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INNOVATIVE ACTIVITY AND COMPETITIVENESS OF SMALL ENTERPRISES: EVIDENCE FROM DEVELOPING ECONOMIES

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Abstract: Small enterprises are central to the transformation of economic structures in developing economies, as they account for a large share of employment. However, they often face difficulties in converting innovation efforts into sustainable competitive advantages. Comparative results on the GII show that innovative strengths exist in developing countries such as India, Vietnam, Turkey, Uzbekistan and Kenya, but that barriers to institutional, financing and firm-level capacity building remain. The article translates these findings into practical recommendations for small enterprise strategy (innovation portfolio, networked learning, digital technology deployment) and public policy (capacity development tools, innovative services and market-shaping public procurement).

Key words: small enterprises; innovation activities; competitiveness; developing economies; enterprise capacity; Global Innovation Index; sectors; productivity.

Annotatsiya: Kichik korxonalar rivojlanayotgan iqtisodiyotlarda bandlikning katta qismini tashkil etishi sababli iqtisodiy tuzilmalarning transformatsiyasida markaziy o'rin tutadi. Biroq ular ko'pincha innovatsion harakatlarni barqaror raqobat ustunligiga aylantirishda qiyinchiliklarga duch keladi. GII bo'yicha qiyosiy natijalar Hindiston, Vetnam, Turkiya, O'zbekiston va Keniya kabi rivojlanayotgan mamlakatlarda innovatsion kuchli jihatlari mavjudligini, biroq institutlar, moliyalashtirish va firma darajasidagi salohiyatni jamg'arishdagi to'siqlar saqlanib qolayotganini ko'rsatadi. Maqolada ushbu xulosalar kichik korxonalar strategiyasi (innovatsion faoliyat portfeli, tarmoqlangan o'rganish, raqamli texnologiyalarni joriy etish) hamda davlat siyosati (salohiyatni rivojlantirish vositalari, innovatsion xizmatlar va bozorni shakllantiruvchi davlat xaridlari) uchun amaliy tavsiyalarga aylantiriladi.

Kalit so'zlar: kichik korxonalar; innovatsion faoliyat; raqobatbardoshlik; rivojlanayotgan iqtisodiyotlar; korxonalar salohiyati; Global Innovatsiya Indeksi; tarmoqlar; unumdorlik.

Аннотация: Малые предприятия играют центральную роль в трансформации экономических структур развивающихся стран, поскольку на них приходится значительная доля занятости. Однако они часто сталкиваются с трудностями в преобразовании инновационных усилий в устойчивые конкурентные преимущества. Сравнительные результаты Глобального инновационного индекса показывают, что инновационные возможности существуют в развивающихся странах, таких как Индия, Вьетнам, Турция, Узбекистан и Кения, но сохраняются барьеры для институционального, финансового и корпоративного развития. В статье эти выводы представлены в виде практических рекомендаций для стратегии малых предприятий (инновационный портфель, сетевое обучение, внедрение цифровых технологий) и государственной политики (инструменты развития потенциала, инновационные услуги и государственные закупки, формирующие рынок).

Ключевые слова: малые предприятия; инновационная деятельность; конкурентоспособность; развивающиеся страны; потенциал предприятий; Глобальный инновационный индекс; секторы; производительность.

INTRODUCTION

The competitiveness of small enterprises is increasingly determined by their ability to innovate under conditions of growing constraints. These constraints include limited financial resources, low absorptive capacity, restricted managerial resources, and high vulnerability to external shocks. In developing economies, such

limitations are compounded by institutional weaknesses, market fragmentation, and uneven access to global value chains, making innovation simultaneously necessary and complex. According to the Global Innovation Index (GII) 2024, a number of upper-middle- and lower-middle-income countries have improved their innovation performance over the long term; however, due to changes in models and data, caution is required when making year-to-year comparisons [1].

