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INNOVATION IN TÜRKİYE AND EGYPT: THE ROLE OF NATIONAL CULTURE

Research

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Abstract

The dynamic globe where we live necessitates research on innovation and entrepreneurship as factors fostering economic growth, competitiveness, and technological advancement. This study aims to understand the relationship between national culture dimensions and innovation in Egypt and Türkiye, and to analyze which cultural dimension contributes national innovation. The study adopts a theoretical approach using secondary data from Hofstede's cultural model, and Global Innovation Index (GII) indicators as a measurement of innovation. Data covers 2013-2023. It is found out that despite sharing cultural similarities like high uncertainty avoidance and power distance, Egypt and Türkiye differ in individualism and indulgence, whereas Egypt is highly collectivist, compared to Türkiye. High power distance in both countries reflects a lack of egalitarianism and can impede communication and innovation. Egypt and Türkiye have high scores on short-term orientation. This necessitates a more pragmatic approach, considering the future by focusing on education and its long-run returns. According to the GII, the performance in Egypt and Türkiye, is at expectations for their level of development, relative to their GDP. In terms of innovation, Egypt and Türkiye share weaknesses concerning their business policies and the stability of their operational environments. These deficiencies reflect systematic problems slowing the pace of innovative processes. While this study aims to provide a theoretical foundation, empirical research is necessary to analyze further how Egypt and Türkiye can increase their innovative capacity, considering their national cultural values. Moving beyond a mere focus on scores on cultural dimensions, even within a single cultural cluster like the MENA region, is a prerequisite for research on innovation. This highlights the need for a multifaceted approach to understand the exact reasons impeding innovative activities in each country. Also, country-based structural challenges that the GII identifies should be considered while acknowledging the cultural structure of society.

Keywords: National culture, innovation, Türkiye, Egypt, global innovation index.

JEL Code: Z1, 010, 052, 055

Türkiye ve Mısır'da İnovasyon: Ulusal Kültürün Rolü

Özet

İçinde yaşadığımız dinamik dünya, ekonomik büyümeyi, rekabetçiliği ve teknolojik ilerlemeyi teşvik eden faktörler olarak inovasyon ve girişimcilik üzerine araştırmaları gerekli kılmaktadır. Bu çalışmanın amacı, Mısır ve Türkiye'de ulusal kültür boyutları ile inovasyon arasındaki ilişkiyi anlamak ve hangi kültürel boyutun ulusal inovasyona katkıda bulunduğunu analiz etmektir. Çalışmada Hofstede'nin Kültürel Modeli ve inovasyon ölçümü olarak Küresel İnovasyon Endeksi (KİE) göstergelerinden elde edilen ikincil veriler kullanılarak teorik bir yaklaşım benimsenmektedir. Veriler 2013-2023 yıllarını kapsamaktadır. Bulgularımıza göre, yüksek belirsizlikten kaçınma ve güç mesafesi gibi kültürel benzerlikleri paylaşmalarına rağmen, Mısır ve Türkiye bireycilik ve hoşgörü açısından farklılık gösterirken, Mısır Türkiye'ye kıyasla oldukça kolektivisttir. Her iki ülkedeki yüksek güç mesafesi eşitlikçilik eksikliğini yansıtmakta ve iletişim ve inovasyonu engelleyebilmektedir. Mısır ve Türkiye kısa vadeli yönelim konusunda yüksek puanlara sahiptir. Bu durum, eğitime ve uzun vadeli getirilerine odaklanarak geleceği düşünen daha pragmatik bir yaklaşım gerektirmektedir. KİE'ye göre Mısır ve Türkiye'nin performansı, GSYİH'lerine oranla gelişmişlik düzeylerine göre beklenen seviyededir. İnovasyon açısından Mısır ve Türkiye, iş politikaları ve faaliyet ortamlarının istikrarı konusunda zayıf yönleri paylaşmaktadır. Bu eksiklikler, yenilikçi süreçlerin hızını yavaşlatan sistematik sorunları yansıtmaktadır. Bu çalışma teorik bir temel sağlamayı amaçlasa da Mısır ve Türkiye'nin ulusal kültürel değerlerini göz önünde bulundurarak inovasyon kapasitelerini nasıl artırabileceklerini analiz etmek için ampirik araştırmalara ihtiyaç vardır. MENA bölgesi gibi tek bir kültürel küme içinde bile kültürel boyutlara ilişkin puanlara odaklanmanın ötesine geçmek, inovasyon araştırmaları için bir ön koşuldur. Bu durum, her bir ülkede inovasyon faaliyetlerini engelleyen nedenleri tam olarak anlamak için çok yönlü bir yaklaşıma duyulan ihtiyacı vurgulamaktadır. Ayrıca, KİE'nin tanımladığı ülke bazlı yapısal zorluklar, toplumun kültürel yapısı göz önünde bulundurularak değerlendirilmelidir.

