentals. Still, in the face of imperfect information, perceptions regarding the business environment do influence investors' decisions (Senbet and Otchere, 2006). In their Cote D'Ivoire study, Sleuwaegen and Goedhuys (2002) found that governments

regulations in general were perceived to strongly hamper the growth of small and medium firms. Lack of business support and perceptions of 'Customs and Trade Regulation' and 'Business licensing and operating permits' as hampering firm performance was also found to depress productivity in Tanzania (Goedhuys *et al.*, 2008).

Indeed, low institutional incentives and high formalisation costs including fees, taxes, and time spent dealing with government red-tape were found to be important disincentives to firm formalisation in Tanzania (Nelson and De Bruijn, 2005). Also, unlike large firms, small firms are unable to lobby the government (Tybout, 2000), as they may not have the resources, to obtain legal counsel for example, nor the clout to demand attention. With no input into policy decisions, or timely awareness of policy changes that may affect them, small firms are thus subject to regulatory uncertainty (Nichter and Goldmark, 2009), and their perceptions of the business environment may, at least in the short-term, influence their actual business undertakings.

Also important are the influences of the socio-cultural context of the economic agents. Culture has been found to have a moderating effect on the innovation - performance relationship (see for example, Rosenbusch *et al.* (2011) for a review). A recent European study comparing the innovation activities of firms in peripheral regions and those in 'accessible' regions found that the entire innovation gap between them could be attributed to nonobservable factors like culture (Copus *et al.*, 2008).

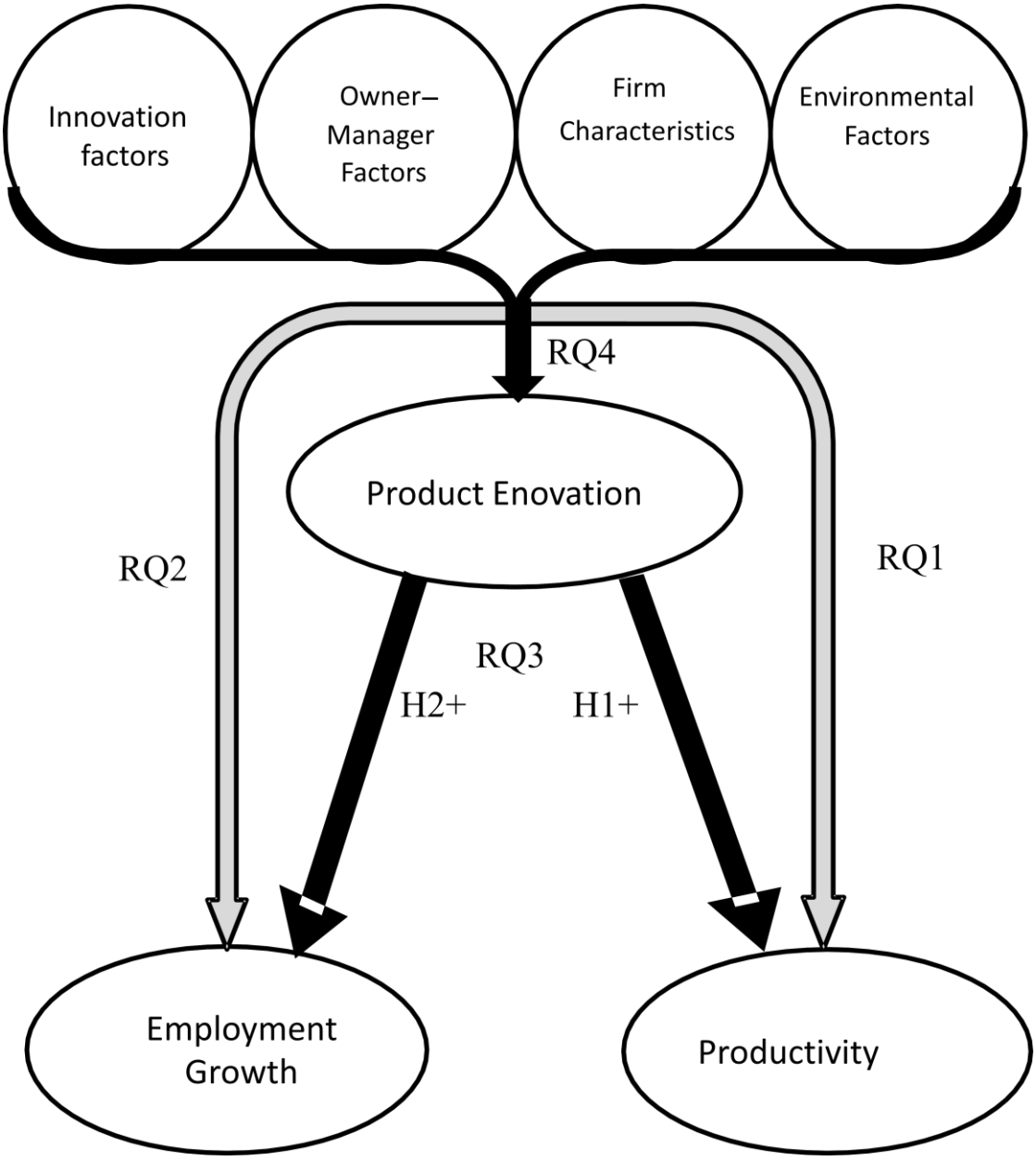
4.5 Summary

The objective of this chapter has been to review the empirical literature on the determinants of product *enovation,* firm productivity and employment growth, particularly amongst small firms in Africa, and to especially investigate whether past research has found product *enovation* to be a significant driver of productivity and employment growth. Other determinants of productivity, employment growth and product *enovation* drawn from the literature were classified under the following banners: owner-manager factors, firm characteristics and environmental factors.

The review not only appreciates extant evidence and understandings of the pertinent relationships, hence allowing the formulation of particular hypotheses and controls to be empirically applied in the present study, but also helps specify the operational data to be gathered to test such hypotheses. Figure 4.1 below presents the overall conceptual framework that this review has engendered.

This framework guides the empirical study undertaken in the present work. Towards operationalizing the conceptual framework for the empirical analysis, the following chapter outlines the methodology employed in collecting the data. In turn, Chapter 6 analyses the data and discusses the findings thereof, towards the conclusions and policy implications offered in Chapter 7.

Figure 4.1: Conceptual Framework



5 RESEARCH METHODOLOGY

'There are two basic goals in the design of survey instruments: to obtain relevant information, and to ensure the reliability and validity of the data collected' – Martin Bulmer and Donald P. Warwick, 1983

5.1 Introduction

Towards an empirical investigation of the role of product *enovation* and other factors that may determine small firm productivity and growth in a developing country context, the preceding chapter has enumerated a number of factors that past studies have found to be significantly related with the pertinent phenomena. This chapter builds on the conceptual framework thereof (Figure 4.1) as well as earlier conceptual elaborations (Chapters 2 and 3) and outlines the methodology employed in the collection of the data upon which the empirical investigation of interest to the present study is carried out.

In what follows, section 5.2 recounts the considerations that guided the choice of the data collection method. In turn, Section 5.3 describes how the variables identified in Chapter 4 were operationalized. Section 5.4 introduces the population that was elected for the empirical study and discusses the considerations that led to the choice of micro and small firms in the clothing and garments industry as the study population. Finally, a brief account of the procedures followed during sampling and data collection is given in Section 5.5. Section 5.6 summarises the chapter.

5.2 Method choice

In a highly acclaimed article, Todd Jick observed that 'if the research is not clearly focussed theoretically or conceptually, all the methods in the world will not produce a satisfactory outcome' (Jick, 1979, p609). This is a problem that has profoundly afflicted entrepreneurship research which 'in the absence of definitions that capture the essence of entrepreneurship, and entrepreneurship indicators that are internationally comparable, policy makers are left somewhat rudderless' (Ahmad and Hoffman, 2008, p3). Indeed, the prodigious interest from diverse disciplines has produced multiple research approaches and discourses (Grant and Perren, 2002).

Generally, 'the stage of the research question' demands the nature of data to be collected. Quantitative data, whether subjective or objective in nature, is suitable when interest is in testing relatively developed theories. On the other hand, case-studies and qualitative data are appropriate for a young research question where there is a need to build theory (Smith *et al.*, 1989). Although the present study falls under the broad rubric of the amorphous entrepreneurship research, by specifying the particular factors whose influence on firm productivity and growth is to be investigated, the present study is able to side-step the problems of conceptualisation that blight entrepreneurship research. This is because empirical studies of the particular phenomena we target abound, terminological ambiguity notwithstanding.

This allows the suitability of a quantitative research method as precise hypotheses can be specified and tested. Indeed, leading authors and authoritative peer review journals in entrepreneurship and small business, including Entrepreneurship Theory and Practice, Journal of Business Venturing, Journal of Small Business Management, Small Business Economics, International Small Business Journal, and

Entrepreneurship and Regional Development, have been found to use quantitative techniques (Grant and Perren, 2002). Accordingly, the present research investigating firm productivity and growth in developing countries lent itself to quantitative methods.

Still, methods 'must also be tailored to the sources of these data' (Peil, 1993, p71) and researchers 'should employ the most rigorous methods possible within the practical constraints imposed by the nature of the assignment' (Harrison, 1994, p22). Indeed, there are complex research challenges in developing countries that demand careful research designs, not least because the unsatisfactory nature of government supplied data means that secondary quantitative data is usually unsuitable for formal research purposes (Bulmer and Warwick, 1993b). However, Bulmer and Warwick (1993a) expeditiously note that the problem is not of presence of difficulties, as any research anywhere will encounter some difficulties, but the frequency, severity and uncontrollability of them.

In many developing countries, there are several significant obstacles to the effectiveness of survey techniques, for example. To begin with, there is a lack of adequate sampling frames, including directories, reliable central registry, street plans, etc. Moreover, efficient means of administering questionnaires, i.e. identifiable postal addressees, landline telephones for telephone interviews, etc, are underdeveloped (Bulmer and Warwick, 1993a; Peil, 1993). Further, the inherent culture of the individual respondent impacts on responses to questionnaires.

Thus, there are crucial concerns regarding lexical equivalence, conceptual equivalence, equivalence in measurement, and equivalence of response (Bulmer and Warwick, 1993a, p152-156). In addition, respondents in highly informal social contexts may be unaccustomed to condensing their thoughts into abstract pre-determined

categories (Bulmer and Warwick, 1993a). Therefore, it is found to be worthwhile to also employ an anthropological approach to appreciate the relevant community dynamics (Warwick, 1993).

Still, even these anthropological methods are not immune to research difficulties. Should the researcher overcome 'access' hurdles (Peil, 1993), fear and suspicion (Stycos, 1993), 'too much courtesy' might yet yield significant errors (Jones, 1993). Stycos (1993) also alerts of 'situational opinions' with information given in a group contradicting that given individually. Such an environment may therefore make triangulation (Jick, 1979) necessary.

Grant and Perren (2002, p201) however caution that many attempts at pluralistic approaches to research 'strive for a more robust view', but 'fall short of a thoughtfully articulated philosophical position'. Indeed, commentators on research methodology have argued that it is not always the case that convergence will be established with triangulation since convergence is in fact often not achieved – which explains perhaps why few researchers employ multi-methods (Smith *et al.*, 1989; Warwick, 1993). Methodological integration is also not an easy task 'financially, psychologically, intellectually or administratively' (Warwick, 1993, p295).

Considering the nature of the research questions, their treatment in the literature and the afore-discussed issues regarding research in a developing country context, of the various standard methods of data collection (Table 5.1), this study elected to employ a researcher-administered survey technique. This was not only pragmatic, given that self-enumeration would have been unsuccessful, but it also allowed the researcher to absorb contextual and ethnographic 'soft' data during the enumeration process that may supplement the interpretation of objective quantitative findings.

Table 5.1: A comparison of methods for data collection

Method of data collection	Advantages	Disadvantages
Questionnaire/ structured interview – fixed choices	• Easy to quantify and summarise results • Quickest and easiest way to gather new data rigorously • Useful for large samples, repeated measures, comparisons between variables • Ability to cover a large number of firms even with limited resources • Generates data amenable to statistical testing	• Hard to obtain data on behaviour and structure • Little information on the contexts shaping behaviour • Not suited to subtle / sensitive issues – e.g culture • Impersonal • Risks non-response, biased/invalid answers, • over-reliance on standardised measures • Meaning of questions not equally transparent to all respondents
Open-ended Interviews	• Readily cover many topics • Can be modified before or during interview • Can convey empathy and build trust • Rich data generated • Data collected in respondents' own words	• Expensive [time consuming] • Sampling problems in large organisations • Respondent and interviewer bias • Hard to analyse and interpret responses • Distortion due to personal feelings and opinions • Self-consciousness • Unreliability of memory
Observations - of people, work settings	• Behavioural data independent of self-descriptions, feelings, opinions, etc. • Data on situational contextual effects • Rich data on hard-to-measure topics – e.g. actual practices, tacit patterns • Data could yield new insights, hypotheses	• Constraints on access • Costly and time-consuming • Observer bias • Presence of researcher may affect behaviour of people observed • Hard to analyse, interpret and report data • May seem unscientific
Analysing secondary data – reports, records, files, documents, etc.	• Non-reactive • Often quantifiable • Repeated measures show change • Members of an organisation can help analyse • Credibility of familiar measures • Often cheaper and faster to obtain • Independent sources	• Access, retrieval and analysis problems, • Validity and credibility of sources and measures • Limited to analysing data in context for which data was originally collected which maybe different to current research • Limited data on many topics
Workshops, Group discussions	• Useful for complex, subtle processes • Can stimulate thinking • Data available for instant analysis and feedback	• Biases due to group processes • Requires high trust and co-operation • Impressionistic, superficial • Not rigorous

(Source: Adapted from Harrison (1994, p25-26); James (2003, p50))

5.3 Operationalisation

'To be useful' observes D.A. De Vaus (1996, p47), 'concepts must have empirical indicators'. In transforming concepts into empirical indicators, De Vaus suggests three steps to be helpful: 1) clarify the concepts, 2) develop initial indicators, and 3) evaluate the indicators. Accordingly, this thesis has argued that the firm represents an *instance* of entrepreneurship and elected to study firm productivity and employment growth. To obtain empirical indicators of firm productivity, a simple measure of value-added is adopted in the present work taking annual sales less annual cost of input materials. Firm employment growth is also captured as the annual growth in the number of workers since the year the firm was founded and the time of the survey.

The use of these simple and clearly defined concepts and variables ascertains their validity - that we are actually measuring what we purpose to measure, and reliability - that we should obtain the same responses on repeated occasions (De Vaus, 1996). A potential reliability concern, however, is that secrecy and poor record keeping may lead to respondents giving incorrect figures. Thus, prior to the full scale survey, a pilot study was undertaken to help device a method of increasing reliability that would work. In the pilot study, seven textiles and garments firms were randomly selected and approached to participate in the pilot study.

The use of a researcher-administered questionnaire was also reinforced by the pilot exercise. It was discovered that upon informing the respondents on the purpose of the study insisting that interest was not in firm's profits but in the value-added, respondents were more willing to disclose. This would not happen in a self-administered questionnaire.

Further, although many respondents do not keep detailed financial records, they have a clear estimate of these headline figures. That the questionnaire is completed on site also helped obtain fairly correct figures as the likelihood that the respondent blatantly gives figures that are observably untrue is reduced, given that they surely recognise that the enumerator is able to reckon a fair estimation of the business' performance range by observing the business and its environment. Another factor enhancing the validity of our data is that respondents not willing to participate or to disclose certain information were not pressured to do so.

To capture the growth and development contribution of entrepreneurship at the firm level, this study uses the annual growth in employment since the firm started. This is the normal practice in research on firm growth in developing countries due to the fact that while poor record keeping does not allow for historical financial variables to be obtained for research purposes, owners/managers can reliably remember how many workers they had when they started the business and are happy to disclose such information (Biggs and Shah, 2006; McPherson, 1996; Ramachandran and Shah, 1999; Sleuwaegen and Goedhuys, 2002).

The key hypothesis for this study concerns itself with the link between innovation and the firm performance variables afore-discussed. In our conceptual elaboration, we sought to clarify the concept of innovation by suggesting that the base notion strictly referred to with regard to innovation is indeed 'novation'. In turn, by virtue of their terminological connotations, *in*novation may refer to efforts at novation including innovation inputs such as R&D as well as innovation outputs such as patents that indicate practicability of the new knowlege, while *e*novation denotes the novation actually realised (Section 3.5). Our study is specifically interested in investigating the

role of product innovation and product *enovation* in explaining variation in productivity and growth amongst firms.

In the present work, indicators of these two concepts are developed in line with previous studies especially borrowing from the Community Innovation Survey[5] which has inspired many of the studies discussed in Section 4.3 and 4.4, and the Kenya Manufacturing Survey of 2003[6] which was part of the World Bank's Regional Program on Enterprise Development (RPED) studies. The former is favoured in our study for measures of product *enovation* as the share of sales attributable to new products may allow variation amongst firms that is richer in information than a dummy variable merely indicating whether a firm introduced new products - which is what the RPED study used.

Here, whilst validity is ensured by the clarity of the concept and the chosen empirical indicator of it, the observations actually collected are informed estimates as respondents are asked to indicate the percentage of sales in the present year that were attributable to new or significantly modified products. Still, one would assume that firms would not give wildly incorrect facts and so the figures reported are taken to reflect the general product enovativeness of the firm.

For innovation efforts, the standard measures past studies have used were included in the survey questionnaire. However, recognising that many firms in developing countries may not allocate a budget for innovation endeavours, or systematically carry out innovations efforts in a manner that is appreciable in pecuniary terms, higher emphasis was placed on innovation efforts in terms of man hours devoted to research design and development per week on average. A recent study in Tunisia

[5] Obtained from http://www.oecd.org/dataoecd/37/39/37489901.pdf (accessed 23/08/2012)
[6] Codebook obtained from The Kenya Institute of Public Policy Research And Analysis (KIPPRA) that carried out the survey.

used the presence of an R&D department as an indicator of R&D efforts as weak R&D budgets invalidated the conventional innovation inputs measures (Rahmouni *et al.*, 2010). Our study attempts to observe continuous rather than merely categorical variability amongst firms.

All the other variables follow similar operationalisation as previous studies. In particular, the Birmingham Jewellery Sector 2005 Firm Survey[7] and the Entrepreneurs and their Businesses survey (Quince and Whittaker, 2002) provide useful guides. To attempt to measure the respondents' enterprising spirit, the advisement of De Vaus (1996) that to capture the scope of the concept such attitude and perception variables should be measured with a number of questions was followed. Thus, a selection of questions was adapted from the General Enterprising Tendency test.[8] A similar format was followed for perceptions of culture and other environmental variables.

The full questionnaire developed for the present study is provided in Appendix I. The steps taken to prepare the data for analytical purposes and the descriptive summaries of these data are provided in Chapter 6.

5.4 The population and units of analysis: Nairobi's Clothing and Garments firms

The population elected for our empirical study is the Clothing and Garments industry in Nairobi, Kenya. The City of Nairobi is Kenya's Capital and the largest City in Kenya. The City was founded around 1899 as a shunting yard for the Kenya-Uganda Railway (KUR) under construction then and a camping site for the immigrant Indian

[7] Provided in person by Dr. Lisa De Propris who led that investigation.
[8] Available at http://get2test.net/test/index.htm. (accessed 21/08/2012)

and other British colonial labourers employed on the railway construction project. It would later in 1899 become the headquarters of the KUR and by 1905 the capital of the British East Africa Protectorate. Nairobi kept its capital status when Kenya gained independence in 1963 (Nairobi City Council, 2012).

The City is located to the South Eastern part of Kenya (Figure 5.1) and occupies a land mass of around 700 square kilometres (UNEP, 2009).[9] Growing from only 8,000 people in 1901 (UNEP, 2009), the population of Nairobi is about 3.1 million according to the 2009 census (NCAPD, 2011). Nairobi's workforce constitutes about 43% of the country's urban workers, and generates over 45% of national GDP (da Cruz *et al.*, 2006). In 2011, Kenya's GDP (at market prices) was valued at around Kenya Shillings 3 Trillion (PPP$71.4 Billion) with about KShs. 76,489 (PPP$ 1,746) GDP per capita (KNBS, 2012).[10]

Figure 5.1: Map of Nairobi

[9] Roughly two and a half times the size of Birmingham, UK.
[10] PPP Dollars figures from the IMF: http://www.imf.org/external/pubs/ft/weo/2012/01/weodata/weorept.aspx?sy=2009&ey=2012&scsm=1&ssd=1&sort=country&ds=.&br=1&pr1.x=44&pr1.y=12&c=664&s=NGDPD%2CNGDPDPC%2CPPPGDP%2CPPPPC%2CLP&grp=0&a= (Accessed 15/08/2012)

Despite its huge economic contributions to the nation, Nairobi suffers from high levels of inequality within it. The richest 10% of the population accrue over 45% of the City's income with the poorest 10% getting less than 2% (da Cruz *et al.*, 2006). Unemployment is also high in Nairobi and above the national average. A 2008 World Bank report indicates that youth (15-29 years) unemployment in Nairobi was 35%, with adult (30–64 years) unemployment at 10% (World Bank, 2008). The average education of the unemployed was also higher than that of the employed (World Bank, 2008), in part because over 80% of employment in Kenya is in the informal sector (Pollin *et al.*, 2008), and highly educated persons usually shun the informal sector (Farstad, 2002). Generally, open unemployment amongst graduates in Kenya is almost the same as that of primary school drop-outs at 8.5% and 9.6% respectively (Pollin *et al.*, 2008).

Several reasons underscored the choice of the clothing and garments sector in our Nairobi survey. To begin with, in the light historical accounts of the Industrial Revolution (Blackford and Kerr, 1986; Hudson, 1992), the importance of the textiles industry in the industrialisation and economic development process cannot be overemphasised. Indeed, as one of the most global of all industries, clothing and garments is an ideal 'starter' industry for industrialization, especially through exports, and is said to have been instrumental in the renowned East Asian miracle (Gereffi, 1999).

The Multi-Fibre Arrangement (MFA) which imposed textiles and garments importation quotas on certain countries, especially China and South East Asian countries, under a special international trade rules also highlights the salience of the industry (Naumann, 2006).[11] Further, the African Growth and Opportunity Act

[11] See http://www.wto.org/english/tratop_e/texti_e/texintro_e.htm (Accessed 15/08/2012)

(AGOA)[12] initiative, signed into law by President Clinton in May 2000 the objective being to assist the economic development of Sub-Saharan economies through preferential access to the American market, also adds weight to the potential economic significance of the textiles and garments industry towards fostering economic development in Africa.

The apparels industry generally also has other unique characteristics. For example, mirroring the ideal industry of neoclassical microeconomic theory, the garments industry is generally found to be extraordinarily dynamic with a swift cycle of innovation, vast markets with a high number of buyers, high levels of deconcentration and low Intellectual Property (IP) rights protections (Raustiala and Sprigman, 2006).

Indeed, there are other features that make the textile and garments industry an important development research area. For example, in Bangladesh, the flourishing garments sector has created employment for over 1 million young women effecting changes in the perception of women's role in society and indeed intra-household gender relations (Khundker, 2002). Garments firms have also been found to have a strong female labour participation and firm ownership in Kenya (Akoten and Otsuka, 2007; Imo *et al.*, 2010; McCormick *et al.*, 2007).

Moreover, contradictory findings from past research also make garments a rich field of inquiry. For example, a recent study in the Ivory Coast found that textile firms had a high likelihood of informality and decreasing sales growth, but they still reported significant employment growth compared with other industries (Sleuwaegen and Goedhuys, 2002). This may, of course, be linked to the 'basic needs' nature of clothing which creates large markets even domestically. Indeed, the textile, clothing and

[12] See http://www.agoa.gov/index.html (Accessed 15/08/2012)

garments manufacturing sub-sector in Kenya represents about 4% of non-agricultural household enterprises in Kenya; larger than even food processing at 2.3% (Pollin *et al.*, 2008).

This notwithstanding, conservative estimates indicate that imports constitute about 93% of textile consumption in the Kenyan domestic market. Indeed, if the industry was to operate at full potential, it would have the capacity to create over 2.3 million jobs, thereby supporting over 25% of the Kenyan population, as opposed to current 73,000 jobs the industry presently offers. Besides, the textiles value chain going all the way back to cotton growing that would make use of land conducive for cotton growing that is presently unutilised and considered marginal with very poor households. Such cotton would feed into the already present ginning sector which only uses a quarter of its capacity, and in turn into textile milling with a 50% underutilisation at present, before apparels can finally be made for the domestic market to counter the huge importation and for the export markets to even only take full advantage of existing trade agreements.[13] This vast potential of the textiles industry that remains unrealised therefore made the industry an interesting area to study.

Besides these impelling considerations, there were specific theoretical and methodological reasons as to why the garments industry was selected our study. Firstly, with the Kenyan economy being mostly a services economy, where trade activities for example account for 64% of the activities of MSEs in Kenya (Ronge *et al.*, 2002), textile and garments was an important manufacturing sector to study given the prevailing preference of research into manufacturing where value-added is readily palpable.

[13] Communication from a Textile and Garments sector representative within the Kenya Association of Manufacturers citing a position paper by the Kenya Government Textile Task Force.

Secondly, unlike other manufacturing sectors in Kenya that tend to be dominated by a few large oligopolistic firms, especially multi-nationals (Gachino, 2006), the garments industry consists of all firm sizes from the micro to the very large (Kamau and Munandi, 2009; McCormick *et al.*, 2007). The sector also tends to demonstrate strong agglomeration and clustering effects (Akoten and Otsuka, 2007; McCormick, 1997; McCormick, 1998), a subject that has received significant academic attention recently. Indeed, micro and small enterprises in the garments industry account for about 15 per cent of all MSEs in the country and over 30% of manufacturing MSEs in Kenya (McCormick *et al.*, 2007). Thus, textile and garments is perhaps the only industry in the manufacturing sector that has all firm sizes as constituent parts of the industry and represented in large enough numbers to allow representative sampling.

Finally, the clothing industry in Kenya has been an area of academic inquiry over the years (Akoten *et al.*, 2006; Imo *et al.*, 2010; Kamau and Munandi, 2009; McCormick, 1997; McCormick, 1998; McCormick *et al.*, 2007). This meant that a number of respondents will have participated in some other research thereby making them more receptive of our research approaches as opposed to an industry where no research infrastructure or contacts had been established. This was especially helpful given that time and financial constraints of the doctoral study. This later consideration was also crucial in limiting the study to Nairobi and the surrounding areas as opposed to the entire country.

Figure 5.2: A typical micro-firm operating from a stall in a City Council market block▲

▲These stalls were designed for retailing purposes when the market blocks were built in 1974 and are hence not suitable for the garment mini-manufacturing they are now used for (McCormick, 1998). A market block like the one shown here houses between 80 – 100 stalls but the number of firms is larger than the number of stalls due to sub-letting and the private use of corridors and other public areas as business areas.

Figure 5.3: A typical very- large manufacturing plant producing for export in the Export Processing Zones (EPZ)

5.5 Sampling protocol and data collection

With a population selected, the actual field work was undertaken between April and September 2010 following ethical approvals. Towards gathering a representative picture of the entire textile and garments industry in Nairobi, we obtained a Nairobi City Council database of all businesses in Nairobi that had been issued with an operating

licence. Our target was to obtain a sample of at least 150 businesses in the textiles and garments sector to minimise the sampling (standard) errors as much as possible so our results would reflect the population to a reasonable degree, while still considering our resource constraints.[14]

This Nairobi City Council Licence database was helpful in that it made it possible to have within the sample the so-called informal enterprises that constitute a major part of the garments industry in Kenya which would have an operating licence due to the uncompromising licensing administration employed by the council (which sees to it that even hawkers and street vendors are licensed), even though not registered officially with the Companies Registry for other statutory purposes, like the mandatory filing of annual returns. This means that firms in Nairobi may be licensed but not registered as the Council is principally interested in the collection of the licence fee within its Local Government mandate as opposed to enforcing other Central Government procedures such as compliance with the Companies Act.

Because of this nature of the original purpose of this database for the City Council of Nairobi, the businesses had not been categorised by industry or activity. Thus, from a database that included over 160,000 businesses, we endeavoured to sift through all the entries selecting businesses whose business name or business description suggested textile and garment production. This exercise yielded 9,030 firms which was regarded as the population of all textile and garments firms in Nairobi.

Following confirmations from City Council officials that the licence fee was arrived at mainly depending on various indicators of revenues,[15] and our study was

[14] According to De Vaus (1996), a sample size of 156 has a sampling error of 8% which is a significant increase in accuracy compared with a sample size of 100 which as a sampling error of 10%.
[15] There are some flexible guidelines regarding the estimation of the licence fee including location, number of employees, type and number of machinery used, factory/office space in square metres, etc.

interested in the output variations amongst the various firms within the industry rather than the number of firms constituting the industry *per se*, total licence fee contributions by the various firm categories as a percentage of total licence fee collection was used to weight the final representations of the various firms by output (proxy). Mere numbers by licence category would have ended in an overrepresentation of micro and small businesses (see Table 5.2).

It should be recognised, however, that this proxy for output is perhaps somewhat compromised given that different firms within the various licence fee categories will have varying outputs between them. Moreover, because the Nairobi City Council itself uses arbitrary proxies as opposed to the real revenues, in reality, some firms may have higher or lower revenues than the licence fee proxy would suggest. In fact, other non-economic factors also influence the value of the licence fee. One major distortionary factor that was noted is that firms located in premises that are owned by the Nairobi City Council paid lower licence fees (KShs. 3,000) than similar firms operating from private premises (KShs. 5,000).

Nevertheless, the licence fee was the only employable proxy given the information available in the original database. Besides, in taking account of KShs.3,000 City Council bias by replacing the KShs. 3,000 fee with the KShs. 5,000 those businesses would have paid in private premises, the redistribution mainly affected firms of a similar size (from KShs2,000 to KShs10,000) rather than all firm types hence not requiring a major revision of the sampling criteria overall. The final stratified sample was arrived at as shown in Table 5.2 below.

Table 5.2: Sample Formulation

Fee PA (Kenya Shillings)	Firm Population	Total Fee	Pop %	Fee %	Sample %pop	Sample %Fee	Final Sample	Collected	Confirm collected representativeness
2000	43	86,000.00	0.48%	0.20%	0.71	0.30	1	1	0.33
2200	66	145,200.00	0.73%	0.34%	1.10	0.51	1	1	0.55
3000	4787	14,361,000.00	53.01%	33.55%	79.52	50.32	50	52	54.35
3420	22	75,240.00	0.24%	0.18%	0.37	0.26			0.28
4000	215	860,000.00	2.38%	2.01%	3.57	3.01	3	3	3.25
4200	1	4,200.00	0.01%	0.01%	0.02	0.01			0.02
5000	3453	17,265,000.00	38.24%	40.33%	57.36	60.50	60	64	65.34
7000	78	546,000.00	0.86%	1.28%	1.30	1.91	2	3	2.07
8000	3	24,000.00	0.03%	0.06%	0.05	0.08			0.09
10000	222	2,220,000.00	2.46%	5.19%	3.69	7.78	8	8	8.40
15000	2	30,000.00	0.02%	0.07%	0.03	0.11			0.11
20000	36	720,000.00	0.40%	1.68%	0.60	2.52	3	4	2.72
25000	2	50,000.00	0.02%	0.12%	0.03	0.18			0.19
40000	24	960,000.00	0.27%	2.24%	0.40	3.36	3	4	3.63
50000	2	100,000.00	0.02%	0.23%	0.03	0.35		1	0.38
70000	56	3,920,000.00	0.62%	9.16%	0.93	13.74	14	14	14.84
80000	18	1,440,000.00	0.20%	3.36%	0.30	5.05	5	7	5.45
Total	**9,030**	**42,806,640**	**100%**	**100%**	**150**	**150**	**150**	**162**	**162**
EPZ/MUB							5	5	5
Grand TTL							**155**	**167**	**167**

The survey questionnaire (Appendix I) was then administered to the relevant firms in line with the stratified sample above. Towards getting a variety of opinions from the entire industry, we sought to include firms in the Export Processing Zones (EPZ) and the allied Manufacturing Under Bond (MUB) scheme. These schemes were started in 1990 as part of a change in the national growth strategy in Kenya from import substitution to export led growth.[16] Firms in these schemes will not have been in the Nairobi City Council licence database as they have a special status outside of local government jurisdiction and are thus registered and licensed by the central government.

[16] For more details, see http://www.epzakenya.com/ (accessed 21/08/2012).

For the smaller firms in Council premises, efforts were made to visit all Nairobi City Council markets where there would be an agglomeration of garment businesses and a questionnaire would then be administered randomly at any business that was willing to co-operate. To reach the smaller non-Council premises firms, the location details given in the licensing database were used. It was noted that even these mainly operated in agglomerated zones but efforts were made to randomly reach a number of firms that were not in these agglomerations by randomly picking firms from the database and then finding them by visiting them at their addresses.

It was hoped that medium to large firms would be reached by using the telephone numbers provided on the licence database (or the EPZ Authority list) and then calling the firms and asking to speak with a relevant person to arrange an appointment. This method proved quite unfruitful. Towards gaining quicker and more trusted access to firms, named contact details of persons in the firms who had been respondents in similar research conducted by researchers at the Institute for Developing Studies, University of Nairobi in the past were obtained. As most receptionists will not direct cold calls to senior management, direct access to a named contact using the IDS links yielded quite a few leads.[17]

The Kenya Association of Manufacturers (KAM) was also approached. Here, we obtained the contact details of their member firms' General Managers and/or Managing Directors whom we would call mentioning the KAM contact to help with gaining legitimacy. Whilst we recognise that this method may have slightly compromised the preferred random sampling technique, major obstacles in obtaining data at all was attenuated. Moreover, the firms targeted this way were low in number in the population

[17] Many special thanks to Isabel Munandi, Prof. Dorothy McCormick and Dr. Kamau Kuria, all of the IDS, University of Nairobi, for their generosity.

anyway so the probability that they would have been selected randomly may not have changed by much. In all, 60 medium to large textile and garments firms were contacted.

Table 5.2 shows the total number of acceptably completed questionnaires for each stratum. However, because of the very expansive nature of the questionnaire, not all questionnaires were actually exhaustively completed. As such, there were many missing values. This problem was experienced in the full scale survey itself especially when assistant enumerators were employed. Pilot participants had been found to be extremely generous with data and information even volunteering site-visits and unsolicited information.

In the survey itself, however, many respondents who we visited and asked to participate in the survey would agree to take part but request to be left with a copy of the questionnaire for collection at a later agreed date. On the designated collection day, unfortunately, many were found to not have completed the questionnaire beforehand. Of these, several would outrightly withdraw their participation but a few would offer to complete the questionnaire while the enumerator waited, perhaps out of guilt. Still, laments that the size and nature of their firms meant that taking time out of their normal production activities was tantamount to losing business for the day and therefore income were frequent.

These posed serious concerns for the research exercise. Nevertheless, since the quantity of statistically useful observations was of significant import to the study, a decision was taken to emphasize on data collection for certain important and straightforward questions. Thus, questions that were not central to the key hypotheses of the research and those not frequently analysed, even as control variables, in similar research as found in the literature were not emphasized in the enumeration. Focus was

instead placed first on questions that proxied firm productivity, innovation and enovation, and questions that captured some basic features of the firm and the respondent. Emphasis was thus placed on Sections 1, 2 and 7 of the survey questionnaire.

Given that this problem emerged while the research was already underway, designing and printing a new questionnaire was judged to be unfeasible. Indeed, since the vast majority of the questionnaires were enumerator-administered, the risk that different respondents would choose to skip different sections arbitrarily was mitigated. Also, it was hoped that there would be enough responses for the skipped sections to allow the imputation of missing variables should need be - a weak prospect that was ultimately not employed.

In sum, the survey exercise managed to return 167 useful questionnaires. This represented a sample of 5.7% of total licence fee paid by textile and garments firms and 1.8% of all textile and garments firms on the 2006 Nairobi City Council Licence database. The distribution of our respondent firms by number of firms and their percentage share in the sample in terms of employment, ownership status and mode of establishment is given in Figures 5.4, 5.5 and 5.6 below respectively.

