Engaging for the love of place? The role of place attachment in academics’ regional engagement efforts

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ABSTRACT
The third mission of universities is often conceived as a regional one, encompassing contributions to regional development and engagement with regional actors. Yet, universities are increasingly global institutions with internationally mobile faculty. This raises the question of how the embeddedness of academics in their regions shapes engagement at the regional scale. Using survey data of 625 faculty members at seven universities, we investigate the role of place attachment and informal social networks in shaping academics’ regional engagement efforts. The findings indicate that academics with a strong sense of local attachment and extensive social networks engage more with local partners.

KEYWORDS
place attachment; informal social networks; academic engagement; native and non-native academics; regional engagement

INTRODUCTION
The relationship between universities and their host regions has historically at times been tense. The metaphors of town and gown and the ivory tower reflect that universities have often sought to create distance from the places in which they are located (Addie et al., 2015) to maintain independence from local control and to create a sanctuary for scholars free from worldly pursuits. However, with innovation and knowledge now considered the main drivers of regional development, policymakers increasingly see universities as engines of growth for their regions (Goddard & Vallance, 2011; Trippl & Maier, 2011) and expect universities to take on a third mission of innovation and knowledge exchange. This is often understood as a regional mission of universities (Pinheiro et al., 2016; Sánchez-Barrioluengo & Bennworth, 2019). Universities contribute to regional development in various ways, including through teaching and research. However, regions and universities try to enhance knowledge spillovers by encouraging academics to interact and exchange knowledge with public and private actors in the region (Looy et al., 2003). While universities’ external engagement occurs at multiple geographical scales (Ponds et al., 2009), it is frequently oriented towards the local community. Collaboration with stakeholders such as firms often takes place at the local scale (Fitjar & Gjelsvik, 2018; Trippl, 2013). Significant policy efforts have been geared toward promoting academics’ engagement in their regions (Charles, 2003; Chatterton & Goddard, 2000).

However, universities remain inherently global institutions that are part of international scientific communities, and which aim to develop knowledge new to the world. Zencey (1996, p. 15) described professors as ‘citizens of the cosmopolis, … expected to owe no allegiance to geographical territory’. Research is increasingly conducted through international collaboration (Henriksen, 2016; Wagner & Leydesdorff, 2005), and universities attract growing numbers of international faculty and students (Adnett, 2010; Altbach & Yudkevich, 2017). This raises the question of to what extent universities can balance increasing internationalization and increasing expectations for regional engagement. To assess whether these developments are in conflict, we need to know how important the local rootedness of faculty is for regional engagement. However, prior research has paid little attention to how academics’ attitudes and dispositions, and their social
relations in the region, shape regional engagement. Which factors lead academics to engage with regional partners despite the inherent tension between the performance of this role and other core duties? While research has examined how the regional and university contexts shape regional engagement (Bagchi-Sen & Smith, 2012; Looy et al., 2003; Qiantao et al., 2016; Sánchez-Barrioluengo & Consoli, 2016), the embeddedness of the individual academic in the region also matters. For instance, individuals’ place attachment—which denotes the emotional ties people form with specific places—affects a wide range of place-related behaviours (Lewicka, 2011; Low & Altman, 1992; Stedman, 2002). It stands to reason that academics’ engagement may also be shaped by their affective dispositions. However, previous research has not studied how the emotional bonds academics form with the regions in which they live and work stimulare or dampen their local engagement efforts. Examining this relationship empirically could provide valuable input to regional engagement policies.

Similarly, academics’ professional and social networks tend to shape their engagement decisions. For example, academics may engage more if they interact with colleagues who are engaged (Aschhoff & Grimpe, 2014; Tartari et al., 2014). Similarly, informal network links with industry partners help academics to engage in industrial collaborations (Östergaard, 2009; Ponomarov & Boardman, 2008). Thus, embeddedness in social networks can unlock collaboration opportunities. However, not all academics are equally well placed to benefit from social ties in their locale. For instance, foreign-born academics tend to have less extensive regional networks, which hampers their ability to engage in local collaboration (Lawson et al., 2019; Libaers, 2014). Hence, social networks can facilitate as well as hinder academic engagement. However, little attention has been paid to the role of social networks for local engagement, or to how their relationship to engagement behaviour differs between native and non-native academics.

Building on place attachment and social network literatures, this paper bridges these gaps by exploring whether academics’ place attachment and their informal social networks are related to engagement with local actors. Furthermore, we compare non-native and native academics in order to examine whether embeddedness works through different processes for those who migrate to a region than for those who were born there.

The paper uses data from a cross-sectional survey of 625 academics from seven universities affiliated with the European Consortium of Innovative Universities (ECIU). The findings demonstrate the relevance of place attachment and informal social networks in the regional engagement of academics. Furthermore, the effect of place attachment is consistent across the two groups, albeit with a weaker effect for non-native academics. However, the informal social networks of native academics are strongly related to regional engagement, whereas they are insignificant for non-natives to the region.

LOCAL ROOTEDNESS AND ACADEMIC ENGAGEMENT

The rationale for academics’ local engagement
Universities are increasingly broadening their external interaction to be relevant and responsive to the needs of societal stakeholders. Academic engagement, which used to be an informal activity performed by few academics, is now recognized by most universities as an integral role (Pinheiro et al., 2012). Academic engagement is understood as academic scientists’ knowledge exchange collaboration with non-academic partners or organizations (Perkmann et al., 2013). Whereas much attention has been on interaction with industry, academics equally engage with public and third sector organizations (Hughes et al., 2016; Olmos-PEúuela et al., 2014). Collaboration with external actors occurs through a variety of channels, including formal knowledge-exchange activities such as patenting, consultancy and contract research, and informal activities such as advisory roles, training of personnel and student supervision (Cohen et al., 2002; D’Este & Patel, 2007; Grimpe & Hussinger, 2013; Perkmann et al., 2013).

Many studies have examined the geographical contexts in which academics’ collaboration takes place (Fromhold-Eisebith & Werker, 2013). Engagement activities happen at varied geographical (i.e., local, national and international) scales (Lawson et al., 2019; Ponds et al., 2009). However, as with other types of collaboration, academic engagement tends to happen more frequently between co-located actors (Fitjar & Gjelsvik, 2018; Ponds et al., 2007; Tripli, 2013). Local collaboration brings well-known benefits from geographical proximity. Coordination of cooperation relationships requires considerable time and effort, which grow when the parties are far apart. Collaborating with geographically close actors helps minimize coordination costs (Cummings & Kiesler, 2007). In fact, geographical proximity may be even more important for collaboration between academics and non-academic partners, since the institutional, cognitive and social distances are often larger (Alpaydın & Fitjar, 2021). Local collaboration can also reduce opportunistic behaviour. Academic engagement may involve the exchange of proprietary knowledge, and partners need to be trustworthy. Given the difficulty in assessing the trustworthiness of unknown distant actors, academics may be more inclined to interact with local partners whose credibility can be evaluated through existing networks (Ponds et al., 2007).