Anahtar Kelimeler: Ulusal kültür, inovasyon, Türkiye, Mısır, küresel inovasyon endeksi.

JEL Kodu: Z1, 010, 052, 055

Introduction

Innovation as a concept has been a main driver of sustainable economic growth and global competitiveness, by creating new products, implementing innovative ideas, and developing advanced technologies. Innovation also plays a leading role in addressing economic and social development challenges such as poverty, inequality, and human development (Autio et al., 2013; Fagerberg & Srholec, 2008). As a result, the economy can stagnate if the country fails to adopt technological innovation, adapt to constant changes, and create innovative ideas and opportunities (Schumpeter & Backhaus, 2003).

Andrijauskienė and Dumčiuvienė (2017) state that many nations fail to raise their innovation indices despite spending money on industrial infrastructure and R&D. This can result from several factors affecting innovation across countries and societies. Among such factors comes the national culture. According to Shane (1993), countries must encourage cultural values promoting innovation if they aspire for change. Societies exhibit different degrees of openness to innovative ideas, with some being more supportive of innovation while others may discourage such initiatives. Innovation-related behaviors, including entrepreneurial activities and the establishment of new ventures, are more likely to increase in cultural systems encouraging cultural values such as independence, risk-taking, and determination. These behaviors are related to the prevailing cultural conditions, mindsets, and unique cultural contexts individuals encounter when pursuing innovative ideas (Herbig & Dunphy, 1998; Alon et al., 2016).

Previous researchers found that national culture affects innovation (Elsig et al., 2022; Khan & Cox, 2017). Findings, however, vary among different studies, from positive association, negative association, or insignificant relation between national culture and innovation. This study adopts Hofstede's (2011) cultural model, which describes cultural dimensions as analytical tools to describe and compare national cultures. These dimensions include the Uncertainty Avoidance Index (UAI), Individualism/Collectivism (IND), Power Distance Index (PDI), Masculinity/Femininity (MAS), in addition to Indulgence/Restraint (INDUL), and Long/Short-Term Orientation (LTO).

This study examines the relationship between national culture and innovation in Egypt and Türkiye. Both countries, a part of the Middle East, offer a unique opportunity to compare the impact of diverse cultural profiles on innovative performance. While these countries share some cultural similarities, they exhibit distinct characteristics that may influence innovation. This study explores how cultural values, such as individualism, collectivism, uncertainty avoidance, and power distance, shape innovative performance in both countries. The study utilizes data from Hofstede's cultural dimensions scores and the Global Innovation Index (GII) to explore the relationship between culture and innovation. We aim to offer valuable insights into cultural obstacles to innovation and discuss opportunities for a more innovative environment in both countries by discussing how each component of the GII can be affected by cultural dimensions.

Cultural Dimensions and Innovation

National Culture and Its Dimensions

Culture, a collectively shared understanding of beliefs, values, and behaviors, significantly influences a group's response to its surrounding environment (Hofstede, 1983). This collective understanding of culture becomes the basis for interaction and shared understandings among group members, shaping people's behaviors by determining their social preferences and expectations (Schwarz, 2014). These cultural differences in preferences affect people's behavior and their incentives toward risk-taking, innovation, and tolerance of novel ideas, all prerequisites of innovation (Espig et al., 2022; Tian et al., 2018).

