Influential Article Review - Analyzing the Variations Between the Motivations of Traditional and Entrepreneurial Scientists

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This paper examines entrepreneurship. We present insights from a highly influential paper. Here are the highlights from this paper: In recent decades, the rise of the entrepreneurial university and the need for commercialization of university knowledge has gained significant attention, thus posing major challenges for higher education institutions. The adequacy of commercialization requirements causes problems not only for institutions but also for individual researchers as well. Although an increasing number of scholars are focusing on researchers' motivation in academic entrepreneurship, there is still a lack of surveys that investigate the motivational differences by specific group of academics. In this study, our aim is to investigate motivational differences among specific groups of researchers at 20 Hungarian higher education institutions. We distinguished academics into two segments: entrepreneurial scientists plan to commercialize their research results at a spin-off company, while traditional scientists show no interest in this. Our results suggest that there are differences and significant relationships with entrepreneurial intention in the case of direct control over the commercialization process, securing jobs for young researchers at one's spin-off company, and the desire to demonstrate the practical relevance of one's research to family/friends. With regard to previous experience, managerial experience gained at companies may play also an important role. For our overseas readers, we then present the insights from this paper in Spanish, French, Portuguese, and German.

Keywords: Motivation, Intention, Researchers, Entrepreneurship, University

SUMMARY

- First, we analyzed the motivational factors. Figure 1 summarizes the importance of the different motivational factors. According to the researchers, the two most important motivational factors are to obtain financial resources for further research and to ensure an ecosystem that is more flexible than the university for the further development of their invention. To increase personal income, to collect industrial feedback, to benefit society with their invention, to ensure direct control over the commercialization of their invention , and to secure jobs for young researchers also play an important role. Surprisingly, a strong reputation, including a scientific and a social reputation, and to demonstrate the practical relevance of their research were ranked lower as the motivational factors than other motivations.

- Comparing the opinions of traditional and entrepreneurial scientists, we found differences between the two groups.
- We wanted to investigate not only motivations but also previous experience as well. Using an independent-samples t test to comparing experience, we concluded that there are differences between traditional and entrepreneurial scientists regarding the research EXP-COM-RES, t test and managerial EXP-COM-MAN, t test experience gained at companies .
- Table 1 summarizes the research results and statistical methods described above. According to the results, we can observe differences and significant relationships with entrepreneurial intention in the case of direct control over the commercialization process , securing jobs for young researchers at one's spin-off company , and the desire to demonstrate the practical relevance of one's research to family/friends . Regarding previous experience, managerial experience gained at companies may play an important role. Although there were significant differences between the traditional and entrepreneurial scientists in the research experience gained at companies, the relationship to entrepreneurial intention did not prove important.
- We have demonstrated the research results of the survey we carried out at 20 Hungarian higher education institutions. The aim was to investigate the major motivational factors related to entrepreneurial intention. Two groups of researchers were formed based on their entrepreneurial intention: while the traditional scientists did not want to establish a spin-off company for the commercialization of recent research results, the entrepreneurial scientists planned to commercialize their inventions through entrepreneurship within 1 year.
- We assumed that the researchers would not differ in their entrepreneurial intentions, but in their motivations towards commercialization of scientific results. Although the respondents valued many motivations as important, the results highlight the fact that the most important motivational differences between the traditional and entrepreneurial researchers can be observed in exercising control over the commercialization process , securing jobs for young researchers at their spin-off company , and demonstrating the practical relevance of their research to family/friends . Regarding experience, managerial experience gained at companies plays the most important entrepreneurship-related role.
- We could not find significant differences in the development-driven motivations between the two groups or a notable relationship between motivations and entrepreneurial intention despite the previous results of other scholars.

HIGHLY INFLUENTIAL ARTICLE

We used the following article as a basis of our evaluation:

Huszár, S., Prónay, S., & Buzás, N. (2016). Examining the differences between the motivations of traditional and entrepreneurial scientists. Journal of Innovation and Entrepreneurship, 5(1), 1–22.

This is the link to the publisher's website:
https://innovation-entrepreneurship.springeropen.com/articles/10.1186/s13731-016-0054-8

INTRODUCTION

Universities contribute greatly to social development with their educational and research activities. In recent decades, the rise of the entrepreneurial university and the need for commercialization of university knowledge has gained significant attention, thus posing major challenges for higher education institutions (Etzkowitz 1998).

In our knowledge-based economy, the role of universities is increasingly important (Laredo and Mustar 2001) because they play a significant role in innovation and economic development (Mansfield and Lee 1996). Academic knowledge can also contribute to economic growth, while the more a company applies

university knowledge in its business activities, the more economic growth can be achieved. But only a small proportion of university knowledge is applied by industrial actors, a fact which can be explained by the scarce knowledge flow channels between academia and industry (Mueller 2006). In the commercialization of university knowledge, spin-off companies can act as intermediaries. In this case, the researcher can commercialize his research results at his own spin-off company, and he or she can thus retain control over the further development of the invention and the commercialization process.

Universities were traditionally the centers of knowledge production, although usually—in the case of second-generation universities—the knowledge application only meant education and the spread of scientific publications (Wissema 2009). By the end of the twentieth century, the process of knowledge application altered and the "third-generation" universities emerged, where the gates were opened for the commercialization of research results and (early stage) technologies produced at universities were introduced to the market, so the commercial application of knowledge became predominant (Wissema 2009). Etzkowitz (1983) called these institutions as "entrepreneurial universities" where the applied research and the knowledge application gained importance. The industrial relationships of universities began to expand, and special institutions—like technology transfer offices—were established to coordinate them (Buzás 2005; Bercovitz and Feldmann 2006). In the knowledge-based economy of the twenty-first century, this process has gained a new impetus; the "fourth-generation" universities have emerged where knowledge has become the foundation stone of the economy of a region. These institutions influence their environment including the community and the society of the region in a proactive way (Pawlowski 2009; Prónay–Buzás 2015). Concerning this phenomenon, it is important to note that according to Carayannis and Campbell's (2006) understanding, these generations can be seen not only as successive phases but also as different innovation models that can be perceived simultaneously. The authors call it mode 3 approach where pluralism of different knowledge and innovation modes (paradigms) coexists (Carayannis and Campbell 2010).

The adequacy of commercialization requirements causes problems not only for institutions but also for individual researchers as well. Participation in the commercialization process can threaten academic freedom (Nelson 2004) and create difficulties in fundamental research and publication activities (Arvanitis et al. 2008). However, it is necessary that the inventor should be enthusiastic for commercialization of research results to succeed through spin-off creation (Blair and Hitchens 1998). Furthermore, we usually cannot expect researchers to determine the possible application areas or the commercial potential of the invention (Nilsson et al. 2010). Recent studies highlight various factors that influence researchers' decision-making process related to commercialization, including institutional, organizational, and individual factors (Perkmann et al. 2013). Thornton (1999) distinguished two groups of influencing factors. The former group includes attitudes towards commercialization and the personal characteristics of the researchers, which affect the intrinsic motivations of the individual (supply-side), while the latter group of factors consists of institutional and organizational factors (demand-side). In our study, we will approach the individuals' motivation; thus, organizational and institutional factors are excluded in our investigation.

With regard to the personal characteristics of the inventor, there are two important areas which can highly influence the possible commercial outcomes of the invention. Firstly, we have to consider the ability of the researcher to determine possible application areas and acquire financial resources for commercialization. Secondly, we must take aspiration into account, which reflects on the willingness of the researcher to engage in commercialization (Hoye and Pries 2009). The determination of the possible application areas greatly depends on the individual's technical expertise, previous experience gained in commercialization, and his or her industrial network outside academia. Furthermore, the incentives provided, perceived risks, and expected benefits with respect to commercialization play an important role in one's participation in university–industry activities (Phan and Siegel 2006).

The tacit knowledge of the inventor also requires the participation of the scientist in the transfer of early-stage technologies (Shane 2004). In this regard, the successful application of the invention is questionable without particular knowledge about the technology that is possessed by the inventor. If the researcher finds it difficult to participate in the technology transfer or does not want to, it is difficult to apply the invention in an industrial environment (Siegel et al. 2003; Stevens and Bagby 1999).

Although the major obstacles noted above can greatly influence the successful commercialization of university scientific results, the international literature has not focused on individual researchers sufficiently (Ankrah et al. 2013). In this study, our aim is to investigate motivational differences among specific groups of researchers. We distinguished academics into two segments: entrepreneurial scientists plan to commercialize their research results at a spin-off company, while traditional scientists show no interest in this. We assumed that these two groups of scientists differ in motivations, and we wanted to determine these motivations.

