# DEGLOBALIZATION AND TALENT SOURCING:

# CROSS-NATIONAL EVIDENCE FROM HIGH-TECH FIRMS


## ABSTRACT

As corporate globalization is restricted through changes in macro-environments, firms traditionally reliant on global talent pools are suffering. This is particularly true for high-tech firms' seeking to source high-skilled STEM (science, technology, engineering, mathematics) talent. The aim of this study, in line with the special issue, is to explore the impact of macro-level trends in national government policy and political climates on high-tech firms seeking to source high-skilled STEM talent. By applying coevolutionary reasoning, we develop propositions that link the macro environment with corporate strategizing. A multi-respondent, qualitative research design is adopted, involving interviews and focus groups with 40 practitioners and industry experts. Through qualitative data analysis, we identify emergent adaptations to corporate talent sourcing activities for dealing with increasing STEM shortages linked to deglobalization. As the data highlight, the adaptations are a consequence of both internal strategic factors as well as external institutional forces and the interplay between the two. Implications for future research and practice are discussed.



**Keywords**: qualitative research methodology; strategic HR; corporate level strategies; international HRM.

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## INTRODUCTION

"*Global labor markets are undergoing major transformations. These transformations, if managed wisely, could lead to a new age of good work, good jobs and improved quality of life for all, but if managed poorly, pose the risk of widening skills gaps, greater inequality and broader polarization*" (WEF, 2018: vii).

Corporate globalization, which has been growing steadily since World War II, has heralded expanded high-value talent pools (Sparrow, Vaiman, Schuler, & Collings, 2018), creating a wealth of intercountry dependencies (WTO, 2017). In recent years, however, there has been increased protectionism (including taxes on imported goods, subsidies paid to import-competing firms, and export incentives) that has stabilized this growth (Evenett, 2019). Consequently, we are witnessing what is described as a period of globalization 'on pause' (Petricevic & Teece, 2019) or deglobalization (Witt, 2019), reducing levels of global interdependence. Essentially, the infrastructure that supports global trade is breaking down (viz., among others, Brexit, the failed Transatlantic Trade and Investment Partnership negotiations, a trade war between the USA and China, and travel bans as a consequence of the COVID-19 pandemic), which decreases efficiencies in the global market (Verbeke, Coeurderoy, & Matt, 2018). During this period of deglobalization, there has been a concurrent shift in the boundaries of global talent management (GTM) (Bello, 2013) with an increase in business uncertainty in line with skilled talent shortages (Allen & Raynor, 2004).

These trends are particularly pertinent in developed economies such as the USA, UK, and Australia, where there is an increasing demand for STEM skills in their innovation-driven economies, alongside a decreasing domestic supply of talent, forcing heavy reliance on highly qualified migrants (Chen, 2009) or services offshoring (hereafter 'offshoring') to where the talent is located (Lewin & Zhong, 2013). In what is an increasingly uncertain political environment, the US, UK, and Australian governments have simultaneously curbed offshoring and immigration, placing greater controls on temporary work visas (as well as other visa types) over concerns of misuse (Khadem, 2019; Preston, 2016). Many firms are suffering the effects, particularly in the high-tech sector (defined as "industries having high concentrations of workers in STEM": Wolf & Terrell, 2106, p.1), because of the more limited opportunities to source required talent from the STEM fields (Guynn & Mandaro, 2017).

Reports from governmental bodies, consultancies, and industry associations abound from Australia, the UK, and the USA. They speak to the question of whether there is a real shortage of STEM talent, largely concluding that this depends on the STEM discipline. For example, the US Bureau of Labor Statistics (Xue & Larson, 2015) notes how graduates in computer and information sciences as well as engineering and engineering technology are particularly in demand, and hence the talent shortage is more evident than among agricultural or biological sciences, for example. It is on these high-tech industry STEM fields that this study focuses.

Across Australia, the UK, and the USA, there is substantial evidence of a STEM talent shortage in the high-tech industry. For example, an Australian government report noted that STEM jobs were growing almost twice as fast as other jobs, yet "a majority of employers (56%) have difficulty recruiting for STEM occupations, compared to 41% for all other jobs" (DESE, 2020). In the USA, a House of Representatives Committee on Science, Space, and Technology

(2019) hearing similarly noted that: “When we look at the state of STEM education and the STEM workforce in the U.S., we also have cause for concern. Our students have not shown improvements in math or science assessments in the last decade, and they continue to perform well behind the average for the top performing countries internationally.” In the UK, economic modelers EMSI (2019) report that research among recruiters that rely on high-tech STEM talent shows that: “7 out of 10 said they had found it difficult to hire staff with the required skills in the last year; 9 out of 10 said that their recruitment of such positions is taking longer, with the process taking an average of 31 days longer than expected; 48% are looking abroad to find the right skills”. In brief, a typical headline observed across these countries reads: “STEM businesses have warned of a growing skills shortage as they struggle to recruit qualified workers in science, technology, engineering and mathematical fields” (STEM Learning, 2018).

Firms have never had an easy task of sourcing STEM talent, including from overseas due to the complex processes involved (Verbeke et al., 2018), but current political nationalism trends appear to be exacerbating the situation (Horak, Farndale, Brannen, & Collings, 2019). Moreover, these trends run counter to corporate expectations of the expansion of international markets and cooperation (Allen & Raynor, 2004), hence requiring new strategic talent responses. The aim of this study, in line with the special issue call, is to explore the impact of macro-level trends in national government policy and political climates on high-tech firms seeking to source high-skilled STEM talent.

In this exploratory qualitative study, we identify firm coping strategies related to STEM talent shortages in the current climate of deglobalization evidenced through national political climates and government policy trends. We argue that such strategies should be considered simultaneously from a macro environment and mezzo organizational perspective. We do so by

introducing coevolution reasoning, bringing together "environmental determinism resulting from institutional factors, and managerial intentionality resulting from organizational factors" (Lahiri & Kedia, 2011: 254). In other words, we explore how internal corporate talent sourcing activities enacted through managers are constrained or enabled by external environmental conditions and vice versa. Coevolution reasoning incorporates a broader understanding of the multidirectional causality and interdependencies of corporate and governmental actions (i.e., from firms to societies and from societies to firms) (Lahiri & Kedia, 2011; Pisani & Ricart, 2016; Zimmermann & Ravishankar, 2016).