Figure 5.4: Survey respondents by employment

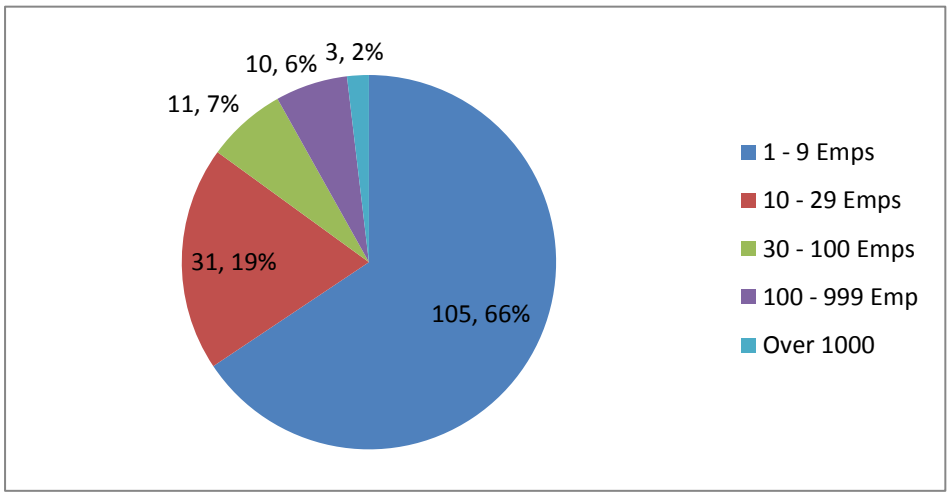


Figure 5.5: Survey respondents by ownership status

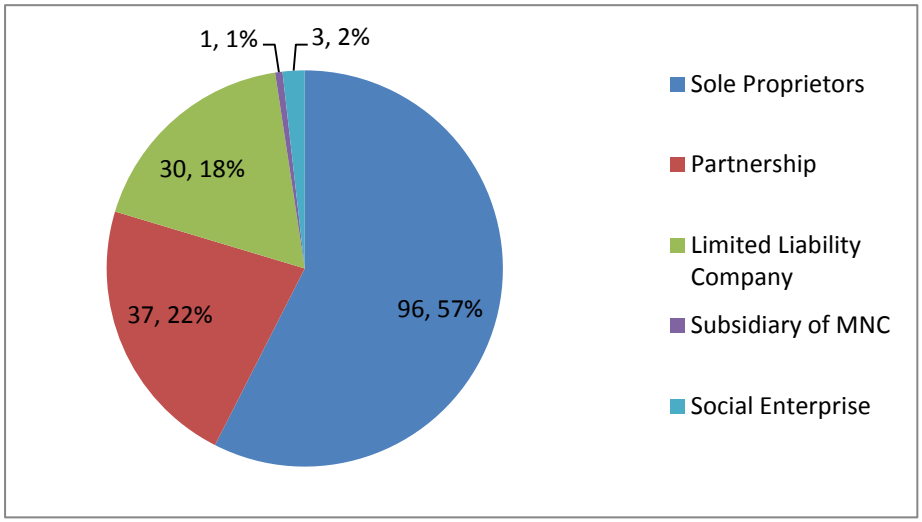
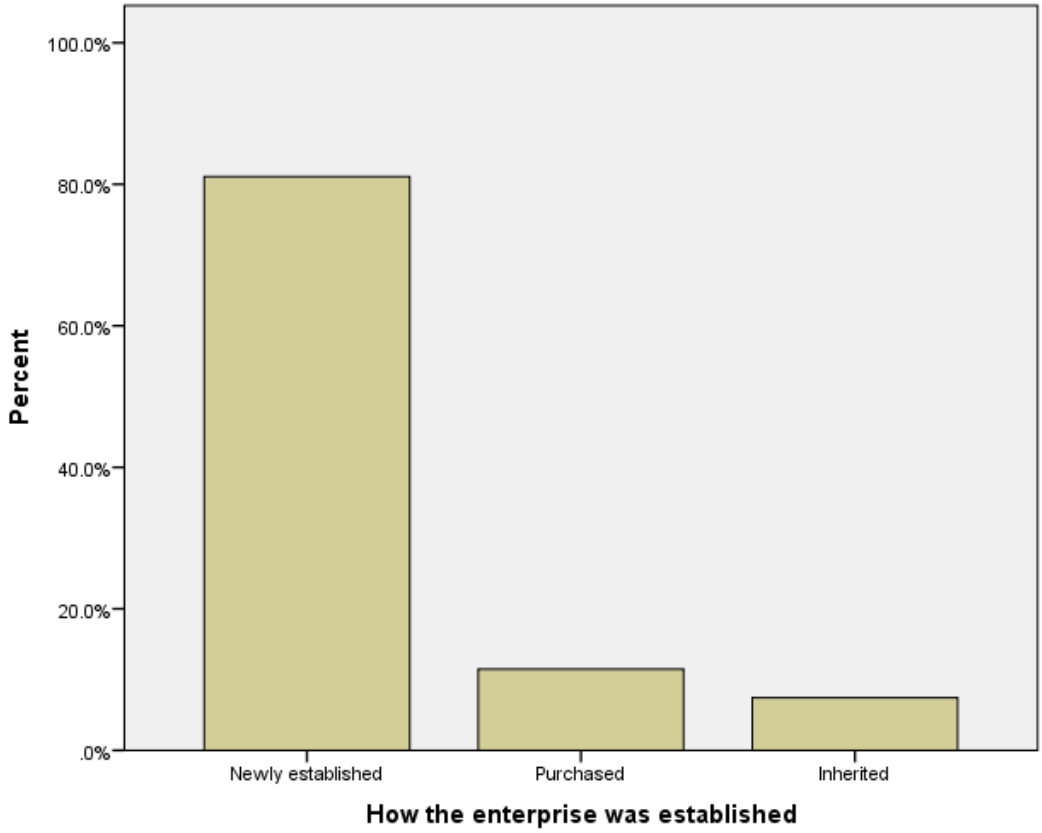


Figure 5.6: Survey respondents by mode of establishment



5.6 Summary

This chapter has outlined the methodology employed in the present doctoral research towards bridging the theoretical part of the study with the empirical investigation. The chapter has argued that the clarity of the concepts and phenomena targeted for empirical inquiry and the use of standard measures of the pertinent economic variables allowed a quantitative approach to the research. Still, recognising the documented challenges with regards to data collection in developing countries, this chapter has also justified the use of a researcher-administered survey questionnaire method and given the rationale for electing the garments industry in Nairobi, Kenya as the population to be studied.

The uniqueness of the industry, including the fact that it is a manufacturing industry with many firms hence allowing random sampling unlike the other manufacturing industries in Kenya that are largely oligopolistic, as well as other pragmatic methodological considerations, were important factors. The survey returned 167 questionnaires representing a stratified sample of textile and garments industry in Nairobi, Kenya. A majority of the firms surveyed are micro enterprises that were founded by their sole proprietors. In the following chapter, we conduct the empirical analyses of these data and discuss the results. Implications of the present study for policy and further research are offered in the concluding chapter.

6 DATA ANALYSIS AND RESULTS

6.1 Introduction

In Chapter 3, we argued that increases in firm productivity would only happen if new combinations of factors of production were realised. In turn, it should be empirically interesting to investigate whether a particular manifestation of the realisation of such new combinations of factors of production is associated with better firm performance. In line with these postulates, the object of this chapter is to present the results of the empirical analysis conducted to test the hypotheses formulated in Chapter 4. The key empirical hypotheses of the present study are as follows: 1) Firm productivity increases with increases in the share of new products in the firm's sales (i.e. more product enovative firms have higher productivity levels); 2) Firm employment growth is positively associated with higher shares of new products in the firms' sales (i.e. more product enovative firms' have higher employment growth rates).

In what follows, we conduct the empirical analysis and present the results. In particular, Section 6.2 discusses the preparation of the primary data collected in the survey, as described in Chapter 5, to a dataset suitable for statistical analysis and presents the descriptive statistics thereof. In Section 6.3 the discussion is advanced to identify significant correlations between the specified variables. Section 6.4 presents the econometric models specified and run to estimate firm productivity, employment growth rates and product enovation. The results are presented in Section 6.5 and discussed in 6.6.

6.2 Data preparation and descriptive statistics

Once the raw data from the survey were tabulated, the amenability of the data to quantitative analytical techniques was considered. Some issues were identified and suitable remedies developed. Firstly, as explained in Chapter 5, because of the very expansive nature of the questionnaire, there were many missing values in the resultant dataset. Thus, not all of the (control) variables identified in Chapter 4 would be represented in the final dataset.

Secondly, it had been discovered that firms in textile manufacturing were markedly different from their garments counterparts not least in terms of their capital structure due to their extremely large minimum efficient scale requirements.[18] Besides, they were very few in number but had very weighty values due to their size and therefore greatly skewed the variable distributions in the sample. This clearly foretold that these observations would pose serious outlier and leverage problems in subsequent analysis. Thus, these large textile firms, along with larger garment manufacturers, some of which operate under special circumstances like designated Export Processing Zones, were excluded from the final dataset.

In effect, following these changes to the sample data, the study population changed to Micro and Small Enterprises (MSEs) in the garment-making sector in Nairobi, Kenya with all firms in the final data set having no more than 50 employees. This allowed the study to be more focused and for the sample to fit within the definitions of micro and small enterprises in Kenya (Ronge *et al.*, 2002) and the

[18] The minimum efficient scale is the output level at which input costs are minimised and economies of scale fully exploited. Textile manufacturing entails the production of a large stretch of undifferentiated fabric that is then cut or dyed differently in subsequent processing. The indivisibility of the production of this commodity thus requires heavy capitalisation and production is efficient only at very large scales to maximise both technical and non-technical efficiencies.

generally accepted definitions internationally (European Commission, 2003; UNIDO, 2004).

Finally, appropriate variable recoding, variable construction and (log) transformations were carried out to assemble a dataset amenable to statistical analyses. T construct variables from the perception questions in the questionnaire, factor analyses techniques were employed. Due to unsatisfactory test results in Eigen values and Cronbach alpha (see for example, Cortina, 1993; Gliem and Gliem, 2003), all perception variables were dropped from the analyses.[19] The usual problems of validity and reliability commonly associated with perception variables was thus acknowledged. Descriptive statistics and operational definitions of the final list of variables are represented in Table 6.1 below.

[19] Factor analyses was first carried out to check if there were any latent variables within the sets of questions designed to capture specific constructs. It was discovered that many items had high uniqueness and factors with Eigen values of more than 1 where mainly according to the nature of the questioning (i.e. negative or positive) than key constructs. Besides, to get a Cronbach alpha of 0.7 or more in line with accepted rules of thumb, many items would have to be dropped and the fewer the items the less reliability (Gliem and Gliem, 2003). Because of these problems, and additionally the fact that perception questions generally face reliability and validity questions in general because responses may not be replicated and may not even unquestionably capture the intended concept, it was determined that these variables be left out of the analysis altogether.

Table 6.1: Descriptive statistics and variable definitions

Variable (Operational variable name)	**Operational definition**	**Obs**	**Mean**	**Std. Dev.**	**Min**	**Max**
Firm performance indicators						
Firm's value-added (VA)	Value Added of the firm in 2009 in PPP$ (PPP$1 = KShs. 37.92)†	122	20950.04	45004.19	316.46	316455.70
Labour Productivity (LABRPTY)	Unadjusted Labour Productivity in 2009 (PPP$) = VA/ LABR	122	2332.64	3079.63	164.82	19778.48
Labour Productivity (LP)	Adjusted Labour Productivity in 2009 (PPP$) = VA/ L	122	3219.94	4863.43	199.78	36754.43
Employment Growth (Av_Lgrowth_pa)	Average annual employment growth (%) [(((WrkrTTL- WrkrStrt)/WrkrStrt)/EntAge)*100]	122	46.11	71.88	-25.00	400.00
Firms' internal resources						
Labour (LABR)	Total number of workers	122	8.50	8.54	1	42
Labour (L)	Adjusted Labour variable [L =(1.2*Owner-Managers) +Fulltime +(0.5*Parttime) +(0.33*Apprentice)+(0.25*UnpaidFamily/Friends)]*	122	5.79	5.31	0.50	26.10
Capital Stock (KStock)	Total value of the firm's fixed assets (Machines, tools, etc, excluding building) in PPP$	122	24881.76	92015.30	606.54	922995.78
Capital Stock (KpW)	Capital Stock per worker (unadjusted LABR) in PPP$.	122	1782.71	5437.70	178.01	57687.24
Human Capital (HumanK)	Workers with university qualifications as a percentage of total workers	122	6.49	15.44	0	100
Human Capital (HumanKD)	Dummy variable. 1 = Firm employs university graduates, 0 = No graduates	122	0.25	0.43	0	1

Variable (Operational variable name)	Operational definition	Obs	Mean	Std. Dev.	Min	Max
Product enovation and innovation variables						
Product Enovation (NewP_Share)	Percentage share of sales of new or significantly modified products (introduced between 2005 – 2009) in 2009 sales.	122	32.22	32.77	0	100
Product Enovation (NewP1pc)	Product enovators and non-enovators categorisation by the percentage share of new products in total sales (0=0pc, 1= (= >1pc))	122	0.59	0.49	0	1
Product Enovation (NewP26pc)	0 = 0-25pc, 1= (>25pc)	122	0.52	0.50	0	1
Product Enovation (NewP51pc)	0 = 0-50pc, 1= (>50pc)	122	0.31	0.47	0	1
Product Enovation (NewP76pc)	0 = 0-75pc, 1= (>75pc)	122	0.11	0.32	0	1
Product Enovation (NewP25pcOrder)	Ordered Enovativeness (0 = 0-25pc, 1 = 26-50pc, 2 = 51-75pc, 3 = 76-100pc)	122	0.94	1.07	0	3
Enovation Orientation (EnovStrategyD)	1= The business intends to expand sales by selling new products, 0 = Expansion by selling more of existing products	122	0.30	0.46	0	1
Innovation inputs (RDHrs)	Number of man hours per week devoted to Research, Design and Development.	122	5.91	17.07	0	160
Process innovation (ProcessInnovD)	A dummy variable that takes the value of 1 if the firm did any of the following between 2005 and 2009: Replaced, upgraded or increased machinery; Outsourced some functions; Changed production process or the handling of merchandise; Engaged in technological training or hiring; Obtained Quality Certification.	122	0.37	0.48	0	1

Variable (Operational variable name)	**Operational definition**	**Obs**	**Mean**	**Std. Dev.**	**Min**	**Max**
Other characteristics of the firm						
Age of the firm (EntAge)	Enterprise age in years	122	11.50	10.48	1	59
Young Workforce (YngWkr)	Workers under 30 years of age as a percentage of total workers	122	53.61	31.43	0	100
Start-up Size (WrkrStrt)	Number of workers when the business was founded	122	2.61	3.46	1	30
Customer Type (HseholdsD)	Dummy variable. 1= Main customers are households, 0 = Other (business) entities	122	0.56	0.50	0	1
External Funding (OthrFinanceD)	1 = If firm was able to secure start-up capital from sources other than owners' funds, 0 = owner/ owner's family funds only	122	0.45	0.50	0	1
Recent sales trend (SalesTrend)	If sales have been decreasing (0), stable (1), or increasing (2) over the last five years.	122	1.29	0.81	0	2
Location of Main Market (MktReach)	Location of the firm's main market. Represents exporting propensity (1 = Local (up to 5KM), 2= City-wide, 3= City plus surrounding areas, 4 = National (Kenya), 5 = East Africa, 6 = International	122	2.76	1.11	1	5
Location of Main Market (CityD)	Dummy location of the firm's main market. 1 = Nairobi City-wide, 0 = Otherwise	122	0.24	0.43	0	1
Location of Main Market (GreaterCityD)	1 = Main market is Nairobi plus surrounding areas 0 = Otherwise	122	0.35	0.48	0	1
Location of Main Market (NationalD)	1 = Main market is the whole country 0 = Otherwise	122	0.20	0.40	0	1

Variable (Operational variable name)	Operational definition	Obs	Mean	Std. Dev.	Min	Max
Other characteristics of the firm (cont.)						
Location of Main Market (EastAfricaD)	1 = Main market is East Africa region 0 = Otherwise	122	0.06	0.23	0	1
Location of Main Market (InternationalD)	1 = Main market is exports to other countries 0 = Otherwise	122	0.00	0.00	0	0
Value chain network (SuplrFrms)	Number of supplier firms	122	5.06	4.55	1	25
Internet Use (InternetD)	Dummy. 1 = If the internet is a top three source of industry information, 0 = Internet not named as a top three source of information.	122	0.14	0.35	0	1
Productivity Gap (LPgap)	Labour Productivity gap between the firm and the industry's (Sample's) best performer	122	17445.86	3079.63	0.03	19613.69
Owner/Manager factors						
Owner/Managers age (EntrAge)	Age of the respondent (Owner/ Manager)	122	38.33	9.76	22	65
Owner managers education (EntrEduyrs)	Owner/Manager's number of years in formal education	122	12.91	2.35	8	18
Owner managers education (SecondaryD)	Dummy for education level. 1= up to Secondary school qualifications 0 = Otherwise	122	0.34	0.48	0	1

Variable **(Operational variable name)**	**Operational definition**	**Obs**	**Mean**	**Std. Dev.**	**Min**	**Max**
Owner/Manager factors (cont.)						
Owner managers education (CollegeD)	1 = up to College level education 0 = Otherwise	122	0.35	0.48	0	1
Owner managers education (UniversityD)	1 = Owner/manager is a university graduate 0 = Otherwise	122	0.16	0.37	0	1
Gender (FemaleD)	Gender dummy (Female = 1, Male = 0)	122	0.45	0.50	0	1
Dynamic networks (DynamicNetD)	1 = If owner/manager was in an association which had new members joining in the previous year, 0 = Otherwise	122	0.29	0.45	0	1
Ownership of other businesses (OtherBizD)	1 = Runs other business(es) 0 = Otherwise	122	0.27	0.45	0	1

† See http://www.imf.org/external/pubs/ft/weo/2012/01/weodata/weoseladv.aspx?a=&c=664&s=PPPEX.

♦ All log transformations are natural logarithms. Where pecuniary values apply, log transformations are of the raw values from the survey reported in Kenya Shillings.

*The applied weights are advised by judgements from interactions with the firms during the fieldwork

6.3 Descriptive analysis

The Kenyan micro and small scale enterprises landscape is dominated by low value-added activities with trade services accounting for 64% of all MSEs in Kenya (Ronge *et al.*, 2002). A manufacturing activity like garment making might therefore be expected to be report good performance in such an economy. Indeed, at PPP$2,333 the average labour productivity for all workers in our sampled firms is 144% the Kenyan GDP per capita in 2009 which stood at PPP$1616.[20] Average value added per firm in 2009 was PPP$ 20,950, with the least productive firm generating a value added of PPP$316 in 2009. The best performing small enterprise in the sample of garment firms added PPP$316,456 to the national economy in 2009.

This suggests that while the average performance of the garments sector in Nairobi appears to compare well with the preeminent national indicator of average economic wellbeing, there may be some disparities within the industry that warrant closer scrutiny. Indeed, the least productive workers only generated PPP$ 165 in 2009. This is not only 120 lower than the best performers in the industry, whose productivity is PPP$ 19,778, but is also significantly below the Kenyan urban poverty line set at PPP$ 714 per annum for food and PPP$ 1508 to cover food and basic goods (UNICEF, 2007, p15). Thus, this worker will yet bear high levels of deprivation in spite of working in an industry that appears to do relatively well against the national average welfare in Kenya, seemingly corroborating its repute as launch pad for industrialisation.

[20] For Kenyan economic statistics, see https://opendata.go.ke/Manufacturing-and-industry/Gross-Domestic-Product-And-National-Income-2001-20/g2ru-za5h (Accessed 03/08/2012) and http://www.imf.org/external/pubs/ft/weo/2012/01/weodata/weoseladv.aspx?a=&c=664&s=PPPEX. (Accessed 03/08/2012)

Indeed, globally, the apparels and garments industry is considered to have such a swift cycle of innovation that patents and other intellectual property rights would be an unnecessary hindrance (Raustiala and Sprigman, 2006). For garments firms in Nairobi, almost a third of all sampled firms have new products constituting more than half of their 2009 sales, with 11% of sampled firms having new products accounting for more than three quarters of their revenues. About 4% of firms, selling mostly bespoke and designer items, exclusively traded newly designed products. This suggests that there is some dynamism in the industry in terms of new products which may have positive growth implications for the pertinent firms and by extension the economy in line with the general expectations of the garments industry.

However, this may be undermined by the fact that on average, only 32% of sales in 2009 were from new products developed between 2005 and 2009. This suggests that the new products dynamism may be a minority phenomenon in the garments industry in Nairobi. In fact, about 41% of the sampled firms did not report to have sold any new products at all in 2009. This is not only clearly a significant drag for an otherwise vibrant industry, but also a curious finding for a highly cosmopolitan city associated with a lot of touristic activity and international business.

Indeed, whilst some firms are highly design intensive, with one firm employing four full-time workers to conduct design amounting to a total of 160 hours devoted to research design and development activities per week, about 60% of firms engage in no such activities at all. Recent research also indicates that for many firms in the garments industry in Kenya, including producers of touristic garments, innovation is employed as an *ad hoc* survival tactic in the face of competition rather than as a purposed growth strategy (Kamau and Munandi, 2009). Corroborating this, our findings show further that

only 30% of firms intended to expand revenues by selling new products, with the deepening of the sales of existing products preferred by the overwhelming majority.

It is plausible, yet, that firms may want to pursue scale economies by expanding their markets for existing products as opposed to incurring new costs in the development of new product portfolios. However, with three quarters of our sampled firms selling only within Nairobi and surrounding areas, Nairobi's garments firms appear to be very narrowly tethered in terms of market reach. This clearly limits their performance growth the more. In fact, only a fifth of the sampled firms serve national markets with only about 6% of firms selling their wares in other East African countries and none of the firms exporting beyond East Africa.

The absence of scale economies is evidenced further by capital endowment amongst the sampled firms. Whilst the average suggests that firms have almost PPP$ 25,000 worth of capital stock, this figure is distorted by the fact that some firms employ modern computerised equipment such as synchronised embroidery machines that are very expensive. Thus, the most highly endowed firm has about PPP$ 920,000 in capital stock and the maximum capital per worker figure in our sample is PPP$ 58,000. However, the median firm has only about PPP$ 2,600 worth of capital with the median capital per worker being the equivalent of about PPP$ 600. In the least capitalised firm, the average worker only has PPP$ 178 worth of machinery to work with, probably an old second-hand sewing machine. As such, it is the use of simple hand tools that characterises most firms.

Two decades ago, McCormick (1993) argued that the use of such tools by micro and small firms in the garments industry are a significant impediment to development in two related ways. Firstly, such tools are highly inefficient by modern standards.

Secondly, contrary to popular belief, smaller firms using such tools are actually less labour intensive than medium firms using more modern tools. Accordingly, the employment of inefficient tools by small firms not only stunts productivity growth, but it also does little towards creating the mass unskilled jobs required in many developing countries. As such, McCormick (1993) advocated for the upgrading to more efficient machinery in medium scale firms. Yet, our survey suggests that many of the firms are technologically static with over 60% not having implemented any new process technologies at all between 2005 and 2009, including the replacement of defective machinery. Indeed, other research on African firms has found that on average less that 5% of firms make positive investments in a typical year (Bigsten and Söderbom, 2006).

Be that as it may, micro and small garment makers in Nairobi seem to be able to create employment at remarkable rates. Average annual employment growth since start-up is 44% with the highest growth rate standing at 400% per annum. An important caveat, however, is that growth is calculated from start-up and many firms start small, the average start size being 2.57 workers. Thus, a firm that grows employment from one to 5 workers in a year reports an employment growth rate of 400% which exaggerates the average growth rate. Absolute numbers may therefore tell a less remarkable story. Indeed few micro and small garments firms in Kenya sustain the high growth rates to become medium sized firms. Van Biesebroeck (2005) finds this to be the case in many African countries.

As such, the garments industry in Kenya is characterised by a 'missing middle' with swarms of micro and small firms on the one hand and a few large firms on the other (McCormick, 1993). Table 5.2 in Chapter 5 also illustrates this. Indeed, even within the micro and small firms category, the distributions skews towards the micro. In

our sample, the smallest firm employs just one person, who incidentally only works part-time (Minimum adjusted Labour variable = 0.5), while the largest small firm employs 42 workers (26.1 labour units adjusted). However, the average firm is a micro enterprise with 8.5 workers which reduces to 5.8 full-time worker units when the postulated work-time adjustments are applied. The median unadjusted number of workers is 5.

Also attesting to the shortlived nature of the rapid average growth rates reported is the age of the firms in the light of the mode of establishment. As Figure 5.6 indicates, about 80% of sampled firms were established as new firms. In turn, at over 11 years old, the average firm in the sample is relatively established. A median age of 8 years also corroborates this. Also, there is a strong and significant correlation between the age of the owner/manager and the age of the firm (Appendix II). All these suggests that most new firms rapidly add a few workers post-startup but then stagnate in size and therefore remain micro enterprises. Taken together, the fact that most firms are sole proprietorships that were newly established and that the average owner/manager is almost 40 years old running an 11 year old firm and employing 8.5 workers suggests that many garments firms in Nairobi languish in the micro scale of over a protracted period of time.

A cited explanation for the retardation commonly observed in the micro and small scale sector in Kenya is that most MSE owner/managers are recruited from those with a weak educational background (Farstad, 2002). Indeed, almost half of all respondents (48.4%) have only attained up to secondary school (O-Level) qualifications. Considering that firms require technical and managerial skills that school leavers are not equipped with, the micro and small scale garments sector in Nairobi has

been argued to be unlikely to solve Kenya's unemployment problems over the long term (Ongile and McCormick, 1996).

Indeed, whilst over half of all workers (53%) are below 30 years old, therefore contributing to the amelioration of chronic youth unemployment in Kenya, about three quarters of sampled firms do not have a single graduate in their workforce. This clearly limits the growth prospects for the MSE sector. As such, capacity impediments are likely to be the bane that continues to undermine the reputed International Labour Office (ILO) (1972) proposition that the informal sector should be promoted to enhance indigenous industry and employment creation in Kenya.

However, with a mean number of years in formal education at 12.9, it appears that on average, owner/managers in the small scale garments industry in Nairobi do pursue some post-secondary qualifications. Indeed, graduates constitute about 6.5% of all employed workers on average which may not be insignificant for a largely low skill industry like garment-making. Further, 32% of owner/managers have completed college education, 13% have a bachelor's degree and 3% have attained postgraduate qualifications. These are resourceful potentials that could be harnessed and supported to bolster performance and growth in the garments industry in Nairobi.

In fact, there are indications of promising prospects for micro and small garment-makers in Nairobi. In spite of the prevailing tough economic conditions, 78% of firms reported that sales had been either stable or increasing over the preceding five years, with the later being the case for over 50% of all firms sampled. Indeed, one of the oft-cited challenge facing the garments industry in Kenya is faced fatal competition from the importation of both cheap second hand apparels from Europe and America that are deemed to be of higher quality and new low-priced garments from China

(McCormick *et al.*, 2007). However, with 44% of the sampled firms mainly serving business to business customers rather than the general public, the resultant more stable relationships with business customers may have allowed the garments sector in Nairobi to weather the competition and forge new growth paths.

Indeed, while inter-firm linkages and joint action has always been found to be weak amongst micro and small firms in Kenya (McCormick *et al.*, 1997; Moyi, 2006; Ronge *et al.*, 2002), the surveyed micro and small garments firms appear to harness an array of networking avenues that afford a variety of complementary resources and opportunities. Besides the forward linkages with business customers discussed above, there is evidence of emergent backward linkages as well with the average firm sourcing variously from 5 suppliers. About 10% of firms have between 10 and 25 suppliers which is not a small feat for micro and small firms in a low skill industry. This clearly expands the sources and scope of the flow of knowledge and also affords a platform for the development of other efficiency enhancing facilities such as credit.

Beyond these commercial linkages, another potent avenue for new knowledge as well as other resources is membership in purposed associations. In Kenya, associations of micro and small enterprises are especially beneficial as their resourcefulness is usually beseeched for both formal and personal welfare needs of the members (McCormick *et al.*, 2003). Perhaps for such reasons, associations and networks amongst in the small scale garments industry in Nairobi have been said to be closed and built around kinship and ethnicity (McCormick, 1997).

In an attempt to counter the weakness of such strong ties (Grabher, 1993), this study sought to capture membership only in dynamic associations which had at least one new member joining in the previous year. Here, only 29% of sampled firms

reported membership in such dynamic associations. This therefore corroborates the documented networking drawback amongst micro and small firms in Kenya. Moreover, attesting to further deficiency in connectivity, only 14% of sampled firms were avid users of the internet as a source of new knowledge and information, i.e. considered the internet as one of their top three sources of information.

An alternative form of dynamic networking amongst small firms in developing countries is portfolio entrepreneurship which also serves to spread entrepreneurial risks and harness sparse resources (Lingelbach *et al.*, 2005). On this measure, 27% of the owner/managers of surveyed firms indicated that they own or run other businesses. This suggests entrepreneurial dexterity amongst owner/managers in Nairobi, Kenya. Indeed, besides portfolio entrepreneurship, a further important indicator of entrepreneurial resourcefulness especially in a developing country context is women entrepreneurship (Jiggins, 1989). other has been found to be a significant driver of firm growth. In our study, Table 6.1 indicates that 45% of the sampled firms have female owner/managers. An earlier study of MSEs in Southern and East Africa found that 48% of MSEs were owned by women (Mead, 1999).

Beyond mere participation, however, scholars identify other gender specific factors that may hinder the performance of female entrepreneurship. For example, the title to property in many African cultures is a prerogative of the men. Women may therefore not have the collateral to obtain external financing for their businesses (Nichter and Goldmark, 2009). However, our survey indicates that only 45% of all garments firms in Nairobi are able to source capital from external sources other than their own funds or funds supplied by their families. This figure is barely different for women in particular at 44%. In fact, female-led firms appear to better male-led

garments firms in terms of labour productivity with PPP$2,630 valued-added per worker compared to PPP$2,080 for firms with male owner/managers.

Indeed, whilst access to capital generally can be seen to have improved significantly from the 1990s when only about 10% of micro and small firms in Kenya were able to obtain external funding (Ronge *et al.*, 2002), mere access to credit financing has been found to have no significant relationship with actual firm performance amongst micro and small firms in Kenya (Akoten *et al.*, 2006; Daniels and Mead, 1998). Against this backdrop, beyond these general characteristics of Nairobi's garments industry, we investigate the relationships between these variables especially towards understanding which factors have significant associations with productivity and employment growth.

6.4 Correlations

As summarised in figure 4.1, the object of the present study is to investigate the factors that are associated with higher firm productivity and higher employment growth, both important contributions of firms to society and key elements of economic growth that are of particular interest to developing countries seeking to reverse high levels of poverty and unemployment. In Chapter 3, we argued that only when new combinations of factors of production are actualised is betterment actually achieved. Thus, the relationship between product enovation and both productivity and employment growth are key hypothesis in this study. In turn, the factors that are associated with higher levels of product enovation are investigated.

Table 6.2 presents the correlation matrix depicting the correlations between our headline variables and other variables representing innovation factors, owner/manager

characteristics, other characteristics of the firm and external factors in line with the conceptual model summarised in Figure 4.1. Pairwise correlations between all variables are presented in Appendix II.[21] The Asterisks denote significance at the 0.10 level.

In line with convention, the firm's value added seems to increase with increases in labour, physical capital and the human capital (education) of both the owner/manager and other employed staff. Firms whose owner/managers attained up to secondary school qualifications, are however associated with lower valued-added.

Firms led by women also appear to correlate with lower value-added compared to male-led firms, as do firms which primarily serve households directly as opposed to trading with other businesses. Indeed, firms with a large network of suppliers appear to have higher value-added. Being in associations that have had new members also correlates positively with value-added. Firms' economic output also significantly correlates positively with firms' start-up size, firm's age, the age of the owner/manager, a broader market reach and portfolio entrepreneurship respectively.

Of particular interest to the present study is innovation and product enovation. An enovation orientation, where the firm's strategic orientation is towards selling more of new products as the avenue for expansion, positively correlates with higher value-added. Increases in the magnitude of product enovation itself, i.e. increases in the share of new products in the firm's turnover, appear to increase with the firm's value-added. Also, increases in innovation inputs in absolute terms is associated with increases in value-added; but higher innovation intensity (i.e. innovation inputs per worker), appears to have a negative and significant correlation with value-added. This is perhaps because

[21] Please note that rather than a *ceteris paribus* assumption where the effect of other factors is acknowledged but held constant, the reported pairwise correlations only consider the relationship between just the two variables ignoring other relationships with other variables. Thus, the reported relationships may not be assumed to have any predictive power beyond the indication of the strength of the supposed linear relationship between the two variables only.

intensity is inputs per worker and so a high number of workers will dilute the large absolute measures. Additionally, process innovation does not appear to have a significant correlation with value-added.

Indeed, neither product enovation nor innovation inputs appear to have a significant pairwise relationship with the rate of firm employment growth in the garments industry in Nairobi. One notes, however, that higher employment levels are associated with higher innovation efforts suggesting that it is firms that are already large, rather than the rapidly growing ones, that undertake innovation pursuits. Nevertheless, of the factors that positively correlate with value-added, only portfolio entrepreneurship appears to also have a significant and positive relationship with higher levels of employment and higher rates of employment growth respectively.

Also, while firms managed by women have fewer workers than their male-led counterparts, they are associated with higher rates of employment growth. The rate of employment growth also correlates negatively with the age of the firm, age of the owner/manager, education, start-up size and market reach respectively.

With regard to product enovation, broadening market reach is positively associated with higher shares of new products in firms' total revenues. Product enovation also correlates positively with enovation orientation, absolute innovation inputs, innovation intensity and process innovations. Internet use also corresponds with higher enovation, as does bigger supplier networks and membership in dynamic associations. Firms with university educated workers enovate more and owner/managers with higher education are also associated with higher sales of new products. Specifically, college educated owner/managers appears to be significantly

associated with higher enovation. Lastly, higher product enovation has a significant relationship with a positive sales trend.

The correlations discussion above gives a sense of how the various variables relate with each other pairwisely. One observes further that none of the associations is profoundly strong bar the conventional relationships involving labour, capital and output. The absence of high correlations between variables suggests that they each capture unique factors. As such, the problem of multicollinearity may be assumed to not overtly afflict the dataset. With an idea of the mutual behaviour between the different variables, therefore, the next section attempts to investigate if these respective relationships may actually be useful in predicting the changes in firms' productivity, employment growth and product enovation, while accounting for the influence of other specified variables.

Table 6.2: Correlations†

	Value-added	Labour Productivity	Employment growth (pa)	Product Enovation (log)
Value-added	1			
Labour Productivity	0.7870*	1		
Employment growth (pa)	-0.06	-0.1765*	1	
Labour	0.6619*	0.0584	0.1173	
Capital	0.8267*	0.4895*	-0.0816	
Capital per worker	0.6674*	0.6657*	-0.2268*	
Employs university graduates	0.2864*	0.0672	-0.0194	
Product Enovation (log)	0.1970*	0.1914*	-0.031	1
Product Enovators (at least 1pc threshold)	0.2324*	0.2044*	-0.0394	0.9329*
Product Enovators (at least 26pc threshold)	0.1611*	0.1933*	-0.081	0.8606*
Product Enovators (at least 51pc threshold)	0.0005	0.0933	-0.0328	0.6377*
Product Enovators (at least 76pc threshold)	0.1387	0.1472	0.0983	0.4193*
Product Enovation (Ordered by 25pc intervals)	0.1172	0.1752*	-0.0228	0.8059*
Expansion by enovation	0.1293	0.2698*	0.0896	0.2824*
Innovation inputs	0.2757*	0.2412*	-0.0252	0.2857*
Innovation intensity	-0.2214*	0.1164	-0.1468	0.3912*
Process Innovation	-0.0279	0.0261	0.1325	0.2027*
Age of the firm	0.2790*	0.1011	-0.5369*	0.0056
Start-up size	0.3345*	0.0597	-0.1895*	0.0887
Share of young workers	-0.0902	0.0366	0.0254	0.0929
Sells mainly to households than other businesses	-0.4261*	-0.2310*	0.1402	-0.0191
Some start-up capital from external sources	0.0985	0.1452	-0.0263	0.0679
Sales Trend	0.1363	0.0473	0.1253	0.2192*
Market Reach	0.3117*	0.2194*	-0.2140*	0.3433*
City	-0.0305	-0.0392	0.077	0.0827
Greater City	0.0603	0.1197	-0.0085	-0.0021
National	0.0737	0.0079	-0.1408	0.126
East Africa	0.2292*	0.1465	-0.1012	0.2122*
Number of Suppliers	0.3774*	0.2229*	-0.0518	0.2401*
Internet use	0.1363	0.0917	0.0974	0.2649*
Productivity gap with industry's best performer	-0.3327*	-0.3899*	0.0734	-0.0884
Owner/manager Age	0.3613*	0.1508*	-0.2014*	-0.0288
Owner/mgrs. education	0.3033*	0.3417*	-0.1461	0.2520*
Secondary School	-0.2816*	-0.1983*	0.0265	-0.1326
College	0.0497	0.1115	-0.1966*	0.1833*
University graduate	0.3775*	0.2964*	0.033	0.1023
Female owner/manager	-0.143	-0.0175	0.2148*	0.06
Dynamic Networks	0.1517*	0.064	0.1076	0.2378*
Runs other businesses	0.1628*	-0.0168	0.2066*	0.0228

† Shaded cells indicate high correlation, i.e. correlation coefficient above 0.5. A darker shade signifies that the correlation coefficient is above 0.8.

