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## Innovation in the Informal Economy

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### Introduction

As Chapter 1 showed, the central economic and social role of the informal sector is increasingly appreciated. Yet while evidence shows that informal entrepreneurs can drive innovation, research on innovation in developing countries has been devoted mostly to formal sectors, organizations and institutions. What is lacking are studies assessing the role of innovation emanating within and from the informal sector. Who is the archetypical innovator in the informal economy? What types of innovations are generated? What is different from what one would encounter in the formal economy?

Finding answers to these questions is a new field of research. On the one hand, the literature devoted to the study of the informal sector does not directly address the topic of innovation. In fact, the ability of the informal economy to do “new things in a different way,” its inventive ingenuity, rarely features as a topic at all. On the other hand, the equally vast literature on national innovation systems in countries at different stages of development largely overlooks the informal sector.

The objective of this chapter is to push the boundaries of research in this field, first by conceptually integrating so far separate analyses of innovation and the informal economy and second by using research methods not often used by those studying the economic and employment aspects of innovation or the informal economy. The findings are based on an analysis of the existing literature, but more importantly on analytical fieldwork conducted for this book in three countries, and in the context of research undertaken by the Open African Innovation Research (Open AIR) network.<sup>1</sup>

<sup>1</sup> [www.OpenAIR.org.za](http://www.OpenAIR.org.za).

## Defining Innovation

At the outset, it is important to establish a clear conceptual understanding of innovation. Often innovation is equated with research and development (R&D) – intensive technological breakthroughs or, in IP circles, patentable inventions. In the context of this book, however, a broader and deeper understanding of innovation is needed.

One does not need to reinvent the wheel for this purpose. In high- and low-income countries alike, for measurement purposes, innovation is now understood as the “implementation of a new or significantly improved product (good or service), or process, a new marketing method [e.g. a novel product design], or a new organizational method in business practices, workplace organization or external relations” (OECD/Eurostat 2005, p. 46). This definition includes incremental innovations that are new to the firm or new to the country.

According to this well-established innovation framework, innovation activities could include the acquisition of machinery, equipment, software and licenses, engineering and development work, design, training, marketing and R&D where undertaken to develop and/or implement a product or process innovation. Motives to innovate include the desire to increase market share or enter new markets, to improve the product range, to increase the capacity to produce new goods and to reduce costs.

While the above characteristics mainly describe innovation in relatively developed countries, they have also been adapted to developing countries and provide a good conceptual guidepost for studies of innovation in the informal economy.

However, measures of innovation based on the conventional definition given above may not always be appropriate in the context of developing countries or activities in the informal sector. Generally, definitions of innovation in developing countries posit it as a way to improve people’s lives by transforming knowledge into new or improved ways of doing things in a place where, or by people for whom, they have not been used before (Kraemer-Mbula and Wamae 2010a). In Chapter 8 of this book, we examine how existing metrics, survey instruments, notions of collaboration and linkages, and impact assessment tools apply – or do not apply – in this setting.

## What We Know about Informal Sector Innovation in Developing Countries

Clearly, innovation-driven growth is no longer the prerogative of high-income countries. Fostering innovation is now firmly on the agenda of many low- and middle-income countries to spur economic and social development (Lundvall *et al.* 2009; Gault 2010; Hollanders and Soete 2010; NEPAD 2010; Dutta *et al.* 2015).

The fact that innovation should not be equated simply with R&D-intensive technological breakthroughs or patentable inventions is important in this context.

It is notable, however, that for the most part, studies and metrics of innovation in developing countries focus on large-scale, formal sector R&D activities, organizations and institutions.

Several insights can be drawn from this literature.<sup>2</sup> Generally, there is a lower level of science and technology (S&T) activity in developing countries than in developed countries, in part due to human capital and infrastructure constraints. Often, government and international donors are the main funders of S&T. National public research organizations are the main R&D performers. Also, government S&T expenditures often focus on agriculture rather than on engineering or industrial research. There is a lack of applied research, a deficit of trained engineers and scientists, weak technological capability and mostly inadequate scientific and technological infrastructures in these economies.

Limited science–industry linkages are explained by the low absorptive capacity of firms and an ensuing lack of “business” demand for S&T. Questions also persist about the relevance of research to the business sector. Finally, there is a lack of policies and institutional structures necessary to facilitate the establishment of new firms, as well as constrained access to financing.

While assessments of innovation systems in developing countries have produced a number of important insights, the informal sector is usually not considered a potential source of innovation. As noted by Maharajh and Kraemer-Mbula (2010, p. 138),

The informal sector, especially in developing countries, comprises millions of enterprises that operate under extreme conditions of survival, scarcity and constraints. The dynamics of innovation in the informal sector, which is most extensive in developing countries, are largely

<sup>2</sup> For a summary of this literature, see WIPO (2011).

ignored in the literature on both developing and more developed economies. Yet disregarding the role of such innovation in developing countries produces misleading, asymmetrical or ineffective innovation strategies.

At best, the limited literature focused on innovation in the informal economy has concentrated on the “development of technological capacity” and/or the purchase and use of machines to produce a given set of outputs (ILO 1972, 1992).

To be fair, an economic literature has developed that focuses on urban informal entrepreneurs in developing countries (Nordman and Coulibaly 2011; Ouedraogo *et al.* 2011; Grimm, Knorringer and Lay 2012; Grimm *et al.* 2012; Thai and Turkina 2012). The group of researchers involved in these studies consists mostly of labor economists who have continually improved the methods for surveying informal sector firms via better questionnaires and better sampling and data collection strategies (Joshi, Hasan and Amoranto 2009). However, these studies generally do not focus on innovation, neither explicitly nor – for the most part – implicitly.

In addition, a fast-growing body of recent research has begun to identify innovation in low-income economies. Many terms and definitions have emerged in this context: “grassroots” innovation, “base-of-the-pyramid” (BoP) innovation, innovation “for the poor by the poor,” “frugal,” “*jugaad*” and “inclusive” innovation are just some examples that are relevant to this study of the informal economy,<sup>3</sup> although these terms are not synonymous (Gupta 2013). Some of this literature focuses on serving low-income populations through innovations on the consumption side, namely radically lower-cost goods and services that meet poor people’s ability to pay, thus providing business strategies for global firms entering emerging markets (Radjou, Prabhu and Ahuja 2012). Other studies look at the actual experiences and perspectives of “knowledge rich – economically poor people,” explaining how groups such as the Honey Bee Network have helped to catalog 140,000 grassroots innovations throughout India during the past twenty years (Gupta 2012b). This blossoming part of the literature increasingly encapsulates the study of the informal sector, though often without defining it as such.

Innovation in the informal sector is also largely overlooked in the available survey data. Even in those countries and regions for which surveys of the informal economy exist – for example, establishment

<sup>3</sup> See, for example, Gault *et al.* (2012), pp. 23–32; Gupta (2012a, 2012b), pp. 28–39; and Radjou, Prabhu and Ahuja (2012).

or enterprise surveys and mixed surveys along the lines discussed in Chapters 1 and 8 of this book – the information gathered about informal employment and economic units is not directly related to innovation. Such data cover matters such as the socio-demographic characteristics of workers, terms of employment, wages and benefits, and the place of work and working conditions. Survey data and analysis that focus on firms relate to, for example, the size, type and industry of enterprise; bookkeeping and accounting practices of enterprises; input purchasing and investment; sales and profits; access to credit, training and markets; forward and backward linkages; major difficulties encountered in developing the business; and demands for public support (ADB 2011). One exception aside – see Fu *et al.* (2014) for work surveying formal and informal textile firms in Ghana carried out in parallel to the fieldwork underlying this book – there has been no survey specifically examining innovation in the informal sector.

Partly in consequence, few existing innovation or S&T policy frameworks do target innovation in the informal economy (see Chapter 7 of this book and IDRC 2011).

In the following section, the innovation system approach is used to overcome the current knowledge gap and distil the main characteristics of innovation in the informal sector.

### Analyzing Informal Innovation Systems

Whether exploring innovation within a conventional, formal paradigm or in the emerging context of informality, there is a consensus that the analysis of so-called innovation systems is required (see, e.g. Nelson (1993), Freeman (1987) and Lundvall (1992) on the innovation system literature).

