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How diaspora knowledge networks make difference to post-Soviet scientists' migration, research and career

Antoshchuk, I.

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CONCLUSION

From Chernogolovka to the Nobel Prize

In a recent interview, Andre Geim, a famous physicist of Russian origin, stated that "back in Russia, in Chernogolovka, neither I nor people ten times smarter than me stood a chance of receiving the Nobel Prize."[117] His statement implies that his outstanding achievements became possible due to the superior material and technological conditions provided by "Western" universities. My dissertation challenges this argument by showing the extreme importance of diaspora knowledge networks (DKNs) to foreign-born scholars' scientific enquiries, academic careers, as well as their ability to migrate and successfully integrate abroad. A foreigner with little knowledge of and no experience in Western academia, Geim encountered various difficulties in the United Kingdom and Netherlands, his destination countries, ranging from social alienation to exhausted samples, from outdated facilities to a lack of collaborators. As a means to negotiate these difficulties, he started mobilizing his connections to his compatriots. Reaching out to his former colleagues in Russia and expanding the local presence of Russian-speaking scholars in his destination countries, Geim created a Diaspora Knowledge Network (DKN). This transnational network connected Russian-speaking scholars across destination and origin countries and developed into a distinctive social structure that produced a range of important social effects. The DKN was essential to Geim's and Novoselov's integration, advancement in their foreign academic careers and to their scientific success, enabling them to make an impressive breakthrough in their field. It also opened a route for migration of other Russian-speaking scholars and their subsequent careers abroad.

The story of Geim, Novoselov, and their fellow physicists is not unique. The migration and career trajectories of Russian-speaking computer scientists (RCS) in the United Kingdom followed a similar pattern and set of dynamics. The overwhelming majority of Russian-speaking scholars who migrated to the UK from former Soviet

117 Kristina Safonova, "If he is killed, hiding behind oprichniks won't help. Putin personally will bear the responsibility". What Nobel Laureate Andre Geim said why he ceased being Putin's proponent and began supporting Navalny" Medusa, April 19, 2021, https://meduza.io/feature/2021/04/19/esli-ego-ubyut-oprichnikami-ne-prikroeshsya-vse-otvetstvennost-budet-na-putine-lichno.

states in the 1990s–2010s faced multiple tensions as foreigners in their new locations and sought support from their co-nationals. RCS established connections to Russian-speaking scientists inside the UK, as well as in Europe and the US, and brought to the UK researchers from their home countries (mostly Russia, Ukraine, Belarus, and Kyrgyzstan). In sum, DKNs become a great source of assistance to Russian researchers, providing them benefits as migrants, scientists, and members of the academic community. They also were the loci of important ecologies of innovation and scientific knowledge production.

DKNs in Contemporary Academia: Key Findings

First, my study advances understandings of what a DKN is as a specific phenomenon and identifies its distinct features. It reveals that DKNs are neither associations, nor research collectives, but empirically accessible social networks which consist of actors (scientists) and ties among them that cross institutional and national borders. What particularly characterizes DKNs is that they are hybrids of migrant and scientific collaboration (professional) networks, in which the migrant and professional roles of members converge, according to which the norms and expectations tied to these roles intermingle, producing a range of new social effects. As migrant networks, DKNs connect scientists of common origin: newcomers with former migrants in destination countries and non-migrants in the home country. As collaboration networks, DKNs unite scholars who share research interests, pursue common scientific objectives, and are engaged in knowledge generation and exchange. My study suggests a new definition of DKN that underlines its hybrid character: A DKN consists of a set of migrant and non-migrant scientists,[118] of the same ethnicity, nationality, or common origin, connected by relations of collaboration and producing knowledge in their field (publications, patents, projects, etc.).

There are three principal actor positions in a DKN that structure the network and ensure its functionality: a pioneer migrant (a senior academic), a follower migrant (junior researcher), and a non-migrant member in the home country. Pioneer migrants play the major role in the formation of DKNs and shape their subsequent development, taking advantage of their established positions in foreign universities. They reach out to their non-migrant colleagues in home countries and make arrangements for and support the relocation of their former compatriots, the follower migrants. The latter are generally recent university graduates or early career

118 This definition may be extended to highly skilled migrant professionals, but here I discuss scientists in academia as they are the major focus of the study.

researchers. Pioneer and follower migrants are united by common interests: they are keen to realize their professional aspirations and advance in their careers, but encounter difficulties on their way as foreigners. DKNs thus substantially enhance their ability to achieve their goals. Finally, non-migrant scientists based in home countries, often senior scholars, play an important role as intermediaries by connecting pioneer migrants with potential follower migrants.

