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Academic entrepreneurial engagement with weak institutional support: roles of motivation, intention and perceptions*

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ABSTRACT

The paper investigates the potential impact of entrepreneurial motivation, entrepreneurial intention and academic researchers' perceptions of departmental and university support on academic entrepreneurial engagement in the context of weak or missing institutional support. A conceptual model linking motivation, intention and perceptions to entrepreneurial engagement is developed and tested on primary data collected from academic researchers in Nigeria. We find that while entrepreneurial motivation strongly influences the entrepreneurial intentions of researchers, the link between intention and engagement is weaker. Perceptions of departmental entrepreneurial orientation positively mediate a significant proportion of the latter link. In contrast, perceptions about the university's supportive framework and facilities play a relatively weaker role. Subsequently, the implications of these findings on policies and incentives for entrepreneurial academics and universities in weak institutional settings are explored.

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Academic entrepreneurship; entrepreneurial university; emerging and developing economies; Nigerian higher education; university third mission

1. Introduction

The last few decades have seen the gradual rise of entrepreneurial universities (Guerrero and Urbano 2012), for whom research commercialization and engagement with non-academic stakeholders have become increasingly important (Etzkowitz and Leydesdorff, 2000; Sharifi, Liu, and Ismail 2014). Incentives have been put in place not just for academic commercialization, which includes disclosures, patenting, licensing, and spin-out creation, but also for a wide variety of engagements via consulting, collaborative and contract research, executive education and training, among others. Consequently, studies of academic entrepreneurial engagement phenomena (referred to as AEE henceforth). its antecedents and consequences have also expanded (Guerrero and Urbano 2012; Perkmann et al. 2013, 2021).

Extant research has largely focussed on universities located in developed western economies, with only a handful of exceptions where universities in the developing and emerging world are examined (Athreye and Rossi 2021; Bodas Freitas, Geuna, and Rossi 2013; Brimble and Doner 2007; Ray and Sengupta 2022). Developing economies are usually characterized by weak innovation

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ecosystems, missing institutional support and organizational apathy (Göksidan, Erdil, and Çakmur 2018; Ray and Saha 2011; Ray and Sengupta 2022), but AEE activities do occur and are becoming increasingly more important. Low levels of awareness about opportunities, weak support structures, lack of intermediaries, and associated organizational problems make it difficult for academic researchers to engage with non-academic stakeholders (De Silva, Howells, and Meyer 2018; Humphrey and Schmitz 1998).

The extent to which 'well intentioned' researchers can overcome these institutional and organizational barriers to successfully engage in AEE is a less-studied question. Although supportive innovation and entrepreneurial ecosystems are key influences on entrepreneurial outcomes in general (Hayter 2016), can AEE be sustained where such positive influences are missing or weak? In this paper, we address this research gap and examine the extent to which entrepreneurial motivations and intentions of individual academics can stimulate tangible AEE within the context where entrepreneurial support mechanisms have a limited influence?

Concerns have been raised about the capacity of academics in African universities, including in Nigeria, to engage successfully and productively with the industry, community and government, and make relevant contributions to real-world problems (Bamiro 2004; Bogoro 2015; Sá 2014). While a culture of academic research exists in Nigeria, commercialization rates are low and the higher education sector lacks innovation and entrepreneurial capabilities at individual academic and organizational levels (OECD 2013). Thus, the Nigerian context makes it an ideal setting for our study.

Borrowing elements of the well-established Theory of Planned Behavior by Ajzen (1991, 2005), we examine the impact of individual motivations and intentions on AEE alongside the role of environmental perceptions. To adapt the theory for the study of an academic context, we include 'motivation' and 'entrepreneurial orientation' as key constructs determining 'intention' to carry out AEE. We find that the entrepreneurial motivation of academic researchers explains entrepreneurial intention, but the latter only has a marginal impact on AEE. And of the link that exists between intention and AEE, a significant part of it is mediated by the perceptions of entrepreneurial support coming from the academic department of the researcher, and less so from the central university. These findings have important implications for both the theory and practise of AEE in weak institutional settings.

2. Literature and hypotheses

2.1. Academic entrepreneurship and engagement

De Silva, Uyarra, and Oakey (2012) define academic entrepreneurship as the engagement of academics and universities in a broad spectrum of knowledge exchange activities in addition to their traditional academic roles. AEE can be classified into three major groups of activity: (1) academic engagement: research-related entrepreneurial activities, such as contract research with industry, government or non-government bodies, consultancies, joint research with non-academic partners etc (Perkmann et al. 2013; 2021). (2) commercialization: via patenting, licensing and spin-out creation based on own research (Clarysse et al. 2005; Di Gregoria and Shane 2003), and (3) teaching such as delivering executive education and training, placing student trainees in industry, etc. (Klofsten and Jones-Evans 2000; D'Este and Patel 2007). AEE thus refers to the whole gamut of professional activities that university academics participate in, *outside* the traditional role of education, research and administrative responsibilities, with the potential for social and economic impact.

Given the wide prevalence of AEE in universities from developed countries research has largely focussed on these contexts (Bozeman and Gaughan 2007; D'Este and Perkmann 2011; Perkmann et al. 2013; Perkmann et al. 2021; Haeussler and Colyvas 2011; Klofsten and Jones-Evans 2000). In developed countries, the knowledge ecosystem is well developed, and we see a bi-directional flow of people and knowledge between universities with industry. In addition to these people

and knowledge-centric flows, which can be based on both institutionalized and interpersonal links, there are arms length transactions in technology and ideas through formal knowledge transfer routes, based on patenting and licensing, technology contracts or equity investments – all outcomes which were targeted by policies such as Bayh Dole and its variants (Athreye and Rossi 2021).

