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Frameworks for Analysing African Innovation: Entrepreneurship, the Informal Economy and Intellectual Property

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Chapter 2

Frameworks for Analysing African Innovation: Entrepreneurship, the Informal Economy and Intellectual Property

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Abstract

This chapter reviews conceptual frameworks to understand and measure innovation, and then outlines links between innovation and the concepts of entrepreneurship, the informal economy (IE) and intellectual property (IP). The review suggests that the time is ripe for African policy-makers to seek more holistic approaches to facilitating innovation and, in turn, to fostering socio-economic development in African nations.

1. Introduction

Innovation is a key driver of economic development, but the gap between socio-economic climates that foster innovation in developed and developing countries, particularly the developing nations of Africa, is large (Aubert, 2006; GTZ, 2010). This is a problem that must be addressed. Innovation is affected by many variables, one of which is intellectual property (IP). While IP plays an especially important role in formal-sector innovation, its role in the informal economy (IE) is just beginning to be explored (De Beer *et al.*, 2013). The existing literature on the role of intellectual property in innovation, entrepreneurship, the IE and economic development is largely disconnected, providing inadequate bases for understanding how IP does, or could, function in a manner beneficial to social and economic progress.

For example, those who study or make policy on innovation usually rely on a definition in a document called the *Oslo Manual*, published by the Organisation for Economic Co-operation and Development (OECD) and the Statistical Office of the European Communities (Eurostat). The *Oslo Manual* defines innovation as

[...] the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations (OECD and Eurostat, 2005, p. 46).

Citing this *Manual*, and the theoretical concepts and study methods contained in it, is trite for innovation scholars and policy-makers. But too few IP experts, especially intellectual property lawyers, are familiar with this well-established framework. For many people working on IP, innovation is less an established field of study than a rhetorical buzz word. Similarly, entrepreneurship is a concept intuitively connected to IP, but too often IP law, policy and practice are insufficiently tied to various theoretical models of how and why entrepreneurship happens. The problems with such gaps in the discourses and understanding among different fields of research are exacerbated in the context of Africa's predominantly informal economic activities.

To avoid, or at least mitigate, the pitfalls inherent in multidisciplinary analyses of intellectual property and innovation, this chapter begins to establish conceptual common ground. Inevitably, for some readers, the chapter will be too simple; for others, it may be the opposite. To strike a balance, the modest goal of this chapter is to examine linkages among disparate strands of thinking in the literature on these topics, and to weave the strands together in an interdisciplinary way, relevant to emerging realities on the African continent.

2. Innovation

Our understanding of the links between technological innovation, economic growth and human development has evolved significantly over the past century. Despite more sophisticated understandings of development, based on human freedom (Sen, 1999) or capabilities (Nussbaum, 2011), economic growth is still a key metric to measure success. Thus, this section begins by discussing the role of technological innovation in classical, neoclassical and Keynesian economic theory. Next, it explores the interdisciplinary conceptions of innovation as presented by proponents of development economics and modernisation theory. Third, this section discusses the systems approach to innovation, which in the 1970s aimed to address the fragmented research on the topic that had emerged up to that point. The section concludes by examining current views on the innovation–development nexus.

Classical and neoclassical economics

Since the 18th century, when classical economic theory emerged as the first modern school of economic thought, various conceptions of innovation have shaped

the economic discourse. Adam Smith (1776), a leading proponent of classical economics, argued that savings and capital accumulation are the key determinants of economic growth, and that competitive markets facilitate invention and innovation. This reasoning endured until the late 19th century, when neoclassical economics displaced classical economic theory.

Neoclassical economists assumed: that individuals have rational preferences among various outcomes to which values can be attributed; that individuals maximise utility; that firms maximise profits; and that people base their economic decisions on full information. Alfred Marshall, a key figure in the neoclassical school, acknowledged the link between innovation and local economic development (Marshall, 1920). He argued that firms involved in similar activities and clustered in the same place can be more efficient than isolated producers, because locational proximity allows third-party firms to benefit from new, non-excludable ideas generated by other firms. This early insight laid the groundwork for contemporary discourse around open, inclusive, networked or community-driven innovation, discussed later in this chapter.

Dynamic development of economic systems

In the 1930s and 1940s, Joseph Schumpeter countered the neoclassical view of orderly economic change and market equilibrium, arguing that adjustments in the economy are abrupt and uneven. He sought to explain how productive innovations arise sporadically within capitalist systems, displacing old equilibriums and creating radically new and more efficient socio-economic conditions. Schumpeter (1934, 1942) argued that such productive innovations can occur through the introduction of a new good or a new quality of a good; the introduction of a new method of production; the opening up of a new market; the conquest of a new source of supply; and/or the carrying out of a new mode of organisation of an industry.

Notwithstanding Schumpeter's novel ideas about the dynamic development of economic systems, neoclassical economic theories dominated the subsequent decades. Our understanding of innovation was thus impoverished, because the prevalent assumptions of rational optimisation – full information availability and an obsession with determinate solutions to fully specified models – left little room for analysis of technological change (AU-NEPAD, 2010).

Keynesian economics and growth theory

During the post-war period, economists viewed growth as the key requirement for development, and a number of growth theories emerged based on Keynesian

economic principles. Notably, the Harrod-Domar Growth Model posited that increased investment is a prerequisite for economic growth, and that the state should encourage savings in order to accumulate investment and should support technological advances to increase productive capacity and efficiency (Domar, 1947; Harrod, 1939; Peet and Hartwick, 2009).

