



LINKING MEXICAN IMMIGRANTS' CONTRIBUTIONS TO THE U.S. KNOWLEDGE ECONOMY

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Introduction: High-skilled Migration and the Global Knowledge Economy

Today, knowledge is the basis of economic growth. It creates virtuous cycles of unlimited ideas (Cortright 2001). Human mobility enhances that cycle of scientific innovation, because it allows high-skilled individuals to pair their knowledge with that of others by working in countries where they can find the right economic, social, and policy resources (van der Wende 2015). As such, there appears to be an intrinsic relationship between knowledge and innovation and human mobility and migration. Aboites and Díaz further this idea by arguing that “in this era of globalization, the knowledge economy is supported by knowledge mobility” (2018, 1443). The relationship between these two factors has become more evident in the past decade, as developed economies experienced a talent shortage just as human capital became as important as financial capital for enabling economic growth and competitiveness (Ryan and Silvanto 2021).

This hypothesis is supported by the facts on the ground. During the past two decades, the share of migrants with higher education grew at an annual rate of 1.5 times the rate of general migration (Delgado Wise, Chávez Elorza, and Gaspar Olvera 2021). In developed economies, the arrival of highly skilled migrants drives technological innovation and patenting potential (Dennis 2020; Gaspar Olvera 2021). As Peri (2016) states, the mobility of high-skilled workers toward the poles of innovation contributes to global science, and consequently to long-term global growth. By the same token, Bernstein et al. (2019) find that immigrant inventors foster the importation of ideas and technologies and facilitate the diffusion of knowledge. In this vein, Gaspar Olvera (2021) examines the small number of countries which together concentrate 70% of all high-skilled migrants—the U.K, Canada, Australia, and the U.S., with the last containing 50% of all high-skilled migrants.

So, what is a high-skilled migrant? This population comprises students, university professors, researchers, professionals, CEOs, and technicians, among others (Tuirán and Ávila 2013), who look for countries whose environment supports innovation development, knowledge, and productivity spillovers (Ryan and Silvanto 2021) and are conducive to the creation of technological clusters, centers of innovation, research universities, and knowledge-based industries that demand their skills (Clarke, Li, and Xu 2013; Dickmann and Cerdin 2014). Some common areas related to the knowledge economy are health, math, computers, life science, physical science, and engineering.

Moreover, immigrants drive innovation in both sending and receiving countries through entrepreneurial or inventive activity or collaboration with native workers in their home countries (Harnoss et al. 2021). As such, Duleep, Jaeger, and Reget (2012) argue that migrants are flexible economic actors who may be more willing to engage in disruptive business models. Kautto (2019) adds that in developed countries, migrant entrepreneurs have founded more than 40% of the Fortune 500 companies, which create innovative products and services that foster the knowledge economy. In terms of

inventive activity, the role of high-skilled migrants becomes even more relevant because, as stated by Jones (2002), the long-run growth of an economy is strongly related to the share of workers specializing in research and development (R&D).

More recently, high-skilled migrants from emerging economies are playing an increasingly important role in innovation processes, and many of them are patent generators in developed nations (Delgado Wise, Chávez Elorza, and Gaspar Olvera 2021). Coda-Zabetta et al. (2021) recognize the role of migrant inventors in the success of the largest technological clusters in English-speaking countries and in Europe. And these migrants transfer technology back home through enterprise development or by providing support to research institutions in their native countries, since they possess the ability to assimilate and apply knowledge. Thus, they become crucial for their home countries' absorptive capacities (Gelb and Krishnan 2018).

The Role of High-skilled Migration in the U.S. Knowledge Economy

The United States is experiencing a talent shortage due to an aging population and slowing labor force expansion. Moreover, because growth in the foreign-born population has slowed since the beginning of this century and will likely maintain the same trajectory over the next three decades (Radford 2019), the U.S. nowadays accounts for lower shares of high-skilled migrants and international students than it did in the past (Batalova and Fix 2017). In fact, skilled labor shortages resulting from a pronounced information technologies (IT) and software development shift in innovation led U.S. multinational corporations (MNCs) to search abroad for science, technology, engineering, and mathematics (STEM) workers (Branstetter, Glennon, and Jenson 2019). The coronavirus pandemic only added to the strain on the labor market related to STEM research and development (Fry, Kennedy, and Funk 2021). These factors pose challenges to the economic strength and fiscal health of the U.S. (Decker and Fluhr 2019), making it important that the country find ways to harness the full diversity of available talent (Dennis 2020)—not only to alleviate the talent shortage but also to propel forward the knowledge economy. This makes sense since, according to Gelatt, Batalova, and Capps (2020), the jobs of the future will mainly be high-skilled or middle-skilled.