In contrast, in many middle-income countries, only weak formal linkages exist (or are absent) for transferring research ideas, knowledge and technology from the university science base to industry. Universities in middle-income countries mainly engage in training and provide the human capital for both industry and public research institutes. These training links have resulted in informal people-mediated channels of knowledge transfer, but formal channels are largely limited (Athreye and Rossi 2021; Ray and Sengupta 2022).

The absence of linkages between universities and industry in developing and emerging contexts poses two main challenges to the implementation of knowledge transfer policies. First, the onus is on academic researchers to bridge the gap between basic research outputs and more application-oriented derivatives such as prototypes, working models, policy designs, etc. Second, the absence of or underdeveloped state of legal infrastructure surrounding university research reduces trust and communication even further between universities and potential stakeholders' AEE (Ray and Sengupta 2022). Thus, even though research thrives in many universities within such weak knowledge ecosystem contexts, levels of AEE are very low (Ray and Saha 2011; Ray and Sengupta 2022). The incentives and resources of individual researchers may also matter more for AEE outcomes.

2.2. Antecedents of academic entrepreneurship: the individual

A wide variety of individual characteristics of the academic researcher play a role in predicting AEE, but the study of the role of academic motivations and intentions of researchers in determining AEE is limited. Such studies are especially relevant in relatively weaker institutional contexts, where personal capabilities become even more relevant as a substitute for missing institutional links. University scientists may need to possess the entrepreneurial capabilities required to turn their inventions into saleable products or services, by engaging directly with the end users. Thus, personal motivation and intentions ought to be examined in the context of AEE outcomes.

2.2.1. Academic entrepreneurial motivation (AEM)

Motivation is the key reason for engaging in any kind of action, including AEE. Non-monetary incentives have been found to represent higher-order *intrinsic* motivation for some academics, while financial incentives represent higher-order *extrinsic* motivation for others (D'Este and Perkmann 2011). Non-monetary, intrinsic factors found to motivate some academics in engaging in entrepreneurship include the search for independence (Birley and Westhead 1994; Shane 2004), prestige and peer recognition (Stuart and Ding 2006; Dietz and Bozeman 2005), individual willingness to bring some research onto the market (Shane 2004; Fini, Grimaldi, and Sobrero 2009; Minshall and Wicksteed 2007), desire to apply inventions in practice (Nilsson, Rickne, and Bengtsson 2010), necessity (Rizzo 2015), and the need to help solve societal and community problems. Extrinsic factors include increased wealth from spin-offs (D'Este and Perkmann (2011), research funding (Fini, Grimaldi, and Sobrero 2009; Lee 1998) and top-ups to personal income (Nilsson, Rickne, and Bengtsson 2010).

While entrepreneurial motivation may be a necessary antecedent factor, studies have indicated that it is not sufficient to predict AEE outcomes. An additional key factor is an entrepreneurial intention.

2.2.2. Academic entrepreneurial intention (AEI)

Ajzen (1991) defines intentions as indications of an individual's perseverance and effort towards performing a given behaviour. Entrepreneurial intention reflects an individual's willingness and readiness to become an entrepreneur (Ajzen 1991; Krueger 2017). It is believed to be important in understanding the entrepreneurship process which underpins the founding of new organizations

and indicates the effort that an academic may be willing to commit to carrying out an entrepreneurial action. An individual may have the required capability and the motivation to be entrepreneurial but cannot be successful in it until the time he or she has the intention to do so (Ismail et al. 2009). Therefore, AEI is a critical factor to consider for AEE outcomes, whether it has to do with enterprise formation, commercialization of research through patenting and licensing, or knowledge transfer through consulting and contracts. AEI corresponds to the academics' state of mind that directs their attention, experience, and action toward the goal of AEE, and in particular, it embodies their commitment to start the business (Bird 1988; Krueger and Casrud 1993).

The importance of AEI has been well demonstrated in academic entrepreneurship studies (Prodan and Drnovsek 2010), in developed economies, but not much is known about AEI in emerging countries, and how AEIs get translated into actual AEE. However, as pointed out above, entrepreneurial engagements are intentional behaviors and not reflexive ones, and intention cannot form without some form of intrinsic or extrinsic motivation at play. We hypothesize that this is independent of the context, that is it is true even for emerging countries with weak institutions and lack of entrepreneurial support – leading us to the first set of hypotheses in our paper.

Hypothesis 1: AEM of a university researcher is positively associated with their AEI.

Hypothesis 2: AEI of a university researcher is positively associated with their AEE.

2.3. Antecedents of academic entrepreneurship: the environment

Social norms as identified by Ajzen (2005), either hinder or enhance intrinsic or extrinsic motivations. In the context of AEE, universities and departments promoting an entrepreneurial environment can go further in motivating and facilitating academic engagement. Entrepreneurial academics who are embedded in a context that emphasizes AEE are more likely to engage in entrepreneurial activities than academics who are not (Bercovitz and Feldman 2008).