CONCLUSION

Previous studies have focused on researchers' motivation in academic entrepreneurship, but there is a lack of surveys that investigate the motivational differences by specific group of academics. Our research results contribute to the need for a better understanding of motivational differences between traditional and entrepreneurial scientists. In our study, we provided evidence that managerial experience gained at companies can affect scientists' entrepreneurial intention. In this regard, universities should consider how institutions can motivate scientists to gain managerial—or at least research related—experience at companies. In most cases, higher education institutions do not tolerate researchers holding other positions at companies in addition to their current academic position; however, this stance could be a barrier to entrepreneurial intention and hinder academic entrepreneurship in general.

APPENDIX

FIGURE 1
RESEARCHERS' MOTIVATION (MEAN OF RESPONSES BETWEEN 1 AND 5). SOURCE: AUTHORS' COMPILATION

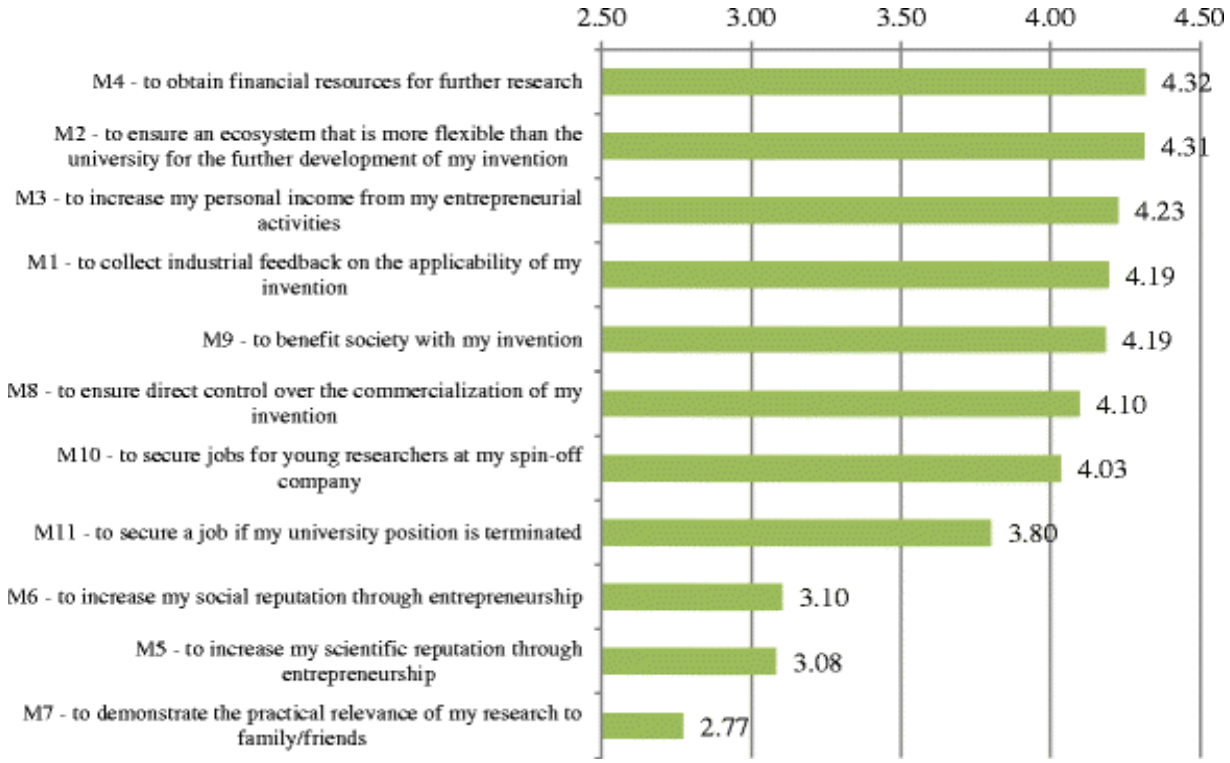

FIGURE 2
MOTIVATIONAL DIFFERENCES BETWEEN TRADITIONAL AND ENTREPRENEURIAL SCIENTISTS (MEAN OF RESPONSES BETWEEN 1 AND 5)