In the late 1950s, Robert Solow (1957) presented a revolutionary growth model that focused on the role of technological development to explain economic growth that could not be accounted for by capital accumulation or labour productivity. Solow argued that technological progress is not a product of economic forces, but rather an exogenous collection of knowledge that is continuously expanding. In subsequent decades, economists relied heavily on Solow's growth model when formulating their development policy recommendations (Peet and Hartwick, 2009).

Development economics

The post-war period also saw the establishment of the development economics school, which was premised on the idea that economic processes in developing countries are distinct from those in developed ones. While institutions, technology and entrepreneurship were assumed to be exogenous in the neoclassical economics school, development economists considered these factors to be endogenous. Albert Hirschman (1958) argued that developing countries lack entrepreneurship, or the perception of opportunities for investment. Accordingly, Hirschman envisioned a role for the state that involved developing confidence among entrepreneurs, enabling them to make investments in key sectors such as manufacturing.

Other development economists focused on the link between geography, technological innovation and economic growth. François Perroux (1955) viewed the innovative capacities of propulsive industries as growth stimuli for geographically proximate firms involved in technologically complementary industries. Geographer Allan Pred (1965) shared this idea; he posited that the clustering of firms in specific locations would lead to the development of innovative centres, which would in turn attract economic activity. He also argued that there is a positive correlation between the importance of an innovative centre and the speed of its economic growth (Peet and Hartwick, 2009; Pred, 1965).

Modernisation theory

In 1959, Seymour Martin Lipset set the stage for the emergence of modernisation theory, which presented a sociological alternative to purely economic theories

of development. According to Lipset, industrialisation leads directly to positive social change, because it facilitates the emergence of democratic political institutions (Lipset, 1959). Bert Hoselitz also espoused a sociological approach to development, focusing on cultural change as a prerequisite for economic growth. Hoselitz argued that capitalist entrepreneurs, who of necessity set themselves apart from the mainstream, are the ones who generate new ideas. Hoselitz also believed that cities, to a greater extent than rural areas, are birthplaces of innovation, and he thus favoured political power being held by entrepreneurs in urban areas (Hoselitz, 1960; Peet and Harwick, 2009). Sociologist Talcott Parsons (1966) considered the most successful societies to be those that are able to adapt and differentiate for the purpose of using resources effectively and gaining a competitive advantage over other societies.

Another group of modernisation theorists presented a more psychological orientation. David McClelland (1961) argued that economic development can only take place in a society that accords importance to the achievement of innovation and entrepreneurship. Everett Hagen (1962) argued that society's values would shift towards favouring innovation and economic growth once traditional peoples searching for new identities engaged in processes characterised by creativity and the need to achieve.

Alongside the development of these diverse perspectives on modernisation, the 1960s saw a resurgence of interest in the notion of innovation, with one area of particular interest being the inexplicably rapid rise of Japanese productivity (Freeman, 1987). Economists became interested in identifying factors instrumental in pushing countries along the path of modernisation. Walt Whitman Rostow (1960) argued that all societies pass through five sequential categories of economic development: (1) traditional society; (2) preconditions for take-off; (3) take-off; (4) the drive to maturity; and (5) an age of high mass consumption. In Rostow's thinking, technological development is the stimulus that moves a society from one stage to the next. As such, the emergence of new production functions, which facilitate rapid growth in primary sectors, is a prerequisite for development even in mature, industrialised economies.

Everett Rogers (1962) also devised a five-step theory, about the diffusion of innovation, whereby an individual (1) becomes aware of an innovation; (2) becomes interested in the innovation and seeks information about it; (3) chooses to either adopt or reject the innovation; (4) (if the innovation is accepted) puts the innovation to use on a small scale; and (5) adopts the innovation for continued use in the future. According to Rogers, the successful spread of an innovation follows an S-shaped curve: after the first 15% of people in a society adopt an innovation there is relatively rapid adoption by the remaining members.

During the years that followed the publication of Rogers' work, others put forward geographic versions of diffusion theory, highlighting the spatial aspects of modernisation. Peter Gould (1964) argued that new ideas are diffused from one area to another through communication. An innovation will be adopted earliest in areas of close proximity to the innovation's place of origin, and adopted much later in areas farther away. Gould, of course, was writing in the 1960s, an era when communications were limited by less sophisticated technologies than are available today.

Evolutionary economic theory

By the end of the 1970s, researchers were taking a view that prevailing theories were providing an inadequate picture of innovation, because the theories were fragmented across multiple intellectual disciplines. Moreover, neoclassical economists' preoccupation with profit maximisation and market equilibrium was causing them to overlook the uncertainty of innovation and the wide variety of institutions that support innovation across different sectors (Nelson and Winter, 1977). Richard Nelson and Sydney Winter developed an evolutionary theory of business capabilities and behaviour that was modelled on biology. Drawing on Schumpeter's ideas about discontinuous economic change, Nelson and Winter (1982) concluded that firms facing key business decisions rely not only on past experience, but also on innovative alternatives to their past behaviour.

Later in the 1980s, Christopher Freeman broadened the emerging field of evolutionary economics by stressing the importance of national systems of innovation, which he defined as "the network of institutions in the public and private sectors whose activities and interactions initiate, import, modify and diffuse new technologies" (Freeman, 1987, p. 1). Bengt-Åke Lundvall (1992) supported this view, concluding that the two key factors acting on a system of innovation are its structure of production and its institutional set-up. Charles Edquist (1997) presented a more general definition of systems of innovation, which included consideration of the economic, social, political, organisational and institutional factors that affect development and diffusion of innovation.