By building propositions based in coevolution reasoning, we contribute to the broader GTM literature in several ways. First, we uncover the activities adopted by high-tech firms "to locate, source, and manage resources anywhere in the world" (Ashton, Brown, & Lauder, 2010: 838) under conditions of deglobalization. Second, we expand the limited theorizing around the impact of macro-level factors on talent sourcing activities by adopting a coevolution lens (Lahiri & Kedia, 2011), exploring simultaneously the role of government policy and political climates as well as organizational strategies. Third, we advance the GTM field to assist firms in their search for global competence (Cascio & Boudreau, 2016) by exploring the interaction between talent sourcing activities and the macro operating environment.

## AVENUES TO ADDRESS TALENT SHORTAGES

Talent shortages (although sometimes disputed depending on how 'shortage' is defined in terms of labor market versus organizational supply and demand: Shah & Burke, 2005) receive limited attention in the GTM literature despite the obvious challenges they pose (Khilji, Tarique, & Schuler, 2015). We focus on the high-tech industry as it is here where the talent sourcing is

particularly challenging: Deglobalization reduces a firm's opportunity to hire internationally, yet global talent sourcing is critical for high-tech firms because they require STEM skills that advanced economies (including Australia, the UK, and the USA) are unable to produce a sufficient supply to meet demand. For example, in the USA and the UK, around 25% of higher education students score two or less out of five on numeracy upon graduation (OECD, 2017a, b). Australia also reports strong skill imbalances in the labor market, whereby supply cannot meet demand (OECD 2019a). This leads the OECD to conclude that the strong focus in these economies on technologically advanced industries cannot be supported by the country's skill levels, and hence a reliance on overseas STEM talent pools. A similar conclusion was reached by the European Union that despite high unemployment, there was strong evidence of a STEM skill shortfall across many member states including the UK (Caprile, Palmén, Sanz, & Dente, 2015).

Firm strategies for handling domestic skill shortages include moving the work to where talent is available (i.e., offshore) or bringing the talent to the work through high-skilled migration. Offshoring has grown to be a key global business strategy (Zimmermann & Ravishankar, 2016), while migration has become a defining feature of the international labor market (OECD, 2017a), with significant socio-economic implications at country level (Boucher & Cerna, 2014). Developing strong STEM skills in the economy remains a challenge for countries where high-tech industry is a cornerstone of economic growth (OECD, 2017a). Firms target skilled migrants (i.e. those with a minimum of an undergraduate degree: Zikic, Bonache, & Cerdin, 2010) to fill their talent needs because the qualifications are an asset to the employer (Cerdin, Abdeljalil, & Brewster, 2014). Hence, a growing source of STEM talent is through international students who, post-graduation, transfer to work visas (Amuedo-Dorantes, Furtado, & Xu, 2019). The STEM talent shortage is also being exacerbated further by countries typically supplying STEM talent

increasingly encouraging their diaspora to return home given the new high-tech employment opportunities in the home countries (Lewin & Zhong, 2013; Ragazzi, 2014; Sparrow et al., 2018).

Addressing domestic skill shortages with overseas talent solutions can lead to a negative political climate: the share of STEM positions as a proportion of overall employment has not grown substantially, yet the proportion of STEM workers being foreign-born has (Borjas & Doran, 2012). There is also evidence that high-skilled immigrant workers are prepared to work for lower wages than domestic workers (Hira, 2010), although the pay gap may be less than in other occupations (Hanson & Slaughter, 2016).

Similarly, offshoring has traditionally been used to reduce transactional labor costs by relocating work to lower-cost countries (Pisani & Ricart, 2016). It has grown to be a popular business strategy driven by the need to source scarce high-skilled global talent (Gott & Sethi, 2016). Offshore high-tech jobs move mainly to emerging economies, especially India, where wages are low and the availability of STEM skilled talent exceeds that of developed economies (Joshi & Mudigonda, 2008). Offshoring is, however, politically controversial, with concerns about domestic job losses, protection of privacy of data held overseas, and perceptions of lower standards of business ethics in host locations (Gupta & Sao, 2009). Governments have, therefore, attempted to control the extent to which firms offshore their activities, akin to the immigration controls put in place to protect domestic workers (Grant, 2005).

The offshoring debate appears to be lower on the government policy agenda in the USA, UK, and Australia than a decade ago, however, while immigration is debated with greater vigor. Nevertheless, government policy around preferential taxation for domestic operations is designed to reduce the offshoring of work to lower cost locations (Gupta & Sao, 2009). While the ongoing

need to access qualified talent is a key explanatory variable in offshoring decisions (Lewin & Zhong, 2013), this business strategy is not without significant invisible organizational costs and challenges associated with running operations from a distance (Dunkley, 2016; Stringfellow, Teagarden & Nie, 2008).

## IMPERFECT SOLUTIONS

Despite firms' reliance on high-skilled migration and services offshoring to boost global talent pools, both strategies have come under heavy criticism in Western developed economies, questioning whether they are being used for genuine skill shortages (Preston, 2016; ACTU, 2013) or to push down wages (Kerr, 2013) and circumvent training costs and time (Martin, 2002). Both migration and offshoring are, therefore, imperfect solutions for firms to deal with the STEM talent challenges. Concurrently, the costs, time, and challenges involved in retraining a local workforce can be considerable. For example, at the macro-level, it has been estimated that it can take up to sixteen years to improve the national education pipeline (NSB, 2004).

To date, the GTM literature has paid little attention to exploring these macro-level considerations regarding firm responses to talent shortages (Khilji et al., 2015). Moreover, we need to understand how firms decide and create an appropriate balance of the different enabling and constraining factors between the different GTM solutions available (Collings, Melahi, & Cascio, 2019). We therefore propose adopting a coevolution lens to improve our understanding and theorizing of the talent sourcing decisions firms face, exploring the phenomenon through the intersection between managerial intentionality and environmental determinism.

### Managerial intentionality

Managers operate strategically and with intentionality (McKelvey, 1997). Managerial intentionality thus refers to the role of managers in firms in making deliberate strategic choices. Such choices can be curbed by external forces but they also thwart path dependencies, with each manager's choice creating a potentially different organizational outcome (Hutzschenreuter, Pedersen, & Volberda, 2007). Due to the human factor involved, managerial intentionality is often unpredictable and non-rational (Buckley, Devinney, & Louvier, 2007) but is usually based on previous experience and knowledge accumulated (Hutzschenreuter et al., 2007). Managers can thus choose the extent to which they wish to avoid external constraints, respond to them, or attempt to shape them (Cantwell, Dunning, & Lundan, 2010).