This systemic approach takes a broader understanding of innovation, beyond R&D, taking into account the role of firms, education and research organizations and S&T policies and including the public sector, financing organizations and other actors and elements that influence the acquisition, use and diffusion of innovations (Freeman 1987; Lundvall 1992). Understanding innovation as a systemic process puts emphases on its interactive character, the connections among actors involved in innovative activities and the complementarities that emerge between incremental, radical, technical and organizational innovations in the context

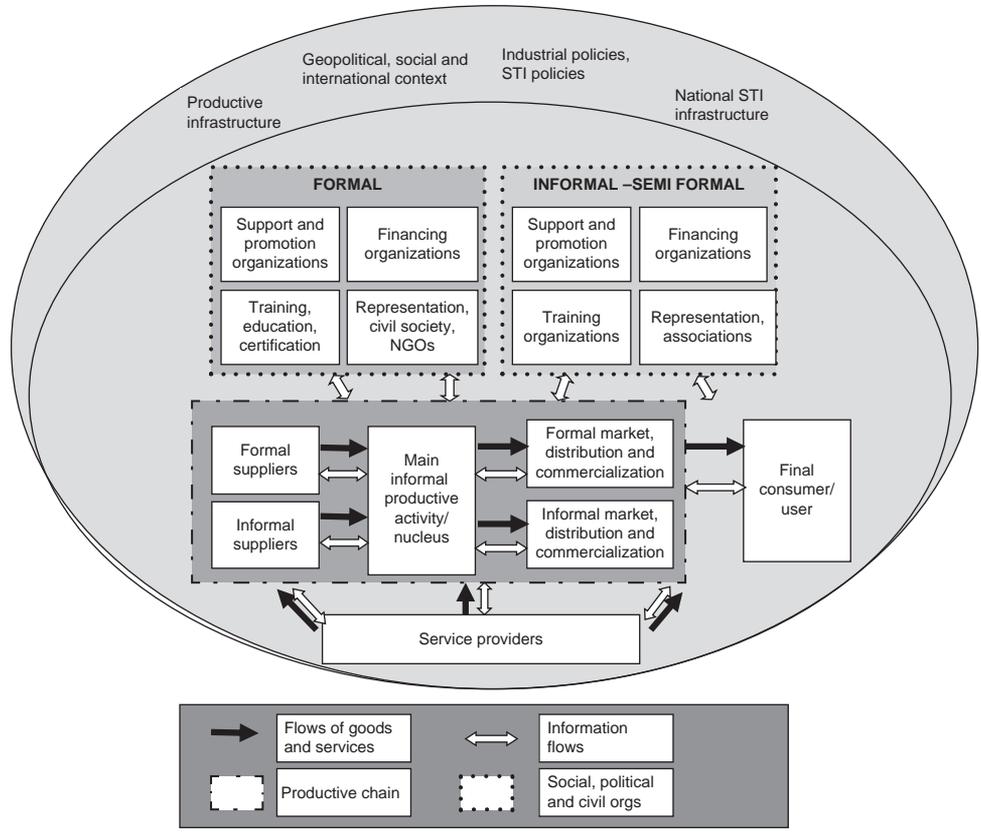
in which they emerge. Innovation systems thus evolve as the result of different development trajectories and institutional evolution – with very specific local features and dynamics.

The existing literature building on the innovation system approach has largely been applied in high-income countries and the formal sector, but researchers are now starting to apply and modify the innovation system framework to the conditions of developing countries, where economic activities are largely informal (Kraemer-Mbula and Wamae 2010b, Gault *et al.* 2012; Konté and Ndong 2012; WIPO and IERI, 2012). Funding agencies also increasingly appreciate the need for better understanding of – and support for – the linkages between the supply of new ideas from research and the demand for those ideas by local economies (Rath *et al.* 2012).

Usefully, this more recent work in developing countries also stresses the importance of the localized character of systems of innovation (Cassiolato and Lastres 2008). For instance, the work of the Research Network on Local Productive and Innovative Systems (RedeSist) in Brazil has highlighted the local dimension of innovative and productive processes, aiming to identify challenges in and concrete opportunities for fostering local development (see also Soares, Scerri and Maharajh 2013). These systems range from the simplest, most modest and disjointed to the most complex and articulated (De Matos, Soares and Cassiolato 2012). They include actors with (a) different dynamics and trajectories, from the most knowledge intensive to those that use traditional or indigenous knowledge, and (b) different sizes and functions, originating in the primary, secondary and tertiary sectors and operating on a local, national or international plane (De Matos, Soares and Cassiolato 2012). This work provides a useful platform for incorporating a set of economic, political and social actors, including informal entrepreneurs that mainly operate “locally” in relatively small geographical territories.

Figure 2.1 illustrates how the informal economy would fit within such a “local innovative and productive system” framework, alongside the formal sector, suppliers, users and broader innovation parameters such as the economic and social context, the productive and national Science, Technology and Innovation (STI) infrastructure and relevant policies and regulations.

At the core of this framework, we find a diverse range of productive structures in developing economies. These comprise formal and informal suppliers exchanging goods, services and knowledge with formal and



**Figure 2.1** The informal economy in a local innovation framework  
 Note: Adapted from De Matos, Soares and Cassiolato (2012). Erika Kraemer-Mbula with comments from Christopher Bull, George Essegbey and participants in the International Workshop on “Innovation, Intellectual Property and the Informal Economy,” Pretoria, South Africa, November, 2012.

informal businesses (in agriculture, manufacturing or services), which in turn transform those inputs into goods and services that are distributed and commercialized through both formal and informal channels until they reach the final customers or users. This diverse productive system in developing countries is largely populated by micro and small enterprises, and the majority of them are informal.

The flows of goods and services around micro and small enterprises tend to remain in their immediate locality, especially in a context where insufficient infrastructure (both physical and digital) may limit the geographical coverage of productive activities. Similarly, the information and knowledge that is assimilated and used by productive organizations also tends to remain local. These knowledge flows would involve what are commonly known as the formal organizations – comprising training and education organizations, banks and other financial organizations, as well as formal representative associations, non-governmental organizations (NGOs), community-based organizations (CBOs) and the like. There are also relevant organizations that may not hold a legal status but have some degree of structure and often membership, such as associations of traditional healers, apprenticeship training organizations and so on. It is inherently difficult to delimit these types of organizations, but they are nonetheless very relevant in shaping and steering knowledge flows, especially at the local level. In this respect, the local innovation system encloses the space where learning processes happen, productive and innovative capabilities are created and tacit knowledge flows are exchanged. In their context, therefore, territory, history and cultural context do matter.

Also importantly, as the figure illustrates, the informal economy is not disconnected from the range of economic and productive actors surrounding it. It interacts with and is influenced by parameters that are shared by formal sector innovation actors and networks. Moreover, the formal sector is impacted by the presence and activities of the informal sector as well. The most appropriate conceptualization of the informal economy (IE) is as a continuum from formal to informal, where different activities and actors occupy different places along the continuum. The transition from informal to formal status is gradual; single firms, households and workers may carry out some activities informally and others formally at the same time. In some circumstances, the IE competes with the formal sector. Often, however, the IE produces for, trades with, distributes for and provides services to the formal economy, interacting symbiotically (see Box 2.1).

**BOX 2.1 EVOLVING UNDERSTANDING OF THE INFORMAL ECONOMY**

Traditionally, formal and informal firms and their characteristics have been juxtaposed as extremes on two opposite sides of a spectrum.

A typified view of the informal sector firm retained the following characteristics: (i) low entry requirements in terms of capital and professional qualifications; (ii) a small scale of operations, often with fewer than five employees; (iii) unskilled labor/skills often acquired outside formal education; (iv) labor-intensive methods of production and simple/adapted technology; (v) scarce capital, low productivity and minimal saving; (vi) an unregulated and competitive market; and (vii) family ownership of enterprises.

These characteristics were often contrasted to the somewhat idealized characteristics of formal firms, which are often presented as having the exact opposite characteristics, that is, large scale of operations, skilled labor, capital-intensive production and so on (ILO 1972; see Table 2.1).

As argued above, the more appropriate conceptualization of the informal sector is to look at it as a continuum, from formal to informal, where different activities and actors occupy different locations along the continuum. In reality, small firms in the formal sector probably share many commonalities with firms of the IE as to what innovation and the use of appropriation mean. The transition from informal to formal enterprise status is also gradual; indeed, single firms and single households/workers can carry out some activities informally and others formally at the same time.

The degree of informality, the type of activity, the technology used, the profile of the owner and the market characteristic in which the informal sector firm operates vary significantly from one firm to another. Some IE actors are single street traders with limited education and skills who essentially operate for subsistence. Others can be unofficial firms with labor-intensive or more knowledge-intensive operations. The latter can operate in markets with high barriers to entry and capital requirements and can be dynamic businesses with wage employment.