6.5 Model estimation

With these research objectives and our survey data as described earlier, a suitable analytical technique for estimating the relationship between two variables, given other factors that may also have a relationship with the dependent variable, is multiple regression analysis. Usually, the nature of the dependent variable determines the most appropriate estimation technique to apply. Thus, to estimate productivity and employment growth, we employ the method of Ordinary Least Squares (OLS) as these are continuous variables that satisfy the linearity criterion (see Appendix III).

However, our measure of product enovation is the percentage of sales from new or significantly modified products (introduced between 2005 – 2009) in 2009 sales. This is a continuous variable but with upper and lower bounds. Since it is censored between 0 and 100, the assumptions of linear regression are not met because there can be concentrations of observations at the limits thus violating the linearity assumption (Tobin, 1958). At the same time, there is available information on the different measurable and meaningful values the dependent variable takes. Thus, only estimating the probabilities of ordinal or binary responses would be throwing away useful information. Accordingly, a hybrid of probabilistic analysis and multiple regression, the Tobit model, is the most appropriate in such a case (Tobin, 1958).

Still, as seen in the previous section, variants of this variable are easily generated by installing different thresholds of product enovativeness. This converts the variable to a set of distinct categories where probabilistic analysis may be applied to also investigate the determinants of ‘discrete’ differences in product enovativeness. This may develop a richer account of the variability in product enovation amongst firms.

Given that our research attempts to understand the link between product enovation and firm productivity and in turn the determinants of such product enovation, the empirical approach outlined here may appear to lend itself to draw on the CDM methodology ((Crepon *et al.*, 1998)). However, unlike Crepon *et al*.(1998) who conceptualise innovation as knowledge capital and investigate its impact, in line with the exposition in Chapter 3, enovation is herein argued to engender growth by definition. This is because realising new combinations of factors of production in kind, and not merely in degree, means that the output necessarily changes, especially in 'per unit of inputs' terms. Thus, any change in output is necessarily the result of aggregate enovation (total effective change). Empirically, therefore, it should be interesting to investigate the effect of an observable aspect of aggregate enovation, such as product enovation on firm performance. Product enovation is selected because it is celebrated as the preeminent type of new 'in kind' combinations (Schumpeter, 1934; 1939; 1943).

Strictly speaking, however, an analysis of enovation is best suited to a panel regression estimation technique investigating the behaviour of the same firm over time. We assume, nevertheless, that the resultant growth may be captured in a cross-sectional analysis of firm performance such that firms' higher value-added is hypothesised to be attributable to higher levels of product enovation, accounting for the contributions to the firms' outputs by other factors. This is why product enovation is only but one of the many factors that would explain productivity in a snapshop scenario.

Further, the CDM technique appears to seek to validate economic effectiveness of firms' decisions and activities with regards to innovation and thus start by estimating the innovation decision. Interest is in the production of 'knowledge' which is in turn hypothesized to enhance productivity in a recursive structural fashion. As discussed in

Chapter 3, however, the share of new products may not be a good indicator of knowledge capital not least because firms may possess knowledge but not employ it in production.

Moreover, firms may not have a large portfolio of products such that a high share of new products may be the result of low sales overall and effectively high losses, emanating from the ignorance of market intelligence about the demand for the new risky commodity. Furthermore, the share of new products sold is an outcome of many variables, many of which are external to the firm. As such, the predominance of observed innovation efforts over product enovation is questionable.

Thus, predictions of product enovation based on R&D efforts are prone to misspecification and misestimation due to the many unobserved variables. Besides, for many small firms that take a very *ad hoc* approach to innovation and enovation, treating the introduction of new products for example as something that 'just happens' (Vermeulen *et al.*, 2005), the measurement of innovation inputs in R&D efforts is itself prone to many errors. Furthermore, given that the knowledge is first produced then employed to engender a change in the whole through a change in particular elements such as new products or new processes, the CDM technique may be seen to not appreciate the entire 'structure' of the process of developing and implementing innovations (see also, Roper *et al.*, 2008).

In contrast, our study simply subscribes to the Schumpeterian notion that changes in outputs are only as a result of a 'novation' of some sort on the inputs side. We therefore ask if product enovation, one of the many possible observable novations, has a linear relationship with the variability in firm productivity. In turn, what factors is product enovation itself associated with. Indeed, because we ask these two correlational

questions separately, our approach is not nearly as sophisticated as the structural CDM methodology, its challenges notwithstanding. Thus, instead of a complex model of recursive equations, we simply seek to investigate the factors associated with high productivity, including product enovation, and then examine the factors that may explicate why some firms have more product enovation than others. To do this, we specify our empirical models as follows:

To begin with, we specify the standard two-factor Cobb-Douglas production function towards estimating Total Factor Productivity (TFP).

$$Y_i = A_i K_i^{\beta k} L_i^{\beta l} \quad (1)$$

where Y_i is the gross value-added of the firm *i*, K is capital stock, L is labour, and A the Total Factor Productivity. βk and βl represent the coefficients for capital and labour respectively.

With log tranformations, the function is reformulated to

$$y_i = \beta_k.k_i + \beta_l.l_i + u_i \quad (2)$$

In turn,

$$u_i = logA_i = TFP_i \quad (3)$$

We then estimate the firm's total factor productivity function as follows:

$$TFP_i = \beta_0 + \beta_1 ENOV_i + \beta_2 INN_i + \beta_3 MGR_i + \beta_4 FRM_i + \beta_5 EXT_i + \varepsilon^4_i \quad (4)$$

For purposes of comparison and robustness, we also estimate the labour productivity function:

$$LP_i = \alpha_0 + \alpha_1 ENOV_i + \alpha_2 INN_i + \alpha_3 MGR_i + \alpha_4 FRM_i + \alpha_5 EXT_i + \varepsilon^5_i \quad (5)$$

Equations (4) and (5) estimate how the firm *i's* TFP and labour productivity are determined by product enovation ($ENOV_i$), a set of innovation variables (INN_i), owner/manager characteristics (MGR_i), other features of the firm (FRM_i) and factors external to the firm (EXT_i) as described in the preceding sections. The respective error terms are represented by ε^4_i and ε^5_i.

Employment growth is estimated by the following equation:

$$LGRWTH_i = \theta_0 + \theta_1 ENOV_i + \theta_2 INN_i + \theta_3 MGR_i + \theta_4 FRM_i + \theta_5 EXT_i + \varepsilon^6_i \quad (6)$$

To analyse the determinants of product enovation, the following function is estimated for each of the product enovation variables:

$$ENOV_i = \delta_0 + \delta_1 INN_i + \delta_2 MGR_i + \delta_3 FRM_i + \delta_4 EXT_i + \varepsilon^7_i \quad (7)$$

After ascertaining that the assumptions required for the OLS technique to be employed were met,[22] the above estimations were carried out. To allow a deeper analysis, the equations were also modified accordingly to accommodate various interactions. In what follows the results of the estimations of these equations are presented and interpreted.

[22] Please see Appendix III for details.

6.6 Multiple regression results

6.6.1 The Cobb-Douglas two-factor production function

As described in the preceding section, our first estimation is the standard Cobb-Douglas production function. The results of this estimation, as represented in Table 6.3, show that only capital reports the expected significant relationship. While the model's Adjusted R-Squared improves slightly, and the labour coefficient increases from 0.057 to 0.172, thereby increasing the sum of the coefficients and improving the returns to scale, even the adjusted labour variable does not indicate a statistically significant relationship between labour and output. Further, the constant returns to scale assumption is not supported, even following labour variable adjustments. Potential explanations for this result are offered in Section 6.7.1.

Table 6.3: Cobb-Douglas two-factor production function[23]

VARIABLES	Unadjusted	Labour Adj1	Labour Adj2	Labour Adj3
Capital Stock (log)	0.698***	0.653***	0.658***	0.668***
	(0.067)	(0.067)	(0.064)	(0.067)
Total Workers (log)	0.057			
	(0.115)			
Adjusted Labour (log)		0.172		
		(0.124)		
Adjusted Labour 2 (log)			0.167	
			(0.119)	
Adjusted Labour 3 (log)				0.139
				(0.127)
Observations	122	122	122	122
Adjusted R-squared	0.679	0.683	0.683	0.681
Model Significance	0.000	0.000	0.000	0.000

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1, ^ p<0.15

[23] Adjusted Labour1 is as described in the descriptive statistics. [Llog = ln(1.2*Owner/Managers) +Fulltime +(0.5*Part-time) +(0.33*Apprentice)+(0.25*UnpaidFamily/Friends)].
Adjusted Labour 2 = log ((1.5* Owner/Managers)+ Fulltime+(0.3* Part-time) +(0.3* Apprentice) + (0.3*UnpaidFamily/Friends)).
Adjusted Labour 3 = log ((1.5* Owner/Managers)+ Fulltime+(0.5* Part-time) +(0.5* Apprentice) + (0.5*UnpaidFamily/Friends)).

6.6.2 Determinants of firm productivity

The second set of estimations seek to investigate the determinants of firm productivity. Initially, only the control variables are included, in part to answer our first research question.[24] Separate regressions are run for Total Factor Productivity and Labour Productivity, in line with Equation (4) for TFP and Equation (5) for Labour productivity. As Tables 6.4 and 6.5 show, in addition to the controls model (1), six models were run representing different measures of product enovation.

Some differences are observed between the two productivity models. Firstly, innovation intensity appears to have a statistically significant relationship with labour productivity, in line with the literature, but not TFP. A 10% increase in innovation intensity is associated with about 1.5% (1.1^0.152) increase in average labour productivity, holding other factors constant. This relationship is not found to be significant in the TFP estimation, although the expected sign is reported.

Similarly, on average, firms that are members of associations that have welcomed new fellows in the last year appear to have about 35% (exp(0.298)) more TFP than those not participating in such dynamic networks. This effect is however not upheld in labour productivity estimations. TFP also appears to increase with recent increases in sales, but labour productivity does not move in tandem with the sales trend. The type of customers the firm serves also matters for TFP but not labour productivity; although the similar negative sign indicates that firms that engage in business to business sales, as opposed to serving household customers directly, tend to have higher productivity on average (28% higher TFP).

[24] Please see Appendix IV for details on the procedure followed in the inclusion and exclusion of the variables considered in the analysis.

Perhaps the most unexpected result corroborated by both TFP and labour productivity estimations is the finding that on average, micro and small firms that employ graduates have significantly lower productivity than those that do not. However, where the owner/managers are themselves graduates, firms report higher productivity on average, *ceteris paribus.* Both productivity estimations also give credence to a broader market reach but find no evidence of a gender divide for both TFP and labour productivity.

Running other businesses also appears to be significantly associated with lower productivity. Further, micro and small firms that start with fewer employees have significantly higher productivity. An enovation orientation, where firms seek to expand sales by increasing the sale of new products, is also found to be an important indicator of differences in productivity. Firms with an enovation orientation have 46% more labour productivity on average (27% more TFP).

Be that as it may, the hypothesis on the actual realisation of product enovation in explaining productivity differences is not supported in all the various product enovation models for TFP and labour productivity. Indeed, the indicative non-significant relationship is mostly negative. More importantly perhaps, adding enovation variables to the controls model does not seem to increase the variability explained by the model at all. In fact, Adjusted R-Squared either marginally decreases or only increases by a percentage point or less following the inclusion of the various product enovation variables. Further tests were therefore carried out to investigate if this relationship between enovation and productivity is moderated by other variables that characterise the firm.

Table 6.4: Estimation of the determinants of firm TFP

Dependent Variable:	Total Factor Productivity						
Independent Variables	(1) Controls	(2) Enovation (Log of New Products % share)	(3) Enovation (Dummy: 1 = New Pdts share >1%)	(4) Enovation (Dummy: 1 = New Pdts share >25%)	(5) Enovation (Dummy: 1 = New Pdts share >50%)	(6) Enovation (Dummy: 1 = New Pdts share >75%)	(7) Enovation (Ordered categories 0-3at 25% New Pdts share intervals)
Enovation	0.242^	0.259*	0.255*	0.254*	0.235^	0.243*	0.238^
Orientation	(0.145)	(0.140)	(0.143)	(0.142)	(0.139)	(0.141)	(0.140)
Innovation intensity	0.025	0.039	0.035	0.040	0.019	0.017	0.021
	(0.042)	(0.038)	(0.039)	(0.042)	(0.038)	(0.045)	(0.039)
Owner/mgr educated	0.078	0.080	0.073	0.073	0.077	0.077	0.078
up to secondary sch.	(0.253)	(0.256)	(0.254)	(0.255)	(0.256)	(0.253)	(0.254)
Owner/mgr has	0.358	0.368	0.367	0.363	0.357	0.351	0.356
up to college edu.	(0.249)	(0.248)	(0.252)	(0.246)	(0.254)	(0.252)	(0.253)
Owner/mgr is a	0.637**	0.634**	0.633**	0.623**	0.643**	0.646**	0.641**
university graduate	(0.292)	(0.290)	(0.289)	(0.291)	(0.288)	(0.289)	(0.288)
Female owner/mgr	-0.022	-0.018	-0.021	-0.021	-0.024	-0.032	-0.024
	(0.149)	(0.150)	(0.150)	(0.151)	(0.151)	(0.150)	(0.150)
Runs other Business	-0.299*	-0.306*	-0.301*	-0.308*	-0.293*	-0.286*	-0.295*
	(0.154)	(0.153)	(0.154)	(0.152)	(0.153)	(0.158)	(0.152)
Start-up size	-0.038**	-0.037**	-0.037**	-0.037***	-0.038**	-0.037**	-0.038**
	(0.014)	(0.014)	(0.014)	(0.013)	(0.015)	(0.015)	(0.015)
Sells to households	-0.249*	-0.249*	-0.249*	-0.254**	-0.245*	-0.250*	-0.247*
(not B2B)	(0.125)	(0.123)	(0.125)	(0.123)	(0.124)	(0.134)	(0.125)
Sales trend	0.129**	0.136**	0.133**	0.134**	0.127**	0.125**	0.128**
	(0.056)	(0.056)	(0.056)	(0.053)	(0.056)	(0.053)	(0.055)
Market Reach	0.086**	0.102**	0.098**	0.100**	0.083**	0.079**	0.083**
	(0.038)	(0.046)	(0.046)	(0.045)	(0.038)	(0.036)	(0.039)
Employs graduates	-0.329***	-0.308***	-0.314***	-0.314***	-0.327***	-0.345***	-0.331***
	(0.093)	(0.093)	(0.093)	(0.092)	(0.095)	(0.090)	(0.092)
Dynamic Networks	0.298*	0.325**	0.318**	0.327**	0.291^	0.266	0.291^
	(0.168)	(0.154)	(0.154)	(0.159)	(0.172)	(0.187)	(0.177)
Enovation (log)		-0.026					
		(0.037)					
Enovation			-0.082				
(Dummy 1= >1%)			(0.165)				
Enovation				-0.101			
(Dummy 1= >25%)				(0.119)			
Enovation					0.041		
(Dummy 1= >50%)					(0.144)		
Enovation						0.197	
(Dummy 1= >75%)						(0.153)	
Enovation							0.012
(Ordered categories)							(0.054)
Observations	122	122	122	122	122	122	122
Adjusted R-squared	0.200	0.195	0.194	0.195	0.193	0.199	0.192
Model Significance	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1, ^ p<0.15

Table 6.5: Estimation of the determinants of firms' Labour Productivity

Dependent Variable:	Labour Productivity						
Independent Variables	(1) Controls	(2) Enovation (Log of New Products % share)	(3) Enovation (Dummy: 1 = New Pdts share >1%)	(4) Enovation (Dummy: 1 = New Pdts share >25%)	(5) Enovation (Dummy: 1 = New Pdts share >50%)	(6) Enovation (Dummy: 1 = New Pdts share >75%)	(7) Enovation (Ordered categories 0-3at 25% New Pdts share intervals)
Enovation	0.380*	0.420**	0.420**	0.401**	0.395**	0.381*	0.393**
Orientation	(0.187)	(0.176)	(0.178)	(0.181)	(0.177)	(0.188)	(0.178)
Innovation intensity	0.152***	0.192***	0.193***	0.185***	0.164***	0.148***	0.170***
	(0.049)	(0.054)	(0.051)	(0.055)	(0.048)	(0.053)	(0.053)
Owner/mgr educated	0.144	0.149	0.127	0.134	0.146	0.144	0.143
up to secondary sch.	(0.268)	(0.273)	(0.278)	(0.274)	(0.268)	(0.270)	(0.270)
Owner/mgr has	0.371	0.395	0.400	0.379	0.372	0.369	0.375
up to college edu.	(0.294)	(0.285)	(0.290)	(0.284)	(0.287)	(0.297)	(0.288)
Owner/mgr is a	0.557*	0.536*	0.527^	0.517^	0.543*	0.563*	0.534*
university graduate	(0.320)	(0.312)	(0.310)	(0.318)	(0.310)	(0.321)	(0.313)
Female owner/mgr	0.106	0.123	0.121	0.114	0.111	0.101	0.114
	(0.189)	(0.193)	(0.192)	(0.195)	(0.192)	(0.197)	(0.197)
Runs other Business	-0.395**	-0.418**	-0.408**	-0.418**	-0.408**	-0.389*	-0.413**
	(0.183)	(0.187)	(0.186)	(0.186)	(0.186)	(0.195)	(0.190)
Start-up size	-0.063***	-0.062***	-0.062***	-0.064***	-0.062***	-0.062***	-0.063***
	(0.020)	(0.018)	(0.019)	(0.019)	(0.019)	(0.020)	(0.019)
Sells to households	-0.133	-0.125	-0.120	-0.134	-0.143	-0.135	-0.137
(not B2B)	(0.166)	(0.156)	(0.157)	(0.155)	(0.151)	(0.171)	(0.155)
Capital Stock (log)	0.464***	0.480***	0.484***	0.478***	0.464***	0.461***	0.470***
	(0.073)	(0.079)	(0.080)	(0.078)	(0.073)	(0.078)	(0.077)
Sales trend	0.039	0.057	0.054	0.049	0.042	0.037	0.045
	(0.078)	(0.080)	(0.077)	(0.079)	(0.081)	(0.080)	(0.082)
Market Reach	0.086^	0.128*	0.128**	0.115*	0.091^	0.083^	0.098^
	(0.056)	(0.064)	(0.061)	(0.066)	(0.058)	(0.055)	(0.061)
Employs graduates	-0.571***	-0.532***	-0.542***	-0.556***	-0.574***	-0.573***	-0.567***
	(0.182)	(0.172)	(0.175)	(0.179)	(0.186)	(0.177)	(0.180)
Dynamic Networks	0.144	0.212	0.210	0.199	0.161	0.132	0.176
	(0.187)	(0.151)	(0.154)	(0.160)	(0.172)	(0.204)	(0.174)
Enovation (log)		-0.067					
		(0.048)					
Enovation			-0.281				
(Dummy 1= >1%)			(0.207)				
Enovation				-0.201			
(Dummy 1= >25%)				(0.141)			
Enovation					-0.093		
(Dummy 1= >50%)					(0.168)		
Enovation						0.075	
(Dummy 1= >75%)						(0.224)	
Enovation							-0.052
(Ordered categories)							(0.071)
Observations	122	122	122	122	122	122	122
Adjusted R-squared	0.436	0.442	0.443	0.437	0.432	0.431	0.433
Model Significance	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1, ^ p<0.15

6.6.3 Factors moderating the effect of product enovation on firm productivity

As Tables 6.6 and 6.7 below show, the effect of selling new products on the firm's productivity is significantly moderated by the gender of the firm's owner/manager (Model 3) and by the firm's enovation orientation (Model 2). The inclusion of these interactions increases the Adjusted R-squared of the TFP model (Table 6.4 (2)) from 0.195 to 0.210 for the enovation orientation interaction and to 0.209 for the gender interaction; and 0.442 to 0.442 and 0.453 for the Labour productivity model respectively.

The results indicate that, when gender is assumed to be male, larger shares of new products in firm sales has no statistically significant relationship with the firm's productivity levels, on average. However, the interaction term indicates that there is a significant difference in the effect of product enovation on productivity between male-led firms and female-led firms. By adding together the interaction coefficient and the main coefficient for product enovation, the results indicate that for female-led firms, the product enovation parameter is -0.08 for TFP; for labour productivity the parameter is -0.13. This suggests that on average, a 10% increase in product enovativeness lowers productivity for female-led firms by about a percentage point, *ceteris paribus*. One notes that a 10% increase product enovativeness at the mean for females would increase the share of new products in total sales for female-led firms from about 35% to 38%.

In fact, once these product enovation differences between male-led and female-led firms are controlled for, the coefficient for female becomes positive and significant at the 15% level in the labour productivity estimation. This somewhat softly suggest that all other factors held constant, including the gender differences in the effect of

product enovation, female-led firms may actually outperform their male-led counterparts in labour productivity by about 50%.

For enovation orientation, while the effect of product enovation on productivity is not significantly different from zero for firms without an enovation orientation, the results suggest that the relationship between product enovation and productivity is significantly different between firms that wish to expand by selling new products and those who would like to sell more of their existing products.[25] On average, a 10% increase in the product enovativeness of firms with an enovation orientation, say from their 46% mean share of new products sales to about 51%, is predicted to be associated with a 1% reduction in both total factor productivity and labour productivity.

Moreover, while the interaction between innovation intensity and product enovation is itself not significant, suggesting that the effect of product enovation on productivity is not significantly moderated by innovation intensity, accounting for it appears to allow a negative, albeit weak, relationship between product enovation and labour productivity to emerge. However, the variation in labour productivity explained by the model with the interaction reduces marginally to 0.440 from the 0.442 explained by the model without the enovation-innovation interaction indicating that the interaction hardly improves the model.

In all, our estimations suggest that selling more of new products appears to neither have a statistically significant relationship with productivity levels amongst firms, as the null hypothesis is scarcely rejected, nor economically, since where a statistically significant effect is found, the actual elasticity is quite small. Therefore, at least in the short-term, for firms that have higher levels of productivity, their superior

[25] In fact, firms with an enovation orientation have a mean enovative sales share of 46%, compared to 26% for firms seeking to expand by selling more of their existing products.

performance is attributable to other factors other than selling new or significantly modified products. Thus, we find little support for our first hypothesis (H1+).

Table 6.6: Factors moderating the effect of* enovation *on Total Factor Productivity

Dependent Variable:	Total Factor Productivity					
	(1)	(2)	(3)	(4)	(5)	(6)
	Enovation#	Enovation#	Enovation#	Enovation#	Enovation#	Enovation#
Independent Variables	Innovation	Orientation	Female	Market Reach	University	Households
Enovation (log)	0.002	0.008	0.033	0.039	-0.012	-0.032
	(0.049)	(0.047)	(0.057)	(0.105)	(0.042)	(0.049)
Enovation	0.247*	0.637**	0.229^	0.251*	0.271*	0.261*
Orientation	(0.144)	(0.299)	(0.149)	(0.140)	(0.146)	(0.138)
Innovation intensity	-0.038	0.050	0.041	0.033	0.045	0.039
	(0.110)	(0.039)	(0.040)	(0.045)	(0.038)	(0.040)
Owner/mgr educated	0.111	0.030	0.105	0.076	0.080	0.079
up to secondary sch.	(0.253)	(0.252)	(0.254)	(0.255)	(0.257)	(0.258)
Owner/mgr has	0.415^	0.315	0.338	0.364	0.338	0.366
up to college edu.	(0.260)	(0.250)	(0.259)	(0.246)	(0.254)	(0.251)
Owner/mgr is a	0.657**	0.616**	0.698**	0.615**	0.910**	0.629**
university graduate	(0.293)	(0.289)	(0.277)	(0.275)	(0.355)	(0.288)
Female owner/mgr	-0.026	-0.049	0.233	-0.030	0.012	-0.019
	(0.150)	(0.153)	(0.184)	(0.157)	(0.146)	(0.149)
Runs other businesses	-0.310*	-0.315*	-0.309**	-0.310*	-0.300*	-0.306*
	(0.156)	(0.155)	(0.144)	(0.156)	(0.155)	(0.156)
Start-up size	-0.038**	-0.036**	-0.034**	-0.036**	-0.040**	-0.037**
	(0.014)	(0.016)	(0.014)	(0.014)	(0.014)	(0.014)
Sells to households	-0.239*	-0.286**	-0.244**	-0.239*	-0.260*	-0.272
(not B2B)	(0.126)	(0.124)	(0.119)	(0.126)	(0.128)	(0.213)
Sales trend	0.139**	0.143**	0.119*	0.137**	0.144**	0.136**
	(0.058)	(0.055)	(0.061)	(0.056)	(0.055)	(0.057)
Market Reach	0.106**	0.083^	0.084*	0.151**	0.092*	0.101**
	(0.044)	(0.050)	(0.043)	(0.064)	(0.050)	(0.048)
Employs graduates	-0.308***	-0.325***	-0.309***	-0.312***	-0.262***	-0.303***
	(0.091)	(0.088)	(0.092)	(0.096)	(0.088)	(0.088)
Dynamic Networks	0.310*	0.326*	0.291*	0.322**	0.342**	0.326**
	(0.160)	(0.162)	(0.161)	(0.155)	(0.154)	(0.156)
Enovation# Innovation	0.025					
	(0.029)					
Enovation# Orientation		-0.136**				
		(0.061)				
Enovation# Female			-0.113**			
			(0.054)			
Enovation#				-0.023		
Market Reach				(0.034)		
Enovation# University					-0.117	
					(0.089)	
Enovation# Households						0.010
						(0.082)
Observations	122	122	122	122	122	122
Adjusted R-squared	0.193	0.210	0.209	0.192	0.198	0.188
Model Significance	0.000	0.000	0.000	0.000	0.000	0.000

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1, ^ p<0.15

Table 6.7: Factors moderating the effect of* enovation *on Labour Productivity

Dependent Variable:	Labour Productivity					
	(1)	(2)	(3)	(4)	(5)	(6)
Independent Variables	Enovation# Innovation	Enovation# Orientation	Enovation# Female	Enovation# Market Reach	Enovation# University	Enovation# Households
Enovation (log)	-0.095^	-0.046	0.003	-0.015	-0.054	-0.045
	(0.060)	(0.055)	(0.063)	(0.120)	(0.054)	(0.069)
Enovation	0.432**	0.678**	0.385**	0.414**	0.431**	0.412**
Orientation	(0.173)	(0.294)	(0.185)	(0.177)	(0.181)	(0.171)
Innovation intensity	0.269**	0.204***	0.194***	0.187***	0.203***	0.193***
	(0.118)	(0.054)	(0.056)	(0.057)	(0.053)	(0.053)
Owner/mgr educated	0.118	0.115	0.178	0.146	0.150	0.153
up to secondary sch.	(0.271)	(0.266)	(0.273)	(0.272)	(0.271)	(0.281)
Owner/mgr has	0.347	0.356	0.359	0.392	0.359	0.402
up to college edu.	(0.269)	(0.286)	(0.295)	(0.282)	(0.292)	(0.293)
Owner/mgr is a	0.511^	0.512^	0.612*	0.520*	0.838***	0.554^
university graduate	(0.304)	(0.312)	(0.302)	(0.299)	(0.293)	(0.337)
Female owner/mgr	0.131	0.108	0.420^	0.114	0.165	0.126
	(0.196)	(0.194)	(0.266)	(0.197)	(0.188)	(0.192)
Runs other businesses	-0.414**	-0.430**	-0.423**	-0.422**	-0.418**	-0.415**
	(0.187)	(0.189)	(0.179)	(0.191)	(0.186)	(0.193)
Start-up size	-0.062***	-0.064***	-0.059***	-0.062***	-0.068***	-0.062***
	(0.019)	(0.020)	(0.018)	(0.018)	(0.018)	(0.020)
Sells to households	-0.135	-0.141	-0.118	-0.116	-0.127	-0.034
(not B2B)	(0.148)	(0.165)	(0.152)	(0.160)	(0.159)	(0.299)
Capital Stock (log)	0.480***	0.495***	0.480***	0.480***	0.497***	0.480***
	(0.077)	(0.080)	(0.076)	(0.079)	(0.077)	(0.079)
Sales trend	0.054	0.064	0.037	0.058	0.068	0.057
	(0.078)	(0.082)	(0.083)	(0.081)	(0.081)	(0.082)
Market Reach	0.124*	0.116*	0.107^	0.168*	0.118*	0.130**
	(0.066)	(0.067)	(0.065)	(0.086)	(0.067)	(0.063)
Employs graduates	-0.532***	-0.558***	-0.534***	-0.536***	-0.497***	-0.550***
	(0.174)	(0.169)	(0.176)	(0.177)	(0.178)	(0.169)
Dynamic Networks	0.228	0.213	0.172	0.210	0.232^	0.209
	(0.161)	(0.156)	(0.159)	(0.151)	(0.154)	(0.151)
Enovation# Innovation	-0.025					
	(0.030)					
Enovation# Orientation		-0.093*				
		(0.053)				
Enovation# Female			-0.133**			
			(0.062)			
Enovation# Market Reach				-0.019		
				(0.038)		
Enovation# University					-0.134^	
					(0.085)	
Enovation# Households						-0.039
						(0.092)
Observations	122	122	122	122	122	122
Adjusted R-squared	0.440	0.442	0.453	0.438	0.444	0.438
Model Significance	0.000	0.000	0.000	0.000	0.000	0.000

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1, ^ p<0.15

6.6.4 Determinants of firm employment growth rates

Table 6.8 presents the regression results estimating the growth rates of firm employment.[26] The first model includes only the control variables. As generally found in empirical studies of firm growth, negative relationships between employment growth, on the one hand, and the start-up size and firm's age, on the other, are here confirmed. It is estimated that, other factors constant, an additional member of staff at start-up is associated with about 1.2% reduction in the annual growth rate of employment. Similarly, a 10% increase in age of the firm is associated with about 1.6% reduction in the annual rate of employment growth.

In contrast, older owner/managers appear to create new jobs at a faster rate. On average, a 10 year increase in owner/manager's age is associated with a 4% increase in annual employment growth rates. Also associated with higher job growth rates is portfolio entrepreneurship. Here, owner/managers who own or run other businesses, besides the one surveyed, grow employment in their firms at a rate that is 12% higher than that of owner/managers only focussed on just the one firm.

The results also suggest that firms with higher capital intensity grow jobs relatively slowly on average. Increasing capital per worker by 10% appears to slow annual employment growth rate by half a percentage point on average. Employing highly skilled human capital, however, appears to enhance employment growth, albeit weakly supported statistically (at the 15% level). Firms that have graduates in their workforce grow at a rate that is 5% faster than those not employing degree holders.

[26] As in the previous section, independent variables with meagre contributions to the analysis were excluded from the model following test runs. Variables representing the number of suppliers and use of the internet were thus excluded.

In terms of technology, process enovation appears to have a statistically significant association with jobs growth. Holding other factors constant, firms that obtained new machinery in the preceding 5 years (or undertook other process changes as earlier defined), report an estimated 6% higher annual growth rate on average. Product innovation intensity, however, reports a negative and significant relationship with employment growth rates. A 10% increase in the number of hours per week per worker devoted to innovation activities is associated with a 0.4% drop in the rate of jobs growth on average.

Of particular interest to the present study is the effect of product enovation on employment growth rates. This is investigated in Model (2). The Adjusted R-squared of the model increases from 0.429 to 0.433 suggesting that the model including product enovation has a slightly improved goodness of fit. Although a relationship only emerges at the 15% level, a 10% increase in product enovation appears to be associated with about 0.14% increase in employment growth, *ceteris paribus*.

However, as Model (6) indicates, rather than a linear relationship between product enovation and employment growth rate (Model 2), what appears to be the case is that it is the very highest enovators who experience higher employment growth rates. Transformative firms, whose new products account for more than three quarters of their sales, have an 11% higher employment growth rate, on average, than firms not as enovative in terms of their products sold. Indeed, it is perhaps this strong relationship that accounts for the significant result suggested by model (7) where climbing to the next product enovator category[27] raises the growth rate by about 3% on average. In all, these findings appear to conditionally support our second hypothesis (H2+).

[27] Enovator categories are demarcated at 25% new products sales share intervals. See also Figure 3.3.

Table 6.8: Estimation of the determinants of firm employment growth rates

Dependent variable: Annual employment growth rate (log)							
Independent Variables	(1) Controls	(2) Enovation (Log of New Products % share)	(3) Enovation (Dummy: 1 = New Pdts share >1%)	(4) Enovation (Dummy: 1 = New Pdts share >25%)	(5) Enovation (Dummy: 1 = New Pdts share >50%)	(6) Enovation (Dummy:1 = New Pdts share >75%)	(7) Enovation (Ordered 0-3 at 25% intervals)
Enovation	0.050	0.040	0.038	0.046	0.047	0.053	0.044
Orientation	(0.037)	(0.034)	(0.032)	(0.037)	(0.039)	(0.036)	(0.037)
Innovation intensity	-0.038***	-0.046***	-0.047***	-0.044***	-0.041***	-0.042***	-0.046***
	(0.013)	(0.016)	(0.016)	(0.014)	(0.014)	(0.015)	(0.015)
Process enovation	0.058*	0.050*	0.049**	0.058**	0.058*	0.058*	0.058**
	(0.029)	(0.025)	(0.024)	(0.028)	(0.029)	(0.030)	(0.028)
Owner/Manager Age	0.004*	0.004*	0.004*	0.004*	0.004^	0.005*	0.004*
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)
Education (yrs)	-0.001	-0.001	-0.001	-0.001	-0.001	-0.000	-0.000
	(0.005)	(0.005)	(0.005)	(0.005)	(0.004)	(0.004)	(0.004)
Female owner/mgr	0.009	0.008	0.008	0.008	0.009	0.003	0.007
	(0.042)	(0.042)	(0.042)	(0.042)	(0.042)	(0.041)	(0.042)
Runs other Business	0.115***	0.120***	0.118***	0.120***	0.119***	0.124***	0.125***
	(0.032)	(0.030)	(0.030)	(0.031)	(0.034)	(0.030)	(0.031)
Capital per worker(log)	-0.040*	-0.043**	-0.044**	-0.043**	-0.040*	-0.045**	-0.042**
	(0.021)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)
Firm age (log)	-0.165***	-0.165***	-0.168***	-0.166***	-0.164***	-0.166***	-0.165***
	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)
Workers <30yrs (%)	-0.001	-0.001^	-0.001^	-0.001	-0.001^	-0.001^	-0.001^
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Start-up size	-0.012***	-0.013***	-0.013***	-0.012**	-0.012***	-0.012**	-0.012**
	(0.004)	(0.005)	(0.005)	(0.004)	(0.004)	(0.004)	(0.005)
Sells to households	0.036	0.034	0.034	0.038	0.039	0.036	0.041
(not B2B)	(0.036)	(0.036)	(0.035)	(0.036)	(0.035)	(0.038)	(0.037)
Sales trend	-0.002	-0.007	-0.008	-0.005	-0.003	-0.005	-0.005
	(0.019)	(0.020)	(0.020)	(0.019)	(0.019)	(0.020)	(0.019)
Market Reach	-0.018	-0.027	-0.027	-0.024	-0.019	-0.022	-0.024
	(0.017)	(0.020)	(0.020)	(0.018)	(0.018)	(0.018)	(0.018)
Employs graduates	0.047^	0.037	0.038	0.043^	0.048^	0.040	0.043^
	(0.029)	(0.031)	(0.033)	(0.028)	(0.029)	(0.028)	(0.027)
Dynamic Networks	0.037	0.019	0.017	0.024	0.033	0.016	0.019
	(0.035)	(0.032)	(0.029)	(0.037)	(0.036)	(0.032)	(0.037)
Enovation (log)		0.015^					
		(0.010)					
Enovation			0.072				
(Dummy 1= >1%)			(0.050)				
Enovation				0.040			
(Dummy 1= >25%)				(0.029)			
Enovation					0.022		
(Dummy 1= >50%)					(0.030)		
Enovation						0.109**	
(Dummy 1= >75%)						(0.046)	
Enovation							0.026*
(Ordered categories)							(0.014)
Observations	122	122	122	122	122	122	122
Adjusted R-squared	0.429	0.433	0.437	0.428	0.425	0.443	0.433
Model Significance	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1, ^ p<0.15

6.6.5 Determinants of product enovation

So far, we have examined the determinants of productivity (RQ1) and employment growth (RQ2), and especially investigated the role of product enovation in explaining the variability of these two outcomes amongst firms (RQ3: H1+, H2+). The next step is to address our fourth research question (RQ4) which seeks to evaluate the determinants of product enovation itself.