High-skilled migrants alleviate the skills mismatch between U.S. employers' labor demand and U.S. natives' labor supply (Orrenius, Zavodny, and Gullo 2020), particularly for job positions such as software developers and testers, health services managers, financial managers, accountants, and auditors, as well as in specialized areas such as cybersecurity, energy independence, and biomedical research. Moreover, due to an aging population and its lower rates of mobility, the advantage of high-skilled immigrants is that they tend to be younger than the native population and more willing to move to other locations. Thus, they can also ameliorate the mismatch between where jobs are located and where workers live, which increases the likelihood of innovation (Chishti, Gelatt, and Meissner 2021).

Decker and Fluhr (2019) report that recent immigrants to the U.S. are more likely to be college- educated than in the past. The Migration Policy Institute confirms that almost half of the immigrants arriving in the U.S. in the past five years have a bachelor's degree or higher. The number of highly skilled immigrant adults grew 42% between 2010 and 2019, from 9 million to 12.8 million (Batalova and Fix 2021). This favors innovation, according to research by Kerr and Lincoln (2010), who argue that since the 1970s, the joint work of immigrants with locals in innovation-driven activities explains about 30% of the increase in per capita productivity in the United States. Bernstein et al. (2019) further assert that combining the knowledge bases of immigrants and natives is relevant for innovation. They also state that two-thirds of the contributions of immigrants to U.S. innovation are due to immigrants making U.S. natives substantially more productive.

Now, according to Kerr (2020), immigrants account for about a quarter of all U.S. innovation and entrepreneurship. Even though U.S. universities dominate STEM disciplines globally, individuals born abroad increasingly make up the U.S. STEM labor force (Hanson and Liu 2018). Immigrants constitute 29% of college-educated STEM workers and 52% of doctorate-holders in the U.S. (Kerr 2020). The U.S. is thus a net importer of technology and qualified human capital (Gaspar Olvera 2021). In effect, between 1990 and 2017, the growth rate of skilled (with an undergraduate degree) and high-skilled (with a graduate degree) migration to the U.S. was more than double the growth rate of low-skilled (less than an undergraduate degree) migration (Delgado Wise, Chávez Elorza, and Gaspar Olvera 2021). Hunt and Gauthier-Loiselle (2010) showed that a 1% increase in immigrant college graduates in the U.S. results in a 9%-18% increase in patents per capita. Moreover, the U.S. patent registry office is among the leaders worldwide in patents filed. Maintaining that depends on patent applications by foreign-born individuals, since only 47.9% of the applications issued correspond to U.S. natives, confirming a high rate of inventor immigration (Gaspar Olvera 2021).

The Purpose of This Paper

There is a need for more accurate high-skilled migration statistics to scale up data-mining, surveys, and interviews on this issue. Data collection efforts to identify migrants involved in innovation-relevant professional categories and to determine the extent of knowledge transmission among these migrants are also needed (Lissoni 2018). Thus, the objective of this paper is to undertake an exploratory examination of the role that high-skilled migrants, specifically Mexican migrants, play within the U.S. knowledge economy. This research intends to identify unanswered questions regarding their participation in knowledge transfer to their host and home countries. As there is not enough available data to measure these migrants' participation in the technological state-of-the-art sectors of the U.S. economy,¹ I resort to a review of key literature studies on high-skilled migration and

¹ One of the few exceptions in this regard is the solid work recently published by Delgado Wise, Chávez Elorza, and Gaspar Olvera on highly skilled Mexican migration. The reference to their work is available at the end of this paper.

an analysis of the international and national documentary sources of migrants' contributions to host countries' knowledge economies. Second, I conduct in-depth interviews with high-skilled Mexican immigrants in the U.S. to understand their role in these sectors.

