

Original article

Why stay, why return: Mobility choices of Indian scientists and engineers

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Abstract

This paper examines the factors motivating scientists and engineers to return to India after working in information technology and biotechnology companies in the United States of America (USA). Drawing on a qualitative study, the findings reveal that decisions to return are influenced by family considerations, career opportunities, entrepreneurial aspirations, challenges associated with immigration to the USA, and an affinity for Indian culture. Conversely, migrants who choose to remain in the USA cite superior career prospects, favorable work environments, and a high quality of life. Despite their differing choices, both returnees and stayers actively maintain transnational professional relationships with scientists and engineers in the USA and India, respectively, fostering connections across borders.

Keywords

brain drain, Indian immigrant, return migration, scientific diaspora, transnationalism

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Introduction

The United States of America (USA) has implemented various policies to regulate immigration flows while addressing concerns related to national security, economic impacts, and social integration. The Immigration and Nationality Act of 1965 marked a pivotal shift in immigration policy by abolishing the previously established national quota system and introducing a preference system that prioritized family reunification and employment-based immigration. It also set a cap of no more than 20,000 immigrants from any one country. The Immigration Act of 1990 further shaped immigration policy by establishing the H-1B visa program with a cap of 65,000 visas, allowing US employers to hire highly skilled foreign workers

for specialized roles (Varma, 2007). These policies seek to attract and retain highly skilled individuals who contribute to the USA's economic growth. In 2022, 46.2 million foreign-born individuals resided in the USA. They make up 13.7% of the US population—nearly triple the 4.7% recorded in 1970 (Azari et al., 2024). In 2021, foreign-born workers made up 19% of the science, technology, engineering, and mathematics (STEM) workforce. They also accounted for 19% of workers in STEM occupations at the bachelor's level, 37% at the master's level, and 43% at the doctorate level (National Science Board, 2024). This shows that the US scientific enterprise relies heavily on a foreign-born workforce.

For decades, the dominant trend has been the migration of scientists and engineers to the USA. However, a growing number of these professionals are now returning to their countries of origin. A report by Accenture Federal Services (2023) for the National Science Foundation (NSF) estimated that over 900,000 foreign-born scientists are considering returning home. While it has long been common for some to return after studying or working in the USA, the recent surge in this trend is noteworthy. It signals that international migration is no longer a one-way movement but a dynamic process connecting both sending and receiving countries. This shift reflects broader changes in the global landscape of science and technology. Their return challenges the traditional view that skilled immigrants primarily benefit host nations; instead, it underscores the transformative potential of return migration to drive economic and technological progress in their origin countries.

The literature on return migration has largely concentrated on specific groups such as labor migrants, international students, and retirees, often within the broader contexts of development, reintegration, and demographic shifts (King and Kuschminder, 2022). A growing body of work has also begun to explore brain gain—the idea that skilled returnees bring valuable human capital back to their home countries. However, there remains a significant gap when it comes to understanding the return migration of scientists and engineers. Existing studies that address this group tend to focus on the macro-level impacts of their return, such as contributions to innovation systems, knowledge transfer, and national development strategies (e.g., Khadria, 1999, 2010, 2012). Far less attention has been paid to the microlevel motivations, constraints, and decision-making processes that shape why and how scientists and engineers choose to return. As a result, we lack a nuanced understanding of how structural, social, and personal factors intersect in shaping return pathways for these professionals.

This paper examines return migration among foreign-born scientists and engineers of Indian origin, a group that holds a significant presence in the US workforce. Currently, individuals of Indian origin account for 29% of foreign-born scientists and engineers in the USA (National Science Board, 2024). India also leads in H-1B visa holders; since 2010, a majority of H-1B approvals have gone to workers born in India (Pew Research Center, 2025). The data for this paper comes from a qualitative study with two groups of Indian scientists and engineers working in high-technology companies: Fifty “returnees,” those who chose to return to India after working in the USA, and 40 “stayers,” those who chose to stay in the USA. This paper's strength is its comparative lens on the mobility choices of Indian immigrants.

Literature review

Early scholarship on migration flows from developing to developed countries often drew on Lee's (1966) “push-pull” model. In this framework, adverse conditions in origin countries—such as political instability, economic hardship, and social constraints—were seen as “push” factors, while favorable conditions in destination countries—such as economic opportunities, political stability, and greater personal freedoms—functioned as “pull” factors. Economic indicators were typically dominant in explaining migration. Scholars emphasized wage differentials and labor market

imbalances as primary drivers of migration (Borjas, 1989; de Haas, 2010). However, critics argued that economic theories of migration overlooked the role of social and cultural influences. Social network theory, for instance, emphasized the importance of interpersonal ties linking migrants and non-migrants, enabling migration through information flows, mutual support, and reduced uncertainty (Boyd, 1989; Massey, 1990). Despite theoretical divergence, early perspectives largely treated motivations for migration as broadly similar across occupational categories, including those among scientists and engineers.

By the late 20th century, the international migration of scientists and engineers had grown substantially (Czaika and de Haas, 2014). This phenomenon was increasingly referred to as “brain drain”—a term that framed such movement as a net loss for developing countries (Docquier and Rapoport, 2012). “Brain” denoted individuals with advanced training or credentials, while “drain” referred to the outflow of this human capital. In contrast, host countries benefited from “brain gain” (Kapur and McHale, 2005) especially as they faced demographic shifts and heightened demand for technical expertise (Khadria, 1999). During the 1970s and 1980s, concerns over brain drain led many developing countries to adopt policies aimed at stemming the outmigration of skilled professionals.