As economists began to experiment with models and surveys to measure innovation, the OECD's Working Party of National Experts on Science and Technology Indicators (NESTI) identified the need for a coherent set of analytical tools. Hence, in 1992, the OECD published the first edition of the aforementioned *Oslo Manual*, subtitled *Proposed Guidelines for Collecting and Interpreting Technological Innovation Data*. This first edition focused on technological product and process innovation in manufacturing: an innovation is considered implemented if it has

been introduced to the market (product innovation) or used within a production process (process innovation). This first *Oslo Manual* identified scientific, technological, organisational, financial and commercial activities as innovations (OECD and Eurostat, 1992).

In parallel, Paul Romer (1992) proposed a new growth theory, which characterised technological advancements as an endogenous product of economic activity, and knowledge as the driver of progress. Other scholars corroborated the importance of the knowledge–development nexus. Richard Nelson and Nathan Rosenberg (1993) concluded that the main sources of innovation are organisations that promote the creation and dissemination of knowledge, and Joseph Cortright (2001) viewed government policies focusing on innovation and the diffusion of knowledge as instrumental to economic growth. Notably, Cortright argued that economic strategies should value not only the knowledge generated through scientific research, but also the innovation of frontline workers (Cortright, 2001; Peet and Hartwick, 2009). When the OECD published the second edition of its *Oslo Manual* in 1997, it recognised the importance of both the knowledge transfer and systems approaches to innovation. The 1997 edition of the *Oslo Manual* also expanded the definition of innovation to cover a wider range of industries, including construction, utilities, manufacturing and marketed services (OECD and Eurostat, 1997).

The current state of innovation literature

Research on innovation and development split in several directions around the start of the 21st century, partly due to shifts in global economic and geopolitical power triggered by the emergence of the BRICS nations of Brazil, Russia, India, China and now, South Africa (Lawson and Purushothaman, 2003). Recent literature on innovation and progress has begun to reflect global heterogeneity. For example, scholars examining African development using the systems of innovation approach have focused on indigenous knowledge and capabilities, because these factors emphasise learning and capacity building (Muchie *et al.*, 2003). Interestingly, such approaches mirror one proposed 30 years earlier in a UN-commissioned study entitled *Sussex Manifesto: Science and Technology for Developing Countries during the Second Development Decade*, which stressed the need for developing countries to nurture indigenous scientific capabilities rather than relying on technologies transferred from developed countries (Ely and Bell, 2009).

The current, third edition of the *Oslo Manual*, published in 2005, includes an annex on innovation surveys in developing countries. According to the OECD, these surveys are intended to serve as guiding tools for public policy development

and business strategy designs that seek to incorporate new ideas and knowledge. The current OECD view is that measurement exercises should focus on the innovation *process* rather than its outputs, and should emphasise how countries deal with *capabilities* and *efforts* as well as results. The OECD now sees efforts made by firms and organisations (innovation activities) and capabilities (stocks and flows) as equal to, or even more important than, the results (innovations), as elements requiring determination and analysis by researchers. Factors that hamper or facilitate innovation are key indicators for gauging a country's innovative profile in this context (OECD and Eurostat, 2005).

The recently established African Science, Technology and Innovation Indicators (ASTII) initiative is working to improve the measurement of science and technology indicators by Member States of the African Union (AU-NEPAD, 2010). ASTII published the *African Innovation Outlook* report (2010), which provides an overview of science, technology and innovation (STI) activities in 19 African countries.¹ Notably, the report asserts that

[g]iven the appropriate institutional context, entrepreneurship at all scales (in micro, small, medium and large enterprises) has the potential to meet the huge demands of the continent and its population of over one billion. Legitimate, participative governance, strengthened through an innovation systems policy perspective, will also improve social cohesion by reducing uncertainties and enabling evolutionary change. In combination, these discrete components of policymaking and coordination offer the continent the opportunity to escape the vicious cycles of underdevelopment. (AU-NEPAD, 2010, p. 30)

Innovation scholars also postulate that risk-taking entrepreneurs are the driving force behind innovative activities (Gault and Zhang, 2010). The AU's work connects the institutional context for entrepreneurship, including governance, with social cohesion and other, broader development objectives.

While this vision of a well-governed, cohesive entrepreneurial society is one prospect for parts of Africa, it is not the only plausible scenario for the future. To help imagine alternative evolutions of African entrepreneurship, the next section of this chapter examines the literature on entrepreneurship and highlights its linkages to economic development theory.

1 The 19 countries are: Algeria, Angola, Burkina Faso, Cameroon, Egypt, Ethiopia, Gabon, Ghana, Kenya, Lesotho, Malawi, Mali, Mozambique, Nigeria, Senegal, South Africa, Tanzania, Uganda and Zambia.

3. Entrepreneurship

Entrepreneurship defined

Development scholars have tended to define entrepreneurship extremely broadly. In particular, recent literature has deemed any form of innovation that creates or improves a product, service or process as entrepreneurship. One of the most commonly referenced definitions in development literature defines entrepreneurship as

[t]he manifest ability and willingness of individuals, on their own, in teams within and outside existing organizations, to perceive and create new economic opportunities (new products, new production methods, new organizational schemes and new product-market combinations) and to introduce their ideas in the market, in the face of uncertainty and other obstacles, by making decisions on location, form and the use of resources and institutions. (Wennekers and Thurik, 1999, pp. 46–7; Caree and Thurik, 2003, p. 441)

This definition of entrepreneurship hinges on two aspects that jointly create capacity for entrepreneurship: an environmental component and a behavioural component. Thus, this definition links to the argument, seen in the work of McClelland (1961), that in order to foster entrepreneurship it is necessary to examine factors that exist at both the system level and the individual level of any given economy. This definition is also compatible with descriptions of entrepreneurship as a “process” rather than a somewhat static phenomenon that an economy seeks to achieve (UNCTAD, 2005).