The ties that forming DKNs are simultaneously diasporic (among globally dispersed migrants of common ethnicity, nationality, or place of origin) and professional (among collaborating researchers). Thus, as stated above, DKNs combine features of both organizational and interpersonal networks. On the one hand, membership in a DKN is highly selective: common origin is not a sufficient (although it is important) criterion for inclusion. More decisive criteria are research interests and abilities, qualifications, and experience. Pioneer migrants tightly control the admission of young scholars into DKNs by setting requirements, evaluating candidates, and closely cooperating with their colleagues in home countries. On the other hand, despite their extremely selective nature and hierarchical structures, DKNs simultaneously display a high degree of informality and trust, which causes them to resemble interpersonal ties like friendships or kin relations. Informal communication, assistance in private matters, home visits, and common leisure activities are common. Relations of patronage between senior and junior scholars are widespread. In DKNs, we also find collaboration between spouses, such that wives organise family and private life in destination countries, while husbands support the wives' research endeavors and help them find employment in academia. This experience of diasporic ties as warm and cozy, quasi-familial or even familial, renders invisible the implicit expectations and taken-for-granted, mutually binding obligations inherent in DKNs, many of which go far beyond professional duties and formal academic roles.

Second, DKNs generate meaningful and important benefits for their members, substantially influencing their migration and career as well as positively impacting their scholarly activities. The hybrid character of the networks accounts for their impressive effects: compared to traditional ethnic networks, DKNs are more open and less subject to insularity; compared to professional networks, they are more informal, warm, and supportive. As a result, their capacities for enhancing adaptation and integration processes and for improving the career prospects for foreign-born scientists surpass those of both ethnic and professional networks. The varied and considerable

benefits of DKNs are largely responsible for their emergence and persistence, despite changing environments over time.

DKNs positively impact the migration trajectories of foreign-born scholars, from the pre-migration to post-migration stages and improve their overall mobility experiences and migration outcomes. Connecting scientists with their compatriots, DKNs provide access to otherwise unavailable or scarce resources—information, funding, connections, expertise, and administrative assistance, and also ensure psychological comfort and even help secure accommodation or provide logdings. For follower migrants, DKNs lower entry barriers, reduce the costs and risks of cross-border movement, and facilitate their adjustment to and integration into academic circles in the destination countries. DKNs help pioneer migrants to firmly establish themselves in the highest positions in leading British universities and firmly settle down in the UK, discouraging further moves between higher education institutions inside, as well as outside, the country. Though DKNs might have some detrimental effects on the follower migrants—reduced proficiency in the language of the destination country (English) and deep immersion in diasporic circles—these effects are gradually overcome after the initial period of adjustment. However, DKNs have ambiguous or even negative outcomes for female participants: compared to male counterparts, they receive fewer benefits as follower migrants in terms of relocation, adaptation, and integration into British academia and are almost completely deprived of the advantages pioneers enjoy (see the section on inequalities for more detail).

Then, DKNs have a positive impact on employment, professional realization and careers of foreign-born scientists. For follower migrants, DKNs provide a migration infrastructure that enables them to enter the intellectual labor market in their destination country, introduces them to the standards and requirements of British universities, and connects them to the mainstream academic community. As a result, follower migrants have improved chances of obtaining a job in academia or industry and receiving promotions, as well as of avoiding insecure employment. DKNs favorably affect the careers of pioneer migrants as well, connecting them to collaborators and junior staff who advance their scientific ideas. Assisted by DKNs, senior RCS were able to win substantial British and European research grants and produce high-quality publications, which contributed to enhancing their academic reputations and promotion prospects. In general, Russian scholars who collaborate with other colleagues from their diasporas tend to stay in British academia for longer periods of time and achieve higher positions, compared to those who are not involved in DKNs.

Finally, DKNs provide benefits to the scientific activities of foreign-born scholars. Bringing together people from the same origin, who share professional culture and easily achieve mutual understanding, DKNs circumvent the challenges of working in an increasingly culturally and ethnically diverse academic milieu. DKNs are deeply integrated into the various research activities of foreign-born scientists, including visits, conferences, grant proposal applications, and publications. Enabling productive collaborations, DKNs stimulate knowledge creation and increase migrant scholars' scientific productivity and output. In terms of academic work, DKNs merge destination-country and post-Soviet scientific norms and practices. On the one hand, DKNs (re)socialize follower migrants (junior researchers) to Britain's academic environment, imparting its norms and values. On the other, DKNs (re)construct of post-Soviet academic culture and the style and "spirit" of research, while cultivating (post)-Soviet scholar identities.