Since the 1990s, however, scholars have noted a shift from one-way migration to circular forms of mobility among skilled professionals. Increasing numbers of scientists and engineers have been returning to their countries of origin after acquiring education and work experience abroad, a phenomenon described as “brain circulation” (Saxenian, 2005) or “reverse brain drains” (Wadhwa, 2009). These returnees are now seen as agents of innovation and development, contributing to knowledge transfer, entrepreneurial activity, and transnational collaboration (Kale et al., 2008). Their return has been reframed as a form of brain gain (Chacko, 2007; Mayr and Giovanni, 2008). Countries such as India and China have transitioned from efforts to curb brain drain toward policies that actively promote return migration and capitalize on diaspora linkages (Sabharwal and Varma, 2020).

In parallel, the broader literature on return migration has expanded significantly, offering a more nuanced understanding of its drivers, forms, and consequences. Traditionally conceptualized as a failed migration outcome—where return results from unmet expectations or adverse experiences—return migration was often viewed through the lens of disappointment (Borjas and Bratsberg, 1996; Grant and Vanderkamp, 1986). Within this framework, migrants compare actual earnings abroad with anticipated gains, and return is interpreted as evidence of miscalculation or poor integration. Battistella (2018) described such cases as the “return of setback,” marked by dissatisfaction, exploitation, or health challenges. Yet, return migration can be a potential sign of success, not failure. Some scholars argued that migrants return home after achieving specific goals such as acquiring savings, fulfilling contracts, or gaining professional experience (Constant and Massey, 2002; de Haas et al., 2015). Battistella (2018) distinguished between a “return of achievement,” where return is planned and voluntary, and a “return of completion,” where return follows contract fulfillment but is involuntary due to constrained options for re-migration. Alternative motivations for return have also been explored. Lifestyle return migration described individuals who return in pursuit of cultural familiarity, social belonging, or a preferred pace of life, rather than economic gain or loss (Benson and O’Reilly, 2009; Saar and Saar, 2020). Retirement return migration, meanwhile, involved older migrants relocating to their homeland to enjoy a lower cost of living, be near family, or reconnect with cultural roots (Bolzman et al., 2006; De Coulon, 2016). These forms of return emphasized non-material factors and reflected shifting values in later life.

In contrast to models centered on return as a discrete event, the transnationalism framework emphasized sustained cross-border ties that extend beyond physical mobility (Aneesh, 2006; Carling and Erdal, 2014; Sabharwal and Varma, 2020). Return migration, in this view, was often embedded in broader cycles of mobility, with migrants maintaining dual affiliations, fluid identities, and reciprocal exchanges between host and home countries.

Transnationalism also challenged territorially bounded notions of citizenship, illuminating new modes of diaspora engagement and hybrid belonging. Closely aligned with transnationalism is social network theory, which highlighted the role of interpersonal ties—familial, communal, and associative—in shaping return decisions and post-return reintegration (Brettell, 2003). These networks provided social capital, access to resources, and emotional support that enabled or constrained return migration. While both frameworks emphasized ongoing connections across borders, their analytical lenses differed: Transnationalism focused on identity, belonging, and reciprocal practices, while social network theory stressed relational ties and resource flows.

Recent scholarship also emphasized the gendered dimensions of return migration, recognizing that gender roles and expectations shape both decision-making and reintegration outcomes (Christou and Kofman, 2022; Pessar and Mahler, 2003). It is argued that return often reactivated traditional gender norms: Women faced renewed pressures toward domesticity or limited access to public life, while men encountered heightened expectations as primary earners (Silvey, 2006). Gendered labor markets, caregiving roles, and access to opportunities all mediated the return experience in significant ways.

Finally, not all return migration is voluntary. Forced return—often resulting from deportation, restrictive immigration policies, or bilateral readmission agreements—has been a growing concern, particularly in contexts of heightened nationalism and enforcement (Coutin, 2005). The Trump administration's aggressive immigration agenda (from 2017–2021 and resumed in 2025) has intensified involuntary repatriations, frequently without adequate legal protections or due process (Gandhi et al., 2025). These developments have underscored the importance of distinguishing between voluntary and coerced return.

Methodology

This paper is based on data from an NSF-funded study (2017–2019) examining the return migration of scientists and engineers from the USA to India. All interviews were conducted prior to the onset of the COVID-19 pandemic. Therefore, the study does not reflect any migration shifts that may have occurred due to pandemic-related disruptions. A qualitative methodology was adopted to investigate the reasons behind and the mechanisms driving return migration. The study specifically focused on the information and communication technology (ICT) and biotechnology industries because they employ the largest number of Indian scientists and engineers in the USA.

We conducted 90 in-depth interviews with two groups of Indian scientists and engineers. The first group consisted of 50 returnees who had returned to India after working in the USA for at least three years and had subsequently worked in India for a minimum of three years. These returnees were recruited from major Indian cities, including Bengaluru, Chennai, Delhi, Gurgaon, Hyderabad, and Mumbai, which are prominent hubs for technology companies and home to many other returnees. The second group is of 40 stayers who have been working in the USA for at least three years. These stayers were recruited from major cities in four states (i.e., California, New York, New Jersey, and Texas) which are recognized for their high concentration of technology companies and large Indian populations.