But the relationship between entrepreneurship (so defined) and development requires a more precise indication of what type of entrepreneurship is being measured. In the contemporary literature, a distinction has been made between “necessity entrepreneurship” and “opportunity entrepreneurship”, coupled with an assertion that levels of opportunity entrepreneurship are a more significant indicator of a nation’s entrepreneurial capacity than necessity entrepreneurship (Acs, 2006, p. 97).

Entrepreneurship in the developing world

The national economies of countries with low levels of per capita income tend to be characterised by large numbers of micro and small enterprises (Ayyagari *et al.*, 2005). Higher per capita income levels tend to correspond with industrialisation, economies of scale and larger, established organisations satisfying increasing demand while increasing their relative roles in the economy. Thus, both the existence of small entrepreneurial ventures and their eventual growth into large ventures have important places in the transformation sequence of an economy from developing status to developed status. Early-stage entrepreneurial development and the growth of existing entrepreneurial ventures are two different, but equally important, matters.

Once an economy has moved to the industrialised phase of capitalist development, it can be argued that a “qualitative change in the drivers of economic growth occurs” (UNCTAD, 2005, p. 4). This theory of development is premised on the idea of “long cycles” of economic development, a concept attributable to Joseph Schumpeter. Schumpeter deemed the first long cycle of innovation as being the diffusion of the steam engine and textile innovations in the 18th century, followed by railway and steel innovations, electrical power and then the chemical industry (Schumpeter, 1934). He asserted that once an economy graduates from a threshold level of industrial development, technology and the accumulation of human knowledge become the primary drivers of economic growth.

Entrepreneurship is arguably the common denominator behind both technological advances and knowledge accumulation. In Schumpeter’s theory, it is the ability and initiative of entrepreneurs – drawing upon the discoveries of scientists and inventors – that create new opportunities for investment, growth and employment (Schumpeter, 1934, pp. 83–4). For this reason, Schumpeter believed that “new combinations” of factors of production would be a form of entrepreneurial discovery that would drive economic development. Schumpeter’s theory posits that the process of “creative destruction” would allow the innovative entrepreneur to take market share from existing suppliers and increase overall demand for the products offered in that market (Schumpeter, 1942; UNCTAD, 2005, p. 4).

Scholars asserting the importance of the entrepreneurship context have emphasised the critical importance of the “imitating” entrepreneur as opposed to the “innovating” entrepreneur (Schmitz, 1989). Imitating entrepreneurs are individuals who manipulate existing activities and put new products or methods into practice, thereby creating knowledge through a process that development scholars such as James Schmitz have characterised as learning by implementing (Schmitz, 1989). Critics of Schumpeter’s theory have pointed out that in order for learning/growth by imitation to ensue, there must be a trigger innovation of sufficient scale, and the social climate in which it is born must be “favourable” (Freeman, 1982). As major innovations become part of an economy’s backdrop, further growth in that economy can and should be spurred by the activities of individuals seeking to imitate and subtly vary existing innovations.

Mowery and Rosenberg (1979) have argued that the diffusion process of innovation cannot be viewed as one of simple carbon-copy replication. Rather, the economic growth that is spurred involves a sequence of *further* innovations: sometimes large, but mostly small, subtle innovations based on the larger technical innovation. This process is typically cast as an outcome of firms striving to gain an edge over competitors in an industry. As new industries emerge they each set in motion process innovations linked particularly to exploitation of economies of scale (Rosenberg, 1976; Mowery and Rosenberg, 1979). This characterisation of

economic growth appears relevant to markets in which there is an abundance of small firms (rather than a few key heavyweight actors), because small firms hold the capacity to imitate existing innovations. The “imitating entrepreneur” is an especially important figure throughout the developing world.

Fostering an entrepreneurial environment in a developing economy

There are two foundational models outlined in development literature that attempt to link entrepreneurship to development.

The Wennekers and Thurik Model

The Wennekers and Thurik Model divides analysis of innovative capacity growth through entrepreneurship into three categories: (1) individual level, (2) firm level and (3) macro level (Thurik and Wennekers, 2001). Each level operates according to its own set of “conditions” for entrepreneurship, which researchers believe are the factors driving innovative potential in the form of distinctive “cultures”: certain conditions are thought to be required in order for a certain type of culture to be achieved at each level. Each level has an impact on the capacity for entrepreneurship in a given economy, with the impact emanating from the individual level and moving towards the macro level. According to the Wennekers and Thurik Model, entrepreneurial activity originates with a single person, the entrepreneur, and entrepreneurship is, for the most part, dependent on factors affecting the individual. Capacity thus originates at the individual level and is later realised at the firm/institutional level. Innovation is stimulated by an individual’s attitudes, motives, skills and assessment of market risk.

Though this model posits that the individual entrepreneur does not undertake innovation in a timeless/space-less vacuum, the context in which the entrepreneur is acting is given less emphasis than the psychological factors that play on the entrepreneur’s decision to innovate. At the same time, psychological factors are understood to be influenced to some extent by cultural and institutional factors, the business environment and macroeconomic conditions: personal entrepreneurial qualities that cause one to innovate are necessary but not sufficient to foster entrepreneurship.

The Wennekers and Thurik Model asserts that entrepreneurial activity expands the productive potential of a national economy by inducing both “higher productivity” and “an expansion of new niches and industries” (UNCTAD, 2005, p. 7). These results are produced by the individual layer transforming the processes used for providing certain products and services. When factors at the individual

level foster entrepreneurial qualities in individuals, there is greater potential for increasing the productive potential at the firm level and, in turn, at the macro level. Individual entrepreneurs learn from the successes and failures of innovation attempts undertaken by themselves and others. These successes and failures form the basis of what is often referred to as “knowledge capital” – the “know how”. Knowledge capital drives research and development (R&D) in its purest and cheapest form: knowledge makes its way from the individual level to the firm and macro levels, increasing the potential for economic growth.