Admittedly, this research is exploratory. It analyzes the extent to which Hispanic immigration is involved in U.S. STEM areas. Then, it delves into the role of high-skilled Mexican immigrants in the U.S. knowledge economy. This approach makes it possible to identify key facts regarding the participation of Mexican migrants in the sectors that drive innovation both in the U.S. and in their country of origin, and to suggest some implications that their participation has for public policy.

A Picture of Hispanic High-skilled Immigration in U.S. STEM

The Hispanic population in the U.S. has contributed to the “offset[ting of] low birth rates and the aging of the Baby Boom generation, allowing the U.S. labor force to grow at rates needed to maintain healthy increases in GDP” (Eisenach and Kulick 2019, 5). The growth of the Hispanic population compared to other ethnic groups, the fact that they constitute a younger group of the U.S. population, their higher labor force participation rates, and their higher levels of employment (Eisenach and Kulick 2019) explain this. In fact, by 2034, Hispanics are projected to account for 23% of the U.S. labor force (Gillula 2015). It is also worth noting the entrepreneurial spirit of the Hispanic population, illustrated by the highest entrepreneurship rate of any ethnic group in the U.S. (Morelix, Fairlie, and Tareque 2017). The Pew Research Center (2016) reports a 13% increase for Hispanics ages 18 to 24 enrolled in a 2- or 4-year college in 2016 as compared to 1993. They are the second-largest group of highly skilled migrants in the U.S. (Batalova and Fix 2017).

Nonetheless, the Pew Research Center (2016) points to the underrepresentation of Hispanic workers across most STEM job clusters, since they make up 17% of total employment across all occupations but just 8% of all STEM workers (Fry, Kennedy, and Funk 2021). Gelatt, Batalova, and Capps (2020) confirm this by showing that immigrant Hispanics are less likely than workers in other major racial or ethnic groups to hold the jobs of the future. Ironically, before the COVID-19 pandemic, the share of Hispanics earning a bachelor's degree in a STEM field had been increasing, with 8% of STEM graduates in 2010 and 12% in 2018, but their college enrollment declined after the coronavirus outbreak, jeopardizing their progress (Fry, Kennedy, and Funk 2021). One of the reasons that explains this underrepresentation is linked to Hispanics having fewer student loans. About 22% of young Hispanic households (those headed by someone younger than 40) have student loans. The share is nearly twice as high among young white households (42%) and young black households (40%) (Pew Research Center 2016).

The institutional voids in Hispanic migrants' home countries deter them from undertaking knowledge-intensive projects. In the case of Latin America, the gross coverage rate for public higher education is only 48.4%, compared to 74.7% in the Organisation for Economic Co-operation and Development (OECD) countries. In the case of Mexico, the situation is

even worse, since the coverage rate is only 38.4%. As for high-skilled Hispanic migrants, the precariousness of wages and work opportunities in terms of the application of knowledge is another daunting factor of staying in the home country, as is the decreased offer of education concentrated in certain degrees (Delgado Wise, Chávez Elorza, and Gaspar Olvera 2021). Moreover, the investment that Latin American countries have in R&D as a percentage of their GDP is well below the average of the OECD countries. Conversely, migrant-receiving countries' ease of hiring foreign labor, their macroeconomic stability, and their quality of life (Ryan and Silvanto 2021) draw migrants to apply their knowledge to advanced sectors. In the case of the U.S., high-skilled migrants are also motivated by considerable financial rewards.

What about Mexico?

Mexico constitutes an exception in terms of its relatively low share of high-skilled individuals migrating overseas compared to the vast proportion of lower-skilled migrants exiting the country. In this sense, the average global behavior is the opposite, since highly skilled individuals represent an increasing share of international mobility flows (Hatton and Williamson 2005). The socioeconomic conditions of Mexico, along with its institutional voids and its geographical location vis-à-vis the U.S., explain this behavior.