Sample sizes were guided by the principle of data saturation, the point at which additional interviews yield no new insights (Hennink and Kaiser, 2022). Given the absence of an accessible database for identifying returnees and stayers and the challenge of gaining company access, participants

were selected using snowball sampling. The process began with a small group of initial returnees and stayers who met the selection criteria of having worked for a minimum of three years. This referral process continued until the saturation was reached.

We used a semi-structured interview guide to conduct in-depth interviews with both returnees and stayers. Each interview was conducted in English and lasted over an hour. Most interviews were conducted face-to-face, with a few returnees ($n = 6$) being interviewed via Skype to accommodate their availability and location. All interviews were recorded and transcribed verbatim, and the transcriptions were analyzed using NVivo. Two independent coders analyzed the transcripts. The codes were organized into themes, allowing for the identification of patterns within the responses. Findings are presented using two approaches: (1) interview excerpts to highlight the complexity and nuance of the concepts discussed and (2) frequency data to underscore the relative significance of specific themes. Also, the sample included a small number of female participants, thus findings were not generalized on gender. Finally, participants had been working for at least three years upon return, so return for retirement was not to be addressed. To protect participants' privacy and to comply with the Institutional Review Board (IRB) requirements for research involving human subjects, the identities of respondents and the names of their companies have been anonymized. Characteristics of participants are presented in [Table 1](#).

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Findings

Findings are presented first by frequency data to underscore the relative significance of specific concepts and then supported with interview excerpts to highlight the complexity and nuance of the concepts discussed. Percentages are reported to highlight thematic patterns across the sample, consistent with qualitative analysis.

Why go to the USA?

Both returnees ($n = 50$) and stayers ($n = 40$) were asked why they chose to migrate to the USA. Their responses were categorized into three categories: Pursuing postgraduate education, seeking employment, and family obligations. Each response was coded once under its primary category (see [Table 2](#)). While there was little difference between returnees and stayers regarding these three categories, notable gender differences emerged between the two groups.

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Over half of returnees (52%) and stayers (60%) reported moving to the USA to pursue postgraduate education. While the majority initially aimed to earn a master's degree, many continued to pursue a PhD after completing their master's degree. Among women, a higher proportion of stayers (67%) cited postgraduate studies as their primary reason for migrating compared to returnees (29%). Some mentioned that during their final year of

undergraduate studies, it was a common trend to consider studying abroad. A male returnee noted, “There was tremendous peer and family pressure. They were asking me, ‘Everyone is going to the USA; why are you not applying?’”

Interviews also highlighted the perceived superiority of US education, emphasizing that the most prestigious institutions are located there. They considered these factors crucial for enhancing their career prospects after graduation. For some, acceptance into prestigious universities with financial aid was the decisive factor in their decision to move. Those without financial aid acknowledged the support of family members residing in the USA, who facilitated their transition.

Approximately one-third of returnees (32%) and stayers (33%) migrated to the USA after being recruited for work. This category was predominantly composed of male returnees and stayers; only 8% of women stayers, and no women returnees migrated to the USA for work. Both returnees and stayers perceived work in the USA as valuable for career development. Some highlighted that securing job offers with multinational companies, either within or outside India, was a common aspiration among students. They accepted positions offering higher salaries and better prospects.

My company offered me a project over there, and it was a handsome salary, so I just preferred to go there with my family. (Male Returnee)

In India, even if you work hard, you make a lower salary and don’t get good career opportunities. (...) That is why I came [to the USA] for better job opportunities. (Male Stayer)

Some returnees (16%) and stayers (7%) left India due to family obligations. Many women returnees (71%) and a few women stayers (25%) stated that they moved to the USA after marrying spouses who were either already living there or planning to move. These women relocated to join their spouses, and once in the USA, they found work. However, there were also a small number of male returnees (7%) who migrated to escape parental pressure to marry.

I really did not have any desire to come to the USA. (...) It was an arranged marriage, and he happened to be working [in the USA], so I came. (Female Returnee)

As soon as you start working, there is tremendous pressure for you to get married. If you don’t, people start thinking that something is wrong with you. (Female Returnee)

Why return to India?

Interviews with the returnees revealed multiple reasons for returning, which were categorized into five main themes: Familial ties, career opportunities, business prospects, immigration difficulties, and cultural differences (see [Table 3](#)).

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Family-related reasons emerged as the most common motivation for return, with nearly all returnees (96%), except for two, citing family considerations. Key factors included general references to family, parental responsibilities, support from extended family networks, and child-rearing considerations. Parental issues, such as caring for elderly or ill parents and supporting widowed parents, were among the most prominent concerns, as with child-related reasons. Returnees also expressed a desire to immerse their children and benefit from the support of an extended family. For nearly all women returnees, family obligations emerged as the dominant factor influencing their decision to return to India.

I am the only son, my father fell sick at the beginning of 2004, and he passed away in 2005. My mom was living alone, and I did not want her to be alone for the rest of her life. (Male Returnee)

My father is getting older, my mother is getting older, similarly for my wife's parents... So, we thought let's go back and spend some quality time with them. (Male Returnee)

We wanted our kids to be close to our families and relatives rather than just being with the two of us in the USA. The hired help for kids available in the USA does not compare to the Indian family support system. (Female Returnee)

Career-related factors were the second most significant motivation for returning to India, with 52% of returnees mentioning them. Career considerations included opportunities in high-technology companies, potential for career advancement, and stagnation in professional growth in the USA. Many returnees highlighted the dynamic and evolving nature of the Indian economy, contrasting it with its earlier stagnation that offered limited prospects for technical professionals. They noted the emergence of high-tech hubs which host both prominent Indian and international companies catering to global markets.