The GEM Model

The Global Entrepreneurship Monitor (GEM) Model depicts entrepreneurship as something that is fuelled at the macro level, with movement to the micro level (Reynolds *et al.*, 2000). According to this model, capacity for entrepreneurship is fuelled by an economy’s social/political context: the context generates the economic conditions that allow for entrepreneurship to occur, resulting in opportunities/capacity at the individual level. This model views entrepreneurship predominantly as firm creation, defining entrepreneurship more strictly than does the Wennekens and Thurik Model. More particularly, the GEM Model measures entrepreneurship on the basis of new firm creation, as opposed to the Wennekens and Thurik Model’s broader focus on entrepreneurship as innovation in its purest form (i.e. innovation demonstrated by any form of improvement or imitation of existing products and processes).

The GEM Model also embodies a heavy focus on the role of existing firms. Existing firms are thought to generate new market opportunities for small and medium-sized firms, whether by technology spillover or by increasing domestic demand. The number of firms operating in the economy is thus regarded as an indicator of growth. In essence, the GEM Model conceptualises economic growth as firm growth and firm creation. Entrepreneurship in this context depends on the “emergence and presence of new market opportunities” – often the product of existing firms themselves – and the “capacity, motivation and skills of individuals to establish firms” (UNCTAD, 2005, p. 8). This is a narrower conceptualisation of entrepreneurship as it places less focus on opportunities for existing firms to increase returns through innovations in their production process.

Entrepreneurship and IP

Where, then, might IP dynamics affect a national economy’s capacity to foster entrepreneurship? A prudent approach to answering this question would seem to require consideration of both the Wennekens and Thurik and GEM models

of building entrepreneurship. In fact, the models provide two distinct avenues through which to examine the potential for bolstering economic development through IP.

IP and the Wennekers and Thurik Model

Given the focus on the individual entrepreneur that is proposed by the Wennekers and Thurik Model, it is essential to consider how changes to IP law and policy affect attitudes, motives and assessment of market risk in the economy. It is necessary to flesh out the ways in which IP can create attitudes of openness to innovation, increase incentives for the individual to pursue innovation, and shape conceptions of innovation in products and services as carrying minimal risk if pursued appropriately. According to this model, changing perceptions at the individual level will be the primary way to increase innovation at the firm level and, in turn, to foster high productivity in the broader economy. Crafters of IP laws and policies must thus take into account bottom-up approaches to increasing innovative capacity in target countries.

The most prominent scholar in this area is Harvard psychologist David McClelland, who has highlighted the importance of the “motivational aspect” of the entrepreneur. McClelland’s studies have demonstrated that entrepreneurial behaviour is “driven by a need for personal achievement leading to a clear proclivity for becoming an entrepreneur” (McClelland, 1961, pp. 358–99; UNCTAD, 2005, p. 10). Critically, McClelland’s work emphasises the fact that entrepreneurs with high motivation will almost always find ways to maximise economic achievement. This view implies that the levels of motivation of entrepreneurs are more critical than the economic conditions supporting their potential innovations. McClelland has identified 10 entrepreneurial competencies that must be strengthened in order to increase entrepreneurial potential at the individual level: (1) opportunity-seeking and initiative; (2) risk-taking; (3) demand for efficiency and quality; (4) persistence; (5) commitment to the work contract; (6) information-seeking; (7) goal-setting; (8) systematic planning and monitoring; (9) persuasion and networking; and (10) independence and self-confidence (McClelland, 1961).

IP and the GEM Model

The GEM Model, in contrast to the Wennekers and Thurik Model, lends support to the notion that innovative capacity is impacted predominantly at the macro level and must trickle downwards. Viewed via the GEM Model, IP laws and policies could themselves be cast as the driving forces behind increases in entrepreneurship and innovation. The GEM Model would thus seem to favour a domestic

IP structure that specifically encourages: (1) the growth of existing large firms, thus generating profit opportunities for small and medium-sized firms; and (2) the establishment of new firms. Based on the GEM Model's focus on more formalised concepts of R&D, increasing innovative capacity would require some form of incentive system to encourage the formal sector to spend more on R&D.

Entrepreneurship and Africa

The scholarly literature on African entrepreneurship provides several explanations of why entrepreneurship has not succeeded in lifting the continent's people from poverty. There is less analysis of how entrepreneurship needs to be – and has the potential to be – a key force for economic growth in African countries. The limited literature that does exist in relation to the importance of entrepreneurship in Africa tends to single out large youth populations, high levels of youth unemployment and rural–urban shifts as primary reasons why entrepreneurship needs to, and can, spur development in the context of Africa.

There are concerns that a large portion of Africa's youth population² has become marginalised and excluded from access to education, health care and salaried jobs. There is extensive literature on the increased marginalisation of African youth, including their inability to create sustainable livelihoods for themselves, and there is also evidence that this marginalisation phenomenon has affected not only impoverished youth but also youth across a broad spectrum of socioeconomic classes, including the well-educated (Chigunta, 2002, p. 11; Chigunta *et al.*, 2005, p. 5).