Third, my thesis reveals how DKNs emerge and develop. Although DKNs exist in various countries and contexts, they do not form automatically simply because migrant scientists share an ethnicity or nationality or speak the same language. My dissertation demonstrates that foreign-born scientists and professionals do not always and necessarily unite in DKNs. On the contrary, the formation of DKNs is a selective process, arising under specific conditions and driven by the intentions and conscious efforts of the scholars involved in their creation. This dissertation outlines the specific circumstances that stimulate the revitalization of the diasporic, national, ethnic identities that undergird DKNs, how those identities are mobilized for the purposes of forming DKNs and (re)produced during the processes that maintain and expand them.

My research revealed that structural disadvantages in destination countries, such as when foreign-born scholars encounter specific professional tensions because they are migrants, play a major role as the structural conditions that stimulate the formation of DKNs. The experiences of RCS in the UK demonstrate that, first and foremost, restrictive migration policies and immigration legislation, ranging from visa sponsorship rules to naturalization regulations, matter. They discriminate against foreign-born scholars in comparison to their native-born counterparts, creating additional barriers and reducing the opportunities for them to realize themselves professionally. Second, the volatility and intense competition in the British academic labor market negatively affect foreigners' chances of accessing and remaining in both

temporary and permanent positions. Third, British higher education and research regulations (and European regulations when they apply to UK-based scholars) play a role in the difficulties foreign-born scholars experience. Often, they formally restrict and complicate the employment of foreign professionals at universities, research centers, and in particular projects, due to their stipulations with regard to quotas, prescribed complex hiring procedures, and salary thresholds, among other restrictions. As a result, migrant scholars encounter systemic tensions when seeking to enter, adapt to, and integrate themselves into British scientific and higher education institutions.

In addition, certain structural conditions either accentuate or diminish the disadvantages of foreign-born scholars. These pertain to both the home and destination countries and include such characteristics as relations of cooperation, level of incorporation into global science, the country's ranking in the global academic hierarchy of states. In case of RCS, the long isolation of Soviet science up until 1991, Russia's limited incorporation into the European research arena after the fall of the USSR, and insufficient collaboration with the UK made it more difficult for scholars from post-Soviet states to enter and become incorporated into British academia. Subject to multiple discriminatory measures, Russian-speaking scientists were marginalized on the British academic labor market, in comparison to their British and European colleagues.

Mobilizing ties in the diaspora is one of the primary forms migrant agency takes under such conditions and it enables foreign-born scholars to overcome these difficulties. To initiate and sustain DKNs, RCS successfully navigate, link, and use structurally embedded resources, effectively exploiting their intermediary position between home and destination countries. They take advantage of education, research, and mobility opportunities in British higher education and science system and at the EU level (institutional resources) to seek out collaborators among their former compatriots, to organize their visits to the UK, or to find them regular positions. RCS also negotiate opportunities (positions, funding, and employment conditions) in the institutions where they work, including research-intensive, teaching-oriented universities or research centers (organizational resources). Then, they use their native knowledge of their home country's higher education and scientific institutions and reach out to their professional connections in their alma mater institutions and beyond.

Fourth, by demonstrating their internal dynamics and inherent inequalities, my dissertation explains the means by which DKNs endure and reproduce themselves. There are three main relationship patterns—mentorship, companionship, and spousal ties—that sustain DKNs' internal structures. These patterns arise at the intersection of professional and informal roles and the respective unequal statuses each set of roles entails. In a peculiar gender dynamics, based on the mobilization of masculinities and the cultivation of male bonding, male scholars appropriate more influential positions in networks (as mentors, companions, and husbands): they make decisions, build alliances, and recruit and dismiss members. Women also take part in DKNs, but they face various barriers to inclusion and the repertoire of their roles is more limited than men's. Female scholars are admitted to the networks preferably as proteges, as the spouses of male scientists, and sometimes as companions, but they are strongly excluded from authoritative mentor roles and have never been allowed to become the "founding mothers" of DKNs. Thus, DKNs are fundamentally not simply diaspora networks, but male-dominated diaspora networks: they are largely constituted by male-to-male ties and based on male bonding. In them, the roles and positions are gendered and the authority is masculine. As a result, DKNs substantially improve the migration experience and career chances of male scholars, while women bear greater costs and risks when migrating than men do. This contributes to the internal stratification of DKNs, according to intersecting inequalities along the lines of gender and academic positions. Similar to British universities and Western academia in general, within circles of Russian-speaking scientists, male scholars in senior positions become more central and influential than women, enjoying DKNs benefits to the greater extent. Thus, DKNs become deeply entrenched in and mirror existing power hierarchies in British academia and develop so that they are no longer recognized as migrant or ethnic social formations in the destination institutions. They successfully adapt to various institutional environments, becoming smoothly integrated into them, and reproducing themselves as part of the British and European academic communities.