Industries in India have changed; they have much more global perspective rather than just being profit-making entities. (Male Returnee)

In 2003, there was a big dip in the US supply, so we were not getting a lot of new activities... Whereas [in India], we saw a lot of activities happening. (Male Returnee)

I applied to a [US company] in India. The work I was offered to do was challenging... I realized that one can do world-class work from India, so I did not blink and said yes. (Male Returnee)

A few returnees felt that, in the USA, they were contributing more than they were receiving in return. Due to the challenges of obtaining organizational sponsorship for permanent residency and a political climate that fostered the perception that immigrants were taking skilled jobs from Americans, they faced a highly competitive work environment. Despite long hours and delivered results, they found it difficult to secure high-ranking technical or managerial positions. They believed that factors such as their nationality, ethnicity, and communication style—which were not issues during recruitment—became barriers to career progression.

There is not enough diversity in the tech world when it comes to top positions. Most tech businesses are run by White Americans... I wanted to maximize my chances of success, which were better in India than in the USA. (Male Returnee)

There is no bias against me in India, but there was in the USA. (Female Returnee)

Some returnees (22%) found the economic environment in India more favorable to establishing businesses compared to the USA, where such ventures were often deemed unfeasible. These returnees cited starting a business in India as a reason for their return.

I felt that I would be much more successful in India than in the USA. It is mainly because the USA is very stable and has very few problems. India, on the other hand, is rather chaotic, filled with so many unimaginable problems. But all these problems also create numerous opportunities to succeed. (Male Returnee)

In India, there is a huge market for your products. Here, we could achieve more than just additional volume. But it was nearly impossible to do this in the USA, where nobody would even consider what you had to offer. (Male Returnee)

The motivation to start a company was also closely tied to challenges arising from US immigration laws, which significantly restricted the entrepreneurial opportunities of returnees. From the returnees, 8% explicitly cited difficulties related to their immigration status as a key factor in their decision to return.

An Indian cannot start a company in the USA without the proper visa. (...) I had an H-1B visa (...) [but,] US banks would not give a loan to someone with temporary status in the USA. (Male Returnee)

The only way you could get a loan to start a company is to find someone who is an American citizen. This is a very different requirement since it is not based on technical or administrative qualifications. (Male Returnee)

Even for those whose return was not directly influenced by immigration status, one-fourth of them expressed frustration with the lengthy and uncertain immigration process. They disliked the US immigration system, particularly its impact on their families, who often could not join them or, if they did, were restricted to short stays.

A segment of returnees highlighted ancillary reasons for moving back to India, including dissatisfaction with social life in their host country and personal cultural preferences. Nearly 20% mentioned an affinity for Indian culture and lifestyle, feeling that India better represented their identity and provided a more suitable environment for raising children. Nearly all women returnees emphasized India's stronger social and cultural milieu as key advantages over life in the USA. However, cultural differences were rarely the primary motivator for their return.

For me, the USA felt socially and culturally uninteresting. While there are many smart people, the general public seemed less intelligent and rather arrogant. I could not take that. (Male Returnee)

India aligns better with my personality. Every country has its unique culture and style. The USA was not for me. (Female Returnee)

Children [in the USA] are raised very independently to the point of disrespecting their parents over simple matters. In India, children work with their parents even when they disagree. I was not comfortable with such an atmosphere in the USA. (Female Returnee)

To understand the permanence of their decision, returnees were asked if they would consider moving back to the USA in the near future. A majority (63%) expressed satisfaction with their work and social lives in India and had no plans to relocate permanently to the USA or any other country. Nearly a quarter of returnees (24%) reported that relocating to the USA or Europe was unnecessary, as they maintain strong connections and collaborations across borders through projects, professional networks, and conferences. Despite living in India, they continue to exchange knowledge, ideas, and expertise with scientists and engineers in the USA. Many of them use online platforms and communication tools to stay in touch with colleagues globally, while some are engaged in joint projects, frequently supported by their companies. Beyond digital interconnectedness, these returnees also travel to the USA for work meetings, knowledge sharing, and training.

I have been going back and forth to the USA. I have continued to work with them on some projects with the base in India. (Male Returnee)

Only 13% of the returnees indicated that they might move back to the USA if a better opportunity presented itself. While they were not actively considering such a move at the time of the interview, they remained open to the idea. A few returnees expressed interest in temporary relocations, such as working as visiting scientists or engineers on specific projects.

I would not consider a long-term move. I am mentally set on staying [in India], but going to the USA occasionally, perhaps for a short-term project, would not hurt. (Male Returnee)

Why stay in the USA?

The stayers were asked about their decision to stay in the USA, focusing on their primary motivations and how they would rank these factors. Their responses revealed multiple reasons for staying, which were categorized into three main themes: Career goals, work environment, and quality of life (see Table 4). Often, stayers contrasted their reasons for staying in the USA with the contrasting conditions in India.