There are several strategic make/buy/ally decisions behind talent sourcing that managers in high-tech firms make regarding the development of a sufficient global STEM talent pool. These include internal talent development, skilled migration (permanent or temporary), talent outsourcing, and offshoring. Firms can develop internal talent to meet their needs, either using existing talent in local operations or expatriating talent from one location of the business to another. When there is insufficient internal talent available (either due to ability, motivation, or mobility reasons), alternative sources might be sought such as hiring externally from the local labor market or recruiting talent from overseas. If talent cannot be moved to the firm's location of operation, then offshoring activities to countries where talent is available is another managerial choice.

In summary, managers are expected to act with intentionality to develop the most effective strategies they can to deliver the necessary talent to enable them to implement corporate strategies. We therefore propose that:

P1: *In high-tech firms, the need to implement* c*orporate strategy drives managerial intentionality to achieve desired levels of access (internally and externally) to high-skilled STEM talent.*

**Environmental determinism**

Managerial decisions are made in the context of the macro operating environment of a firm. Although managerial intentionality is essential to talent decisions inside firms, governments also recognize their role in achieving economic competitiveness through home-grown talent, such that developing an educated workforce that exceeds that of other highly developed economies is a priority (Khilji et al., 2015). Simultaneously, emerging economies have equally recognized human capital as a fundamental means of economic development (Ragazzi, 2014), and hence the war for talent is rife. At the macro level, governments play a critical role in managing and controlling the quantity and quality of talent (Kshetri, 2007), at least in part through investment in education systems (Tregaskis & Heraty, 2012). For example, a lack of attention paid to creating a strong linkage between educational curricula and skills needed in the economy can lead to sustained talent shortages, forcing firms to look to other countries as potential sources of supply (Brown & Tannock, 2009).

In the context of macro environmental determinism, government control over firms' access to overseas talent is particularly pertinent to high-tech firms due to the international sourcing of talent. Immigration is a policy instrument available to governments to address skill shortages, or more generally improve the levels of human capital (Iredale, 2001). A switch from governments creating immigration policies that favor high-skilled applicants (Carr, Inkson, & Thorn, 2005; Iredale, 2001) to such programs being tempered by quotas to appease concerns that local talent

will otherwise suffer (Kirkegard, 2007) has shifted the consequences of the operating environment from enabling to constraining (Vaiman, Collings, & Scullion, 2017). We therefore propose that:

P2: *Macro environmental determinism surrounding high-tech firms constrains managers' ability to achieve desired levels of access to high-skilled STEM talent required to implement corporate strategy.*

**Coevolution interdependencies**

Coevolution reasoning focuses on the interdependencies between managerial intentionality and environmental determinism (Zimmermann & Ravishankar, 2016); when one dimension is in conflict with another (for example, when managerial intentionality points to seeking overseas talent but environmental determinism indicates that such activities cannot be supported), we expect to see a shift in firms' activities such that there is an attempt to change the perceived constraints or barriers. For example, well-known high-tech firms such as Microsoft, Uber, Apple, and Google lobbied the government to try to overturn a newly introduced travel ban in the USA in 2017 (Guynn & Mandaro, 2017). In contrast, when external demands are in line with managerial choices, a more harmonious interdependence between managerial intentionality and environmental determinism would be expected to prevail. Accordingly, we present a final proposition that:

P3: *High-tech firms apply managerial intentionality to attempt to influence the external macro environment in which they are operating to create more favorable conditions for achieving corporate strategic goals related to sourcing high-skilled STEM talent.*

Bringing the three propositions together, Figure 1 summarizes the conceptual model for the study.

>>> Insert Figure 1 about here <<<

## METHODOLOGY

To gather exploratory data, a multiple respondent, qualitative research design was adopted. A semi-structured interview schedule was developed by the research team (see Appendix A) based on the themes that emerged from the literature review: type and extent of talent shortage; reliance on offshoring and/or high-skill migration and/or local talent; other measures for addressing skill gaps; the role of talent sourcing within the business strategy; and the consequences of different talent sourcing activities. Before going into the practitioner field, interviews were held with five expert scholars to check that the interview schedule covered the full range of issues required to fully address the topic.

Once the interview schedule was finalized, we developed a list of the key informants that would best address the research questions, including talent managers in high-tech firms, managers of global talent provider firms and consultants, and high-tech industry association experts. This mix of informant backgrounds enabled the collection of data from the perspective of internal corporate strategies as well as gaining an understanding of macro-level external factors beyond the high-tech firms. The authors then contacted potential participants based on their personal and professional networks to arrange telephone or video-conference interviews at convenient times.

The interviews were conducted by three of the four authors, across the UK, the USA, and Australia. These three countries were selected due to their being typical examples of the

deglobalization factors described here, yet are among the most attractive countries for high-skilled migration and international students (OECD, 2019b). For example, Australia saw political controversy over the '457' (temporary business entry) visa, with trade unions accusing employers of using the visas to recruit lower-cost, foreign labor and displace Australians from their jobs (Khadem, 2019). Similar accusations were made in the USA, such as the case of Disney replacing US technology workers with cheaper high-skilled immigrant talent on H-1B (temporary employment) visas (Preston, 2016). Access to H-1B visas has been reducing since the 2008 financial crisis (Mukherjee, 2014) and this trend has continued under the Trump administration, with strong reactions from firms dependent upon overseas talent (Bensinger, 2017). In the UK, the 2016 vote by the British people for Brexit, i.e., to leave the European Union, means the end of free movement of talent (HM Government, 2018). The Australian points-based skilled migration model, which is similar to Canada and New-Zealand, has since been hailed by US President Trump and UK Prime Minister Johnson as worth emulating as an optimum solution to leverage global talent without harming local talent (Staton & Wright, 2019; Williams, 2017). We therefore argue that these three economies are similarly aligned in their goals and their challenges related to global talent sourcing.

The in-depth interviews ranged from 30 to 90 minutes each (average 48 minutes) and all interviews were recorded and transcribed. Company documents where made available were also used for data triangulation. All practitioner interviewees were representatives of either large, well-known corporations, medium-sized talent providers or consultancies, or well-established industry associations. All names of organizations and individuals have been withheld for confidentiality reasons.

