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17 Entrepreneurship and Innovation in Africa

Abstract: Entrepreneurship and innovation in Africa—pivotal for the continent's economic progress—present a contrast to Europe and North America with unique challenges and opportunities facing African startups and micro, small, and medium enterprises. This chapter offers a comprehensive examination of these differences and distinctive features of African startup and innovation ecosystems, highlighting insights from extant research and opportunities for empirical exploration and theoretical elaboration. It explores the relevance of these African experiences to similar emerging and developing economies and emphasizes the need for research that specifically addresses these unique dynamics, particularly in areas where existing theories and insights may not fully apply.

Keywords: Africa, innovation, entrepreneurship, MSMEs, institutions, firm performance

17.1 Introduction

Entrepreneurship and innovation hold critical significance for economic growth and development on the continent of Africa (Adusei, 2016; Mijiyawa, 2013; Peprah & Adekoya, 2020).[1] These activities are integral to creating jobs, new products, and services to address market needs and enhance the quality of life for more than 1.2 billion people living on the continent, the second most populous in the world after Asia. While entrepreneurship in the Western world is often studied in the context of high-growth Silicon Valley ventures, the phenomenon spans a wide range of entrepreneurial activity in Africa, from informal microenterprises and small and medium-sized enterprises (MSMEs) (Adom, 2014; Benjamin & Mbaye, 2012; Falco, Kerr, Rankin, Sandefur, & Teal, 2011), to high-technology startups, such as those working at the frontier of artificial intelligence and fin-tech (Ndabeni, 2008; Solomon & van Klyton, 2020). In contrast to Europe and North America, where entrepreneurship and innovation benefit from substantial venture capital investment, favorable regulations, and well-established ecosystems, the African context presents distinct challenges for entrepreneurs.

1 We focus specifically on sub-Saharan Africa in this chapter and use the term 'Africa' to refer to this region. We follow other scholarship to distinguish North Africa as culturally, institutionally, and economically distinct from sub-Saharan Africa.

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First and foremost, African entrepreneurs face significant institutional voids—critical economic and legal institutions, such as courts, credit-rating agencies, and regulatory bodies, which are either missing or underdeveloped (Akanmu, Prabhat, Khanna, & Palepu, 2005; Gao, Zuzul, Jones, & Khanna, 2017). These voids severely limit the potential for innovation and the creation of new enterprises (Gao et al., 2017; Mair & Marti, 2009; Mair, Marti, & Ventresca, 2012; Stephan, Uhlaner, & Stride, 2015) and contribute to high startup costs, significant regulatory obstacles, and limited access to finance, which are profoundly different from the conditions in more developed economies. For instance, the cost of starting a new enterprise in Africa averages nearly 120 percent of annual income per capita, in stark contrast with the less than 1 percent cost in North America, putting new enterprise creation out of reach for many Africans. Moreover, rampant corruption and high risk of government expropriation compound the problems created by institutional voids (Ajide, 2020; Ashforth & Anand, 2003; Stevens & Newenham-Kahindi, 2021), contributing to a scarcity of investment (Adongo & Lithographic, 2011; Benali & El Ghalfiki, 2021; Fafchamps, 2001). These realities relegate many entrepreneurs to the informal sector, where they operate subsistence-based businesses (Assenova & Sorenson, 2017; Nugent & Sukiassyan 2009; Ulyssea, 2018), which engage in lower levels of innovation (Adom, 2014; Bu & Cuervo-Cazurra, 2020) and lack property rights protection and access to formal finance (Agarwal & Assenova, 2023; Perry, Maloney, Arias, Fajnzylber, Mason, & Saavedra, 2007; Ulyssea, 2020).

Compounding these issues are cultural and political obstacles that hinder innovation and new enterprise formation. These include pervasive violence and political instability that are part of the lived experience of many subsistence-based entrepreneurs in Africa (e.g., Dimitriadis, 2021, 2024) and a culture of mistrust in government institutions (e.g., Assenova & Sorenson, 2017; Pierce & Snyder, 2020), stemming in part from the legacy of the slave trade and European colonialism (cf. Moscona, Nunn, & Robinson, 2017; Nunn & Wantchekon, 2011). Such challenges further complicate the entrepreneurial landscape and distinguish innovation ecosystems in developing economies throughout Africa and other regions with similar colonial legacies (Barasa, Knoben, Vermeulen, Kimuyu, & Kimyanjui, 2017; Oluwatobi, Efobi, Olurinola, & Alege, 2014) from those in the developed world.

When viewed from the perspective of these institutional differences, many phenomena previously examined in the literature on entrepreneurship and innovation in Africa could be seen as symptoms of these broader challenges. For example, the distinction between 'necessity' and 'opportunity' entrepreneurship, which is often cited in research on emerging economies in Africa and the global South (Baptista, Karaöz, & Mendonça, 2014; Dencker, Bacq, Gruber, & Haas, 2021; Fairlie & Fossen, 2018; Gruber, Dencker, & Nikiforou, 2023), could be re-cast in terms of broader challenges with legal and regulatory frameworks that prevent individuals from creating firms in the face of new market opportunities (Klapper, Amit, & Guillén, 2010). Moreover, the dominance of informal and subsistence forms of entrepreneurship throughout Africa

and many developing regions worldwide (cf. Schoar, 2010) may also be seen as an outcome of institutional underdevelopment, rather than lack of entrepreneurial ambition among individuals (Adom, 2014; Dencker et al., 2021). Similarly, the observed lack of productivity-enhancing management practices and poor quality of management among enterprises in many developing economies throughout Africa, as highlighted by Bloom, Genakos, Sadun, and Van Reenen (2012) and Bloom and Van Reenen (2010), may stem from larger and more systemic problems of government corruption, which incentivize entrepreneurs to hide income and output (Dabla-Norris, Gradstein, & Inchauste, 2008), underscoring the interconnected nature of these phenomena.