Hofstede's cultural framework includes six dimensions that offer valuable insights into the connection between culture and innovation (Espig et al., 2022). Dimensions are measured on a scale of 0 to 100: Power Distance, Individualism/Collectivism, Uncertainty Avoidance, Masculinity/Femininity. Long-Term Orientation and Indulgence/Restraint were added later to the four cultural dimensions that Hofstede's initial model included.

The Individualism/Collectivism (IND) dimension examines how individuals view their relationship to the larger group and whether they prioritize personal or collective needs. Individualism reflects societies where individuals prioritize personal needs over group harmony, valuing self-reliance, and individual goals. On the other hand, collectivism

describes societies where individuals prioritize group needs and cooperation (Hofstede, 1983; Khan & Cox, 2017).

Espig et al. (2022) found a positive relationship between individualism and innovation rates. The more individualist cultures have been associated with individual freedom, opportunity, and achievement (Andrijauskienė & Dumčiuvienė, 2017); whereas collectivist cultures prioritize harmony, cooperation, and supervisor relations. While collectivism can foster strong social bonds and loyalty, it may also limit individual autonomy and creativity. Therefore, innovation rates are higher in individualist countries (Khan & Cox, 2017).

Masculinity/Femininity (MAS) explains how societies approach values such as achievement, assertiveness, and motivation. This dimension is also called 'Motivation Toward Achievement and Success.' The masculinity index describes the extent to which values such as assertiveness and competitiveness, success, and achievement are dominant. Societies scoring high on Masculinity/Femininity dimension prioritize values such as rivalry and assertiveness. This reflects that competition, achievement, and success are valued; success is defined as coming out on top or being the best in the field; this kind of performance-based value system begins in school and lasts throughout an organization's existence (Hofstede Insights, 2024). On the other hand, societies scoring high on femininity values emphasize values such as solidarity, empathy, tolerance, and cooperation (Hofstede, 1983). These societies encourage quality of life and caring for others, reflecting an orientation toward people, whereas in societies with prevalent masculinity values the orientation is toward determination and achievement.

Previous researchers found that higher innovation rates were associated with a lower score on the Masculinity/Femininity dimension (Elsig et al., 2022; Khan & Cox, 2017) since people can share innovative ideas when the environment encourages collaboration. However, Williams and McGuire (2010) and Shane (1993) found no significant relationship between scores on the Masculinity/Femininity dimension and innovation (Shane, 1993; Williams & McGuire, 2010). Although a culture dominated by masculine cultural values may encourage individuals to strive for excellence and outperform others, it can also create an environment that prevents creativity owing to its less emphasis on collaboration.

Uncertainty Avoidance (UAI) describes how individuals and societies manage unexpected situations. Some cultures embrace change and ambiguity, while others fear the unknown and prefer well-organized environments (Hofstede, 1983). Uncertainty avoidance influences society's attitudes toward risk-taking and unconventional behaviors, both of which are essential for innovation (Hofstede, 1983). Previous research has shown a negative association between uncertainty avoidance and innovation (Andrijauskienė & Dumčiuvienė, 2017; Espig et al., 2022; Shane, 1993; Williams & McGuire, 2010).

The Power Distance Index (PDI) assesses how societies manage inequalities in power distribution. It reflects on how societies resolve inequality among their members and the degree to which individuals reject or value hierarchies and the authority of a few over the majority (Hofstede, 1983). The degree of inequality tolerated in a society can influence innovation. In low power distance societies, participative relationships and equality in rights are encouraged, which may foster innovation (Shane, 1993; Rinne et al., 2012). On the other hand, in high power distance countries, strict hierarchies and centralized decision-making processes may limit innovation (Espig et al., 2022; Hofstede, 1983).