Academics may also collaborate locally simply because they want to make a difference in their region (Kroll et al., 2016). Many academics are committed to ensuring the economic and social impacts of their work. Considering the importance of knowledge exploitation to economic development, they may be inclined to collaborate with partners who will use their research and with whom they can interact closely in its implementation (Sanchez-Barrioluengo & Benneworth, 2019). Collaborative activities such as joint research, student placements and employee training equip beneficiaries with skills and knowledge.
that enable successful collaboration also in the future (Bishop et al., 2011; Salter & Martin, 2001).

Finally, access to resources such as equipment, facilities, grants and networking opportunities are also rationales for local engagement. Decreasing internal funding for research has compelled academics to act strategically in securing additional resources (Slaughter & Leslie, 2001). Whereas they can search for these resources from varied geographical sources, the characteristics of the local context play a role in the search decision. Funding by regional actors or for regional development purposes may attract academics to regional collaborations. Academic philanthropy often also takes place at the local scale (Glückler & Ries, 2012).

**Place attachment and regional engagement**

There is evidence that people attached to a place are more willing to engage in activities aimed at benefiting that place (Halpenny, 2010; Scannell & Gifford, 2010). Individuals develop affinities through experiences from their relationships with a place. In situations where action is required to protect or improve a place, people draw on place representations stored in memory or by constructing a sense of place on the spot, from contextual cues to guide behavioural response (Bugden & Stedman, 2019). Such representations may involve both physical and symbolic (e.g., cultural, institutional) aspects that make up the identity of a place (Paasi, 2001). Place attachment is related both to the place itself and to the imagined community which it represents and with which an individual may identify to a greater or lesser extent (Fitjar, 2010).

Extending this perspective, we expect academics with stronger place attachment to be more inclined to collaborate with regional actors. A strong regional consciousness or sense of belonging to the region can make academics more motivated to contribute to the development of the region. For example, an academic with a high sense of attachment may be more willing to share knowledge or expertise with local firms or agencies even if they receive no material or financial benefits in return. From studies of firms, we know that the desire to contribute to the region can be an important motivation for university–industry collaboration even when there is no immediate benefit for the firm (Fitjar & Gjelsvik, 2018). Such motivations may also be at work for academics with strong place attachment. Place attachment may also be conducive to trust in other members of the imagined community. Since mistrust or the suspicion that partners would behave opportunistically can impede knowledge exchange interactions (Bruneel et al., 2010), these attitudes can ease suspicions about other peoples’ motives, thereby increasing their willingness to forge collaborative relationships with regional actors (Mesch & Manor, 1998). Accordingly, we hypothesize the following:

**Hypothesis 1:** Strong place attachment will increase the level of regional engagement of academics.

**Informal social networks and regional engagement**

On top of the desire to interact, engagement also depends on opportunities to do so. To collaborate with external actors, networks and contacts with potential partners are necessary. Besides formal social networks developed, for example, in joint projects, academics can also develop relationships through socializing with family, friends, colleagues or members of recreational or voluntary organizations (Granovetter, 1985). Such interactions predominantly take place at the local scale. These amorphous and loose relationships forged in a societal context may also be important in that they are endowed with relevant relational resources that foster external engagement (Al-Tabbaa & Ankrah, 2019). In short, they represent the social capital which enables local engagement.

Informal social networks influence academics’ engagement efforts through various mechanisms, providing academics with network resources (Nahapiet & Ghoshal, 1998). By engaging in frequent casual interactions and leisure activities, academics learn to trust other people and gain the trust of others. More so, obligation norms are cultivated whereby individuals feel obliged to reciprocate favours they receive (Thune, 2007). In addition, informal networks provide opportunities for collaboration (Kalar & Antoncic, 2016). Academics can acquire information for external cooperation through interactions with friends or acquaintances, reducing their search costs (Al-Tabbaa & Ankrah, 2019; Broekel & Binder, 2007). Moreover, since actors in informal networks often come from diverse professional backgrounds, they have the potential to link actors across sectors (Ponomariov & Boardman, 2008). Finally, interactions in social contexts or through voluntary work could bring awareness of the problems and needs of a region, leading to place-based research and collaborations with other researchers and local stakeholders to address these challenges (Bodorkós & Pataki, 2009).

In summary, informal social networks of academics provide diverse organizational contacts and connections to potential partners. These network resources facilitate their engagement with regional actors. Thus, we propose the following:

**Hypothesis 2a:** Informal social networks will increase the level of regional engagement of academics.

While informal social networks may be related to engagement behaviours of academics, this effect may be more pronounced for natives to the region than non-natives because of the possible differences in the composition of their networks. Native academics will have experience from participating in various local social arenas through their life. This may facilitate their interaction with diverse groups of people. This crosscutting interaction allows them to develop expansive networks, accumulate rich socio-cultural capital and access novel knowledge (Behtoui, 2007; Burt, 2005). Drawing on this wealth of
resources enables natives to identify collaboration partners and effectively utilize local opportunities. Although non-native academics carry their networks to new places, they also need to develop new connections in the local environment if they want to engage with local actors. This means that they often must build their local networks from scratch (Trippl, 2013). Building meaningful networks takes considerable time and is quite difficult to achieve (Plöger & Kubiak, 2019). Considering that the workplace provides the most frequent opportunities for socializing, non-native academics may—at least initially—build narrower networks, with a higher share of other academics. To compensate for their lower embeddedness in local networks, non-natives may build social networks more strategically than natives, who often have social networks that predate their academic careers. This may result in social networks for non-natives that are more tailored for their academic careers (Heffernan, 2021). However, this may in many cases also imply networks with other academics, since third mission activities are often less important for career development. Since informal social networks serve as a bridge to formal engagement with external partners (Fitjar & Gjelsvik, 2018; Ponomariov & Boardman, 2008), these narrower networks can limit local engagement opportunities for non-natives. Thus:

**Hypothesis 2b:** The relationship between informal social networks and regional engagement efforts will be stronger for native academics than non-native academics.