Despite these obstacles, Africa is witnessing emergent trends that signal opportunities for further research. Increasing venture capital investment, particularly early-stage venture capital (Assenova & Balachandran, 2024; Benali & El Ghalfiki, 2021), the emergence and rise of startup accelerators and incubators (Assenova, 2020, 2021; Assenova & Amit, 2024), the rapid expansion of sectors such as mobile money and fintech (Agarwal & Assenova, 2023; Wormald, Agarwal, Braguinsky, & Shah, 2021) are notable developments.[2] As well, an increasing prevalence of female entrepreneurship (Ojong, Simba, & Dana, 2021; Uzuegbunam & Uzuegbunam, 2018) and the surge in return migration of African scientists facilitating investment in basic research (Fry, 2022, 2023) present further opportunities to explore the role of gender in entrepreneurship and migration networks in the transfer of knowledge to enable greater innovation on the continent.

This chapter aims to offer a comprehensive exploration of these phenomena within the African context, highlighting both the challenges and opportunities. Our goal is to deepen the understanding of the underlying factors driving entrepreneurship and innovation in Africa and to draw parallels with other regions facing similar cultural or economic conditions, including Asia (see Dong and Luo, Chapter 16 in this volume). By concluding with policy-relevant questions, we aim to contribute to the evolving discourse on African entrepreneurship and innovation, presenting a perspective on the continent that is both phenomenologically and theoretically distinct within the broader field of entrepreneurship and innovation studies.

2 Mobile money is a digital medium of exchange and store of value, allowing users to make payments and store funds via mobile-money accounts accessed through a network of mobile-money agents. Mobile network operators or other entities in partnership with them provide this financial service, and it does not require a traditional bank account. All that is necessary is a primary mobile phone.

17.2 Distinctive Features of African Startup and Innovation Ecosystems

17.2.1 Obstacles to New Firm Formation, Funding, and Growth

17.2.1.1 Ecosystem Characteristics

African entrepreneurs navigate a landscape of extraordinary challenges, facing some of the world's most formidable barriers to starting, growing, and managing new enterprises (Assenova, 2021; Klapper, Laeven, & Rajan, 2006; McAfee, Mialon, & Williams, 2004). These challenges significantly impede the rate of new enterprise formation which is reflected in the comparatively low ease of startup of most African countries as compared with those in North America, Europe, and even Asia (Figure 17.1). For instance, the ease of starting up in most African countries ranges between 29.3 and 56.1 on an index of 0 to 100, with increasing values denoting better ecosystem quality, compared with 89 to 98.6 out of 100 for North America and many parts of Europe and Asia.

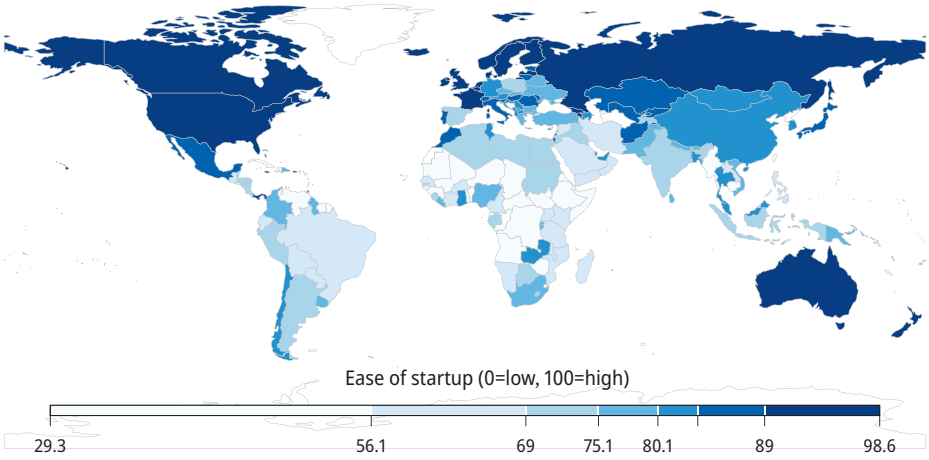

Figure 17.1: Comparative quality of startup ecosystems by world region.
Source: World Bank Data.

The lower ecosystem quality observed in many parts of Africa stems in part from significant startup costs—both upfront costs such as registration and operating permit fees, and ongoing costs, such as high rates of taxation on firm profits. As shown in Table 17.1, the average startup costs in Africa, including registration and operating permit fees, are around 120 percent of annual income per capita. In contrast, the global average is around 50 percent, while the average in North America is 0.68 per-

cent. This dramatic contrast underscores a critical impediment to entrepreneurship, unique to African ecosystems, which is the generally unaffordable costs of starting up in the continent. Another distinctive feature of the African context, which has not received much scholarly attention in the entrepreneurship literature, is taxation. As Table 17.1 shows, the average tax rate as a percentage of firm profits is about 59 percent in sub-Saharan Africa, compared with 33 percent in North America and 35 percent in East Asia and the Pacific. High taxation on firm profits for African enterprises skews incentives away from investment in entrepreneurship and innovation, and toward income hiding and tax evasion (Dabla-Norris et al., 2008; Djankov, Ganser, McLiesh, Ramalho, & Shleifer, 2010), making many African firms appear mismanaged and unproductive (Bloom et al., 2012; Bloom and Van Reenen, 2010). These notable differences present an untapped area for research: What would be the impact of tax reforms on entrepreneurial motivation in Africa? How can African nations balance the need for tax revenue with fostering a thriving business environment?

Table 17.1: Startup Costs by Income Group and Region.

INCOME GROUP	Startup Cost (as % of income per capita)	Time (days)	Procedures (number)	Total Tax Rate (as % of firm profit)	Size of Informal Economy (as % of GDP)
Low-Income Economies	154.23	38.68	9.18	66.45	41.27
Lower-Middle-Income Economies	63.97	39.01	9.23	45.48	39.12
Upper-Middle-Income Economies	23.31	42.52	8.77	40.77	35.97
High-Income Economies	6.88	18.77	6.66	37.95	21.66
REGION					
East Asia & Pacific	30.26	35.04	7.57	35.13	26.26
Europe & Central Asia	7.60	20.37	6.92	42.02	28.63
Latin America & Caribbean	41.37	49.86	9.31	46.99	40.23
Middle East & North Africa	37.25	26.75	9.13	33.53	25.13
North America	0.68	4.37	3.32	33.68	12.15
South Asia	25.50	22.55	7.73	39.17	33.16
Sub-Saharan Africa	119.60	41.79	9.38	59.09	40.85
Overall average	**49.65**	**33.84**	**8.31**	**45.20**	**32.94**

Source: World Bank Enterprise Surveys.