In addition to the interviews, two half-day focus group discussions were held: one in the USA with eight participants and one in the UK with sixteen participants. The participants were key stakeholders in talent decisions from industry associations, global high-tech firms, and offshoring vendors. The focus groups facilitated open discussion between the key stakeholders (rather than between interviewer and interviewee), allowing the expression of both supporting and contradictory agendas and expectations. The focus groups lasted approximately three hours each and were recorded and transcribed to supplement the interview data. The complete data collection resulted in over 400 pages of transcribed text based on over 20 hours of recorded conversations.

In total, 40 participants were involved in either interviews or focus groups (see Table 1): 15 in the USA, 5 in Australia, and 20 in the UK. Data were gathered until saturation was achieved, when there was sufficient data on all questions, and no new information was being added by the participants. Thematic content analysis (Boyatzis, 1998; Hyde, Harris, Boaden, & Cortvriend, 2009) was used to analyze the data. The analysis was led by the author who had not been involved in the interviews to reduce any recollection bias. Two additional research assistants were also involved in the coding process to continually check for interpretation of codes and text. The software package NVivo was used to facilitate the coding process.

>>> Insert Table 1 about here <<<

The coding process started by identifying themes based on the literature review to develop the initial heuristic framework (as suggested by Miles, Huberman, & Saldaña, 2019). Three aggregate dimensions were identified: talent shortages; talent solutions; and coping strategies.

From these aggregate dimensions, eleven second order themes were identified from an iterative process of reviewing the literature and the data collected: talent demand and supply; skilled migrants; local hires; skills retraining; expatriation; offshoring; cost control; education; business alignment; balancing risk; involving multiple stakeholders. As the transcripts were analyzed, each second-order category was further classified into multiple first-order codes (see Appendix B). This followed an iterative process whereby as a new code started to emerge, initial coding of transcripts was revised to ensure all codes were explored in all interviews. The final coding structure was checked for accuracy by the three authors who had conducted the original interviews. Minor discrepancies were discussed, and an appropriate code agreed upon between all authors before the final coding of all transcripts.

## FINDINGS

We structure the findings to address the propositions, starting with a description of the general operating context regarding access to STEM talent under a context of deglobalization. We then present the different activities being undertaken to source STEM talent, describing for each the perceived influence of the macro environment along with the activities adopted internally by managers. The final focus is on evidence of interdependencies between the external and internal environments as evidence of coevolution.

### Deglobalization and STEM talent

The data from all three countries revealed evidence of STEM talent shortages in both quantity and quality. For example, graduates' skills do not match job requirements (lack of quality) and the supply of experienced talent is even more restricted (lack of quantity): "*it's the*

*barrier between [desired and actual] skill. In other words, you could have someone who has come out of university and has got a particular skill, but they lack a particular type of experience*" (IT talent vendor, Australia). This was described as not being a new phenomenon in the high-tech industry, but deglobalization was worsening the situation. Previously there had been an alternative technical talent supply from overseas (e.g., India for technical skills), but this supply was diminishing due to two primary factors. First, local companies in the supply locations (such as India) are employing more local talent, meaning fewer people feel the need to relocate for work:

> "*maybe 10-15 years ago skill shortage was local to various countries and people were attracting talent from other countries, especially from India and East Asian countries, but because they have their own operations back in these countries now, they are recruiting locally*" (IT talent vendor, UK).

Second, tighter immigration regulations (such as restricted availability of H1-B visas in the USA and 457 visas in Australia, along with the move to Brexit in the UK) are reducing talent's mobility globally:

> "*I talk to several clients or networks and for them it is completely exacerbating the issue, so all of a sudden they have lost access to a talent pool that they believe they don't have the skills to find and source locally*" (Consultant, Australia).

A trend toward stricter immigration regulations is encouraging local firms in supply countries such as India to focus on retaining talent and restricting the outward flow. There is also evidence of talent moving back to their home country due to the changed political climate: "*similarly Brexit has happened because people see that there is job loss happening*" (UK workshop). Simultaneously, talent in the supply countries is focusing more on finding local positions rather

than looking to move overseas as the conditions in the home country are improving at the same time as the conditions for entering a developed economy are becoming more challenging.

However, deglobalization in terms of stricter immigration regulations is not the full story. Interviewees described the overseas talent supply as not always being the talent needed to meet demands anyway: high-tech skilled migrants are not necessarily business savvy, nor may they have the desired work experience. The combination of technical skills, work experience, and business skills/industry knowledge is most in demand.

## Talent sourcing activities

Interviewees described the activities they were undertaking related to high-tech talent sourcing, including opportunities for hiring high-skilled migrants and offshoring work, as well as other activities related to internal talent or local hires. We take each in turn here, discussing macro and strategic concerns.

### *High-skilled migrants*

Interviewees raised government policy as a highly relevant constraint to talent flows due to stricter immigration conditions. Policy is perceived as protecting local talent but also increasing the compliance issues for firms attempting to hire high-skilled migrants, including challenging visa application processes: "*even with people who have been with our company for a number years and have already been approved for sponsorship, just to renew their H-1B we are seeing very cumbersome, very detailed requests for evidence*" (Talent manager, USA).

One reason identified for the current tightening of immigration policies was the abuse of visa systems that has occurred in the past as talent has been brought in from overseas with the primary aim of displacing more expensive local hires. Minimum salary thresholds are therefore

being introduced by some governments to counter this abuse: "*In several cases it becomes even more cumbersome and costlier to bring in people from India to fill in these jobs because of course there is a minimum salary threshold, which is above the market wage*" (Industry association, UK). Uncertainty (in this case, Brexit) is also causing skilled people to withdraw from the available talent pool, with skilled talent placing more focus on finding local jobs.

Overall, the dependence on visa-related employment is reducing: "*recent changes in the mood is resulting in them having a much bigger interest in investing in the development of a local talent rather than bringing talent in*" (Industry association, Australia). This is for two primary reasons: (a) because of the increasing difficulty in gaining appropriate visas for talent, and (b) because of the difficulties associated with integrating foreign workers in the workplace (especially in climates of increasing political nationalism): "*then you have the standard issue of somebody from another country needing to be able to integrate into the new context on a cultural level and language level*" (Talent manager, USA).