Asking why some universities are more entrepreneurial than others has drawn attention to the university environment in which AEE occurs. Chang et al. (2016), universities and departments collectively develop nourishing contexts, which, in turn, shape individual faculty members' entrepreneurial attitudes and behaviors. Academic departments act as the springboard for research and knowledge transfer to thrive among academic staff. They play an intermediate role between the central university administration and faculty performance, ensuring that performance is not only evaluated in terms of their scientific outcomes but also considers AEE success. To play their role in fostering academic engagement, academic departments must be entrepreneurially oriented and perceived to be so (Lee and Peterson 2000; Toledano and Urbano 2008). Studies based on the organizational outlook of entrepreneurial universities have found internal mechanisms, structures, and supportive legal frameworks are important to stimulate academics' attitudes towards AEE (Shane 2004; Kenney & Patton, 2011).

Similar studies for universities from emerging economies have been relatively few. Unlike universities in developed economies, these universities are reported to lack the capacity for entrepreneurial engagement due to the absence of appropriate departmental and university-level entrepreneurial orientation and infrastructure, the prevalence of bad governance and lack of appropriate leadership (Bamiro 2004 2017; Bogoro 2015; Oyelaran-Oyeyinka and Adebowale 2012; Oyelaran-Oyeyinka and Gehl-Sampath 2006).

While actual support from the department and university may be relatively weak overall in universities located in such economies, a positive *perception* about these on the academic researcher's part may have a crucial role to play in the context of AEE (Chang et al. 2016). In effect, for both departmental entrepreneurial orientation and the university's entrepreneurship support system, the perception of academics is critical to instigating the commercial research activities of the academics (Perkmann et al. 2013; Chang et al. 2016). Such perceptions may themselves be subjective and dependent on the individual academic's entrepreneurial intentions. Thus, it is likely that

individuals with stronger intentions also *perceive* the department and the university settings in a more positive light – while those with weaker intentions perceive them more negatively. We argue that not only do perceptions about organizational support matter, as has been pointed out previously (Chang et al. 2016), but also these perceptions are subjective and determined by individual intentions. In other words, we can expect that perceptions about the departmental entrepreneurial orientation and the university's institutional framework and infrastructure will mediate the link between entrepreneurial intention and actual engagement.

This leads us to our next set of hypotheses, as stated below:

Hypothesis 3: The relationship between AEI and AEE is positively mediated by their perceptions of their department's entrepreneurial orientation (DEO).

Hypothesis 4: The relationship between academic entrepreneurial intention and entrepreneurial engagement of academics is positively mediated by their perceptions of the university's institutional framework and facilities (UIFF).

2.4. Conceptual framework

The complete conceptual model represented in the hypotheses developed above and tested in this paper, is represented in Figure 1. We use key elements of the well-known Theory of Planned Behaviour (TPB) (Ajzen 1991, 2005), widely used to study entrepreneurship. The elements borrowed from TPB include AEO (reflecting attitudes), AEI and AEE (reflecting the behaviour). Furthermore, social norms are reflected through the perceptions (DEO and UIFF), which are subsequently treated as mediators as well. Individual-level factors, such as gender, academic experience, seniority and status and academic area, have been shown to impact AEE in various contexts. These are included as controlling factors within the conceptual framework underlying this study. At the same time, an individual's *attitude* towards engaging in entrepreneurial actions, or entrepreneurial orientation, is also considered important for entrepreneurial outcomes. Lam (2010) suggests that there is a need for considering academic entrepreneurial orientation (AEO) when discussing academic entrepreneurial engagement, especially in an entrepreneurially deprived university setting in institutionally weak countries. We include it as a key control in our study.

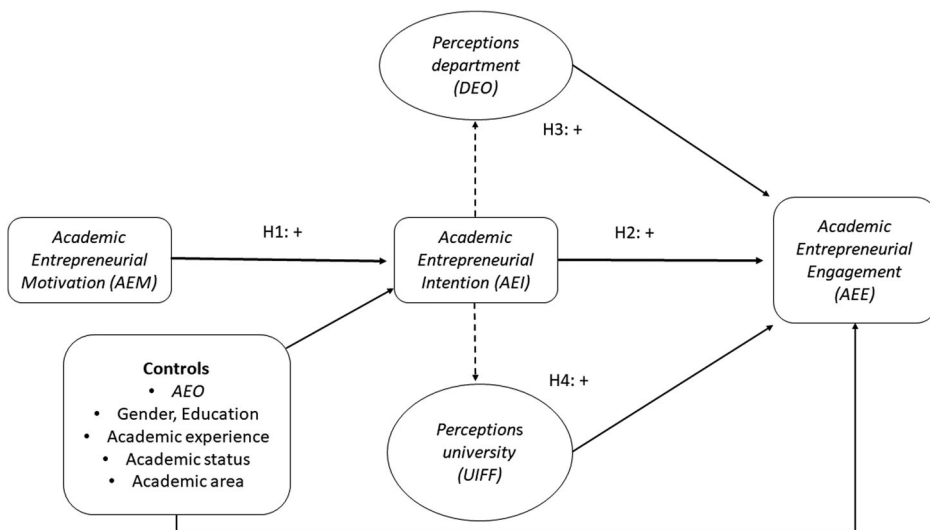


Figure 1. The Conceptual Framework.