DKNs in the Context of Scholarly Debates

My thesis makes important contributions to at least three fields of scholarly literature. These include: studies of DKNs, research on the internationalization of higher education and academic mobility, and scholarship on brain drain. Below, I discuss how the findings of my dissertation develop these research areas.

Rediscovering DKNs: Hybridity and Inequality

Previous studies have approached DKNs mostly as professional or collaboration networks, mediating knowledge flows and enabling the transfer of knowledge (Brown 2002; Meyer 2007; Meyer and Wattiaux 2006; Grossman 2010; Jin et al. 2007; Jonkers 2010; Kerr 2008; Breschi and Lissoni 2013; Agrawal et al. 2008). But the significance of transnational mobilities for the formation of DKNs has only been partially addressed (Saxenian 1999; Xiang 2006; Karaulova 2016). In my work, I find that the processes of migration and the disadvantages migrant scholars encounter are primarily responsible for DKNs' emergence and development, and are closely tied to their effects on scientific knowledge production. Therefore, we need to change the dominant approach to studying DKNs. They should be treated and explored as hybrids of migrant and professional networks, which acquire essentially new character and distinctive capacities by integrating essential traits from both of these configurations. When informal migrant relations and affinities based on a "shared community of origin" (Massey et al. 1993: 448) enter the domain of academia, they facilitate interactions between researchers who become engaged in knowledge generation and exchanges. My research reveals that migrant coping strategies and diasporic solidarities, as well as ethnic and national identities, become increasingly mobilized as resources for building and maintaining productive scientific collaborations. Bringing to the fore the hybridity of DKNs as knowledge-generation structures, my study advances scholarship on invisible colleges (Lievrouw 1989; Zuccala 2006; Wagner 2009) and scientific networks (Newman 2001; Glänzel and Schubert 2004; Velden and Lagoze 2013). It demonstrates that, under conditions of internationalization, it is not possible to understand scientific collectives, networks, and knowledge activities in which they are engaged without introducing analysis of migration structures and processes.

Existing research concentrates on macro-level effects of DKNs and their potential or real contribution to the national economies and technological development of both home and destination countries (Brown 2002; Barre et al. 2003; Meyer 2007; Grossman 2010; Minoian and Freinkman 2006; Tettey 2016; Cruz and Sabillon 2019). In contrast, I identify a range of meaningful micro-level effects that DKNs have on individual scholars, demonstrating their regular and systematic character. Previous research also prioritizes the knowledge effects of DKNs at the transnational (Kerr 2008; Breschi and Lissoni 2013; Breschi et al. 2015), national (Agrawal et al. 2008; Almeida et al. 2015; Schneider et al. 2019) and even the individual levels (Tanyildiz 2008; Ortiga et al. 2020). My thesis complicates this picture, demonstrating that DKNs profoundly affect migration trajectories and the overall mobility and integration experiences of foreign-born scholars. Moreover, it reveals that the effects of DKNs on the migration,

career trajectories, and scientific activities of migrant scholars are closely tied to and must be explicated in connection to one another.