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For most stayers (88%), the decision to stay in the USA is largely driven by their career. They tied their career goals to professional development and higher compensation. Many pointed to the unparalleled access to cutting-edge technology and innovation, particularly in fields like artificial intelligence and biotechnology, which are still developing in India. They believed that access to advanced tools and research facilities provided an environment where they could excel professionally and contribute to groundbreaking work.

Once you start growing and succeeding in this country, you realize that you are on a treadmill. (...) Soon you recognize there is no treadmill in India for you. (Male Stayer)

American high-tech companies are leaders in innovation. They have modern facilities, use robotics and [computer-aided design] (...) You will not find such things in India. (Male Stayer)

Alongside professional growth, stayers also spoke about the higher compensation packages offered in the USA. Furthermore, they saw the opportunity to build a strong financial foundation in a stable economic environment as a significant advantage over returning to India, where economic volatility and limited options for certain high-paying roles could hinder their aspirations.

The kind of compensation package you get [in the USA] is way better than what [one] will get in India. (Female Stayer)

The USA offers 10 times what India has to offer. (Female Stayer)

Related to career goals was the workplace environment, which was another factor keeping stayers (65%) in the USA. They praised US high-tech companies for emphasizing individual initiative and self-reliance. They found open communication and feedback to be an integral part of the US tech culture, allowing them to share ideas or challenge decisions irrespective of ranking. According to them, employees at all levels are encouraged to contribute to decision-making processes, fostering a sense of inclusion and ownership. They found teamwork to be informal and goal-oriented, with a focus on delivering results. They believed that high-tech companies value innovation and reward employees for creative problem-solving or out-of-the-box thinking. This has fostered a relatively flat organizational structure in US tech companies. In contrast, they viewed Indian tech work as operating within a hierarchical framework, where decision-making authority lies with senior management. Employees are expected to follow directives rather than question them. While innovation is encouraged in both Indian and foreign tech companies in India, stayers thought that the workplace environment there leans toward maintaining the status quo.

I wanted to have academic-type freedom with industry-type relevance... American tech companies give both... You cannot get that in India. (Female Stayer)

For the most part, if you are doing a good job, you get recognized [in the USA]. But in India, you must play the political game. (Male Stayer)

Finally, remaining in the USA was also tied to a high quality of life. Their high-paying jobs not only enabled stayers to achieve financial stability but also provided a pathway to a higher standard of living. They also mentioned stable infrastructure, less corruption, and safety in the USA.

When you stay longer in the USA, you start noticing that India is extremely dirty, streets have holes, traffic jams are the norm where everyone is honking, the air is polluted and people are trying to cheat. (Male Stayer)

Another preferred aspect of US culture cited by stayers was access to personal freedoms. This aspect was mostly cited by women who expressed disagreement with how Indian culture treats women.

The USA is good for women; we enjoy a lot of freedom here that we would not have in India. I think women in India do not mind living there because they have not tasted the freedom that women in America enjoy. (Female Stayer)

To determine whether their stay in the USA is permanent, stayers were asked if they planned to return to India to work or live. A little more than half (53%) stated they had no intention of going back. Many explained that this decision was not even a consideration, as they felt settled and preferred

life in the USA. While most expressed a firm unwillingness to return, some shared that they had initially planned to move back but abandoned the idea due to India's political and economic challenges. A few had attempted to return to India but eventually came back to the USA, unable to adjust.

I had always planned on moving back to India, pretty much from the time I came here, and it is typical of Indian people... But the reality is, we never go back to restart life again. (Female Stayer)

We even tried to buy land in India... It was a terrible experience. We lost a lot of money... So, we returned to the USA, where we are very happy. (Male Stayer)

A small group of stayers (11%) expressed a desire to return to India, primarily due to family obligations. These individuals considered the needs of their aging parents and were willing to move back to provide care, but only after securing suitable employment in India. However, at the time of the interviews, they were not actively seeking jobs. For a few, their future in the USA was dependent on their immigration status. Those on temporary visas indicated they would have no choice but to return to India if their visa was not renewed.

If I don't get a green card... then I don't have any option and must return to India. (Male Stayer)

The remaining 36% of stayers were open to returning to India, but only temporarily. While they considered the USA their home, they expressed a deep connection to the Indian community, culture, and extended family, which fueled their desire for short-term visits.

If I go back, it would be on a temporary basis, not a permanent relocation. (Female Stayer)

I would go [to India] only when necessary—maybe for a project. But, definitely not to stay outside the USA. (Male Stayer)

Both types of stayers—those unwilling to move back to India permanently and those open to returning temporarily—expressed that there was no compelling need to relocate to India permanently. They frequently visit the country, and their immediate family members often come to see them in the USA. Beyond personal visits, many attend business meetings, conferences, and workshops in India. Some even collaborate on projects with peers based there.

Right now, I am working on a project where certain components are being developed in [Hyderabad]. So, I am collaborating with developers in India. (Male Stayer)

People can now work from anywhere. There is no longer a need to be physically present to contribute to a project. You don't have to relocate to work on global initiatives. (Male Stayer)

I consider myself a global citizen rather than solely an Indian or US citizen. (Female Stayer)

Discussion

Migration scholars traditionally have focused on the three core groups: Temporary labor migrants, settler-migrants, and refugees (see, [King, 2012](#)). In contrast, the migration of scientists and engineers has often been analyzed through a different lens, particularly in terms of its impact on both sending and receiving countries. This movement is frequently characterized by the concept of brain drain for countries of origin, which lose valuable talent and brain gain for host nations that benefit from their expertise ([Bhagwati, 1979](#)). While the motivations of scientists and engineers are often assumed to mirror those of manual laborers and refugees—seeking better opportunities or escaping unfavorable conditions—their decision-making processes, as findings show, involve complex professional, academic, and personal considerations.