***Offshoring***

Unlike with immigration issues, interviewees did not readily mention environmental constraints or enablers when talking about the use of offshoring. Their attention was more internally focused in terms of developing a competitive strategy for the market. Interviewees described a prior reliance on relocating work to where the skills were available if lacking in the local context. Captive offshoring (i.e., offshoring activities overseas but keeping those activities in-house rather than outsourcing to a third party) was described as a preferred approach to gain access to talent at lower cost in response to client / competitive cost pressures. However, it was noted that costs were rising for experienced talent in traditionally cheap labor economies: "*but*

*for India […], it is not that much cheaper than hiring in the UK because in metro cities getting somebody senior is probably the same or very similar price*" (Industry association, UK).

Interviewees described offshoring as an opportunity both to gain access to talent and to scale up quicker than in the home country. This strategy can, however, raise quality issues related to the work being undertaken and management issues related to communication, time zones, and local leadership. As a result, outsourced (rather than captive) offshoring was described as less popular given offshoring was no longer considered purely a cost-cutting exercise, but instead a means to source necessary talent and keep knowledge in-house. Outsourcing was also seen as creating greater risk because of working through third parties:

> "*this is one area which has seen the biggest shift in the last 3 to 5 years because cost cutting remains important, and it will always be, but it is not the only objective […]. What are emerging as other stronger objectives are […] how do I leverage the talent or the capabilities in the wider sense from this ecosystem*" (Consultant, UK).

There were also disadvantages to offshoring described by the interviewees. Captive offshoring creates competition within the supply country between the foreign-owned firm seeking local talent and the domestic firms that are increasingly seeking the same talent. Moreover, firms indicated a preference for their operations to be located where the clients were based: "*I know for a fact that a lot of our companies actually do not prefer this model because it is important for them to be in close proximity with the market that they are actually serving*" (Industry association, UK).

***Internal talent***

Given the constraints and challenges of both high-skill migration and offshoring, alternative methods for sourcing talent were identified by interviewees. Looking at the talent already in the

organization, a first solution is to relocate an existing employee with the requisite talent to an overseas site, i.e., expatriation. This option is being used, but there has been a shift towards greater use of short, project-based rather than long-term assignments, predominantly due to the very high costs of expatriate assignments as well as the problems of finding talent who are willing to relocate for the assignment (especially to less developed economies). Moreover, expatriation is described as 'not sustainable' due to the transient nature of skill transfer:

> "*it is very expensive to even internally move someone […] from another country here regardless of the immigration visa, so expat assignments are something that I have seen in my career go down drastically over time*" (Talent manager, USA).

Another internally focused option mentioned by interviewees is to give current employees the opportunity to develop new skills, e.g., through tuition reimbursement programs. The cost and time required to retrain talent for the required skills was, however, described as prohibitive especially given the fast pace at which process and product digitization occurs. Interviewees noted that it can take a couple of years to retrain someone but by which time those new skills are already outdated. This is, therefore, an uncommon practice: "*we have fairly strong tuition reimbursement programs. In these highly technical fields, you see that occasionally people grow from a lower level end of these jobs, but that is not frequent, […] and become an engineer over time*." (Talent manager, USA).

***Local hires***

When talent is not available internally or too costly to retrain or relocate, and when high-skill migration and offshoring are not seen as viable alternatives, the talent management strategy of preference across interviewees was to focus on local hires: "*the core focus is on trying to find local talent […] I think most companies are coming to that conclusion because it is just so*

*expensive to move people a lot*" (Talent manager, UK). The definition of 'local' talent is, however, quite broad. For example, foreign talent is not necessarily being hired directly from overseas, but from local colleges, i.e., foreign students graduate and then find work in the host country. This provides firms with the advantage of the talent having received local training: "*in the US […] they have a US training, so there is already a certain quality of certification there*" (Academic expert, Australia).

Local workforces (i.e., anyone legally allowed to work in a country rather than necessarily that being their country-of-origin) are the preferred option and increasingly so based on the value of their local knowledge in addition to more generic technical skills. Cost reasons, in addition to immigration restrictions, are given for why talent is being moved around less. Local hires are seen as more cost-effective, easier to retain, lower risk and a way to build a stronger employer reputation in the local community "*foreign labor has to – when you bring in somebody you have to take care of all of these additional costs and on top of that housing arrangements and things like that*" (Industry association, UK). High-skill migrant and expatriate hires being made to fill skill gaps are also being asked to pass on their skills to local workers to prevent the need for future overseas hires.

Overall, country-of-origin was not described by interviewees as a criterium per se for hires; talent is talent wherever it comes from. It is a question of whether the person has the necessary skills and the right to work in that country.

***Interdependencies***

From a managerial intentionality perspective, interviewees highlighted a primary concern of driving down costs. Lower cost options were described as always being a priority where they can deliver the necessary talent, however, this is not always the best route due to regulatory

constraints in the macro environment. Immigration fees and expatriation costs were explicitly mentioned as to why local hires were increasingly preferred, balanced against quality concerns: "*the supply base of talent is now the driver, not the cost*" (USA workshop).

A second priority was to focus on a long-term solution through education. Due to the perceived skills gaps, interviewees talked of the need to build a strong pipeline of talent for the future by making young people excited about STEM-skill areas. The macro environment was not ideal in that college curricula were not delivering the skills that the firms were seeking, nor were they attracting students to skill-shortage disciplines. Interviewees commented that education systems do not appear to be progressing at the same rate as industry was changing, and hence they were taking a proactive stance to address this by partnering with universities and schools:

> "*we have tried to look at the university and educational systems not only as customers, because selling software into universities happens to be one of our vertical markets, but the common interest that we have in partnering with these academic institutions is not only selling […] so that they are either training the students in our software […]; [but also] we are getting the next generation to be familiar with, excited about careers in hi-tech careers in software coding*" (Talent manager, USA).

This strategic partnering involves getting people, especially students, excited about technology fields and learning about what they are being taught relates to business. Interviewees described how they were sending volunteers into schools to share their enthusiasm for an industry or job role. Hiring students as interns or on apprenticeships was another way that firms were focusing on making the education/business link, creating potential future career hires who already understand something of the business. Strategic partnerships with local communities

(e.g., indigenous communities in Australia) was identified as another way to train local talent for future hires into the companies. In brief, interviewees were adopting proactive measures to reach out externally to ensure their future talent sourcing.