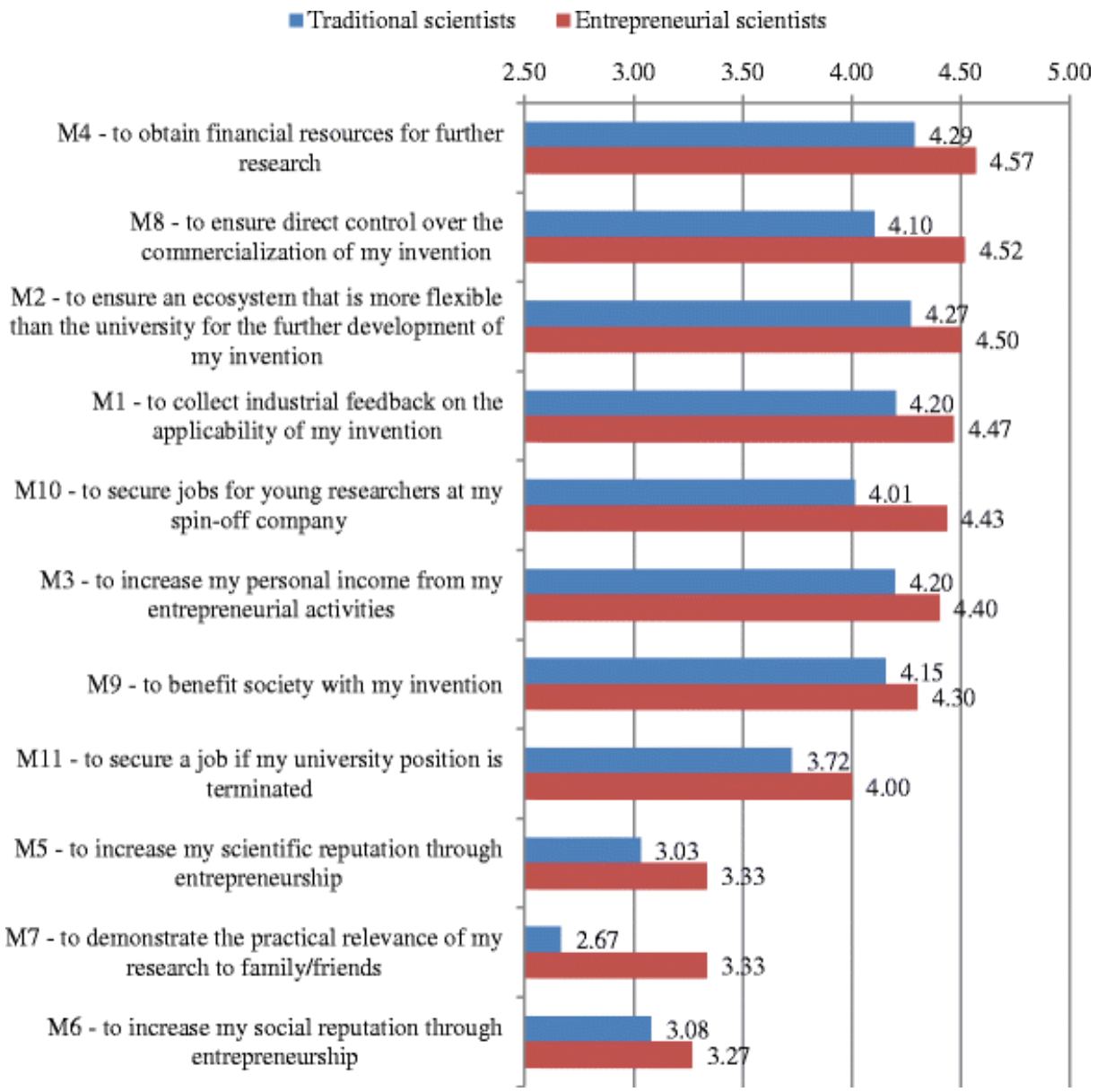

FIGURE 3
RELATIONSHIPS BETWEEN ENTREPRENEURIAL INTENTION, MOTIVATIONS, AND EXPERIENCE

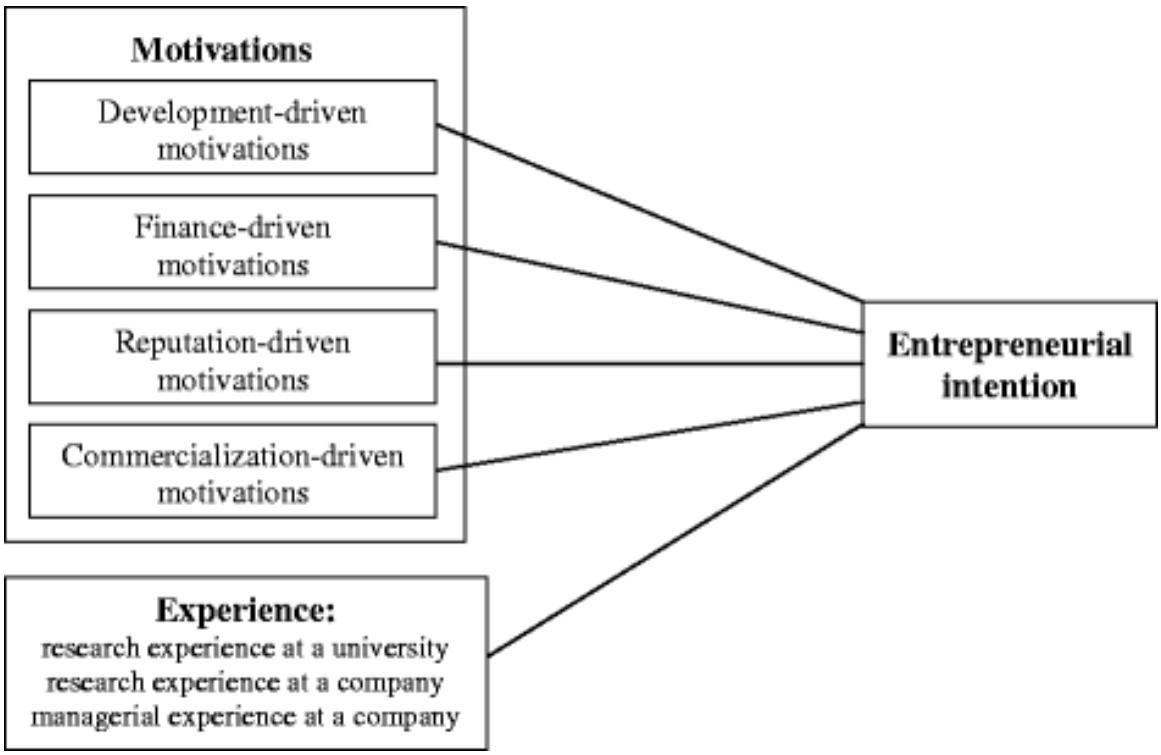

TABLE 1
SUMMARY OF RESULTS

Variables	**Differences between traditional and entrepreneurial researchers (method: independent-samples *t* test)**	**Relationship with entrepreneurial intention (method: correlation)**
Motivations		
Development-driven motivations		
M1—to collect industrial feedback on the applicability of my invention	No difference	No relationship
M2—to ensure an ecosystem that is more flexible than the university for the further development of my invention	No difference	No relationship
Finance-driven motivations		
M3—to increase my personal income from my entrepreneurial activities	No difference	No relationship

M4—to obtain financial resources for further research	No difference	Weak positive relationship
Reputation-driven motivations		
M5—to increase my scientific reputation through entrepreneurship	No difference	Medium positive relationship
M6—to increase my social reputation through entrepreneurship	No difference	No relationship
M7—to demonstrate the practical relevance of my research to family/friends	Significant difference	Medium positive relationship
Commercialization-driven motivations		
M8—to ensure direct control over the commercialization of my invention	Significant difference	Weak positive relationship
M9—to benefit society with my invention	No difference	No relationship
Job security-driven motivations		
M10—to secure jobs for young researchers at my spin-off company	Significant difference	Medium positive relationship
M11—to secure a job if my university position is terminated	No difference	No relationship
Experience		
Research experience at a university (EXP-HEI-RES)	No difference	Medium positive relationship
Research experience at a company (EXP-COM-RES)	Significant difference	No relationship
Managerial experience at a company (EXP-COM-MAN)	Significant difference	Medium positive relationship

TABLE 2
MOTIVATIONAL VARIABLES

Motivational factors
Development-driven motivations
M1—to collect industrial feedback on the applicability of my invention
M2—to ensure an ecosystem that is more flexible than the university for the further development of my invention
Finance-driven motivations
M3—to increase my personal income from my entrepreneurial activities
M4—to obtain financial resources for further research
Reputation-driven motivations
M5—to increase my scientific reputation through entrepreneurship
M6—to increase my social reputation through entrepreneurship
M7—to demonstrate the practical relevance of my research to family/friends
Commercialization-driven motivations
M8—to ensure direct control over the commercialization of my invention
M9—to benefit society with my invention
Job security-driven motivations
M10—to secure jobs for young researchers at my spin-off company
M11—to secure a job if my university position is terminated

TABLE 3
VARIABLES OF EXPERIENCE

Experience	**Measurement**
Research experience at a higher education institution (EXP-HEI-RES)	Scale
Research experience at a company (EXP-COM-RES)	Scale
Managerial experience at a company (EXP-COM-MAN)	Scale

TABLE 4
THE NUMBER AND SHARE OF RESPONDENTS BY POSITION

Position	Traditional scientists		Entrepreneurial scientists		Total	
	N	%	*N*	%	*N*	%
Professor emeritus/emerita	6	2.1	1	3.6	7	2.2
Full professor	50	17.5	4	14.3	54	17.2
Associate professor	90	31.5	8	28.6	98	31.2
Assistant professor	48	16.8	5	17.9	53	16.9
Assistant lecturer	29	10.1	5	17.9	34	10.8
PhD candidate	9	3.1	1	3.6	10	3.2
PhD student	14	4.9	2	7.1	16	5.1
Senior research fellow	14	4.9	1	3.6	15	4.8
Research fellow	18	6.3	1	3.6	19	6.1
Research assistant	8	2.8	0	0.0	8	2.5
Total	286	100.0	28	100.0	314	100.0

TABLE 5
THE NUMBER AND SHARE OF RESPONDENTS BY SCIENTIFIC FIELD

Scientific fields	Traditional scientists		Entrepreneurial scientists		Total	
	N	%	*N*	%	*N*	%
Biological sciences	39	13.3	5	17.9	44	13.7
Physical sciences	13	4.4	3	10.7	16	5.0
Dental medicine	1	0.3	0	0.0	1	0.3
Geography	4	1.4	0	0.0	4	1.2
Earth sciences	14	4.8	0	0.0	14	4.3
Pharmaceutical sciences	8	2.7	0	0.0	8	2.5
Informatics	35	11.9	4	14.3	39	12.1
Chemistry	30	10.2	2	7.1	32	9.9
Environmental sciences	10	3.4	1	3.6	11	3.4
Mathematics	4	1.4	0	0.0	4	1.2
Engineering	64	21.8	7	25.0	71	22.0

Agriculture	13	4.4	3	10.7	16	5.0
Theoretical medicine	38	12.9	1	3.6	39	12.1
Clinical medicine	21	7.1	2	7.1	23	7.1
Total	294	100.0	28	100.0	322	100.0

TABLE 6
RESEARCH AND MANAGERIAL EXPERIENCE

Experience (in years)	**Traditional scientists**		**Entrepreneurial scientists**		**Total**	
	Mean	**Std. dev.**	**Mean**	**Std. dev.**	**Mean**	**Std. dev.**
Research experience at a higher education institution (EXP-HEI-RES)	19.1	11.7	19.1	12.0	19.1	11.7
Research experience at a company (EXP-COM-RES)	2.8	4.2	5.1	5.3	3.0	4.3
Managerial experience at a company (EXP-COM-MAN)	2.7	4.0	4.3	5.0	2.8	4.1

TABLE 7
ATTITUDES TOWARDS COMMERCIALIZATION

Attitudinal variables	**Traditional scientists**		**Entrepreneurial scientists**		**Total**	
	Mean	**Std. dev.**	**Mean**	**Std. dev.**	**Mean**	**Std. dev.**
The commercialization of scientific results through spin-off company plays important role in my scientific field.	2.7	1.3	4.1	0.8	2.8	1.3
It is important for me to commercialize my scientific results through spin-off company	2.8	1.3	4.3	0.7	3.0	1.3
If I had commercializable research result, I would commercialize it through spin-off company.	3.5	1.3	4.3	0.7	3.7	1.3