This fact has oriented much of the migration research among academics toward the lower-skilled Mexican migrants moving to the U.S. Nonetheless, in the past two decades, the increase in the number of years of education among Mexican migrants,² along with the growing interest of skilled and high-skilled Mexicans in migrating to the U.S. due to a multidimensional set of factors, has placed at the center of the academic discussion the phenomenon of higher-skilled Mexican migration. As previously mentioned, Mexico faces severe challenges in terms of higher education coverage and career offerings, a very restrained labor market for professionals and researchers in innovation-related fields, and a very low GDP percentage (0.4%) dedicated to R&D. As such, Mexico falls below the average investment of Latin America and the Caribbean (0.6%) (UNESCO 2019). There is also a disconnect between universities, public research centers, and the productive sectors of the economy (Delgado Wise, Chávez Elorza, and Gaspar Olvera 2021). Consequently, there has been a growth in the mobility of Mexican inventors registering patents through foreign companies, universities, and R&D institutes, particularly through U.S. companies (Aboites and Díaz 2018). The figures are overwhelming: Mexico ranks as the first country in terms of sending highly skilled migrants to the rest of Latin America and the sixth to the rest of the world. In addition, it also ranks as the second country for sending skilled migration to the United States. Between 1990 and 2018, the share of high-skilled Mexican migrants (with a graduate degree) living in the U.S. quintupled, going from 43,000 to 237,000 (Delgado Wise, Chávez Elorza, and Gaspar Olvera 2021).

² According to Delgado Wise, Chávez Elorza, and Gaspar Olvera (2021), the number of Mexican migrants with tertiary education increased from 161,000 in 1990 to 1.48 million in 2018.

The contribution of Mexicans to the U.S. knowledge economy is not just explained by the increasing number of high-skilled Mexican immigrants but also by the Mexican inventors who look to patent their inventions abroad. Mexico occupies the 29th position among 125 countries in terms of registered patents in the U.S. (Delgado Wise, Chávez Elorza, and Gaspar Olvera 2021). This is because Mexican inventors find little incentive to patent in Mexico, since their innovations are of scant market value (Gaspar Olvera 2021). Aboites and Díaz (2018) find an explanation for this in the better resources for R&D within institutions in the receiving countries—and the higher salaries. Along the same line, Tuirán (2009) refers to a lack of opportunities in Mexico, including unemployment, inadequate infrastructure for R&D, few positions in public universities and, on the other hand, the better professional opportunities overseas.

According to Aboites and Díaz (2018), the contribution of highly qualified Mexican migrants to the global knowledge economy is also fostered by the growing interest of universities, research institutes, and MNCs in incorporating this Mexican human capital in new knowledge creation processes. It is also further incentivized by the fact that most (89.1%) high-skilled Mexicans living in the U.S. are in the age cohort encompassing active working life (22 to 65 years old), and most of them are employed in managerial, finance, and business occupations, educational services, and STEM fields. Regarding this, it is astonishing that within the STEM disciplines, more Mexican graduates are living in the U.S. than are residing in Mexico. This is also explained by the strong income differential between STEM graduate degree–holding Mexicans working in the U.S. and those working in Mexico. People with graduate degrees in STEM areas in Mexico tend to receive low salaries in relation to other fields of knowledge, while the opposite is true in the U.S., where graduates trained in these areas are rewarded more favorably (Delgado Wise, Chávez Elorza, and Gaspar Olvera 2021). Aboites and Díaz (2018) attribute the participation of high-skilled Mexican migrants in the global knowledge economy to the existence of policies such as scholarships, certifications, and the recognition of studies that foster their international mobility, and to the possible lack of absorption capacity of the Mexican economy coupled with foreign innovation systems' greater capacity for highly qualified Mexicans. Accordingly, Dolores (2016) reports that more than a million Mexicans are working in R&D in at least 20 countries around the world. For example, more than 73,000 Mexican Ph.D.-holders are working in academia, and 20,000 of them are working in the U.S. (Benavides 2015), where an impressive 32.5% of high-skilled Mexican immigrants acquired their graduate degrees in STEM areas (Delgado Wise, Chávez Elorza, and Gaspar Olvera 2021). It is also worth mentioning that among highly skilled Mexicans, corporate migrants (those who have gone on international assignments sponsored by MNCs) have played a major role in the knowledge economy; as reported by Aboites and Díaz (2018), between 1976 and 2016, the number of Mexican inventors working for global organizations multiplied almost threefold.