In some sectors, firms in the IE are perceived to be more competitive than those in the formal sector. Indeed, firms may prefer to remain small and informal, rather than large and formal, if they perceive advantages in doing so. Such advantages may include greater agility to respond to changes in the technological or competitive landscape, or resilience in the face of systemic macroeconomic risks and adversity such as the recent global economic crisis.

Often, the IE produces for, trades with, distributes for and provides services to the formal economy. In some circumstances, the IE competes directly with the formal sector, at times with an unfair advantage, for example, because of tax or regulatory avoidance (Banerji and Jain 2007). In other circumstances, formal and informal actors and activities interact (Thomas 1995; United Nations 1996). Also, these informal firms often

Table 2.1 *The flawed juxtaposition of informal versus formal enterprises*

	Informal firms	Formal firms
Business size	Small – fewer than five workers/paid employees	Large – greater than fifty workers
Start-up capital/ qualification	Low – easy to start a business	High – difficult to start a business
Factor of production	Labor intensive	Automated production
Work conditions	Unprotected by contracts, social welfare or unions	Protected by contracts, social welfare and unions
Skills	Skills passed on through informal apprenticeships	High-level skills from formal training institutions
Raw materials	Scrap from formal and informal sources	New from local and imported sources
Infrastructure	Unreliable power and insecure premises	Reliable power and secure premises
Resources	Limited access to capital goods and funding	Extensive access to capital goods and funding
Selling price	Affordable to local population	Out of reach of local population
Demand	Low	High
Quality	Low-quality goods	High-quality goods
Proximity to consumers	Close	Distant
Profit	Low	High
Medium of exchange	Cash	Cash and bank credit (e.g. credit card)
Market linkages	Poor distribution network, fragmented informational environment	Well-established distribution network
Flexibility	Adapts well to market conditions	Difficult to adapt
Efficiency	Efficiency through coordination among businesses	Efficiency through vertical integration
Risk attitude	Risk avoiders	Risk takers
Culture	Embedded in social relations	Relies on impersonal written rules of the firm

have direct backward or forward linkages with the formal sector.<sup>4</sup> Individuals switch between formal and informal work or, in many cases, engage in both types of activities. These linkages are important for understanding how firms “graduate” from an informal to a formal status (Charmes 2009) – not least because the economic literature suggests that informal enterprises that have links to the formal sector are more profitable and dynamic than those that do not (Grimm *et al.* 2012).

This framework has been applied in the field research underlying this book.

The lessons generated are summarized in the following sections of this chapter. Importantly, the informal economy and its various sub-sectors and clusters are above all extremely diverse, as was noted in Chapter 1. The heterogeneity of the informal sector has been one of the most fundamental findings of research on this topic for decades (Mead and Morrisson 1996).

Naturally, the diversity of the informal economy is also reflected in the innovation that goes on within it. Innovation activities are extremely diverse, as are the sources of knowledge, learning and innovation that shape and diffuse them. Broad generalizations about the entire informal sector must therefore be treated with caution. The incidence, characteristics, role and impact of innovation vary widely across the wide spectrum of varied informal economy clusters and sub-sectors. The findings presented in this book bear witness to the great heterogeneity that exists among informal firms within and across different sectors in terms of not only technological capabilities and capital endowment but also their interactions with the formal sector (see also Kraemer-Mbula and Wamae 2010a).

This in itself is not necessarily surprising or a source of concern. Innovation in the formal sector also varies greatly across firms, sectors and regional clusters.

More generally, the findings in this book suggest that differences between formal sector and informal sector firms may be overstated. Empirical studies often conclude that informal firms behave much like a “normal firm” with formal skills but that they operate under various market imperfections. Furthermore, informal enterprises in developing countries are often as technologically innovative as their formal sector counterparts, or even more so. Clearly, both formal and informal

<sup>4</sup> Backward linkages from the informal sector involve trading of goods produced in the formal sector by the informal sector so that informal traders act as a link between formal producers and customers. Forward linkages from the informal sector involve the production of goods and services in the informal sector for use in the formal sector.

enterprises are affected by the same “backdrop” that characterizes a developing-country economy – the institutional structures/constraints that may hinder access to financial resources, skills of the workforce, access to training, facilities, and other essential factors. In addition, however, mainstream producers in the formal economy actually often overlook many local needs, either because the market is not attractive enough to make a profit or because a certain product cannot reach the local market due to some technology, skill or environment-related constraint. Often, too, formal sector firms operate in rather uncompetitive markets with no incentive to innovate. Finally, they often lack absorptive and technical capacities and skills to innovate.

With these caveats in mind, the following insights into firms and innovation in the informal sector emerge from the fieldwork undertaken for this book and other recent research.

### *Firm Typology in the Informal Sector*

Classifying entities in the informal sector into clearly distinguishable and markedly different groups has conceptual and practical appeal.

The literature often classifies the informal sector into two clearly distinct segments, the so-called lower tier and upper tier (House 1984; Fields 1990; Mead and Liedholm 1998; Nichter and Goldmark 2009). The upper tier is characterized as having a growth orientation whereas lower-tier entrepreneurs are focused on survival (Grimm, Knorringa and Lay 2012). Evidently, informal sector actors of the lower tier have different characteristics from upper-tier actors with respect to firm demographics, profitability, growth prospects and linkages with the formal sector (Ouedraogo *et al.* 2011). A bifurcation between a rather small group of successful entrepreneurs and a larger group of firms that struggle to survive is the evident result (Grimm, Knorringa and Lay 2012).

This binary classification is not perfect. Indeed, detailed empirical studies focusing on firm characteristics in the informal economy and our own fieldwork and survey results suggest that one can really distinguish three types of entities in the informal economy. In this updated framework, the so-called lower tier must be further subdivided between entrepreneurs who simply struggle to survive and those who have a more systematic approach to business organization and relevant profitability, but do not yet meet the criteria for membership of the small upper tier.

As noted by Grimm, Knorringa and Lay (2012), who summarize the literature in this regard: “the typical informal entrepreneur, also in

non-dynamic economies in Africa, should not too easily be labelled a survivalist waiting for a job opportunity, without entrepreneurial capacities or growth potential. We . . . show that among those entrepreneurs typically considered survivalists – mainly because they operate with very little capital and generate low profits in absolute terms – there is a substantial share of entrepreneurs with business skills and an entrepreneurial behavior that resembles [that] of upper tier entrepreneurs.” As Maloney (2004) notes, self-employment instead often serves as the “unregulated developing country analogue of the voluntary entrepreneurial small firm sector in more developed countries.”

Following this three-tier approach, a study of the informal sector in West Africa covering Benin, Côte d’Ivoire and Togo by Grimm, Knorringa and Lay (2012) identifies three sets of firms: (i) a limited number of high-growth firms referred to as “top performers”; (ii) a greater number of small structures with particularly high returns on investment but little capacity to expand, referred to as “constrained gazelles”; and (iii) a majority of firms termed “survivalists” that are essentially concerned with making a minimum of income for subsistence and are generally unable to consider making significant strides in more formal innovation (see Table 2.2). “Constrained gazelles” are mainly constrained by their business environment and thus external factors – lack of access to capital, insurance and productive infrastructure – rather than internal constraints such as education and specific business skills.

Concerning the upper tier, only a minority of firms in the informal sector can aspire to experience significant growth in revenue, to reinvest these proceeds and to have the luxury of thinking more systematically about various forms of product, process, organizational or marketing innovation. These firms are close to the formal end of the informal–formal spectrum,

Table 2.2 *Typology of informal sector entities in West Africa*

Upper tier	Top performers	Better-off, growth-oriented entrepreneurs with high capital stock and medium to high return.
Middle tier	Constrained gazelles	Share many characteristics with top performers, including high capital returns, but face low capital stocks and constrained growth.
Lower tier	Survivalists	Share little or no characteristics with top performers; face low capital stock and low return.

Source: Adapted from Grimm, Knorringa and Lay (2012).

with significant scale, an established firm structure and organization, significant revenues and ability to invest, and overall rather formalized transactions and links to the formal economy. At the top of this scale, there are even dynamic, high-growth informal firms that operate in modern hi-tech industries (Günther and Launov 2006).

The findings of the country fieldwork for this book show that the great majority of firms are micro and small enterprises, clearly different from those upper-tier firms with fast growth, profitability, capital and other investments, and an established and growing organizational structure.

Evidence from the home and personal care sector in South Africa – see Chapter 4 in this book – reveals that the majority of firms in the sector are micro-enterprises, with about 90 percent of the companies comprised of just the owner or only one or two employees. Most informal enterprises had been established recently (60 percent were between one and three years old) and reported low turnover. The fieldwork on Ghana's herbal medicine sector described in Chapter 5 shows similar patterns. Traditional Medicine Practitioners (TMPs) are predominantly micro or small entrepreneurs; 70 percent of TMPs sampled in the study have no more than five employees.