**METHOD**

**Data**

This study employs data from a survey conducted in autumn 2019 to investigate the attitudes and experiences of academics regarding engagement with non-academic actors. The survey forms part of a large-scale research project on the Role of Universities in Innovation and Regional Development (RUNIN). The study population is drawn from institutions affiliated with the ECIU, a university association. This network was selected because of the regional engagement mission of member institutions and accessibility to academics for data collection. The ECIU was established in 1997 as a network of research intensive and entrepreneurial universities committed to promoting innovation and entrepreneurship and solving societal challenges in their regions. This vision is reflected in the close relations between these universities and societal actors. Presently, the consortium has 13 members and one affiliated partner. All are generalist universities with cross-cutting disciplines. The choice of selecting universities in this network is based mainly on a practical reason of getting access to academics for data collection. Due to General Data Protection Regulation (GDPR), university managers are often unwilling to provide proprietary information (e.g., the email addresses of employees) to external researchers. Thus, we had to rely on our networks in the ECIU to secure access to academics.

We relied on the ECIU leadership to invite all members of the consortium to participate in the study, of which seven agreed: the universities of Aalborg, Stavanger, Trento and Twente, the Autonomous University of Barcelona, Dublin City University, and Kaunas University of Technology. The target population was all academics, from research fellows to full professors, in teaching and/or research positions in all scientific disciplines. We contracted a private survey company (Opinion AS) to conduct the data collection. Before the survey was administered, a press release was issued on the intranet of the respective universities to sensitize respondents about the impending exercise. After this, the survey was distributed via email from local university contact persons, using university mailing lists. Employing these methods, the questionnaire was distributed to 7330 academics. In total, we collected 635 usable responses, yielding an overall response rate of 8.7%. After removing responses by ineligible respondents (e.g., doctoral candidates), a final sample of 625 remained for analysis. Table 1 reports the characteristics and geographical locations of the universities.

The high dropout rate implies a risk of non-response bias in the sample. To check for this, we conduct a series of non-response analyses. First, we compare early and late respondents in terms of regional engagement, place attachment, informal social networks, length of residence and control variables (Armstrong & Overton, 1977). We find no significant differences between early and late respondents on any of these dimensions. Second, we compare the sample with the whole population of academics at the selected universities on background variables: institution, disciplinary field, gender, nationality and academic rank (see Table A1 in Appendix A in the supplemental data online). There are significant differences between the sample and population distribution in some of these dimensions: with respect to gender, female academics are overrepresented. Full professors are also highly overrepresented. There is also a smaller, but significant, overrepresentation of social sciences and humanities (SSH) fields. For nationality, there is no significant difference between the sample and the population. The response rate also differs across institutions. We assess whether non-response bias in these dimensions affect the results by constructing post-stratification weights to correct for differences between the sample and the population in these dimensions in a robustness test. Compared with the main unweighted estimates, the weighted results are robust, albeit with some minor differences, which do not qualitatively alter the main results (see Table A5 online).

**Variables**

**Dependent variable**

Respondents were asked to indicate whether they had engaged in any of nine types of interaction with external actors over the past three years, and if the interactions took place within the region, within the country or internationally (for the list of activities and their distribution, see Table 2). We employ the responses from the interaction activities within the region in the main analysis.
Furthermore, we test for the specificity of these results by also estimating the model for engagement at the national and international scales.

The dependent variable, regional engagement index, follows the approach of Bozeman and Gaughan (2007). We weight each engagement activity by the inverse of its percentage, such that less common or less frequently performed activities carry stronger weight than those more common or more frequently performed. For instance, 39% of respondents report giving informal advice or invited lectures, hence we assign a weight of 61. Meanwhile, only 3% engage in commercialization with regional partner(s). Accordingly, that activity receives a weight of 97. We sum the weights of all nine types of engagement activities in which the respondents engage with regional partners. The variable ranges from 0 if a respondent does not engage in any activity to 7.29 if all activities are performed (for full list of items, see Table 2; for summary statistics, see Table A2 in Appendix A in the supplemental data online). This measure has a Cronbach’s alpha of 0.74, indicating a high reliability of the measure.

### Explanatory variables
The place attachment measure assesses a respondent’s attachment to the region in which the university is located. It is measured with five items adapted from the Place Attachment Scale (Lewicka, 2008): 'I miss this region when I am not here'; 'I have little influence on the affairs of this region'; 'I am rooted in this region'; 'I want to be involved in what is going on in this region'; and ‘I would like to move away from this region’ (for summary statistics, see Table A2 in Appendix A in the supplemental data online). Respondents rate each item on a five-point scale ranging from 'strongly disagree' to 'strongly agree’. We reverse-code the negatively worded items and replace ‘don’t knows’ or missing responses with the mean score of each item. Finally, we sum the mean scores to generate a measure for place attachment (Cronbach’s alpha = 0.72).

The informal social networks measure captures the breadth as well as the density of the networks of respondents. This measure is constructed from three questions that asked respondents to indicate the amount of time they spend per month interacting socially with friends, with colleagues from their work or profession, and with people at leisure clubs or voluntary organizations. For each item, the responses were scored on a five-point scale from ‘not at all’ to ‘several times a week’. The measure was generated by mean scoring the three items (Cronbach’s alpha = 0.65).

### Control variables
We control for several factors that may influence regional engagement. First, we include gender (a dummy variable coded 1 for female, and 0 for male), age (a categorical variable coded into three groups: < 40, 40–49 and ≥ 50 years), and employment years to control for the demographic characteristics of respondents. Employment years measures the number of years a respondent has worked at their current university. This variable is highly skewed, so we log-transform it. Second, we control for professional experience outside academia (a dummy taking the value 1 if a respondent has worked in other sectors before joining academia, and 0 otherwise). Third, we include the research orientation of respondents, based on a self-reported classification distinguishing between basic research, user-inspired research, applied research and other. Finally, we include seven dummies to account for variations in external engagement across the universities (and, by extension, the regions in which they are located). Table A3 in Appendix A in the supplemental data online presents the pair-wise correlations between all the variables in the regression model. The correlation coefficients between the explanatory and control variables are mostly low. The variance inflation factors (VIFs) range from 1.10 to 2.05, with a mean of 1.51, indicating that multi-collinearity is not a problem in the analysis.

### Estimation and model specification
We estimate the model with ordinary least squares (OLS) regression using robust standard errors to address possible heteroskedasticity problems. The model specification takes the following form:

\[
\text{Regional engagement}_i = \alpha + \beta_1 \text{Place attachment}_i + \beta_2 \text{Informal social networks}_i + \beta_3 \text{Controls}_i + \epsilon_i
\]  
(1)
where *Regional engagement* refers to the dependent variable delineated above; *Place attachment* and *Informal social networks* represent the explanatory variables of interest; *Controls* is a vector of socio-demographic, research focus, and university specific control variables; and \( e_i \) is the error term.