Africa has a larger youth-to-adult ratio than any other continent, and this ratio is growing. The ILO determined that 62% of Africa's total population was below the age of 25 (ILO, 2006). This “youth bulge”³ is most evident in the sub-Saharan region of Africa, a region noted as having the highest population growth rate in the world (Guarcello *et al.*, 2008). The population of the sub-Saharan region has quadrupled since 1950 and continues to grow. Its youth-to-adult ratio was, in 2002, increasing at a projected rate of 18% (Chigunta, 2002, p. 4; Sommers, 2010, p. 321). To provide some perspective on this figure, a study by Population Action International reveals that there are 46 countries where at least 70% of the population is under 30, and all but seven of those countries are in sub-Saharan Africa (Leahy *et al.*, 2007, p. 23). Meanwhile, Africa also has the highest youth rural–urban mobility rate of any continent. It is estimated that more than 50% of

2 The category of “youth” in Africa is generally deemed to be those individuals in the range of 15 to 30 years of age. The UN definition is individuals aged 15 to 24.

3 The term “youth bulge” was originally coined by demographer Gary Fuller (Hendrixson, 2005, p. 2).

African youth reside in urban centres (Chigunta, 2002, p. 12). At the same time, formal job opportunities in the urban centres are limited. A recent study by the UN Office for West Africa revealed that by 2020, one half of the African population would be living in cities, with more than 50% of urban inhabitants being under the age of 19 (UNOWA, 2005, p.1).

Having a large youth population that is not in the workforce has been consistently pegged in development literature as a significant indicator of risk of general civil instability (Urdal, 2004, p. 16). This concern is reflected in the development community, including at the US Agency for International Development (USAID), which has noted that: “Urbanization concentrates precisely that demographic group most inclined to violence: unattached young males who have left their families behind and have come to the city seeking economic opportunities” (USAID, 2005, p. 7). Of particular concern is evidence that large numbers of unemployed youth in Africa have come to engage in unconventional means of sustaining their livelihoods (Chigunta *et al.*, 2005). Finding formal sector work can be particularly difficult for urban youth, as there are few jobs and many youth lack the qualifications that formal-sector work often requires. For instance, a Sierra Leone study found that only 9% of the working-age population in that country had formal-sector jobs, with opportunities falling significantly lower for youth than the average adult (Peeters *et al.*, 2009). Another study, in Angola’s capital city, Luanda, determined that the average age of individuals working in the city’s outdoor market areas was 21, and that both male and female youth averaged just over five years of education, with the women being exposed to fewer opportunities and lesser pay (De Barros, 2005, p. 212).

The size of the African workforce, estimated at 492 million in 2012, continues to grow at an annual rate of 2.8% per year (the highest in the world), representing roughly 13.8 million new entrants a year, a rate that is declining only marginally year over year (ILO, 2013).⁴ That said, accurate unemployment statistics for the African continent are notoriously difficult to come by. Unemployment information for Africa has proven both difficult to gather and difficult to calculate, due to varying definitions of employment. As a result of these difficulties, the range of reported youth unemployment statistics is described as “phenomenal” (Sommers, 2010, p. 322).

Extensive research has been conducted on the supply-side factors affecting youth unemployment in Africa. This research has pointed to two dominant barriers: (1) a deficiency in skills, and (2) an underlying perception that the only worthwhile employment is “formal employment” rather than less formal employment (the category in which entrepreneurship generally lies) (Chigunta *et al.*, 2005). When it comes to engaging youth, Mike Grant and Jamie Schnurr have argued

4 Between 2000 and 2012, the rate dropped from 2.9% to 2.7% (ILO, 2013).

that demand-side factors are just as critical as supply-side factors. These scholars posit that economic development cannot be bolstered simply by directing youth through “stationary” paths to formal employment roles but rather by creating more “flexible systems” to propel youth into the workforce (Grant and Schnurr, 1999). Michael Todaro (1997) similarly asserts that too much emphasis should not be placed on the formal means of bolstering African economies through youth employment. Thus, it can be inferred that creating favourable conditions for youth entrepreneurship would be a component of any plan to bolster economic development.

In contexts where it is essential that youth create their own employment opportunities, a lack of financial and business resources will be detrimental. Individuals often lack the support that is required to turn innovative ideas into reality. Government budgets are too limited to directly support the large population of unemployed and increasingly marginalised youth in their countries. However, African governments can help alleviate this burden by engaging youth in entrepreneurship. In particular, educational institutions could introduce entrepreneurial education designed to expose youth to entrepreneurship at an early age, increasing the prospect of more successful entrepreneurial ventures in Africa (Chigunta *et al.*, 2005, p. 165). This concept suggests the time is ripe to better understand where government spending should be aimed if it is to target potentially entrepreneurial individuals and to support existing entrepreneurship in Africa.

As part of the OECD’s ongoing work on innovation, it partnered with the UN Educational, Scientific and Cultural Organisation (UNESCO) in 2009 to host an international workshop entitled “Innovation for Development: Converting Knowledge to Value”. Participants highlighted, *inter alia*, the important role of local entrepreneurs with respect to innovation and the need to focus on “the generation, transfer and application of local knowledge” (UNESCO, 2009, p. iii). In developing countries, the institutional framework for knowledge transfer at local levels consists primarily of informal institutions and organisations. For example, in sub-Saharan Africa, informal employment represents nearly three quarters of non-agricultural employment. It contributes, on average, 41% of national GDP in these countries, and over 50% in individual countries such as Ghana, Togo and Niger (ILO, 2002).

As early as 2000, it was estimated that in Africa, two in three urban residents obtain their livelihoods from the informal economic sector, a sector thought to be growing at an annual rate of 7%. At this time, it was estimated that more than 90% of jobs would be created through informal economies (Karl, 2007, pp. 53–4). A failure to recognise the vitality and necessity of informal markets constitutes a denial of fundamental economic realities. Confirming this projection was the

aforementioned Sierra Leone study finding that a mere 9% of the working-age population had formal sector jobs (Peeters, *et al.*, 2009). Such figures highlight the need to recognise and fully harness the informal sector's roles in innovation. Accordingly, Section 4 of this chapter now turns to an examination of the linkages between innovation, entrepreneurship and the informal sector in Africa.