Next, my study advances understandings of the internal organization of DKNs, disclosing the important role of internal power inequalities, particularly along gender lines, in the creation and continuing development of these networks. Existing studies of DKNs remain overwhelmingly nationality and ethnicity-centered (Meyer and Wattiaux 2006; Meyer 2007; Xiang 2006; Tettey 2016; Cruz and Sabillon 2019), mostly disregarding other dimensions of social inequality and potential for internal conflicts in the networks. A few studies provide evidence of gender discrepancies, but their results are not consistent—they either observe only minor differences between the opportunities available to and obligations of men and women (Shih 2006) or document various degrees of female exclusion (Xiang 2006; Zhang 2014). My in-depth study demonstrates that DKNs are profoundly gendered and hierarchically built networks and that such power inequalities are central to DKNs in several respects. First, networks are formed and sustained according to specific gender dynamics (please see Key Findings for more detail). Women also take part in DKNs, but they face various barriers to inclusion and the repertoire of their roles is more limited than men's. Second, DKNs' internal hierarchy accounts for the unequal distribution of the network's benefits (again, see Key Findings section). Third, internal inequalities are at the core of how the diasporic network is constituted. Departing from work that focuses on interactions between the diaspora and professionals (Meyer 2007), I include gender as a dimension in my analysis and show that, in DKNs, diasporic, professional, and masculine qualities partially merge and cannot be totally separated from each other. As a result, diasporic-professional identities are (re)produced through specific men's Russian language, masculine computer science culture, and informal practices, rooted in (post-)Soviet academic traditions. Diasporic interactions are marked as primarily men's space, where men recognize and appreciate each other as "the same" and build meaningful homosocial ties. In these interactions, a masculine image of the "talented Russian scientist" is constructed—the strong, clever scholar, who is a creative and original thinker and passionate about fundamental research—reviving the values of post-Soviet academic and engineering culture. Thus, diasporic solidarity proves to be closely intertwined with professional solidarity and serves as a means for reinforcing men's dominance in DKNs.

But is male dominance a universal feature of DKN? In the case of RCS, male domi-

nance is partially explained by a gender-disbalanced professional field, computer science and IT, which underwent masculinization in the 1960–1970s (Tatarchenko 2017; Ensmenger 2015). Since post-Soviet intellectual emigration consisted predominantly of male STEM professionals (Malakhov et al. 2020), I speculate that DKNs of Russian scientists in other research areas are also characterized by gender inequality. The gender composition of migration flows from the country of origin and the professions of the emigrants seem important in this respect. Other factors might include the gender dynamics of migration. For instance, in post-Soviet countries, male scholars were the first to move and establish themselves abroad. They became pioneer migrants and bridgeheads shaping the development of DKNs. In other national contexts and in other professional fields, women might become pioneer migrants who thus establish female networks with female-specific obligations and trust relations (George 2005; Ryan 2007).

DKNs in the Context of Internationalization and Academic Mobility

My study of DKNs reveals several important qualities of the internationalization of higher education and academic mobility, which are often overlooked or ignored.

First, my thesis contributes to the literature on the new hierarchies that arise among academics based on citizenship, national origin, and migrant status, which occurs as a consequence of internationalization of higher education (Johansson and Silwa 2013; Pustelnikovaite 2016; Tao 2020). My study challenges the widely held assumption that mobile scientists, especially those working in STEM, face few difficulties in moving between countries. On the contrary, internationalization gives rise to a range of entry and incorporation barriers for mobile academics that produce a hierarchy among migrant and non-migrant statuses. These new hierarchies cut across ethnic divisions, generating privileges for native-born academics and favoring expatriate scholars from the countries of Global North, while disadvantaging migrant scientists coming from the developing world. Thus, in the British context, there is marked inequality between British and European citizens and third-country nationals coming from outside of the EU who are placed in different legal status and do not have an English-speaking background, such as Russian-speaking scientists from post-Soviet states. This inequality is sustained through migration policies and immigration legislation, higher education regulations, science policies, and academic labor market regulations. It manifests itself in the disadvantages foreign-born scientists encounter in their movement in and adjustment to the UK. My thesis reveals the systemic character of these disadvantages and helps us better

understand their consequences, which are that they transform the collaboration patterns of migrant scholars, stimulating the mobilization of diasporic ties. In this respect, I conclude that DKNs represent a response to the unintended consequences of the internationalization of higher education. While DKNs partially mitigate these consequences, they are still deeply embedded in the hierarchies of higher education, making them tolerable and acceptable to migrant scientists.

Second, my thesis reveals that the disadvantages that emerge are largely determined by structural factors. This finding challenges culture-centered explanations of the inequalities internationalization of higher education generates, according to which the difficulties of foreign-born academics are viewed as "problems of cultural disconnectedness" (Pherali 2012: 330) or "cultural dislocation" (Saltmarsh and Swirski 2010: 295). Instead of attributing foreign-born scientists' adjustment problems to cultural differences (Alshammari 2013), my findings suggest exploring how particular cultures, as well as ethnic and national belongings, are mobilized in collective response to pressing structural constraints, what narratives of cultural difference arise, and what implications those narratives have. Thus, I seek to overcome the bias against scholars with non-European and non-English-speaking backgrounds, who are sometimes envisioned as culturally distant (Libaers and Wang 2012: 256), "inadequate" and different "others" (Song and McCarthy 2019; Dervon 2009). Rather, I suggest investigating narratives of cultural distance as a symptom of insider-outsider dynamics (Paulle and Kalir 2013) that justify the low status of migrant scholars (Amelina 2013), while privileging natives. In line with a growing body of research on migration that challenges the notion of "groupism" (Brubaker 2002; Paulle and Kalir 2013; Nowicka and Ryan 2015; Hof and Tseng 2020), my study encourages further inquiry into how broad, non-ethnic categories of division—such as migrant, foreign, alien, or outsider—are (re)produced and sustained in academic and professional settings.