TABLE 8
DESCRIPTIVE STATISTICS OF MOTIVATIONAL VARIABLES BY SPIN-OFF CREATION INTENTION

		Levene's test for equality of variances		*t* test for equality of means					95 of t
		F	**Sig.**	***t***	***df***	**Sig. (2-tailed)**	**Mean difference**	**Std. error difference**	Lo
The commercialization of scientific results through spin-off company plays important role in my scientific field.	Equal variances assumed	16.901	.000	−5.747	285	.000	−1.42903	.24864	−
	Equal variances not assumed			−8.297	46.085	.000	−1.42903	.17223	−
It is important for me to commercialize my scientific results through spin-off company	Equal variances assumed	19.550	.000	−6.208	300	.000	−1.50956	.24318	−
	Equal variances not assumed			−10.550	59.539	.000	−1.50956	.14309	−
If I had commercializable research result, I would commercialize it through spin-off company.	Equal variances assumed	12.678	.000	−3.302	294	.001	−.82423	.24962	−
	Equal variances not assumed			−5.270	51.453	.000	−.82423	.15641	−

TABLE 9
DESCRIPTIVE STATISTICS OF MOTIVATIONAL VARIABLES BY SPIN-OFF CREATION INTENTION

	Traditional scientists				**Entrepreneurial scientists**				**Total**		
Motivational variables	**Importance (based on means)**	***N***	**Mean**	**Std. deviation**	**Importance (based on means)**	***N***	**Mean**	**Std. deviation**	**Importance (based on means)**	***N***	M

M4—to obtain financial resources for further research	1	265	4.29	0.8923	1	30	4.57	0.6789	1	353	4
M8—to ensure direct control over the commercialization of my invention	6	246	4.10	0.9948	2	29	4.52	0.6336	6	331	4
M2—to ensure an ecosystem that is more flexible than the university for the further development of my invention	2	237	4.27	0.9583	3	30	4.50	0.9738	2	316	4
M1—to collect industrial feedback on the applicability of my invention	3	245	4.20	1.0065	4	30	4.47	0.7303	4	329	4
M10—to secure jobs for young researchers at my spin-off company	7	260	4.01	1.0076	5	30	4.43	0.7739	7	348	4
M3—to increase my personal income from my entrepreneurial activities	4	267	4.20	0.8895	6	30	4.40	0.6747	3	354	4
M9—to benefit society with my invention	5	265	4.15	1.0237	7	30	4.30	0.8769	5	355	4
M11—to secure a job if my university position is terminated	8	253	3.72	1.2858	8	29	4.00	1.1019	8	339	3
M5—to increase my scientific reputation through entrepreneurship	10	261	3.03	1.2400	9	30	3.33	1.1842	10	351	3

M7—to demonstrate the practical relevance of my research to family/friends	11	261	2.67	1.2153	10	30	3.33	1.4700	11	352	2
6—to increase my social reputation through entrepreneurship	9	262	3.08	1.2369	11	30	3.27	1.0807	9	352	3

TABLE 10
INDEPENDENT-SAMPLES TEST

		Levene's test for equality of variances		***t* test for equality of means**					
		F	**Sig.**	***t***	***df***	**Sig. (2-tailed)**	**Mean difference**	**Std. error difference**	**95 % of th**
									Lowe
M1—to collect industrial feedback on the applicability of my invention	Equal variances assumed	1.340	.248	−1.405	273	.161	−.26667	.18973	−.6
	Equal variances not assumed			−1.801	43.778	.079	−.26667	.14803	−.5
M8—to ensure direct control over the commercialization of my invention	Equal variances assumed	1.889	.170	−2.196	273	.029	−.41562	.18927	−.7
	Equal variances not assumed			−3.109	46.191	.003	−.41562	.13367	−.6
M2—to ensure an ecosystem that is more flexible than the university for the further development of my invention	Equal variances assumed	.011	.918	−1.236	265	.218	−.22996	.18603	−.5
	Equal variances not assumed			−1.221	36.478	.230	−.22996	.18837	−.6

M7—to demonstrate the practical relevance of my research to family/friends	Equal variances assumed	2.946	.087	−2.782	289	.006	−.66667	.23967	−1.1
	Equal variances not assumed			−2.392	33.712	.022	−.66667	.27873	−1.2
M5—to increase my scientific reputation through entrepreneurship	Equal variances assumed	.004	.952	−1.272	289	.204	−.30268	.23799	−.7
	Equal variances not assumed			−1.319	36.705	.195	−.30268	.22942	−.7
M6—to increase my social reputation through entrepreneurship	Equal variances assumed	1.009	.316	−.792	290	.429	−.18651	.23557	−.6
	Equal variances not assumed			−.882	38.258	.384	−.18651	.21158	−.6
M9—to benefit society with my invention	Equal variances assumed	.391	.532	−.747	293	.456	−.14528	.19458	−.5
	Equal variances not assumed			−.845	38.538	.404	−.14528	.17201	−.4
M11—to secure a job if my university position is terminated	Equal variances assumed	6.632	.011	−1.112	280	.267	−.27668	.24871	−.7
	Equal variances not assumed			−1.258	37.321	.216	−.27668	.22002	−.7
M10—to secure jobs for young researchers at my spin-off company	Equal variances assumed	.181	.671	−2.217	288	.027	−.42179	.19024	−.7
	Equal variances			−2.730	41.279	.009	−.42179	.15449	−.7

	not assumed								
M3—to increase my personal income from my entrepreneurial activities	Equal variances assumed	.544	.461	−1.202	295	.230	−.20150	.16767	−.53
	Equal variances not assumed			−1.496	41.264	.142	−.20150	.13467	−.47
M4—to obtain financial resources for further research	Equal variances assumed	.986	.322	−1.663	293	.097	−.27987	.16827	−.61
	Equal variances not assumed			−2.065	41.278	.045	−.27987	.13553	−.55

TABLE 11
CORRELATIONS

		Entrepreneurial intention (Pearson correlation)	**Entrepreneurial intention (Spearman correlation)**
M1—to collect industrial feedback on the applicability of my invention	Correlation	.100	.031
	Sig. (2-tailed)	.098	.610
	N	275	275
M8—to ensure direct control over the commercialization of my invention	Correlation	.120*	.057
	Sig. (2-tailed)	.047	.345
	N	275	275
M2—to ensure an ecosystem that is more flexible than the university for the further development of my invention	Correlation	.041	.024
	Sig. (2-tailed)	.502	.693
	N	267	267
M7—to demonstrate the practical relevance of my research to family/friends	Correlation	.240**	.230**
	Sig. (2-tailed)	.000	.000
	N	291	291
M5—to increase my scientific reputation through entrepreneurship	Correlation	.187**	.198**
	Sig. (2-tailed)	.001	.001
	N	291	291
M6—to increase my social reputation through entrepreneurship	Correlation	.108	.104
	Sig. (2-tailed)	.066	.077
	N	292	292
M9—to benefit society with my invention	Correlation	.043	.006
	Sig. (2-tailed)	.467	.915

	N	295	295
M11—to secure a job if my university position is terminated	Correlation	.058	.012
	Sig. (2-tailed)	.330	.839
	N	282	282
M10—to secure jobs for young researchers at my spin-off company	Correlation	.166**	.151**
	Sig. (2-tailed)	.005	.010
	N	290	290
M3—to increase my personal income from my entrepreneurial activities	Correlation	.089	.043
	Sig. (2-tailed)	.128	.465
	N	297	297
M4—to obtain financial resources for further research	Correlation	.133*	.109
	Sig. (2-tailed)	.022	.062
	N	295	295

*Correlation is significant at the 0.05 level (2-tailed)
**Correlation is significant at the 0.01 level (2-tailed)
Source: authors' compilation

TABLE 12
INDEPENDENT-SAMPLES TEST

Independent-samples test										
		Levene's test for equality of variances		***t* test for equality of means**						
		F	**Sig.**	***t***	***df***	**Sig. (2-tailed)**	**Mean difference**	**Std. error difference**	**95 % confidence interval of the difference**	
									Lower	**Upper**
Research experience at a higher education institution	Equal variances assumed	.000	.985	−.016	314	.988	−.03621	2.31726	−4.59554	4.52312
	Equal variances not assumed			−.015	32.172	.988	−.03621	2.37047	−4.86369	4.79127
Research experience at a company	Equal variances assumed	3.524	.061	−2.906	320	.004	−2.42156	.83326	−4.06091	−.78221
	Equal variances not assumed			−2.383	31.505	.023	−2.42156	1.01606	−4.49247	−.35065
Managerial experience at a company	Equal variances assumed	2.671	.103	−2.076	319	.039	−1.64939	.79448	−3.21246	−.08631
	Equal variances not assumed			−1.723	31.623	.095	−1.64939	.95739	−3.60044	.30166