Towards this, we estimate Equation (7) using OLS, Tobit, Logistic and Ordered Logistic regression techniques. The OLS model, while susceptible to biased estimation due to the nature of the dependent variable (see Section 6.4), gives the general linear relationship between the variables, in part towards corroborating the Tobit model which is the more appropriate estimation technique for the censored product enovation variable. For a deeper analysis, we also install various thresholds of product enovation for the logistic regressions. Table 6.9 presents the respective regression results estimating product enovation.

On average, it would appear that firms that seek to expand by selling new products do actually develop and sell relatively larger shares of new products. Further, higher innovation intensity is associated with higher product enovation. Implementing new process technologies also has a positive and significant relationship with the share of new products in the firm's total sales, as does the employment of more workers. An increase in the firm's market catchment increases the share of enovative sales, and membership in dynamic associations also increases product enovation. Finally, firms farther away from the productivity frontier have significantly lower product enovation.

Unlike the method of OLS, which given the censored nature of our dependent variable may only be taken to indicate the directional relationships between variables as

heeded above, marginal effects following the Tobit estimation may estimate the expected change in product enovativeness while taking into account that product enovativeness achievable is censored (between 0% and 100% before log transformation). Table 6.10 presents the marginal effects of the variables that reported significance in the main model.

The results suggest that all else equal, having an enovation orientation increases the share of new products sold by 78% upon the shares that firms wishing to merely deepen the sales of existing products report Also seemingly a strong driver of product enovation is dynamic associations. Firms in voluntary groups that have a growing membership report product enovation that is 150% higher than that of firms that do not participate in such associations.

The results also indicate that the effect of innovation intensity on the product enovation realised is different at different levels of intensity. On average, at the first and fifth percentile, a 10% increase in innovation intensity is associated with about 3% increase in product enovation. This rate increases slightly to about 4% at the 10^{th} and 25^{th} percentile. At the median level of innovation intensity, the mean, and the 75^{th} percentile, a 10% increase in innovation intensity is associated with progressively higher levels of product enovation increases of 5%, 5.1% and peaking at 5.4% respectively. The marginal effect of a 10% increase in innovation intensity at the 90^{th} percentile is a 5.1% increase in product enovation. At the 99^{th} percentile, a 10% increase in innovation intensity is predicted to result in a 3.9% increase in the share of new products.

This trend also appears to hold when considering the market catchment area. Although these results must be taken with a grain of salt as the market reach variable is

ordinal but certainly not an interval scale,[28] it appears that higher product enovation advances are made by firms already serving broad markets. Accordingly, advancing from serving the Greater City and surrounding areas to the national market and from the national market to the East African region is associated with greater increases in product enovation than is expanding from the local neighbourhood to serving the wider City.

Logistic functions (Models 3 to 7 in Table 6.9) are largely in line with these censored Tobit regression findings although their varied threshold conditions also bring out some interesting subtleties. As model 4 shows, for firms that have introduced any process changes, acquired new machinery, for example, the odds that they produce and sell some new products (at least 1% of sales) rather than unchanged merchandise are 3.5 larger than the odds that firms with no process enovation will enovate their products at all. Further, owner/managers with college qualifications have over 300% higher odds of selling some new products than owner/managers who only attained primary school education.

Moreover, the employment of a single additional worker increases the odds of product enovation being observed at all by 42%. This is not unexpected given the small size of the firms surveyed. There is some evidence, further, that it could be male-led firms that populate the purely inertiative businesses that have not sold any new products whatsoever for five years. This is because for females, the odds of being in the category of product enovators (with at least 1% of their sales attributable to new products) are more than double (2.21) those of male owner/managed firms.

Nevertheless, dynamic networks appear to have a larger impact. For firms that are represented in associations that have welcomed new members recently, the odds of

[28] The Market Reach variable is reported as 1 = Local (up to 5KM), 2= City, 3= City plus surrounding areas, 4 = National (Kenya), 5 = East Africa, 6 = International. The larger the variable the larger the market reach, but the distance between any two ranks is not the same.

being a product enovator are 24 times as large as the odds of firms not in dynamic networks selling new products. At this very low product enovation threshold, however, there is no statistically significant indication that the labour productivity gap with the industry's best performer predicts the odds of enovating the firm's product portfolio. Nevertheless, as Model 5 suggests, a unit increase in the natural log of the productivity gap decreases the odds that new products constitute more than a quarter of the firm's sales by 30%.[29]

At higher thresholds of product enovation, new significant variables emerge. Model 6 estimates that owner/managers who also own other businesses have 70% lower odds of being product enovators with at least 51% new products sales than those who focus on one firm. At an even higher product enovation threshold of at least 76% new products sales share (Model 7), gender emerges as a new significant determinant of high product enovation. All else equal, for female-led firms, the odds that new products constitute more than three quarters of total revenues are three times those of firms with male owner/managers.

Whilst many of the findings just reported are mostly in line with the empirical literature, some sections of the picture that emerges are fraught with question marks that beseech substantiation. In the next section, benefitting in part from observations and knowledge gained from interactions with the firms during the data collection exercise, an interpretation of these findings is offered. In turn, these interpretations advise the implications of the findings for entrepreneurship research and policy discussed in the concluding chapter.

[29] A unit increase in the natural log of the labour productivity gap at the mean is equivalent to an increase in labour productivity itself by about PPP$ 25,000.

***Table 6.9: Estimation of the determinants of product* enovation**

Dependent variable:	Product enovation as described below						
Independent Variables	(1) OLS: Continuous (Log of New Products % share)	(2) Tobit: Censored (Log of New Products % share)	(3) Ordered Logistic (0-3 at 25% intervals)	(4) Logistic (1 = New Pdts share >1%)	(5) Logistic (1 = New Pdts share >25%)	(6) Logistic (1 = New Pdts share >50%)	(7) Logistic (1 = New Pdts share >75%)
Enovation	0.614**	1.154*	1.563	7.993**	1.870	2.963**	0.999
Orientation	(0.228)	(0.632)	(0.806)	(7.243)	(1.564)	(1.586)	(0.854)
Innovation intensity	0.648***	1.027*	2.422***	8.024***	3.555***	2.642**	1.659
	(0.174)	(0.519)	(0.736)	(3.396)	(1.325)	(1.061)	(0.751)
Process enovation	0.432**	0.738	0.939	3.598**	0.928	1.067	1.012
	(0.203)	(0.565)	(0.391)	(2.096)	(0.601)	(0.351)	(0.290)
Owner/Manager	-0.002	-0.001	0.973^	0.998	0.973	0.993	0.952
Age	(0.012)	(0.019)	(0.018)	(0.026)	(0.025)	(0.025)	(0.038)
Owner/mgr educated	0.112	0.472	0.986	1.849	0.847	1.903	0.731
up to secondary sch.	(0.309)	(0.583)	(0.530)	(1.090)	(0.591)	(1.721)	(0.864)
Owner/mgr has	0.422	1.147^	1.480	4.136**	1.506	1.766	0.991
up to college edu.	(0.393)	(0.778)	(0.793)	(2.359)	(0.933)	(1.699)	(1.366)
Owner/mgr is a	-0.096	0.079	0.438	0.765	0.355	0.675	0.117
university graduate	(0.316)	(0.650)	(0.317)	(0.396)	(0.301)	(0.906)	(0.289)
Female owner/mgr	0.182	0.585	1.478	2.210^	1.180	1.360	2.991***
	(0.281)	(0.424)	(0.524)	(1.072)	(0.534)	(0.529)	(1.105)
Runs other Business	-0.334	-0.775	0.424^	0.504	0.382	0.282*	0.379
	(0.255)	(0.639)	(0.240)	(0.320)	(0.293)	(0.198)	(0.327)
Capital per worker	-0.043	-0.075	1.070	1.387	1.118	0.710	1.349
(log)	(0.139)	(0.205)	(0.197)	(0.450)	(0.383)	(0.231)	(0.401)
Firm age (log)	-0.138	-0.365	0.892	1.074	0.966	0.726	0.905
	(0.258)	(0.323)	(0.200)	(0.261)	(0.299)	(0.192)	(0.235)
Total number of	0.066**	0.109^	1.049	1.424***	1.058	1.059	1.043
workers	(0.030)	(0.070)	(0.048)	(0.124)	(0.075)	(0.054)	(0.059)
Workers <30yrs (%)	-0.003	-0.005	0.999	0.999	0.995	1.007	0.996
	(0.002)	(0.004)	(0.005)	(0.006)	(0.005)	(0.008)	(0.007)
Sells to households	0.332	0.564	0.678	1.642	0.624	0.405^	1.522
(not B2B)	(0.292)	(0.557)	(0.316)	(1.074)	(0.309)	(0.228)	(1.006)
Sales trend	0.236^	0.533^	1.367^	1.997***	1.822**	1.184	1.273
	(0.147)	(0.354)	(0.291)	(0.497)	(0.429)	(0.293)	(0.474)
Market reach	0.619***	1.195***	1.904***	3.613***	2.826***	1.524^	1.685**
	(0.171)	(0.418)	(0.316)	(1.556)	(0.687)	(0.436)	(0.409)
Employs graduates	0.326	0.592	1.508	1.139	1.854	0.657	2.184
	(0.370)	(0.482)	(0.828)	(0.755)	(1.360)	(0.601)	(2.255)
Dynamic networks	1.075***	1.888**	5.093***	24.198***	13.817***	3.768*	8.744**
	(0.275)	(0.911)	(2.484)	(16.288)	(10.264)	(2.694)	(9.143)
Productivity gap	-0.197***	-0.345***	0.832*	0.978	0.700*	1.010	0.927
with best performer	(0.062)	(0.109)	(0.092)	(0.211)	(0.148)	(0.150)	(0.183)
Observations	122	122	122	122	122	122	122
Model Significance	0.000	0.000	n.a.	0.000	0.000	0.000	0.000
(Pseudo) R-squared	0.422	0.188	0.213	0.558	0.422	0.286	0.227

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1, ^ p<0.15

Table 6.10: Estimation of (Tobit model) marginal effects

Dependent Variable:		Product Enovation (Log of new products % share)			
		(1)	(2)	(3)	(4)
Variable	'At' condition	Enovation Orientation	Dynamic networks	Innovation intensity	Market reach
Enovation Orientation	0/1	0.574***			
		(0.160)			
Dynamic networks	0/1		0.924***		
			(0.202)		
Innovation intensity (Log of R,D&D hrs per worker per week)	Percentile 1%			0.287***	
				(0.105)	
	Percentile 5%			0.358***	
				(0.0815)	
	Percentile 10%			0.389***	
				(0.0698)	
	Percentile 25%			0.446***	
				(0.0597)	
	Percentile 50%			0.508***	
				(0.0917)	
	Mean			0.522***	
				(0.106)	
	Percentile 75%			0.547***	
				(0.149)	
	Percentile 90%			0.520***	
				(0.168)	
	Percentile 95%			0.487***	
				(0.158)	
	Percentile 99%			0.406***	
				(0.119)	
Market Reach	Local				0.417***
					(0.136)
	City				0.539***
					(0.148)
	Greater City				0.618***
					(0.140)
	National				0.630***
					(0.113)
	East Africa				0.573***
					(0.0973)
	Observations	122	122	122	122

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

6.7 Interpretation of the results

6.7.1 Labour composition and diminishing returns to scale

As a starting point, Table 6.3 presented the results of the estimation of Equation (1). These results provided empirical grounds for rejecting the null hypothesis of constant returns to scale when considering labour and capital inputs only. It would appear, thus, that for garments firms in Nairobi, Kenya, a proportionate increase in the capital and labour factors results in a less than proportionate increase in output. This may be indicative of measurement errors, given especially that the criteria employed in the adjustment of the labour variable was rather heuristic.

However, the decreasing returns to scale finding may yet reflect the actual situation with the sampled firms and therefore the industry. In the neoclassical framework, constant returns to scale suggest a perfect competition state with necessary adjustments already realised. Thus, decreasing returns to scale implies that firms price their output below the marginal cost (Basu and Fernald, 1997). In a highly competitive industry with monopolistic competition characteristics given differentiations in the garments, it may be the case that lower than cost entry prices are used in the unrealised hope of consolidating a market position.

Textbook theory also suggests there may be managerial and co-ordination problems associated with increases in factor inputs that may hinder the maintenance of efficient production with increases in size. For the sampled garments firms in Nairobi, this problem may apply, especially with regard to labour. Indeed, while increasing capital appears to induce a highly significant elasticity in productivity, labour reports no significant relationship. This problem may emanate from the constitution of the labour factor.

In fact, 32% of firms reported to have unpaid family and friends within their workforce, ranging from one to five such workers. This is clearly not trivial for micro and small firms with a mean size of 8 workers. Moreover, 86% of firms employed casual or temporary workers, with over 8% of firms employing more than 10 casual and temporary members of staff. With such a composition of the firm's labour, it is not unreasonable to predict that a doubling of family and friends and/or casuals working irregularly may not double their output, not least because of the managerial problems related to a commercial enterprise that is not strictly professional also entailing high worker turnover and irregular employment.

Besides, the fact that some workers are 'unpaid' or perhaps paid in an *ad hoc* fashion, probably also in kind rather than proper wages at market rates, further suggests that for firms with such labour output prices may not take account of the marginal products of these workers and decreasing returns to scale will thus be reported. Indeed, a previous study on Kenyan MSEs found that firms that employ paid workers generate more revenue and that in fact, unpaid workers actually result in lower returns per worker (Daniels and Mead, 1998).

6.7.2 The productivity of starting small and expanding markets

Building on the previous section, the estimation of productivity suggests further puzzles related to workers. Our results suggest that micro and small enterprises that start with more employees have lower productivity. A possible explanation is that firms that start small may have the flexibility of shifting to more productive activities as they learn and grow while larger start-ups may entail heavier sunk costs that may tie the firm to given products. Indeed, during the administration of the survey, it was observed that

MSEs with many employees tended to make standardised garments, like school uniforms, and therefore start relatively larger. Such products are however unlikely to yield high productivity returns or indeed any productivity gains over time as the designs of items like school uniforms are rather static and so is the demand.

In fact, one respondent intimated that the only way such firms can sell more is by trying to target upcountry markets, not least since school children upcountry areas are more slender than those in the city for reasons such as poverty or sparse rural population that means children walk longer distances to school and are generally more 'outdoor'. Whatever the case, this allows the garments manufacturers to save on the amount of fabric used per unit item of clothing. Further, since school uniform is mandatory and there is a limited multiplicity of designs, the market for the pertinent firms is both expansive and stable which allows scale economies and therefore a lower focus on the immediate saturated market.

Indeed, the results indicate that, all else equal, firms that pursue a broader market have higher productivity levels. Beyond scale economies, it may be the case that price competitive pressures are less intense outside the capital Nairobi. Moreover, serving broader markets may especially afford growth opportunities for small firms through new knowledge, wider networks and new business opportunities. Indeed, broader markets appear to correlate significantly with business to business commerce, a positive sales trend, a conservative profile in terms of the sale of new products, higher capital endowment and university educated owner/managers (Appendix II).

6.7.3 The fecundity of entrepreneurial human capital

As Tables 6.4 and 6.5 show, university education on the part of the owner/manager significantly enhances productivity, but firms employing graduates were found to be associated with lower productivity levels. Recent studies have also found owner/managers' education and other abilities to accrue higher returns that employees' (Hartog *et al.*, 2010; van Praag *et al.*, 2009; van der Sluis *et al.*, 2007), but the negative relationship is rather unexpected.

Still, there may be several reasons why graduate owner/managers may be associated with firms with higher productivity levels that may not apply for graduate employees. As earlier indicated, higher education is often found to be an important driver of post-entry performance (Bates, 1990; Vivarelli, 2012). For graduate owner/managers, the whole university experience, both academic and in extra-curricular activities, may have prepared them in a variety of different subtle ways that may be harnessed in an entrepreneurial capacity than in an employee role. For example, university education, including tuition and assessments, may cultivate graduates to be better in gathering, analysing, and synthesizing information into a coherent and robust package.

Further, there may be an array of other (subtle) skills learnt directly or tacitly such as networking, multi-tasking and working under pressure that may prove useful in an owner/manager capacity but not evoked by employees. Indeed, graduates may also benefit from more resourceful networks where their former course-mates go on to fill managerial and other positions in for example, banks, the government or other firms, in different countries even. Graduate owner/managers may thus be able to harness the free information, counsel and other benefits from such highly endowed and expansive social

networks alongside their own human capital thereby enhancing the productivity of their business.

Indeed, as Delmar and Wiklund (2008) find in a study of Swedish small firms, owner/managers who have attained university education may have higher growth motivations than those with lower levels of education. In fact, while many small scale owner/managers see the pursuit of credit financing as a futile effort to forgo (Bigsten and Söderbom, 2006; Hoffman *et al.*, 1998), Bates (1990) finds that high education is associated with bank financing and thus larger start-up capital. As earlier discussed, the very obtainment of (prudent) debt capital itself hallmarks business viability since the banks will have carried out due diligence before issuing the credit (Hernández-Trillo *et al.*, 2005). In fact, higher educated owner/managers in Africa have been found to start larger firms (Biggs and Shah, 2006), and larger African firms are able to take advantage of scale economies and other size advantages such as reputation to uphold their positions (Bigsten and Söderbom, 2006; Sleuwaegen and Goedhuys, 2002; Van Biesebroeck, 2005). It can be seen, therefore, that higher education on the part of owner/managers actually embodies and reinforces many other factors with significant positive effects on firm performance.

For graduate employees on a fixed salary, however, there may not be any motivation to pursue and exploit these opportunities as the private financial gain for the effort is unlikely to be realised. As such, the salaried employee may not have an incentive equivalent to the owner/manager's to 'go that extra mile'. Other scholars have also argued that whilst 'iron caged' employees only carry out a highly specified role, freedom and control allows entrepreneurs to freely engage their human capital in a variety of areas they may be more productive in (van Praag *et al.*, 2009).

Indeed, it was observed during the survey that graduate employees in the garments sector will usually be employed in accountancy roles in larger small firms, than in technical roles with direct technical contribution to production on the shop floor. As earlier indicated, such firms may only be producing commoditised garments which though may be high in volumes, productivity may yet be low. In fact, since the variable is only a dummy, the negative relationship may be capturing other features generally applying to firms that have graduate employees, rather than the contribution of graduate employees themselves to firm productivity.

Still, there could be other reasons related to the nature of the graduate qualifications and the graduate labour market in Kenya that may yet have a role in the negative relationship between the employment of graduates and small firm productivity. Indeed, researchers have found long-run falls in the returns to education in Kenya (Söderbom *et al.*, 2006), perhaps attributable to the global trend of 'mass higher education' that has also taken effect in Kenya (Oketch, 2004). Mutula (2002) observes that in spite of the education expansion, most Kenyan universities have paid little emphasis on science and technology courses instead extending business and accountancy courses that have a high market demand. It may also be the case that these courses have lower obstacles in terms of staffing and teaching equipment (e.g. laboratories) than science courses thereby allowing large class sizes and therefore more graduates in these business courses.

In turn, the glut in graduates with such qualifications may be a major contributor to the high unemployment rates observed amongst Kenyan graduates (Pollin *et al.*, 2008). In spite of a traditional preference by Kenyan graduates to secure employment in large firms, a glut of qualified accountants will make some all too happy to take a lower

wage to secure employment at all. As a result, the owner/managers of small firms who may have been doing amateur bookkeeping themselves may now afford to employ qualified personnel.

A further point is that such graduate employment in book-keeping may indeed have been indirectly forced upon the owners of the larger small firms following the Kenya Revenue Administration Reforms and Modernisation Programme (RARMP) which has led to very strict tax administration in Kenya since 2004.[30] These factory-type producers would have been conspicuous to the tax authorities and would therefore have had to employ accountants. Indeed, during the survey, owner/managers of larger small firms frequently lamented of what they perceive as harassment from government officials which discourages them from operating at full capacity, in spite of their sunk costs in factory size, nor undertake investments to improve their businesses.

6.7.4 Unproductive portfolios and prolific networks

Besides uncertainty regarding government policy on Micro and Small firms in Kenya and outright state harassment of such firms (Moyi and Njiraini, 2005; Ronge *et al.*, 2002), micro and small firms in Nairobi yet have to contend with cut throat competition amongst themselves as well as stiff competition from second hand clothing from Europe and America as well as cheap imports from China (McCormick *et al.*, 2007). One of the survival tactics that entrepreneurs employ in this adverse business environment is to reduce their risk exposure by owning several small firms.

[30] For more details, see http://www.kra.go.ke/index.php/reform-and-modernisation/about-rarmp (accessed 06/08/2012).

However, our results indicate that portfolio entrepreneurship is actually associated 30% lower productivity than dedication to one firm. This is evidently not a trivial effect and may epitomise the old ‘jack of all trades, master of none’ adage. Running several small firms means that none of the firms is able to pursue or realise scale economies. Besides, the straddling also has implications on firm performance as active supervision and robust strategic management of the several firms may not be maintained evenly across the firms. As such, whilst perhaps a subjectively sound survival tactic, it is clear that the lack of focus hurts productivity at the firm level.

A more resourceful survival strategy in the face of a harsh business environment is the use of networks. This is a widely researched phenomenon in Africa (Biggs *et al.*, 2002; Biggs and Shah, 2006; Fafchamps, 2001; Fafchamps and Minten, 2002; McCormick, 1998; McCormick *et al.*, 2003). As discussed in Section 4.4.3, networks may be categorised as exchange networks, communications networks of social networks (Mitchell, 1973; Szarka, 1990). This study has not empirically differentiated social networks and communications networks as the associations that firms participate in usually straddle both categories.

In such associations, however, it may be crucial to harness both embeddedness (bonding) and the integration of external resources (bridging). This study has found that dynamic cohesiveness, herein captured as dynamic networks, as opposed to mere stagnant cohesions or no networks at all, is a significant driver of total factor productivity. Clearly, towards boosting their productivity, firms in associations that are growing in membership are able to benefit from both the stable relations a structured association enables, as well as draw from the newly injected resources that new members bring into the network.

The type of exchange networks, i.e. who the firm trades with (Mitchell, 1973; Szarka, 1990), also appears to have a significant effect on productivity. In the present work, exchange networks were captured distinctly as the number of suppliers and the type of customers the firm serves. Whilst the density of upstream relations with suppliers had a negligible effect on productivity (Appendix IV), our study found that downstream exchanges matter. Here, firms that sell to other businesses rather than to household customers directly are found to have higher productivity.

A typology of garments firms in Nairobi developed by McCormick (1997) may shed more light. McCormick (1997) classified Nairobi's micro and small garments firms into custom tailors, contract workshops and mini-manufacturers. Custom tailors make made-to-measure garments for individual customers as and when ordered. Contract workshops usually produce garments in batches for specific high quantity orders, for example, choir robes for churches or staff uniform for factories, small hotels and petrol stations. Mini-manufacturers, on the other hand, produce for the general market in a rather commoditised fashion. For example, charcoal gray trousers for men or children's clothing of various kinds.

A ready disadvantage on the part of custom tailors that sell to households is the absence of any scale economies. Whilst the 'personal relationship' may cultivate loyalty and potential word-of-mouth references that may bring more customers, the made-to-measure element sees to it that production is a highly protracted process. The two parties must deliberate on a design, take measures, perhaps produce a paper model, renegotiate and agree on changes before the actual garment is finally produced. Because these types of firms constitute the majority of garments firms, and the customer often provides their own fabric (McCormick, 1997), the firm is usually unable to charge a

meaningful premium for this elaborate service as customers may readily shift to the next tailor.

Besides, the end product will often come with certain imperfections that customers will often use to drive the price further down upon completion of the item. The *ad hoc* nature of the business also guarantees that there will be unpredictable hiatuses in production while tailors idly anticipate the unannounced arrival of the next customer. All the while, firms engaging in business to business trade may have established trade credit arrangements that enhance the continuity of production and cement exchange relations between the firms in question. Further, the intra-firm division of labour, for example mini manufacturers not having to detail with retailing travails, allows scale economies to be exploited and particular expertise to be developed. In addition, the steady cashflows would in turn allow these firms to devise and implement other strategies that contribute to the growth of their business.

6.7.5 Enovation intent and innovation inputs enhance productivity, but not product enovation by itself

One the key relationships particularly explored in the present study is the relationship between the firm's innovation activities and productivity especially whether the production and sale of new or significantly modified products enhances productivity. The first condition explored is the impact of the mere intent of pursuing growth through new products. Here, our results indicate that micro and small garments firms in Nairobi that have a product enovation orientation have high productivity levels.

Because the micro and small firms surveyed are unlikely to have an inscribed corporate strategy or mission grounded in certain principles, a product enovation orientation at the time the survey was administered may be more judiciously taken as the prevailing sentiment regarding new products. This may in turn indicate several things about the firm that one may help conjecture the productivity advantage. Firstly, firms indicating that they intend to pursue growth by selling more of new products may have already exhausted or saturated the markets for their existing products. Such firms may thus already have a productivity advantage over firms that are perhaps still striving to achieve scale economies, sustained sales and satisfactory returns from their existing product range.

Secondly, the respondent may just be passionate about new designs, perhaps owing to talent or special skills, in which case they may be deemed to be relatively more dexterous in garment-making, or just more motivated and therefore perhaps more productive. Research suggests that firms with higher growth motivations do actually realise higher growth (Delmar and Wiklund, 2008). Thirdly, the previous points notwithstanding, an enovation orientation may indicate a cognizance of the general trend in the market or an educated speculation of trends in the near future given the prevailing market circumstances. This in itself may indicate a judicious approach to business with suitable analysis and preparation which, if taken to apply generally in the rest of the business, may explain the productivity advantage.

Indeed, the next step that should logically follow a product enovation strategy is preparation for product enovation through innovation efforts. This is not to say, however, that all firms with an enovation orientation, whether a principled strategy or a circumstantial sentiment, will then undertake innovation activities ending in product

enovation. Indeed, while significant, the pairwise correlations between the variables have rather low coefficients (Appendix II). Further, like enovation orientation, the estimated significant positive effect of innovation intensity on labour productivity may be an indicator of other productive by-product effects innovation efforts will have on the firm or other highly resourceful factors, like technical human capital, that firms engaging in innovation would ordinarily have to engage in innovative pursuits (Cohen and Levinthal, 1989; Cohen and Levinthal, 1990).

In the present study, innovation intensity is measured as the number of hours per worker per week devoted to research design and development activities. The usual measure as investments in R&D could not be applied for micro and small firms in Kenya due to poor book-keeping. Also, firms may not directly spend money on innovation but they will spend time developing new designs, for example. Owner/managers of such firms will usually also have a fair idea of how much time on average they devote to such activities, which is also an indication of how seriously they take design and innovation activities.

Still, some of the surveyed firms were generally top end design houses, complete with regular catwalk fashion shows,[31] and have up to four full-time workers who exclusively carry out design work. In fact, some have attained fashion qualifications in reputed institutions abroad, including Domus Academy (Italy), Koefia Academy (Italy), and The *Savannah College* of Art and Design (USA), as well as local fashion and design colleges in Kenya. In fact, many of the micro firms engaging in bespoke outfits (like wedding dresses) are graduates of these local fashion colleges. For such firm, the sources of higher productivity are readily apparent.

[31] See for example http://www.fafakenya.org/ (accessed 06/08/12).

Other common innovation activities, carried out by less own design oriented firms, entail buying popular designer labels, usually readily available cheaply from imported second hand clothes dealers, and 'reverse engineering' them. Some firms indicated they devoted a Saturday morning's work every fortnight or every month for these endeavours. Visiting high-end shopping malls at the occasional weekend and fashion shows every so often to 'steal' ideas was cited as a source of design ideas. All these suggest that innovation activities may engender or embody other factors that may themselves enhance productivity overall, whether new products are thereafter introduced or not.

Indeed, controlling for innovation activities and other factors, product enovation itself does not appear to have a significant influence on productivity levels. In fact, though not statistically significant, the negative sign of the coefficient (Table 6.7; 6.11) indicates that on average, higher shares of new products in firm sales may actually lower productivity levels, all else equal. An investigation into whether there are factors that significantly moderate the effect of product enovation on productivity identified enovation orientation and gender. For firms with female owner/managers, we find that selling more of new products lowers productivity, on average.

There could be several factors explaining this finding. Firstly, female-led firms tend to produce garments for women. In turn, women may mostly prefer bespoke made-to-measure items in which case firms may indicate higher shares of product enovation. Indeed, female-led firms are three times as likely to have more that 75% of their total turn-over accounted for by new products than are firms with male owner/managers. With such high levels of novelty, the resultant effect will be similar to that discussed earlier with respect to the disadvantages and inefficiencies associated with selling to

household customers, chiefly the protracted production process, lack of economies of scale, intervening periods of inactivity and little scope to charge a premium.

Secondly, it is conceivable that in general, designs of women's clothing run out of fashion very rapidly. Thus, firms wanting to uphold a place in the fast moving women's garments market are forced to perhaps over-zealously produce and try to sell new designs of clothing, perhaps also having to lower their asking prices to attract customers. Because of the lower offer prices, higher shares of sales of new products may be associated with lower sales overall. Should the firms find it difficult to eventually raise their prices, product enovation may lead to a situation where the lower prices, and therefore lower firm value-added, remain suboptimal. With prices of the products not reflecting the marginal costs of the input factors, this situation is not sustainable and may eventually lead to closure of the respective firms.

Thirdly, related to the suppositions above, in a fast moving market for women's garments, firms may venture to leap ahead of the market. A plausible consequence is that this may predispose them to risks, such as the market not embracing their products. As conjectured above, the result may be that while reflecting as higher shares of total sales, it may be a large share of a low turnover overall and therefore lower productivity. Similar explanations may be given for the negative effect found for the interaction between an enovation orientation and actual product enovation. Firms that are decidedly predisposed to transform their product offerings may go ahead and actually take that risk and therefore potentially encounter pitfalls.

Still, given that an enovation orientation in itself has a positive and significant influence on productivity, one may argue that following the motivation to enovate, firms may take different paths. On the one hand, some may adopt a 'look before you

leap' approach through the innovation route. Here, innovation may enable the firms to acquire useful market intelligence as well as productivity enhancing knowledge and capabilities. In general, innovation activities may provide the wisdom and preparation required to avoid the risks associated with new products. Innovative firms will thus undergo savvy enovation and considered growth.

On the other hand would be the firms inclined to implementing vast changes in their product offerings. For these firms, a raring motivation may impel them to leap imprudently disregarding the innovation due diligence route. In fact, by holding other controlled for factors at zero, the *ceteris paribus* regression technique makes this very assumption. Thus, heedless transformative pursuits may leave firms exposed to risks that may undermine the productivity productivity gains accruable from new products if introduced in a measured fashion. This may serve to highlight the perilous nature of 'short-cut' product enovation, and the pivotal importance of innovation efforts, especially in the case of a very capricious industry like garment-making by micro and small firms in a City environment.

Nevertheless, statistical significance merely indicates that it may be concluded that the event did not occur by chance in the sample and thus exists in the real population. It may be of interest, therefore, to assess just how much detriment to productivity product enovation causes. The results suggested that for both female-led firms and firms proclaiming a product enovation orientation respectively, a 10% increase in product enovation only docks productivity by a percentage point. Because the study investigates micro and small firms with relatively small absolute values, this result may actually be negligible in absolute terms.

At the mean of annual labour productivity (PPP$ 2333), the annual reduction in productivity attributable to a 10% increase in new products sold would be about PPP$23 or a paltry PPP$2 a month. This is clearly not a significant change in practical terms. Recall actually that female-led firms have an above average labour productivity at PPP$2,630 compared to PPP$2,080 for male-led firms. [32] Further, firms with a product enovation orientation have almost double the labour productivity of those without. Thus, while not in and of itself immediately generating significant productivity gains or losses, firms might still elect product enovation because of its ostensible benefits and expected future productivity gains. In any case, because of its very nature as an outcome of other inputs, product enovation is not a strictly 'in and of itself' type of factor.

As such, it may be useful to understand what factors have significant relationships with product enovation itself as it would be these that would be manipulated to modulate the effect of product enovation on productivity. As Table 6.9 and Table 6.11 show, on the whole, factors found to have statistically significant relationships with product enovation, including an enovation orientation, innovation intensity, market reach and dynamic networks, have the same nature of relationship with productivity.

Because the realisation of product enovation is part of general production in the firm, it is plausible that product enovation does not in and of itself indicate an explicit relationship with the firm's productivity levels. This confirms the structural nature of the impact of product enovation on productivity. However, rather than being conditional only on R&D efforts, product enovation can be seen to draw variously from enovation

[32] This difference is however not statistically significant, *ceteris paribus.*

orientation, innovation intensity, market reach and dynamic networks – all plausible sources of new knowledge and business vitality.

Thus, firms that pursue or embrace these dynamics will realise productivity enhancements, which may in part reflect through higher sales of new products. Indeed, the results strongly indicate that on average, firms that are closer to the productivity frontier enovate more. Taken together, therefore, it would appear that for Nairobi's micro and small garmet-makers at least, product enovation and productivity are intricately conjoined economic outcomes that are produced in tandem by a purposeful enovation strategy, diligent innovation efforts, broader markets and richer networks.

Table 6.11: Sources of* enovation*, productivity and employment growth

	Dependent variables			
	(1)	(2)	(3)	(4)
Independent Variables	TFP	LP	Growth	Enovation
Enovation (log)	-0.027	-0.048	0.015^	
	(0.037)	(0.037)	(0.010)	
Enovation Orientation	0.283*	0.315**	0.040	1.196*
	(0.148)	(0.146)	(0.034)	(0.667)
Innovation intensity	0.039	0.071^	-0.046***	1.034*
	(0.039)	(0.043)	(0.016)	(0.525)
Process innovation	-0.037	-0.004	0.050*	0.743
	(0.171)	(0.173)	(0.025)	(0.523)
Owner/Manager Age	-0.002	-0.004	0.004*	-0.006
	(0.010)	(0.009)	(0.002)	(0.019)
Education (yrs)	0.079**	0.062*	-0.001	0.070
	(0.034)	(0.034)	(0.005)	(0.080)
Female owner/mgr	0.053	0.073	0.008	0.573
	(0.158)	(0.166)	(0.042)	(0.411)
Runs other Business	-0.270*	-0.299*	0.120***	-0.957
	(0.154)	(0.173)	(0.030)	(0.692)
Capital per worker(log)		0.645***	-0.043**	-0.123
		(0.055)	(0.020)	(0.223)
Firm age (log)	0.059	0.061	-0.165***	-0.258
	(0.101)	(0.100)	(0.025)	(0.319)
Workers <30yrs (%)	-0.001	-0.002	-0.001^	-0.003
	(0.003)	(0.003)	(0.001)	(0.004)
Start-up size	-0.038**	-0.045***	-0.013***	
	(0.017)	(0.014)	(0.005)	
Sells to households	-0.277**	-0.209^	0.034	0.553
(not B2B)	(0.129)	(0.128)	(0.036)	(0.560)
Sales trend	0.182***	0.112**	-0.007	0.512
	(0.048)	(0.055)	(0.020)	(0.377)
Market Reach	0.094*	0.128**	-0.027	1.148***
	(0.055)	(0.053)	(0.020)	(0.415)
Employs graduates	-0.272***	-0.256**	0.037	0.480
	(0.096)	(0.106)	(0.031)	(0.513)
Dynamic Networks	0.327**	0.319*	0.019	1.851*
	(0.157)	(0.162)	(0.032)	(0.951)
Total number of workers				0.116^
				(0.072)
Productivity gap				-0.336***
				(0.105)
Observations	122	122	122	122
Adjusted R-squared	0.165	0.521	0.433	0.181
Model Significance	0.000	0.000	0.000	0.000

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1, ^ p<0.15

6.7.6 Tradeoffs between higher jobs growth and lower productivity

Whilst product enovation and productivity appear to demonstrate some complementarity by drawing from the same sources, most drivers of employment growth rates appear to be almost completely at odds with product enovation and productivity (Table 6.11). In line with Jovanovic's (1982) learning theory, young and small firms are found to grow faster, a finding that corroborates past African studies (Biggs and Shah, 2006; McPherson, 1996; Sleuwaegen and Goedhuys, 2002).

This would also be expected of firms led by older owner/managers. However, a curious statistically significant relationship is that a 10 year increase in owner/manager's age is associated with a 4% increase in annual employment growth rates. A possible reason is that older owner/managers may grow jobs faster perhaps because they may have to offer apprenticeships, casual work and/or unpaid work opportunities to family members and relatives. As they grow older and sustain their businesses, the recognition as successful businessmen, by their extended families, for example, may come with a 'duty' to help others. Besides, in a sea of micro firms wallowing in stagnation, marginal better performance in employment creation may yet be large enough to manifest as statistically significant.

However, perhaps subtly capturing an extra age effect, it may also be the case that a significant number of new firms are founded by older owner/managers, who may have closed shop somewhere else. Indeed, many new firms in garments will have been founded by persons coming from fulltime employment in the large firms operating in the Export Processing Zones (EPZ). With the expiry of the Multi-Fibre Agreement (MFA) in 2005, many large EPZ firms, which included a significant number of

footloose Asian Multi-National Corporations (Naumann, 2006), terminated their operations in Kenya.