Guadarrama (2018) has stated that not enough has been done to stimulate innovation and scientific and technological development in Mexico, but that what has instead prevailed are insufficient budgets, reduced spending, and little private and public investment. This cannot be attributed only to the government, but is also the joint

responsibility of the private sector and research centers. On this issue, Díaz (2014) underlines the lack of demand for technology by Mexican companies as one of the main drivers of high-skilled migration.

Highly skilled Mexicans become part of the knowledge economy in the United States through different work-life histories. Some of them arrive in the country through an international assignment sponsored by an MNC, and eventually, once their assignment finishes—and given the perceived lack of opportunities in Mexico to which to apply their knowledge—decide to stay in the U.S., becoming self-initiated expatriates who undertake business ventures in innovative areas. Others work for MNCs as full-time employees, and they get involved in intrapreneurial projects through which they develop and patent inventions. Entrepreneurs who find in the U.S. a more suitable environment to undertake business in the knowledge economy constitute another group of high-skilled migrants. Many members of this last group have a graduate degree in management, business, or finance, disciplines which are closely linked to innovation ecosystems, as many startup founders in the U.S. come from these educational fields (Delgado Wise, Chávez Elorza, and Gaspar Olvera 2021). This shows that high-skilled Mexican entrepreneurs can play a decisive role in the U.S. economy, including in business creation. It shows that young immigrant entrepreneurs foster innovative activity and in turn contribute to productivity growth (Orrenius, Zavodny, and Gullo 2020). These high-skilled Mexicans become change agents in innovation for both the U.S. and Mexico, since they are “uniquely positioned to explore novel combinations of knowledge acquired in their home countries, together with technologies to which they are exposed in the U.S.” (Bernstein et al. 2019, 17).

In the case of Mexican immigrant entrepreneurs who undertake businesses in the U.S. knowledge economy, their profile renders potential, since they tend to be young, possess higher education degrees acquired in U.S. or foreign universities, are English-proficient, and conceive of themselves as global citizens. Their global perspective leads them to integrate corporate networks linked to R&D and innovation systems. And they become suitable bridges for knowledge and technology transfers with a strong potential to influence the Mexican national innovation system.

Despite the statistics collected by various studies, there is a whole set of unanswered questions regarding the participation of high-skilled Mexican migrants in the U.S. economy. These questions have not been addressed in the literature. We do not know if the contribution of Mexican migrants to the U.S. economy is constrained to the primary and secondary sectors, and to a lesser extent to essential but not very sophisticated services within the tertiary sector, or if we simply are not aware of their growing involvement in tertiary-sector sophisticated and technology-related services. Some of the unanswered questions are: What percentage of high-skilled migrants are working in the U.S. knowledge economy? What is their average age? In which U.S. states are they concentrated? In what sectors? Where did they get their educational degrees, and in what areas? What is their average annual income? Where are they registering their patents? Are they integrating partnerships with other Mexican immigrants? And, are they partnering with Hispanics, or with non-Hispanic U.S. natives?

Public Policy Implications

High-skilled Mexican migrants involved in innovative sectors linked to information technologies, and more broadly to the knowledge economy, are standing in front of an exceptional opportunity to conform innovation networks that propel knowledge-sharing. They may play a crucial role in alleviating the weaknesses of the national innovation system in Mexico if they transfer back to other Mexican entrepreneurs, scientists, and engineers their knowledge and innovative practices. They may also foster entrepreneurship and business development if they invest in their home country's startups with local partners, or if they provide business mentorship or financial funding (Gelb and Krishnan 2018). This is particularly relevant at a time when, according to Glennon (2020), most R&D and other high-skilled activities remain concentrated in a few countries where MNCs have their headquarters. An interesting trend that became visible due to the labor and technological changes brought on by the COVID-19 pandemic, and that may benefit high-skilled Mexican immigrants in the U.S., is employers' interest in reducing labor costs by using contract labor or gig workers³ instead of regular employees (Gelatt, Batalova, and Capps 2020). Many young high-skilled Mexican immigrants may choose to freelance or be self-employed, and they may find attractive business opportunities through the gig economy that are strongly linked to the IT field. This is coupled with the fact that, coming from a challenging emerging economy, high-skilled Mexican immigrants are well placed to undertake reverse innovation processes in the U.S. by adapting efficient industrial and end-user processes to the context of the receiving country. Since they face unsuitable institutional conditions in Mexico, they are able to think out of the box and plan and execute creative and feasible solutions.