The lower ecosystem quality in Africa is also attributable to several major obstacles to enterprise operations. Foremost—cited by 23 percent of all enterprises in Africa—is access to electricity (Figure 17.2). Electricity and other infrastructure—a necessity for entrepreneurship (Czernich, Falck, Kretschmer, & Woessmann, 2011; Dutta, Armanios, & Desai, 2021; Woolley, 2014) that is largely taken for granted in many other regions—is still highly unreliable and inadequate throughout most of the continent. Only 9 percent of enterprises in East Asia and the Pacific, 4 percent of enterprises in Europe, and 7 percent of enterprises in Latin America and the Caribbean cite electricity as a major obstacle to their operations (Figure 17.2). Access to finance is another formidable hurdle to new enterprise formation and growth (Ajide & Ojeyinka, 2022). Twenty-one percent of enterprise owners and managers in Africa report access to finance as the leading operational obstacle, compared with 12 percent in Europe and Central Asia, and 11 percent in Latin America and the Caribbean (Figure 17.2). These figures suggests that despite progress in financial inclusion, access to finance remains low. Finally, nearly 10 percent of enterprise owners in Africa cite the practices of competitors in the informal sector as the most significant obstacle to their operations. While informality is prevalent in many developing regions of the world, the informal sector is particularly large in Africa (Assenova & Sorenson, 2017), where enterprises that do not have formal operating permits and are not registered with the government account for more than half of total economic output and nonagricultural employment (Chen, 2005; Schneider, 2002).

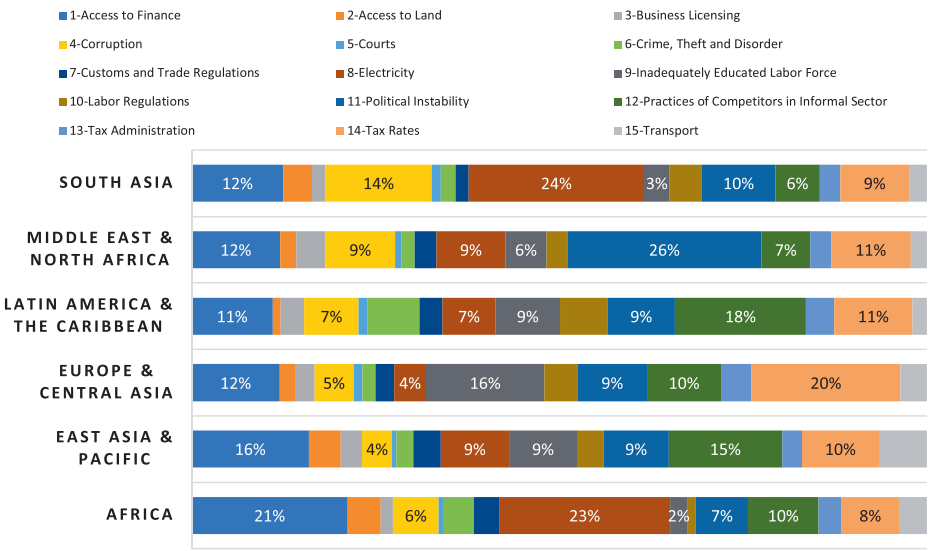

Figure 17.2: Obstacles affecting enterprise operations by region.
Source: Enterprise Surveys Data.

17.2.1.2 Challenges with Financial Access and Inclusion

Financial inclusion in Africa is critical for the region's enterprise development and growth. Yet, data from the International Finance Corporation (IFC, 2017), a leading international financial institution that promotes private sector development in developing countries, show that up to 93 percent of African micro-enterprises and up to 94 percent of African small and medium enterprises lack adequate access to bank loans and lines of credit (Figure 17.3).[3] Research examining the reasons for the low financial inclusion among small firms has argued that poor access to finance among small firms stems from the historical legacy of the slave trade in Africa (Pierce & Snyder, 2018). In parallel, emerging research on mobile-money platforms—including M-PESA, a leading mobile money service pioneered in Kenya—suggests that grassroots innovations such as these may hold the key to financial inclusion (Agarwal & Assenova, 2023; Wormald et al., 2021). These platforms have been shown to increase access to formal finance through commercial banks, microfinance institutions, and credit unions by certifying end users through alternative digital data, providing unified access to distributed services, and scaling through network effects, thereby reaching a broader base of previously excluded users (Agarwal & Assenova, 2023). Despite this increase in research evaluating access to finance, critical research questions about the reasons for financial exclusion of new businesses in Africa remain. How can innovative financing models, like crowdfunding or digital financial services, such as mobile-money platforms, revolutionize access to capital in Africa, particularly among MSMEs? What can other regions with similar financial constraints learn from Africa's approach to overcoming these barriers? Which policies can deepen credit information and credit market development to ensure greater inclusivity?

In addition to these challenges in obtaining debt capital from formal financial institutions such as commercial banks, the scarcity of venture capital for African startups, especially compared with their North American counterparts, presents another major obstacle to new enterprise development and innovation (Dutta, Lanvin, Rivera León, & Wunsch-Vincent, 2023). Given the role that venture capital plays in funding high-technology startups and technological innovation (George & Prabhu, 2003; Siqueira & Bruton, 2010), it is an essential engine for enabling economic growth (Samila & Sorenson, 2011). Yet, according to data from the World Intellectual Property Organization, a UN agency devoted to promoting and protecting intellectual property across the world, African startups receive less than 1 percent of all venture capital deal volume and investment—the lowest share of any world region. By comparison, startups in North America (primarily the United States) receive more than 50 percent of the

3 Micro-enterprises are firms with fewer than 10 employees, small enterprises with 10 to 49 employees, medium-sized enterprises with 50 to 249 employees, and large enterprises with 250 or more people. The IFC defines financially constrained enterprises as those that sought financing for their operations but could not secure it or not do so on favorable terms for the business.