Most migration theories are grounded in economic determinism, suggesting that income disparities between developing and developed nations are the primary catalysts for migration ([de Haas, 2010](#)). Such economic reasoning is particularly effective in explaining the movement of unskilled, low-skilled, and manual laborers seeking improved financial opportunities. However, it fails to fully account for the motivations of scientists and engineers, whose decisions are often driven by a broader range of factors. The findings highlight that returnees and stayers did not migrate solely to escape economically substandard conditions in India or to achieve financial prosperity in the USA. Instead, their migration was largely motivated by aspirations for educational advancement. The appeal of the US higher education system, characterized by its global reputation and its ability to offer financial support to foreign graduate students, played a pivotal role in shaping their decisions to migrate. Furthermore, for those who migrated directly from India for employment in the USA, their primary objective was to gain valuable technical expertise and experience by working in cutting-edge, high-tech industries. While financial benefits were not disregarded, they were often viewed as secondary to the professional growth and learning opportunities available in the USA. These findings support earlier studies with Indian scientists and engineers in the USA ([Varma, 2007](#)) and Information Technology (IT) professionals who returned to Bengaluru, India ([Khadria, 2004](#)).

International migration theories on skilled labor have emphasized how American companies recruit temporary skilled workers to address domestic labor shortages and benefit from lower wages ([Bhagwati, 2003](#); [Khadria, 1999](#)). In the present study, more than half of the returnees and stayers held temporary H-1B visas. Many initially came to the USA for higher education and, upon completing their degrees, secured employment, competing with US-born workers, and placing strong faith in the merit-based system. Some were directly recruited from India by agencies to work for Indian companies contracted by US firms. These individuals, often holding bachelor's degrees as their highest qualification, migrated to improve their economic and social well-being, driven by the salary differential. However, they frequently reported earning less than expected, which supports the perspective of hiring cheap labor from abroad. However, this pattern did not apply to those who earned their degrees in the USA before finding employment. These findings align with studies that distinguish between different categories of H-1B visa holders ([Ontiveros, 2017](#); [Varma, 2020, 2022](#)). Scientists and engineers recruited directly from India face different labor conditions and support structures and mobility constraints compared to those transitioning from US academic programs to employment.

Frameworks that primarily emphasize financial and economic factors often overlook the significant role of social and political considerations in migration decisions. While economic motivations may explain certain movements, political factors are particularly relevant in cases where individuals flee religious or political persecution, as well as wars. Social factors such as traditions followed by local population and personal freedom especially for women are equally important in migration decisions ([Sabharwal and Varma, 2017, 2020](#)). In this study, however, the migration of returnees and stayers to the USA was not primarily driven by the need to escape social or political constraints in Indian society. These individuals were motivated by aspirations to advance their education and secure employment opportunities. Their primary focus was on leveraging the academic

and professional resources offered by the USA to enhance their skills and career trajectories. Interestingly, after gaining work experience in the USA, many returnees expressed dissatisfaction with the work environments and social norms they encountered upon returning to India. Similar sentiments about working environment were held by stayers. This dissatisfaction reflects a notable shift in their perceptions, shaped by their exposure to international standards and practices (Varma, 2021). Their changed outlook underscores the transformative effect of migration experiences.

Social network theory emphasizes the importance of non-economic factors in migration decisions (Boyd, 1989; Massey, 1990). Connections with individuals in developed countries significantly influence the international migration of unskilled, low-skilled, and manual laborers, as well as skilled workers on H-1B visas. This study revealed that many returnees and stayers chose to study in the USA to attend top-tier institutions, driven by a desire for academic excellence. While social networks were not the primary motivation for their migration to the USA, many had connections with individuals already pursuing education there. However, social networks played a crucial role for those who migrated directly from India to work in the USA. These individuals often came through recruiting agencies with established links to US companies. Such dynamics represent a political-economy mechanism at work.

Most importantly, this paper has highlighted that migration is no longer a linear, one-way process; it has transformed into a dynamic and multidirectional phenomenon, with return migration playing an increasingly prominent role. Rather than being viewed solely as a permanent relocation, migration now often involves scientists and engineers returning to their countries of origin. While there is consensus on the occurrence of return migration from developed to developing countries, scholars hold varying perspectives on the underlying motives driving this trend.

The sojourn perspective suggests that migration is temporary, where individuals move from developing countries to developed ones with the intention of returning to their country of origin (Lee, 1966). Migration, in this view, is characterized by specific, time-limited goals, such as completing studies, earning money, or acquiring new skills. According to the economics of labor migration, return migration signifies the successful fulfillment of migration goals (de Haas et al., 2015). This perspective applies to various groups, including international students, seasonal workers, and professionals on temporary work visas, such as H-1B visas in the USA. It also applies to those sent abroad by their companies on specific projects. However, the present study reveals that most returnees and stayers did not have clearly defined goals to achieve in the USA before returning to India, even though the idea of returning home may have been at the back of their minds.