**EMPIRICAL FINDINGS**

**Descriptive results**

Table 2 reports the distribution of engagement activities across varied geographical scales between 2016 and 2019. Giving informal advice and participating in joint research projects are the most widely used activities for engagement. Around one-third of academics collaborate with external actors through student internships and projects, joint supervision of students, contract research and consultancy services. Commercialization activity is the least used channel.

When disaggregated by scale, levels of engagement tend to be higher at the national than at the regional and international scales. For instance, 44% of academics report giving informal advice to external actors at the national scale. This figure is 5 percentage points higher than at the regional scale. Also, more academics engage in contract-based interactions at the national scale compared with the regional scale. However, student-related engagement mostly occurs at the regional scale. At the regional scale, 24% and 19% of academics interact through student internships and projects, and joint supervision of students, respectively. By contrast, interactions through these activities at the national scale are about 4 percentage points lower.

With respect to differences between native and non-native academics (Table 3), the former engage in relatively more activities than the latter at the regional scale. On average, natives to the region engage in 1.9 types of activities in the region compared with 1.5 types for non-natives. This difference is statistically significant (\( t(623) = -2.54, p < 0.05 \)). At the national and international scales there are no significant differences between natives and non-natives in the level of engagement: Natives engage in an average of 1.8 types of activities at the national scale and 1.1 types of activities at the international scale, while non-natives engage in an average of 2.0 and 1.2 types of activities at these respective scales. Natives also report higher place attachment (3.7) than non-natives (3.0). This difference is also significant (\( t(623) = -10.1, p < 0.001 \)). Finally, both groups report engaging in social interactions with

**Table 2.** Share of academics who participate in different engagement activities overall and at each geographical scale (%) (\( n = 625 \)).

| Activities                                | Engagement          |
|-------------------------------------------|---------------------|
|                                           | Overall | Regional | National | International |
| Informal advice                           | 62%     | 39%      | 44%      | 24%           |
| Joint research                            | 59%     | 33%      | 37%      | 29%           |
| Student placements and projects           | 36%     | 24%      | 20%      | 13%           |
| Contract research                         | 32%     | 15%      | 20%      | 11%           |
| Joint supervision of students             | 30%     | 19%      | 16%      | 9%            |
| Consultancy services                      | 28%     | 14%      | 18%      | 9%            |
| Training of employees of external organizations | 27%     | 15%      | 23%      | 8%            |
| Membership of advisory boards             | 25%     | 8%       | 14%      | 11%           |
| Commercialization of research results     | 6%      | 3%       | 4%       | 2%            |

**Table 3.** Difference between native academics and non-native academics on key variables.

| Key variables                  | Non-native | Native       | Mean | t-value | p-value |
|-------------------------------|------------|--------------|------|---------|---------|
| Regional engagement           | 361        | 264          | 1.54 | -2.54   | 0.011   |
| National engagement           | 361        | 264          | 2.00 | 1.53    | 0.130   |
| International engagement      | 361        | 264          | 1.23 | 0.97    | 0.335   |
| Place attachment              | 341        | 254          | 3.03 | -10.09  | 0.001   |
| Informal social networks      | 361        | 264          | 3.02 | -1.70   | 0.088   |

Note: Standard errors are shown in parentheses.
activities. Informal social networks are also positively
Hypothesis 1. As predicted, a strong sense of attachment
difference in the coefficients is not statistically significant
(χ²(1) = 2.33, p = 0.13). This result is consistent with
studies in other contexts (e.g., Wu et al., 2019). While
there are differences between natives and non-natives in
the levels of place attachment, the importance of place
attachment for regional engagement is similar for both
groups.

For informal social networks, we find no significant
association for non-natives, but a significant positive cor-
relation for natives. The difference in the coefficients
between the two groups is statistically significant
(χ²(1) = 5.60, p < 0.05). Thus, Hypothesis 2b is sup-
ported. Informal social networks tend to be more relevant
for natives’ local engagement than for non-natives. This
result chimes with findings from Plöger and Kubiak’s
(2019) study of high-skilled mobile professionals. Regard-
ning controls, we find a positive and strong correlation
between employment years and the regional engagement
of non-natives, but an insignificant association for natives.
This finding is similar to Lawson et al. (2019) who show
that foreign-born academics tend to engage more locally
the longer they stay in the UK. The analysis here shows
that this also holds at the regional scale.

Robustness checks and subsample analyses
To check the robustness of the results, we estimate various
alternative specifications of the model. Of particular con-
cern is whether endogeneity might be an issue, for
instance, because more engaged academics can develop
stronger place attachment. To account for this, we esti-
mate the model using an instrumental variables (IV)
regression. As is typically the case with survey data, there
are no truly exogenous instruments available for the analy-
is. The best option available is residence length, which we
use to instrument for place attachment, considering that
length of residence will be important for forming attach-
ment to a place. While length of residence can certainly
affect regional engagement through other mechanisms
than place attachment (and informal networks, which we
control for), it offers at least some additional insight on
whether endogeneity might be driving the results. The
F-test (F = 49.7) confirms that residence length is a
strong instrument. The results of the two-stage least
squares (2SLS) estimator are not qualitatively different
from those of the OLS estimator (see Table A6 in Appen-
dix A in the supplemental data online). Additionally, the
Durbin–Wu–Hausman test of endogeneity is non-signi-
ficant (robust score χ² = 0.93, p = 0.33; robust regression
F = 0.94, p = 0.33). This suggests that place attachment
is exogenous, confirming the robustness of the main
results.

We conduct several subsample analyses to explore vari-
ations across different groups (see Table A7 in Appendix
A in the supplemental data online). The coefficient for
place attachment is significant across all academic ranks,
with no significant differences across the groups. How-
ever, informal social networks are significant only for full
professors. Furthermore, since professors control more
resources and engage more than their peers, their inclusion
might be driving the results. So, in a further analysis we
restrict the analysis to only assistant and associate pro-
fessors. This does not alter the main results, with the
exception that the coefficient of informal social networks
is now significant at the 90% level. We also differentiate
between SSH and science, technology, engineering and
mathematics (STEM) disciplines. Again, place

Regression results
Table 4 reports the regression results both for the full
sample and separately for natives and non-natives to the
region. We adopt three steps in the estimation of the regression model. First, we estimate a baseline model
(model 1) with only the control variables. Next, the
main model (model 2) introduces the key explanatory vari-
ables. Finally, we run separate regressions for non-native
(model 3) and native academics (model 4) to compare the
drivers of regional engagement across the two groups.