TABLE 13
CORRELATIONS

		Research experiences at university	Research experiences at company	Managerial experiences at company	Entrepreneurial intention
Research experience at a higher education institution	Pearson Correlation	1			
	Sig. (2-tailed)				
	N	502			
Research experience at a company	Pearson correlation	.118*	1		
	Sig. (2-tailed)	.010			
	N	473	493		
Managerial experience at a company	Pearson Correlation	.136**	.716**	1	
	Sig. (2-tailed)	.003	.000		
	N	466	484	486	
Entrepreneurial intention	Pearson Correlation	.139**	.093	.158**	1
	Sig. (2-tailed)	.007	.069	.002	
	N	375	383	380	393

*Correlation is significant at the 0.05 level (2-tailed)
**Correlation is significant at the 0.01 level (2-tailed)

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TRANSLATED VERSION: SPANISH

Below is a rough translation of the insights presented above. This was done to give a general understanding of the ideas presented in the paper. Please excuse any grammatical mistakes and do not hold the original authors responsible for these mistakes.

VERSION TRADUCIDA: ESPAÑOL

A continuación se muestra una traducción aproximada de las ideas presentadas anteriormente. Esto se hizo para dar una comprensión general de las ideas presentadas en el documento. Por favor, disculpe cualquier error gramatical y no responsabilite a los autores originales de estos errores.

INTRODUCCIÓN

Las universidades contribuyen en gran medida al desarrollo social con sus actividades educativas y de investigación. En las últimas décadas, el auge de la universidad emprendedora y la necesidad de comercialización del conocimiento universitario han ganado una atención significativa, planteando así grandes retos para las instituciones de educación superior (Etzkowitz 1998).

En nuestra economía basada en el conocimiento, el papel de las universidades es cada vez más importante (Laredo y Mustar 2001) porque desempeñan un papel importante en la innovación y el desarrollo económico (Mansfield y Lee 1996). El conocimiento académico también puede contribuir al crecimiento económico, mientras que cuanto más una empresa aplica el conocimiento universitario en sus actividades comerciales, más crecimiento económico se puede lograr. Pero sólo una pequeña proporción de los conocimientos universitarios es aplicada por los actores industriales, un hecho que puede explicarse por los escasos canales de flujo de conocimiento entre la academia y la industria (Mueller 2006). En la comercialización del conocimiento universitario, las empresas derivadas pueden actuar como intermediarios. En este caso, el investigador puede comercializar sus resultados de investigación en su propia empresa derivada, y por lo tanto puede mantener el control sobre el desarrollo posterior de la invención y el proceso de comercialización.

Tradicionalmente, las universidades eran los centros de producción de conocimiento, aunque por lo general, en el caso de las universidades de segunda generación, la aplicación del conocimiento sólo significaba educación y la difusión de publicaciones científicas (Wissema 2009). A finales del siglo XX, el proceso de aplicación del conocimiento alteró y surgieron las universidades de "tercera generación", donde se abrieron las puertas para la comercialización de los resultados de la investigación y las tecnologías (principios) producidas en las universidades se introdujeron en el mercado, por lo que la aplicación comercial del conocimiento se hizo predominante (Wissema 2009). Etzkowitz (1983) llamó a estas instituciones como "universidades emprendedoras" donde la investigación aplicada y la aplicación del conocimiento ganaron importancia. Las relaciones industriales de las universidades comenzaron a expandirse y se establecieron instituciones especiales, como las oficinas de transferencia de tecnología, para coordinarlas (Buzás 2005; Bercovitz y Feldmann 2006). En la economía basada en el conocimiento del siglo XXI, este proceso ha adquirido un nuevo impulso; las universidades de "cuarta generación" han surgido donde el conocimiento se ha convertido en la piedra fundamental de la economía de una región. Estas instituciones influyen en su entorno, incluida la comunidad y la sociedad de la región de manera proactiva (Pawlowski 2009; Prónay-Buzás 2015). Con respecto a este fenómeno, es importante señalar que, según la comprensión de Carayannis y Campbell (2006), estas generaciones pueden ser vistas no sólo como fases sucesivas, sino también como diferentes modelos de innovación que pueden ser percibidos simultáneamente. Los autores lo llaman enfoque de modo 3 donde el pluralismo de diferentes modos de conocimiento e innovación (paradigmas) coexiste (Carayannis y Campbell 2010).

La adecuación de los requisitos de comercialización causa problemas no sólo para las instituciones, sino también para los investigadores individuales. La participación en el proceso de comercialización puede amenazar la libertad académica (Nelson 2004) y crear dificultades en las actividades fundamentales de

investigación y publicación (Arvanitis et al. 2008). Sin embargo, es necesario que el inventor esté entusiasmado con la comercialización de los resultados de la investigación para tener éxito a través de la creación derivada (Blair y Hitchens 1998). Además, por lo general no podemos esperar que los investigadores determinen las posibles áreas de aplicación o el potencial comercial de la invención (Nilsson et al. 2010). Estudios recientes destacan varios factores que influyen en el proceso de toma de decisiones de los investigadores relacionados con la comercialización, incluyendo factores institucionales, organizativos e individuales (Perkmann et al. 2013). Thornton (1999) distinguió dos grupos de factores que influyeron. El primer grupo incluye actitudes hacia la comercialización y las características personales de los investigadores, que afectan a las motivaciones intrínsecas del individuo (lado de la oferta), mientras que el último grupo de factores consiste en factores institucionales y organizativos (del lado de la demanda). En nuestro estudio, abordaremos la motivación de las personas; por lo tanto, los factores organizativos e institucionales están excluidos en nuestra investigación.

Con respecto a las características personales del inventor, hay dos áreas importantes que pueden influir en gran medida en los posibles resultados comerciales de la invención. En primer lugar, tenemos que considerar la capacidad del investigador para determinar posibles áreas de aplicación y adquirir recursos financieros para su comercialización. En segundo lugar, debemos tener en cuenta la aspiración, que reflexiona sobre la voluntad del investigador de participar en la comercialización (Hoye y Pries 2009). La determinación de las posibles áreas de aplicación depende en gran medida de la experiencia técnica del individuo, la experiencia previa adquirida en la comercialización y su red industrial fuera de la academia. Además, los incentivos proporcionados, los riesgos percibidos y los beneficios previstos con respecto a la comercialización desempeñan un papel importante en la participación de la empresa en las actividades de la universidad y la industria (Phan y Siegel 2006).

El conocimiento tácito del inventor también requiere la participación del científico en la transferencia de tecnologías en etapas tempranas (Shane 2004). A este respecto, la aplicación exitosa de la invención es cuestionable sin un conocimiento particular sobre la tecnología que posee el inventor. Si al investigador le resulta difícil participar en la transferencia de tecnología o no quiere, es difícil aplicar la invención en un entorno industrial (Siegel et al. 2003; Stevens y Bagby 1999).

Aunque los principales obstáculos mencionados anteriormente pueden influir en gran medida en la comercialización exitosa de los resultados científicos universitarios, la literatura internacional no se ha centrado suficientemente en los investigadores individuales (Ankrah et al. 2013). En este estudio, nuestro objetivo es investigar las diferencias motivacionales entre grupos específicos de investigadores. Distinguimos a los académicos en dos segmentos: los científicos emprendedores planean comercializar sus resultados de investigación en una empresa derivada, mientras que los científicos tradicionales no muestran interés en esto. Asumimos que estos dos grupos de científicos difieren en motivaciones, y queríamos determinar estas motivaciones.

CONCLUSIÓN

Estudios previos se han centrado en la motivación de los investigadores en el emprendimiento académico, pero hay una falta de encuestas que investiguen las diferencias motivacionales por parte de un grupo específico de académicos. Nuestros resultados de investigación contribuyen a la necesidad de una mejor comprensión de las diferencias motivacionales entre los científicos tradicionales y emprendedores. En nuestro estudio, proporcionamos evidencia de que la experiencia gerencial adquirida en las empresas puede afectar la intención empresarial de los científicos. En este sentido, las universidades deben considerar cómo las instituciones pueden motivar a los científicos a obtener experiencia gerencial, o al menos relacionada con la investigación, en las empresas. En la mayoría de los casos, las instituciones de educación superior no toleran a los investigadores que ocupan otros puestos en empresas además de su posición académica actual; sin embargo, esta postura podría ser un obstáculo para la intención empresarial y obstaculizar el emprendimiento académico en general.