The Long-term Orientation (LTO) dimension examines how societies approach their time horizon through future planning or adherence to traditions. Put differently, this dimension pertains to how societies address current and future difficulties while giving priority to their customs and traditions (Hofstede, 2011). Elsig et al. (2022) found that higher innovation rates are associated with a higher long-term orientation. In future-thinking societies with a long-term orientation, individuals are more likely to identify opportunities, take risks, and invest in the future by focusing on sustainable economic growth and education. On the other hand, short-term-oriented societies are cautiously aware of social change, suggesting that they are less innovative (Hofstede, 2011).

Indulgence versus Restraint (INDUL) reveals how societies tolerate the free gratification of basic human desires such as having fun and enjoying life. In contrast to restraint, which prevents people from satisfying their desires and controls them through social conventions. Individuals in high-indulgence societies have positive emotions that reduce stress, improve health, and value freedom of speech. Restraint societies, on

the other hand, have strong restraints on their needs and strict rules governing immediate gratification of human needs (Espig et al., 2022; Hofstede, 2011).

People in highly indulgent societies are more likely to be optimistic, encouraging innovation as a means of gratifying whims connected to enjoyment and fulfillment (Khan & Cox, 2017). Within the context of an organization, this dimension pertains to the expected behavior and organizational structure. According to Prim et al. (2017), organizations that have less restrictive settings encourage innovation by considering new products, services, expertise, and technologies. Espig et al. (2022) found that higher innovation rates are associated with higher indulgence levels. While some research has found a positive association between indulgence and innovation rates (Espig et al., 2022), others have found no significant relationship between the two.

Innovation and Its Measurement

Innovation describes something new or enhanced, whether it is a product or a service. National innovativeness denotes a nation's ability to consistently generate commercially valuable products and innovative technology (Porter & Stern, 2001; Furman et al., 2002). Innovation has several proxies such as trademarks and the quantity of patents (Shane, 1992; Shane, 1993), in addition to measures such as the Global Competitive Index (GCI) and the Global Innovation Index (GII). Since 2007, the Global Innovation Index (GII) has been one of the most widely used proxies measuring a country’s innovation performance, highlighting innovation weaknesses and strengths. Its objective was to identify indicators and methodologies that accurately represent the intricate nature of innovation. The GII rankings of countries are determined by the average of two sub-indices: the Innovation Input Sub-Index (IISI) and the Innovation Output Sub-Index (IOSI), which provide insights into the innovation inputs and outputs of countries.

The GII includes about 80 indicators measuring infrastructure and creation of knowledge, political environment, and education in each country (WIPO, 2023). The IISI defines five pillars supporting innovative activities: institutions, human capital and research, infrastructure, market sophistication, and business sophistication. Institutions reflect the economy's institutional framework, including the business, political, and regulatory environment. Human capital and Research are about education and R&D.

Infrastructure is about ecological sustainability, infrastructure, information, and communication technologies (ICTs). Under Market Sophistication, there are investment, credit, market scale, and diversification. Finally, Business Sophistication includes innovation linkages, knowledge absorption, and knowledge workers (Lee et al., 2022).

The IOSI includes two pillars to help understand countries' innovative capacities: Knowledge and Technology Outputs, and Creative Outputs. Knowledge and Technology Outputs cover knowledge creation, impact, and diffusion, while Creative Outputs include Online Creativity, creative goods and services, and intangible assets (Lee et al., 2022).

Methods

This comparative review study aims to explore how national cultural dimensions shape innovation performance in both countries. We use secondary data represented by country scores for Egypt and Türkiye on Hofstede's cultural dimensions (Hofstede Insights, 2024), and annual Global Innovation Index scores (GII, 2023). We use data from 2013 to 2023. To add more depth to the above discussion on the relationship between national culture dimensions and the Global Innovation Index, we attempt to reflect on how Sub-components of the Global Innovation Index can be affected by cultural dimensions in Egypt and Türkiye.

Figure 1 shows Egypt and Türkiye's Global Innovation Index (GII) scores from 2013 to 2023 to get a general understanding of both countries' innovation performance. Although both countries have progressed in innovation performance, Türkiye has consistently shown more sustained progress, compared to Egypt. In 2023, both countries' GII performance was at expectations for their level of development, relative to GDP. Additionally, both countries perform better in innovation outputs than innovation inputs (WIPO, 2023).