This activity was described as working better in developed nations than in India, a primary STEM talent supply country. There, a lack of trust between employers and universities means that they are less likely to work in unison. Universities are considered not to be in touch with business and therefore are not developing relevant skills: "*I think the relationship between the universities, at least in the Indian context, and the private sector, on many occasions is adversarial, although they recruit quite a number of students. So, I think this trust building has to happen*" (UK workshop). This demonstrates a different dynamic between the external environment and internal strategizing.

From a managerial intentionality perspective, interviewees identified a strong need for business alignment: "*you can't run a business in a high-tech environment unless you are fundamentally thinking about talent*" (Talent manager, USA). This also applies to the desired skill sets: technical skills were not described as the primary supply problem, but rather technical skills aligned with business skills. Moreover, alignment between the core goals of the organization, the talent supply, and the resourcing options was highlighted as essential. For example, certain business models lead to typical talent approaches: "*I think it goes back to the business model […] I think you start with a default model. So, if you are a dotcom company, you probably start with a default model of outsourced hiring*" (UK workshop).

This alignment, driven by managerial intentionality, also needs to be flexible to adapt to changing regulatory environments and customer needs over time, creating an 'optimal balance' between the different resourcing options: "*for companies and for the customers, I think these*

*three things will have to co-exist in terms of skill migration and offshoring and local hires […]. If you stick to one strategy, it will definitely create an imbalance*" (UK workshop). The reduction in the number of visas available to transfer talent, for example, was described as having been quite a sudden change for organizations with little time to put an alternative strategy in place. The notion of 'optimal balance' emerged from the data as being based on two core concepts: risk management and involving multiple stakeholders.

Risk management was described as critical when combining talent sourcing activities as a necessary response to a changing macro context, e.g., migration regulations, education curricula, costs, and customer demands. Balance is primarily driven by two factors: the internal drivers in terms of business profitability and growth, and the external regulatory (and political climate) requirements. Demand spikes were being met by overseas labor, while more stable talent demands were focused on local hires and long-term development:

> "*for strategic and planned business needs and growth, local hires and training turn out to be more effective, while sudden spikes in the demand can be met through skill migration or offshoring, however that really depends upon the situation. Well-crafted talent management involves a mix of all these measures right from the start based on the delivery model*" (Talent manager, UK).

'Granularization' was a term introduced by one interviewee, which represented the notion of balanced risk management resulting in different strategies for different parts of the business. For example, business units focusing on the local market placed more emphasis on local hires with local knowledge: "*They will super granularize their talent need and at the super granular level, they will decide is this for the robot, is this for the American employed in the US, is this job for someone employed by my company outside the US?*" (Consultant, UK).

Finally, interviewees suggested that multiple stakeholders need to be involved in addressing the range of talent challenges. The notion of interdependencies was well understood by interviewees and is captured through the knowledge that there is a need to work together between governments, educational institutions and firms to address talent challenges for the future:

> "*how to achieve the optimum balance is, primarily driven by two factors: the internal drivers, in terms of your business profitability and growth and the future business and things like that; and there are external drivers, in terms of you have to also take into account the regulatory requirements, if there are any political issues at government level, government policies, taxations, legal issues and things like that*" (UK workshop).

The findings are summarized in Table 2, which highlights elements of managerial intentionality, environmental determinism, and the interdependencies between the two that emerged from the interview data.

>>> Insert Table 2 about here <<<

## DISCUSSION

We have established thus far that the USA, UK, and Australia are typical examples of economies in which high-tech industry is critical to growth, yet the supply of STEM talent remains limited (OECD, 2017a). A reliance on high-skilled migration and offshoring is being challenged by both the changing government policy and the negative political climate against 'foreign' workers that are part of a wave of deglobalization (Bello, 2013). Simultaneously, firms

are acutely aware of the problems of having to rely on an insufficient local talent supply. This study was therefore designed to explore the activities firms are undertaking to address these challenges alongside the external macro environment to the extent that it constrains or enables these activities; propositions and a conceptual model were developed based on the coevolution that occurs between these macro and mezzo-level contexts. The exploratory interviews and focus groups revealed several insights that we discuss here to enhance our understanding of this dynamic field.

Our first proposition built on the notion of managerial intentionality, expecting managers in high-tech firms to focus on seeking internal and external access to STEM talent to achieve corporate strategic goals. Intentionality is potentially irrational yet is based in prior education and experience (Buckley et al., 2007; Hutzschenreuter et al., 2007). The data indicate a clear desire to source the best talent available in a limited market to achieve competitive advantage, irrespective of from where that talent may come. High-skilled migration can, therefore, be considered a rational strategy, commonly adopted to fill this gap (Lewin & Zhong, 2013; Vaiman et al., 2017). Similarly, captive offshoring was described as a necessary means to source and retain talent and knowledge inhouse, demonstrating how talent availability was a key motivating factor alongside cost for offshoring (Gott & Sethi, 2016). Despite this managerial choice to offshore activities, it was not without challenges, as there were concerns noted regarding the quality of host providers as well as rising competition for the scarce talent in the offshore location (in line with previous studies noting relevant invisible costs: Dunkley, 2016; Stringfellow et al., 2008).

The use of inhouse talent was considered less of a solution due to the high costs of expatriation and of retraining talent to meet new skill demands. Although the costs of expatriation were balanced against potential performance benefits, persuading talent to be mobile

was described as an additional factor that minimized use of this talent sourcing approach (in line with previous findings: Ashton et al., 2010). Overall, local hires emerged as a preferred option where possible as this supported cost-reduction and avoided immigration bureaucracy or the challenges of offshoring, but the desired levels of quality and quantity were not always available.

Second, drawing from the notion of environmental determinism, we proposed that the external macro environment (government policies and the political climate around immigration and offshoring) would be considered a constraint to high-tech firms achieving desired levels of access to STEM talent. The data confirmed that the macro environment has shifted from being one perceived as enabling to constraining (Vaiman et al., 2017). Interviewee descriptions of government policies in the USA, UK, and Australia all show evidence of tightening immigration regulations, lengthy and bureaucratic visa application processes affecting new hires and expatriation, increasing control over high-skilled migrant salaries, and overall a political climate of uncertainty affecting talent's willingness to relocate.