Nevertheless, in policy debates innovation is often interpreted narrowly—primarily as formal R&D activity. The World Bank's productivity project emphasizes that innovation policy in developing countries should not simply replicate R&D-centric models from advanced economies, but should instead focus on broader firm capabilities that enable incremental innovation and technology adoption, including managerial, organizational, and production capacities [2].

This article seeks to address how innovation activity influences the competitiveness of small enterprises in developing economies through specific mechanisms, and which policy instruments most reliably enhance the likelihood of achieving sustainable competitive advantage. By answering these questions, the study proposes an integrated conceptual approach that links innovation activity to competitiveness outcomes through capabilities and networks, and presents comparative trends based on GII 2024 results for selected developing countries.

REVIEW OF LITERATURE ON THE SUBJECT

From a theoretical perspective, innovation is regarded as a primary driver of competitive dynamics and productivity growth. Classical approaches emphasize “creative destruction” and entrepreneurial experimentation as key forces in market reallocation and the formation of new combinations [3]. Strategic management perspectives, in turn, explain why some firms are able to transform innovation into competitive advantage more effectively than others. The resource-based view considers valuable, rare, inimitable, and non-substitutable resources as the foundation of sustainable advantage [4]. Dynamic capabilities theory focuses on firms' ability to “sense, seize, and reconfigure” assets under conditions of environmental uncertainty [5].

For developing economies, the central challenge is that resources invested in innovation do not automatically translate into innovative outcomes. Cirera and Maloney (2017) emphasize the critical role of capability accumulation, arguing that innovation extends beyond R&D to include design and engineering, quality management, market intelligence, workforce development, and linkages with customers, suppliers, and research institutions. They also note a strong association between management quality and innovation outcomes, including patenting. For example, global evidence suggests that a one-standard-deviation increase in management quality is associated with approximately five additional patents per firm.

Moreover, the OECD's SME and Entrepreneurship Outlook 2023 highlights that SMEs operate within interconnected “networks of networks,” and that access to production, knowledge, and innovation networks is crucial for productivity, resilience, and green transformation [6].

Empirical studies on developing countries further demonstrate complementarities between digital orientation, innovative practices, and firm performance. Recent research confirms that digital strategic orientation affects outcomes both directly and indirectly through innovation and complementary practices [7].

RESEARCH METHODOLOGY

This article applies a mixed-methods approach to identify the mechanisms linking innovation activity and competitiveness. The methodology combines a systematic literature review, comparative indicator analysis based on GII 2024 rankings and descriptive indicators for developing countries, and triangulation with World Bank evidence on firm capabilities in developing economies.

Competitiveness is measured using outcomes commonly applied in the small enterprise literature, including productivity, export readiness, market share stability, resilience to shocks, and growth capacity. Innovation activity is conceptualized as a portfolio encompassing product and process innovations, organizational and managerial practices, technology adoption and digitalization, and external knowledge linkages.

For the indicator analysis, five countries discussed in the GII 2024 Executive Summary were selected: India (rank 39), Viet Nam (44), Türkiye (37), Uzbekistan (83), and Kenya (96). These countries represent different regions and development levels and are highlighted in terms of ranking dynamics, performance, and identified strengths.

Descriptive comparisons were conducted, and the results were interpreted through a capability- and network-based lens. Particular attention was paid to the links between innovation-related strengths—such as trade-related indicators, intellectual property activity, and online services—and pathways to competitiveness for small firms (Table 1).

Table 1. Developing Countries: GII 2024 Rankings and Highlighted Innovation Strengths

Country	GII 2024 Rank	Income Group Context	Strengths Highlighted in GII 2024
Türkiye	37	Upper-middle-income: 3rd in group	Among improving middle-income economies; strong output efficiency
India	39	Lower-middle-income: 1st in group	Leader in Central and South Asia; consistent "overperformer"
Viet Nam	44	Lower-middle-income: 2nd in group	Strong trade-related indicators; ranked first in high-tech export/import and creative goods exports
Uzbekistan	83	Lower-middle-income: 10th in group	Significant long-term improvement since 2013; "overperformer" status
Kenya	96	Sub-Saharan Africa	Largest improvement in the region in 2024; growth in innovation outputs and IP indicators

Note: Rankings indicate global positions; descriptions are based on the GII 2024 Executive Summary (WIPO, 2024).