4. The informal economy (IE)

The “informal sector” concept

According to the International Labour Organisation (ILO), the “informal sector” comprises non-agricultural, private, unincorporated enterprises that produce their goods or services for sale or barter and are not registered under national legislation (ILO, 1993). While this definition provides some direction with respect to measuring the size of the informal sector in a given economy, it does not capture the various discipline-specific approaches that have been developed over the past 60 years to value informal sector activities.

In 1954, William Arthur Lewis first conceptualised the economy as constituting more than one sector. Lewis posited a dual economy model, whereby “[t]he capitalist sector is that part of the economy which uses reproducible capital, and pays capitalists for the use thereof [and the] subsistence sector is by difference all that part of the economy which is not using reproducible capital” (Lewis, 1954, p. 407). Lewis believed that the flow of labour is unidirectional, moving from the subsistence sector into the more formal, capitalist sector. Two decades later, economic anthropologist Keith Hart (1973) presented a different approach to the dual economy analysis. While studying the economy of urban Ghana in 1971, Hart noted that a thriving “informal sector” exists alongside the formal sector in urban economies. According to Hart, labour flows back and forth between these sectors in response to the availability of employment in each one at any given time.

The prevalent economic thinking in the 1960s was that employment levels would increase if an economy achieved success in generating capital and promoting exports. However, in 1967 the ILO proposed that development efforts should focus on increasing employment as a distinct policy objective. Accordingly, the ILO established the World Employment Programme (WEP) and organised “comprehensive employment missions” to analyse employment in developing countries (Bangasser, 2000, p. 5).

During the WEP's 1972 mission to Kenya, the ILO acknowledged the informal sector concept that Hart had coined a year earlier. However, the ILO presented a more nuanced perspective, asserting that informal activities “are not confined to employment on the periphery of the main towns, to particular occupations

or even to economic activities. Rather, informal activities are the way of doing things” (ILO, 1972, pp. 5–6). Based on this view, the ILO (1972) identified seven elements that characterise the informal sector: (1) ease of entry; (2) reliance on indigenous resources; (3) family ownership of enterprises; (4) small scale of operation; (5) labour-intensive and adapted technology; (6) skills acquired outside the formal school system; and (7) unregulated and competitive markets.

The years that followed saw a gradual recognition of the need for an international statistical definition of the informal sector (Husmanns, 2004). Consequently, in 1993, the 15th International Conference of Labour Statisticians (ICLS) adopted the following definition:

The informal sector may be broadly characterised as consisting of units engaged in the production of goods or services with the primary objective of generating employment and incomes to the persons concerned. These units typically operate at a low level of organisation, with little or no division between labour and capital as factors of production and on a small scale. Labour relations – where they exist – are based mostly on casual employment, kinship or personal and social relations rather than contractual arrangements with formal guarantees. (ILO, 1993, p. 2)

In 2001, the Expert Group on Informal Sector Statistics (Delhi Group) assessed existing methods for measuring informal sector employment, and highlighted the need for a definition of informal employment (Husmanns, 2004). In 2003, the 17th ICLS responded by officially defining informal employment as “the total number of informal jobs [...] whether carried out in formal sector enterprises, informal sector enterprises, or households, during a given reference period” (ILO, 2003, p. 2).

The ILO has described a continuum of economic relations that exists in the informal sector: “production, distribution, and employment relations tend to fall at some point on a continuum between ‘formal’ relations (i.e., regulated and protected) at one pole and ‘informal’ relations (i.e., unregulated and unprotected) at the other” (ILO, 2002, p. 12). (See Chapter 3 of this volume for Kawooya’s case study of linkages between the formal and informal sectors in automotive engineering in the Ugandan capital city, Kampala.) Steve Daniels recently built on this idea in his analysis of Kenya’s local economy by noting that informality exists along a spectrum (Daniels, 2010). According to Daniels, enterprises in the country’s formal and informal sectors differ, to varying degrees, with respect to several factors: business size, start-up capital, labour, labour protection, skills, selling price, raw materials, infrastructure, quality, resources, market linkages, flexibility, efficiency, self-sufficiency and culture. For example, in terms of business size, an enterprise at the informal end of the formal–informal spectrum has fewer than five employees, while an enterprise at the formal end has more than 50 (Daniels,

2010). Meanwhile, firms with 6 to 50 employees are situated somewhere along the spectrum. Given the varying levels of regulation and legal protection for those providing goods and services across the spectrum of informality, striking the optimal balance between tight and loose regulation is likely to be critical to harnessing the potential of Africa's IE to facilitate innovation and development.

Paul Godfrey (2011) has reviewed how various disciplines – ranging from economics to sociology to management – define the IE. Godfrey found that the term receives varying treatment across the literature. Some development economists see limited potential for efficiency in the informal sector due to the small size of local enterprises and these enterprises' lack of protection of property rights (Godfrey, 2011). Hernando de Soto (2000), for example, positions informal work arrangements as a rational response by micro-entrepreneurs to onerous regulations governing the licensing and registration of businesses. Not all business and economics literature characterises informality in that light. Sparks and Barnett (2010), for example, argue that the informal sector is a source of vibrant entrepreneurship and job creation.