Scholars have suggested that return migration is influenced by strict US immigration regulations, delays in processing immigration and visa applications, and the threat of deportation (Wadhwa et al., 2009). In contrast, the introduction of more favorable immigration policies may encourage some migrants to stay or return to the USA. The findings of this study suggest that immigration-related issues in the USA are indeed a factor driving some returnees to return to India. However, the study does not fully support the argument that reverse brain drain is primarily driven by US immigration policies. Only 8% of returnees reported returning to India due to immigration challenges. While many did not face significant issues with obtaining work visas, about one-quarter expressed frustration with bureaucratic procedures. However, US immigration policies—particularly those revived or proposed during Trump's second term in 2025, namely, tighter restrictions on H-1B visa, H4 visa for spouses and unmarried children under 21, and Optional Practical Training (OPT)—are likely to heighten uncertainty among Indian professionals to return home.

Traditionally, return migration has been conceptualized as a failed outcome (Borjas and Bratsberg, 1996; Grant and Vanderkamp, 1986). Recently, it has been described as the “return of setback” (Battistella, 2018). These suggest that return migration occurs when migrants' expectations are unmet, such as failing to achieve higher earnings, securing desired employment, or fully assessing the costs and challenges of migration. They are often

applied to unskilled, semi-skilled, and manual laborers, whose migration experiences are typically shaped by economic struggles or misaligned expectations. However, the present study shows that the failed outcome or return of setback do not fully account for the experiences of returnees. Despite holding stable, well-paying jobs and achieving professional success in the USA (Varma, 2024), these returnees chose to return to India. While some returnees acknowledged challenges such as visa restrictions, bureaucratic hurdles, ethnic prejudice in career advancement, and anti-immigrant sentiment in the USA, they did not view these as signs of failure or setback to return. Instead, these challenges influenced their sense of belonging in the USA.

Studies on return migration emphasize the critical role that migrants' sense of belonging to an ethnic community plays in shaping their actions and decisions (Sabharwal et al., 2021). Migrants' self-identification and perceptions of their origin country are often closely tied to their motivations for returning. The present study finds that cultural values significantly influenced return migration for some individuals. About 20% of the returnees cited strong social and cultural identity, along with Indian patriotism, as their primary reasons for returning. These motivations highlight the enduring influence of Indian culture on their decision-making process. Even when economic factors mattered, emotional and ethnic ties played an important role. For these returnees, factors such as lifestyle preferences outweighed purely financial motivations (Benson and O'Reilly, 2009; Saar and Saar, 2020). These findings underscore the complexity of the return migration decision, blending pragmatic concerns with deeply personal and cultural influences. They also show changing preferences over time, through the life cycle of a migrant in the destination country.

For many immigrants, the decision to return home countries is often driven by family obligations that outweigh other considerations. Among Indian immigrants, this reflects deeply rooted cultural values and the Indian extended family system which fosters strong intergenerational relationships and emotional support. Unsurprisingly, the present study found that nearly all returnees cited family as a key factor, with almost half identifying family obligations as the primary motivation. These returnees emphasized the importance of caring for aging parents, supporting family members in need, and reconnecting with their cultural roots to provide a sense of identity for their children. How the migration of one person initiates migration of their significant others, including parents and extended family members has been studied (e.g., Kōu et al., 2017). However, it has been studied to a lesser extent in the context of return migration among highly skilled workers from India. An exception is Khadria's (2004) earlier study of the IT sector in Bengaluru, in which 27 out of 45 return migrants cited family as their primary reason for returning to India.

When migrants return to their home countries due to family obligations, it is often assumed they will face challenges in re-integrating into the domestic labor market (Gillespie et al., 2022). However, findings from this study present a more nuanced picture: From the returnees, 52% cited better career opportunities and prospects for professional growth as central motivations for their return, with 20% specifically identifying enhanced career prospects as the primary reason for their decision. Similar trends are evident in Sabharwal and Varma's (2017) study of Indian faculty and technical staff in national laboratories, where returnees reported improved career outcomes upon repatriation. While Indian immigrants often experience occupational downgrades and mobility constraints abroad—referred to as the “Silicon Ceiling” limiting advancement for Asian American professionals in US tech sectors (Varma, 2006)—returnees reported job stability, promotion opportunities, and accelerated upward mobility in India. Jacobs (2024) corroborates these findings, noting that skilled Indian migrants frequently experience occupational upgrades after returning, enabled by the value of their foreign-acquired human capital and no longer constrained by immigration status in the USA. These findings align with the broader context of India's post-1991 economic liberalization, which transitioned the economy from a state-controlled model to a globally integrated, market-oriented system. Structural reforms such as tariff reduction, deregulation, privatization, and the encouragement of foreign direct investment helped

drive rapid growth in sectors like Information and Communications Technology (ICT) and services (Panagariya, 2010). Returnees with international experience increasingly see themselves as agents of national transformation (Sabharwal and Varma, 2018).

Embedded within both economic and non-economic theories of international migration and the return migration of skilled professionals is the assumption that people around the world are separated by significant geographic and cultural boundaries. However, this study reveals that both returnees and stayers maintain strong connections with colleagues abroad through periodic visits, conferences, workshops, and collaborative projects. These interactions have created a scientific diaspora that remains deeply integrated within the global scientific community. Many of these connections are institutionalized and well-developed, while even those not directly linked to the scientific community maintain ties through family, culture, and personal visits (Khadria, 2003). Physical location no longer limits returnees and stayers from sustaining meaningful connections. In doing so, they contribute to a new global reality where the movement of scientists and engineers transcends national borders, challenging the notion that any single country can contain their intellectual contributions.