Third, my study of DKNs demonstrates that internationalization, unexpectedly, stimulates the revival and actualization of ethnic and diasporic identities. Dominant visions of internationalization prioritize "cross-cultural engagement" (Gopal 2011: 379) and cultivation of a "globally oriented subjectivity" (Matthews and Sidhu 2005: 50). Mobile scientists are supposed to be globally minded individuals with "a new cosmopolitan spirit" (Kirpitchenko 2014: 6), who successfully embrace cultural diversity, facilitate intercultural dialogues, and work in multicultural teams (Tra-

har 2011). However, my research reveals that Russian-speaking scientists not only sustain cross-cultural collaborations, but also readily engage in developing new DKNs, working closely with their co-ethnics and co-nationals. Consequently, DKNs foster the (re)construction of a diasporic "sameness" largely rooted in post-Soviet academic culture. At the same time, DKNs do not lead to insularity, but rather assist RCS to become British academics and develop identities as international scholars. This implies that internationalization is a far more complex and multifaceted process than it is often imagined to be. Characterized by multiple "social and cultural disjunctures" (Britez and Peters 2010: 1), it cannot be reduced to increasing cosmopolitanization and the "smooth, unified presentation of multicultural success" (Guerin and Green 2016: 1). In line with other studies (Out 2018), I find that the internationalization of higher education invokes both ethnic and national affinities and cosmopolitan dispositions, producing a multiplicity of attachments and identities. These exist simultaneously, sometimes clashing, sometimes enriching each other. Therefore, DKNs should be examined as inherently part and parcel of internationalization and diasporic interactions in academic settings, disclosing their contradictions and shortcomings.

Fourth, my thesis improves understandings of the consequences of academic mobility for foreign-born scholars. Mobility is generally associated with various positive effects—extensive collaboration networks, enhanced scientific performance, and career development (Franzoni et al. 2014; Scellato et al. 2015; Ryazanova and McNamara 2019; Netz et al. 2020). Foreign-born scientists are found to surpass their native-born counterparts in research performance and productivity and the visibility and impact of their publications (Lee 2004; Libaers 2007; Webber 2012; Filippo, Casado, and Gomez, 2009; Stephan and Levin 2001). But my study suggests that such "superior performance" (Franzoni et al. 2014: 89) is not fully explained by "the mover's advantage" (Franzoni et al. 2012; Franzoni et al. 2014), which refers to the benefits of international experience and scholars' intermediary position between their home and destination communities (Franzoni et al. 2014; Larner 2015). Transnational movement does not directly yield advantages to mobile scholars, but only when DKNs function as a mediating factor. In line with Berzins' (2017), I find that diaspora networks make significant contributions to migrant scientists' research, compensating for "the difficulty of accessing domestic support" (xiii), as well as for other professional hardships. DKNs help migrant scholars realize themselves professionally in their destination countries. In this respect, the higher productivity and output of foreign-born scholars seems to result more from the foreign scholars' disadvantages than any inherent advantages they enjoy.

DKNs in the Context of Brain Drain and Global Knowledge Flows

Since the discovery of DKNs in the 1990s, studies of the networks have been closely tied to research on brain drain. Reconnecting expatriate scientists and professionals to their home countries, DKNs are supposed to create opportunities that compensate for the negative consequences of intellectual emigration. DKNs are thus expected to facilitate information exchange and knowledge transfer to home countries, contributing their economic and technological development (Brown 2002; Meyer 2007; Meyer and Wattiaux 2006; Grossman 2010; Meyer 2011). At the same time, DKNs are treated as a composite part of "global knowledge networks" (Niu 2013; Larner 2015; Scellato et al. 2015) and "an important mechanism" for international collaboration (Jin et al. 2007). As a result, DKNs are supposed to intensify "knowledge conduits" that are "global in scope" (Turpin et al. 2008: 263) and provide benefits to both home and destination countries, consequently resulting in brain gain.