However, many established garments micro and small firms indicated that they were hesitant to employ ex-EPZ workers. This is because although they will have been producing higher quality garments for the American market, for example, extreme division of labour and specialisation in the EPZ production lines meant that workers who only affixed buttons in their EPZ jobs, for example, did not have the comprehensive garment making skills preferred by the MSEs. Thus ex-EPZ workers tended to start their own firms and express solidarity by employing their former EPZ colleagues.[33]

Also found to be strongly positively associated with employment growth is the ownership of other businesses. In contrast, this variable reported a negative relationship with productivity. One may conjecture that owner/managers who own several businesses may not be sufficiently involved in the day to day management of both firms. This may in turn harbour various forms of X-inefficiency (Leibenstein, 1966). The lack of adequate supervision may, for example, allow slackness amongst the workers with the absentee owner/manager perhaps incorrectly interpreting the delays in production as a need for more workers.

It may, however, also be the case that upon starting a new firm, portfolio entrepreneurs may employ new workers but require them to serve in their various firms in an *ad hoc* fashion. The reported employment growth may thus not strictly be with respect to the firm in question. Such juggling, both on the part of the owner/manager and the employees may yet blight productivity.

[33]On top of not being all-rounded, the general observation by other owner/managers was that ex-EPZ workers and owner/managers were not sufficiently 'street smart' and thus struggled to quickly adapt to the hustle and bustle of a 'survival for the fittest' MSE environment in Nairobi.

Another possible reason could be that, like the owner/managers age earlier discussed, portfolio entrepreneurship may be interpreted as an indicator of socio-economic success. This may in turn lead to the employment of superfluous workforce. Whilst they may yet acquire trade knowledge and skills that may enable them to start their own businesses or secure productive employment elsewhere, it is clear that there will be some productivity detriments sustained in the short-term.

Also associated with higher employment growth is process enovation. In the survey, buying new machinery was captured as process innovation and this expansion of capital is reasonably accompanied by an expansion in workers using the new machines. In contrast, however, product innovation intensity is found to have a negative association with employment growth rates. With innovation intensity being a strong indicator of efficiency, one may posit that as opposed to the charitable reasons we have argued may influence employment growth in Kenyan MSEs, meticulous firms may be thought to have intelligent efficiency-based grounds for increasing employment as well.

It is interesting, however, that firms in the highest product enovator category, those with more than 75% of their sales attributable to new products, appear to create jobs faster than the less enovative firms. It is possible that at lower levels of enovation, the new products merely replace incumbent products in which case existing employees take some additional training and no new employees are required (Yang and Lin, 2008). In contrast, the high enovators that create new jobs may be relatively young firms that come into the market with new products. They may get some indications that their new designs may become fashionable and therefore grow employment rapidly with the hope of securing scale economies. Whether these jobs are efficiently sustainable would remain to be confirmed with time.

Another more likely scenario is that firms mostly producing bespoke garments may only have had the principal designer as the founding owner/manager and perhaps the only permanent worker due to the sporadic nature of production. Still, the firm may get spurts of big orders, like matching wedding outfits for an entire bridal party, with a limited lead time. This would necessitate the employment of temporary workforce thereby creating a façade of high employment growth.

6.8 Summary

This chapter has conducted and presented the empirical analysis testing the key hypotheses (Figure 4.1) that firms with higher levels of product enovation have higher productivity levels, and that firms' employment growth rate is positively related with higher product enovation. On the premier hypothesis, our analysis has not explicitly found support for the direct link between product enovation and productivity. Instead, the investigation concludes that it is not product enovation *per se* that enhances productivity but the process that engenders such product enovation in the first place. This is however not conditional on innovation efforts only.

Thus, product enovation and productivity are intricately nested economic outcomes generated by a predisposition to change and the efforts to pursue and implement such change through innovation, education, membership in dynamic associations, and broader market reach. Our findings can thus be seen to corroborate the importance of absorptive capacity (Cohen and Levinthal, 1989; Cohen and Levinthal, 1990; Zahra and George, 2002) perhaps emphasizing that an enovation inclination may be an important capability or dimension for absorptive capacity on top of acquisition, assimilation, transformation and exploitation.

With regard to employment growth, our study suggests that amongst micro and small firms in the garments sector in Nairobi, Kenya, rapid growth of jobs does not have a straight-forward relationship with product enovation. In fact, high rates of employment growth may be at odds with productivity. Bigsten and Söderbom (2006) suggest that since employment creation is an important development policy, entry of young firms and other high job creation drivers, may have positive outcomes for economies in the short term (see also, Fritsch and Schroeter, 2011). Whilst our study confirms this, it would appear that there would be other crucial economic efficiency trade-offs associated with rapid job growth policies. A more detailed discussion of policy and other implications emanating from our study is presented in the concluding chapter that follows.

7 CONCLUSION

7.1 Thesis overview

One of the most striking sights in many cities and towns in developing countries is the staggering ubiquity of swarms of small businesses, artistic variety and bustling trading activities. That economies teeming with such entrepreneurial verve are also associated with low levels of economic development is a paradox that provided the contextual motivation for the present study. Indeed, entrepreneurship and innovation, and how they interact to contribute to the economic development process, has attracted immense academic and policy interest, especially over the last three decades. As such, an understanding of the factors that determine entrepreneurial performance, especially in a developing country context where micro and small firms abound, is an important research issue.

As the extant literature attests, however, the carrying out of theoretically cogent and empirically valid and reliable research in entrepreneurship has been blighted by the elusive nature of the target construct. Recognising this conceptual lacuna, the first object of this thesis was to establish a conceptual basis for our study by reviewing and elaborating the conceptualisations of the phenomena of interest.

In turn, the second aim was to conduct an empirical study towards generating results and implications that may advise further research on entrepreneurship and innovation especially in a developing country context. The research contributions may also serve to inform economic policy on practicable evidence-based and theoretically sound entrepreneurship related actions that could enhance firm-level contributions to societal interests such as employment growth and higher value-added.

In essence, this thesis has attempted to answer the following conceptual and empirical questions:

Conceptual research questions

C1) What is entrepreneurship?

C2) What is innovation?

C3)What is the link between entrepreneurship, innovation and firm performance?

Empirical research questions

RQ1) Why are some firms more productive than others?

RQ2) Why do some firms realize faster employment growth than others?

RQ3) Does product enovation explain firms' productivity and employment growth differences?

RQ4) What factors explain why some firms are more enovative than others?

Towards this end, this thesis followed the essential building blocks for theory development proposed by Whetten (1989). These are: the *what* - which concerns itself with the determination of which factors 'logically should be considered as part of the explanation of the social or individual phenomena of interest' (p490); the *how* (nature of relationships); the *why* - which demonstrates 'the underlying psychological, economic, or social dynamics that justify the selection of factors and the proposed causal relationships' (p491); and lastly the who, where and when, which helps qualify the generalisability of the findings of the study (Whetten, 1989).

Accordingly, Chapter 2 critically reviewed the existing literature on entrepreneurship towards establishing the particular phenomena to be explained in an entrepreneurship study. Given the absence of a consensus in the literature on what actually constitutes entrepreneurship, following Wiklund *et al.* (2011), the small owner-managed firm may be studied under the rubric of entrepreneurship. In turn, the particular aspects of the small firm to be studied should be more clearly specified and analysed discretely. Accordingly, this thesis submitted that the small firm is *an instance of entrepreneurship* and elected to study firm performance in terms of productivity and employment growth.

A concept related to entrepreneurship, as found in Chapter 2, but may be elaborated separately is innovation. Indeed, innovation was itself found to be a very broad phenomenon even as its role in engendering productivity growth at the firm level and economic growth more generally is undisputed. Chapter 3 therefore sought to reconceptualise innovation in a way that not only allows systematic comprehensibility conceptually, but also enables it to be discretely discerned with the elements distinctly captured for more instructive empirical analysis.

Chapter 3 therefore argued that *enovation* may be conceptualised separately from innovation. Empirically, innovation inputs are usually considered to be research and design efforts and innovation outputs the knowledge capital thereof. This knowledge may or may not be employed in production. Where employed, however, knowledge capital merely constitutes one of the many factors of production. In contrast, *enovation* focuses on the phenomenon of change itself.

The change that is of fundamental interest to economic performance is productivity growth which is necessarily a result of an effective qualitative change in

the production function. Since any number of things could cause the change in productivity, the initial deduction is that *aggregate enovation* (total effective change) necessarily engenders productivity growth. However, it is appreciable that this *aggregate enovation* is a composite of different *sub-enovations.*

It should be interesting, therefore, to empirically investigate whether an abstractable and observable *sub-enovation* such as *product enovation* has a significant influence on firm productivity growth. Empirically, in a cross-sectional study of firms, the effect of *product enovation* and other *sub-enovations* may thus be investigated alongside other factors that may also explain the variability of productivity amongst firms. In line with Whetten (1989), the relationship (the *how)* thus conjectured constitutes the *why* product *enovation* was elected as the key *what* of the present study.

Building on the conceptual understanding of entrepreneurship, innovation and *enovation* described above, Chapter 4 establishes the specific empirical questions this thesis seeks to investigate. Thus, following a review of the pertinent empirical literature, what past research investigating firm productivity, employment growth and product *enovation* has found, especially amongst small firms in developing countries, guides the formulation of the precise hypotheses that *small firms with higher product enovation will have higher productivity and higher employment growth rates.* In turn, the factors that past research has found to be drivers of such product *enovation* are also identified. This chapter therefore articulates the empirical *whats*, *hows*, and *whys* of the present study.

In turn, Chapter 5 described the methodology employed in the present study in terms of method choice, operationalization of the variables, sampling and survey data collection. Here, the actual empirical *whats* to be tested in the present study are

assembled and the *who, where and when* context of the study specified as micro and small firms in the garments industry in Nairobi Kenya surveyed between May and October 2010.

The actual empirical analysis is then conducted in Chapter 6. Descriptive statistics and econometric analyses are carried out and an interpretation of the findings offered. The chapter finds indirect support for the main hypothesis of the present study. Whilst a statistically significant linear relationship between product *enovation* and firm productivity is not found amongst the sampled firms, factors that report a strong relationship with product *enovation,* including innovation efforts, dynamic networks, and a larger market reach are also found to strongly influence productivity. This thesis submits therefore that whilst product *enovation* does not in and of itself enhance productivity, the processes through which such product *enovation* is engendered in the first place do. This suggests that there is a structural relationship between the various input factors, including innovation efforts, the observed product *enovation,* and firm productivity.

There are important lessons, therefore, to be drawn from the present thesis. It is against this backdrop that this conclusion chapter is set. In what follows, Section 7.2 discusses the significance of the present thesis in terms of both the theoretical and empirical contributions advanced herein, and Section 7.3 considers the implications of the findings of this research for entrepreneurship policy and practice. We conclude the thesis with the limitations of the present study and recommendations for future research.

7.2 Research contributions

7.2.1 Theoretical contributions

With the premier objective of our doctoral study being to understand entrepreneurship and innovation towards establishing their link with firm performance, a first task was to review the relevant literature. This collection, integration and critical review of the literature (Chapter 2) may be offered as a contribution to the understanding of the respective concepts, theories and phenomena addressed. Indeed, such a critical appraisal itself furthers the process of knowledge filtering and development.

Still, having 'taken stock', earnest contribution to knowledge must entail augmentation of such stock, especially towards filling the gaps identified in the critical appraisal. In this respect, this thesis submits in the light of the accepted conceptual breadth that characterises the field of entrepreneurship, the small firm may be conceptualised as an *instance of entrepreneurship.* In turn, particular variables pertaining to specific phenomena about the small firm should be analysed discretely. This thesis therefore elected to study two indicators of the economic performance of small firms: productivity levels, and employment growth rates. This answers our first conceptual research question.

Towards answering our second conceptual research question, this thesis has attempted to disentangle the concept of innovation. The default understanding and empirical appreciation of innovation is the inputs towards the introduction of something new, which may indeed be more in line with the etymology of the term. In turn, innovation outputs are taken to be the knowledge produced thereof. The thesis has however argued that the pursuit of knowledge and the obtainment of it does not

necessarily result in the employment of such knowledge in production, not least because some firms may elect to reserve the knowledge thereof as 'real options' for future consideration (Bloom and Van Reenen, 2002).

This thesis has therefore espoused Schumpeter's (1934) view that it is the actual *carrying out* of new *in kind* combinations of factors of production that engenders productivity growth. Novation in the output may however not be fully attributed to purposely deployed knowledge or the specified efforts towards the development of such knowledge. As such, novation that is observed in the firms' ultimate output, and is therefore necessarily *in effect*, should be conceptually and terminologically isolated from efforts towards novation. This thesis has therefore suggested the term *enovation* to represent 'novation' actually realised.

In turn, since the *aggregate enovation* (total effective change) observed may be attributed to other observable *sub-enovations*, such as new products sold and new processes employed, the effect of these *sub-enovations* on the whole may be analysed discretely. By detailing a conceptualisation of the systematic process through which the process of the pursuit, deployment and realisation of novelty in the firm's outputs, the conceptual elaboration offered clearly illuminates the novation process and the pertinent phenomena at the different stages in the process. Thus, for example, whether innovation outputs constitute knowledge capital (Crepon *et al.*, 1998) or if sales of new products are the innovation outputs proper (Roper *et al.*, 2008) is resolved by considering the process in its entirety where the later is considered as product *enovation* – a component of *enovation* that reflects in the ultimate output (value-added) of the firm. This is thus offered as an important theoretical contribution.

A further contribution that followed from this approach is that given that national economic output in a market economy is an aggregation of outputs by the constituent firms, a distribution of firms by their *enovativeness* may give an indication of the economic growth and development situation and prospects in an economy. This is because more *enovative* firms, whether new to the market or an imitation only new to the firm, should have higher productivity growth and therefore contribute to the economy thus.

As such the skewedness of the distribution of firms by their *enovativeness*, and therefore productivity, may give an indication of probable subsequent movements or policy actions. Thus, for example, where a *lugging caterpillar* is observed with most firms not realising new combinations of factors of production, efforts to encourage more *enovation* are warranted. Similarly, for a *lurching caterpillar,* where most firms err on the side of the transformation of their combinations of factors of production, the rapid changes should be tamed in favour of more exploitation of existing opportunities and deepening of incumbent practices. In sum, by illuminating the concepts of innovation and *enovation,* and the link to firm productivity growth, this thesis also contributes to a clearer understanding of the role of firm in enhancing the process of social progress.

Further, the conceptualisation also serves to advise the determinations pertaining to the selection of appropriate methodologies for studies of the link between research and development, new products and other novelties, and productivity growth. This dissection and elaboration of innovation and how it links with firm productivity growth both answers our second and third conceptual research questions, and affords a robust conceptual grounding for the subsequent empirical inquiry.

7.2.2 Empirical contributions

Building on the theoretical and conceptual insights aforediscussed, this doctoral research also makes empirical contributions in its efforts to answer the empirical research questions. Firstly, the research entailed the construction of a new dataset from primary data collected in a survey. Because this data is quantitative and largely measures conventional microeconomic variables, the dataset may be employed in other relevant empirical analyses.

Further, the qualitative subtleties obtained in the data collection exercise, and used variously to interpret and contextualise the findings, also augment the dataset contribution of the present work. The methodological issues related to data collection in a developing country (Chapter 5), may also serve to not only contextualise the data but also advise other research in Kenya and other similar developing countries.

Secondly, the findings of the present study (Chapter 6) augment the empirical literature on entrepreneurship, small firms, productivity, employment growth, innovation and *enovation,* especially in developing country context and on the traditionally intriguing textile and garments industry. Indeed, by submitting that the small firm should be titularly considered as an *instance of entrepreneurship* with emphasis being on particular phenomena such as firm productivity and employment growth, this thesis is able to contribute to the various literatures reviewed in Chapter 4 that may or may not be strictly viewed under the broad rubric of entrepreneurship studies.

Thirdly, it is especially noted that studies of the link between innovation, *enovation,* and firm performance, on which the specific hypotheses of the study are based, are very rare in Africa and other developing countries. This study may thus serve

to both heighten the interest in these issues, as well as add to the growing empirical evidence about them in developing countries.

Finally, in addition to confirming many findings as conventionally accepted, and therefore in line with existing theories and stylised facts, this thesis has also obtained empirical results that may beseech some inductive qualification of the relevant theories. With regard to our specific hypothesis on the relationship between product *enovation* and firm productivity, our results suggest that it is the innovation efforts, rather than *enovation* in and of itself, that appears to be a significant driver of productivity.

Indeed, it is noted also that the factors that significantly determine product *enovation* also determine productivity. This highlights the structural nature of the respective relationships where innovation in part engenders product *enovation* which in turn enhances productivity. Thus, this finding adds credence to the use of suitable methodologies, such as Crepon *et al.* (1998) and Roper *et al.* (2008). However, this thesis yet emphasizes that to be abstract enough conceptually, product *enovation* must be considered separately from innovation.

In fact, this thesis has argued strongly that product *enovation* does not necessarily derive from observed innovation efforts *a la* Crepon *et al.* (1998). Such an understanding is able to accommodate a study of the effect of observed novelty in the products on productivity (growth) in micro and small firms of an artisan nature in a way that would be consistent with similar studies of other types of firms by virtue of construct validity. Indeed, it should be the respective relationships between the different variables at the different stages of the process towards the realisation of productivity growth through innovation that should be discretely investigated. The methodological

implication therefore is that the structural process may be more elaborate than suggested by the prevailing Crepon *et al*. (1998) approach.

In another critical observation with theoretical implications, our analysis of small firms could not support the constant returns to scale assumption with the results suggesting decreasing returns to scale. Textbook theory suggests that size effects render small firms more likely to report constant returns to scale or increasing returns to scale. This is because their small size makes them more efficient, by reducing the agency problems associated with complex hierarchical management systems, for example. Moreover, the indivisibility of some resources, such as machinery, certain owner-manager traits and talents, may suggest increasing returns to scale.

In contrast, this thesis highlights some labour composition issues that could undermine efficiency in small firms, especially in developing countries. The informal and affective nature of small firms may lead to the unsystematic employment of redundant and disruptive workers such as unpaid family members, apprentices and irregular temps, who may all contribute to efficiency setbacks. Indeed, it is also found that factors that drive rapid expansion of employment are mostly at odds with productivity which pits quantity of jobs against their quality.

Perhaps the most unexpected result of the present study concerns human capital. A positive relationship between the owner-manager's education and productivity, but a negative relationship found between the employment of graduates and firm productivity. This may suggest two things. Firstly, incentives matter. The owner-manager optimally utilises his human capital because as the entrepreneur, he also owns the product of the firm. On the other hand, employees on a secure salary may not exert themselves fully.

Secondly, one may argue that it matters what qualifications are attained and where they are employed. Thus, graduate qualifications in bookkeeping may not necessarily augment productivity in commoditised garment manufacturing. Further, small firms that are large enough to employ graduates may have other characteristics, such as the low value-added manufacturing activities, that suggest a lower productivity overall. Such implications of our doctoral study for policy and academic research are addressed in the next section.

7.3 Implications for policy and practice

The present doctoral research has theoretically and empirically attempted to address a topic that has recently interested economic policy greatly. The empirical analysis conducted in the present study enables the thesis to suggest specific policy implications that may be taken to be particular to the population studied in Nairobi, Kenya but may also instructive to other micro and small enterprises based industries. It is noted, however, that the study was conducted purely for academic purposes, without any specific policy intent. As such the following are offered as ideas to be taken under advisement as opposed to policy prescriptions for implementation.

On the question regarding whether *enovation* engenders higher productivity, this thesis answers in the affirmative but adds, crucially, that this happens via an *enovation* orientation and rigorous innovation efforts. Unlike the highly costly scientific laboratory research in industries like pharmaceuticals and hi-tech information technology, innovation activities in the garments industry entail readily and virtually universally achievable tasks like visiting shopping malls to study fashion trends, reverse

engineering imported designs available cheaply in second-hand clothes markets, and (basic) fashion designing.

That firms that carry out these tasks report higher productivity suggests that such innovation activities should be forthrightly be advocated for across all firms. Given, especially that the production and sale of new products without any preceding innovation efforts does not itself enhance productivity, the suggested innovation efforts should be encouraged, not least because the by-products of such efforts have beneficial impacts on productivity as the knowledge gained in innovation is employed variously in the firm. To enhance the skills and absorptive capacity required to fulfil these innovation travails, vocational training in fashion and other garments related proficiencies may be suggested as a propitious policy action.

A further crucial implication regards the link between education, entrepreneurship and economic performance. Three related findings are key here: (1) ownership imperatives imply that graduate owner-managers enhance productivity by maximising the utilisation of their human capital; (2) graduate employees, who need not exert themselves, are associated with firms with low productivity; and (3) smaller start-up size is associated with higher productivity.

These may be juxtaposed against the following findings from previous research: (1) in Kenya, open unemployment among those who have completed higher education at 8.5% compares almost equally with that of persons that did not complete primary education which stands at 9.6% (Pollin *et al.*, 2008); (2) whilst there has been rapid expansion of education, especially higher education, returns to education in Kenya are falling, especially for young people (Söderbom *et al.*, 2006); (3) many young people regard the formal sector as the only employment option, which makes self-employment

the second or third choice for those that cannot find wage employment and thus means that most small firm owner-managers in Kenya are recruited from those with a weak educational background (Farstad, 2002).

It appears, here, that with incentives to encourage entrepreneurship amongst high educated persons, a more optimal use of available human capital could readily help solve the graduate unemployment problem. Moreover, due to the ownership imperatives, the human capital of entrepreneurs would now not only be employed, but would also be enhancing productivity, and improving returns to education generally. Indeed, that garments MSEs that start small have higher productivity bolsters the case for the expeditious entry of graduate entrepreneurs into the garments industry in Nairobi, Kenya.

Even in the cited cases of graduate bookkeepers in small garment manufacturing firms, it may yet be beneficial to the graduate, the garments firm and the general economy if the bookkeeping was subcontracted to the graduate bookkeeper's own firm. Such a firm may also serve other firms in the garments industry and therefore exploit its own economies of scale. One advocates, therefore, for policy in Kenya to emulate developments in Europe and America on the role universities may play in developing and supporting entrepreneurship and entrepreneurialism amongst graduates (Gibb, 2005; Kirby, 2004; Schulte, 2004).

In fact, such developments would link well with other related implications that our findings would suggest. Given that rapid employment growth appears to be at odds with productivity, and considering, further, that many small garments firms appear to also have surfeit and disruptive personnel, encouraging self-employment more generally may be a more effective tool to alleviate the unemployment problem in Kenya.

Thus, policies to enhance self-employment should be complemented with training in basic business management, for example, to enhance a professional, rather than affective and *ad hoc*, approaches to business. Where more formalism is employed, such practices like employment contracts that entail adequate planning and attempts towards the appropriate specification of rights and obligations would follow thereby eliminating the inefficiencies harboured by informality. This would not only enhance productivity by invoking ownership imperatives on the part of the owner-manager as earlier discussed, but employment growth would now be pursued in line with efficient expansion needs of the firm, rather than affective teeming of micro and small firms that merely affords deficient jobs.

Indeed, supporting this view, our results suggest that new machinery is accompanied by employment growth. Moreover, as generally accepted, higher capital was found to enhance productivity. Thus, policies to encourage capital deepening are strongly encouraged. Still, given the discussion in Chapter 4, extending loans facilities, intuitive as it may be, may not itself be effective towards capital deepening as 'a loan does not create a viable business opportunity' (Nichter and Goldmark, 2009, p1457).

Rather, it is factors such as serving broader markets and engaging in business to business trade, found here to enhance productivity, that would seemingly also facilitate production in larger scales. This would then help create viable opportunities for capital deepening alongside other benefits, including, for example, access to new knowledge and trade credit, that enable continuous and growing production. It is plausible that firms with such manifestly strong productivity levels and sound growth prospects may be able to secure growth capital more easily than micro firms seeking to attain such feats in the first place.

There may be opportunities, therefore, for the financial industry that is now increasingly targeting small businesses in Kenya to engage in not only the usual technical assistance in preparation of business plans,[34] but to also involve business consultancy services that may provide information and advice on business expansion based on sound market research, thereby enhancing the firm's growth viability. For example, the analyses of population census data may reveal new demographic developments that may help identify and target new markets. These are measures that enhance the long-term survival of the business. Indeed, as argued above, ownership imperatives would impel more efficient allocation of resources.

Complementing the points afore-discussed, focussing on one business, as opposed to juggling active owner-manager roles in different firms, was found to enhance productivity. Specialisation was argued to allow the development of efficient businesses which enhances their viability. In turn, the prospects of attracting growth capital or indeed securing the gainful business to business contracts are enhanced. It may be suggested therefore that owner-managers in Nairobi, Kenya devote their entrepreneurial efforts to growing one viable business at a time.

It is understandable, yet, that portfolio entrepreneurship may be employed as a strategy to reduce exposure to risk. This calls for improvements in institutions, e.g. the development and enforcement of laws of contract, to reduce risk in the economy generally. A change in the attitude of government itself towards small firms may also be crucial as some government activities may hinder enterprise growth. Indeed, one observes that, small firms in Kenya have long been subjected to undue harassment from various government organs including the Local Governments, Kenya Bureau of

[34]See for example, http://www.businesstoday.co.ke/news/2012/04/11/new-funding-targets-small-businesses (Accessed 02/09/2012).

Standards (KEBS),[35] Kenya Revenue Authority and other government organs (Ronge *et al.*, 2002). Small firms thus avoid growing to reduce their visibility to government officials with several firms cached in the swarm preferred to a protruding successful firm that is easily targetable. Given the reported productivity advantages of focussing on one firm and the other aforementioned firm expansion effects, one would advocate, to borrow from Jose Manuel Barosso, President of the European Commission, that for business, policy needs to 'roll out a red carpet, not create red tape'.[36]

Besides formal institutional unobtrusiveness or welcome support, garments firms in Nairobi may also harness the benefits of other horizontal institutional arrangements through associations. Indeed, associations of small firms in Kenya have been officially recognised, encouraged and (somewhat) supported by the Kenya Government since a Presidential decree on the same was issued in 1985 (Moyi, 2006). This study finds that firms in dynamic associations that have a growing membership have higher productivity levels.

One may suggest therefore that on top of encouraging small firms in Kenya to join associations, to enhance formal and potent channels between small firms and the government for public funds allocations, policy dissemination and advocacy, etc (Moyi, 2006), a growing membership in such associations should also be pursued by recruiting new members. To enhance contributive participation of the new members without jeopardising the cohesiveness necessary for trust, camaraderie and mutual support in the association, and also for purposes of affirmative inclusiveness, certain innocuous

[35] During the survey, one respondent lamented that KEBS frequently declare large batches of firms' products substandard and therefore unfit for sale in the market for marginally failing to meet stringent requirements regarding the distance between stitches, or for a crooked embroidery. The respondent observed that the same body allows imports of far worse quality than his products and was convinced that these imports will have been rejects in their countries of origin.

[36] http://www.eu-un.europa.eu/articles/en/article_5828_en.htm (Accessed 23/08/2012)

positions in the associations' leadership, like vice-chair roles, may be formally reserved for new members.

7.4 Limitations and suggestions for future research

The present doctoral study has endeavoured to observe the counsel advanced by Whetten (1989) towards a thesis that seeks to contribute to the understanding of entrepreneurship, innovation and their role in engendering firm performance and growth. According to Whetten (1989), proposed theoretical improvements must fulfil three general themes. Firstly, multiple elements of the relevant theory must be addressed. Secondly, compelling critique of existing theory must be marshalled by highlighting logical inconsistencies undermining existing theory, predictive unreliability and invalid epistemological assumptions. In turn, lastly, remedies or alternatives should be offered.

Earnest academic effort notwithstanding, this study concedes to potential limitations across the three themes. To begin with, entrepreneurship and innovation are prodigiously broad subjects, jointly and separately. As such, tackling multiple elements of entrepreneurship and innovation theory entails a greatly extended scope. The present research is therefore predisposed to potentially incomplete handling of the respective elements. Indeed, this study does not pretend to have comprehensively diagnosed the logical inconsistencies, predictive unreliabilities and epistemic fallacies of extant theories and conceptualisations of entrepreneurship and/or innovation, nor does it claim to offer a superseding alternative. Instead, what has been here attempted is a modest review of these existing conceptualisations, towards contributing to an on-going

concerted pursuit of a cogent way to empirically analyse entrepreneurship and innovation and their contributions to firm performance.

Needless to say, therefore, there remains enormous academic work to be done towards thoroughgoing reviews, critiques and sifting of extant theories of entrepreneurship, innovation and the other related economic and social dimensions, approached from a variety of perspectives, towards the eventual development of a consensual theories and principles. Such efforts should complement epic tomes that have been resourceful launchpads for entrepreneurship and innovation research (for example, Ács and Audretsch, 2005; Casson *et al.*, 2006; Hébert and Link, 1982; Rogers, [1962] 1995; Scherer, 1986; Schumpeter, 1934; 1939; 1943).

While the theoretical debate carries on, empirical work illuminating on real world phenomena must progress in parallel, perhaps also advising the theory development effort inductively. While such a contribution is also advanced here, it is in order that some limitations of this work are also pointed out. Firstly, due to the scarcity of time and financial resources, and the lack of suitable secondary data on the phenomena of interest, the findings reported in this thesis relate to data on only micro and small enterprises in the garments industry in Nairobi, Kenya, collected between May and October 2010. With such a specific contextual and temporal limit, it is reasonable that the results are received cautiously as they have a limited scope for generalisability.

Indeed, further limitations concern data collection and the data collected. Methodological issues in developing countries are well documented (Bulmer and Warwick, 1993b; Daniels, 2001). In our case, issues included: lack of a suitable sampling frame; many firms' unwillingness to participate; and, lack of objective data.

Little or no bookkeeping amongst many small firms necessitates the use of guesstimate responses, and the intricate nature of variables like labour, which is variously composed, complicate its adjustment and weighting.

There are also the standard problems regarding innovation and *enovation*. Indeed, measurement errors have also long been known to afflict innovation research (Mairesse and Mohnen, 2002). This is especially so in 'informal' small firm innovation (Chudnovsky *et al.*, 2006), where innovation activities are thought to 'just happen' (Vermeulen *et al.*, 2005). Researchers in Kenya have also found that innovation is employed as an *ad hoc* survival tactic rather than a strategic goal undertaken systematically (Kamau and Munandi, 2009), and therefore sufficiently documented and investigable. All these issues may in one way or another have some bias implications on the data employed here. Also, the common problem of incomplete questionnaires also limited the number of responses and/or variables available for data analysis.

Nevertheless, future research in the textiles and garments industry in Nairobi may benefit from the sampling frames that studies such as ours have developed. Indeed, it is noted that given the research attention that this industry has received recently (Chapter 5), respondents are becoming less distrusting of researchers. Further, lessons from the field may pave the way for less errors in future research. For example, developing short focused questionnaires, and using weekly or monthly estimates of financial figures that may be more reliable then applying seasonal (e.g. Christmas, Easter) adjustments, may help improve the quality of data collected. One observes also that the Kenya government has been very aggressively enforcing the use of Electronic Tax Registers (ETRs) that it supplies to traders for tax purposes.[37] All these are measure

[37] See, www.kra.go.ke/publications/ElectronicTaxRegisters2.ppt (accessed 23/08/2012).

that will improve the quality of future data which in turn encourages studies similar to the present one, not least to confirm the reliability of our results.

Yet, the validity of the results may yet depend on the analytical techniques used. This study variously employed OLS, Tobit and logistic regression analyses of cross-sectional data. A recent study in Africa advocated for quantile regression which yields different results from OLS as the average firm may be different from the median firm (Goedhuys *et al.,* 2008). For growth, especially, it is widely accepted now that it is actually usually a small group of high performing 'gazelles' that are responsible for the 'average' effect observed in most regression analyses (Nichter and Goldmark, 2009). On the link between innovation, *enovation,* and productivity, structural models may be more appropriate (e.g. Crepon *et al.,* 1998; Lööf and Heshmati, 2006), especially where expanded to accommodate different sources of knowledge and different outputs (e.g. Roper *et al.,* 2008). Further, the appropriateness of cross-sectional analysis against panel regressions and choices between fixed-effects and random-effects are important considerations that future research should contemplate (Castellacci, 2011).

Indeed, one recalls that this area of research on the link between innovation, *enovation,* and firm performance is relatively young. As such, the limitations above present opportunities that future research could explore, especially in Kenya and other developing countries, towards contributing to the development of both theoretical and empirical knowledge on the pertinent phenomena. This thesis therefore only but heralds opportunities for future research in entrepreneurship and innovation for as Schumpeter (1934, p64) observes, 'every process of development creates the prerequisites for the following'.

8 APPENDICES

8.1 Appendix I: The survey questionnaire

Entrepreneurship and Economic Development Dynamics: A Survey of Manufacturing Enterprises in the Textiles and Garments Industry in Nairobi, Kenya
May – October 2010

Thank you for taking part in this survey. The survey intends to collect data on the activities and entrepreneurial context of your business along with other manufacturing businesses in the textiles industry in Nairobi, Kenya.

Please be assured that identities of persons and businesses involved in this survey will remain anonymous, and all information you provide will be kept confidential.