3. Research methods

3.1. Participants and data collection procedure

Our study is based on a survey of academics from the University of Lagos, Nigeria, a reputed, research-active, large collegiate university with a diverse disciplinary focus, with over 50,000 students and 1700 academic staff. 1563 academics of the university were contacted of which 298 responded (a response rate of 19.1%). Participants comprised academics across the 12 colleges/institutes and 79 departments in the university.

Data collection was done through personal visits to the members of academic staff in their offices and lasted for about 10 weeks with about 4 visits to each of the academics. Personal visits to fill out the questionnaire instead of an anonymous survey were beneficial for several reasons. Sustained AEE activities are not uniformly widespread, nor is information regarding the multiple potential channels of engagement widely available. Additionally, answering the questions required a consistent understanding of the terminology around knowledge exchange, intellectual property, commercialization etc., all of which are unlikely to be present uniformly in the sample. The presence of one of the investigators helped to ensure consistency around the terminology and interpretation by all respondents. Additionally, the multiple visits ensured that the reasonably lengthy questionnaire was completed by all respondents in the sample, giving us almost no missing values. Considerable effort was put to ensure that the chances of bias arising from this format, such as following the script of the structured questionnaire and making sure that responses were recorded without subjective interpretation of the investigator.

The final distribution of individual profiles of the 298 participants of this study is provided in Table 1.

3.2. Measures and estimation method

The constructs we used to test our hypotheses are summarized in Table 2. Each construct was composed of several individual items and the average of the relevant items was calculated as the measure of the specific individual constructs in the final dataset. Each construct is defined in more detail in the online appendix, to save space.

The baseline model, testing Hypotheses 1 and 2, is represented by the following *simultaneously determined* equations:

$$AEI = \alpha_1 + \alpha_2 AEM + \sum_{j>2} \alpha_j x_j + u \quad (1)$$

$$AEE = \beta_1 + \beta_2 AEI + \beta_3 DEO + \beta_4 UIFF + \sum_{j>4} \beta_j x_j + v, \quad (2)$$

where x_j represents the independent controls (as per Figure 1), u represents the error term for Equation (1) and v represents the error term for Equation (2). We allow for u and v to be correlated due to potential unobserved heterogeneity and selection bias at the individual level. Given that AEI in (2) is endogenously determined via (1), we instrument the right-hand sides of (1) and (2) with the full set of exogenous constructs and controls (assuming AEO and AEM are exogenous to the model).¹ The well-known 3-Stage Least Squares (3SLS) estimator is used to jointly estimate the parameters in (1) and (2), allowing for both correlated error terms and endogeneity of AEI. The validity of Hypotheses 1 and 2 is indicated by the sign and significance of α_2 and β_2 respectively, in the jointly estimated model.

To test the mediation effect of DEO and UIFF on the link between AEI and AEE, we used the quasi-Bayesian Monte Carlo inference method for causal mediation analysis. The mediation analysis is done on the DEO and UIFF pathways separately, using OLS coefficients for the respective paths

Table 1. Distribution of academic profiles.

| Academic Profiles | Levels | Count | |
|------------------------------------|-------------------------|-------|-----|
| Gender | Male | 211 | |
| | Female | 87 | |
| Highest Education Level | Bachelors | 62 | |
| | Masters | 40 | |
| | MPhil. | 144 | |
| | PhD. | 52 | |
| Academic Status | Lecturer's Assistant | 40 | |
| | Assistant Lecturer | 51 | |
| | Lecturer II | 54 | |
| | Lecturer I | 62 | |
| | Senior Lecturer | 63 | |
| | Assoc. Professor/Reader | 15 | |
| | Full Professor | 13 | |
| | Academic area | Arts | 20 |
| Basic Medical Sciences | | 7 | |
| Clinical Sciences | | 3 | |
| Distant Learning Institute | | 31 | |
| Education | | 43 | |
| Engineering | | 31 | |
| Environmental Sciences | | 3 | |
| Law | | 4 | |
| Library | | 42 | |
| Pharmacy | | 62 | |
| Management Sciences | | 45 | |
| Science | | 4 | |
| Social Sciences | | 3 | |
| Academic Experience (years) | | 1–5 | 110 |
| | | 6–10 | 83 |
| | | 11–15 | 51 |
| | 16–20 | 35 | |
| | 21–25 | 11 | |
| | 26–30 | 8 | |
| Tenure with the University (years) | 1–5 | 134 | |
| | 6–10 | 93 | |
| | 11–15 | 41 | |
| | 16–20 | 22 | |
| | 21–25 | 4 | |
| | 26–30 | 4 | |

Table 2. Description of constructs used in the study.

| Construct | Acronym | Description |
|--|---------|--|
| Academic Entrepreneurial Orientation | AEO | It is a person's attitude towards engaging in entrepreneurial actions. Associated with being innovative, willingness to pursue risky business and pioneering new innovations. |
| Academic Entrepreneurial Motivation | AEM | Primary motivation driving individuals toward entrepreneurial actions. Defined as the cognitive decision-making process through which goal directed decision making behaviour is initiated. |
| Academic Entrepreneurial Intention | AEI | Intention indicates an individual's perseverance and effort towards performing a given behaviour, in this case an academic's willingness to carry out entrepreneurial actions. |
| Academic Entrepreneurial Engagement | AEE | The broad spectrum of knowledge exchange activities carried out by academics in addition to their traditional academic roles, including but not limited to commercialization (patent licensing, spin out formation), and broader engagement with external stakeholders, such as consulting, contract research, networking etc. |
| Departmental Entrepreneurial Orientation | DEO | Perceptions of departmental entrepreneurial orientation, in the form of encouragement towards risk taking and alternative modes of engagement with external stakeholders. |
| University's Institutional Framework | UIFF | Perceptions of overall university's support in terms of provision of infrastructure and incentives for encouraging academic entrepreneurial engagement. |

indicated in the model. The validity of Hypotheses 3 and 4 is indicated via the significance and proportion of mediation coming from the analysis.