Egypt's GII score declined from 28.5 in 2013 to 22.7 in 2022 (WIPO, 2023). This downturn suggests potential challenges or setbacks in the country's innovative ecosystem during this period. However, a recent recovery can be noticed, with the GII slightly increasing to 24.21 in 2023. This indicates a renewed focus and efforts to revive innovative activities. This improvement is also reflected by a 4% increase in Egypt's

global innovation ranking, which significantly improved from 89th to 86th in 2023. It ranked 15th among the 18 economies in Northern Africa and Western Asia (WIPO, 2023).

Moving to Türkiye, its GII has exhibited a steadier yet slight upward trend, starting from 36 in 2013 to 38.3 in 2021. While there was a minor drop in 2022 and 2023, Türkiye's overall innovation performance remains strong. In 2023, Türkiye had the 39th rank among 132 economies, which is a sign of its improved global innovation performance. Additionally, it ranked 4th among the 18 economies in Northern Africa and Western Asia (WIPO, 2023).

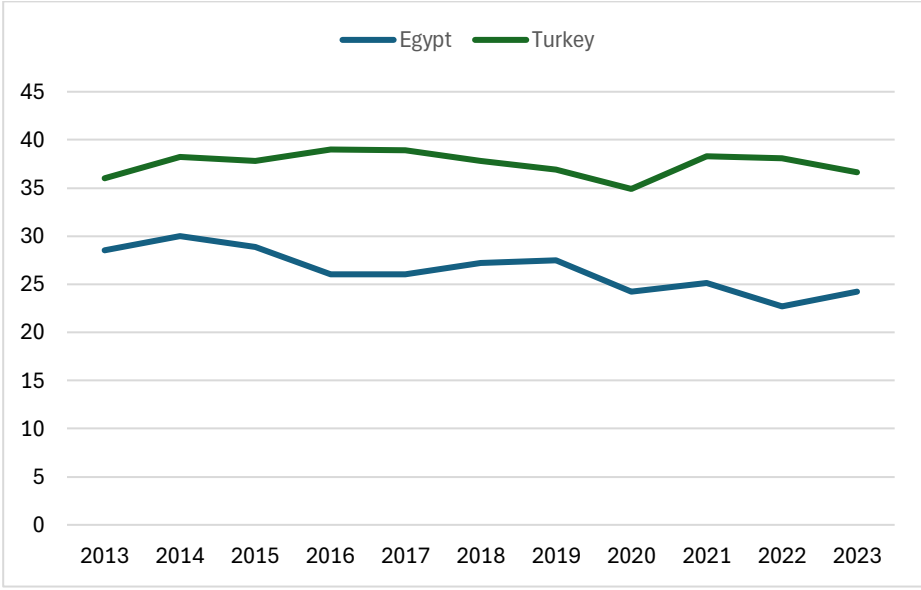


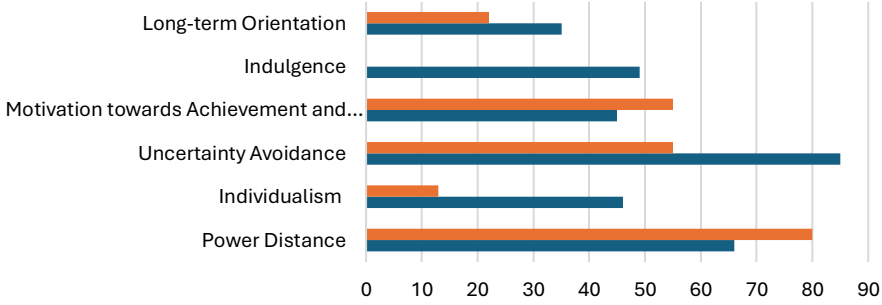
Figure 1. Global Innovation Index Scores for Egypt and Türkiye, 2013-2023
Source: WIPO (2023)

Although both countries perform better in innovation output relative to innovation input, Egypt and Türkiye have distinct strengths in terms of their innovation scores. According to GII (2023), Egypt's main innovation strengths are State of cluster development, Labor productivity growth, and Domestic market scale. On the other hand, Türkiye's main innovation strengths are Tertiary enrolment, % gross, Domestic industry diversification, and Industrial designs by origin/bn PPP$ GDP. In the next section, we aim to discuss the disparities in cultural dimensions in both countries, considering their expected effect on innovative performance. We focus on the Innovation Inputs Sub-index and Outputs Sub-Index.