00. Questionnaire Number: _____

01. GENERAL INFORMATION

A. Ownership status of your firm: (Please tick one only)

☐ 1. Sole trader ☐ 2. Partnership ☐ 3. Franchise ☐ 4. Limited liability partnership

☐ 5. Limited liability company ☐ 6. Subsidiary of East African Company

☐ 7. Subsidiary of foreign-owned company ☐ 8. Social enterprise

B. Business registered? ☐ 1. Yes ☐ 2. No

C. Business Licensed? ☐ **Yes, by** ☐ 1. Provincial Admin ☐ 2.Local Govt ☐ 3. Central Govt, ☐ **4.No**

D. Firm established: Year_____ **E. Main activity of your firm:** _____

F. Reason for start-up: _____ G. Reason for choosing that activity: _____

1 = Skilled in this activity, 2 = Family has worked in this activity, 3 = Advised by others, 4= Availability of capital required, 5 = High demand/ready market, 6 = Influenced by advertisements, 7 = No other alternative, 8 = Better income, 9 = Prefer self employment, 10 = Other (Specify): _____

H. How did the present ownership obtain this business?

☐ 1. Newly established ☐ 2. Purchased ☐ 3. Inherited

☐ 4. Other: _____

I. What percent of the start-up finance came from the following sources?

1) Owner(s) funds .....(%) _____
2) Parent company.....(%) _____
3) Family/Friends.....(%) _____
4) Bank Loan.....(%) _____
5) Venture Capital.....(%) _____
6) Sacco/Other Association... (%) _____
7) Other: _____ (%) _____
Total (%) 100

J. Do you run other businesses? ☐ 1.Yes ☐ 2.No

K. Do you engage in other activities (eg, employment, farming) ☐ 1.Yes ☐ 2.No

L. Have you terminated a business in the last 2 years ☐ 1.Yes ☐ 2.No

M. If yes, main reason(s): -
_____

N. Who are your main customers for this business? (Please tick one only)

☐ 1. Household consumers ☐ 2. Other Businesses

☐ 3. Public institutions (e.g., government agencies, schools, etc) ☐ 4.Other:-
_____

O. Which is your firm's main market? (Please tick one only)

☐ 1. Local Market (Less than 5KM) ☐ 2. City-wide (Nairobi) ☐ 3. Nairobi plus surrounding areas

☐ 4. National ☐ 5. East Africa ☐ 6. Other international

P. What is the average (expected) lifetime of your firm's' most important product before it is replaced or being significantly modified:_____ Years

Q. Number of workers:

Q1a) Working owners	
Q1b) Permanent/ Full-time	
Q1c) Casual/ Temporary	
Q1d) Apprentices	
Q1e) Unpaid family/friends	
Q1f) TOTAL	

Q2a) Number of workers under 30 years old: _____, Q2b) University graduates: _____

Q3) Number of workers at start of business : _____

Q4) Expected change in total number of employees in your firm in 2011: ☐ 1. Increase ☐ 2. No change ☐ 3. Decrease

R. Value-added:

R1) Total Sales in 2009	
R2)Cost of bought-in materials and services	
R3) Value-added (R1 - R2)	

S. Over the past five years, the sales trend has been:

☐ 1. Increasing ☐ 2. Stable ☐ 3. Decreasing

T. Over the past five years, the cost of bought in materials and services has been:

☐ 1. Increasing ☐ 2. Stable ☐ 3. Decreasing

U. How does your business intend to expand sales over the next two years?

1.Selling more of our existing products to existing markets. ☐

2. Selling more of our existing products to new markets.....☐

3. Selling a new product to existing markets…….....☐

4. Selling a new product to new markets……..... ☐

V. Who do you see as your main competitors?

1. Small businesses producing in Nairobi.....☐

2. Small businesses producing outside Nairobi.☐

3. Kenyan large firms/Multinationals.....☐

4. Importers.....…….....☐

5. Other:_____☐

W. How many, a) supplier firms does your firm have?_____b) Client firms? _____

X. a)How many firms do you consider as serious competitors?_____

b) Of these, how many are i) overseas firms_____ ii) Larger than your firm_____ iii) Smaller _____

Y. Where are your supplier firms, client firms and competitors mainly located?

Location	a)Supplier Firms (Please tick all that apply)	b)Client Firms (Please tick all that apply)	c)Competitors (Please tick all that apply)
1) In my local business area (less than 5KM)……	☐	☐	☐
2) Nairobi (outside of my local business area)……	☐	☐	☐
3) Kenya (Outside Nairobi)……	☐	☐	☐
4) East Africa (Outside Kenya)……	☐	☐	☐
5) International (Outside East Africa)……	☐	☐	☐

Z. Which are your three main uses of the net profits of the business?

a) Re-investment in this business
b) Investment in other businesses
c) Household/personal/family use
d) Transfers to parent company
e) Distribution to shareholders
f) Savings
g) Other (Specify)_____

Number 1	
Number 2	
Number 3	

02. NEW COMBINATIONS

A. In the period 2005 – 2009, did you business produce a new (or a significantly modified) product?

☐ 1. Yes ☐ 2. No (please go to **question G**)

B. 1) If yes, was this product also first of its kind in your market?

☐ 1. Yes ☐ 2. No (please go to **question E**)

2) Please describe the difference you introduced from your previous products or others in the market

_____
_____
_____

C. Please estimate how your sales in 2009 were distributed between

1) 'First in the market' products introduced between 2005 – 2009.. .....%
2) Other products…….. ____ %
Total…… 100%

D. What led to the introduction of the new product (please tick one only)?

1. Mainly as a result of our own innovation in-house…… ☐
2. Our business in co-operation with other local businesses from an ongoing innovation project …….. ☐
3. We learnt of the new product from other markets and developed similar products for our local market…… ☐
4. Customers introduced the idea and we developed a product accordingly. ☐
5. Other (Please specify) _____ ☐

E. Upon learning of a new product in your market, how did you respond? (please tick one only)

1. Quickly developed a similar product adding new features to our competitors' product to make our new product also competitive……..... ☐
2. When we realised that consumers liked the new products other businesses had introduced, we started producing similar products…… ☐
3. We concentrate only on our existing products .....……..... ☐
4. Our market does not usually have new products..... ☐
5. Other (Please specify)_____ ☐

F. Please estimate how your sales in 2009 were distributed between

1) All new (or significantly modified) products introduced between 2005 – 2009 .....%

2) Products that remained unchanged in the period 2005 – 2009…….. _____%

Total……... 100%

G. In the period 2005 – 2009, did your business undertake any of the following developments regarding your product/process technologies? (Please tick all that apply):

1) Obtained new equipment or machinery because old one(s) had broken down…… ☐
2) Obtained better equipment or machinery to improve efficiency and save on costs ☐
3) Obtained new equipment and machinery to meet increased demand…… ☐
4) Changed the production process to be able to produce new products…… ☐
5) Changed the way raw materials are purchased and stored to improve efficiency… ☐
6) Changed the way finished products are handled…… ☐
7) Employee training towards more technological knowledge…… ☐
8) Hiring new technology oriented employees..... ☐
9) Started to concentrate more on core functions and outsourcing non-core tasks… ☐
10) Changed the production to meet quality certification requirements (e.g., ISOs)..... ☐
11) Other (Please specify): _____ ☐

H. In the period 2005 – 2009, what were the most important ways in which your firm acquired new technology? Please select your top three from the list below:

a) Developed or adapted within the firm locally
b) Transferred from parent company
c) Developed in cooperation with client firms
d) Embodied in new machinery or equipment
e) By hiring key personnel
f) Licensing or turnkey operations from international sources
g) Licensing or turnkey operations from domestic sources
h)Developed with equipment or machinery supplier
i) Through a business or industry association
j) Trade Fairs
k) Consultants
l) From universities, public institutions
m) Adapted from competitors
n) Other:

_____

Number 1	
Number 2	
Number 3	

I. How much did your firm spend on research, design and development of new products/processes in:

a)2006: Kshs_____, b)2007: Kshs_____, c)2008: Kshs_____,

d)2009: Kshs_____

J. How many members of your staff engage in research, design and development as their main/significant part of their daily work? _____ Employees.

K. On average, how many hours per week would you say are devoted to research, design and development activities in your firm in total? _____ Hours.

L. In the period 2005 – 2009, how many intellectual property rights (IPR) for products, services or processes did your business apply for, was granted, or license from other organisations?

	1)Applied for (Own)	2) Granted (Own)	3)Licensed (others')
a)Patents			
b)Copyrights			
c)Trademarks			
d)Other *(Specify):*_____			

03. ENTREPRENEURSHIP FACTORS: DECISION DRIVERS

A. When your firm makes important decisions about its products and technologies, to what extent are the following influential? (Please rate 1 - 5, Where 5 = Very Influential, 1 = Not at all influential).

B. Please also indicate your top three driving key decision influencers from the listed factors.

a) The vision/ decision of the owner(s)…… _____
b) The vision/ decision of the director…….. _____
c) Consultation with key employees…… _____
d) The strategic guidelines of our business…… _____
e) Customers …….. _____
f) Trade and/or industry associations…….. _____
g) Supplier firm(s) …….. _____
h) Family and friends…….. _____
i) Competitor firms and their products…….. _____
j) The media..... _____
k) Business service providers (e.g. auditors, IT) _____
l) Education/research institutions…… _____
m) Local govt departments and agencies……. _____
n) Central govt departments and agencies…… _____
o) Community organisations ……..... _____
p) Certain individual members of the community _____
q) Trade unions……... _____
r) International organisations/agencies..... _____
s) Other (Specify) _____ _____

Number 1	
Number 2	
Number 3	

C. From the following list, which are your three main sources of news and information about current affairs in your industry and the economy in general

a) Newspapers
b) Radio
c) Television
d) Internet
e) Customers
f) Colleagues/ Employees
g) Family and friends
h) Market rumours
i) Industry newsletters/ magazines
j) Competitors
k) Other businessmen

Number 1	
Number 2	
Number 3	

04. ENTREPRENEURSHIP FACTORS: NETWORKS

A. Does your firm co-operate with other firms and organisations with respect to the following? (Tick all that apply)

Type of Co-operation	YES, Location of Partners from your business is…					NO
	1. Local (Less than 5KM)	2.Nairobi (More than 5KM)	3.Kenya (Outside Nairobi)	4.E. Africa (Outside Kenya)	5.Inter-national (Outside E.A)	6.We do not partner others for
a) Production……	☐	☐	☐	☐	☐	☐
b)Product technology/Innovation/ Design…	☐	☐	☐	☐	☐	☐
c) Purchasing supplies jointly&sharing costs	☐	☐	☐	☐	☐	☐
d) Marketing/Advertising/Exporting……	☐	☐	☐	☐	☐	☐
e) Training……	☐	☐	☐	☐	☐	☐
f) Investment/Finance for important projects.	☐	☐	☐	☐	☐	☐
g) Sharing important business information…	☐	☐	☐	☐	☐	☐
h) Favourable price (Discount) arrangement	☐	☐	☐	☐	☐	☐
i) Other, please specify_____	☐	☐	☐	☐	☐	☐

B. What are the principal characteristics of such cooperative activities? (Please tick one)

1) One-off co-operation when there is an opportunity…… ☐
2) Loose co-operative linkages with familiar firms…… ☐
3) Close and long-term co-operative linkages…… ☐
4) Joint projects initiated by a businessman who reaches out to others…… ☐
5) Joint projects triggered by initiatives promoted by national/local government agencies…… ☐
6) Joint projects triggered by initiatives promoted by NGOs…… ☐
7) Joint projects triggered by initiatives promoted by trade and/or industry associations…….. ☐
8) Other, (please specify)_____ ☐

C. Please list the business associations in which your business is member

1) _____
2) _____
3) _____
4) _____

D. What are the main benefits from membership in the above associations? (Please tick all that apply)

1) Access to and sharing of information relevant to the industry (e.g., newsletters)……. ☐
2) Provision of an opportunity where members exchange ideas and information……..... ☐
3) Access to business advice…… ☐
4) Access to financial support …….. ☐
5) Access to collective marketing (e.g. through trade fairs and/or exhibitions)…… ☐
6) Access to new customers……. ☐
7) Access to training…… ☐
8) Provision of an environment where members can get to know each other…….. ☐
9) Assistance with the settlement of disputes or disagreements with other firms..... ☐
10) Setting up of collaborations towards pressuring the government……..... ☐
11) Very important in times of emergency……..... ☐
12) Provision and management of collective resources (e.g., shared facilities)…… ☐
13) Enjoyment/ recreation.. …….. ☐
14) Prestige/ social esteem…….. ☐
15) Other, please specify_____ ☐

E. Of the associations in which your business is member, which is the most important one to you?

_____

_____

F. How does one become a member of this group?

☐ 1. Mandatory ☐ 2.By official invitation ☐ 3. Introduction by friends/colleagues

☐ 4. Voluntary choice ☐ 5. Other (Please specify): _____

G. How are leaders in this group selected?

☐ 1. By an outside person (e.g., Govt) ☐ 2. Each leader chooses their successor

☐ 3. By a small group of members ☐ 4. By a decision/ vote of all members

☐ 5. Other (Please specify): _____

H. Thinking about the members of this group, are most of them mainly of the….

	1.YES	2.NO
a)Same gender……..	☐	☐
b)Same ethnic or linguistic background……	☐	☐
c) Same education level (Primary, Secondary, College, University)…	☐	☐
d)Same education background (E.g., Engineering, Marketing, etc)…	☐	☐
e)Same occupation……	☐	☐
f)Same religion…..……	☐	☐

I. To what extent have the following factors hindered the participation of your business in cooperative activities, or the success of associations you may have joined? (Please rate 1 – 5, where 5 = Very large extent, 1 = Very small extent)

a) Difficulties in finding suitable like-minded partners……..... _____
b) Being cautious that others may take advantage ..... _____
c) Presence of dominant members / large firms…..... _____
d) Difficulties in getting information about joint activities..... _____
e) A custom of working independently……..... _____
f) Differences in wealth/ social status……..... _____
g) Differences in education……..... _____
h) Members' age differences……..... _____
i) Newer vs older members' differences……..... _____
j) Differences between men and women……..... _____
k) Differences in ethnic background……..... _____
l) Differences in political affiliation……..... _____
m) Levels of commitment and effort shown by other members.. _____

J. Do you know of any new members that have joined any associations you belong to in the last 12 months?

☐ 1. Yes ==➔ How many? _____ ☐ 2. No

K. What do you generally feel about new members joining your business association? (Please rate 1 – 5, where 5 = Strongly agree, 1 = Strongly disagree)

a) New members bring new ideas and energy……..... _____
b) New members unfairly benefit from the hard work of incumbent members……..... _____
c) New members disturb the established harmony and way of doing things…… _____
d) The presence of new members makes old members improve at what they do…… _____
e) New members cannot be trusted……..... _____
f) New members have no say or effect……..…. _____

L. Please fill the table below about people you know by name and who you trust and relate with freely and regularly

	1. Approximately, how many people do you know in each of the following categories?	2. How many of these did you meet for the first time during the last two years?	3. How many people did you know in each category when you first started/acquired/took over this business	4. How many of these belong to your ethnic group?
a) Same line of business				
b) Different line of business				
c) Non-Kenyans in Kenya				
d) Kenyans abroad				
e) Non-Kenyans abroad				
f) Bank officials				
g) Civil servants				

05. ENTREPRENEURSHIP FACTORS: BUSINESS/POLICY CONTEXT

A. How happy are you with the following factors in relation to your business?
(Please rate 1 – 5, where 5 = Very happy, 1 = Very unhappy)

a) Access to bank loans …….... _____
b) Availability of appropriately skilled workers……..... _____
c) Labour costs……..... _____
d) Relations with workers/ trade union ……..... _____
e) Access to suitable business premises..... _____
f) Access to business customers (client firms)……..... _____
g) Access to household customers……..... _____
h) Access to supplier firms……..... _____
i) Access to new technological knowledge……..... _____
j) Access to latest technology and equipment……..... _____
k) Infrastructure (transport, communication, electricity, water, etc.)…….……..... _____
l) Availability of raw materials..... _____
m) The state of competition between firms in my industry.. _____
n) Protection against unfair imitation of innovations..... _____
o) Local government (City Council) regulations……..... _____
p) Awareness on government laws and regulations affecting my industry…… _____
q) Govt capacity to fairly enforce laws and regulations..... _____
r) Taxes and other government levies……..... _____
s) Time and effort it takes dealing with govt. officials…..... _____
t) Govt efforts to encourage and support new businesses.. _____
u) A govt department dedicated to championing enterprise _____
v) Overall national industrial/ economic policy……..…..... _____
w) Recent performance of the economy of Kenya……... _____

x) Presence of a network of business support institutions
(e.g. Chambers of Commerce, Jua kali Assoc)……..... _____
y) A network of trustworthy clients and suppliers……..... _____
z) Relations with local community……..... _____
aa) Other (specify)_____ _____

B. In trying to help your business and industry grow, what should be the government's top priorities? (Please select from the list below)

a) Reduce taxes
b) Provide economic stability
c) Facilitate access to finance
d) More grants and subsidies to small businesses
e) Improve transport infrastructure
f) Improve supply of electricity and water
g) Reduce bureaucracy/ regulatory burden
h) Improve education and training
i) Stimulate local (Kenyan) innovation and R&D
j) Stimulate access to export markets
k) Encouraging joint ventures with foreign companies
l) Reduce monopoly power and unfair competition
m) Protect Kenyan manufacturers against imported goods
n) Improve the law enforcement system (police, courts, etc)
o) Leave business alone to manage its own affairs
p) Other (please specify): _____

Number 1	
Number 2	
Number 3	

06. ENTREPRENEURSHIP FACTORS: SOCIO-CULTURAL CONTEXT

A. In general, to what extent do the following statements apply in your community? (Please rate 1 – 5, Where 5 = Apply very strongly, 1 = Apply very weakly). In my community…….

a) If you are rich, people always come to you for money…… _____
b) People think about/ rely on inheritance too much…… _____
c) People often say bad things about successful people …….... _____
d) A lot of successful businesses are owned by 'outsiders'…… _____
e) If you are successful, people are very proud of you and happy for you... _____
f) People respect that business is different from friendship or kinship…….. _____
g) People are very curious about what other people do…….. _____
h) Generally, you have to leave your place of birth to make it…… _____
i) You have to be careful or someone will take advantage of you……. _____
j) If you start something new, people wish that you to succeed……. _____
k) If you start something new and fail, people ridicule you..... _____
l) Small businesses and new business starters get good media coverage. _____
m) I know a lot of people who are very successful in business……. _____
n) Most people are willing to help if you need help…… _____
o) Owning land/ a big house/big car is more prestigious than business.. _____

07. ENTREPRENEURSHIP FACTORS: PERSONAL ASPECTS

A. Please indicate if you agree or disagree with the following statements.
(Please rate 1 – 5, Where 5 = Strongly agree, 1 = Strongly disagree)

a) I would not mind a routine job if the pay was good…….. _____
b) I feel that being in business brings out the best in me..... _____
c) Am always keen to adapt to the latest developments ..... _____
d) I think I have successfully taken many of the good opportunities I have come across…….. _____
e) Success is a result hard work, not luck…… _____
f) If there is a chance of failure I would rather not do it……. _____
g) I prefer not to be the very first one to do something……. _____
h) When I make plans, I nearly always achieve them…… _____
i) If some people expressed doubts in something I was planning to do, I would likely not do it……... _____
j) In many of the successful things I do, am happy to learn the details along the way than wait to know everything..... _____
k) If I tried something and failed, I would still try again..... _____
l) As long as we shared goals, I would be prepared to partner with people from a totally different background…… _____

B. How many years of working experience did you have prior to establishing/heading this business?
_____Yrs

C. Where did you obtain the most important knowledge and experience?

☐ 1. Foreign firm in Kenya ☐ 2.Local Large firm ☐ 3.Local SME ☐ 4.Employment Abroad ☐ 5. Other: _____

D. About you: ☐ 1. Male ☐ 2. Female **E. Year of Birth:** _____

F. Education Level: ☐ 1. Primary ☐ 2.Secondary started ☐ 3.Secondary completed ☐ 4.College started

☐ 5.College completed ☐6. University started ☐7. University completed ☐ 8. Post-graduate

F. Which of the following best describes you?

☐ 1. Founder/ Managing Partner/ Proprietor ☐ 2. Relative of founder

☐ 3.Recruited/ Headhunted Managing Director ☐4.Promoted Managing Director ☐ 5.Other: _____

G. Overall, what one event would you say had the biggest impact on the course/development of your business?

1. Favourable impact:
   _____
2. Unfavourable impact:
   _____

H. **Other general observations**

_____
_____

Thank you for taking part in this Entrepreneurship and Economic Development Dynamics (EEDD) survey. Your input will be very useful towards understanding entrepreneurship in Kenya's textiles and garments industry and entrepreneurship in Kenya more generally.

We would also like to invite your contribution to this research again by taking part in further research at a later stage. We also intend to share our findings with interested participants. If you would like to be contacted for further research or to be informed about the findings of the survey, please fill in your details below:

Name of respondent: _____

Business Name:_____

Address: _____

_____

Phone Number: _____

Email: _____

Please tick if you would like to be contacted for:

☐ Further Research

☐ Findings of the survey

Thank you for taking part in the Entrepreneurship and Economic Development Dynamics (EEDD) survey that we carried out between May and October last year (2010). Your input has been very useful towards understanding entrepreneurship in Kenya's textiles and garments industry and entrepreneurship in Kenya more generally.

While conducting the analysis, we have found the need to request for some more information to be able to understand the importance of different sources of productivity. Many people say that more physical capital increases productivity, i.e. output per worker. We want to find out if this is true for clothing and garments firms in Nairobi as well. To help us do this, please complete the following two questions.

1. What is the total value of the fixed assets (tools, machines, etc) of your business. Kshs_____.
2. Total number of employees, including working owners: _____

Please be assured that identities of persons and businesses involved in this survey will remain anonymous, and all information you provide will be kept confidential and analysed as part of an industry sample than as an individual business.

We would also like to invite your contribution to this research again by taking part in further research at a later stage. We also intend to share our findings with interested participants. If you would like to be contacted for further research or to be informed about the findings of the survey, please fill in your details below:

Name of respondent: _____

Business Name:_____

Address: _____

_____

Phone Number: _____

Email: _____

Please tick if you would like to be contacted for:

□ Further Research

□ Findings of the survey

8.2 Appendix II: Correlations Matrix[38]

	VAlog	LPlog	Lgrowth	Llog	Klog	KpWlog	HumanKD
VAlog	1						
LPlog	0.7870*	1					
Lgrowth	-0.06	-0.1765*	1				
Llog	0.6619*	0.0584	0.1173	1			
Klog	0.8267*	0.4895*	-0.0816	0.7430*	1		
KpWlog	0.6674*	0.6657*	-0.2268*	0.2712*	0.8247*	1	
HumanKD	0.2864*	0.0672	-0.0194	0.3818*	0.4162*	0.2507*	1
NewP	0.1970*	0.1914*	-0.031	0.0862	0.1394	0.1537*	0.2128*
NewP1pc	0.2324*	0.2044*	-0.0394	0.1276	0.1759*	0.1768*	0.2049*
NewP26pc	0.1611*	0.1933*	-0.081	0.0258	0.1039	0.145	0.1336
NewP51pc	0.0005	0.0933	-0.0328	-0.1126	-0.109	-0.0337	-0.0553
NewP76pc	0.1387	0.1472	0.0983	0.0456	0.0623	0.0665	0.093
NewP25pcOrder	0.1172	0.1752*	-0.0228	-0.0232	0.02	0.0732	0.0665
EnovStrategyD	0.1293	0.2698*	0.0896	-0.1186	0.0539	0.1719*	0.0896
RDHrs	0.2757*	0.2412*	-0.0252	0.1531*	0.2565*	0.2526*	0.2078*
RDHrsPWlog	-0.2214*	0.1164	-0.1468	-0.4997*	-0.3191*	-0.0368	-0.0219
ProcessInn~D	-0.0279	0.0261	0.1325	-0.0769	-0.0701	-0.0428	0.0369
Agelog	0.2790*	0.1011	-0.5369*	0.3286*	0.2939*	0.1105	0.1041
WrkrStrt	0.3345*	0.0597	-0.1895*	0.4687*	0.4741*	0.2972*	0.1852*
YngWkr	-0.0902	0.0366	0.0254	-0.1905*	-0.1303	0.0083	-0.047
HseholdsD	-0.4261*	-0.2310*	0.1402	-0.4088*	-0.3913*	-0.2436*	0.049
OthrFinanceD	0.0985	0.1452	-0.0263	-0.0169	0.1029	0.1225	0.0564
SalesTrend	0.1363	0.0473	0.1253	0.1630*	0.0253	-0.0338	0.0566
MktReach	0.3117*	0.2194*	-0.2140*	0.2378*	0.2312*	0.1307	0.0366
CityD	-0.0305	-0.0392	0.077	-0.0017	0.0173	0.0388	0.3071*
GreaterCityD	0.0603	0.1197	-0.0085	-0.0477	0.0191	0.06	-0.1424
NationalD	0.0737	0.0079	-0.1408	0.1096	0.0111	-0.0584	-0.0432
EastAfricaD	0.2292*	0.1465	-0.1012	0.1929*	0.2339*	0.1514*	0.1047
SuplrFrms	0.3774*	0.2229*	-0.0518	0.3399*	0.4045*	0.2965*	0.4172*
InternetD	0.1363	0.0917	0.0974	0.109	0.0856	0.0137	0.2649*
LPgaplog	-0.3327*	-0.3899*	0.0734	-0.0645	-0.3571*	-0.4487*	0.0486
EntrAge	0.3613*	0.1508*	-0.2014*	0.4013*	0.4061*	0.2457*	0.0395
EntrEduyrs	0.3033*	0.3417*	-0.1461	0.0756	0.1961*	0.2485*	0.2660*
SecondaryD	-0.2816*	-0.1983*	0.0265	-0.2147*	-0.2053*	-0.1546*	-0.2134*
CollegeD	0.0497	0.1115	-0.1966*	-0.055	-0.0267	0.0138	0.0967
UniversityD	0.3775*	0.2964*	0.033	0.2508*	0.3167*	0.2839*	0.2613*
FemaleD	-0.143	-0.0175	0.2148*	-0.2102*	-0.1818*	-0.0699	-0.0583
DynamicNetD	0.1517*	0.064	0.1076	0.1678*	0.0588	-0.036	0.0166
OtherBizD	0.1628*	-0.0168	0.2066*	0.2838*	0.2282*	0.1001	0.0379

[38] Shaded cells indicate high correlation, i.e. correlation coefficient above 0.5. Darker shade signifies correlation coefficient above 0.8.

	NewP	NewP1pc	NewP 26pc	NewP 51pc	NewP 76pc	NewP25pc Order	Enov StrategyD
NewP	1						
NewP1pc	0.9329*	1					
NewP26pc	0.8606*	0.8611*	1				
NewP51pc	0.6377*	0.5605*	0.6509*	1			
NewP76pc	0.4193*	0.3000*	0.3484*	0.5353*	1		
NewP25pcOrder	0.8059*	0.7370*	0.8558*	0.8997*	0.6950*	1	
EnovStrategyD	0.2824*	0.2834*	0.2305*	0.2246*	0.049	0.2203*	1
RDHrs	0.2857*	0.2640*	0.2887*	0.2883*	0.3439*	0.3634*	0.1953*
RDHrsPWlog	0.3912*	0.3700*	0.4087*	0.4160*	0.1923*	0.4298*	0.1965*
ProcessInnovD	0.2027*	0.1880*	0.0939	0.0728	0.0446	0.089	-0.0104
Agelog	0.0056	0.05	0.0375	-0.093	-0.0354	-0.0335	-0.1355
WrkrStrt	0.0887	0.1002	0.0298	-0.007	-0.0493	-0.0038	-0.032
YngWkr	0.0929	0.0991	0.0835	0.136	0.0676	0.1184	0.0775
HseholdsD	-0.0191	-0.038	-0.0368	-0.0064	0.062	-0.0015	0.07
OthrFinanceD	0.0679	0.0851	0.0197	0.0309	-0.0678	0.0024	0.2445*
SalesTrend	0.2192*	0.2143*	0.1820*	0.0902	0.0954	0.1530*	0.0597
MktReach	0.3433*	0.3323*	0.2954*	0.1122	0.054	0.2034*	0.09
CityD	0.0827	0.0347	0.078	0.1234	0.1614*	0.1385	0.1876*
GreaterCityD	-0.0021	0.0217	0.0616	0.0225	-0.0503	0.0236	-0.1011
NationalD	0.126	0.1189	0.0663	-0.0657	0.0159	0.0073	0.0415
EastAfricaD	0.2122*	0.2056*	0.1682*	0.1385	0.0218	0.1456	0.0722
SuplrFrms	0.2401*	0.2203*	0.1716*	0.1595*	0.1487	0.1942*	0.1188
InternetD	0.2649*	0.2872*	0.1526*	-0.0151	0.0037	0.0661	0.1029
LPgaplog	-0.0884	-0.0797	-0.096	0.0398	0.0008	-0.0275	-0.1694*
EntrAge	-0.0288	-0.0165	-0.0163	-0.1119	-0.0756	-0.0788	-0.129
EntrEduyrs	0.2520*	0.2457*	0.1870*	0.0864	0.0578	0.1425	0.1401
SecondaryD	-0.1326	-0.2030*	-0.1273	-0.0031	-0.0444	-0.0743	-0.1284
CollegeD	0.1833*	0.2311*	0.1990*	0.1336	0.1112	0.1846*	0.087
UniversityD	0.1023	0.0989	0.0298	-0.0588	-0.0205	-0.0177	0.1019
FemaleD	0.06	0.0516	0.0197	0.0665	0.0873	0.0642	0.1001
DynamicNetD	0.2378*	0.2338*	0.2512*	0.1604*	0.2265*	0.2552*	-0.013
OtherBizD	0.0228	0.0572	-0.0015	-0.0908	-0.0456	-0.0538	0.0511

	RDHrs	RDHrs PWlog	Process InnovD	Agelog	WrkrStrt	YngWkr	Hse holdsD
RDHrs	1						
RDHrsPWlog	0.5332*	1					
Process InnovD	-0.0419	0.0982	1				
Agelog	0.0918	-0.0974	-0.0924	1			
WrkrStrt	0.0086	-0.2199*	-0.1264	0.0694	1		
YngWkr	-0.0757	0.089	0.0898	-0.2996*	-0.1229	1	
HseholdsD	-0.0268	0.2541*	-0.1396	-0.2138*	-0.2814*	0.0774	1
OthrFinanceD	-0.0291	0.0776	0.1268	-0.0322	0.1299	-0.1013	0.0446
SalesTrend	0.0557	-0.0036	0.0441	-0.2218*	0.0369	0.2548*	0.0101
MktReach	-0.0717	-0.1109	0.1485	0.2365*	0.2311*	0.0617	-0.3695*
CityD	0.2215*	0.1618*	-0.0677	-0.1025	-0.1107	0.0848	0.1875*
GreaterCityD	-0.0534	-0.0211	-0.0306	-0.0851	-0.0071	0.1449	-0.137
NationalD	-0.0713	-0.0921	0.049	0.1602*	0.1988*	0.0082	-0.1402
EastAfricaD	-0.0406	-0.0666	0.1766*	0.2110*	0.0787	-0.1246	-0.2059*
SuplrFrms	0.3655*	0.0696	-0.0172	0.1786*	0.1468	-0.1293	-0.1563*
InternetD	0.0268	0.1301	0.1830*	-0.1088	0.0999	0.0278	-0.0227
LPgaplog	-0.0223	0.0892	-0.1105	-0.1347	0.0375	-0.0209	0.1117
EntrAge	0.0414	-0.2529*	-0.1061	0.5824*	0.1795*	-0.2425*	-0.3399*
EntrEduyrs	0.1971*	0.2192*	0.1384	0.0056	0.0881	0.0943	-0.126
SecondaryD	-0.0805	-0.01	-0.0891	0.0459	-0.0591	-0.1500*	0.1247
CollegeD	0.0008	0.1296	0.0761	0.0401	-0.027	0.1832*	-0.0334
UniversityD	0.2106*	0.0504	0.0745	-0.0328	0.1393	0.0001	-0.1403
FemaleD	0.0743	0.0935	0.1951*	-0.3449*	-0.0373	0.3065*	0.2104*
DynamicNetD	0.1583*	0.0034	-0.0342	0.0176	0.0183	0.1178	-0.055
OtherBizD	0.0842	-0.1365	0.0317	-0.0038	0.1001	0.0971	-0.2747*
	Othr FinanceD	Sales Trend	Mkt Reach	CityD	Greater CityD	National D	East AfricaD
OthrFinanceD	1						
SalesTrend	-0.0774	1					
MktReach	0.0605	0.2050*	1				
CityD	0.0358	0.0402	-0.3838*	1			
GreaterCityD	-0.0133	-0.0285	0.1581*	-0.4120*	1		
NationalD	0.0075	0.1311	0.5522*	-0.2763*	-0.3651*	1	
EastAfricaD	0.0598	0.0873	0.4977*	-0.1378	-0.1820*	-0.1221	1
SuplrFrms	0.0976	0.027	0.1039	0.146	0.0437	-0.0609	0.0903
InternetD	0.0636	0.0919	0.1716*	-0.0023	0.0004	0.1581*	0.0025
LPgaplog	-0.1052	0.118	-0.0219	0.0386	-0.1201	0.044	0.0231
EntrAge	-0.1051	-0.0529	0.2078*	-0.0624	0.0016	0.119	0.1222
EntrEduyrs	0.0912	-0.0037	0.1812*	0.112	0.0871	-0.0426	0.13
SecondaryD	-0.1017	-0.2369*	-0.0003	-0.0804	-0.029	0.0754	-0.0304
CollegeD	0.0902	0.0355	-0.012	0.112	-0.0056	-0.0198	-0.0345
UniversityD	0.0438	0.0898	0.1747*	0.0128	0.0904	-0.052	0.1764*
FemaleD	-0.0263	0.0864	-0.1326	0.1132	-0.0133	-0.034	-0.1527*
DynamicNetD	0.0081	0.1342	-0.0111	0.1141	0.0252	-0.1315	0.0773
OtherBizD	0.0046	0.1728*	0.1638*	-0.0799	-0.063	0.1628*	0.0878

	SuplrFrms	InternetD	LPgaplog	EntrAge	Entr Eduyrs	SecondaryD	CollegeD
SuplrFrms	1						
InternetD	0.0472	1					
LPgaplog	-0.0461	0.0419	1				
EntrAge	0.2588*	-0.0379	-0.1179	1			
EntrEduyrs	0.2472*	0.3392*	-0.0112	-0.0733	1		
SecondaryD	-0.1768*	-0.1919*	-0.087	-0.0067	-0.2817*	1	
CollegeD	-0.0775	0.05	0.0398	-0.0778	0.3144*	-0.5346*	1
UniversityD	0.3659*	0.3333*	0.0034	0.0397	0.6605*	-0.3208*	-0.3267*
FemaleD	-0.1424	0.1111	0.0508	-0.2254*	0.1476	-0.0671	0.0902
DynamicNetD	0.144	0.0588	0.0503	0.1612*	-0.0453	-0.0782	-0.0127
OtherBizD	0.0534	0.1812*	0.0551	0.1256	-0.1106	-0.1305	-0.1403
	UniversityD	FemaleD	DynamicNetD	OtherBizD			
UniversityD	1						
FemaleD	0.0883	1					
DynamicNetD	0.0128	0.0809	1				
OtherBizD	0.1291	0.0787	0.2257*	1			

8.3 Appendix III: Multiple Linear Regression Assumptions

Following Wooldridge (2009), this study sought to satisfy the usual Classical Linear Model (CLM) assumptions as follows:

Table III: Satisfying OLS assumptions

	Assumption	**Satisfaction**
1.	Linear in parameters	The models specified in Section 6.4 assume linearity.
2.	Random Sampling	As discussed in Chapter 5, while the difficulties of survey research were acknowledged, the research sought to observe random sampling as far as possible.
3.	No perfect collinearity	Descriptive statistics (Table 6.1) indicate that none of the variables is constant or a linear combination of others. Also, no perfect or high collinearity is observed among the independent variables as evidenced in Appendix II.
4.	Zero-conditional mean (The error term has an expected value of zero at any values of the independent variables)	Careful specification of the functional relationships between the dependent variable and the independent variables was pursued. Chapter 4 sought to advise the relationships we specify by consulting past empirical studies for control variables and expected relationships. The usual log transformations were also employed and judicious adjustments of the variables (labour) carried out. Conceptual and terminological dissection of compound factors like innovation were also undertaken to abstract factors that may be correlated but are conceptually distinct and therefore an omission may violate the zero-conditional mean assumption.
5.	Homoskedasticity (The error has constant variance at any value of the explanatory variables)	Because we cannot guarantee that the variance in the error term does not depend on the variance in any of our specified independent variables, we employ the clustering option in our regressions to allow changes in the error to change with our specified factors but only within clusters or groups that may be reasonably assumed to have similar characteristics.
6.	Normality (The error is independent of the explanatory variables and is normally distributed)	Estimates of residuals appear to be normally distributed. Formal tests and graphical representations (Appendix V) formally confirm this.

8.4 Appendix IV: Fine-tuning the empirical models

On top of the interest in seeking to answer the first research question, initial results from regressions including only the control variables served two further purposes. Firstly, we study how the model changes on treating education and market reach as a set of dummy variables as opposed to (pseudo) continuous variables. Secondly, due to potential problems of the inclusion of too many variables, or overspecifying the model (Wooldridge, 2009), the results also advise on which variables may be removed from the analysis on the grounds that they may not be useful to the study in part because they have no partial effect on the dependent variable once other variables are controlled for and may have an undesirable effect on the variances of the estimators (Wooldridge, 2009).

As tables IV1a and IV1b below show, owner manager's education has a positive and significant relationship with productivity. In both TFP and Labour Productivity estimations, on average, a marginal year in formal education improves productivity by about 7%, holding other factors constant. This compares well with the average of 5.5% found in other studies of the same in developing countries (van der Sluis *et al.*, 2005). However, using dummy variables for education may be more instructive for interpretation purposes and policy implications as most students attain education qualifications in levels and most complete a given level. Besides, researchers acknowledge that there are threshold effects of education (van der Sluis *et al.*, 2005).

This also applies for the market reach variable which makes more sense as a dummy variable rather than as a pseudo continuous variable assuming a value of 1 – 5. With the use of dummy variables for education and market reach, the R-squared values of the models

increase, although standard errors also increase which compromises the overall significance of the TFP model as p-value increases from 0.008 to 0.015.

The second fine-tuning treatment of the model is thus to investigate which variables may be removed from the regression analysis. The advisement of Cohen et al. (2003) on the consideration of 'research relevance', 'less is more' and 'least is last' on the choice of variables to include in the regressions is followed to prevent lower priority variables from 'stealing' some of the variance of the higher priority variables. Thus variables reporting high correlations between themselves and/ or had low t-statistics were removed from the models in a step-wise fashion.

The variables excluded include (absolute TFP and LP t-statistics in parenthesis respectively) the number of suppliers (0.00, 0.48), internet use (0.28, 0.06), Owner/Manager's age (0.26, 0.08), external financing (0.33, 0.66), share of young workers (0.71, 0.16), age of the firm (0.72, 0.64), and process innovation (0.37, 0.15). Finally, with none of the market reach dummies reporting significant t-statistics, and indeed having very low t-statistics individually, the variable was collapsed back to its original pseudo-continuous form.

The final results following these procedures are presented in table IV-2. The cluster option was employed to allow firms with the same number of workers to be assumed to behave similarly even with regards to the unobserved errors thereby enhancing the robustness of the overall sample results.