The studies also show that only a minority can be regarded as upper tier. Few actors can be associated with highly innovative firms that increase their scale and scope. Indeed, only a handful of entrepreneurs in small businesses have formalized their practice and set up modern enterprises for the production and supply of herbal products. Undeniably, most micro-firms do not grow their business. Kabecha (1998) even argues that in the informal sector technology has often been used to maintain the market, not expand it.

Yet if one adopts a broad understanding of innovation as applied in this book, it is not necessarily reserved to the upper tiers of the economy. While categorizing some firms as upper tier is useful, the spectrum of informal economy firms is large and quite fluid, so any classification must be used with care.

The dominance of micro-firms and the lack of firms with significant revenue growth does not mean that innovation is not taking place in the informal economy. While individual firms in specific informal sectors may be small, they are part of a broader, highly dynamic cluster or network of entrepreneurial firms with overall medium- to large-scale operations. A number of entities harbor the potential for innovative activities, as a strong entrepreneurial dynamism is present despite low capital stocks.

*Education, Training and Knowledge Spillover*

Micro-entrepreneurs generally tend to acquire knowledge and skills on the job in the form of “learning-by-doing,” “learning-by-training” and through apprenticeships in formal or informal workshops. The customary view is that learning and innovation in the informal economy are often based on apprenticeships where senior artisans train younger ones. A significant, often anthropologic, literature has been devoted to the study of these apprenticeships and the passing of knowledge (King 1974; Charmes 1980).

This model of learning and skills diffusion via apprenticeships is still operational today (Kinyanjui 2008). For example, a study of automotive artisans in Uganda as part of the Open AIR project shows that senior artisans help relatives or friends out of generosity; in return young artisans who are eager to learn provide cheap labor (Kawooya 2014). Once they master particular skills, the senior artisans assign them to specific tasks. When their training is completed, junior artisans often leave and perform similar tasks in close geographical proximity, raising important issues of how know-how and innovations are appropriated by the original inventor. Junior apprentices acquire know-how in the course of apprenticeship and then go on to improve processes. At times, an apprentice has been reported to “steal” the master’s secrets (Charmes 1980). When that is done, he or she is ready to go and establish his or her own enterprise.

But skills in the informal economy are not derived solely from such types of apprenticeship. First, the dense relationships in innovation clusters lead to an efficient diffusion of knowledge and know-how. The study of the creation of Kashmiri Pashmina Shawls in India shows how the passing on of skills in close-knit inter-organizational networks helps share knowledge and innovation (Sheikh 2014).

Increasingly, informal sector firms show an openness to codified forms of knowledge. In addition to the approaches described above, skills are acquired through earlier formal education (Kraemer-Mbula and Wamae 2010a). Trial and error, assisted by books, manuals and the Internet, and knowledge spillovers gained by importing and selling equipment are also sources of advanced skills (ILO 1992). At higher stages of development, a combination of some formal education, specific vocational training and work experience can be an important source of innovative capacity among micro-enterprises in the informal sector (Kabecha 1998).

Moreover, supply-and-demand interactions play an important role shaping learning and innovation processes in informal enterprises. Studies suggest, for instance, that informal sector blacksmiths – who are often farmers as well – better understand demand preferences in the informal economy and are able to use local knowledge to produce high-quality customer-tailored tools (Akbulut 2009). Customers prefer their products because they are able to adapt them swiftly to changes in farming conditions. Moreover, customers, suppliers and technology transfer agencies regularly suggest technical and commercial solutions to problems. Best practices are then transferred among manufacturers (see Chapters 4 and 5).

Empirical studies have also discovered rather unusual knowledge flows between the formal and informal sectors, where formally trained designers and academic researchers sometimes draw on the expertise of artisans in the informal sector to provide local society with innovative products or services. The collaboration between informal sector automotive artisans and mechanics and formal university researchers in Uganda is characterized by what is termed a “reverse knowledge flow,” that is, the designs and production techniques of informal economy actors are being introduced to the formal research centers and universities, not the other way around (Kawooya 2014).

As in the formal sector, imported products are an important source of learning for product innovators. Import competition constitutes a supply-side stimulus, giving scope to micro-enterprises to learn and imitate. However, the relative sophistication of imported technology in relation to the sophistication of the local formal industry and the skills of local entrepreneurs reduces the potential to adapt equipment. When there exists no local formal industry, and the technology gap between imports and local production is too high, no local innovation will occur on the basis of imports, a situation referred to as “technological dualism” in the literature (Kabecha 1998). There is thus a link between the availability of skills and capital upgrading in the informal sector and the nature of the local formal industry. The existence of a local capital goods industry, involved in the production of machinery and tools, creates skills that are favorably used in the informal sector as well. Countries solely importing machines from abroad were found to have entrepreneurs with less ability to improve technological capability by demonstration and learning.

*Sophistication of Inventive Activity: Innovation, Imitation and Adaptation*

Most empirical studies stress that entities are – despite their low capital intensity and low use of technology – highly dynamic. Innovations take place in relation to inputs, processes and outputs, allowing informal firms to adapt to new circumstances and exploit market opportunities.

Early case study work focusing on “technological capabilities” already revealed the innovative strain of micro-entrepreneurs in the informal sector (Amin 1989; Khundker 1989; Ranis and Stewart 1999). The informal metal manufacturing and construction sectors of developing countries were studied as examples in the 1980s (Mlinga and Wells 2002).<sup>5</sup> In particular, in the early 1990s the ILO led extensive case study work across different regions to assess technological capability in the manufacturing sector.

In this research, the concept of innovation was relatively limited. It was often understood as the purchase and use of new machines, that is, capital accumulation to improve production processes. It was found that informal actors introduce new products or improve existing ones, that processes are made more efficient and that new tools are tested.

This earlier sector-specific work has been revived more recently with new country- and sector-specific fieldwork such as the work conducted for this book that stresses the adaptive and innovative nature of the informal sector. These more recent dedicated surveys of micro-entrepreneurs or precise sectors are based on a broader understanding of innovation as discussed above.

The new studies share some conclusions with earlier contributions to the literature. Both earlier and current research suggests that there is more adaptation and imitation than original invention in the informal economy (ILO 1992; Chapters 3–6 of this book). Most of the studies cite examples of adaptation of equipment of industrial origin rather than of any intrinsic ability to create original technological components. This type of innovation has been characterized as “quick responses to market demand and supply” (Bryceson 2002; Kraemer-Mbula and Wamae 2010b), “innovation under conditions of scarcity” (Srinivas and Sutz 2008) or “tinkering on the margins,”<sup>6</sup> mostly problem-solving to overcome shortcomings that often

<sup>5</sup> For earlier work on informal metal manufacturing, see King (1974), Aftab and Rahim (1986) and ILO (1992).

<sup>6</sup> A term suggested by Travis Lybbert (University of California, Davis) in the course of this project.

but not exclusively originate from an underperforming formal economy, for example, lack of parts or other supplies in the formal sector, and/or to adapt foreign products to local conditions. Examples abound in the area of self-construction of tools, metal manufacturing and, more generally, repair and maintenance activities.

However, little consistent evidence emanates from these studies concerning the *type* of innovation taking place in the informal economy. It is unclear which type of innovation – product, process, organizational or marketing innovation – is most prevalent in the informal economy, and whether innovation aims to improve product variety or product quality.

On the one hand, technological change often comes from entrepreneurs' imitation of existing models for their own use in workshops, rather than for sale on the market, for example, self-construction of tools to improve processes (ILO 1992). The aim in such cases is to increase production volume and reduce unit costs via process innovation and new tools. This is clearly an important aspect; prices, especially relative to the formal sector, are among the most important drivers of sales (Kabecha 1997).

On the other hand, studies stress that informal economy firms are more concerned with producing new products than utilizing technology because the former can result in an immediate gain (de Beer, Fu and Wunsch-Vincent 2013). Creating new products and product diversification are also a reaction to fierce competition among producers.

Among the few available studies, quality has been found to influence consumers in the informal sector; it is associated not only with durability (Kabecha 1997) but also with product design and packaging.