Relationship between Cultural Dimensions and GII Components

Figure 2 shows the scores of Egypt and Türkiye on Hofstede's national cultural dimensions. The data shows the latest country scores by Hofstede Insights (2024). Masculinity versus Femininity is renamed on Hofstede Insights as 'Motivation toward Achievement and Success' as shown in Figure 2. Throughout the article, however, we use the 'Masculinity versus Femininity' to describe this cultural dimension.

Egypt's extremely low score of 0 on indulgence reflects a restrained culture. As Hofstede (2011) describes restrained cultures, individuals give less priority to leisure and tend to be pessimists. There is respect for traditions, little tendency to save for the future, suspicion of societal changes, and behaviors are constrained by societal norms. On the other hand, Türkiye's moderate score on indulgence indicates a greater emphasis on leisure, enjoyment, and personal gratification, while still maintaining some level of restraint.



	Power Distance	Individualism	Uncertainty Avoidance	Motivation towards Achievement and Success	Indulgence	Long-term Orientation
Egypt	80	13	55	55	0	22
Turkey	66	46	85	45	49	35

Figure 2. Egypt and Türkiye's Scores on Hofstede's Cultural Dimensions
Source: Hofstede Insights (September 2024).

Egypt's significantly higher score on Power Distance compared to Türkiye reflects a more hierarchical and centralized society. In Egypt, individuals are more likely to accept inequality and obey authority figures. This can lead to a top-down decision-making style and limited opportunities for individual initiatives and entrepreneurial activities (Hofstede Insights, 2024). In contrast, Türkiye's moderate score of 66 reflects

a more egalitarian society where individuals may have greater autonomy. Put differently, relative to Egypt, people in Türkiye value cooperative relationships, equal rights for all, and the use of legitimate power as opposed to coercive power (Hofstede, 2011).

Egypt and Türkiye can be considered collectivist societies that value group harmony and loyalty. However, Egypt's score of 13 on Individualism/Collectivism implies a more collectivist society, where people prefer tight social frameworks and exhibit interdependence and loyalty to groups. Additionally, individuals may be less open to interacting with individuals outside their social circle. Türkiye, with a score of 46, while also collectivist, demonstrates a slightly greater balance between individual and group interests.

Egypt's moderate Uncertainty Avoidance score suggests a preference for stability and predictability, but also a willingness to tolerate ambiguity. In contrast, Türkiye's high score indicates a strong preference for structure, rules, and certainty. This may lead to a more risk-averse culture in Türkiye, where individuals may be less willing to embrace change or take on new challenges. These moderate levels of uncertainty avoidance reflect a social preference for stability and predictability. This, in turn, might create a favorable environment for innovation, if there are future initiatives proposed by both governments to encourage entrepreneurship and risk-taking.

Egypt's moderate score of 55 on the Masculinity/Femininity dimension reflects a focus on achievement, success, and competition. This may encourage individuals to strive for excellence and outperform others. However, it can also lead to a more competitive and less cooperative environment. Türkiye's lower score of 45 suggests a more feminine culture, emphasizing caring, cooperation, and quality of life. This may foster a more supportive and collaborative atmosphere (Hofstede, 1983).

Long-term-oriented societies are more sustainable societies since individuals resist consumption while valuing long-term goals (Hofstede Insights, 2024). Egypt's low score of 22 on Long-term Orientation indicates a focus on short-term goals, traditions, and social obligations. This may lead to a less forward-looking approach, with individuals prioritizing immediate needs and gratification over long-term planning. Türkiye's higher score of 35 on Long-term Orientation might reflect a more balanced

perspective, with individuals considering both short-term and long-term goals. However, both countries have still low to moderate scores on the Long-term/Short-term Orientation dimension, which means people uphold values such as respect for tradition, conducting social obligations, and protecting one's face, as well as virtues that are connected to both the past and the present (Hofstede Insights, 2024).