Starting with the controls (model 1), we find a positive
and strong relationship between employment years and
regional engagement. This suggests that academics who
have worked for longer periods in their universities tend
to engage more regionally. Female academics are less likely
to engage with regional actors compared with their male
counterparts, in line with the previous literature on
engagement in general (Tartari & Salter, 2015). Furthermore,
academics between 40 and 49 years of age tend to be
more regionally engaged than those aged 50 and above.
Professional experience outside academia is positive and
strongly significant, indicating that academics with experi-
ence from other sectors tend to engage more, again in line
with the previous literature (Gulbrandsen & Thune,
2017). Finally, those conducting user-inspired and applied
research are more regionally engaged than academics who
undertake basic research.

Model 2 introduces the main independent variables.
Place attachment is positive and highly correlated with
regional engagement (b = 0.30, p < 0.01), confirming
Hypothesis 1. As predicted, a strong sense of attachment
to the region is associated with more regional engagement
activities. Informal social networks are also positively
associated with regional engagement (b = 0.17, p < 0.01),
supporting Hypothesis 2a. Academics who have frequent
social interactions tend to engage more in knowledge
transfer interactions with local actors. Overall, the results
show the importance of academics’ attachment to place
and embeddedness in social networks for their regional
engagement. However, place attachment has a stronger
effect than informal social networks.

Comparing native and non-native academics (models 3
and 4), we find a significant positive relationship between
place attachment and regional engagement for both
groups. Non-natives’ place attachment shows a slightly
weaker association with regional engagement, but the
difference in the coefficients is not statistically significant
(χ²(1) = 2.33, p = 0.13). This result is consistent with
studies in other contexts (e.g., Wu et al., 2019). While

friends, work colleagues and members of recreation organ-
izations an average of two to three times per month. Com-
paring the two groups reveals no significant difference
between them at the 95% level (r(623) = −1.70, p = 0.08).
attachment is positive and significant across both fields. Informal social networks are positive and significant in SSH, but not in STEM disciplines.

We conduct several additional robustness tests (see Table A8 in Appendix A in the supplemental data online). Due to space constraints, we do not discuss the results in detail. One analysis excludes the most highly engaged academics (those in the top 20% or top 10% of the regional engagement index distribution). Another analysis limits the sample to those that have spent 10 years or fewer at their current university. Finally, we use the count form of the dependent variable and estimate the model with Poisson and ordered logit regression methods. In all these analyses, the results are consistent with those of the main analysis, except that informal social networks are not significant when excluding the most engaged academics.

Finally, to check the specificity of these findings to regional engagement, rather than engagement in general, we also examine how the model performs in predicting national and international engagement (see Table A9 in Appendix A in the supplemental data online). The idea behind this is to assess whether there are any underlying confounding variables that affect both engagement in general and the independent variables in the study. According to the theory outlined above, the effects of place attachment and informal social networks should be specific to regional engagement and will not influence engagement.

Table 4. Regression analyses of academics’ regional engagement efforts.

| Baseline model | Full model | Regional engagement by place of birth |
|---------------|------------|--------------------------------------|
| (1)           | (2)        | (3) Non-native academics              |
| (4) Native academics |
| Place attachment | 0.295*** 0.256*** | 0.367*** |
| (0.064) | (0.088) | (0.113) |
| Informal social networks | 0.167*** | 0.031 | 0.319*** |
| (0.064) | (0.089) | (0.095) |
| Controls |
| Employment years (log) | 0.257*** 0.199*** | 0.234*** 0.142 |
| (0.068) | (0.068) | (0.083) | (0.127) |
| Female | −0.204* −0.210* | −0.332** −0.085 |
| (0.108) | (0.108) | (0.137) | (0.173) |
| Age (reference: Age ≥ 50) |
| Age < 40 | 0.206 | 0.084 | 0.123 | −0.042 |
| (0.174) | (0.174) | (0.210) | (0.315) |
| Age 40–49 | 0.332** 0.216 | 0.264 | 0.100 |
| (0.133) | (0.133) | (0.167) | (0.214) |
| Professional experience | 0.461*** 0.461*** | 0.403*** 0.468** |
| (0.119) | (0.119) | (0.154) | (0.187) |
| Research orientation (reference: Basic research) |
| User-inspired basic research | 0.639*** 0.601*** | 0.591*** 0.627** |
| (0.148) | (0.153) | (0.202) | (0.252) |
| Applied research | 0.752*** 0.710*** | 0.773*** 0.590*** |
| (0.133) | (0.138) | (0.188) | (0.207) |
| Other | 0.580* 0.471 | −0.049 | 1.016* |
| (0.342) | (0.343) | (0.323) | (0.581) |
| Constant | −0.377* −1.500*** | −1.022** −1.942*** |
| (0.224) | (0.305) | (0.395) | (0.592) |
| University dummies | Yes | Yes | Yes |
| $R^2$ | 0.129 | 0.182 | 0.184 | 0.233 |
| Adjusted $R^2$ | 0.108 | 0.158 | 0.141 | 0.177 |
| $F$-test | 8.405 | 8.718 | 4.792 | 4.855 |
| Observations | 579 | 551 | 317 | 234 |

Note: Robust standard errors are shown in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$. 
at other scales. Indeed, this is precisely what we find. Place attachment and informal social networks have no significant effect on national and international engagement. Hence, we conclude that the model works in predicting regional engagement specifically.

CONCLUSIONS

This paper contributes to a better understanding of how the embeddedness of faculty in their regions shapes local engagement. Specifically, we examine whether place attachment and informal social networks influence local engagement, and if so, whether there are any differences between native and non-native academics in the effects of these factors. The findings reveal that regional embeddedness matters significantly in academics’ engagement with local partners. Academics who feel strongly attached to the region tend to collaborate more with local actors. The study also shows that academics who maintain diverse social ties engage more regionally. However, informal social networks matter only for native academics’ interactions and have no effect on non-natives’ engagement. The findings provide evidence for the important, yet neglected, role of place attachment and social networks for the regional engagement of academics. It also has implications for policymakers and university managers.