4. Results

The means, standard deviations and correlations for all independent and dependent constructs are shown in Table 3.

4.1. Hypotheses 1 and 2: motivation and intention

To examine the validity of Hypotheses 1 and 2, we examine the 3SLS estimates of Equations (1) and (2) in Table 4. As can be seen, the coefficient of AEM in Equation (1) is positive and significant (0.11 with S.E. of 0.01), implying that at an individual academic level, AEM is positively associated with AEI. On the other hand, for Equation (2), the coefficient of AEI is large and positive (0.73) but marginally significant at a 10% level (S.E. of 0.43). Thus, we find strong support for Hypothesis 1, but the evidence for Hypothesis 2 is relatively weak.

4.2. Hypotheses 3 and 4: perceptions of support

To examine the validity of Hypotheses 3 and 4, we examine the effect sizes and significance resulting from the causal mediation analysis using a quasi-Bayesian Monte Carlo estimator. Tables 5 and 6 report the results from 1000 Monte-Carlo simulations for mediation of the AEI – AEE link, by DEO and UIFF, respectively. The results reported are, the effect size, the 95% confidence interval upper and lower limits and the *p*-value of the following: average causal mediation effect size (ACME), the average direct effect size (ADE), the total effect size (ACME + ADE), and the proportion of the total effect which is the result of mediation.

It was found that DEO mediates around 33.2% (ACME = 0.54 and ADE = 1.50) of the influence of variation in AEI on the variation in AEE. The effect is relatively large, positive and significant.

On the other hand, UIFF is a weaker mediator, with 9.1% (ACME = 0.16 and ADE = 1.50) of the total variation in AEE being explained through mediation by UIFF. However, the effect is significant and positive, implying that although UIFF does mediate between AEI and AEE, DEO has a bigger impact.

Note that an academic's perception of DEO also has a strong direct effect in enhancing AEE (0.68 and SE of 0.12 in Table 4), but UIFF shows no significant impact.

5. Discussion and conclusion

Our study confirms that even in institutionally weaker environments, some entrepreneurially motivated academics do find ways to overcome barriers and engage with external stakeholders. However, there is a wide variation among individuals (as is apparent from the lower level of significance of the coefficient of AEI in Table 4), presumably due to institutional barriers. *Ceteris paribus*, academics with high levels of entrepreneurial intention who are unable to engage with external stakeholders (or show low levels of engagement), could have potentially done better if institutional support was

Table 3. Mean, standard deviation and correlation between constructs.

| | Mean | S.D. | AEO | AEM | AEI | AEE | DEO | UIFF |
|-------------|------|------|------|------|------|------|------|------|
| AEO | 5.05 | 0.84 | 1 | | | | | |
| AEM | 5.53 | 0.98 | 0.47 | 1 | | | | |
| AEI | 5.07 | 1.12 | 0.54 | 0.58 | 1 | | | |
| AEE | 3.77 | 1.46 | 0.23 | 0.21 | 0.41 | 1 | | |
| DEO | 4.88 | 1.11 | 0.26 | 0.28 | 0.39 | 0.45 | 1 | |
| UIFF | 4.92 | 1.10 | 0.33 | 0.32 | 0.32 | 0.3 | 0.56 | 1 |

Table 4. 3SLS Estimates (standard errors) of Equations (1), (2).

| | (1) | (2) |
|---------------------|-------------------|------------------------------|
| (Intercept) | 1.94 (2.22) | 6.48 (12.28) |
| Gender | -1.71** (0.56) | -5.50 ⁺ (3.15) |
| Education | 0.35 (0.37) | 1.88 (2.00) |
| Academic Status | -0.17 (0.30) | 0.60 (1.61) |
| University Tenure | 0.03 (0.07) | -0.29 (0.38) |
| Academic Experience | -0.06 (0.07) | 0.44 (0.37) |
| AEO | 0.14*** (0.02) | - |
| AEM | 0.11*** (0.01) | - |
| AEI | - | 0.73 ⁺ (0.43) |
| DEO | - | 0.68*** (0.12) |
| UIFF | - | -0.01 (0.07) |
| Academic area | Yes | Yes |
| N | 298 | 298 |
| R-squared | 0.48 | 0.33 |
| Adj. R-squared | 0.45 | 0.28 |

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; ⁺ $p < 0.1$.

forthcoming. The weak institutional environment is a key contextual factor. Since universities in emerging markets are quite likely to be resource constrained, relative to their developed counterparts (Ray and Sengupta 2022) it is likely to be difficult for many organizations to demarcate and delegate organizational support between the departments and the center.