Outside the field of economics, additional favourable narratives have emerged regarding the IE. Political scientists Gaughan and Ferman assert that “[i]nformal activity takes place largely in personal and intimate domains [...] reflect[ing] the nature of the personal ties between the participants, defined by norms and institutions that are in essence non-economic” (Gaughan and Ferman, 1987, p. 16). Sociologists Portes and Sensenbrenner believe that “[a] solidary ethnic community represents, simultaneously, a market for culturally defined goods, a pool of reliable low wage labor, and a potential source for start-up capital” (Portes and Sensenbrenner, 1993, p. 1329).

A joint IDRC/OECD-published volume has also acknowledged that innovation among micro and small firms in the informal sector “can result in benefits not only to informal entrepreneurs, but also to the society as whole; the informal sector in fact produces economically viable and beneficial innovations that affect a large proportion of the population” (Kraemer-Mbula and Wamae, 2010, p. 66). The most recent literature on IP and indigenous peoples' innovation further highlights the widespread recognition that “traditional knowledge systems are indeed innovative, dynamic and directly relevant to practical needs; that collective and cumulative forms of innovation and creativity have value and worth in themselves” (Drahos and Frankel, 2012, p. xv).

Measuring innovation in the informal sector

Emerging from the somewhat discipline-specific approaches to defining the IE are various means of measuring informal employment and activities. Historically, the

ILO measured informal employment using the residual method, which assessed existing statistical data from population censuses, labour force surveys and/or household surveys, and compared countries according to international benchmarks (ILO, 1993). In recent years, the OECD has begun to give greater emphasis to country-specific innovation surveys than to international comparisons, because the former are seen as more effective tools for policy-making and business planning to facilitate the building, sharing and application of new knowledge (OECD and Eurostat, 2005).

However, Fred Gault (2010) has highlighted the fact that, in many developing countries, measuring innovation in the IE is not amenable to standard innovation surveys. Gault has proposed the use of case studies, based on structured interviews, as an alternative research approach. According to Gault, “[t]he results may highlight the need, for example, to treat agriculture as a knowledge-based industry in a global world, rather than a subsistence activity, or the need to protect indigenous knowledge so that its use can continue to benefit the community that has developed it over time” (Gault, 2010, p. 133).

5. A framework for development through IP

Parallel to the emergence of a heterogeneous literature on innovation, entrepreneurship and the IE, researchers have constructed an increasingly sophisticated definition of “development” as encompassing not simply economic growth, but more fundamentally, the promotion of human freedom. For example, Amartya Sen (1999) focuses on political, economic and social rights and opportunities that advance the capabilities of the individual. Martha Nussbaum (2000; 2011) argues for an approach whereby all people are afforded a minimum threshold of capabilities, including bodily health and integrity, as well as control over their environments. Thus, while economics is still heavily influential in theories of development, it no longer dominates policy discourse. The dialogue has become infused with international affairs, political science and law (including IP law).

There is now concerted reflection on how innovation can best contribute towards achievement of the UN Millennium Development Goals (MDGs) by 2015. Calestous Juma and Lee Yee-Cheong (2005) have highlighted the important role that innovation and innovation policy can play in this regard. Juma and Yee-Cheong stress that innovation has the potential to increase the ability of existing science, technology and innovation programmes to reduce poverty and expand human capabilities, particularly in the areas of public health, agriculture, energy use and information and communication technologies (ICTs). Development scholars have also begun to explore how innovation can contribute solutions to

global challenges (Kraemer-Mbula and Wamae, 2010), and it is likely that theorists will continue along this trajectory as they broaden their understanding of the innovation–development nexus.

As suggested above, innovation and entrepreneurship encompass not only “pure” forms of innovation, but also imitation as innovation: small but significant improvements on processes and design. Given the limited resources available to most individuals working in the IE, imitation entrepreneurship is inevitably a prominent kind of entrepreneurial activity in the IE. In the context of scarce resources, the creativity to alter and adapt design processes and products is essential and abundant.

However, despite this wealth of creative innovation, those operating in the IE are, in most cases, not optimally incentivised. Among the stifling forces for innovation in the IE are, it would seem, IP dynamics. In the IE, IP dynamics potentially operate negatively in at least two fashions: (1) pure innovations receive little to no IP protection, allowing for duplication by large players in the formal economy; and (2) entrepreneurs do not attempt to expand the reach of their products, perhaps because they fear they are infringing on the rights of IP holders. Such limitations – fear of IP exploitation and fear of IP infringement – may be a disincentive for IE players to innovate and expand the reach of their innovations. Thus, mismatched IP policies and structures may be among the factors hindering the IE’s potential to trigger a new phase of economic development in Africa driven by entrepreneurship and innovation. This is among the overarching uncertainties probed throughout the chapters of this book.

It is necessary when interrogating the functioning of the IE in Africa to interrogate, *inter alia*, the IP system’s potential limitations at both macro and micro levels. Certain macro-level policy changes favouring improved knowledge dissemination in the IE are likely to be necessary to help address innovators’ fears of potential IP expropriation. At the micro level, grassroots programmes will likely be required to quash fears of IP infringement by IE entrepreneurs and to engage entrepreneurship at the individual level in order to bolster the “motivational aspect” of IE entrepreneurship as posited by McClelland (1961). Such micro-level work will likely need to involve programmes that allow for shifts in the mindsets of the individuals that comprise the IE.

Entrepreneurs should be taught not only how to protect and exploit their own IP, formally or informally within the pragmatic parameters of the environments in which they operate. They should also be aware that imitation and improvement of existing products and processes are acceptable and, in fact, encouraged when done within certain parameters. Such a shift from the dominant rhetoric about the perils of IP piracy would seem to be an important component of an innovation policy. A shift in mindset at the individual level could potentially enhance existing incentives for those participating in the IE and, in turn, push the IE’s innovative potential beyond its current threshold.

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