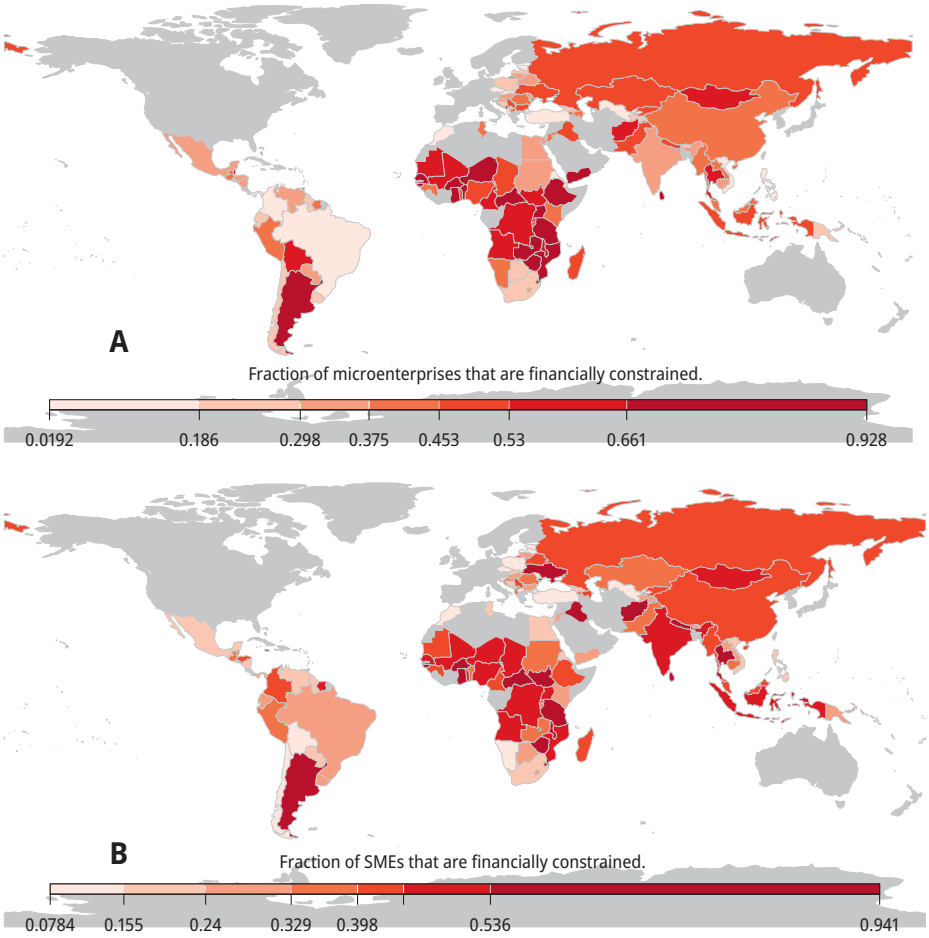

Figure 17.3: Financial access and inclusion among microenterprises and SMEs.
Source: International Finance Corporation.

world's total volume of venture capital investment. There is a scarcity of research on the reasons for these disparities. Probing questions that are important to address include: What factors contribute to the low levels of venture capital investment in Africa, and how can these be mitigated? What role can equity capital play in enhancing the innovation landscape in Africa, and what global lessons can be drawn for other regions with similar levels of underinvestment? Finally, what role can immigrant and returning entrepreneurs and investors play in attracting cross-border investments in African ventures? Research on this latter topic suggests that the ties that venture capitalists form to immigrant entrepreneurs can increase investment in their home countries, broadening the geographic scope of investment (Balachandran & Hernandez, 2021).

17.2.2 Differences in Enterprise Structure and Management

The widespread prevalence of informality in Africa is noteworthy and presents a stark contrast to the typical structure and management practices prevalent in new enterprises in more developed regions of the world (Falco et al., 2011; Wellalage & Locke, 2016). Informal enterprises—often defined as those that do not register with the government or have formal operating permits, do not pay taxes, or keep separate accounts from those of their owners, and do not possess distinct legal entities, such as limited liability corporations or their equivalents—have attracted significant scholarship (Assenova & Sorenson, 2017; Bu & Cuervo-Cazurra, 2020; Kanbur, 2017; Ulyssea, 2020; Webb, Bruton, Tihanyi, & Ireland, 2013; Webb, Ireland, & Ketchen, 2014; Webb, Tihanyi, Ireland, & Sirmon, 2009). The prevalence and extent of informality in Africa and other emerging and developing regions worldwide are in sharp contrast to the more formalized business environments of developed regions such as Europe and North America, where most enterprises are registered and operate using separate accounts and legal entities from their owners.

In addition to differences in enterprise structure, there are also notable differences in enterprise management in African economies compared with those in other regions (Bloom, Mahajan, McKenzie, & Roberts, 2010; Bloom & Van Reenen, 2010; Klüppel, Pierce, & Snyder, 2018; Pierce & Snyder, 2020). Research has shown that most African enterprises are managed by entrepreneurs who are both owners and managers of their enterprises, so-called 'founder-CEOs' (Bennett, Lawrence, & Sadun, 2017). According to data from the World Management Surveys (Center for Economic Performance, 2024), firms managed by founder-CEOs are the worst managed in the world, and African enterprises have the lowest quality of management of any enterprises in the world based on these measures.[4] These firms are characterized by the tendency to hire family members rather than qualified professionals, to not tie pay to performance, and to engage in unproductive management practices that erode firm value (Bloom et al., 2010, 2012; Bloom & Van Reenen, 2010; Pierce & Snyder, 2020).

As depicted in Figure 17.4, a high prevalence of informality is often coupled with poor quality of management, which suggests these choices of enterprise structure and enterprise management may be interdependent or co-determined by similar underlying causes. Countries with higher rates of informal enterprises tend to have a lower average management quality score of these enterprises. These patterns raise several questions: Is the choice to operate informally motivated by the same underlying factors as the choice to hire family members, to not tie pay to performance, and generally not to invest in technology or productivity equipment? If so, what are these underlying rea-

4 Notably, of all the countries in the World Management Surveys sample where firms rank among the lowest in terms of their quality of management: 64 percent are in Africa.

sons, and to what extent do they have to do with the desire to avoid paying bribes to corrupt officials, the lack of access to information, or general mistrust?