Business owners of informal metal manufacture firms in Kenya have been found to focus on quality and style to differentiate their products (see Chapter 3). This indicates that informal firms see value in improving on and competing over the quality of the final product. The informal sofa-makers of Gikomba in Nairobi adopt new coordination modes, experimenting quickly and constantly to produce a large number of new designs and develop new models, about 1,500 sofa frames per week. Similarly, Chapter 4 reports that quite a few South African informal manufacturers of home and personal care products (40 percent of respondents) regard quality as an important feature of their products and perceive their goods to be of higher quality than those of their immediate competitors operating nearby. The case study of traditional medicine in the informal sector in Chapter 5 also finds quality driving innovation in the various components of the value chain. In the production process,

adherence to quality assurance practices enables the traditional medicine products to pass regulatory tests. Even going to market, the quality of packaging differentiates products from competitors.

In general, issues relating to technology and capital affect the scale at which innovation-related production and trade occur in the informal economy. Even studies that tend to be optimistic about the level and scope of innovation in the informal sector, such as Daniels (2010), see “scalability” as an important problem. As the *Oslo Manual* notes, “[T]he sometimes great creativity invested in solving problems in the informal economy does not lead to systematic application and thus tends to result in isolated actions which neither increase capabilities nor help establish an innovation-based development path” (OECD/Eurostat 2005, p. 137). The informal sector’s challenge, to be more precise, is not with innovation itself, but rather with its scalable application.

### *Technology, Capital and Capability*

Many micro-firms in the informal economy demonstrate low capital intensity and limited skills, using simple technologies and facing limitations to technical upgrading. A central problem is the lack of access to techniques and technology and the lack of resources to develop processes and improve machinery. Because of irregular cash flow, time away from production to develop machinery, for instance, is in very short supply. While large producers often have a selection of technology packages to choose from, small entrepreneurs rarely have access to technology to meet their needs.

Instead, informal enterprises often innovate, crafting affordable versions of expensive equipment by reassembling surplus components and at the same time overcoming scarcity and other material constraints. For instance, as reported in Chapter 3, informal metalworkers in Nairobi produce commodity goods such as potato chip cutters using very basic tools and materials but, alas, often with inadequate protective equipment, for example, using cardboard face shields to protect workers. Informal enterprises in the home and personal care sector in South Africa reproduce electric mixers using a secondhand electrical drill and other material found in a scrap yard (see Chapter 4). By doing so, they considerably reduce the cost of machinery. While incremental in nature, these initiatives have significant implications for informal firms, which are able to enlarge their scale of business and change their business models. At the

same time, access to more sophisticated techniques and technology remains elusive.

Furthermore, the skills acquired through traditional types of activities can impose a constraint on the acquisition of new techniques requiring education and training (Aftab and Rahim 1986, 1989; Aftab 2012).

### *Organization of Activities in Clusters and Linkages to the Formal Sector*

Few studies are available on linkages between the formal and informal sectors, the clustering of informal sector activities and the impact of such arrangements.

Existing studies do, however, reveal that instead of individuals, communities can best be regarded as the main agents of innovation (see Chapter 6). Indeed, firms in the informal economy tend to operate in clusters or “agglomerations,” including in the process of creating or applying new knowledge or generating new products or processes (Livingstone 1991). This clustering of operators and strong informal networks facilitates a rapid transfer of skills and knowledge within the sector with a view to solving problems (ILO 1992; Sheikh 2014). Moreover, clusters of informal operators develop reputation over time that can effectively attract potential buyers and suppliers (Chapter 3; Bull *et al.* 2014).

As shown by the country studies in this book, intermediary organizations within these clusters are said to play a strong role in improving production conditions and profitability in the informal sector.

Previously, and despite operation in clusters, collective initiatives or innovation-gearred activities could be considered rare. Individual initiatives by informal sector entrepreneurs with limited support from the wider institutional framework were mostly responsible for improving production conditions and the profitability of commercial activities.

Some improvement has taken place in recent years, as initiatives have sought to organize workers in the informal economy to achieve economies of scale (Kawooya and Musungu 2010; Kraemer-Mbula and Wamae 2010a). For example, the Kamukunji Jua Kali Association, the first informal manufacturing association in Kenya, discussed in Chapter 3, acts as a meaningful intermediary organization, promoting joint production and improvement of processes and also helping to gain recognition of the cluster and government support for the artisans. Informal TMPs in Ghana also make efforts to form associations to address issues of mutual

interest relating to their practice. In their associations, they can socialize with peers, more experienced practitioners and experts in order to exchange ideas and information, obtain new knowledge, and advertise and promote their products (see Chapter 5 and Essegbey *et al.* 2014).

Despite their evident positive impact, not enough is known about the forward and backward linkages between informal and formal sector actors and value chains (Kraemer-Mbula and Wamae 2010a). Backward linkages show the extent to which informal sector enterprises obtain inputs from the formal economy in the form of raw materials, technologies, intermediate products or final goods. Forward linkages show the ability of informal enterprises to supply the formal sector with intermediary or final goods, for instance, through sub-contracting. In particular, the role of formal scientific or R&D institutions in innovation activities within the informal economy is under-researched. Yet these linkages can have an important positive influence on technology diffusion and knowledge acquisition (Bhaduri and Sheikh 2013; de Beer, Fu and Wunsch-Vincent 2013). Connecting with formal organizations can facilitate links with other formal structures and related opportunities for informal actors. Sometimes, too, innovation in the informal sector occurs with the help of formal sector scientific institutions. In sum, the systematic collaboration of the informal economy with the formal sector for innovation, including with formal sector institutions such as universities or public research centers, appears to be the exception, not the norm. Promoting this collaboration is also not traditionally a declared objective of government policy. These issues are discussed in more detail in Chapter 8 of this book.

Where they do take place, however, formal–informal sector interactions are bearing fruit. Recent case studies show that the networking of TMPs in Ghana with local knowledge institutions and regulatory bodies has upgraded their knowledge and stimulated innovations. Informal manufacturers in the home and personal care industry in South Africa who are able to connect with the wider innovation system are also shown to be more likely to succeed in their innovation efforts. As Kraemer-Mbula and Tau note (2014, p. 41), “88% of manufacturers that interacted with formal organizations reported a range of benefits as a result, whilst in 12% of the cases the services provided by formal organizations did not seem to suit their needs. The benefits reported ranged from using manufacturing facilities, products manufacturing training (mostly linked to those interacting with technology transfer organizations), support with book keeping, mentorship and networking with other entrepreneurs.”

In the traditional medicine sector in Ghana, for example, researchers from the Centre for Scientific Research into Plant Medicine have facilitated innovation of traditional medical practitioners by helping to develop product-testing methods and practices. A study of the agricultural subsistence sector in the United Republic of Tanzania and its interaction with the Engineering Department of the local university suggests that technological capabilities have been improved and newly acquired – though at a basic level (Szogs and Mwantima 2009). A study in Uganda shows the cross-fertilization and utilization of innovations between formal institutions, as in universities and research centers, and informal sector entities (Kawooya 2014).

As described earlier, the formal sector also receives fresh ideas and inspiration from skillful and resourceful actors in the informal sector. Innovative informal sector actors are found to inspire their formal sector counterparts with new products or processes. In this sense, copying and learning is not a one-way street between the formal and the informal sector, but rather a dynamic, bi-directional process. One example is the informal sector automotive artisans and mechanics providing knowledge and practical inputs to formal university researchers in the aforementioned study in Uganda, helping them with the novel design and production of cars (Kawooya 2014).

Recognizing this, some more recent policy schemes aim to increase linkages within the informal sector and also between the informal sector and formal institutions and firms.

Table 2.3 synthesizes our findings about the characteristics of innovation in the informal economy based on our three case studies.

### *Barriers to Innovation in the Informal Sector*

Despite their heterogeneity, informal sector enterprises face a number of common obstacles to innovation and upgrading.

Evidently, constraints imposed by corruption, violence, threats to health and safety and other risks may be highly relevant, although generally beyond the scope of this book. Obstacles to technological progress in the informal economy are largely determined by infrastructure, financial, educational and skills, information and other constraints.<sup>7</sup>

<sup>7</sup> Authors' conclusion based on Aboagye (1986), Aftab (2012), Grimm, Knorringa and Lay (2012), IDRC (2011), Kabecha (1998) and Nordman and Coulibaly (2011).