Interestingly, government policy related to offshoring was not mentioned among the concerns raised, indicating less of a focus by the study participants on taxation advantages to domestic operations (Gupta & Sao, 2009). More attention was paid to costs as a constraint, as they were described as increasing as host country wages rise. This stands in contrast to the substantial impact of government immigration policy on talent management strategies. This may be because of the proximal impact of visas on the ability to hire talent versus the more distal taxation implications of locating work offshore. Future research might investigate further the proximal and distal outcomes of government policy on talent management strategies.

Finally, applying coevolution reasoning, we expected to observe an interaction between the macro and corporate contexts through mutual interdependencies (Zimmermann & Ravishankar,

2016). We proposed that high-tech firms would attempt to influence their external macro environment to create more favorable conditions for achieving their strategic goals related to sourcing STEM talent. In the data, we observed how the external environment was changing corporate thinking (for example, shifting away from a reliance on visa-based hiring given the increasing constraints). Firms recognized the increasing need to be responsive to the dynamics and uncertainty in the macro environment and create flexible strategies to adapt to quickly changing circumstances (Harsch & Festing, 2020). For example, the uncertainty caused by Brexit is an external factor resulting in diminishing mobility of talent pools both due to changing government regulations and the willingness of talent to relocate (Kierzenkowski, Pain, Rusticelli, & Zwart, 2016).

Managerial intentionality interacting with environmental determinism means that there can be an attempt made to shape macro-level constraints (Cantwell et al., 2010). The preferred managerial solution was a reliance on local talent, yet this was also affected by the macro environment. Overall, there was a strong appreciation of local knowledge and training and a focus on recruitment from local educational establishments due to the benefits of local training. Although there was a supply of domestic and international students that could help to address local talent shortages, the school curricula were not well-aligned with industry skill demands. Firms were, therefore, developing partnerships with schools, influencing the curricula in order to build a future talent pipeline. This avoids a reliance on government intervention in the educational system (waiting for governments to establish necessary skill supply pipelines: Brown & Tannock, 2009), with firms building relationships directly with schools, colleges, and universities. This allowed the firms to emphasize not only the desired high-tech skills but also the necessary business skills that define high-value talent.

## IMPLICATIONS FOR RESEARCH

Adopting a coevolution perspective (Lahiri & Kedia, 2011) has enabled an expansion of what is currently very limited theorizing around the simultaneous impact of managerial decision-making and macro-level factors affecting global talent management. Managerial intentionality involves making strategic choices that balance corporate needs with relevant constraints: this helps to explain why decisions may appear irrational due to the 'human factor' (Buckley et al., 2007), yet are likely the result of a balancing process. One manager's willingness to accept risk, for example, might be very different from another manager's (Harsch & Festing, 2020), hence the decisions adopted could be equally different. Applying this managerial intentionality lens to talent sourcing decisions provides important theoretical underpinning to the GTM literature.

The notion of environmental determinism as suggested in coevolution reasoning should also be considered a critical dimension of GTM, either as an enabler or constraint. There are nuances, however, in the extent to which government policy and the political climate affect corporate strategy. Our findings lead us to believe that the immediacy of the impact of the macro environment on day-to-day operating contexts as perceived by managers has the greatest impact on whether they will consciously adapt corporate activities. For example, visa bureaucracy was having a direct impact on overseas hiring, whereas offshoring was not so obviously tempered by government taxation policies, yet both could have a bottom-line impact on competitive advantage.

Importantly, investigating the interaction between managerial intentionality and environmental determinism has the greatest potential to expand future GTM theorizing. In a period of deglobalization, we have identified mechanisms that firms are adopting to assist in

sourcing highly valuable STEM talent and the various stakeholders involved. We have addressed the over-emphasis in the global mobility literature on the importance of expatriation to firms, balancing this with a focus on different solutions to talent demands. In particular, we have integrated the literature from high-skilled migration and offshoring, along with inhouse talent and local hires to develop a more holistic model of STEM talent sourcing. Moreover, the study has emphasized the need for both balance and flexibility across these different talent sourcing activities to address the needs and constraints simultaneously of the firm and the macro environment.

As we collected our data, much of the environmental uncertainty described here was still emergent; hence, future research might explore the strategies that firms were able to adopt to develop the appropriate level of flexibility to respond to the dynamic situation (Harsch & Festing, 2020). Moreover, although we find some evidence to support the notion of coevolution between managerial intentionality and environmental determinism, future research over several years would be better placed to observe this phenomenon. For example, the observed activities of firms increasing their partnerships with educational establishments to influence curricula will likely have a longer-term impact on national-level education policies, but this may take many years to be observed.

Overall, firms were designing talent sourcing approaches to meet the demands of macro-level constraints, and in some instances attempting to take action to change these constraints. Moreover, firms were going beyond balancing talent costs and skill utilization (Al Ariss, Cerdin, & Brewster, 2016), also focusing on the levels of risk involved in the different talent solutions and customizing this balance to fit different parts of the business. This was resulting in a granularized talent sourcing approach that both met corporate needs as well as considered

external constraints. This was achieved by involving multiple stakeholders involved in talent supply (including governments, firms, talent providers, and educational institutions) that could facilitate a synergistic integration of internal and external environments. Importantly, for this synergy to take place, trust and respect between the stakeholders was required. Future research might explore further how these trusting relationships between the different stakeholders emerge and can be exploited.

## IMPLICATIONS FOR PRACTICE

The increasing search for global talent "is likely to have a major impact on firm-level strategies and national policies, including education, innovation, and immigration" (Manning, Massini & Lewin, 2008: 41). Research suggests that while many firms adopt talent management practices, their approach has been more ad hoc than strategic (Collings, 2014). Our findings have substantial strategic implications for the development of a scalable and sustainable pipeline of high-tech STEM talent for home countries such as the USA, UK, and Australia. This topic lies at the heart of strategic economic priorities in Western countries to lift productivity and economic growth and maximize competitive advantages in the critical high-tech sector by delivering the right people with the right skills at the right time in the right place.