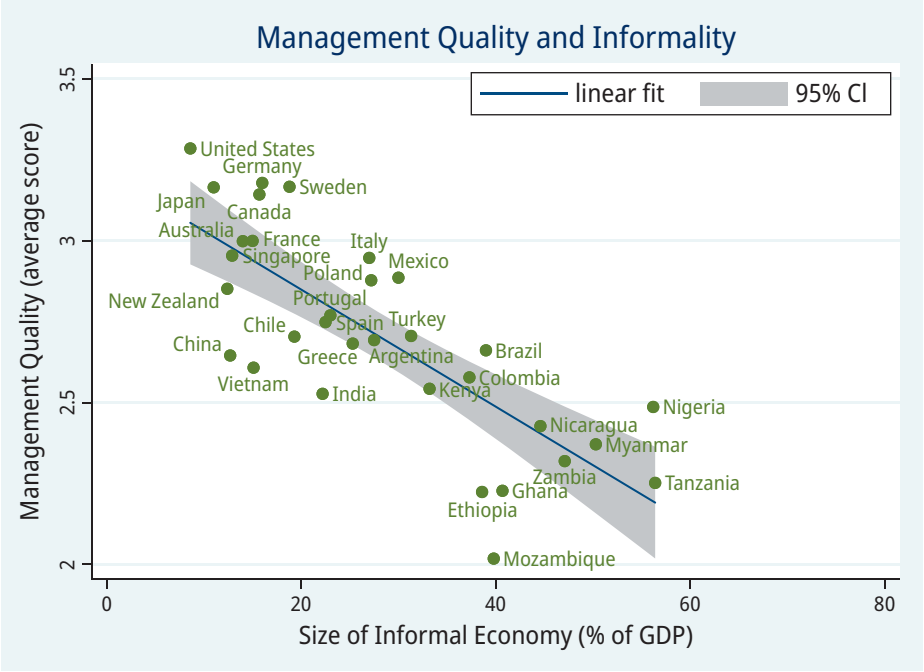

Figure 17.4: Management quality and informality.
Source: World Management Surveys.

Particularly noteworthy is that most enterprises that start informally are also sole proprietorships, with more than 35 percent of all African enterprises being legally organized as sole proprietorships—the highest in the world. To put this figure into context, fewer than one in five enterprises in East Asia and the Pacific, and fewer than one in ten in Europe and Central Asia, are organized as sole proprietorships (Figure 17.5). This pattern of organizing as a sole proprietorship—compared with alternative forms including a shareholding company with shares traded (i.e., a public company listed on a stock exchange) or a shareholding company with non-traded shares (i.e., a private corporation)—generally confers lower prospects of attracting capital and expanding the scope and scale of operations (Wellalage & Locke, 2016). In contrast to sole proprietorships, corporations have more diversified ownership and management and can access more external capital from a diverse set of sources, including international investors. These advantages to corporate forms raise important questions about why African entrepreneurs seemingly tend to favor sole proprietorships given the relative limitations of these legal forms.

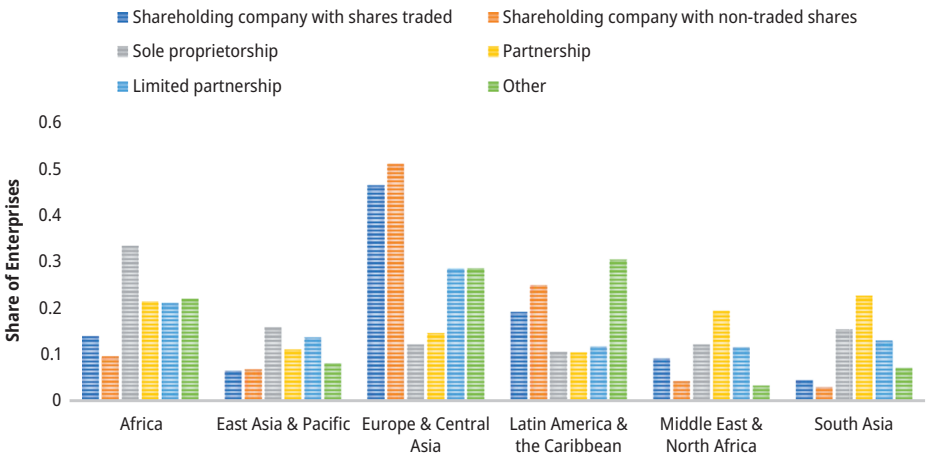

Figure 17.5: Legal form of enterprise by world region.
Source: World Bank Enterprise Surveys.

A rich literature on this topic has evaluated the fundamental reasons for these differences in enterprise form and structure, where African enterprises are overwhelmingly informal and organized as sole proprietorships. Some scholars have argued that the reason for the prevalence of informality is that small, informal firms do not stand to benefit from formalization (La Porta & Shleifer, 2014), while others have theorized that informality confers advantages for firm performance when firms are still small and less productive, enabling them to prove the concept before scaling (Williams, Martinez-Perez, & Kedir, 2016; Williams & Shahid, 2016; Williams, Shahid, & Martinez, 2016). Additionally, research on sole proprietorships in Africa suggests that the reason for this choice of legal form is the legacy of the slave trade (Klüppel et al., 2018; Pierce & Snyder, 2020), which created deep mistrust and contributed to a preference for lineage forms of organization (Moscona et al., 2017; Nunn & Wantchekon, 2011). These forms of organization help explain both the concentrated ownership and management within the family (with many sole proprietors hiring family members), and the resultant poor management practices within these firms. As well, a high prevalence of informal enterprises also corresponds to lower innovation. Informal enterprises tend to engage less in innovative product development, favoring imitative practices instead (Bu & Cuervo-Cazurra, 2020).