Table IV-1a: Estimating the determinants of TFP

VARIABLES	Controls	Education_Dummies	Mkt_Dummies	MKT_Education_Dummies
1.EnovStrategyD	0.248*	0.239^	0.278*	0.266*
	(0.148)	(0.148)	(0.152)	(0.152)
RDHrsPWlog	0.019	0.023	0.022	0.025
	(0.049)	(0.050)	(0.050)	(0.050)
1.ProcessInnovD	-0.074	-0.068	-0.066	-0.054
	(0.144)	(0.144)	(0.148)	(0.148)
EntrAge	-0.002	-0.003	-0.002	-0.002
	(0.009)	(0.009)	(0.009)	(0.009)
1.SecondaryD		0.062		0.089
		(0.220)		(0.223)
1.CollegeD		0.336^		0.372^
		(0.230)		(0.233)
1.UniversityD		0.597**		0.668**
		(0.272)		(0.280)
1.FemaleD	0.060	0.043	0.054	0.031
	(0.148)	(0.149)	(0.149)	(0.150)
1.OtherBizD	-0.289*	-0.313*	-0.300*	-0.325*
	(0.160)	(0.162)	(0.163)	(0.165)
Agelog	0.070	0.066	0.067	0.063
	(0.094)	(0.094)	(0.096)	(0.096)
YngWkr	-0.001	-0.001	-0.001	-0.002
	(0.002)	(0.002)	(0.002)	(0.002)
WrkrStrt	-0.042**	-0.042**	-0.045**	-0.045**
	(0.021)	(0.021)	(0.021)	(0.021)
1.HseholdsD	-0.294*	-0.273*	-0.303*	-0.283*
	(0.162)	(0.162)	(0.164)	(0.165)
1.OthrFinanceD	0.051	0.037	0.056	0.042
	(0.135)	(0.136)	(0.137)	(0.137)
SalesTrend	0.178**	0.158*	0.186**	0.165*
	(0.086)	(0.088)	(0.087)	(0.090)
MktReach	0.071	0.078		
	(0.068)	(0.070)		
1.InternetD	0.156	0.115	0.107	0.058
	(0.210)	(0.210)	(0.215)	(0.216)
1.HumanKD	-0.327*	-0.356**	-0.258	-0.293^
	(0.175)	(0.176)	(0.186)	(0.187)
SuplrFrms	0.004	0.001	0.004	0.000
	(0.017)	(0.017)	(0.017)	(0.018)
DynamicNetD	0.284*	0.296**	0.324**	0.341**
	(0.147)	(0.147)	(0.151)	(0.151)
EntrEduyrs	0.070**		0.077**	
	(0.033)		(0.033)	
1.CityD			-0.121	-0.078
			(0.236)	(0.236)
1.GreaterCityD			0.090	0.114
			(0.216)	(0.217)
1.NationalD			0.229	0.289
			(0.248)	(0.254)
1.EastAfricaD			-0.008	-0.006
			(0.358)	(0.365)
Observations	122	122	122	122
R-squared	0.278	0.297	0.290	0.310
Model p-value	0.007	0.008	0.015	0.015

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1, ^ p<0.15

Table IV-1b: Estimating the determinants of Labour Productivity

VARIABLES	Controls	Education_Dummies	Mkt_Dummies	MKT_Education_Dummies
1.EnovStrategyD	0.345**	0.343**	0.386**	0.383**
	(0.167)	(0.168)	(0.171)	(0.173)
RDHrsPWlog	0.159***	0.158***	0.165***	0.164***
	(0.057)	(0.058)	(0.058)	(0.058)
1.ProcessInnovD	-0.069	-0.062	-0.066	-0.054
	(0.162)	(0.163)	(0.166)	(0.167)
EntrAge	0.001	0.001	0.002	0.002
	(0.010)	(0.010)	(0.010)	(0.010)
1.SecondaryD		0.144		0.180
		(0.249)		(0.252)
1.CollegeD		0.354		0.393^
		(0.260)		(0.264)
1.UniversityD		0.558*		0.613*
		(0.313)		(0.320)
1.FemaleD	0.109	0.091	0.110	0.089
	(0.166)	(0.169)	(0.168)	(0.171)
1.OtherBizD	-0.405**	-0.414**	-0.421**	-0.430**
	(0.182)	(0.185)	(0.185)	(0.189)
Agelog	-0.050	-0.054	-0.053	-0.057
	(0.105)	(0.107)	(0.108)	(0.109)
YngWkr	0.001	0.001	0.001	0.001
	(0.003)	(0.003)	(0.003)	(0.003)
WrkrStrt	-0.069***	-0.068***	-0.073***	-0.073***
	(0.025)	(0.025)	(0.025)	(0.025)
1.HseholdsD	-0.179	-0.170	-0.185	-0.177
	(0.184)	(0.187)	(0.187)	(0.189)
1.OthrFinanceD	0.107	0.100	0.113	0.106
	(0.153)	(0.155)	(0.154)	(0.156)
Klog	0.482***	0.475***	0.488***	0.483***
	(0.070)	(0.071)	(0.071)	(0.072)
SalesTrend	0.036	0.028	0.047	0.041
	(0.096)	(0.100)	(0.097)	(0.102)
MktReach	0.094	0.095		
	(0.077)	(0.079)		
1.InternetD	0.037	0.012	-0.010	-0.036
	(0.236)	(0.238)	(0.241)	(0.245)
1.HumanKD	-0.509**	-0.525**	-0.423*	-0.443**
	(0.206)	(0.209)	(0.218)	(0.221)
SuplrFrms	-0.008	-0.009	-0.008	-0.010
	(0.019)	(0.020)	(0.019)	(0.020)
DynamicNetD	0.142	0.150	0.182	0.193
	(0.165)	(0.166)	(0.170)	(0.172)
EntrEduyrs	0.065*		0.071*	
	(0.037)		(0.038)	
1.CityD			-0.188	-0.164
			(0.264)	(0.267)
1.GreaterCityD			0.124	0.133
			(0.242)	(0.246)
1.NationalD			0.240	0.263
			(0.281)	(0.289)
1.EastAfricaD			0.075	0.058
			(0.402)	(0.414)
Observations	122	122	122	122
R-squared	0.502	0.507	0.511	0.516
Model p-value	0.000	0.000	0.000	0.000

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1, ^ p<0.15

Table IV-2: Robust estimation of the determinants of firm productivity

VARIABLES	(1) TFP_Control	(2) LP_Control	(3) TFP_NewP	(4) LP_NewP
1.EnovStrategyD	0.242^	0.380*	0.259*	0.420**
	(0.145)	(0.187)	(0.140)	(0.176)
RDHrsPWlog	0.025	0.152***	0.039	0.192***
	(0.042)	(0.049)	(0.038)	(0.054)
1.SecondaryD	0.078	0.144	0.080	0.149
	(0.253)	(0.268)	(0.256)	(0.273)
1.CollegeD	0.358	0.371	0.368	0.395
	(0.249)	(0.294)	(0.248)	(0.285)
1.UniversityD	0.637**	0.557*	0.634**	0.536*
	(0.292)	(0.320)	(0.290)	(0.312)
1.FemaleD	-0.022	0.106	-0.018	0.123
	(0.149)	(0.189)	(0.150)	(0.193)
1.OtherBizD	-0.299*	-0.395**	-0.306*	-0.418**
	(0.154)	(0.183)	(0.153)	(0.187)
WrkrStrt	-0.038**	-0.063***	-0.037**	-0.062***
	(0.014)	(0.020)	(0.014)	(0.018)
1.HseholdsD	-0.249*	-0.133	-0.249*	-0.125
	(0.125)	(0.166)	(0.123)	(0.156)
Klog		0.464***		0.480***
		(0.073)		(0.079)
SalesTrend	0.129**	0.039	0.136**	0.057
	(0.056)	(0.078)	(0.056)	(0.080)
MktReach	0.086**	0.086^	0.102**	0.128*
	(0.038)	(0.056)	(0.046)	(0.064)
1.HumanKD	-0.329***	-0.571***	-0.308***	-0.532***
	(0.093)	(0.182)	(0.093)	(0.172)
DynamicNetD	0.298*	0.144	0.325**	0.212
	(0.168)	(0.187)	(0.154)	(0.151)
NewP			-0.026	-0.067
			(0.037)	(0.048)
Observations	122	122	122	122
R-squared	0.286	0.501	0.288	0.511
Model p-value	0.000	0.000	0.000	0.000

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1, ^ p<0.15

9 REFERENCES

Acs, Z. J. and D. B. Audretsch (1987). 'Innovation, Market Structure, and Firm Size', *The Review of Economics and Statistics*, vol. **69**(**4**), pp. 567-574.

Acs, Z. J. and D. B. Audretsch (1988). 'Innovation in Large and Small Firms: An Empirical Analysis', *The American Economic Review*, vol. **78**(**4**), pp. 678-690.

Ács, Z. J. and D. B. Audretsch (2005). *Handbook of entrepreneurship research : an interdisciplinary survey and introduction*, New York: Springer.

Acs, Z. J., P. Braunerhjelm, D. B. Audretsch and B. Carlsson (2009). 'The knowledge spillover theory of entrepreneurship', *Small Business Economics*, vol. **32**, pp. 15 - 30.

Aggrey, N., L. Eliab and S. Joseph (2010). 'Human Capital and Labor Productivity in East African Manufacturing Firms', *Current Research Journal of Economic Theory*, vol. **2**(**2**), pp. 48-54.

Ahmad, N. and A. Hoffman (2008) *A framework for addressing and measuring entrepreneurship*, OECD. Available at http://www.oecd.org/dataoecd/21/51/39629644.pdf.

Akoten, J. E. and K. Otsuka (2007). 'From Tailors to Mini-Manufacturers: The Role of Traders in the Performance of Garment Enterprises in Kenya', *Journal of African Economies*, vol. **16**(**4**), pp. 564-595.

Akoten, John E., Y. Sawada and K. Otsuka (2006). 'The Determinants of Credit Access and Its Impacts on Micro and Small Enterprises: The Case of Garment Producers in Kenya', *Economic Development and Cultural Change*, vol. **54**(**4**), pp. 927-944.

Anderson, P. and M. L. Tushman (1990). 'Technological Discontinuities and Dominant Designs: A Cyclical Model of Technological Change', *Administrative Science Quarterly*, vol. **35**(**4**), pp. 604-633.

Antoncic, B. and R. D. Hisrich (2003). 'Clarifying the intrapreneurship concept', *Journal of Small Business and Enterprise Development*, vol. **10**(**1**), pp. 7-24.

Arthur, W. B. (2007). 'The structure of invention', *Research Policy*, vol. **36**(**2**), pp. 274-287.

Audretsch, D. (2012). 'Entrepreneurship research', *Management Decision*, vol. **50**(**5**), pp. 755-764.

Audretsch, D. B. (1995). 'Innovation, growth and survival', *International Journal of Industrial Organization*, vol. **13**(**4**), pp. 441-457.

Audretsch, D. B. (2009). 'The entrepreneurial society', *Journal of Technology Transfer*, vol. **34**, pp. 245 - 254.

Audretsch, D. B., I. Grilo and A. R. Thurik (2007). 'Explaining entrepreneurship and the role of policy: a framework', in (Audretsch, D. B., I. Grilo and A. R. Thurik Eds.), *Handbook of research on entrepreneurship policy*, pp. 1 - 17, Cheltenham, UK ; Northampton, MA: Edward Elgar.

Audretsch, D. B., L. Klomp, E. Santarelli and A. R. Thurik (2004). 'Gibrat's Law: Are the Services Different?', *Review of Industrial Organization*, vol. **24**(**3**), pp. 301-324.

Barr, A. M. (1998). 'Enterprise performance and the functional diversity of social capital', *Centre for the Study of African Economies*, vol. **WPS/98-1**.

Barreto, H. (1989). *The Entrepreneur in Microeconomic Theory*, London: Routledge.
Basu, S. and John G. Fernald (1997). 'Returns to Scale in U.S. Production: Estimates and Implications', *Journal of Political Economy*, vol. **105**(**2**), pp. 249-283.
Bates, T. (1990). 'Entrepreneur Human Capital Inputs and Small Business Longevity', *The Review of Economics and Statistics*, vol. **72**(**4**), pp. 551-559.
Bauernschuster, S., O. Falck, R. Gold and S. Heblich (2012). 'The shadows of the socialist past: Lack of self-reliance hinders entrepreneurship', *European Journal of Political Economy*, vol. **28**(**4**), pp. 485-497.
Baum, J. R., M. Frese and R. A. Baron (2007). *The psychology of entrepreneurship*, Mahwah, NJ: L. Erlbaum Associates.
Belussi, F. and F. Arcangeli (1998). 'A typology of networks: flexible and evolutionary firms', *Research Policy*, vol. **27**(**4**), pp. 415-428.
Benavente, J. M. (2006). 'The role of research and innovation in promoting productivity in chile', *Economics of Innovation and New Technology*, vol. **15**(**4**-**5**), pp. 301-315.
Benavente, J. M. and R. Lauterbach (2008). 'Technological innovation and employment: complements or substitutes?', *The European Journal of Development Research*, vol. **20**(**2**), pp. 318-329.
Beugelsdijk, S. and N. Noorderhaven (2005). 'Personality Characteristics of Self-Employed; An Empirical Study', *Small Business Economics*, vol. **24**, pp. 159-167.
Beugelsdijk, S. and R. Smeets (2008). 'Entrepreneurial Culture and Economic Growth: Revisiting McClelland's Thesis', *American Journal of Economics and Sociology*, vol. **67**(**5**), pp. 915-939.
Bhide, A. (2000). *The Origin and evolution of New Business*, Oxford: Oxford University Press.
Biggs, T., M. Raturi and P. Srivastava (2002). 'Ethnic networks and access to credit: evidence from the manufacturing sector in Kenya', *Journal of Economic Behavior & Organization*, vol. **49**(**4**), pp. 473-486.
Biggs, T. and M. K. Shah (2006). 'African SMES, networks, and manufacturing performance', *Journal of Banking & Finance*, vol. **30**(**11**), pp. 3043-3066.
Bigsten, A., A. Isaksson, M. Söderbom, P. Collier, A. Zeufack, S. Dercon, M. Fafchamps, J. W. Gunning, F. Teal, A. Simon, B. Gauthier, A. Oduro, R. Oostendorp and C. Pattillo (2000). 'Rates of Return on Physical and Human Capital in Africa's Manufacturing Sector', *Economic Development and Cultural Change*, vol. **48**(**4**), pp. 801-827.
Bigsten, A., P. Kimuyu and K. Lundvall (2004). 'What to Do with the Informal Sector?', *Development Policy Review*, vol. **22**(**6**), pp. 701-715.
Bigsten, A. and M. Söderbom (2006). 'What Have We Learned from a Decade of Manufacturing Enterprise Surveys in Africa?', *The World Bank Research Observer*, vol. **21**(**2**), pp. 241-265.
Birch, D. (1989). 'Change, innovation, and job generation', *Journal of Labor Research*, vol. **10**(**1**), pp. 33-38.
Birch, D. L. (1987). *Job creation in America : how our smallest companies put the most people to work*, New York and London: Free Press, Collier Macmillan.
Blackford, M. G. and K. A. Kerr (1986). *Business enterprise in American history*, Boston: Houghton Mifflin.

Blanchflower, D. G. (2000). 'Self-employment in OECD countries', *Labour Economics*, vol. **7**(**5**), pp. 471-505.
Blanchflower, D. G. and A. J. Oswald (1998). 'What Makes an Entrepreneur?', *Journal of Labor Economics*, vol. **16**(**1**), pp. 26-60.
Blaug, M. (1985). *Economic theory in retrospect*, 4th ed. Cambridge ; New York: Cambridge University Press.
Blaug, M. (2000). 'Entrepreneurship before and after Schumpeter', in (Swedberg, R. Ed.) *Entrepreneurship : a social science view*, pp. x, 403 p., Oxford: Oxford University Press.
Block, J. and P. Koellinger (2009). 'I Can't Get No Satisfaction—Necessity Entrepreneurship and Procedural Utility', *Kyklos*, vol. **62**(**2**), pp. 191-209.
Bloom, N. and J. Van Reenen (2002). 'Patents, Real Options and Firm Performance', *The Economic Journal*, vol. **112**(**478**), pp. C97-C116.
Bolton, B. and J. Thompson (2004). *Entrepreneurs : talent, temperament, technique*, 2nd ed. Boston: Elsevier Butterworth-Heinemann.
Bonanno, G. and B. Haworth (1998). 'Intensity of competition and the choice between product and process innovation', *International Journal of Industrial Organization*, vol. **16**(**4**), pp. 495-510.
Borooah, V. K. and M. Hart (1999). 'Factors Affecting Self-Employment among Indian and Black Caribbean Men in Britain', *Small Business Economics*, vol. **13**(**2**), pp. 111-129.
Braunerhjelm, P. (2008). 'Entrepreneurship, knowledge and growth', *Foundations and Trends in Entrepreneurship*, vol. **4**, pp. 451-533.
Braunerhjelm, P., Z. Acs, D. Audretsch and B. Carlsson (2010). 'The missing link: knowledge diffusion and entrepreneurship in endogenous growth', *Small Business Economics*, vol. **34**(**2**), pp. 105-125.
Brazeal, D. V. and T. T. Herbert (1999). 'The Genesis of Entrepreneurship', *Entrepreneurship: Theory & Practice*, vol. **23**(**3**), pp. 29-45.
Breschi, S., F. Malerba and L. Orsenigo (2000). 'Technological Regimes and Schumpeterian Patterns of Innovation', *The Economic Journal*, vol. **110**(**463**), pp. 388-410.
Bridge, S., K. O'Neill and S. Cromie (2003). *Understanding enterprise, entrepreneurship, and small business*, 2nd Edition ed. New York: Palgrave Macmillan.
Brouwer, E., A. Kleinknecht and J. Reijnen (1993). 'Employment growth and innovation at the firm level', *Journal of Evolutionary Economics*, vol. **3**(**2**), pp. 153-159.
Brozen, Y. (1951). 'Invention, Innovation, and Imitation', *The American Economic Review*, vol. **41**(**2**), pp. 239-257.
Bulmer, M. and D. P. Warwick (1993a). 'Data Collection', in (Bulmer, M. and D. P. Warwick Eds.), *Social Research in Developing Countries*, pp. 145 - 160, London: UCL Press.
Bulmer, M. and D. P. Warwick (1993b). *Social research in developing countries : surveys and censuses in the Third World*, Chichester West Sussex ; New York: Wiley.
Caballero, A., M. P. Torrado, K. O. Becerra and M. R. d. l. Peza (2011) *Innovation and employment: Evidence from Colombian manufacturing firms*. Available at

http://www.ungs.edu.ar/globelics/wp-content/uploads/2011/12/ID-467-Parra-Torrado-Caballero-Retana-Ortiz-Becerra-Innovation-and-Employment.pdf.
Cainelli, G., R. Evangelista and M. Savona (2004). 'The Impact of Innovation on Economic Performance in Services', *Service Industries Journal*, vol. **24**(**1**), pp. 116-130.
Cainelli, G., R. Evangelista and M. Savona (2006). 'Innovation and economic performance in services: a firm-level analysis', *Cambridge Journal of Economics*, vol. **30**(**3**), pp. 435-458.
Calvo, J. (2006). 'Testing Gibrat's Law for Small, Young and Innovating Firms', *Small Business Economics*, vol. **26**(**2**), pp. 117-123.
Camagni, R. (1991). *Innovation networks : spatial perspectives*, London: Belhaven.
Cantillon, R. ([1755] 2001). *Essays on the nature of commerce in general*, New Brunswick, N.J. ; London: Transaction.
Capon, N., J. U. Farley and S. Hoenig (1990). 'Determinants of Financial Performance: A Meta-Analysis', *Management Science*, vol. **36**(**10**), pp. 1143-1159.
Carland, J. W., F. Hoy and J. A. C. Carland (1988). '"Who is an Entrepreneur?" Is a Question Worth Asking', *American Journal of Small Business*, vol. **12**(**4**), pp. 33-39.
Carlsson, B. and A.-C. Fridh (2002). 'Technology transfer in United States universities', *Journal of Evolutionary Economics*, vol. **12**(**1-2**), pp. 199-232.
Carrier, C. (1994). 'Intrapreneurship in Large Firms and SMEs: A Comparative Study', *International Small Business Journal*, vol. **12**(**3**), pp. 54-61.
Carroll, G. R. and E. Mosakowski (1987). 'The Career Dynamics of Self-Employment', *Administrative Science Quarterly*, vol. **32**(**4**), pp. 570-589.
Casson, M. ([1982] 2003). *The entrepreneur : an economic theory*, 2nd Edition ed. Cheltenham, UK ; Northhampton, MA: Edward Elgar.
Casson, M., B. Yeung, A. Basu and N. Wadeson (eds.) (2006). *The Oxford handbook of entrepreneurship*, Oxford: Oxford University Press.
Castellacci, F. (2011). 'How does competition affect the relationship between innovation and productivity? Estimation of a CDM model for Norway', *Economics of Innovation and New Technology*, vol. **20**(**7**), pp. 637-658.
Chell, E. and S. Baines (1998). 'Does gender affect business 'performance'? A study of microbusinesses in business services in the UK', *Entrepreneurship & Regional Development*, vol. **10**(**2**), pp. 117-135.
Chudnovsky, D., A. López and G. Pupato (2006). 'Innovation and productivity in developing countries: A study of Argentine manufacturing firms' behavior (1992–2001)', *Research Policy*, vol. **35**(**2**), pp. 266-288.
Clerides, S. K., S. Lach and J. R. Tybout (1998). 'Is Learning by Exporting Important? Micro-Dynamic Evidence from Colombia, Mexico, and Morocco', *The Quarterly Journal of Economics*, vol. **113**(**3**), pp. 903-947.
Coad, A. and R. Rao (2008). 'Innovation and firm growth in high-tech sectors: A quantile regression approach', *Research Policy*, vol. **37**(**4**), pp. 633-648.
Cohen, J. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences*, Mahwah, N.J. ; London: Erlbaum.
Cohen, W. M. and D. A. Levinthal (1989). 'Innovation and Learning: The Two Faces of R & D', *The Economic Journal*, vol. **99**(**397**), pp. 569-596.

Cohen, W. M. and D. A. Levinthal (1990). 'Absorptive Capacity: A New Perspective on Learning and Innovation', *Administrative Science Quarterly*, vol. **35**(**1**), pp. 128-152.

Cole, A. H. (1946). 'An Approach to the Study of Entrepreneurship: A Tribute to Edwin F. Gay', *The Journal of Economic History*, vol. **6**, pp. 1-15.

Cooke, P., N. Clifton and M. Oleaga (2005). 'Social capital, firm embeddedness and regional development', *Regional Studies*, vol. **39**(**8**), pp. 1065-1077.

Copus, A., D. Skuras and K. Tsegenidi (2008). 'Innovation and Peripherality: An Empirical Comparative Study of SMEs in Six European Union Member Countries', *Economic Geography*, vol. **84**(**1**), pp. 51-82.

Cortina, J. M. (1993). ' What is coefficient alpha? An examination of theory and applications', *Journal of Applied Psychology*, vol. **78**(**1**), pp. 98-104.

Cozza, C., F. Malerba, M. L. Mancusi, G. Perani and A. Vezzulli (2011). 'Innovation, profitability and growth in medium and high-tech manufacturing industries: evidence from Italy', *Applied Economics*, vol. **44**(**15**), pp. 1963-1976.

Crépon, B. and E. Duguet (1997). 'Estimating the Innovation Function from Patent Numbers: GMM on Count Panel Data', *Journal of Applied Econometrics*, vol. **12**(**3**), pp. 243-263.

Crepon, B., E. Duguet and J. Mairesse (1998). 'Research, Innovation and Productivity: An econometric analysis at the firm level', *Economics of Innovation and New Technology*, vol. **7**(**2**), pp. 115-158.

Crespi, G. and E. Tacsir (2011). 'Effects of innovation on employment in Latin America', in (Editor Ed.)^Eds.), *Book Effects of innovation on employment in Latin America*, pp. 1-11, City.

Crespi, G. and P. Zuniga (2012). 'Innovation and Productivity: Evidence from Six Latin American Countries', *World Development*, vol. **40**(**2**), pp. 273-290.

Crespi, G. and P. Zuniga (2012a). 'Innovation strategies and employment in Latin American firms', *UNU-MERIT Working Papers*, vol. **2012 - 22**.

Crevoisier, O. (2004). 'The Innovative Milieus Approach: Toward a Territorialized Understanding of the Economy?', *Economic Geography*, vol. **80**(**4**), pp. 367-379.

Cunningham, J. B. and J. Lischeron (1991). 'Defining Entrepreneurship', *Journal of Small Business Management*, vol. **29**(**1**), pp. 45 - 61.

da Cruz, F., K. Sommer and O. Tempra (2006) *Nairobi: Urban Sector Profile*, Nairobi, United Nations Human Settlements Programme (UN-HABITAT). Available at http://www.unhabitat.org/pmss/listItemDetails.aspx?publicationID=2791.

Daniels, L. (2001). 'A guide to measuring profits and net worth microenterprise', *Small Enterprise Development*, vol. **12**, pp. 54-66.

Daniels, L. and D. C. Mead (1998). 'The Contribution of Small Enterprises to Household and National Income in Kenya', *Economic Development and Cultural Change*, vol. **47**(**1**), pp. 45-71.

Dasgupta, P. (1988). 'Patents, Priority and Imitation or, the Economics of Races and Waiting Games', *The Economic Journal*, vol. **98**(**389**), pp. 66-80.

Dasgupta, P. and J. Stiglitz (1980). 'Uncertainty, Industrial Structure, and the Speed of R&D', *The Bell Journal of Economics*, vol. **11**(**1**), pp. 1-28.

Davidsson, P., M. B. Low and M. Wright (2001). 'Low and MacMillan Ten Years On: Achievements and Future Directions for Entrepreneurship Research', *Entrepreneurship: Theory & Practice*, vol. **25**(**4**), pp. 5.

De Propris, L. (2002). 'Types of innovation and inter-firm co-operation', *Entrepreneurship and Regional Development.*, vol. **14**, pp. 337-353.
De Vaus, D. A. (1996). *Surveys in social research*, 4th ed. London: UCL Press.
Delmar, F. and P. Davidsson (2000). 'Where do they come from? Prevalence and characteristics of nascent entrepreneurs', *Entrepreneurship & Regional Development*, vol. **12**(**1**), pp. 1-23.
Delmar, F. and J. Wiklund (2008). 'The Effect of Small Business Managers' Growth Motivation on Firm Growth: A Longitudinal Study', *Entrepreneurship Theory and Practice*, vol. **32**(**3**), pp. 437-457.
Dimov, D. (2007). 'Beyond the Single-Person, Single-Insight Attribution in Understanding Entrepreneurial Opportunities', *Entrepreneurship Theory and Practice*, vol. **31**(**5**), pp. 713-731.
Dosi, G. (1982). 'Technological paradigms and technological trajectories : A suggested interpretation of the determinants and directions of technical change', *Research Policy*, vol. **11**(**3**), pp. 147-162.
Eifert, B., A. Gelb and V. Ramachandran (2006). 'Business Environment and Comparative Advantage in Africa:Evidence from the Investment Climate Data', in (Bourguignon, F. and B. Pleskovic Eds.), *Growth and Integration*, pp. 195 - 238, Washington DC: The World Bank.
European Commission (2003). 'Commission Recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises ', *Official Journal of the European Union*, vol. **L 124**, pp. 36 - 38.
Fafchamps, M. (2000). 'Ethnicity and credit in African manufacturing', *Journal of Development Economics*, vol. **61**(**1**), pp. 205-235.
Fafchamps, M. (2001). 'Networks, Communities and Markets in Sub‐Saharan Africa: Implications for Firm Growth and Investment', *Journal of African Economies*, vol. **10**(**suppl 2**), pp. 109-142.
Fafchamps, M. and B. Minten (2002). 'Returns to social network capital among traders', *Oxford Economic Papers*, vol. **54**(**2**), pp. 173-206.
Farstad, H. (2002) *Integrated Entrepreneurship Education in Botswana, Uganda And Kenya*, National Institute of Technology, Oslo. Available at http://siteresources.worldbank.org/INTLM/214578-1103217503703/20295558/IntegratedEntrepreneurship.pdf.
Fernandes, A. M. (2008). 'Firm Productivity in Bangladesh Manufacturing Industries', *World Development*, vol. **36**(**10**), pp. 1725-1744.
Freel, M. S. (2000). 'Do Small Innovating Firms Outperform Non-Innovators?', *Small Business Economics*, vol. **14**(**3**), pp. 195-210.
Freel, M. S. and P. J. A. Robson (2004). 'Small Firm Innovation, Growth and Performance', *International Small Business Journal*, vol. **22**(**6**), pp. 561-575.
Fritsch, M. and G. Franke (2004). 'Innovation, regional knowledge spillovers and R&D cooperation', *Research Policy*, vol. **33**(**2**), pp. 245-255.
Fritsch, M. and F. Noseleit (2012). 'Start-ups, long- and short-term survivors, and their contribution to employment growth', *Journal of Evolutionary Economics*, pp. 1-15.
Fritsch, M. and A. Schroeter (2011). 'Why does the effect of new business formation differ across regions?', *Small Business Economics*, vol. **36**(**4**), pp. 383-400.
Fukuyama, F. (1995). 'Social Capital and the Global Economy', *Foreign Affairs*, vol. **74**(**5**), pp. 89-103.

Gachino, G. (2006). 'Foreign Direct Investment, Firm-Level Capabilities and Human Capital Development: Evidence from Kenyan Manufacturing Industry', *UNU-MERIT Working Papers*, vol. **2006-014**.

Gamser, M. (2003) *Improving the business trade licensing reform environment*, Department for International Development, UK. Available at http://siteresources.worldbank.org/INTWDRS/Resources/477365-1327693758977/8397896-1327771331430/dfid_gamser_4.pdf.

Ganotakis, P. and J. H. Love (2011). 'R&D, product innovation, and exporting: evidence from UK new technology based firms', *Oxford Economic Papers*, vol. **63**(**2**), pp. 279-306.

Gartner, W. (1988). '"Who is an entrepreneur?" is the wrong question', *American Journal of Small Business*, vol. **12**, pp. 11 - 32

Gartner, W. B. (1990). 'What are we talking about when we talk about entrepreneurship?', *Journal of Business Venturing*, vol. **5**(**1**), pp. 15-28.

Gartner, W. B. (2007). 'Is There an Elephant in Entrepreneurship? Blind Assumptions in Theory Development', in (Cuervo, Á., D. Ribeiro and S. Roig Eds.), *Entrepreneurship*, pp. 229-242: Springer Berlin Heidelberg.

Gereffi, G. (1999). 'International trade and industrial upgrading in the apparel commodity chain', *Journal of International Economics*, vol. **48**(**1**), pp. 37-70.

Geroski, P. and S. Machin (1992). 'Do Innovating Firms Outperform Non-Innovators?', *Business Strategy Review*, vol. **3**(**2**), pp. 79-90.

Gibb, A. (2005) *Towards the Entrepreneurial University: Entrepreneurship Education as a lever for change*, National Council for Graduate Entrepreneurship. Available at http://www.irpds.com/FileEssay/karafarin-c-1386-10-30-m21.pdf.

Glazer, A. (1985). 'The Advantages of Being First', *The American Economic Review*, vol. **75**(**3**), pp. 473-480.

Gliem, J. A. and R. R. Gliem (2003). 'Calculating, interpreting, and reporting Cronbach's alpha reliability coefficient for Likert-type scales ', in (Editor Ed.)^Eds.), *Book Calculating, interpreting, and reporting Cronbach's alpha reliability coefficient for Likert-type scales* pp. 82-88, City.

Goedhuys, M. (2007a). 'The impact of innovation activities on productivity and firm growth: evidence from Brazil', *UNU-MERIT Working Papers*, vol. **2007 - 02**.

Goedhuys, M. (2007b). 'Learning, product innovation, and firm heterogeneity in developing countries; Evidence from Tanzania', *Industrial and Corporate Change*, vol. **16**(**2**), pp. 269-292.

Goedhuys, M., N. Janz and P. Mohnen (2008). 'What drives productivity in Tanzanian manufacturing firms: technology or business environment?', *The European Journal of Development Research*, vol. **20**(**2**), pp. 199-218.

Goedhuys, M. and L. Sleuwaegen (1999). 'Barriers to growth of firms in developing countries: evidence from Burundi', in (Audretsch, D. and R. Thurik Eds.), *Innovation, industry evolution and employment*, pp. 297-314, Cambridge: Cambridge University Press.

Goedhuys, M. and L. Sleuwaegen (2010). 'High-growth entrepreneurial firms in Africa: a quantile regression approach', *Small Business Economics*, vol. **34**(**1**), pp. 31-51.

Golovko, E. and G. Valentini (2011). 'Exploring the complementarity between innovation and export for SMEs growth', *Journal of International Business Studies*, vol. **42**(**3**), pp. 362-380.

Gort, M. and S. Klepper (1982). 'Time Paths in the Diffusion of Product Innovations', *The Economic Journal*, vol. **92**(**367**), pp. 630-653.

Grabher, G. (1993). 'The weakness of strong ties: the 'lock-in' of regional development in the Ruhr area', in (Grabher, G. Ed.) *The embedded firm : on the socioeconomics of industrial networks*, pp. 306p., London ; New York: Routledge.

Grandori, A. and G. Soda (1995). 'Inter-firm Networks: Antecedents, Mechanisms and Forms', *Organization Studies*, vol. **16**(**2**), pp. 183-214.

Grant, P. and L. Perren (2002). 'Small Business and Entrepreneurial Research', *International Small Business Journal*, vol. **20**(**2**), pp. 185-211.

Griffith, R., E. Huergo, J. Mairesse and B. Peters (2006). 'Innovation and Productivity Across Four European Countries', *Oxford Review of Economic Policy*, vol. **22**(**4**), pp. 483-498.

Griliches, Z. (1979). 'Issues in Assessing the Contribution of Research and Development to Productivity Growth', *The Bell Journal of Economics*, vol. **10**(**1**), pp. 92-116.

Griliches, Z. (1998). *R&D and productivity : the econometric evidence*, Chicago: University of Chicago Press.

Hadjimanolis, A. (2000). 'An investigation of innovation antecedents in small firms in the context of a small developing country', *R&D Management*, vol. **30**(**3**), pp. 235-246.

Hall, B. H. (2011) *Using productivity growth as an innovation indicator*, European Commission. Available at http://ec.europa.eu/commission_2010-2014/geoghegan-quinn/hlp/documents/20120309-hlp-productivity-innovation_en.pdf.

Hall, B. H., F. Lotti and J. Mairesse (2008). 'Employment, innovation, and productivity: evidence from Italian microdata', *Industrial and Corporate Change*, vol. **17**(**4**), pp. 813-839.

Hall, B. H., F. Lotti and J. Mairesse (2009). 'Innovation and Productivity in SMEs: Empirical Evidence for Italy', *National Bureau of Economic Research Working Paper Series*, vol. **No. 14594**.

Harrison, M. I. (1994). *Diagnosing organizations : methods, models, and processes*, 2nd ed. Thousand Oaks, Calif.: Sage Publications.

Harrison, R., J. Jaumandreu, J. Mairesse and B. Peters (2008) *Does innovation stimulate employment? A firm-level analysis using comparable micro-data from four European countries*, National Bureau of Economic Research. Available at http://eprints.ucl.ac.uk/18867/.

Hartmann, H. (1959). 'Managers or Entrepreneurs: A Useful Distinction?', *Administrative Science Quarterly*, vol. **3**(**4**), pp. 429 - 451.

Hartog, J., M. van Praag and J. van Der Sluis (2010). 'If You Are So Smart, Why Aren't You an Entrepreneur? Returns to Cognitive and Social Ability: Entrepreneurs Versus Employees', *Journal of Economics & Management Strategy*, vol. **19**(**4**), pp. 947-989.

Hawley, F. B. (1900). 'Enterprise and Profit', *The Quarterly Journal of Economics*, vol. **15**(**1**), pp. 75-105.

Hébert, R. and A. Link (2006). 'The Entrepreneur as Innovator', *The Journal of Technology Transfer*, vol. **31**(**5**), pp. 589-597.