TRANSLATED VERSION: FRENCH

Below is a rough translation of the insights presented above. This was done to give a general understanding of the ideas presented in the paper. Please excuse any grammatical mistakes and do not hold the original authors responsible for these mistakes.

VERSION TRADUITE: FRANÇAIS

Voici une traduction approximative des idées présentées ci-dessus. Cela a été fait pour donner une compréhension générale des idées présentées dans le document. Veuillez excuser toutes les erreurs grammaticales et ne pas tenir les auteurs originaux responsables de ces erreurs.

INTRODUCTION

Les universités contribuent grandement au développement social par leurs activités éducatives et de recherche. Au cours des dernières décennies, l'essor de l'université entrepreneuriale et la nécessité de commercialiser les connaissances universitaires ont attiré beaucoup d'attention, posant ainsi des défis majeurs aux établissements d'enseignement supérieur (Etzkowitz, 1998).

Dans notre économie du savoir, le rôle des universités est de plus en plus important (Laredo et Mustar, 2001) parce qu'elles jouent un rôle important dans l'innovation et le développement économique (Mansfield et Lee, 1996). Les connaissances académiques peuvent également contribuer à la croissance économique, tandis que plus une entreprise applique les connaissances universitaires dans ses activités commerciales, plus la croissance économique peut être atteinte. Mais seule une faible proportion des connaissances universitaires est appliquée par les acteurs industriels, ce qui peut s'expliquer par les rares canaux de flux de connaissances entre le milieu universitaire et l'industrie (Mueller, 2006). Dans la commercialisation des connaissances universitaires, les entreprises dérivées peuvent agir comme intermédiaires. Dans ce cas, le chercheur peut commercialiser ses résultats de recherche dans sa propre entreprise dérivée, et il ou elle peut ainsi garder le contrôle sur le développement ultérieur de l'invention et le processus de commercialisation.

Les universités étaient traditionnellement les centres de production du savoir, bien que généralement — dans le cas des universités de deuxième génération — l'application des connaissances ne signifiait que l'éducation et la diffusion de publications scientifiques (Wissema, 2009). À la fin du xxe siècle, le processus d'application des connaissances a changé et les universités de « troisième génération » ont vu le jour, où les portes de la commercialisation des résultats de la recherche et des technologies (à un stade précoce) produites dans les universités ont été introduites sur le marché, de sorte que l'application commerciale des connaissances est devenue prédominante (Wissema, 2009). Etzkowitz (1983) a qualifié ces institutions d'« universités entrepreneuriales » où la recherche appliquée et l'application des connaissances ont pris de l'importance. Les relations industrielles des universités ont commencé à s'étendre, et des institutions spéciales, comme des bureaux de transfert de technologie, ont été créées pour les coordonner (Buzás, 2005; Bercovitz et Feldmann, 2006). Dans l'économie du savoir du xxie siècle, ce processus a pris un nouvel élan; les universités de « quatrième génération » ont vu le jour là où le savoir est devenu la pierre angulaire de l'économie d'une région. Ces institutions influencent leur environnement, y compris la communauté et la société de la région d'une manière proactive (Pawlowski, 2009; Prónay-Buzás 2015). En ce qui concerne ce phénomène, il est important de noter que, selon la compréhension de Carayannis et Campbell (2006), ces générations peuvent être considérées non seulement comme des phases successives, mais aussi comme des modèles d'innovation différents qui peuvent être perçus simultanément. Les auteurs l'appellent mode 3 approche où le pluralisme des différents modes de connaissance et d'innovation (paradigmes) coexiste (Carayannis et Campbell 2010).

L'adéquation des exigences en matière de commercialisation pose des problèmes non seulement aux institutions, mais aussi aux chercheurs individuels. La participation au processus de commercialisation peut menacer la liberté académique (Nelson, 2004) et créer des difficultés dans les activités de recherche

fondamentale et de publication (Arvanitis et al., 2008). Toutefois, il est nécessaire que l'inventeur soit enthousiaste à l'idée de commercialiser les résultats de la recherche pour réussir grâce à la création dérivée (Blair et Hitchens, 1998). De plus, nous ne pouvons habituellement pas nous attendre à ce que les chercheurs déterminent les domaines d'application possibles ou le potentiel commercial de l'invention (Nilsson et coll., 2010). Des études récentes mettent en évidence divers facteurs qui influencent le processus décisionnel des chercheurs en ce qui a rien à voir avec la commercialisation, y compris les facteurs institutionnels, organisationnels et individuels (Perkmann et coll., 2013). Thornton (1999) a distingué deux groupes de facteurs d'influence. Le premier groupe comprend les attitudes à l'égard de la commercialisation et les caractéristiques personnelles des chercheurs, qui affectent les motivations intrinsèques de l'individu (côté offre), tandis que le dernier groupe de facteurs se compose de facteurs institutionnels et organisationnels (côté demande). Dans notre étude, nous aborderons la motivation des individus; par conséquent, les facteurs organisationnels et institutionnels sont exclus dans notre enquête.

En ce qui concerne les caractéristiques personnelles de l'inventeur, il existe deux domaines importants qui peuvent fortement influencer les résultats commerciaux possibles de l'invention. Premièrement, nous devons tenir compte de la capacité du chercheur de déterminer les domaines d'application possibles et d'acquérir des ressources financières pour la commercialisation. Deuxièmement, nous devons tenir compte de l'aspiration, qui reflète la volonté du chercheur de s'engager dans la commercialisation (Hoye et Pries, 2009). La détermination des domaines d'application possibles dépend en grande partie de l'expertise technique de l'individu, de son expérience antérieure acquise en commercialisation et de son réseau industriel en dehors du milieu universitaire. De plus, les incitatifs offerts, les risques perçus et les avantages escomptés en ce qui concerne la commercialisation jouent un rôle important dans la participation à des activités universitaires et industrielles (Phan et Siegel, 2006).

La connaissance tacite de l'inventeur exige également la participation du scientifique au transfert des technologies à un stade précoce (Shane, 2004). À cet égard, l'application réussie de l'invention est discutable sans connaissance particulière de la technologie qui est possédée par l'inventeur. Si le chercheur a de la difficulté à participer au transfert de technologie ou ne le veut pas, il est difficile d'appliquer l'invention dans un environnement industriel (Siegel et coll., 2003; Stevens et Bagby, 1999).

Bien que les principaux obstacles mentionnés ci-dessus puissent grandement influencer la commercialisation réussie des résultats scientifiques universitaires, la littérature internationale ne s'est pas suffisamment concentrée sur les chercheurs individuels (Ankrah et coll., 2013). Dans cette étude, notre objectif est d'étudier les différences de motivation entre des groupes spécifiques de chercheurs. Nous avons distingué les universitaires en deux segments : les scientifiques entrepreneuriaux prévoient de commercialiser leurs résultats de recherche dans une entreprise dérivée, tandis que les scientifiques traditionnels ne s'y intéressent pas. Nous avons supposé que ces deux groupes de scientifiques diffèrent dans les motivations, et nous voulions déterminer ces motivations.

CONCLUSION

Des études antérieures ont mis l'accent sur la motivation des chercheurs dans l'entrepreneuriat universitaire, mais il y a un manque d'enquêtes qui étudient les différences de motivation par un groupe spécifique d'universitaires. Nos résultats de recherche contribuent à la nécessité d'une meilleure compréhension des différences de motivation entre les scientifiques traditionnels et les scientifiques entrepreneuriaux. Dans notre étude, nous avons fourni la preuve que l'expérience en gestion acquise dans les entreprises peut affecter l'intention entrepreneuriale des scientifiques. À cet égard, les universités devraient réfléchir à la façon dont les institutions peuvent motiver les scientifiques à acquérir de l'expérience en gestion , ou du moins en recherche, dans les entreprises. Dans la plupart des cas, les établissements d'enseignement supérieur ne tolèrent pas les chercheurs occupant d'autres postes dans des entreprises en plus de leur poste universitaire actuel; toutefois, cette position pourrait être un obstacle à l'intention entrepreneuriale et entraver l'entrepreneuriat universitaire en général.

TRANSLATED VERSION: GERMAN

Below is a rough translation of the insights presented above. This was done to give a general understanding of the ideas presented in the paper. Please excuse any grammatical mistakes and do not hold the original authors responsible for these mistakes.