However, surveys of informal entrepreneurs reveal a more nuanced picture, suggesting that the underlying reasons for both informality and concentrated ownership may be varied and complex (Ulyssea, 2018, 2020). Based on recent data from the World Bank, only one in ten informal enterprise owners and managers in Africa say that there is no benefit of formalization for their business. A majority—25 percent—cite bribes that registered businesses pay to government officials as the main reason

they operate informal enterprises (Figure 17.6). The reasons for small, sole proprietorships may be similar—these enterprises do not face the same regulatory and reporting requirements and bypass the need to interact with government officials who often engage in rent seeking from complex and unevenly enforced regulations (Djankov, La Porta, Lopez-de-Silanes, & Shleifer, 2002). These realities suggest that more research is needed to evaluate entrepreneurs' varied motivations for choosing specific enterprise forms (Adom, 2014). Several important questions remain unanswered: What drives the choice between formal and informal enterprise structures, and between concentrated and distributed ownership structures, both in Africa and in emerging economies more generally? How do these choices impact enterprise access to capital, employees, and property rights protection? What policies can encourage more entrepreneurs to choose more formal and complex enterprise structures?

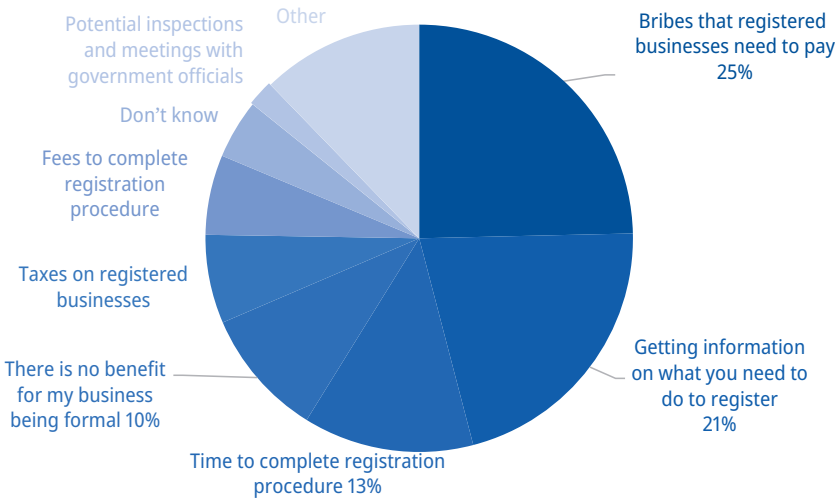

Figure 17.6: Reasons given by African entrepreneurs for operating informal enterprises.
Source: World Bank Enterprise Surveys.

The unique context of African entrepreneurship not only demands a tailored research approach but also offers an opportunity for scholars to investigate important differences in the type, form, and structure that entrepreneurial activity takes in Africa and other developing regions worldwide to inform global entrepreneurship research. Addressing these questions could yield insights about how to encourage a higher quality of entrepreneurship in these ecosystems, with profound implications for policy and practice, both within Africa and in other parts of the world facing similar challenges and constraints to firm formation, funding, and growth.

17.2.3 Obstacles to Product and Process Innovation

African enterprises have some of the lowest innovation rates in the world (Barasa et al., 2017; Oluwatobi et al., 2014). World Bank data show that only a quarter of African enterprises introduced new products or services over the previous three years in 2022, and only 16 percent introduced innovations new to their primary market (Figure 17.7). This is significantly lower than new product innovation rates in Latin America and the Caribbean (37 percent), South Asia (33 percent), and Europe and Central Asia (27 percent), as Figure 17.7 illustrates. Additionally, only 25 percent of African enterprises introduced new or significantly improved processes over the previous three years, compared with 47 percent of South Asian enterprises and 31 percent of Latin American and Caribbean enterprises. These comparatively low levels of product and process innovation raise myriad questions about the potential causes of firms' underinvestment in innovation activities and basic research and development (R&D).

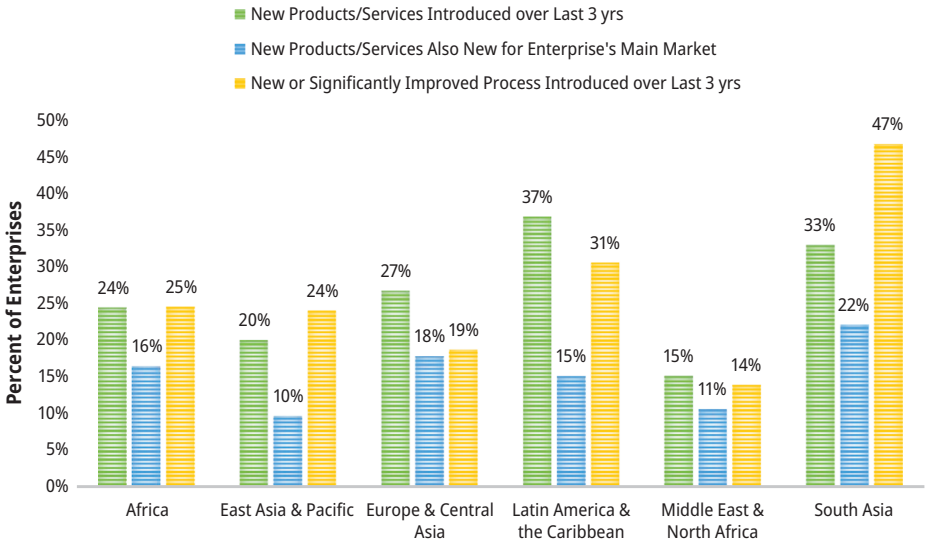

Figure 17.7: Enterprise product and process innovation.
Source: World Bank Enterprise Surveys.

Several key factors may contribute to this divide. First, comparatively low R&D expenditure in Africa may account for some of these differences. Africa's aggregate expenditure on R&D, standing at only 0.32 percent of the total GDP of all African economies combined, according to data from UNESCO, is markedly lower than the global average of 1.92 percent (UNESCO, 2024). In stark contrast to North America and Western Europe, where R&D expenditure as a share of GDP has been increasing, sub-Saharan Africa has seen a decline in such investments over the past five years. This decline in

R&D expenditure highlights a significant gap in the existing literature on African innovation, which often fails to account for the unique economic and institutional contexts of African nations. The scarcity of resources dedicated to innovation in Africa is also evident in human capital. With only about 97 researchers per million individuals in 2023, Africa has the lowest number of researchers per capita compared with other regions, based on UNESCO data. This figure is a mere fraction of the world average and far below the numbers in Latin America and Central Asia.