As for the receiving country's approach, as stated by Harnoss et al. (2021), although skilled migrants constitute the least politically polarizing group of migrants, there is no agenda in the United States to harness their potential. To tackle the talent shortage facing the country, the U.S. should reform the H-1B temporary visa program and, from a generic point of view, realign its permanent immigration rules with the country's long-run economic needs.⁴ This is urgent, since the countries with which the U.S. is fiercely competing for talent are already innovating and tuning up their recruitment efforts (Dennis 2020). For instance, the U.K. has introduced a point-based immigration system to attract innovators and entrepreneurs, and the Netherlands has instituted an entry procedure conceived for "knowledge migrants" (Pekkala et. al 2016). By contrast, the U.S. has lost some of its appeal as a destination country. Dennis (2020) acknowledges that the share of potential migrants who consider this country as their top desired destination fell from 28% in 2001 to 24% in 2017. This contrasts with the fact that the percentage of

³ Gig workers are individuals who work independently through formal agreements established with on-demand companies to provide them with services. Contrary to standard workers, gig workers do not have a long-term employer-employee relationship.

⁴ In this line of thinking, the Migration Policy Institute, as part of its Rethinking U.S. Immigration Policy Initiative, recently proposed a feasible road map for reforming the U.S. legal immigration system. It is available at: https://www.migrationpolicy.org/sites/default/files/publications/Rethinking-LegalImmigration-Roadmap_FINAL.pdf.

countries that had policies to increase the immigration of highly educated people went from 22% to 44% between 2005 and 2015 (Dennis 2020). Furthermore, a recent study by Khanna and Lee (2020) found that a 10% increase in the share of H-1B workers at any given company results in a 2% increase in product reallocation rates, which is associated with firm growth and productivity. In the same vein, Kerr and Lincoln (2010) found that increasing the quota of H-1B visas positively impacts the amount of U.S. patents. In fostering startup visa programs aimed at attracting early-career entrepreneurs (Dennis 2020), most developed countries have left the U.S. behind. In brief, as Dennis (2020) states, the U.S. immigration system is inflexible and outdated, which prevents the country from maintaining a functional labor market. Another obstacle that is preventing the U.S. from reaping the full economic benefits of high-skilled immigrants is underemployment caused by the limited social and professional networks of migrants, employer bias against foreign-born or foreign-educated workers, and reluctance to hire immigrants with unfamiliar credentials, little U.S. work experience, an unresolved migration status, or a lack of English-language proficiency (Batalova and Fix 2021).

Inflexible high-skilled immigration policies have two sides. Immigrant entrepreneurs' home countries may be benefiting from stricter U.S. policies, since U.S. MNCs may decide to move high-skilled activities to their foreign affiliates located in these immigrants' native countries. From the host country approach, if high-skilled workers are working for the U.S. MNCs' foreign affiliates, the innovative spillovers that these U.S. immigrants formerly living in the U.S. generate will go to another country instead (Glennon 2020). Furthermore, the U.S. will also face a fiscal opportunity cost, since highly paid skilled immigrants widen the tax base and help offset fiscal challenges (Aydemir 2020).

Of particular importance in terms of public policies aimed at advancing the U.S. knowledge economy are foreign students, because apart from being the fastest-growing group of foreign-born residents, they imply the creation and execution of innovation projects as well as value-added services for the American economy with a U.S. degree. They can thus become productive workers and professionals straight away (Peri 2016).

Despite the significance of public policies, the U.S. government is far from being wholly responsible for harnessing the potential of high-skilled migrants to foster innovation. Corporate players and universities have a clear responsibility for this task too. The former employ many high-skilled migrants, largely determining how visas are used within sponsoring firms and oftentimes reaping the greatest gains from hiring immigrants. The latter play a decisive role in configuring the future U.S. high-skilled migration pool and labor market through their admission decisions (Pekkala et al. 2016). As such, it is not all about top-down governmental initiatives, but also about the involvement of the private and the academic sectors and particularly of self-organized high-skilled networks, considering that intellectual products are not usually individual contributions but the result of the work of research and development teams (Delgado Wise, Chávez Elorza, and Gaspar Olvera 2021).