We find that academics' perceptions about their immediate environment, such as departmental orientation and support explain a significant amount of the variation in engagement outcomes— it is an effective mediating factor between intentions and engagement. Perceptions about university-level support matter less. This is a key finding, as it implies that incentive schemes and support structures need to be brought 'closer' to the academics when overall institutional weaknesses exist. The department, which is where the academic spends most of his/her professional time and with which has ongoing interactions, *must be seen* to support entrepreneurial engagement strongly. Perceptions of support at the departmental level can influence academic engagement positively.

Our results suggest that in weak institutional contexts, financial and non-financial rewards for patenting, licensing, consultancies, and research contracts ought to be provided at the departmental level to be relevant and effective. Departmental leaders ought to be seen as encouraging applied research, ideas unconventional to traditional academic norms and collaborative practices, more so than messages that may arise centrally in the university. Entrepreneurial support infrastructure that the university might be considering investing in, such as knowledge transfer offices, support

Table 5. Mediation Effect of DEO on AEI – AEE link.

| Effect | Estimate | 95% CI Lower | 95% CI Upper | p-value |
|----------------|----------|--------------|--------------|------------|
| ACME | 0.54 | 0.24 | 0.89 | 0.002 ** |
| ADE | 1.09 | 0.44 | 1.68 | 0.002 ** |
| Total Effect | 1.63 | 0.97 | 2.26 | <2e-16 *** |
| Prop. Mediated | 0.33 | 0.15 | 0.58 | 0.002** |

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; ⁺ $p < 0.1$.

Table 6. Mediation Effect of UIFF on AEI – AEE link.

| Effect | Estimate | 95% CI Lower | 95% CI Upper | p-value |
|----------------|----------|--------------|--------------|------------|
| ACME | 0.16 | 0.03 | 0.36 | 0.016* |
| ADE | 1.50 | 0.84 | 2.13 | <2e-16 *** |
| Total Effect | 1.67 | 1.02 | 2.27 | <2e-16 *** |
| Prop. Mediated | 0.09 | 0.02 | 0.23 | 0.016* |

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; + $p < 0.1$.

staff, and science parks would be better with an explicit decentralized approach, i.e. where relevant organizational sub-units are directly linked to the department or faculty than a centralized facility. The importance of decentralization of support structures and incentives for entrepreneurial engagement has been previously shown to be important within some developed contexts (Bercovitz et al. 2001; Sengupta and Ray, 2017) and our study now illustrate this in the case where institutional support is weak or non-existent.

University management has a role to play in providing the enabling environment, associated infrastructural facilities and credible leadership that will promote AEE. However, such provisions will have a greater effect if academics can perceive positive attitudes and support from their immediate department and colleagues. Knowledge management policies in universities have often been imposed centrally and our analysis suggests in weak institutional settings, decentralized knowledge management policies may be more effective.

Note

1. There are two possible sources of endogeneity in the specification. First arises from common method bias (CMB) due to the use of a common survey instrument for measuring variables which feed into both endogenous and exogenous constructs in (1) and (2). The second is the potential endogeneity of DEO and UIFF, both of which are self-reported and subject to omitted variable bias. While we are unable to control for the CMB in the current analysis, the potential endogeneity of DEO and UIFF is only an issue in testing for H2, where they act as controls. They are not included in the test of H1 and are treated as (endogenous) mediators for H3 and h4.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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References

- Ajzen, I. 1991. "The Theory of Planned Behaviour." *Organizational Behaviour and Human Decision Processes* 50 (1): 179–211. doi:10.1016/0749-5978(91)90020-T
- Ajzen, I. 2005. *Attitudes, Personality and Behaviour* (2nd ed.). Berkshire: Open University Press.
- Athreya, S., and F. Rossi. 2021. "Policy Recommendations: Aiming for Effective Knowledge Transfer Policies in High- and Middle-Income Countries." In *Harnessing Public Research for Innovation in the 21st Century: An Assessment of Knowledge Transfer Policies*, edited by A. Arundel, S. Athreya, and S. Wunsch-Vincent, 393–417. Cambridge University Press.
- Bamiro, O. A. 2004. "University-Industry Partnership in the Innovation Process: Cases from Nigeria and Ghana." Published in the *proceedings of the regional conference on innovation systems and innovation clusters in Africa, Dar-es-salaam/bagamowo, Tanzania*, 341-366.
- Bercovitz, J., and M. Feldman. 2008. "Academic Entrepreneurs: Organizational Change and the Individual Level." *Organisational Science* 19: 69–89. doi:10.1287/orsc.1070.0295