My thesis challenges the brain gain argument and demonstrates that DKNs create minor benefits in terms of transfer of knowledge to home countries, while increasing the emigration of "the best and brightest." Instead of mitigating the inequalities between countries of origin and destination, DKNs may actually lead to their accentuation. On the one hand, DKNs seem to reinforce the exploitation of home countries as resources, particularly in terms of the resource of highly qualified people, making the "extraction" of human capital even more efficient than it would be otherwise. For instance, the case of RCS shows that DKNs intensify the migration flows of highly skilled professionals from post-Soviet countries, especially of fresh graduates and early-career researchers. DKNs have enabled the exodus of Russian-speaking researchers who would hardly be able to move to the UK on their own, due to a lack of cultural, social, and economic capital. On the other hand, DKNs provide advantages to destination countries. First, by attracting and aggregating highly qualified migrant workforces, they ensure a constant supply of much needed research staff. Then, DKNs facilitate the socialization and adaptation of newcomers to unfamiliar working environments, assisting their integration into foreign institutions and professional communities. By focusing on relations between particular destination and host countries, DKNs unintentionally discourage migration of foreign-born scholars to other destinations, in this case, keeping them in the UK and prolonging the period of their productive work there. In this way, DKNs generate considerable brain gains for destination countries. Instead of channeling new technologies back to the home countries and thus advancing the state of science in those locations, DKNs enhance scientific and technological development in the

destination countries, bringing qualified staff there and increasing their efficiency with regards to the sophistication and volume of their research, innovations, and publications. Though DKNs have some negative effects at the individual level, particularly for female researchers, they seem to have a greater number of detrimental consequences at the macro level, accentuating global discrepancies between home and destination countries.

At the same time, my study suggests that it is not inevitable that DKNs have these particular effects. Advancing research on the mechanisms and factors for and factors that contribute to knowledge transfer within DKNs (Tettey 2016; Naghavi and Strozzi 2017; Cruz and Sabillon 2019), I find that the directions and density of the knowledge flows matter, and that they largely depend on a network's composition and structure. When a majority of DKN members are densely localized in destination countries and ties to home countries are few and weak, knowledge flows toward the latter are insignificant and a DKN's positive impact on science and technology there is minor. National science and higher education policies seem to influence the destination and home countries' ability to take advantage of DKNs, but that is a question that requires separate study.

Another contribution my research makes to brain drain studies is its disclosure of the bottom-up character of DKNs. Previous research emphasizes the role of macro actors such as the state, government institutions, and intergovernmental organizations in developing DKNs (Chaparro et al. 2004; Séguin et al. 2006; Meyer 2007). In contrast, I find that DKNs emerge not as a result of state-led efforts to harness expatriate human capital, but instead arise from the deliberate actions and creative efforts of the scientists themselves. First and foremost, DKNs link expatriates with other expatriates in order to serve the needs of those expatriates and provide assistance in professional, as well as migration matters. Thus, an orientation towards "the common origin as a pivotal centre" (Meyer and Wattiaux 2006: 8) turns out not to be DKNs' primary characteristic. It is not the relation to the "hostlands," but rather activities, interactions, and interrelations among "segments of diaspora" (Butler 2001: 206–207) that constitute DKNs and define their character. In this respect, my study suggests a need to shift scale and focus in future DKNs studies—from macro- to meso-level structures, from states to networks, from large scale government projects to the dynamics of the collective initiatives started by diasporic academics, from national priorities to highly skilled migrants' needs and concerns.

Limitations of Research and Directions for Future Study

Although my thesis makes important contributions to the study of DKNs, it also has limitations connected to the aims of the study, the scope of its questions, and the specificity of the empirical case I researched.

First, the study is limited in terms of the generalizability of its findings to all foreign-born scientists and consequently in terms of its contribution to understanding internationalization as a whole through the prism of DKN. I focus on computer scientists who originate from countries of former Soviet Union and only one particular destination country, the UK. Because my research does not include scientists from other states who immigrated to other destinations, it cannot shed light on how a "hegemonic academic hierarchy of countries" (Bauder et al. 2018: 52) operates in general. However, in line with the argument that DKNs take root in the disadvantages migrants face, immigrant scientists from Global North and English-speaking countries, i.e., the privileged core in global science, do not rely on diasporic connections in professional matters (Scott 2004; Beaverstock 2002, 2005; Harvey 2009; Harvey and Beaverstock 2016; Samarsky 2020). Since scientists face various structural disadvantages that vary depending on their nationality, country of origin, and destination country, my results may be particularly relevant for explaining the experience of scholars from non-English-speaking developing countries or "third countries" who live and work in the core countries (see Wagner 2014; Tanyildiz 2015; Ortiga et al. 2020). Further research is required in order to understand the differences between migrants from periphery and semi-periphery countries and the question remains as to how far the results can be extended.