Culture and Innovation Input Sub-Index

Institutions as a component of IISI are expected to be affected by cultural dimensions such as Power Distance and Uncertainty Avoidance. In countries with high levels of uncertainty avoidance, and power distance, rules and institutional structures are expected to be set, as citizens accept unequal power distribution. This, in turn, can impede innovation, as it discourages people from sharing information, starting entrepreneurial initiatives, and taking risks. Since Egypt has lower uncertainty avoidance than Türkiye, it can be expected that Egypt performs better on components of institutions. However, both countries have the lowest ranks in Institutions.

Cultural dimensions of Masculinity/Femininity and Individualism/Collectivism can influence the IISI component of Human Capital and Research. Although masculinity values are associated with lower innovation, such values can encourage competition and achievement. Consequently, this can lead to advancements in technology through more research and higher human capital reflected by higher educational attainment. Similarly, countries with higher individualism prioritize individual achievement and independence. Therefore, they are expected to invest more in education and skills development. This, in turn, creates a favorable environment for increasing the quality of human capital.

Business Sophistication and Market Sophistication are expected to be shaped by Uncertainty Avoidance, Power Distance, and Individualism/Collectivism. Higher emphasis on Long-term Orientation values reflects valuing future-focused development plans, motivating the utilization of new knowledge and technologies, leading to increased business sophistication. In long-term-oriented societies, individuals are typically modest, pragmatic, and thrifty. On the other hand, short-term-oriented societies emphasize traditions and principles.

Similarly, countries with higher scores on Uncertainty Avoidance tend to value stability and predictability. This, in turn, means they might develop more sophisticated financial markets and credit systems, which can facilitate access to capital for innovative ventures. Finally, countries with higher Individualism and Indulgence prioritize individual initiative, freedom, and entrepreneurship, and tend to have more innovative and competitive business environments.

Long-term/Short-term Orientation can affect the component of Infrastructure. Countries with a Long-term Orientation prioritize the future. Therefore, they emphasize ecological sustainability and general infrastructure.

Culture and Innovation Output Sub-Index

Cultural dimensions are expected to affect Innovation Output Sub-Index components; of Knowledge Creation and Technology Outputs in addition to Creative Outputs. Higher scores on Individualism/Collectivism and Masculinity/Femininity dimensions emphasize cultural values such as individual achievement, success, and independence, which can be reflected by a higher number of patents, and scientific publications. This, in turn, should promote knowledge creation, and creative Outputs. However, whereas moderate scores on Uncertainty Avoidance can reflect a sense of stability, a higher societal preference for uncertainty avoidance would block creative outputs if people became averse to change and innovative ideas. Also, high scores on Power Distance in both countries indicate a strict structure and rigid roles that may hinder information flow and knowledge sharing. A hierarchical power structure, where decisions are made by those at the top of the hierarchy, can be associated with lower innovation outputs. Therefore, the balance between such two cultural dimensions should be maintained.

Similarly, Egypt has a higher score on Masculinity/Femininity dimension, compared to Türkiye. If managed properly, a society such as Egypt dominated by masculinity values such as determination and achievement can encourage knowledge creation through governmental initiatives facilitating success and individual initiatives. On the other hand, in Türkiye scoring lower on Masculinity/Femininity dimension, projects that foster collaboration and cooperation can build on prevalent values under feminism, which can be translated into higher innovation outputs.

Countries with higher Long-Term Orientation scores emphasize long-term planning and investments in research and sustainability. Therefore, they are expected to disseminate knowledge and technology, leading to higher scores on Knowledge and Technology Outputs. Türkiye and Egypt have low scores on Long-term Orientation. Such societies with Short-term Orientation prioritize immediate results and quick solutions to problems (Hofstede Insights, 2024). This might reduce Knowledge Creation and Technology Outputs in addition to Creative Outputs if it prevents future-focused investment and sustainable growth.