Second, underdeveloped scientific and research infrastructure (Eniayejuni, 2020), knowledge gaps in conducting basic scientific research (Fry, 2022, 2023), and government policy (Acharya & Subramanian, 2009; Assenova, 2021; Ederer & Manso, 2011; Lee, Peng, & Barney, 2007; Lee, Yamakawa, Peng, & Barney, 2011) further impede Africa's innovative capacity. These realities starkly contrast with the innovation-driven business environments of more developed regions, such as North America and East Asia and the Pacific, where innovation ecosystems are more robust.

Although the research output across African countries has been increasing in recent years, the volume of research output from Africa is still relatively small (Eniayejuni, 2020). Intra-regional collaboration is minimal compared with the more impactful inter-regional collaboration (Eniayejuni, 2020), suggesting that African countries could enhance their research production capabilities through collaborative efforts to improve their global research contribution and impact. As well, enacting effective innovation policies holds the key to more systematic increases in scientific investment and innovation capacity.

Azoulay and Li (2022) present a comprehensive discussion on the five essential dimensions that constitute an effective innovation policy, offering insights that are particularly relevant to African innovation ecosystems. These are: (1) public support for innovative activity, (2) scientific grant systems, (3) human capital policy, (4) tax policy, and (5) new venture creation. Innovation ecosystems that feature these dimensions are crucial for driving economic growth and addressing societal challenges in African nations (Eniayejuni, 2020; Taylor-Robinson, Olupot-Olupot, Morgan, et al., 2022), may hold the key to Africa's economic progress.

Foremost, an emphasis on the social returns to innovation investment and the public support for innovative activity underscores the importance of fostering an environment where innovation is not only encouraged but also materially supported. This aspect is particularly pertinent to Africa, where public investment in innovation can catalyze significant social and economic benefits, given the continent's unique challenges with building scientific research capacity (Fry, 2022, 2023; Taylor-Robinson et al., 2022).

Moreover, the role of scientific grant systems in funding basic research is another critical dimension. Institutions like the National Institutes of Health and the National Science Foundation in the United States serve as benchmarks for how African countries have sought to structure their own funding bodies, such as the African Academy of Sciences, to support foundational research. This approach not only aids in building

a robust scientific infrastructure but also ensures that the continent is contributing to and benefiting from global scientific advancements.

Additionally, human capital policy and mechanisms to expand the pool of innovative labor are particularly relevant for African nations. With a burgeoning youth population, Africa stands at a pivotal point where policies aimed at enhancing education, skill development, and research opportunities could exponentially increase the continent's innovative capacity. Strategies to retain talent and prevent brain-drain, alongside initiatives to attract diaspora talent and international collaborations, could further enrich the continent's human capital in science and technology.

As well, tax policy, including both direct mechanisms like R&D tax credits and indirect effects through corporate and personal income taxes, plays a vital role in incentivizing innovation. For African countries, tailoring these policies to support startups, small and medium-sized enterprises, and large corporations in undertaking R&D activities can significantly impact the innovation landscape. By making innovation financially attractive, these tax policies can stimulate private sector investment in research and development, complementing public funding.

Finally, new venture creation is crucial for translating innovation into marketable products and services, thereby driving economic growth. Encouraging entrepreneurship through supportive policies, access to finance, mentorship, and incubation programs can transform innovative ideas into successful businesses. This is especially important in Africa, where new ventures can address local needs, create jobs, and contribute to the diversification of economies.

While there has been significant progress and initiatives aimed at enhancing research training and access to funding in Africa (Eniayejuni, 2020; Taylor-Robinson et al., 2022), most of the research-building infrastructure is still based on colonial ties between African and European nations, particularly the United Kingdom and France (Fry, 2023). Partnerships between notable scientific research entities like the Africa Research Excellence Fund and the European and Developing Countries Clinical Trials Partnership have provided substantial funding and support for research, particularly in areas of infectious diseases. The UK-based Wellcome Trust has also been instrumental in supporting research in Africa, establishing key research centers focused on diseases relevant to the continent and training African scientists.

The Alliance for Accelerating Excellence in Science in Africa, backed by the African Union and supported by international partnerships and funding ventures from various global entities, including the British Council, the Newton Fund, and others, aims to catalyze long-term research funding and innovation in Africa, working toward reversing the brain-drain and fostering a conducive research environment. This effort highlights the importance of joint funding ventures in research training and the role of return migration of African scientists in forging knowledge-sharing ties (Fry, 2022).

These features unique to African innovation ecosystems offer a rich area for scholarly investigation, with potential relevance to other less developed regions facing

similar challenges. Further research in this area could explore the factors hindering innovative capacity in Africa and identify strategies to overcome barriers to product and process innovation among African enterprises. While understanding barriers to basic scientific output and R&D is important, a complementary perspective is needed to evaluate barriers to technology commercialization through entrepreneurship. Questions of how government policies and institutional frameworks can either promote or impede technology commercialization by new ventures, and the role of international collaborations and technology transfer, are particularly pertinent. As well, a deeper investigation is needed into what policies can effectively support the return migration of highly capable and educated scientists and support the development of the basic knowledge infrastructure needed for scientific knowledge production and output. Moreover, studying successful innovation ecosystems in Africa could provide valuable insights for replicating these successes both within the continent and in other regions with similar economic, institutional, and cultural contexts. This research can illuminate pathways to foster stronger innovation in environments with limited resources, offering global insights into building resilient and innovative ecosystems.

17.3 Emerging Research Opportunities

Africa is witnessing a vibrant transformation in its economic landscape, presenting a plethora of emerging research opportunities. The continent is experiencing a significant surge in venture capital finance, which is a testament to the growing investor confidence in the region's startup ecosystem. This influx of investment is particularly noticeable in the technology sector, with fin-tech and mobile-money platforms at the forefront, revolutionizing the way financial transactions are conducted and offering unprecedented financial inclusion across the continent. Additionally, the rise of accelerators and incubators, coupled with entrepreneurial training initiatives, is nurturing a new generation of African entrepreneurs by providing them with the essential tools, resources, and networks needed to succeed. Collectively, these dynamics underscore Africa's evolving role as a hub for innovation and entrepreneurship, inviting researchers to delve into the intricacies of this transformation and its implications for the continent's future economic trajectory.