ÜBERSETZTE VERSION: DEUTSCH

Hier ist eine ungefähre Übersetzung der oben vorgestellten Ideen. Dies wurde getan, um ein allgemeines Verständnis der in dem Dokument vorgestellten Ideen zu vermitteln. Bitte entschuldigen Sie alle grammatikalischen Fehler und machen Sie die ursprünglichen Autoren nicht für diese Fehler verantwortlich.

EINLEITUNG

Die Universitäten tragen mit ihren Bildungs- und Forschungsaktivitäten einen großen Beitrag zur sozialen Entwicklung bei. In den letzten Jahrzehnten hat der Aufstieg der unternehmerischen Universität und die Notwendigkeit der Kommerzialisierung von hochschultechnischem Wissen große Aufmerksamkeit erregt und stellt damit die Hochschulen vor große Herausforderungen (Etzkowitz 1998).

In unserer wissensbasierten Wirtschaft wird die Rolle der Universitäten immer wichtiger (Laredo und Mustar 2001), da sie eine bedeutende Rolle bei Innovation und wirtschaftlicher Entwicklung spielen (Mansfield und Lee 1996). Akademisches Wissen kann auch zum Wirtschaftswachstum beitragen, während je mehr ein Unternehmen universitäres Wissen in seiner Geschäftstätigkeit anwendet, desto mehr Wirtschaftswachstum kann erreicht werden. Aber nur ein kleiner Teil des universitären Wissens wird von industriell geprägten Akteuren eingesetzt, was sich durch die knappen Wissensflusskanäle zwischen Wissenschaft und Industrie erklären lässt (Mueller 2006). Bei der Kommerzialisierung von universitärem Wissen können Spin-off-Unternehmen als Vermittler fungieren. In diesem Fall kann der Forscher seine Forschungsergebnisse in seinem eigenen Spin-off-Unternehmen kommerzialisieren und somit die Kontrolle über die Weiterentwicklung der Erfindung und den Kommerzialisierungsprozess behalten.

Universitäten waren traditionell die Zentren der Wissensproduktion, obwohl die Wissensanwendung in der Regel – im Falle von Universitäten der zweiten Generation – nur Bildung und die Verbreitung wissenschaftlicher Publikationen bedeutete (Wissema 2009). Am Ende des zwanzigsten Jahrhunderts änderte sich der Prozess der Wissensanwendung und die Universitäten der "dritten Generation" entstanden, wo die Tore für die Kommerzialisierung von Forschungsergebnissen geöffnet wurden und (frühe) Technologien, die an Universitäten produziert wurden, auf den Markt gebracht wurden, so dass die kommerzielle Anwendung von Wissen vorherrschend wurde (Wissema 2009). Etzkowitz (1983) bezeichnete diese Einrichtungen als "unternehmerische Universitäten", an denen die angewandte Forschung und die Wissensanwendung an Bedeutung gewannen. Die industriellen Beziehungen der Universitäten begannen sich zu erweitern, und es wurden spezielle Institutionen – wie Technologietransferbüros – eingerichtet, um sie zu koordinieren (Buz es 2005; Bercovitz und Feldmann 2006). In der wissensbasierten Wirtschaft des 21. Jahrhunderts hat dieser Prozess neue Impulse erhalten; Die Universitäten der "vierten Generation" sind entstanden, wo Wissen zum Grundstein der Wirtschaft einer Region geworden ist. Diese Institutionen beeinflussen ihr Umfeld, einschließlich der Gemeinschaft und der Gesellschaft der Region, proaktiv (Pawlowski 2009; Prénay–Buzs 2015). In Bezug auf dieses Phänomen ist es wichtig zu beachten, dass nach Carayannis und Campbells (2006) Verständnis diese Generationen nicht nur als aufeinanderfolgende Phasen, sondern auch als verschiedene Innovationsmodelle gesehen werden können, die gleichzeitig wahrgenommen werden können. Die Autoren nennen es Mode-3-Ansatz, bei dem Pluralismus verschiedener Wissens- und Innovationsmodi (Paradigmen) nebeneinander existieren (Carayannis und Campbell 2010).

Die Angemessenheit der Kommerzialisierungsanforderungen bereitet nicht nur den Institutionen, sondern auch einzelnen Forschern Probleme. Die Teilnahme am Kommerzialisierungsprozess kann die

akademische Freiheit bedrohen (Nelson 2004) und Schwierigkeiten bei der Grundlagenforschung und Veröffentlichung spart (Arvanitis et al. 2008). Es ist jedoch notwendig, dass der Erfinder für die Kommerzialisierung der Forschungsergebnisse begeistert ist, um durch Spin-off-Kreation erfolgreich zu sein (Blair und Hitchens 1998). Darüber hinaus können wir von Forschern in der Regel nicht erwarten, dass sie die möglichen Anwendungsbereiche oder das kommerzielle Potenzial der Erfindung bestimmen (Nilsson et al. 2010). Jüngste Studien zeigen verschiedene Faktoren auf, die den Entscheidungsprozess der Forscher im Zusammenhang mit der Kommerzialisierung beeinflussen, einschließlich institutioneller, organisatorischer und individueller Faktoren (Perkmann et al. 2013). Thornton (1999) zeichnete zwei Gruppen von Einflussfaktoren aus. Die erste Gruppe umfasst Einstellungen zur Kommerzialisierung und die persönlichen Eigenschaften der Forscher, die die intrinsischen Motivationen des Individuums (Angebotsseite) beeinflussen, während die letztere Gruppe von Faktoren aus institutionellen und organisatorischen Faktoren (Nachfrageseite) besteht. In unserer Studie werden wir uns der Motivation des Einzelnen nähern; organisatorische und institutionelle Faktoren sind daher in unserer Untersuchung ausgeschlossen.

Hinsichtlich der persönlichen Eigenschaften des Erfinders gibt es zwei wichtige Bereiche, die die möglichen kommerziellen Ergebnisse der Erfindung stark beeinflussen können. Erstens müssen wir die Fähigkeit des Forschers in Betracht ziehen, mögliche Anwendungsbereiche zu bestimmen und finanzielle Mittel für die Kommerzialisierung zu erwerben. Zweitens müssen wir das Streben berücksichtigen, das die Bereitschaft des Forschers zur Kommerzialisierung widerspiegelt (Hoye und Pries 2009). Die Bestimmung der möglichen Einsatzgebiete hängt in hohem Maße von der fachlichen Expertise des Einzelnen, den bisherigen Kommerzialisierungserfahrungen und seinem industriellen Netzwerk außerhalb der Wissenschaft ab. Darüber hinaus spielen die Anreize, die wahrgenommenen Risiken und die erwarteten Vorteile im Hinblick auf die Kommerzialisierung eine wichtige Rolle bei der Teilnahme an universitären Und industrietreibenden Aktivitäten (Phan und Siegel 2006).

Das stillschweigende Wissen des Erfinders erfordert auch die Beteiligung des Wissenschaftlers am Transfer von Frühphase-Technologien (Shane 2004). In soweit ist die erfolgreiche Anwendung der Erfindung ohne besondere Kenntnisse über die Technologie, die der Erfinder besitzt, fragwürdig. Wenn es dem Forscher schwer fällt, am Technologietransfer teilzunehmen oder nicht will, ist es schwierig, die Erfindung in einem industriellen Umfeld anzuwenden (Siegel et al. 2003; Stevens und Bagby 1999).

Obwohl die oben genannten Haupthindernisse die erfolgreiche Kommerzialisierung universitärer wissenschaftlicher Ergebnisse stark beeinflussen können, hat sich die internationale Literatur nicht ausreichend auf einzelne Forscher konzentriert (Ankrah et al. 2013). In dieser Studie wollen wir Motivationsunterschiede zwischen bestimmten Forschergruppen untersuchen. Wir haben Akademiker in zwei Segmente einteilen: Unternehmerwollende planen, ihre Forschungsergebnisse in einem Spin-off-Unternehmen zu kommerzialisieren, während traditionelle Wissenschaftler kein Interesse daran zeigen. Wir gingen davon aus, dass sich diese beiden Gruppen von Wissenschaftlern in ihren Beweggründen unterscheiden, und wir wollten diese Motivationen bestimmen.