First, reaping the benefits of research at the regional university may be dependent on the ability of the region to embed the university and its academics in wider regional structures. Unlocking the regional development potential of a university does not just require investing in research and technology transfer. The university and its academics must also be embedded into the region in a socio-cultural sense. Hence, regional innovation policy that relies on the contribution of universities needs to adopt a dual approach of investing both in research and in embedding the university in the region. Research universities with an international profile may become cathedrals in the desert unless their academics develop an attachment to the region. The challenge for regional policymakers is to think about strategies or initiatives to stimulate academics’ identification and attachment to the region and the development of their social networks.

Second, universities need to manage the tension between internationalization and research excellence, on the one hand, and the need to create impact and participate in the regional community, on the other. While there is certainly potential for regional development to benefit from universities bringing in excellent academics and taking central positions in global knowledge networks, these rewards do not happen automatically. Rather, the university must help their academics to embed in the region. The findings show that place attachment is a more important driver of regional engagement for non-native academics than informal social networks. Therefore, it is not sufficient to provide opportunities for mobile academic faculty to network locally. It is more important to help non-native academics to integrate into their host regions and develop local roots.

Third, universities face the challenge of attracting and retaining academics for a long time in the context of increasing international academic mobility. To keep talented academics (especially non-natives), university managers need to pay particular attention to reward systems and career development. Career development policies that ensure research autonomy, attractive research–teaching balance and tenure prospects – particularly for early-stage academics – could incentivize them to stay relatively longer (Janger & Nowotny, 2016).

These findings notwithstanding, the study has limitations that must be duly acknowledged. One limitation is that we rely on self-reported data from academics both for engagement and embeddedness. Both dimensions are difficult to observe using other methods, but there are obvious measurement issues with this approach. Relatedly, the measure of informal social networks only captures the physical interaction aspect. Future studies could use a multidimensional measure that incorporates other dimensions. Another limitation is that the study is limited to a relatively small number of entrepreneurial universities. This may have introduced some sorting problems notwithstanding the measures taken to prevent this biasing the results. Hence, we do not know to what extent these results can be generalized to less entrepreneurial universities. Future studies might consider using large-scale survey design targeting different types of universities.

Moreover, we only have data from a cross-section at one point in time and have no way of assessing the evolution of engagement and embeddedness across time for individual academics. Future studies could use life and career history data of academics to unravel the dynamics of engagement and embeddedness. Additionally, future research using longitudinal research design could examine the causal mechanisms underlying the engagement, place attachment and social networks relationships. Finally, this paper has only focused on the academics’ perspectives. Future research might also examine the effect of embeddedness of regional actors on their choice of engaging with local academics. For example, it will be interesting to know whether place attachment of local actors partly explains their decision to collaborate locally rather than outside the region. These limitations notwithstanding, we believe that this study – being the first on this topic – provides useful insights into an important set of drivers of academic engagement.

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**NOTES**

1. Several definitions of the concept of a region exist. However, we define a region in this paper as the subnational-level administratively or political unit within a country equivalent to a Nomenclature of Territorial Units for Statistics (NUTS) 3-level classification.

2. We define regional engagement as academics’ collaboration with external actors in broad regionally oriented activities with the intention of exchanging knowledge and other resources for the mutual benefits of partners.

3. Doctoral candidates are considered as faculty in some countries in the sample (e.g., Norway and Denmark), but as students in other countries (e.g., Italy, Spain and Lithuania). To avoid these institutional differences affecting the results, we follow earlier surveys on the topic (e.g., the Centre for Business Research University–Industry Knowledge Exchange (HEI) Survey in the UK and the Triple-I-Research Survey of Academics in Denmark 2017) and exclude doctoral students from the study population.

4. By conventional standards this suggests a low reliability. However, the items measure different types of social networks, and we do not necessarily expect these to be highly correlated. A measure can be useful despite a low alpha when it has ‘other desirable properties like meaningful content coverage of some domain’ (Schmitt, 1996, p. 352). In this case, the items cover various dimensions of informal social networks which together provide a meaningful coverage of the concept.

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**REFERENCES**

Addie, J. P. D., Keil, R., & Olds, K. (2015). Beyond town and gown: Universities, territoriality and the mobilization of new urban structures in Canada. *Territory, Politics, Governance*, 3(1), 27–50. https://doi.org/10.1080/21622671.2014.924875

Adnet, N. (2010). The growth of international students and economic development: Friends or foes? *Journal of Education Policy*, 25(3), 623–637. https://doi.org/10.1080/02680931003782827

Alpaydın, U. A. R., & Fitjar, R. D. (2021). Proximity across the distant worlds of university–industry collaborations. *Papers in Regional Science*, 100(3), 689–711. https://doi.org/10.1111/ptrs.12586

Al-Tabbaa, O., & Ankrah, S. (2019). ‘Engineered’ university–industry collaboration: A social capital perspective. *European Management Review*, 16(3), 543–565. https://doi.org/10.1111/emre.12174

Altbach, P. G., & Yudkevich, M. (2017). International faculty in 21st-century universities: Themes and variations. In M. Yudkevich, P. G. Altbach, & L. E. Rumbley (Eds.), *International faculty in higher education: Comparative perspectives on recruitment, integration, and impact* (pp. 1–14). Routledge.

Armstrong, J. S., & Overton, T. S. (1977). Estimating nonresponse bias in mail surveys. *Journal of Marketing Research*, 14(3), 396–402. https://doi.org/10.1177/002224377701400320

Aschhoff, B., & Grimpe, C. (2014). Contemporaneous peer effects, career age and the industry involvement of academics in biotechnology. *Research Policy*, 43(2), 367–381. https://doi.org/10.1016/j.respol.2013.11.002

Bagchi-Sen, S., & Smith, H. L. (2012). The role of the university as an agent of regional economic development. *Geography Compass*, 6(7), 439–453. https://doi.org/10.1111/j.1749-8198.2012.00497.x

Behtoui, A. (2007). The distribution and return of social capital: Evidence from Sweden. *European Societies*, 9(3), 383–407. https://doi.org/10.1080/1466690701314093

Bishop, K., D’Este, P., & Neely, A. (2011). Gaining from interactions with universities: Multiple methods for nurturing absorptive capacity. *Research Policy*, 40(1), 30–40. https://doi.org/10.1016/j.respol.2010.09.009

Bodorkós, B., & Pataki, G. (2009). Linking academic and local knowledge: Community-based research and service learning for sustainable rural development in Hungary. *Journal of Cleaner Production*, 17(12), 1123–1131. https://doi.org/10.1016/j.jclepro.2009.02.023

Bozeman, B., & Gaugham, M. (2007). Impacts of grants and contracts on academic researchers’ interactions with industry. *Research Policy*, 36(5), 694–707. https://doi.org/10.1016/j.respol.2007.04.007

Broekel, T., & Binder, M. (2007). The regional dimension of knowledge transfers – A behavioral approach. *Industry and Innovation*, 14(2), 151–175. https://doi.org/10.1080/13662710701252500

Brunnel, J., D’Este, P., & Salter, A. (2010). Investigating the factors that diminish the barriers to university–industry collaboration. *Research Policy*, 39(7), 858–868. https://doi.org/10.1016/j.respol.2010.03.006

Bugden, D., & Stedman, R. (2019). Place and behavior: The role of place attachment in academics’ regional engagement efforts. *Regional Studies*, 53(11), 1895–1910. https://doi.org/10.1080/00343404.2019.1653580

Burt, R. S. (2005). *Brokerage and closure: An introduction to social capital*. Oxford University Press.