The first emerging trend we have observed is the growth of venture capital finance for African startups. Where there has been significant research on the venture capital industry in the US, with many notable studies investigating trends and dynamics (Nanda, Samila, & Sorenson, 2020; Samila & Sorenson, 2010, 2011; Sorenson & Stuart, 2001), a comparable investigation of African venture capital ecosystems presents a fruitful area for further research. The recent funding surge in the technology sector, which has more than quadrupled over the last five years to approximately $3 billion,

surpassing growth rates in other regions, according to data from Pitchbook (Hodgson, 2024), merits further analysis. The fintech portion of this sector, capturing more than 63 percent of this investment, is at the forefront of this surge. However, the distribution of these investments across Africa is highly concentrated—much like the concentration of venture capital investment in the US (Sorenson, Assenova, Li, Boada, & Fleming, 2016)—with Nigeria accounting for more than half of this funding, and Egypt, South Africa, and Kenya receiving an additional 23 percent of total funding.

These patterns raise significant questions about the impact of venture capital investment on both the quality and vibrancy of technology entrepreneurship in Africa and the role of tech ecosystems in expanding innovation and economic growth. For instance, the emergence of innovation clusters in Africa, such as Kenya's fintech and South Africa's health-tech ecosystems, offers a unique perspective compared with established tech hubs like Silicon Valley or Bengaluru. Studying these emerging clusters can provide insights into the interplay between venture capital, technology, innovation, and regulation. As well, the underlying institutional, geographic, and sociological factors that shape the emergence, entrepreneurial processes, and outcomes in these tech ecosystems are yet to be evaluated. The investment landscape, particularly the divergence between Francophone and Anglophone countries due to differences in languages, culture, and administrative and regulatory systems, presents another opportunity for research to understand how these cultural factors and institutional divides may influence the African venture capital landscape.

There is also a crucial need for research to explore the role of foreign venture capital firms in shaping local entrepreneurship and innovation in Africa. This includes investigating how foreign investment impacts local business ecosystems and identifying the factors attracting foreign investors to specific African regions and industries. Further research is also needed to assess the potential benefits and drawbacks of foreign venture capital investment for African startups, including impacts on ownership, governance, and long-term sustainability.

The rapid growth of the technology sector—particularly fintech—alongside the growth of mobile-money and other digital multi-sided platforms in Africa (Agarwal & Assenova, 2023; Jack & Suri, 2014; Suri & Jack, 2016; Wormald et al., 2021) has been attributed to factors such as a young and increasingly urban population, higher mobile phone penetration, and affordable internet services.Similar trends in other developing regions like Latin America and South Asia have contributed to the proliferation of novel fintech services and businesses in these regions (Agarwal & Assenova, 2023; Wormald et al., 2021). Investigating the factors enabling some fintech startups to effectively compete against traditional financial institutions and exploring potential collaborations between the two sectors could provide critical insights into promoting financial inclusion and innovation in Africa. As well, the need for regulatory frameworks to adapt to the pace of innovation provides an opportunity for research into how regulations shape and support innovation and how innovations, such as mobile money, drive regulatory changes. This is particularly relevant in Africa, where the potential

of entrepreneurship to generate economic and societal value is often hindered by underinvestment in R&D and innovation.

Training programs that enhance entrepreneurial skills are also critical in Africa (Anderson, Chandy, & Zia, 2018; Campos, Frese, Goldstein, et al., 2017; Mano, Iddrisu, Yoshino, & Sonobe, 2012). Startup accelerators and incubators have also become increasingly important vehicles for the delivery of basic training in startup skills among African entrepreneurs (Assenova, 2020; Assenova & Amit, 2024; Hmaddi & Younkin, 2023). Compared with North America, applicants to startup accelerators in Africa seem to place a higher value on business skills development, reflecting a critical skills gap. This observation underscores the importance of research into the effectiveness of accelerators and incubators—as well as entrepreneurial training more generally—in developing specific entrepreneurial skills and knowledge. Research opportunities also arise in understanding the unique challenges and opportunities faced by female entrepreneurs in Africa. Despite a higher prevalence of female entrepreneurship in Africa compared with other regions (Ojong et al., 2021), significant challenges remain, including limited access to capital and pervasive gender-based discrimination (Agyire-Tettey, Ackah, & Asuman, 2018; Uzuegbunam & Uzuegbunam, 2018). Investigating strategies to create an enabling environment for female entrepreneurs, such as increasing access to finance, targeted training, and mentorship programs, is critical.

These emerging trends in Africa present distinct opportunities for scholars to compare African startup and innovation ecosystems with those of more developed regions like Europe and North America. Understanding these dynamics is crucial for policymakers, investors, and entrepreneurs aiming to foster a conducive environment for startup growth and innovation on the continent. The identified research questions above offer a roadmap for scholars to explore these unique aspects of African entrepreneurial and innovation ecosystems, providing insights that are not only relevant for Africa but also for other regions facing similar challenges.

17.4 Conclusion

Entrepreneurship and innovation in Africa present a unique and complex landscape with a set of distinctive features. These features include pervasive institutional voids, high startup costs, a culture of mistrust, and low capital availability, which have historically contributed to low levels of innovation, coupled with high levels of informality and subsistence entrepreneurship. While recent growth in venture capital, especially in the fintech sector, marks a positive shift, investments are still concentrated in a few countries, reflecting the deep-seated institutional, geographic, and sociopolitical challenges.

African entrepreneurial ecosystems, characterized by these constraints, unfold diverse research opportunities. Key areas include understanding the impact of foreign

investment in a landscape marked by institutional voids, exploring the role of accelerators and incubators in bridging capital and skills gaps among founders, and addressing the unique hurdles to innovation. Moreover, the rise of digital innovation, primarily through mobile-money platforms, offers fertile ground for research in technology governance and digital infrastructure development in a context where traditional banking infrastructure is limited. The emergence of innovation clusters in areas such as fintech, contrasted with the need for adaptive regulatory frameworks and the overarching issue of informality and subsistence entrepreneurship, underscores the potential for research that addresses the specific challenges and distinctive features of the African context. Such research is crucial not only for developing tailored approaches for fostering sustainable growth and innovation in the region but also for offering insights applicable to other emerging markets with similar institutional environments.

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