For stayers in the USA, this ease of connection diminishes the need to return to India, as they can maintain strong ties with colleagues, friends and family from afar. This supports the perspective of transnationalism, illustrating that stayers maintain dual connections: They are deeply attached to their homeland while remaining emotionally tied to the USA. Similarly, for returnees, there has been a shift in their relationship with colleagues in the USA. They are no longer isolated in India; with enhanced global communication and the World Wide Web (WWW), returnees can access cutting-edge research from the USA as easily as their counterparts anywhere in the world. Indians who hold US citizenship can have an Overseas Citizens of India (OCI) card, which allows them to have a lifelong visa to visit India and participate in financial, economic, and educational fields, except in the acquisition of agricultural or plantation properties. Furthermore, major multinational corporations operating in India have helped cultivate a critical mass of researchers, creating a dynamic and productive scientific environment. Returnees, as highlighted in this study, are particularly enthusiastic about these advancements in India's scientific landscape.

Gender dynamics, while not the primary focus of this study, emerged as an important yet underexamined factor influencing migration decisions. The sample was predominantly male in both returnee and stayer groups, and the study did not include interviews with participants' spouses, thereby limiting the ability to capture how spousal influences shaped migration and return trajectories. Nevertheless, anecdotal evidence offers preliminary insights into gendered patterns of mobility. A few female participants reported migrating to the USA following marriage—either to join spouses already residing there or as part of a joint migration plan—suggesting that women's initial migration decisions were often embedded within broader family strategies. However, once in the USA, these women actively pursued professional opportunities, indicating a measure of agency within the context of family-driven migration. For women who chose to remain in the USA, gender-related concerns were more explicitly articulated. Some expressed dissatisfaction with the treatment of women in Indian society, citing this as a salient reason for not returning. These findings underscore the importance of incorporating gender as an analytical lens in future research on skilled migration and return, particularly through the inclusion of both male and female perspectives and the voices of spouses.

Finally, it should be noted that this study was undertaken before COVID-19. Consequently, it does not capture the return migration of scientists and engineers from the USA to India because of COVID-19. There are no studies that confirm COVID-19 as the primary driver for large-scale return migration of scientists and engineers from the USA to India. However, there are some indications which suggest that COVID-19 may have indirectly influenced some returns. For instance, the pandemic may have caused increased desire to be closer to family members. Also, scientists and engineers

on H-1B visas may have been the first to hit by job layoffs or lack of contract renewal, which may have forced them to consider returning to India (Rajan, 2023).

Conclusion

This paper has analyzed the migration patterns of Indian scientists and engineers, emphasizing the multidirectional and dynamic nature of migration rather than the traditional view of permanent settlement. Return migration emerges not from a single cause, but from a strategic calculation of where individuals can best thrive—professionally and personally. While US immigration constraints and dissatisfaction with career trajectories influenced some returnees, the majority were motivated by professional growth, entrepreneurial ambitions, and a desire to contribute to India's development with newly acquired skills. Returnees were particularly drawn to leadership roles and influence in India's expanding science and technology sectors. Their return was not to ancestral hometowns but to cities like Bengaluru, Chennai, Delhi, Gurgaon, Hyderabad, and Mumbai—hubs of technological innovation and global integration. These individuals are not merely returning—they are reshaping India's scientific landscape. At the same time, many maintain active collaborations with their US-based peers, through joint projects, diaspora networks, and advisory roles in Indian start-ups and institutions. Those who remain in the USA also contribute significantly by facilitating knowledge exchange, fostering entrepreneurship, and mentoring talent in India. Their involvement exemplifies a shift from brain drain to transnationalism, where expertise flows in both directions. Indian scientists and engineers trained in the USA, whether they stay or return, underscore the interconnectedness of the global scientific ecosystem. In this context, traditional remittances have evolved into skill remittances—the transfer of ideas, skills, mentoring, and innovation practices acquired abroad to build local capacity in India. Stayers and returnees function as bridges, enriching science and technology on both sides of the globe.

Looking ahead, changes in US immigration policies during Trump's second term in 2025 are likely to prompt more Indian professionals to return. This shift presents an opportunity for India to convert brain drain into brain gain, while the USA risks losing its competitive edge in STEM fields. To fully leverage this potential, India should implement a multi-pronged strategy: (1) invest in world-class infrastructure to attract returnees from resource-rich environments; (2) strengthen the entrepreneurial ecosystem in deep-tech, biotech, and advanced manufacturing through venture capital access, streamlined regulations, and incubator support; (3) provide family-oriented incentives, such as spousal employment, quality schooling, and relocation aid, to ease reintegration; and (4) recognize and strategically engage its scientific diaspora as a vital asset in national development. By addressing both structural and personal factors, India can position itself as a global hub for innovation and talent circulation.

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Ethical considerations

The Institutional Review Board (IRB) at the University of New Mexico (approval 24116) and the University of Dallas at Texas (approval MR17-043) approved this research on 20 December 2016.

Consent to participate

All participants provided written informed consent prior to participating in interviews.

Consent for publication

All participants provided written informed consent for publication of findings without identifying participants and their organizations.

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