Charles, D. (2003). Universities and territorial development: Reshaping the regional role of UK universities. *Local Economy: The Journal of the Local Economy Policy Unit*, 18(1), 7–20. https://doi.org/10.1080/02690430200073780

Chatterton, P., & Goddard, J. (2000). The response of higher education institutions to regional needs. *European Journal of Regional Studies*.
REGIONAL STUDIES

Janger, J., & Nowotny, K. (2016). Job choice in academia. *Research Policy, 36*(10), 1620–1634. https://doi.org/10.1016/j.respol.2007.09.001

D’Este, P., & Patel, P. (2007). University–industry linkages in the UK: What are the factors underlying the variety of interactions with industry? *Research Policy, 36*(9), 1295–1313. https://doi.org/10.1016/j.respol.2007.05.002

Fritjar, R. D. (2010). *The rise of regionalism: Causes of regional mobilization in Western Europe*. Routledge.

Fritjar, R. D., & Gjelvisv, M. (2018). Why do firms collaborate with local universities? *Regional Studies, 52*(11), 1525–1536. https://doi.org/10.1080/00343404.2017.1413237

Fromm-Eseth, M., & Werker, C. (2013). Universities’ functions in knowledge transfer: A geographical perspective. *The Annals of Regional Science, 51*(3), 621–643. https://doi.org/10.1007/s10584-013-0599-z

Glückler, J., & Ries, M. (2012). Why being there is not enough: Organized proximity in place-based philanthropy. *The Service Industries Journal, 32*(4), 515–529. https://doi.org/10.1080/02642069.2011.596534

Goddard, J., & Vallance, P. (2011). Universities and regional development. In A. Pike, A. Rodríguez-Pose, & J. Tomaney (Eds.), *Handbook of local and regional development*. In A. Pike, A. Rodríguez-Pose, & J. Tomaney (Eds.), *Handbook of local and regional development*. Routledge.

Granovetter, M. (1985). Economic action and social structure: The problem of embeddedness. *American Journal of Sociology, 91*(3), 481–510. https://doi.org/10.1086/228311

Grimpe, C., & Hussinger, K. (2013). Formal and informal knowledge and technology transfer from academia to industry: Complementarity effects and innovation performance. *Industry and Innovation*, 20(8), 683–700. https://doi.org/10.1080/13662713.2013.856620

Gulbrandsen, M., & Thune, T. (2017). The effects of non-academic work experience on external interaction and research performance. *The Journal of Technology Transfer, 42*(4), 795–813. https://doi.org/10.1007/s10961-017-9556-1

Halpenny, E. A. (2010). Pro-environmental behaviours and park visitors: The effect of place attachment. *Journal of Environmental Psychology, 30*(4), 409–421. https://doi.org/10.1016/j.jenvp.2010.04.006

Heffernan, T. (2021). Academic networks and career trajectory: ‘There’s no career in academia without networks’. *Higher Education Research & Development, 40*(5), 981–994. https://doi.org/10.1080/07294360.2020.1799948

Henriksen, D. (2016). The rise in co-authorship in the social sciences (1980–2013). *Scientometrics, 107*(2), 455–476. https://doi.org/10.1007/s11192-016-1849-x

Hughes, A., Lawson, C., Salter, A., Kitson, M., Bullock, A., & Hughes, R. (2016). The changing state of knowledge exchange: UK academic interactions with external organizations 2005–2015. National Centre for Universities and Business. https://michaelkitchon.files.wordpress.com/2018/06/nceu_the_changing_state_of_knowledge_exchange_mar2016_web.pdf

Janger, J., & Nowotny, K. (2016). Job choice in academia. *Research Policy, 45*(8), 1672–1683. https://doi.org/10.1016/j.respol.2016.05.001

Kalar, B., & Antoncic, B. (2016). Social capital of academics and their engagement in technology and knowledge transfer. *Science and Public Policy, 43*(5), 646–659. https://doi.org/10.1093/scipol/scv062

Kroll, H., Dornbusch, F., & Schnabl, E. (2016). Universities’ regional involvement in Germany: How academics’ objectives and opportunity shape choices of activity. *Regional Studies, 50*(9), 1595–1610. https://doi.org/10.1080/00343404.2015.1051016

Lawson, C., Salter, A., Hughes, A., & Kitson, M. (2019). Citizens of somewhere: Examining the geography of foreign and native-born academics’ engagement with external actors. *Research Policy, 48*(3), 759–774. https://doi.org/10.1016/j.respol.2018.11.008

Lewicka, M. (2008). Place attachment, place identity, and place memory: Restoring the forgotten city past. *Journal of Environmental Psychology, 28*(3), 209–231. https://doi.org/10.1016/j.jenvp.2008.02.001

Lewicka, M. (2011). Place attachment: How far have we come in the last 40 years? *Journal of Environmental Psychology, 31*(3), 207–230. https://doi.org/10.1016/j.jenvp.2010.10.001

Lipaers, D. (2014). Foreign-born academic scientists and their interactions with industry: Implications for university technology commercialization and corporate innovation management. *Journal of Product Innovation Management, 31*(2), 346–360. https://doi.org/10.1111/jpim.12099

Looy, B. V., Debackere, K., & Andries, P. (2003). Policies to stimulate regional innovation capabilities via university–industry collaboration: An analysis and an assessment. *R&D Management, 33*(2), 209–229. https://doi.org/10.1111/1467-9310.00293

Low, S. M., & Altman, I. (1992). Place attachment. In I. Altman & S. M. Low (Eds.), *Place attachment* (pp. 1–12). Springer.