The study provides evidence on which firms can base the development of a GTM strategy, avoiding the adoption of ad-hoc practices to address talent shortages from a narrow, local perspective. The findings have demonstrated the intersection between managerial decision-making and macro environmental conditions associated with sourcing high-skilled migrants, offshoring, and local talent sourcing options. Gathering data from a range of key stakeholders has provided a rich understanding of the different perspectives of relevant players, including

talent hirers, providers, and industry associations. Overall, this allows for an evidence-based rather than purely intuitive discussion about dealing with STEM talent shortages. The study's findings have global implications and are relevant to many advanced countries facing similar STEM talent shortages.

## LIMITATIONS

Although the findings from this exploratory study are illuminating, there are of course limitations to the research. We focused specifically on the high-tech industry, which we argue is the most suitable setting in which to study how firms deal with high-skilled STEM talent shortages. The ICT industry is, for example, the most prolific user of both services-offshoring and high-skilled migration to meet workforce needs (AWPA, 2013). Future research might explore the extent to which the observations in this study apply to other industries suffering tight talent markets, such as the healthcare industry.

We also limited the study to exploring our research questions in the USA, UK, and Australia. While the USA and UK are global trendsetters in leveraging services offshoring and skilled migration, and Australian immigration policy and trends are mirroring those of the UK, these three countries are representative of many Western developed economies. While we acknowledge that there was no representation at the firm level of talent managers in the Australian sample, the intention of the study was exploratory rather than developing a fully representative sample. The data presented is also limited to the responses of 40 study participants, so wider and more varied respondent samples may be drawn in future studies.

Moreover, it is important to consider the specific country or industry context in terms of macro environmental factors when considering the generalizability of the ideas presented here.

Future studies might consider potential differences between countries, or between industries or individual firms. As an exploratory study, our intention here was to uncover commonalities in responses to macro-level deglobalization factors affecting all three countries included in the study. In contrast, a comparative study could gather representative data from a range of countries to unpick the differences that could occur at national, industry, or firm level.

## CONCLUSIONS

Firms have multiple options (including outsourcing, offshoring, hiring high-skilled migrants, developing inhouse talent, expatriation, and hiring locally) to source STEM talent. Overall, we observed that managerial decisions on which sources to use were based on a combination of cost-effectiveness, government policy constraints and enablers, and the need for expediency. The period of deglobalization is forcing firms to look more closely at local talent sources and sustaining a long-term local talent pipeline. The definition of 'local talent', however, shows the effects of prior globalization: local hires are anyone with the appropriate right to work in a given location and thus could range from migrant workers to international students to indigenous talent. It will be interesting to observe in the future how managerial talent sourcing decisions evolve in line with changes in government policy and the political climate, and whether greater synergies between the various stakeholders might be achieved.

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**FIGURE 1**

**Conceptual model**

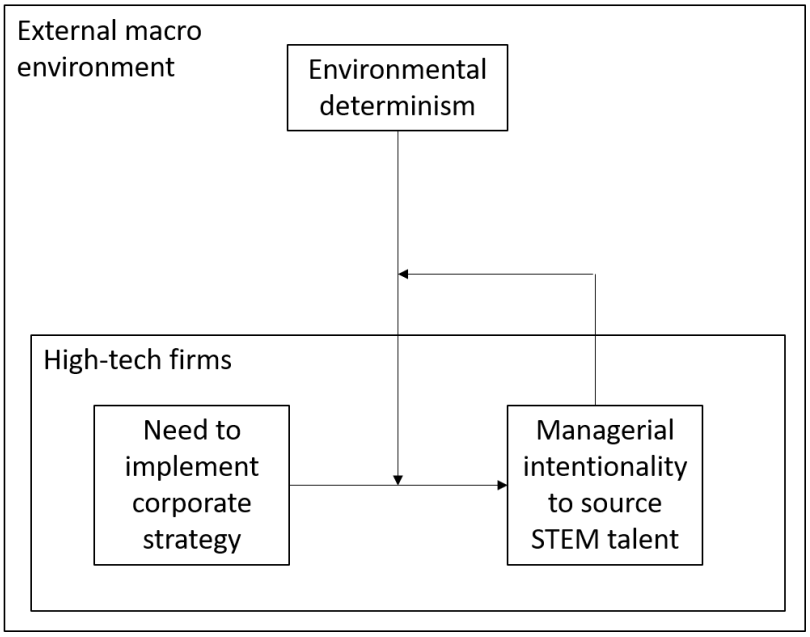

**TABLE 1**

**Interview and focus group participants by country**

| | **Australia** | **UK** | **USA** |
|---|---|---|---|
| *Practitioner: Talent manager* | - | 4 | 9 |
| *IT service provider/ consultancy* | 3 | 10 | 4 |
| *Industry association/ government policy expert* | 2 | 6 | 2 |
| **Total number of participants** | **5** | **20** | **15** |

**TABLE 2**

**Summarized interview findings**

| | **Managerial intentionality** | **Environmental determinism** | **Interdependencies/ coevolution** |
|---|---|---|---|
| ***Talent supply and demand*** | – Desire to source the best talent to achieve a competitive advantage constrained by talent availability | – Supply country talent choosing not to relocate overseas<br>– Skill sets in the labor market do not match firm demands | – Designing talent strategies to meet business model requirements considering external constraints<br>– Balancing talent strategies to manage risk, customized to different parts of the business<br>– Involving multiple stakeholders to create synergies between external and internal environments |
| ***Talent sourcing strategies:*** | | | |
| *High-skill migration* | – Desire to select the best talent irrespective of location<br>– Integration difficulties of foreign workers in workplace | – Tighter immigration regulations<br>– Cumbersome visa application processes<br>– Minimum salary thresholds<br>– Uncertainty causing talent to withdraw | – Flexibility in business strategies to adapt to sudden changes in government policy/ political climate<br>– Talent management strategies that can adapt to uncertainty |
| *Captive offshoring* | – A means to source necessary talent and keep knowledge in-house<br>– Allows market proximity<br>– Quality concerns in overseas locations<br>– Creating rising competition with local firms | – Costs rising in supply countries | |
| *Internal talent* | – Unsustainable costs of expatriation<br>– High cost and long duration of skill retraining | – Visa requirements for expatriation contributes to costs | |
| *Local hires* | – Supports cost-reduction strategies<br>– Avoids immigration bureaucracy<br>– Quality not always available | – Supply of international students with local training<br>– School curricula not in line with industry demands | – Partnerships between firms and schools/communities to build future talent pipeline with technical and business skills<br>– Requires mutual trust and respect |