Table 2.3 *Features of innovation in the informal economy – evidence from the case studies*

	Informal metalworking sector in Kenya	Informal manufacture of home and personal care products in South Africa	Traditional herbal medicine in Ghana
<b>Firms and entrepreneurs</b>	<p>Three types of informal enterprises are observed, over two-thirds of which employ no more than one employee:</p> <ul style="list-style-type: none"> <li>– clusters of micro-enterprises (e.g. Kamukunji) with small revenues producing mass commodity goods for low-income consumers who care mainly about the functionality of the product;</li> <li>– clusters of micro-enterprises (e.g. Racecourse) producing custom artworks for middle- and upper-income markets with consumers looking for better-quality products and services;</li> <li>– isolated small-scale enterprises founded by skilled or creative <i>jua kali</i> or formal entrepreneurs developing new products and seeking formal intellectual property protection.</li> </ul>	<p>A large number of newly established micro-firms and informal manufacturers are observed, essentially catering to the demand for cheap products while hiring few or no employees (e.g. one or two people) and generating only small revenues.</p>	<p>Predominantly micro or small entrepreneurs are observed serving primarily low-income households and the poor, generating low revenues and employing few employees (two people on average).</p> <p>Some TMPs are observed who have formalized their practice and set up larger commercial entities.</p>

Table 2.3 (cont.)

	Informal metalworking sector in Kenya	Informal manufacture of home and personal care products in South Africa	Traditional herbal medicine in Ghana
<b>Education and training</b>	<p>Most craftsmen have primary school education while some have completed secondary and even tertiary schooling. There is also some influx of workers trained in the formal sector. Fundis most often receive training from other fundis in the cluster. Some receive training from employers, relatives or friends. Few receive training from professional instructors.</p>	<p>Education levels of informal manufacturers surveyed are high, with one-third of respondents having some tertiary education. Training is often provided by suppliers and technology transfer agencies. Many informal actors learn informally from other manufacturers, through self-training and by experimentation.</p>	<p>Most TMPs are educated with many going beyond secondary education. Most TMPs acquire their skills for practice through apprenticeship and family traditional medicine practice.</p>
<b>Imitation, adaptation, and innovation</b>	<p>Low levels of innovation are observed in production clusters, mostly product adaptations to suit available materials, tools and skills. A moderate amount of product innovation takes place in semi-formal small enterprises and in informal clusters producing for middle- and upper-income buyers. New products are mostly developed by informal firms operating away from the large clusters without fear of their products being quickly copied. Cost reduction, customer demand and creativity of individual fundis are the primary drivers of innovation.</p>	<p>Incremental product innovation and occasionally incremental process innovation occur in this sector. Innovation activities are largely triggered by information provided by suppliers, and thus reactive rather than proactive innovation. Proactive innovation is often based on the imitation of other formal and/or informal micro-enterprises.</p>	<p>Some TMPs show no sign of innovation. Some micro- and small-scale practitioners adopt innovations developed by others. A more sophisticated category of informal firms carries out product, process and organizational innovations in healthcare delivery. Drivers of innovation are policy and regulation in the public health sector, competition with domestic and imported traditional medicine products, market demand and the entrepreneurial spirit of the informal sector.</p>
<b>Technology, capital, and capability</b>	<p>Lack of machinery and adequate technology are common in this sector. Less advanced production technologies, simple tools and basic material are prevalent among informal micro-enterprises producing mass commodity goods. Informal metalworkers targeting middle- and upper-income markets have access to specialized suppliers for tools, hardware and materials producing products with better quality and novelty. Innovative enterprises have sufficient cash flow to support the development process.</p>	<p>Informal manufacturers mainly rely on manual techniques and production processes. Owing to the lack of capital, informal manufacturers use rather basic equipment. The use of sophisticated technology and equipment is reserved to a minority. Lack of machinery and equipment is a major limitation on innovation.</p>	<p>There is a medium to high rate of technological progress in production. Some old modes of production are giving way to modern machinery and scientific equipment. Most respondents are self-reliant financially with little help to accumulate capital to finance new tools and materials.</p>
<b>Knowledge flows and collaboration</b>	<p>Business in certain clusters (e.g. Kamukunji) relies heavily on networks and collaboration underpinned by trust-based relationships and the sharing of resources within the cluster. Most <i>fundis</i> allow other <i>fundis</i> to copy their designs. To a lesser extent, linkages with formal sector firms also matter. Producers in other clusters (e.g. Racecourse) rely less on collaboration and openness but share resources when needed. These firms have more access to formal training, financing and suppliers. Innovative informal actors often have a network of support organizations and intermediaries</p>	<p>Informal entrepreneurs rely on collaboration and the exchange and sharing of ideas with other informal manufacturers to innovate. A sense of responsibility and duty toward the community underpins this knowledge exchange. About half of the respondents interact with formal or semi-formal organizations to access opportunities and innovate. Knowledge is acquired from both formal sources such as suppliers, technology transfer agencies, business incubators, associations and networking initiatives</p>	<p>A strong tradition of knowledge-sharing underpins innovation in the traditional medicine sector. TMPs join local, national and international associations to foster networking and facilitate the flow of knowledge. TMPs reach out to local knowledge institutions, regulatory bodies and other intermediaries to upgrade their knowledge. Universities and research institutions promote innovation by upgrading the knowledge base and by investing in human resource.</p>

Table 2.3 (cont.)

Informal metalworking sector in Kenya	Informal manufacture of home and personal care products in South Africa	Traditional herbal medicine in Ghana
<p>(e.g. the Kenya Industrial Property Institute and the Center for Intellectual Property and Information Technology). Via associations, sharing is encouraged by holding meetings and by intervening when a member works in secrecy. The government shows support for informal enterprises by encouraging partnerships with the formal sector, e.g. via incentives for vendors that partner with informal micro-firms.</p>	<p>and informal sources such as experimentation, self-training and apprenticeship. Formalization through business registration is usually required in order to access support from government in the form of funding, training and access to technology. As a result existing policies are not always available to spur knowledge creation and diffusion.</p>	<p>Most TPMs surveyed want to team up with somebody to commercialize their enterprise on a large scale. The Ministry of Health formulates relevant policies and programs to encourage knowledge-sharing and further innovation in the TM sector.</p>

Source: Authors based on Chapters 3–5.

In terms of infrastructure, the most important constraints are a lack of space and infrastructure to expand operations coupled with inconsistent energy supply and other factors. In terms of financial constraints, informal sector actors face capital market imperfections as lenders are risk averse and uncertain about lending to them, meaning they face pressure to achieve immediate return. In terms of educational and skills constraints, informal sector operators often have insufficient education, skills and knowledge, and classic training organizations are geared to supplying their services to formal enterprises only. At times, informal sector operators lack the ambition and skills to successfully operate and grow their business, with the focus being mainly on ensuring subsistence. Also, informal entrepreneurs often face information constraints, in that information about new products and processes, new machinery or tools, or changes in market demand does not reach them.

Institutional constraints pose severe limitations on informal economy operators. For one thing, there is often a lack of government support and policy measures aimed at stimulating and facilitating innovation in the informal economy.

Social constraints also matter greatly. Informal entrepreneurs are often obliged to share their profits with a family or extended network or to invest in informal collective social insurance schemes, often discouraging them from developing their business in the first place. Many also find themselves obliged to employ family members, sometimes counteracting efforts to have the right skills levels in place, and further diverting time and pecuniary resources from investing in more appropriate infrastructure, machinery or innovation more broadly.

It is worth noting that these characteristics of, and barriers to, innovation are not unique to the informal economy in developing countries. Formal enterprises also often operate far from optimal efficiency and have few differentiated products. Important market failures relating to economies of scale and externalities present high barriers to innovation for formally established firms too.

## Conclusion

Frequently, innovation in the informal economy takes place in clusters that facilitate the flow of knowledge and technology via simple exchanges of ideas. Depending on the sector in question and the appropriation methods applied, entrepreneurs imitate and copy products from each

other, from local formal and informal industries and from imported products. Labor migrates from the formal to the informal sector, and vice versa, facilitating the transfer of knowledge.

Apprenticeships and on-the-job learning are common in the informal economy and facilitate the intergenerational transmission of knowledge and technology. Apprentices with sufficient skills or resources tend to open their own operations in close proximity to their “master,” and often copy the master directly. In sectors that rely on traditional knowledge, oral transmission helps to preserve and transmit knowledge from generation to generation and within family or other social groups. A few exceptions aside, there is less evidence to show that clusters rely directly on knowledge from formal public research centers or other educational institutions. This indicates that the linkages between informal and formal public actors are underdeveloped. However, where a connection is made and interaction takes place, the benefit for informal firms is substantial.