Mesch, G. S., & Manor, O. (1998). Social ties, environmental perception, and local attachment. *Environment and Behavior, 30*(4), 504–519. https://doi.org/10.1177/001906259803000405

Nahapet, J., & Ghoshal, S. (1998). Social capital, intellectual capital, and the organizational advantage. *Academy of Management Review, 23*(2), 242–266. https://doi.org/10.5465/amr.1998.333225

Olmos-Petuelas, J., Castro-Martinez, E., & D’Este, P. (2014). Knowledge transfer activities in social sciences and humanities: Explaining the interactions of research groups with non-academic agents. *Research Policy, 43*(4), 696–706. https://doi.org/10.1016/j.respol.2013.12.004

Ostergaard, C. R. (2009). Knowledge flows through social networks in a cluster: Comparing university and industry links. *Structural Change and Economic Dynamics, 20*(3), 196–210. https://doi.org/10.1016/j.strucdev.2008.10.003

Paasi, A. (2001). Bounded spaces in the mobile world: Deconstructing ‘regional identity’. *Tijdschrift voor Economische en Sociale Geografie, 92*(3), 137–148. https://doi.org/10.1111/1467-9663.00190

Pinheiro, R., Tartari, V., McKelvey, M., Autio, E., Brostrom, A., D’Este, P., Fini, R., Geuna, A., Grimaldi, R., Hughes, A., Krabel, S., Kitson, M., Llerena, P., Lissoni, F., Salter A., & Sobero, M. (2013). Academic engagement and commercialisation: A review of the literature on university–industry relations. *Research Policy, 42*(2), 423–442. https://doi.org/10.1016/j.respol.2012.09.007

Pinheiro, R., Bennworth, P., & Jones, G. A. (Eds.). (2012). *Universities and regional development: A critical assessment of tensions and contradictions*. Routledge.

Pinheiro, R., Normann, R., & Johnsen, H. C. (2016). External engagement and the academic heartland: The case of a regionally-embedded university. *Science and Public Policy, 43*(6), 787–797. https://doi.org/10.1093/scipol/scv020

Plögner, J., & Kubiak, S. (2019). Becoming ‘the international’ – How place shapes the sense of belonging and group formation of high-skilled migrants. *Journal of International Migration and Integration, 20*(1), 307–321. https://doi.org/10.1007/s12134-018-0608-7

Poel, R., Oort, F. V., & Franken, K. (2009). Innovation, spillovers and university–industry collaboration: An extended knowledge production function approach. *Journal of Economic Geography, 10*(2), 231–255. https://doi.org/10.1093/jeg/lbp036
Ponds, R., Van Oort, F., & Frenken, K. (2007). The geographical and institutional proximity of research collaboration. *Papers in Regional Science, 86*(3), 423–443. https://doi.org/10.1111/j.1435-5957.2007.00126.x

Ponomariov, B., & Boardman, P. C. (2008). The effect of informal industry contacts on the time university scientists allocate to collaborative research with industry. *The Journal of Technology Transfer, 33*(3), 301–313. https://doi.org/10.1007/s10961-007-9029-z

Qiantao, Z., Niall, G. M., Dylan, J., & Robert, H. (2016). Leveraging knowledge as a competitive asset? The intensity, performance and structure of universities’ entrepreneurial knowledge exchange activities at a regional level. *Small Business Economics, 47*(3), 657–675. https://doi.org/10.1007/s11187-016-9759-0

Salter, A. J., & Martin, B. R. (2001). The economic benefits of publicly funded basic research: A critical review. *Research Policy, 30*(3), 509–532. https://doi.org/10.1016/S0048-7333(00)00091-3

Sánchez-Barrioluengo, M., & Benneworth, P. (2019). Is the entrepreneurial university also regionally engaged? Analysing the influence of university’s structural configuration on third mission performance. *Technological Forecasting and Social Change, 141*, 206–218. https://doi.org/10.1016/j.techfore.2018.10.017

Sánchez-Barrioluengo, M., & Consoli, D. (2016). Regional human capital and university orientation: A case study on Spain. *Science and Public Policy, 43*(6), 798–811. https://doi.org/10.1093/scipol/scw032

Scannell, L., & Gifford, R. (2010). The relations between natural and civic place attachment and pro-environmental behavior. *Journal of Environmental Psychology, 30*(3), 289–297. https://doi.org/10.1016/j.jenvp.2010.01.010

Schmitt, N. (1996). Uses and abuses of coefficient alpha. *Psychological Assessment, 8*(4), 350–353. https://doi.org/10.1037/1040-3590.8.4.350

Slaughter, S., & Leslie, L. L. (2001). Expanding and elaborating the concept of academic capitalism. *Organization, 8*(2), 154–161. https://doi.org/10.1177/13505080401082003

Stedman, R. C. (2002). Toward a social psychology of place: Predicting behavior from place-based cognitions, attitude, and identity. *Environment and Behavior, 34*(5), 561–581. https://doi.org/10.1177/0014082002034005001

Tartari, V., Perkmann, M., & Salter, A. (2014). In good company: The influence of peers on industry engagement by academic scientists. *Research Policy, 43*(7), 1189–1203. https://doi.org/10.1016/j.respol.2014.02.003

Tartari, V., & Salter, A. (2015). The engagement gap: Exploring gender differences in university–industry collaboration activities. *Research Policy, 44*(6), 1176–1191. https://doi.org/10.1016/j.respol.2015.01.014

Thune, T. (2007). University–industry collaboration: The network embeddedness approach. *Science and Public Policy, 34*(3), 158–168. https://doi.org/10.3152/030234207X206902

Trippl, M. (2013). Scientific mobility and knowledge transfer at the interregional and intraregional level. *Regional Studies, 47*(10), 1653–1667. https://doi.org/10.1080/00343404.2010.531119

Trippl, M., & Maier, G. (2011). Knowledge spillover agents and regional development. In P. Nijkamp & I. Siedschlag (Eds.), *Innovation, growth and competitiveness: Dynamic regions in the knowledge-based world economy* (pp. 91–111). Springer.

Wagner, C. S., & Leydesdorff, L. (2005). Network structure, self-organization, and the growth of international collaboration in science. *Research Policy, 34*(10), 1608–1618. https://doi.org/10.1016/j.respol.2005.08.002

Wu, R., Li, Z., Liu, Y., Huang, X., & Liu, Y. (2019). Neighborhood governance in post-reform urban China: Place attachment impact on civic engagement in Guangzhou. *Land Use Policy, 81*, 472–482. doi:https://doi.org/10.1016/j.landusepol.2018.11.019

Zencey, E. (1996). Rootless professors. In W. Vitek & W. Jackson (Eds.), *Rooted in the land: Essays on community and place* (pp. 15–19). Yale University Press.