- Bercovitz, J., M. Feldman, I. Feller, and R. Burton. 2001. "Organizational Structure as Determinants of Academic Patent and Licensing Behaviour: An Exploratory Study of Duke, Johns Hopkins, and Pennsylvania State Universities." *Journal of Technology Transfer* 26: 21–35. doi:10.1023/A:1007828026904
- Bird, B. 1988. "Implementing Entrepreneurial Ideas: The Case for Intentions." *Academy of Management Review* 13: 442–53. doi:10.2307/258091
- Birley, S., and P. A. Westhead. 1994. "Taxonomy of Business Start-up Reasons and Their Impact on Firm Growth and Size." *Journal of Business Venture* 9: 7–31. doi:10.1016/0883-9026(94)90024-8
- Bodas Freitas, I. M., A. Geuna, and F. Rossi. 2013. "Finding the Right Partners: Institutional and Personal Modes of Governance of University-Industry Interactions." *Research Policy* 42 (1): 50–62. doi:10.1016/j.respol.2012.06.007
- Bogoro, S. E. 2015, December 3. *Enhancing the relevance of research and industry partnership in Nigeria: a case for new strategies*. Being the Convocation Lecture delivered at the 2015 Convocation Ceremony of the Federal University of Technology, Owerri, Nigeria.
- Bozeman, B., and M. Gaughan. 2007. "Impacts of Grants and Contracts on Academic Researchers' Interactions with Industry." *Research Policy* 36: 694–707. doi:10.1016/j.respol.2007.01.007
- Brimble, P., and R. F. Doner. 2007. "University-Industry Linkages and Economic Development: The Case of Thailand." *World Development* 35 (6): 1021–36. doi:10.1016/j.worlddev.2006.05.009
- Chang, Y.-C., P. Y. Yang, B. R. Martin, H.-R. Chi, and T.-F. Tsai-Lin. 2016. "Entrepreneurial Universities and Research Ambidexterity: A Multilevel Analysis." *Technovation* 54: 7–21. doi:10.1016/j.technovation.2016.02.006
- Clarysse, B., M. Wright, A. Lockett, E. V. de Velde, and A. Vohora. 2005. "Spinning out new Ventures: A Typology of Incubation Strategies from European Research Institutions." *Journal of Business Venturing* 20: 183–216. doi:10.1016/j.jbusvent.2003.12.004
- De Silva, M., J. Howells, and M. Meyer. 2018. "Innovation Intermediaries and Collaboration: Knowledge-Based Practices and Internal Value Creation." *Research Policy* 47 (1): 70–87. doi:10.1016/j.respol.2017.09.011
- De Silva, L. R., E. Uyerra, and R. Oakey. 2012. "Academic Entrepreneurship in a Resource-Constrained Environment: Diversification and Synergistic Effects." In *Technology Transfer in a Global Economy. International Studies in Entrepreneurship, Vol 28*, edited by D. Audretsch, E. Lehmann, A. Link, and A. Starnecker, 73–97. Boston, MA: Springer.
- D'Este, P., and P. Patel. 2007. "University-industry Linkages in the UK: What are the Factors Underlying the Variety of Interactions with Industry?" *Research Policy* 36 (9): 1295–1313. doi:10.1016/j.respol.2007.05.002.
- D'Este, P., and M. Perkmann. 2011. "Why do Academics Engage with Industry? The Entrepreneurial University and Individual Motivations." *The Journal of Technology Transfer* 36: 316–39. doi:10.1007/s10961-010-9153-z
- Dietz, J., and B. Bozeman. 2005. "Academic Careers, Patents, and Productivity: Industry Experience as Scientific and Technical Human Capital." *Research Policy* 34: 349–67. doi:10.1016/j.respol.2005.01.008
- Di Gregoria, D., and S. Shane. 2003. "Why do Some Universities Generate More Startups Than Others?" *Research Policy* 32: 209–27. doi:10.1016/S0048-7333(02)00097-5
- Etzkowitz, H., and L. Leydesdorff. 2000. "The Dynamics of Innovation: From National Systems and "Mode 2" to a Triple Helix of University-Industry-Government Relations." *Research Policy* 29 (2): 109–23. doi:10.1016/S0048-7333(99)00055-4
- Fini, R., R. Grimaldi, and M. Sobrero. 2009. "Factor Fostering Academics to Start up New Ventures: An Assessment of Italian Founders' Incentives." *Journal of Technology Transfer* 34: 380–402. doi:10.1007/s10961-008-9093-z
- Göksidan, H. T., E. Erdil, and B. Çakmur. 2018. "Catching-up and the Role of University-Industry Collaboration in Emerging Economies: Case of Turkey." In *Innovation and the Entrepreneurial University*, edited by D. Meissner, E. Erdil, and J. Chataway, 83–113. Cham: Springer.
- Guerrero, M., and D. Urbano. 2012. "The Development of an Entrepreneurial University." *Journal of Technology Transfer* 37 (1): 43–74. doi:10.1007/s10961-010-9171-x
- Haeussler, C., and J. A. Colyvas. 2011. "Breaking the Ivory Tower: Academic Entrepreneurship in the Life Sciences in UK and Germany." *Research Policy* 40: 41–54. doi:10.1016/j.respol.2010.09.012
- Hayter, C. S. 2016. "A Trajectory of Early-Stage Spinoff Success: The Role of Knowledge Intermediaries Within an Entrepreneurial University Ecosystem." *Small Business Economics* 47 (3): 633–56. doi:10.1007/s11187-016-9756-3
- Humphrey, J., and H. Schmitz. 1998. "Trust and Inter-Firm Relations in Developing and Transition Economies." *Journal of Development Studies* 34 (4): 32–61. doi:10.1080/00220389808422528
- Ismail, M., S. A. Khalid, M. Othman, K. Jusoff, N. Abdul Rahman, K. M. Mohammed, and R. Z. Shekh. 2009. "Entrepreneurial Intention among Malaysian Undergraduates." *International Journal of Business and Management* 4 (10): 54–60. doi:10.5539/ijbm.v4n10p54
- Kenny, M., and Patton D. 2011. "Does inventor ownership encourage university research-derived entrepreneurship? A six university comparison." *Research Policy* 40 (8): 1100–1112.
- Klofsten, M., and D. Jones-Evans. 2000. "Comparing Academic Entrepreneurship in Europe –the Case of Sweden and Ireland." *Small Business Economics* 14 (4): 299–309. doi:10.1023/A:1008184601282
- Krueger, N. F. 2017. "Entrepreneurial Intentions Are Dead: Long Live Entrepreneurial Intentions." In *Revisiting the Entrepreneurial Mind: International Studies in Entrepreneurship*, edited by A. Carsrud, and M. Brannback, 13–34. Heidelberg: Springer.