Innovation in the informal economy exhibits the following main characteristics:

- Large amounts of constraint-based innovations take place under conditions of survival, scarcity and constraints to address mostly the needs of less-affluent customers. There are, however, cases of innovative products in the informal economy that are distributed to high-income customers and overseas markets.
- Innovations are rarely driven by R&D but are often driven by knowledge gained through adopting, adapting and improving available good ideas, best practices and technologies in novel and economic ways to solve customer problems.
- Incremental rather than radical innovations are the main source of innovative performance. Sophisticated technologies and machinery are rarely used. Adapting imported products or those from the formal mainstream market to simple tools and material available locally is a popular conduct of innovation in the informal economy.
- Innovations in the informal economy have various connections with the formal sector. Knowledge, skill, capital, people and other types of resources can sometimes flow both ways.
- Innovations in the informal economy often take place in geographically concentrated regions in a collaborative manner. This way of organizing production and innovation helps entrepreneurs in the informal economy build their collective identity and product brand.

- Innovations in the informal economy are not only economically viable but also socially influential as they often affect a large share of population involved in the innovation system and value chain.
- The copying of ideas is rapid. Partly this is due to a lack of effort or methods to appropriate techniques, designs and final outputs. Sharing knowledge within clusters/communities is also the social norm in many cases, encouraged and supported by the local culture.

Importantly, much of the evidence garnered in this chapter relies on studies covering mainly goods-producing sectors. The focus is largely on innovation in the agricultural and manufacturing sectors. This somewhat neglects the fact that innovation also occurs in the service sectors such as construction, wholesale and retail trade, transportation, food service and other service activities.<sup>8</sup> Technological capabilities, the type and sophistication of innovation and relevant horizontal lessons generated with respect to firm characteristics, learning, knowledge creation and diffusion are potentially different in the service sector.

Finally, traditional knowledge practices of indigenous peoples and local communities exist, which are often discussed separately from the informal economy (see Drahos and Frankel 2012; Finger and Schuler 2004; and the treatment in Chapter 6). Studies of these practices and communities that aim at deciphering innovation activities and impacts and the subsequent development of traditional knowledge may also need to be undertaken as part of future innovation research.

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<sup>8</sup> Informal economic activities, as they relate to the creative sector, are also not covered, although one study in Brazil, for example, highlights the importance of informal mechanisms of "technobrega" music production, performance and distribution (Mizukami *et al.* 2011). Similar evidence has emerged from studies on informal aspects of the software industry in Egypt (Rizk 2012).

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## COMMENT 2.1

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This chapter represents the first known attempt to analyze how innovation occurs in the informal economy in developing economies. In this comment, I wish, first, to assert that many of the ideas raised are just as applicable to western economies and, second, to identify the possible future steps required to further understanding of how the informal economy is a source of innovation.

The study of the informal economy has its origins in the developing world and was largely confined to studies of developing economies for many decades (Hart 1973). However, a burgeoning literature has recently revealed the persistence of the informal economy in the western world. Although the informal economy accounts for a larger proportion of GDP and a greater proportion of the workforce in the developing world than in the western world (Schneider 2008, 2013; Williams 2015), estimates nevertheless suggest that the informal economy is equivalent to about 16 percent of GDP in OECD countries (Schneider and Williams 2013; Williams 2014b) and that about 5 percent of the population annually work in the informal economy (Williams 2014a).

In the early literature studying the informal economy in the western world, such endeavor was largely represented as low-paid waged work conducted under “sweatshop-like” conditions (Castells and Portes 1989; Benton 1990). Indeed, even discussions of informal self-employment depicted it as “precarious” or “false” self-employment arising as a result of advanced capitalism sub-contracting and outsourcing to the informal economy as a cost-reduction strategy (Gallin 2001; Davis 2006). Based on this negative depiction, the policy approach advocated was its eradication (Williams 2014a).

Following the turn of the millennium, however, this view and the resultant policy approach have begun to be challenged. Grounded in recognition that the vast majority of informal economic activity in western economies is conducted on an own-account basis (European Commission 2014; Williams 2014a), such activity has been re-read as entrepreneurial endeavor and as constituting a “hidden enterprise culture” (Williams 2006, 2014c). The result has been a new sub-field of entrepreneurship scholarship focused on “informal sector entrepreneurship” that has sought to understand the role played by the informal

economy in business start-ups (Williams and Martinez-Perez 2014a, 2014b): who engages in such endeavor (Small Business Council 2004; Williams 2008), what types of activity are conducted (Williams 2007; Deloit 2012; Barbour and Llanes 2013) and the motives for participating in entrepreneurship in the informal economy (Snyder 2004; Williams 2010). One outcome has been a shift in policy approach. Rather than pursue its eradication, much of the literature and many western governments are now seeking to harness this sphere (European Commission 2007; Williams and Nadin 2013, 2014; OECD 2014; Williams 2014b). The current chapter is part of this shift.

One useful way to understand what is happening is to recognize that in conceptual terms the binary hierarchy between the formal and informal economy is being deconstructed. For Derrida (1967), western thought is characterized by a hierarchical binary mode of thinking that, first, conceptualizes objects/identities as stable, bounded and constituted via negation (e.g. the formal and informal economy) and, second, reads the resultant binary structures in a hierarchical manner whereby the first term in any dualism (the superordinate) is endowed with positivity (in this case, the formal economy) and the second term, the subordinate (or subservient) “other,” with negativity (the informal economy). The outcome is to establish a relation of opposition and exclusion, rather than similarity and mixture, between the two sides and to overlay onto it a normative narrative of “progress” that privileges the superordinate “us” over the subordinate “other.” This lens is a useful heuristic device for viewing both the way in which the concept of the informal economy has evolved and analyses of it like the one in this chapter. It becomes immediately obvious that much of literature over the past three decades or so in the western world has been contesting the binary hierarchy between formal and informal economy and that this chapter is part of that process.

Conventionally, the informal economy was viewed as a residual and marginal sphere, as separate and discrete from the formal economy, and as a negative phenomenon. All these elements reflect its position as a subordinate other in the formal/informal economy binary hierarchy. The literature on the informal economy in the western world over the past few decades has been deconstructing this conventional binary hierarchical depiction. It has shown that the informal economy is persisting and even growing in the western world, that the formal and informal economies are not discrete and separate realms and that the boundaries are often blurred (for example, formal firms conducting a portion of their

trade off the books); and attempts have been made to revalue the “subordinate” status of the informal economy such as by showing how it is a hidden enterprise culture.

The identification of innovation in the informal economy continues in this tradition. It is part of this broader process of deconstructing the conventional binary hierarchy. This signals the way forward and also the barriers that need to be addressed when seeking to represent the informal economy as a source of innovation. Innovation is itself the superordinate term in an innovation/non-innovation binary hierarchy, and this chapter and the book of which it forms part represent an attempt to break the close association between two superordinate terms (the formal economy and innovation) and two subordinate terms (the informal economy and non-innovation). To do this, however, one cannot simply apply the superordinate term of innovation to the subordinate term of the informal economy. The innovation/non-innovation binary hierarchy itself needs to be deconstructed. This chapter begins to do so by questioning what constitutes innovation, such as when the authors note that there is more adaptation and imitation than original invention in the informal economy. The problem remains that the innovation/non-innovation binary hierarchy is closely associated with many other binary hierarchies such as export production/local production, productive/unproductive, formal/informal skills and external/local markets. To assert that a superordinate term in one binary hierarchy (innovation) is associated with a subordinate term in another binary hierarchy (the informal economy) requires us to question the normative values attached to superordinate and subordinate terms in many other binary hierarchies. This is perhaps the biggest challenge now confronting those asserting that the informal economy is a source of innovation. It requires the re-valuing of many other subordinate terms (for example, local production, local markets, informal skills) and the de-valuing of many superordinate terms (for example, export production, external markets, formal skills). Unless this is done, then perhaps the inevitable outcome will be to show only that the informal economy is lacking in innovation relative to the formal economy.

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## COMMENT 2.2

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This chapter introduces a new field of research, the study of innovation in the informal economy. It goes beyond the literature on the informal economy as an object of study and literature on entrepreneurship that does address the informal economy, but not so much the role of innovation. The literature on national systems of innovation has concentrated on developed and formal economies, although there are efforts to look at innovation systems in the context of development (Lundvall, Joseph, Chaminade and Wang 2009).

To fill this gap, the chapter looks at the characteristics of innovators, the types of innovations and the differences between innovation in the informal and the formal economies. Significantly, it does this in a way that supports measurement of the activities through surveys and case studies. This draws on experience of measuring the introduction of new or significantly improved goods or services onto the market (formal or informal) and the development of new or significantly improved processes that get goods or services to market in a better way (the transformation of inputs into outputs and their delivery, the organization of the business and the use of business practices, and the development of existing markets or the discovery of new ones).