Hébert, R. F. and A. N. Link (1982). *The entrepreneur : mainstream views and radical critiques*, New York, N.Y.: Praeger.
Hébert, R. F. and A. N. Link (1989). 'In search of the meaning of entrepreneurship', *Small Business Economics*, vol. **1**(**1**), pp. 39-49.
Hernández-Trillo, F., J. A. Pagán and J. Paxton (2005). 'Start-up Capital, Microenterprises and Technical Efficiency in Mexico', *Review of Development Economics*, vol. **9**(**3**), pp. 434-447.
Hessels, J., M. van Gelderen and R. Thurik (2008). 'Entrepreneurial aspirations, motivations, and their drivers', *Small Business Economics*, vol. **31**(**3**), pp. 323-339.
Heunks, F. J. (1998). 'Innovation, Creativity and Success', *Small Business Economics*, vol. **10**(**3**), pp. 263-272.
Hewitt-Dundas, N. (2006). 'Resource and Capability Constraints to Innovation in Small and Large Plants', *Small Business Economics*, vol. **26**(**3**), pp. 257-277.
Hoffman, K., M. Parejo, J. Bessant and L. Perren (1998). 'Small firms, R&D, technology and innovation in the UK: a literature review', *Technovation*, vol. **18**(**1**), pp. 39-55.
Hoselitz, B. (1960). 'The early history of entrepreneurial theory', in (Spengler, J. J. and W. R. Allen Eds.), *Essays in Economic Thought: Aristotle to Marshall*, pp. 234 - 258, Chicago: Rand McNally.
Hoselitz, B. F. (1952). 'Entrepreneurship and Economic Growth', *American Journal of Economics and Sociology*, vol. **12**(**1**), pp. 97-110.
Hudson, P. (1992). *The industrial revolution*, London ; New York: E. Arnold ; Distributed in the USA by Routledge, Chapman, and Hall.
Hughes, N. and S. Lonie (2007). 'M-PESA: Mobile Money for the "Unbanked" Turning Cellphones into 24-Hour Tellers in Kenya', *Innovations: Technology, Governance, Globalization*, vol. **2**(**1-2**), pp. 63-81.
Imo, B. E. a., O. Mugenda and K. Mburugu (2010). 'Challenges Facing Apparel Traders in Nairobi, Kenya, and Strategies for Flourishing in a Liberalized Market', *Fashion Practice: The Journal of Design Creative Process*, vol. **2**(**1**), pp. 67-84.
International Labour Office (1972). *Employment, incomes and equality: a strategy for increasing productive employment in Kenya*, Geneva: International Labour Office.
International Labour Office (2004). *A fair globalization : Creating Opportunities for All*, Geneva: International Labour Office.
Jack, S. L. and A. R. Anderson (2002). 'The effects of embeddedness on the entrepreneurial process', *Journal of Business Venturing*, vol. **17**(**5**), pp. 467-487.
Jahan, S. (2000) *Measuring Human Development: Evolution of the Human Development Index*, UNDP. Available at http://hdr.undp.org/en/media/Jahan_HDI.pdf.
James, A. (2003). 'Regional culture, corporate strategy, and high tech innovation:Salt Lake City', *Unpublished thesis, Department of Geography, University of Cambridge*.
Janz, N., H. Lööf and B. Peters (2003). 'Firm Level Innovation and Productivity - Is there a Common Story Across Countries?', *ZEW Discussion Paper No. 03-26*.
Jick, T. D. (1979). 'Mixing Qualitative and Quantitative Methods: Triangulation in Action', *Administrative Science Quarterly*, vol. **24**(**4**), pp. 602-611.

Jiggins, J. (1989). 'How poor women earn income in sub-Saharan Africa and what works against them', *World Development*, vol. **17**(**7**), pp. 953-963.
Johnsen, G. J. and R. G. P. McMahon (2005). 'Owner-manager Gender, Financial Performance and Business Growth amongst SMEs from Australia's Business Longitudinal Survey', *International Small Business Journal*, vol. **23**(**2**), pp. 115-142.
Johnson, D. (2001). 'What is innovation and entrepreneurship? Lessons for larger organisations', *Industrial and Commercial Training*, vol. **33**(**4**), pp. 135-140.
Jones, E. (1993). 'The courtesy bias in South-East Asian surveys', in (Bulmer, M. and D. P. Warwick Eds.), *Social Research in Developing Countries*, pp. 253 - 260, London: UCL Press.
Jones, P. (2001). 'Are educated workers really more productive?', *Journal of Development Economics*, vol. **64**(**1**), pp. 57-79.
Jovanovic, B. (1982). 'Selection and the Evolution of Industry', *Econometrica*, vol. **50**(**3**), pp. 649-670.
Kamau, P. and I. Munandi (2009) *Innovation in the Kenyan Clothing Sector and its Impact on Employment and Poverty Reduction*, IDS, University of Nairobi. Available at http://acfrn.uonbi.ac.ke/sites/acfrn.uonbi.ac.ke/files/Innovation%20in%20Kenyan%20clothing%20sector_0.pdf.
Kantis, H., M. Ishida and M. Komori (2002) *Entrepreneurship in Emerging Economies: The Creation and Development of New Firms in Latin America and East Asia*, Washington D.C., Inter-American Development Bank.
Khundker, N. (2002). 'Garment industry in Bangladesh', in (Joshi, G. Ed.) *Garment industry in South Asia: Rags or riches?*, pp. 23 - 48, New Delhi: International Labour Organization2002.
Kihlstrom, R. E. and J.-J. Laffont (1979). 'A General Equilibrium Entrepreneurial Theory of Firm Formation Based on Risk Aversion', *The Journal of Political Economy*, vol. **87**(**4**), pp. 719-748.
Kirby, D. A. (2004). 'Entrepreneurship education: can business schools meet the challenge?', *Education + Training*, vol. **46**(**8-9**), pp. 510-519.
Kirchhoff, B. (1996). 'Self-employment and dynamic capitalism', *Journal of Labor Research*, vol. **17**(**4**), pp. 627-643.
Kirchhoff, B. A. (1994). *Entrepreneurship and Dynamic Capitalism*, Westport: Praeger.
Kirzner, I. M. (1999). 'Creativity and/ or alertness: A reconsideration of the Schumputerian entrepreneur', *Review of Austrian Economics*, vol. **11**, pp. 5 - 17.
Klepper, S. (1996). 'Entry, Exit, Growth, and Innovation over the Product Life Cycle', *The American Economic Review*, vol. **86**(**3**), pp. 562-583.
KNBS (2012) *Kenya Facts and Figures 2012*, Nairobi, Kenya National Bureau of Statistics. Available at http://knbs.or.ke/downloads/pdf/Kenyafacts2012.pdf.
Knight, F. H. (1942). 'Profit and Entrepreneurial Functions', *The Journal of Economic History*, vol. **2**, pp. 126-132.
Knight, F. H. ([1921] 2006). *Risk, uncertainty and profit*, New York: Dover Publications.
Koellinger, P. (2008). 'Why are some entrepreneurs more innovative than others?', *Small Business Economics*, vol. **31**(**1**), pp. 21-37.

Köllinger, P. and M. Minniti (2006). 'Not for Lack of Trying: American Entrepreneurship in Black and White', *Small Business Economics*, vol. **27**(**1**), pp. 59-79.
Koolman, G. (1971). 'Say's conception of the role of the entrepreneur', *Economica*, vol. **38**(**151**), pp. 269 - 286.
Landström, H. (2005). *Pioneers in entrepreneurship and small business research*, New York, N.Y.: Springer Science+Business Media.
Lee, C. (2011). 'Trade, productivity, and innovation: Firm-level evidence from Malaysian manufacturing', *Journal of Asian Economics*, vol. **22**(**4**), pp. 284-294.
Leibenstein, H. (1966). 'Allocative Efficiency vs. "X-Efficiency"', *The American Economic Review*, vol. **56**(**3**), pp. 392-415.
Lentz, R. and D. T. Mortensen (2008). 'An Empirical Model of Growth Through Product Innovation', *Econometrica*, vol. **76**(**6**), pp. 1317-1373.
Li, H. and K. Atuahene-Gima (2001). 'Product Innovation Strategy and the Performance of New Technology Ventures in China', *The Academy of Management Journal*, vol. **44**(**6**), pp. 1123-1134.
Liedholm, C. (2002). 'Small Firm Dynamics: Evidence from Africa and Latin America', *Small Business Economics*, vol. **18**(**1**), pp. 225-240.
Lingelbach, D. C., L. De La Vina and P. Asel (2005). 'What's Distinctive about Growth-Oriented Entrepreneurship in Developing Countries?', *UTSA College of Business Center for Global Entrepreneurship*, vol. **Working Paper No. 1**
Lööf, H. and A. Heshmati (2006). 'On the relationship between innovation and performance: A sensitivity analysis', *Economics of Innovation and New Technology*, vol. **15**(**4-5**), pp. 317-344.
Lotti, F., E. Santarelli and M. Vivarelli (2003). 'Does Gibrat's Law hold among young, small firms?', *Journal of Evolutionary Economics*, vol. **13**(**3**), pp. 213-235.
Loury, G. C. (1979). 'Market Structure and Innovation', *The Quarterly Journal of Economics*, vol. **93**(**3**), pp. 395-410.
Love, J. H. and P. Ganotakis (2012). 'Learning by exporting: Lessons from high-technology SMEs', *International Business Review*.
Low, M. B. (2001). 'The Adolescence of Entrepreneurship Research: Specification of Purpose', *Entrepreneurship: Theory & Practice*, vol. **25**(**4**), pp. 17.
Low, M. B. and I. C. MacMillan (1988). 'Entrepreneurship: Past research and future challenges', *Journal of Management*, vol. **14**, pp. 139 - 161.
Low, M. B. and I. C. MacMillan (2007). 'Entrepreneurship: Past Research and Future Challenges', *Entrepreneurship*, pp. 131-154.
Lundmark, E. and A. Westelius (2013). 'Entrepreneurship as Elixir and Mutagen', *Entrepreneurship Theory and Practice*.
Lundström, A. and L. Stevenson (2005). *Entrepreneurship policy : theory and practice*, New York: Springer.
Lundvall, K. and G. E. Battese (2000). 'Firm Size, Age and Efficiency: Evidence from Kenyan Manufacturing Firms', *Journal of Development Studies*, vol. **36**(**3**), pp. 146.
Mairesse, J. and P. Mohnen (2002). 'Accounting for Innovation and Measuring Innovativeness: An Illustrative Framework and an Application', *The American Economic Review*, vol. **92**(**2**), pp. 226-230.
Mansfield, E. (1961). 'Technical Change and the Rate of Imitation', *Econometrica*, vol. **29**(**4**), pp. 741-766.

Mansfield, E. (1962). 'Entry, Gibrat's Law, Innovation, and the Growth of Firms', *The American Economic Review*, vol. **52**(**5**), pp. 1023-1051.
Mansfield, E. (1963). 'Intrafirm Rates of Diffusion of an Innovation', *The Review of Economics and Statistics*, vol. **45**(**4**), pp. 348-359.
Mansfield, E., M. Schwartz and S. Wagner (1981). 'Imitation Costs and Patents: An Empirical Study', *The Economic Journal*, vol. **91**(**364**), pp. 907-918.
Mansury, M. A. and J. H. Love (2008). 'Innovation, productivity and growth in US business services: A firm-level analysis', *Technovation*, vol. **28**(**1–2**), pp. 52-62.
Martinez, D., J.-G. Mora and L. E. Vila (2007). 'Entrepreneurs, the Self-employed and Employees amongst Young European Higher Education Graduates', *European Journal of Education*, vol. **42**(**1**), pp. 99-117.
Martins, P. and Y. Yang (2009). 'The impact of exporting on firm productivity: a meta-analysis of the learning-by-exporting hypothesis', *Review of World Economics*, vol. **145**(**3**), pp. 431-445.
McClelland, D. C. (1961). *The achieving society*, Princeton, N.J: Van Nostrand.
McCormick, D. (1993) *Risk and Firm Growth: The dilemma of Nairobi's Small-scale manufacturers*, Nairobi, University of Nairobi.
McCormick, D. (1997). 'Industrial District or Garment Ghetto? Nairobi's Mini Manufacturers', in (van Dijk, M. P. and R. Rabellotti Eds.), *Enterprise Clusters and Networks in Developing Countries*, pp. 109 - 130, London: Frank Cass.
McCormick, D. (1998) *Enterprise clusters in Africa: On the way to industrialisation?*, University of Nairobi. Available at http://www2.acdivoca.org/acdivoca/Amapbds.nsf/f8aed16f1717ff208525738f00036e21/90942cf7bc1ad5ee85256e590070a49a/$FILE/Enterprise%20Clusters%20in%20Africa%20Industrialization,%20McCormick.pdf.
McCormick, D., P. Kimuyu and M. Kinyanjui (2007). 'Textiles and Clothing: Global Players and Local Struggles', in (McCormick, D., Patrick Alila and Mary Omosa Ed.) *Business in Kenya: Institutions and Interactions*, Nairobi: University of Nairobi Press.
McCormick, D., M. N. Kinyanjui and G. Ongile (1997). 'Growth and barriers to growth among Nairobi's small and medium-sized garment producers', *World Development*, vol. **25**(**7**), pp. 1095-1110.
McCormick, D., W. Mitulla and M. Kinyanjui (2003) *How to Collaborate: Associations and other Community Based rganisations among Kenyan Micro and Small-scale Entrepreneurs*, Nairobi, Institute for Developments Studies, University of Nairobi.
McDade, B. E. and A. Spring (2005). 'The 'new generation of African entrepreneurs': networking to change the climate for business and private sector-led development', *Entrepreneurship & Regional Development*, vol. **17**(**1**), pp. 17-42.
McPherson, M. A. (1996). 'Growth of micro and small enterprises in southern Africa', *Journal of Development Economics*, vol. **48**(**2**), pp. 253-277.
Mead, D. C. (1999). 'MSEs tackle both poverty and growth (but in differing proportions)', in (King, K. and S. McGrath Eds.), *Enterprise in Africa: Between Poverty and Growth* pp. pp. 61-70, London: Intermediate Technology Publications.
Mead, D. C. and C. Liedholm (1998). 'The dynamics of micro and small enterprises in developing countries', *World Development*, vol. **26**(**1**), pp. 61-74.

Metcalfe, J. S. (2006). 'Entrepreneurship: An evolutionary perspective', in (Casson, M., B. Yeung, A. Basu and N. Wadeson Eds.), *The Oxford Handbook of Enterpreneurship*, pp. 59 - 90, Oxford: Oxford University Press.

Michelacci, C. (2003). 'Low Returns in R&D due to the Lack of Entrepreneurial Skills', *The Economic Journal*, vol. **113**(**484**), pp. 207-225.

Miller, D. (1983). 'The Correlates of Entrepreneurship in Three Types of Firms', *Management Science*, vol. **29**(**7**), pp. 770 - 791.

Mitchell, J. C. (1973). 'Networks, Norms and Institutions ', in (Boissevain, J. and J. C. Mitchell Eds.), *Network Analysis: Studies in Human Interaction*, pp. 2-35, The Hague: Mouton.

Monge-González, R., J. A. Rodríguez-Alvarez, J. Hewitt, J. Orozco and K. Ruiz (2011). 'Innovation and Employment Growth in Costa Rica A Firm-level Analysis', *TECHNICAL NOTES Inter-American Development Bank Science and Technology Division, Social Sector*, vol. **No. IDB-TN-318**.

Moroz, P. W. and K. Hindle (2012). 'Entrepreneurship as a Process: Toward Harmonizing Multiple Perspectives', *Entrepreneurship Theory and Practice*, vol. **36**(**4**), pp. 781-818.

Moyi, E. (2006) *Policy Advocacy Needs of MSE Associations in Kenya: A Survey of MSE Associations in Nairobi, Mombasa, Kisumu and Nakuru*, Kenya Institute for Public Policy Research and Analysis (KIPPRA). Available at http://www.kippra.org/docs/SP8.pdf.

Moyi, E. and P. Njiraini (2005) *Misallocation of Workspaces for MSEs in Kenya: Some Lessons and Models*, http://www.kippra.org/docs/DP53.pdf, Kenya Institute for Public Policy Research and Analysis (KIPPRA).

Mueller, S. L. and A. S. Thomas (2001). 'Culture and entrepreneurial potential: A nine country study of locus of control and innovativeness', *Journal of Business Venturing*, vol. **16**(**1**), pp. 51-75.

Murphy, J. T. (2002). 'Networks, Trust, and Innovation in Tanzania's Manufacturing Sector', *World Development*, vol. **30**(**4**), pp. 591-619.

Mutula, S. M. (2002). 'University education in Kenya: current developments and future outlook', *The International Journal of Educational Management*, vol. **16**(**3**), pp. 109-119.

Nairobi City Council (2012). 'History of Nairobi', in (Editor Ed.)^Eds.), *Book History of Nairobi*, City.

Naumann, E. (2006) *The Multifibre Agreement - WTO Agreement on Textiles and Clothing*, Tralac. Available at http://www.fibre2fashion.com/industry-article/pdffiles/the-multifibre-agreement.pdf.

NCAPD (2011) *State of Kenya Population 2011*, National Coordinating Agency for Population and Development, Nairobi Kenya. Available at http://www.ncapd-ke.org/index.php?option=com_docman&task=doc_download&gid=111&Itemid=73.

Nelson, E. G. and E. J. De Bruijn (2005). 'The voluntary formalization of enterprises in a developing economy—the case of Tanzania', *Journal of International Development*, vol. **17**(**4**), pp. 575-593.

Nelson, R. R. and S. G. Winter (1982). *An evolutionary theory of economic change*, Cambridge, Mass ; London: Belknap Press of Harvard University Press.

Nemet, G. F. (2009). 'Demand-pull, technology-push, and government-led incentives for non-incremental technical change', *Research Policy*, vol. **38**(**5**), pp. 700-709.

Nichter, S. and L. Goldmark (2009). 'Small Firm Growth in Developing Countries', *World Development*, vol. **37**(**9**), pp. 1453-1464.

Noorderhaven, N., R. Thurik, S. Wennekers and A. Van Stel (2004). 'The Role of Dissatisfaction and per Capita Income in Explaining Self-Employment across 15 European Countries', *Entrepreneurship: Theory & Practice*, vol. **28**(**5**), pp. 447-466.

Oketch, M. O. (2004). 'The emergence of private university education in Kenya: trends, prospects, and challenges', *International Journal of Educational Development*, vol. **24**(**2**), pp. 119-136.

Ongile, G. and D. McCormick (1996). 'Barriers to Small Firm Growth: Evidence from Nairobi's Garment Industry', in (McCormick, D. and P. O. Pedersen Eds.), *Small Enterprises: Flexibility and Networking in an African Context*, pp. 40 - 62, Nairobi: Longhorn.

Parisi, M. L., F. Schiantarelli and A. Sembenelli (2006). 'Productivity, innovation and R&D: Micro evidence for Italy', *European Economic Review*, vol. **50**(**8**), pp. 2037-2061.

Parker, S. C. (2009). 'Why do small firms produce the entrepreneurs?', *The Journal of Socio-Economics*, vol. **38**(**3**), pp. 484-494.

Pearsall, J. (2002). *The concise Oxford English dictionary*, 10th ed. Oxford: Oxford University Press.

Peil, M. (1993). 'Situational Variables', in (Bulmer, M. and D. P. Warwick Eds.), *Social Research in Developing Countries*, pp. 71 -88, London: UCL Press.

Peneder, M. (2009). 'The Meaning of Entrepreneurship: A Modular Concept', *Journal of Industry, Competition and Trade*, vol. **9**, pp. 77 - 99.

Penrose, E. T. (2009 [1959]). *The theory of the growth of the firm*, 4th ed. Oxford ; New York: Oxford University Press.

Pollin, R., M. w. Githinji and J. Heintz (2008). *An employment-targeted economic program for Kenya*, Cheltenham: Edward Elgar.

Prestowitz, C. V. (1988). *Trading places : how we allowed Japan to take the lead*, New York: Basic Books.

Quince, T. and H. Whittaker (2002) *Entrepreneurs and their Businesses: Executive Summary of Key Findings*, Centre for Business Research, University of Cambridge. Available at http://www.esds.ac.uk/doc/5458%5Cmrdoc%5Cpdf%5C5458userguide.pdfhttp://www.esds.ac.uk/doc/5458%5Cmrdoc%5Cpdf%5C5458userguide.pdf.

Rahmouni, M., M. Ayadi and M. Yildizoğlu (2010). 'Characteristics of innovating firms in Tunisia: The essential role of external knowledge sources', *Structural Change and Economic Dynamics*, vol. **21**(**3**), pp. 181-196.

Ramachandran, V. and M. K. Shah (1999). 'Minority Entrepreneurs and Firm Performance in Sub-Saharan Africa', *Journal of Development Studies*, vol. **36**(**2**), pp. 71.

Rauch, A. and M. Frese (2007). 'Let's put the person back into entrepreneurship research: A meta-analysis on the relationship between business owners' personality traits, business creation, and success', *European Journal of Work and Organizational Psychology*, vol. **16**(**4**), pp. 353-385.

Raustiala, K. and C. Sprigman (2006). 'The Piracy Paradox: Innovation and Intellectual Property in Fashion Design', *Virginia Law Review*, vol. **92**(**8**), pp. 1687-1777.

Redlich, F. (1949). 'The Business Leader in Theory and Reality', *American Journal of Economics and Sociology*, vol. **8**(**3**), pp. 223-237.

Reynolds, P. D., S. M. Camp, W. D. Bygrave, E. Autio and M. Hay (2001) *Global Entrepreneurship Monitor: 2001 Summary Report*, London Business School and Babson College. Available at http://www.gemconsortium.org/document.aspx?id=189.

Ricketts, M. (2006). 'Theories of Entrepreneurship: Historical Development and Critical Assessment', in (Casson, M., B. Yeung, A. Basu and N. Wadeson Eds.), *The Oxford Handbook of Enterpreneurship*, pp. 33 - 58, Oxford: Oxford University Press.

Roberts, P. W. (1999). 'Product innovation, product–market competition and persistent profitability in the U.S. pharmaceutical industry', *Strategic Management Journal*, vol. **20**(**7**), pp. 655-670.

Rocha, H. (2004a) *Entrepreneurship and Regional development: The Role of Clusters*, London, London Business School.

Rocha, H. and J. Birkinshaw (2007). *Entrepreneurship safari: a phenomenon-driven search for meaning*, Boston: Now Publishers.

Rogers, E. M. ([1962] 1995). *Diffusion of innovations*, 4th Edition ed. New York: Free Press.

Romer, P. M. (1986). 'Increasing Returns and Long-Run Growth', *Journal of Political Economy*, vol. **94**(**5**), pp. 1002.

Romer, P. M. (1990). 'Endogenous Technological Change', *Journal of Political Economy*, vol. **98**(**s5**), pp. S71.

Romer, P. M. (1994). 'The Origins of Endogenous Growth', *The Journal of Economic Perspectives*, vol. **8**(**1**), pp. 3-22.

Ronge, E., L. Ndirangu and H. Nyangito (2002) *Review of Government Policies for the Promotion of Micro and Smallscale Enterprises*, Kenya Institute for Public Policy Research and Analysis.

Roper, S. (1997). 'Product Innovation and Small Business Growth: A Comparison of the Strategies of German, U.K. and Irish Companies', *Small Business Economics*, vol. **9**(**6**), pp. 523-537.

Roper, S., J. Du and J. H. Love (2008). 'Modelling the innovation value chain', *Research Policy*, vol. **37**(**6–7**), pp. 961-977.

Rosa, P., S. S. Kodithuwakku and W. Balunywa (2009). 'Entrepreneurial Motivation in Developing Countries: What Does 'Necessity' and 'Opportunity' Entrepreneurship Really Mean?', *Frontiers of Entrepreneurship Research*, vol. **26**(**20**).

Rosenbusch, N., J. Brinckmann and A. Bausch (2011). 'Is innovation always beneficial? A meta-analysis of the relationship between innovation and performance in SMEs', *Journal of Business Venturing*, vol. **26**(**4**), pp. 441-457.

Sala-i-Martin, X., G. Doppelhofer and R. I. Miller (2004). 'Determinants of Long-Term Growth: A Bayesian Averaging of Classical Estimates (BACE) Approach', *The American Economic Review*, vol. **94**(**4**), pp. 813-835.

Sala-i-Martin, X. X. (1997). 'I Just Ran Two Million Regressions', *The American Economic Review*, vol. **87**(**2**), pp. 178-183.

Sarasvathy, S. D. and S. Venkataraman (2011). 'Entrepreneurship as Method: Open Questions for an Entrepreneurial Future', *Entrepreneurship Theory and Practice*, vol. **35**(**1**), pp. 113-135.

Saxenian, A. (1994). *Regional advantage : culture and competition in Silicon Valley and Route 128*, Cambridge, Mass.: Harvard University Press.
Saxenian, A. (2006). *The new argonauts : regional advantage in a global economy*, Cambridge, Mass.: Harvard University Press.
Say, J. B. ([1821] 1971). *A treatise on political economy; or, The production, distribution & consumption of wealth*, New York: A. M. Kelley.
Schein, E. H. (1995). 'The Role of the Founder in Creating Organizational Culture', *Family Business Review*, vol. **8**(**3**), pp. 221-238.
Scherer, F. M. (1986). *Innovation and growth : Schumpeterian perspectives*, Cambridge, Mass: MIT Press.
Schmookler, J. (1962). 'Economic Sources of Inventive Activity', *The Journal of Economic History*, vol. **22**(**1**), pp. 1-20.
Schulte, P. (2004). 'The entrepreneurial university: a strategy for institutional development', *Higher Education in Europe*, vol. **29**(**2**), pp. 187-191.
Schultz, T. W. (1975). 'The value of the ability to deal with disequilibria', *Journal of Economic Literature*, vol. **13**(**3**), pp. 827 - 846.
Schumpeter, J. A. (1934). *The theory of economic development*, New Brunswick: Transaction Publishers.
Schumpeter, J. A. (1939). *Business cycles; a theoretical, historical, and statistical analysis of the capitalist process*, Abridged Version ed. New York, London,: McGraw-Hill Book Company, inc.
Schumpeter, J. A. (1943). *Capitalism, socialism, and democracy*, London,: G. Allen & Unwin ltd.
Scott, M. and P. Rosa (1996). 'Has Firm Level Analysis Reached its Limits? Time for a Rethink', *International Small Business Journal*, vol. **14**(**4**), pp. 81-89.
Sen, A. (1999). *Development as freedom*, New York: Anchor books.
Senbet, L. W. and I. Otchere (2006). 'Financial Sector Reforms in Africa: Perspectives on Issues and Policies', in (Bourguignon, F. and B. Pleskovic Eds.), *Growth and Integration*, pp. 81 - 124, Washington DC: The World Bank.
Shackle, G. L. S. (1966). *The nature of economic thought*, Cambridge: Cambridge University Press.
Shane, S., E. A. Locke and C. J. Collins (2003). 'Entrepreneurial motivation', *Human Resource Management Review*, vol. **13**(**2**), pp. 257-279.
Shane, S. and S. Venkataraman (2000). 'The promise of entrepreneurship as a field of research', *Academy of Management review*, vol. **25**(**1**), pp. 217 - 226.
Shane, S. A. (2003). *A general theory of entrepreneurship : the individual-opportunity nexus*, Cheltenham, UK ; Northampton, MA, USA: E. Elgar.
Shaver, K. G. (2007). 'C2D2: Psychological methods in Entrepreneurship research', in (Baum, J. R., M. Frese and R. A. Baron Eds.), *The psychology of entrepreneurship*, Mahwah, NJ: L. Erlbaum Associates.
Shaver, K. G. and L. R. Scott (1991). 'Person, Process, Choice: The Psychology of New Venture Creation', *Entrepreneurship: Theory & Practice*, vol. **16**, pp. 23-45.
Silverberg, G., G. Dosi and L. Orsenigo (1988). 'Innovation, Diversity and Diffusion: A Self-Organisation Model', *The Economic Journal*, vol. **98**(**393**), pp. 1032-1054.
Sleuwaegen, L. and M. Goedhuys (2002). 'Growth of firms in developing countries, evidence from Côte d'Ivoire', *Journal of Development Economics*, vol. **68**(**1**), pp. 117-135.

Smith, A. ([1776] 1976). *An inquiry into the nature and causes of the wealth of nations*, Oxford: Clarendon Press.
Smith, K. G., M. J. Gannon and H. J. Sapienza (1989). 'Selecting Methodologies for Entrepreneurial Research: trade-offs and Guidelines', *Entrepreneurship: Theory & Practice*, vol. **14**(**1**), pp. 39-49.
Söderbom, M., F. Teal, A. Wambugu and G. Kahyarara (2006). 'The Dynamics of Returns to Education in Kenyan and Tanzanian Manufacturing', *Oxford Bulletin of Economics and Statistics*, vol. **68**(**3**), pp. 261-288.
Solow, R. M. (1956). 'A Contribution to the Theory of Economic Growth', *The Quarterly Journal of Economics*, vol. **70**(**1**), pp. 65-94.
Solow, R. M. (1957). 'Technical Change and the Aggregate Production Function', *The Review of Economics and Statistics*, vol. **39**(**3**), pp. 312-320.
Spencer, A. and B. Kirchhoff (2006). 'Schumpeter and new technology based firms: Towards a framework for how NTBFs cause creative destruction', *International Entrepreneurship and Management Journal*, vol. **2**(**2**), pp. 145-156.
Stewart Jr, W. H., W. E. Watson, J. C. Carland and J. W. Carland (1999). 'A proclivity for entrepreneurship: A comparison of entrepreneurs, small business owners, and corporate managers', *Journal of Business Venturing*, vol. **14**(**2**), pp. 189-214.
Storey, D. J. (1994). *Understanding the small business sector*, London ; New York: Routledge.
Stycos, J. M. (1993). 'Sample surveys for social science in underdeveloped areas', in (Bulmer, M. and D. P. Warwick Eds.), *Social Research in Developing Countries*, pp. 53 - 64, London: UCL Press.
Szarka, J. (1990). 'Networking and Small Firms', *International Small Business Journal*, vol. **8**(**2**), pp. 10-22.
Thornhill, S. (2006). 'Knowledge, innovation and firm performance in high- and low-technology regimes', *Journal of Business Venturing*, vol. **21**(**5**), pp. 687-703.
Thornton, P. H. (1999). 'The Sociology of Entrepreneurship', *Annual Review of Sociology*, vol. **25**, pp. 19-46.
Thurik, A. R., M. A. Carree, A. van Stel and D. B. Audretsch (2008). 'Does self-employment reduce unemployment?', *Journal of Business Venturing*, vol. **23**(**6**), pp. 673-686.
Tobin, J. (1958). 'Estimation of Relationships for Limited Dependent Variables', *Econometrica*, vol. **26**(**1**), pp. 24-36.
Todaro, M. P. and S. C. Smith (2011). *Economic development*, 11th Edition ed. Harlow: Pearson Addison Wesley.
Tomlinson, P. R. (2011). 'Strong ties, Substantive Embeddedness and Innovation: Exploring Differences in the Innovative Performance of Small and Medium-sized Firms in UK Manufacturing', *Knowledge and Process Management*, vol. **18**(**2**), pp. 95-108.
Tushman, M. L. and P. Anderson (1986). 'Technological Discontinuities and Organizational Environments', *Administrative Science Quarterly*, vol. **31**(**3**), pp. 439-465.
Tybout, J. R. (2000). 'Manufacturing Firms in Developing Countries: How Well Do They Do, and Why?', *Journal of Economic Literature*, vol. **38**(**1**), pp. 11-44.
Ucbasaran, D., M. Wright and P. Westhead (2003). 'A longitudinal study of habitual entrepreneurs: starters and acquirers', *Entrepreneurship & Regional Development*, vol. **15**(**3**), pp. 207-228.

UNEP (2009) *Kenya: Atlas of our Changing Environment*, United Nations Environment Programme, Nairobi. Available at http://www.unep.org/dewa/africa/kenyaatlas/PDF/Kenya_Atlas_Full_EN_72dpi.pdf.

UNICEF (2007) *Can the Kenyan State put the 300,000 most vulnerable children in the country on a cash transfer programme by the end of 2010?*, New York, United Nations Children's Fund (UNICEF), . Available at http://www.unicef.org/Can_the_Kenyan_State_put_300K_Most_Vulnerable_Children_on_Cash(4).pdf.

UNIDO (2004) *Survey of Small and Medium Enterprises in The Global Compact*, Vienna, UNIDO. Available at http://www.unido.org/fileadmin/media/documents/pdf/Services_Modules/csr_smes_global_compact.pdf.

Utterback, J. M. and F. F. Suárez (1993). 'Innovation, competition, and industry structure', *Research Policy*, vol. **22**(**1**), pp. 1-21.

van Praag, M., A. van Witteloostuijn and J. van der Sluis (2009) *Returns for Entrepreneurs versus Employees: The Effect of Education and Personal Control on the Relative Performance of Entrepreneurs vis-à-vis Wage Employees*, Tinbergen Institute. Available at http://www.tinbergen.nl/discussionpapers/09111.pdf.

Van Biesebroeck, J. (2005). 'Firm Size Matters: Growth and Productivity Growth in African Manufacturing', *Economic Development and Cultural Change*, vol. **53**(**3**), pp. 545-583.

van der Sluis, J., M. van Praag and A. van Witteloostuijn (2007). 'Why are the returns to education higher for entrepreneurs than for employees?', in (Editor Ed.)^Eds.), *Book Why are the returns to education higher for entrepreneurs than for employees?*, City: IZA Bonn.

van der Sluis, J., M. van Praag and W. Vijverberg (2005). 'Entrepreneurship Selection and Performance: A Meta-Analysis of the Impact of Education in Developing Economies', *The World Bank Economic Review*, vol. **19**(**2**), pp. 225-261.

van Praag, C. M. (1999). 'Some Classic Views on Entrepreneurship', *De Economist*, vol. **147**(**3**), pp. 311 - 335.

van Praag, C. M. and P. Versloot (2007). 'What is the value of entrepreneurship? A review of recent research', *Small Business Economics*, vol. **29**(**4**), pp. 351-382.

van Stel, A., M. Carree and R. Thurik (2005). 'The Effect of Entrepreneurial Activity on National Economic Growth', *Small Business Economics*, vol. **24**(**3**), pp. 311-321.

Vermeulen, P. A. M., J. P. J. De Jong and K. C. O'Shaughnessy (2005). 'Identifying key determinants for new product introductions and firm performance in small service firms', *The Service Industries Journal*, vol. **25**(**5**), pp. 625-640.

Vinding, A. L. (2006). 'Absorptive capacity and innovative performance: A human capital approach', *Economics of Innovation and New Technology*, vol. **15**(**4-5**), pp. 507-517.

Vivarelli, M. (2012). 'Innovation, Employment and Skills in Advanced and Developing Countries: A Survey of the Literature', *IZA Discussion Paper No. 6291*.

Waheed, A. (2011). 'Innovation and firm-level productivity: econometric evidence from Bangladesh and Pakistan', *UNU-MERIT Working Paper Series*, vol. **2011 - 061**.

Waheed, A. (2012). 'Employment effect of innovation: microdata evidence from Bangladesh and Pakistan', *UNU-MERIT Working Papers*, vol. **2012-024**.

Warwick, D. P. (1993). 'On methodological integration in social research', in (Bulmer, M. and D. P. Warwick Eds.), *Social Research in Developing Countries*, pp. 275 -298, London: UCL Press.

Wennekers, S. and R. Thurik (1999). 'Linking Entrepreneurship and Economic Growth', *Small Business Economics*, vol. **13**(**1**), pp. 27-56.

Westhead, P. and S. Birley (1995). 'Employment Growth in New Independent Owner-Managed Firms in Great Britain', *International Small Business Journal*, vol. **13**(**3**), pp. 11-34.

Whetten, D. A. (1989). 'What Constitutes a Theoretical Contribution?', *The Academy of Management Review*, vol. **14**(**4**), pp. 490-495.

Wiklund, J., P. Davidsson, D. B. Audretsch and C. Karlsson (2011). 'The Future of Entrepreneurship Research', *Entrepreneurship Theory and Practice*, vol. **35**(**1**), pp. 1-9.

Wilkinson, R. G. and K. Pickett (2010). *The spirit level : why greater equality makes societies stronger*, New York: Bloomsbury Press.

Witt, U. (1998). 'Imagination and leadership – The neglected dimension of an evolutionary theory of the firm', *Journal of Economic Behavior & Organization*, vol. **35**(**2**), pp. 161-177.

Witt, U. (1999). 'Do Entrepreneurs Need Firms? A Contribution to a Missing Chapter in Austrian Economics', *The Review of Austrian Economics*, vol. **11**(**1-2**), pp. 99-109.

Wolff, J. A. and T. L. Pett (2006). 'Small-Firm Performance: Modeling the Role of Product and Process Improvements', *Journal of Small Business Management*, vol. **44**(**2**), pp. 268-284.

Wooldridge, J. M. (2009). *Introductory econometrics : a modern approach*, 4th ed. Mason, OH: South Western, Cengage Learning.

World Bank (2008) *Kenya poverty and equality assessment*, World Bank, Nairobi. Available at http://siteresources.worldbank.org/INTAFRREGTOPGENDER/Resources/PAKENYA.pdf.

Wyrwich, M. (2012). 'Can socioeconomic heritage produce a lost generation with regard to entrepreneurship?', *Journal of Business Venturing*.

Xavier, S. R., D. Kelley, J. Kew, M. Herrington and A. Vorderwülbecke (2013) *Global Entrepreneurship Monitor: 2012 Global Report*, Global Entrepreneurship Research Association. Available at http://www.gemconsortium.org/docs/download/2645.

Yang, C.-H. and C.-H. A. Lin (2008). 'Developing employment effects of innovations: microeconometric evidence from Taiwan', *The Developing Economies*, vol. **46**(**2**), pp. 109-134.

Zahra, S. A. and G. George (2002). 'Absorptive Capacity: A Review, Reconceptualization, and Extension', *The Academy of Management Review*, vol. **27**(**2**), pp. 185-203.