From perspective of a sending country, such as Mexico, since resolving deeply ingrained institutional voids is a complex, ambitious, and long-term endeavor, it would be more pragmatic and realistic to turn high-skilled migration into a benefit. This can be materialized through high-skilled migrants' engagement in business exchanges with their home countries to share know-how and practical skills as well as information related to prices, business opportunities, suppliers, and customers (Lissoni 2018), to transfer scientific and technical knowledge, and to develop technology facilitated by their access to recent innovations. From a corporate stance, Mexican migrant inventors in the U.S. may further the investment and innovation processes of U.S. multinationals in Mexico since, as found by Foley and Kerr (2013), U.S. MNCs with a high number of patents by migrant inventors invest in such inventors' countries and rely less on joint ventures with local companies.

Conclusion

The responsibility of fostering high-skilled Mexican migrants' involvement in the innovation potential of both the sending and receiving societies should be understood through a stakeholders' approach. This means considering not only migrants and their respective home and host countries' governments, but also relevant players such as venture capital firms, startups, law firms and MNCs, and universities and research centers. In this sense, it is important that academic institutions keep their bonds with sponsored students and with the high-skilled Mexican diaspora. As for venture capital firms, they can play a more active role in pushing entrepreneurial projects. Young high-skilled workers, either immigrants in the U.S. or Mexicans who have stayed in their country, are eager to undertake such projects, but a major obstacle for these talented people who generate innovative ideas linked to sophisticated IT (e.g., fintech) is a lack of capital.

In the long run, high-skilled Mexican migrants can play a crucial role in balancing, or at least changing favorably, the unequal economic and social relationship between Mexico and the U.S. How? Mexico, along with other emerging economies, could provide the U.S. and other developed countries with the critical mass of scientists and technology professionals that their economies need (Delgado Wise, Chávez Elorza, and Gaspar Olvera 2021). But this should be transnational, through the knowledge exchanges that were emphasized throughout this paper. In other words, high-skilled Mexican migrants can and should be part of the so-called brain chains.⁵

⁵ These are transnational knowledge networks integrated by and between individuals, communities, and nations. W. Friesen and F.L. Collins, "Brain chains: managing and mediating knowledge migration," *Migration and Development* 6, no. 3. (2017): 323–342, <http://dx.doi.org/10.1080/21632324.2016.1168107>.

Now, Mexico urgently needs to harness the advantages of the relationship between mobility and migration and knowledge production, by exchanging, disseminating, validating, and collaborating with these knowledge networks (Jöns 2011). This is paramount, since, whereas for the U.S. the share of high-skilled Mexican immigrants constitutes only 3.5% of foreign graduates living in the country, for Mexico, they represent a little more than 20% of graduates (Delgado Wise, Chávez Elorza, and Gaspar Olvera 2021).

The role of Mexican firms is also critical since, contrary to what happens in the U.S. corporate ecosystem, there is a myopia within Mexico's corporate sector. It does not give proper value to the tangible innovative applications that researchers and graduates from doctorate programs can develop, and it continues to conceive of these high-skilled people as individuals whose skills can only be applied to academia. By the same token, higher education institutions in Mexico, as well as research centers and think tanks, can also play a decisive role in fostering the transnational nature of the knowledge gained by high-skilled migrants in the U.S. Why? Because, as suggested by Wang (2021), academics and intellectuals who devote themselves to education and research form a critical foundation for technological advancement. In other words, it is not all about monetary incentives or corporate interests, but also about the passion for knowledge generation and diffusion. All stakeholders should be conscious of the imminent danger that Mexican society faces in terms of losing its intellectual capital, since it too has started to experience the aging of its population with the expected consequence that young, educated people will become scarcer (Pande, Tigau, and Yuan 2017). From a generic approach, fostering the contribution of high-skilled migrants from emerging countries for the knowledge economies of developed ones will push or enhance—if we adopt a more interconnected perspective—the globalization of innovation, through the joint effort of public policymakers, immigrants, and multinational corporations.

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