While these four types of innovations – product (goods or services) and three types of processes – are found in the *Oslo Manual*, the *Manual* also observes that “informality is not a favorable context for innovation” (OECD/Eurostat 2005, p. 137). But the authors of this chapter show that innovation does happen in the informal sector and that its characteristics can be identified.

What is different in the informal sector is the emphasis on problem-solving and learning by doing, interacting and using rather than the formal generation of knowledge through R&D, leading to new products and processes and the protection of intellectual property through formal instruments. Skills, absorptive capacity for knowledge and technological capabilities are limited, and “firms” are small, yet there is innovation that goes beyond just innovation for survival.

This raises a number of issues that need to be understood in order to develop our understanding of innovation in the informal economy. How big are the entities that engage in innovation? What are they? What

linkages exist between them and other groups and institutions, both formal and informal? What characteristics does the market have (if indeed there is a market)? And what are the implications of all this for policy?

The fieldwork reported in this book finds that the bulk of firms in the informal economy are micro-firms that may just be a means of surviving for the entrepreneurs; then come the “constrained gazelles” with limited resources; and then the few high-growth firms. Such a classification supports a differentiation of the analysis of the dynamics of firm activity in the informal sector. Of course, this distribution of firm size is also found in developed and formal economies, where 90 percent of firms will have fewer than twenty employees and the activity of innovation is size-dependent: generally large firms have a higher propensity to innovate.

However, there is a question about what is a firm in the informal sector. It could be a sole proprietorship, a family group, a faith group or some other group whose members have a reason for coming together to engage in an economic activity. As the group operates in the informal economy, it is unlikely to be registered and it is difficult to study using conventional survey methods. While formal firms sell to markets at economic prices, informal firms may be motivated by other things – providing employment to the community or serving some other element of the common good.

This brings the concept of “market” into question, and that is an issue in measuring innovation. For there to be innovation, the *Oslo Manual* requires that the new or significantly improved product be put on the market or that the new or significantly improved process (of any of the three types discussed) gets product to market in a better way (see Chapter 8 of this book). This question of the role of the market does not just arise in the informal economy, it is present when dealing with public sector activities; these may be identical to the innovation activities specified in the *Oslo Manual*, but, when it comes to the activity of innovation, the connection with the market is not there. The same problem arises when consumers modify goods or services to meet their own needs, as they do not bring their product to market and, in spite of an extensive literature on “user innovation” (von Hippel 2005), the consumers are not innovators according to the *Oslo Manual*.

The discourse around public sector innovation (Bloch 2013) and consumer innovation (de Jong and von Hippel 2013) led me to suggest

that the phrase “introduced on the market” in paragraph 150 of the *Oslo Manual* be replaced by “made available to potential users” (Gault 2012). This would allow an institution in the public sector to be classified as an innovator, and the same would hold for consumers so long as they share the product or knowledge of the product with potential users. I raise the point again here as it also has applications in the study of the informal economy when the “innovation” is transferred through non-market transactions.

Firms or groups of like-minded people can innovate and can make their product available. As in the formal economy, they are actors in a system, where the firm interacts with other firms and consumers and is acted upon by framework conditions that may present barriers or opportunities for the firm to thrive. Understanding these linkages with other institutions and accounting for education and skills, culture, health and history is part of understanding an innovation system, and innovation systems are present in informal economies just as they are in the formal economy. The actors may be smaller, the human and financial resources more limited, and the barriers greater, but the actors engage in their activities and are influenced by their linkages, giving rise to short-term outcomes and longer-term social and economic impacts. Understanding this is part of the creation of a subject that addresses innovation in the informal economy, and which studies the science of innovation policy (Gault 2011).

At this point, one might ask why this subject is being created and what use the new knowledge created will serve. The response is the generation of better policies to promote innovation in the informal economy – or at least not get in its way. Such policy matters and grows in proportion to the amount of GDP generated by the informal economy. Without policy dealing with innovation in the informal economy, there is a risk of “misleading, asymmetrical or ineffective innovation strategies” (Kraemer-Mbula and Wamae 2010). This provides substantial justification for the creation of a new subject dealing with innovation in the informal sector, and this chapter is a step in that direction.

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## COMMENT 2.3

**XIAOLAN FU***University of Oxford*

This chapter prompts us to ask whether innovation is relevant for the informal economy in developing countries.

Innovation will be low on most people's list of priorities when they think about issues facing poorer nations, and especially when they think about the informal sector. Other concerns spring more readily to mind: food security, water, health and the prevention of conflict. Innovation may seem like a luxury by comparison, something countries can afford only once they have transcended issues of survival.

But this attitude is probably outdated. Innovation and technical progress can provide fundamental solutions to the major challenges facing low-income countries, such as poverty reduction, coping with environmental and resource constraints and sustainable development. Innovation does not have to be a luxury. Sometimes it requires neither hi-tech research labs nor expensive equipment but more small-scale, smart changes to processes and products driven by people on the ground.

Moreover, innovative capacity in low-income countries is important in increasing their inward technology transfer. Technological innovation is a key element of industrialization and catch-up in developing countries and has traditionally been concentrated in a few developed countries and among a small number of firms. Foreign sources of technology account for a large part of productivity growth in most countries, and the development process in lower-income countries can be supported by tapping into existing knowledge and know-how. Innovative capacity in low-income countries becomes critical for the successful transfer and adaptation of knowledge. Yet several constraints and obstacles prevent firms from innovating.

Nicely complementing the findings of this book, a project co-founded by the UK's Department for International Development (DFID) and the Economic and Social Research Council (ESRC) on "The diffusion of innovation in low-income countries" (DILIC) carried out a survey of 500 formal and informal firms in Ghana in 2013 aiming to understand the form, nature and source of innovations in a low-income country (Fu *et al.* 2014). The survey generated the following findings:

- Innovation occurs within a wide spectrum of sectors in the economy. Firms in both the formal and informal sectors in Ghana undertake relevant innovation activities, in both technological and non-technological fields.
- Most research on the subject looks at the number of patents registered or R&D expenditure to see if innovation has occurred, but in lower-income countries such measures often miss the point completely. In fact – and as the authors of this chapter recognize – most innovations in low-income countries are incremental in nature, demand driven and mainly based on learning, adoption and adaptation. In other words, they are adoptions and adaptations diffused mainly within a country.
- The Ghana study found numerous instances of African entrepreneurs discovering ingenious new ways to turn a profit. Their talent for remodeling old car wheels into cooking stoves, developing ways to preserve fresh mushrooms with the help of local universities, designing amazing fashions from local textiles or making delicious food products from the most humble ingredients – to name just a few examples – is much more than just a local curiosity.
- Mostly innovations constitute “appropriate technology” and processes in or for the base of the development pyramid. In other words, innovation must be appropriate in its economic and technical aspects and also socially appropriate for the characteristics of a given low-income country. It thus addresses the constraints around resources, skills institutions, affordability and accessibility in the country.
- Innovations in Ghana mainly originate and spread within Ghana, especially when innovation occurs in the informal economy. Some (mainly formal) firms source innovations directly from a range of foreign countries, they adapt and localize them and then those localized innovations are diffused through various business and social networks, industry associations and supply chains to the rest of the economy and the informal sector.
- International knowledge is mainly acquired via imports, the Internet and multinational enterprises in the same industry, as well as by participating in export markets. Innovations originated by foreign firms are more novel than those achieved by local firms, suggesting potential knowledge and technology spillovers from the foreign entity to local actors.
- The current role of universities and research institutions in innovation creation and knowledge transfer appears to be limited.

- Firms have scarce knowledge of government policy instruments in place to support innovation.

In sum, the Ghana research suggests that firms in low-income countries are innovative, but also very largely unsupported. Too often in low-income countries, and in the informal economy in particular, innovations are not recognized and innovation efforts in the firms are not properly supported, for example, by mitigating financial and labor skills constraints (see also Chapter 7 of this book). New thinking and policies to recognize and support innovation are required in these countries to help support long-term growth and development.

Innovation needs to be redefined to be more relevant to the informal sector: based not so much on R&D but on the diffusion of ideas and learning. Better metrics are also required to more accurately measure innovation in this sector (see Chapter 8 of this book). A theory of how innovation is created and diffused in the informal sector should be developed, helping to create a road map to help upgrade capability in this sector. We also need to better understand the role of networks and clusters in facilitating knowledge transfer among firms in the informal sector and in building greater network-based production capacity within the sector. Finally, we need to investigate how government policies can effectively help firms in the informal sector to address resource, capability and institutional constraints, and so greatly stimulate creativity and dynamism in the informal economy.

This book is an important step in the right direction.

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