ANALYSIS AND RESULTS

The literature review identifies three mechanisms explaining how innovation translates into competitiveness gains for small enterprises.

Mechanism A (capability strengthening): Without managerial and organizational capabilities, innovation inputs yield limited results. World Bank evidence underscores the importance of capabilities encompassing market intelligence, quality management, delegation, incentive systems, and workforce development.

Mechanism B (network efficiency): Innovation is accelerated through participation in supplier, customer, and knowledge networks. The OECD (2023) characterizes SMEs as embedded in complex network ecosystems and recommends expanding access to production and innovation networks.

Mechanism C (institutional returns): The returns to innovation are sensitive to institutional factors such as the rule of law, regulatory quality, and protection of property and patent rights, which shape incentives for adoption and scaling.

Viet Nam's strong trade-related indicators enable small firms to develop through export-oriented clusters; India, as the leading lower-middle-income economy, demonstrates broad-based capabilities; Türkiye exhibits high output efficiency; Uzbekistan's improvement reflects the benefits of systematic development; and Kenya shows that strengthening IP- and export-related capabilities can significantly improve rankings (Table 2) [1].

Table 2. Innovation Activity Portfolio for Small Enterprises and Expected Competitiveness Effects

Innovation domain	Typical practices	Competitiveness pathway	Evidence base
Managerial and organizational innovations	Goal setting, performance monitoring, incentives; delegation; training	Higher productivity and quality stability; faster scaling	Management practices are linked to innovation and patenting
Process innovation and technology	Lean improvements; automation; digital tools	Cost reduction; reliability; resilience to shocks	Capability development matters more than narrow R&D
Product innovation (incremental)	Customer-oriented iteration; design; packaging	Differentiation; price premium; exports	Oslo-type measurement frameworks
Networked learning	Supplier development; customer feedback; HEI linkages	Faster diffusion; access to complementary assets	"Networks of networks" approach

The results indicate that innovation activity should be interpreted not as a single investment decision, but as a bundle of complementary actions. In developing economies, the most sustainable outcomes are achieved through portfolios that emphasize capability development and network participation. This aligns with World Bank conclusions that R&D returns vary with distance from the technological frontier.

In addition, strategic implications for small enterprises include viewing innovation as a staged pathway, leveraging clusters and customer learning to approach scale effects, and using digital tools as enablers of process innovation and market access. From a policy perspective, expanding access to knowledge and innovation networks, strengthening management capability programs, and demand-shaping public procurement are critical.

CONCLUSIONS AND SUGGESTIONS

Innovation activity is a practical driver of small enterprise competitiveness in developing economies; however, it operates most reliably through capabilities and networks. Comparative evidence from GII 2024 shows that while innovation strengths exist in developing countries, constraints related to firm capabilities, institutions, and network access remain decisive. Future research could integrate firm-level panel data with policy changes to examine sectoral differences more deeply.

List of used literature:

1. World Intellectual Property Organization (WIPO). (2024). Global Innovation Index 2024: Executive Summary. Geneva: WIPO (8–9, 16–19, 23-betlar).
2. Cirera, X., & Maloney, W. F. (2017). The Innovation Paradox. Washington, DC: World Bank (21, 46, 81, 87, 96–106, 216-betlar).
3. Schumpeter, J. A. (1934). The Theory of Economic Development. Cambridge, MA: Harvard University Press (66–94-betlar).
4. Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99–120 (101–105-betlar).
5. Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, 18(7), 509–533 (509–516-betlar).
6. OECD. (2023). OECD SME and Entrepreneurship Outlook 2023. Paris: OECD Publishing (4–5, 63–76-betlar).
7. Clemente-Almendros, J. A., va boshq. (2025). Emerging countries could be different for MSMEs: Digital strategic orientation and performance through innovation and environmental practices. *Journal of Innovation & Knowledge*.

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