SCHLUSSFOLGERUNG

Frühere Studien konzentrierten sich auf die Motivation von Forschern im akademischen Unternehmertum, aber es fehlt an Umfragen, die die Motivationsunterschiede nach bestimmten Akademischen Gruppen untersuchen. Unsere Forschungsergebnisse tragen dazu bei, dass Motivationsunterschiede zwischen traditionellen und unternehmerischen Wissenschaftlern besser verstanden werden müssen. In unserer Studie haben wir beweise, dass Unternehmenserfahrung die unternehmerische Absicht von Wissenschaftlern beeinflussen kann. In diesem Zusammenhang sollten Universitäten überlegen, wie Institutionen Wissenschaftler motivieren können, Management- oder zumindest forschungsbezogene Erfahrungen in Unternehmen zu sammeln. In den meisten Fällen tolerieren die Hochschulen nicht, dass Forscher neben ihrer derzeitigen akademischen Position andere Positionen in Unternehmen innehaben; diese Haltung könnte jedoch ein Hindernis für unternehmerische Absichten darstellen und das akademische Unternehmertum im Allgemeinen behindern.

TRANSLATED VERSION: PORTUGUESE

Below is a rough translation of the insights presented above. This was done to give a general understanding of the ideas presented in the paper. Please excuse any grammatical mistakes and do not hold the original authors responsible for these mistakes.

VERSÃO TRADUZIDA: PORTUGUÊS

Aqui está uma tradução aproximada das ideias acima apresentadas. Isto foi feito para dar uma compreensão geral das ideias apresentadas no documento. Por favor, desculpe todos os erros gramaticais e não responsacule os autores originais responsáveis por estes erros.

INTRODUÇÃO

As universidades contribuem muito para o desenvolvimento social com suas atividades educacionais e de pesquisa. Nas últimas décadas, a ascensão da universidade empreendedora e a necessidade de comercialização do conhecimento universitário ganharam atenção significativa, colocando grandes desafios para as instituições de ensino superior (Etzkowitz 1998).

Em nossa economia baseada no conhecimento, o papel das universidades é cada vez mais importante (Laredo e Mustar 2001) porque desempenham um papel significativo na inovação e no desenvolvimento econômico (Mansfield e Lee 1996). O conhecimento acadêmico também pode contribuir para o crescimento econômico, enquanto quanto mais uma empresa aplica conhecimento universitário em suas atividades empresariais, mais crescimento econômico pode ser alcançado. Mas apenas uma pequena proporção do conhecimento universitário é aplicada por atores industriais, fato que pode ser explicado pelos escassos canais de fluxo de conhecimento entre a academia e a indústria (Mueller 2006). Na comercialização do conhecimento universitário, as empresas spin-off podem atuar como intermediários. Neste caso, o pesquisador pode comercializar seus resultados de pesquisa em sua própria empresa spin-off, e ele ou ela pode, assim, manter o controle sobre o desenvolvimento adicional da invenção e do processo de comercialização.

As universidades eram tradicionalmente os centros de produção de conhecimento, embora geralmente — no caso das universidades de segunda geração — o aplicativo de conhecimento significava apenas educação e disseminação de publicações científicas (Wissema 2009). No final do século XX, o processo de aplicação do conhecimento alterou e surgiram as universidades de "terceira geração", onde os portões foram abertos para a comercialização de resultados de pesquisa e (estágio inicial) tecnologias produzidas nas universidades foram introduzidas no mercado, de modo que a aplicação comercial do conhecimento tornou-se predominante (Wissema 2009). Etzkowitz (1983) chamou essas instituições de "universidades empreendedoras" onde a pesquisa aplicada e o aplicativo de conhecimento ganharam importância. As relações industriais das universidades começaram a se expandir, e instituições especiais — como escritórios de transferência de tecnologia — foram criadas para coordená-las (Buzás 2005; Bercovitz e Feldmann 2006). Na economia baseada no conhecimento do século XXI, esse processo ganhou um novo impulso; as universidades de "quarta geração" surgiram onde o conhecimento se tornou a pedra fundamental da economia de uma região. Essas instituições influenciam seu ambiente, incluindo a comunidade e a sociedade da região de forma proativa (Pawlowski 2009; Prónay-Buzás 2015). Quanto a esse fenômeno, é importante notar que, de acordo com o entendimento de Carayannis e Campbell (2006), essas gerações podem ser vistas não apenas como fases sucessivas, mas também como diferentes modelos de inovação que podem ser percebidos simultaneamente. Os autores chamam de abordagem modo 3 onde o pluralismo de diferentes modos de conhecimento e inovação (paradigmas) coexiste (Carayannis e Campbell 2010).

A adequação dos requisitos de comercialização causa problemas não só para as instituições, mas também para pesquisadores individuais. A participação no processo de comercialização pode ameaçar a liberdade acadêmica (Nelson 2004) e criar dificuldades em atividades fundamentais de pesquisa e publicação (Arvanitis et al. 2008). No entanto, é necessário que o inventor esteja entusiasmado com a

comercialização dos resultados da pesquisa para ter sucesso através da criação spin-off (Blair e Hitchens 1998). Além disso, geralmente não podemos esperar que os pesquisadores determinem as possíveis áreas de aplicação ou o potencial comercial da invenção (Nilsson et al. 2010). Estudos recentes destacam vários fatores que influenciam o processo de tomada de decisão dos pesquisadores relacionados à comercialização, incluindo fatores institucionais, organizacionais e individuais (Perkmann et al. 2013). Thornton (1999) distinguiu dois grupos de fatores influenciadores. O primeiro grupo inclui atitudes em relação à comercialização e às características pessoais dos pesquisadores, que afetam as motivações intrínsecas do indivíduo (lado da oferta), enquanto este último grupo de fatores consiste em fatores institucionais e organizacionais (lado da demanda). Em nosso estudo, abordaremos a motivação dos indivíduos; assim, fatores organizacionais e institucionais são excluídos em nossa investigação.

Em relação às características pessoais do inventor, existem duas áreas importantes que podem influenciar muito os possíveis resultados comerciais da invenção. Em primeiro lugar, temos que considerar a capacidade do pesquisador de determinar possíveis áreas de aplicação e adquirir recursos financeiros para comercialização. Em segundo lugar, devemos levar em conta a aspiração, que reflete na disposição do pesquisador em se engajar na comercialização (Hoye e Pries 2009). A determinação das possíveis áreas de aplicação depende muito da expertise técnica do indivíduo, experiência prévia adquirida na comercialização e sua rede industrial fora da academia. Além disso, os incentivos proporcionados, os riscos percebidos e os benefícios esperados no que diz respeito à comercialização desempenham um papel importante na participação nas atividades universidade-indústria (Phan e Siegel 2006).

O conhecimento tácito do inventor também requer a participação do cientista na transferência de tecnologias em estágio inicial (Shane 2004). Nesse sentido, a aplicação bem sucedida da invenção é questionável sem conhecimento particular sobre a tecnologia que é possuída pelo inventor. Se o pesquisador tem dificuldade em participar da transferência de tecnologia ou não quer, é difícil aplicar a invenção em um ambiente industrial (Siegel et al. 2003; Stevens e Bagby 1999).

Embora os principais obstáculos observados acima possam influenciar muito a comercialização bem-sucedida dos resultados científicos universitários, a literatura internacional não se concentrou suficientemente em pesquisadores individuais (Ankrah et al. 2013). Neste estudo, nosso objetivo é investigar diferenças motivacionais entre grupos específicos de pesquisadores. Destacamos os acadêmicos em dois segmentos: cientistas empreendedores planejam comercializar seus resultados de pesquisa em uma empresa spin-off, enquanto cientistas tradicionais não demonstram interesse nisso. Assumimos que esses dois grupos de cientistas diferem em motivações, e queríamos determinar essas motivações.

CONCLUSÃO

Estudos anteriores têm focado na motivação dos pesquisadores no empreendedorismo acadêmico, mas há uma falta de pesquisas que investiguem as diferenças motivacionais por um grupo específico de acadêmicos. Nossos resultados de pesquisa contribuem para a necessidade de uma melhor compreensão das diferenças motivacionais entre cientistas tradicionais e empreendedores. Em nosso estudo, fornecemos evidências de que a experiência gerencial adquirida nas empresas pode afetar a intenção empreendedora dos cientistas. Nesse sentido, as universidades devem considerar como as instituições podem motivar os cientistas a ganhar experiência gerencial — ou pelo menos relacionada à pesquisa — nas empresas. Na maioria dos casos, as instituições de ensino superior não toleram pesquisadores que oduem de outros cargos em empresas, além de sua posição acadêmica atual; no entanto, essa postura pode ser uma barreira à intenção empreendedora e dificultar o empreendedorismo acadêmico em geral.