- Krueger, N., and A. L. Casrud. 1993. "Entrepreneurial Intentions: Applying the Theory of Planned Behaviour." *Entrepreneurship and Regional Development* 5: 315–30. doi:10.1080/08985629300000020
- Lam, A. 2010. "From 'Ivory Tower Traditionalists' to 'Entrepreneurial Scientists'? Academic Scientists in Fuzzy University-Industry Boundaries." *Social Studies of Science* 40 (2): 307–40. doi:10.1177/0306312709349963
- Lee, Y. S. 1998. "University-industry Collaboration on Technology Transfer: Views from the Ivory Tower." *Policy Studies Journal* 26 (1): 69–84. doi:10.1111/j.1541-0072.1998.tb01925.x
- Lee, S. M., and S. I. Peterson. 2000. "Culture, Entrepreneurial Orientation, and Global Competitiveness." *Journal of World Business* 35 (4): 401–16. doi:10.1016/S1090-9516(00)00045-6
- Minshall, T., and B. Wicksteed. 2007. *University Spin-Out Companies: Starting to Fill the Evidence Gap, in New Technology-Based Firms in the New Millennium*. Amsterdam: Elsevier.
- Nilsson, A. S., A. Rickne, and L. Bengtsson. 2010. "Transfer of Academic Research: Uncovering the Grey Zone." *Journal of Technology Transfer* 35 (6): 617–36. doi:10.1007/s10961-009-9124-4
- OECD. 2013. *Commercialising Public Research: New Trends and Strategies*. Accessed from Paris, France: <http://www.oecd.org/science/sci-tech/commercialising-public-research.pdf>.
- Oyelaran-Oyeyinka, B., and B. A. Adebowale. 2012. "University-Industry Collaboration as a Determinant of Innovation in Nigeria." *Institutions and Economies* 4 (1): 21–46.
- Oyelaran-Oyeyinka, B., and P. Gehl-Sampath. 2006. Rough Road to Market: Institutional Barriers to Innovations in Africa. United Nations University-MERIT Working Paper Series #2006-026.
- Perkmann, M., R. Salandra, V. Tartari, M. McKelvey, and A. Hughes. 2021. "Academic Engagement: A Review of the Literature 2011-2019." *Research Policy* 50 (1): Article 104114. doi:10.1016/j.respol.2020.104114
- Perkmann, M., V. Tartari, M. McKelvey, E. Autio, A. Broström, P. D'Este, R. Fini, et al. 2013. "Academic Engagement and Commercialisation: A Review of the Literature on University-Industry Relations." *Research Policy* 42 (2): 423–42. doi:10.1016/j.respol.2012.09.007
- Prodan, I., and M. Drnovsek. 2010. "Conceptualizing Academic-Entrepreneurial Intentions: An Empirical Test." *Technovation* 30: 332–47. doi:10.1016/j.technovation.2010.02.002
- Ray, A. S., and S. Saha. 2011. "Patenting Public-Funded Research for Technology Transfer: A Conceptual-Empirical Synthesis of US Evidence and Lessons for India." *The Journal of World Intellectual Property* 14 (1): 75–101. doi:10.1111/j.1747-1796.2010.00410.x
- Ray, A. S., and A. Sengupta. 2022. "Knowledge Exchange Under Asymmetric Information in Emerging Economies: Impact of Signals from Indian Universities." *Industrial and Corporate Change* 31 (1): 62–88. doi:10.1093/icc/dtab036
- Rizzo, U. 2015. "Why do Scientists Create Academic Spin-off? The Influence of the Context." *Journal of Technology Transfer* 40: 198–226. doi:10.1007/s10961-014-9334-2
- Sá, C. M. 2014. *Perspective of Industry's Engagement with African Universities*. For the African Association of Universities.
- Sengupta, Abhijit, and Amit S Ray. 2017. "University research and knowledge transfer: A dynamic view of ambidexterity in british universities." *Research Policy* 46 (5): 881–897. doi:10.1016/j.respol.2017.03.008.
- Shane, S. 2004. *Academic Entrepreneurship: University Spin-Offs and Wealth Creation*. Cheltenham: Edward Elgar.
- Sharifi, H., W. Liu, and H. S. Ismail. 2014. "Higher Education System and the 'Open' Knowledge Transfer: A View from Perception of Senior Managers at University Knowledge Transfer Offices." *Studies in Higher Education* 39 (10): 1860–1884. doi:10.1080/03075079.2013.818645
- Stuart, T., and W. Ding. 2006. "The Social Structural Determinants of Academic Entrepreneurship: An Analysis of University Scientists' Participation in Commercial Ventures." *American Journal of Sociology* 112: 97–144. doi:10.1086/502691
- Toledano, N., and D. Urbano. 2008. "Promoting Entrepreneurial Mindsets at Universities: A Case Study in the South of Spain." *European Journal of International Management* 2 (4): 382–99. doi:10.1504/EJIM.2008.021244.