Second, my thesis does not systematically examine the role and position of DKNs in comparison to other migrant strategies. My analysis concentrates on diasporic ties and mostly excludes non-diasporic connections. Networking strategies may be divided into four types depending on whether migrants socialize with natives and/or other immigrants: assimilation, integration, separation, and marginalization (Epstein and Heizler 2016). Engagement in a DKN does not necessarily entail separation, although separation may be helpful for early career scholars during initial stages of their adaptation abroad. DKNs mostly constitute the strategy of integration, according to which post-Soviet scientists sustain both diasporic and non-diasporic connections and it yields benefits, especially for mature scholars in high-level academic positions. Further research is needed to understand how integration works. Key questions should include: how scholars perceive, navigate, and

combine diasporic and non-diasporic connections; whether diasporic and non-diasporic ties perform different roles and differently affect workplace integration and careers; and how DKNs are incorporated into other ethnically diverse professional networks, are affected by them, or shape them. In this respect future research that systematically compares the differentiation between diasporic and (various types of) non-diasporic connections in academic migration and mobility and diasporic vs. non-diasporic strategies would provide fruitful insights. A mixed methods research design, combining quantitative method of diaspora detection (Lepinay et al. 2014; Karaulova 2016) and quantitative enquiry seems promising in this respect. Moreover, it is not clear how DKNs compare to assimilation, according to which foreign-born scholars refuse altogether to socialize with co-nationals. How do they cope with adaptation and integration difficulties under these circumstances? How does immersion in non-diasporic connections affect their migration, careers, and research? It might be interesting to systematically explore, whether reliance on non-diasporic ties is less effective and costlier than involvement in DKNs as I found in case of RCS.

Third, my thesis has limited value in terms of diaspora engagement and brain drain policy-oriented research. It argues that to understand the effects of brain drain and brain gain effects, we need to know how DKNs are internally organized and sustained and how they are incorporated into destination and home country contexts. But I do not thoroughly explore the features and structural peculiarities of DKNs in comparative perspective to establish causal links with their generated effects by means of social network analysis or otherwise. Multiple questions that require further research arise: what properties would DKNs have to possess to benefit the development of scientific research in home country as much as in destination countries? How does the contextual embeddedness of DKNs influence the character, direction, and intensity of knowledge flows? What instruments are available to shape the development DKNs and their effects? Answering these questions could help in the development of effective diaspora engagement policies that enhance the gains and reduce losses for the countries of origin of foreign-born scholars.

DKNs disclose “the darker side” of internationalization and the transformative power of academic migrants’ agency, overturning the brain gain argument and revealing the productive vitality of diasporic affinities in scientific research. What future do DKNs have? Speaking about post-Soviet area, inequalities between origin and destination countries are not diminishing, but become stronger due to recent

war conflict in Ukraine, confrontations between powerful countries (US, European states, China, Russia) and mobility restrictions (Brexit, visa bans/ reductions for citizens of Russia). So DKNs are expected to grow and proliferate, and there is a promising and fruitful field for empirical comparative research with recent political events dramatically changing the landscape of diasporic interactions and affinities. The Russian Federation's invasion of Ukraine not only caused the influx of large numbers of highly skilled Ukrainians to European states, but induced a split among the Russian-speaking population and further disrupted the already-shattered post-Soviet commonality. Multiple initiatives supporting relocation of Ukrainian scientists have become visible in Europe and the US, including both institutional and informal ones, and those initiated by members of Ukrainian diaspora. Russian academics who disapprove of their home country's military operation and consequently emigrated do not receive the same level of support and tend to suffer from isolation, though they have already started building DKNs.[119] How do these newly displaced academics overcome the hardships they encounter abroad and what is the role of DKNs? Will Ukrainian scholars become engaged in DKNs, bearing in mind their peculiar circumstances and refugee status? Will they unite in exclusively Ukrainian networks or mix with Russian-speaking scientists of post-Soviet origin? How will previously existing Russian-speaking DKNs react towards new academic migrants, both Ukrainians and Russians who fled the country after the war began in February 2022? These questions open new interesting pages in the studies of DKNs.

119 For instance, Social Researchers Across Borders (https://srab.life/) was formed by Russian social scientists who moved to Georgia, Armenia, and other countries after 24 February 2022.