Conclusion and Discussion

This study aimed to discuss how innovation in Egypt and Türkiye is affected by the national cultural dimensions Hofstede (2011) proposed. We adopted a theoretical approach to portray differences and similarities in both countries' cultural dimensions and their respective innovation rates, as measured by the Global Innovation Index, from 2013 to 2023. Given the crucial role innovation plays in economic growth, poverty reduction, and social development, the GII scores present important implications for the future of Türkiye and Egypt.

In this article, we discussed Hofstede's cultural model in terms of each dimension's relationship to innovation, based on previous literature. We aimed in this article to examine closely these dimensions in Egypt and Türkiye and discuss how they might be related to Global Innovation Index Components, of Innovation Inputs and Innovation Outputs.

Considering cultural dimensions, while both countries share cultural similarities, such as having high scores on Uncertainty Avoidance and Power Distance, they differ in terms of scores on Individualism/Collectivism and Indulgence/Restraint. These differences, in turn, can provide interesting insights for innovation in both countries. Compared to Egypt, Türkiye's higher score on Individualism/Collectivism and lower score on Power Distance could create a more favorable environment for innovation, which is reflected by its stable improving innovation performance. Egypt reflects a more collectivist culture, coupled with its higher score on Uncertainty Avoidance and Power Distance, associated with lower innovation rates. However, according to Taylor and Wilson (2012), collectivism can increase national innovation if it reflects

nationalism and patriotism, while it can impede innovation if it means family-based collectivism.

Both countries have high scores on Power Distance, which reflects a lack of egalitarianism and can pose challenges to innovation. Additionally, they both score low on Long-Term/Short-Term Orientation, which means governments should prioritize a more pragmatic approach that takes the future into account, such as focusing on education and sustainable economic growth.

The influence of cultural dimensions on innovation is multifaceted. While high individualism and low Power Distance may suggest a predisposition towards innovation, they are not the sole determinants. Taylor and Wilson (2012) argue that collectivism, particularly in times of crisis, can foster national innovation by promoting social ties that aid in recovery and progress. Therefore, it is crucial to move beyond a narrow focus on cultural dimension scores, especially within a single cultural cluster like the Middle East and North Africa (MENA) region, to conduct in-depth research on innovation. This underscores the necessity of a comprehensive approach to comprehend the specific barriers to innovation in each country. Additionally, it is essential to consider country-based structural challenges identified by the Global Innovation Index (GII) while considering the societal and cultural structure of each society.

Both countries should address their shortcomings in innovation input and output sub-indices. In terms of innovation, both Egypt and Türkiye exhibit weaknesses in areas such as business policies and operational stability, indicating systemic gaps that would have adverse effects on innovation relative to their GDP. In Innovation, both countries exhibit common weaknesses related to institutions and business sophistication. Governments can offer support services to business firms to help them adopt up-to-date technology and train their employees. Also, both governments can increase transparency of regulatory frameworks and laws related to patents and property rights. For example, since Egypt ranks the lowest on Business Sophistication, Institutions, Human Capital, and Research, the country should design policies to improve its regulatory environment, allocate higher budgets for education and human capital, and offer facilitations to firms to enhance the degree of business sophistication and institutional quality.

Limitations

While cultural dimensions can influence innovation, the relationship is complex and varies across countries. However, cultural factors are just one of many influences on innovation, and other factors such as economic conditions, political stability, and educational systems also play significant roles. Further research is needed to fully understand the interplay between cultural dimensions and innovation in these countries.

While the GII data available for Egypt and Türkiye covers the period from 2013 to 2022, this may not capture the full range of potential variations in both GII scores and cultural influences. Future studies with a longer data series could provide a more comprehensive understanding of the relationship between these variables. Additionally, this study adopts a theoretical rather than a quantitative approach to examining the relationship between national culture and innovation in Egypt and Türkiye. It is recommended that future studies examine the relationship through a quantitative approach incorporating country-level control variables that affect the level of national innovation besides culture such as population, GDP per Capita, and government expenditures on Research and Development, to get deeper insights into this relationship.

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