



SOBER
PROCEEDINGS

CIBES 2025 / 5th Current Issues in Business and Economic Studies Conference

From Motivation to Impact: Academic and Industrial Motivational Factors in the Output of University-Industry Collaboration

Klaudja Guga^a Ilira Pulaj^{b*}

^aDr., "Ismail-Qemali" University of Vlora, Albania, Orcid: 0000-0002-5257-9128

^bDr., "Ismail-Qemali" University of Vlora, Albania, ilira.pulaj@univlora.edu.al, Orcid: 0000-0001-5014-8933

*Corresponding Author

Abstract

Universities, industry, society, and government should collaborate to enhance their positive impact on the socio-economic system. While the academic literature has examined both the factors contributing to the success as well as the challenges that they face the collaboration between university and industry equally significant are the motivating factors. Some collaborations fail in the early stages due to insufficient motivation or lack of incentives, which limits further growth. Clarifying the expected benefits can help create a clearer framework for understanding the motivating factors, as well as aligning them with the expectations of universities and enterprises. The focus of this study is to explore perceived benefits that serve as incentives for the collaboration in the context of a developing country, such as Albania. Through empirical results, this paper adds knowledge to the existing literature and helps provide a clearer framework for designing the necessary strategies. After studying the literature, a questionnaire was constructed from which data were generated for the elaboration of the empirical model. According to the Principal Components Analysis, all questions load positively and significantly on PC1. This shows that from both the academic and business perspectives, the collaboration between university and industry is very valuable and useful in developing country. According to the perception of academics and industry the main encouragement for these partnerships comes due to the perceived benefits from stakeholders like the exchange of knowledge, ideas, access to new technologies or process improvement and innovation. These elements contribute directly to the improvement of the organization's performance. For the university staff is also considerable the impact on improving the quality of the university. The results from the business perspective highlight that the main learner of these collaborations are the perceived benefits in terms of employee training.

Keywords: University-industry collaboration, motivational factors, perceived benefits, developing country

Cited: Guga, K., & Pulaj, I. (2026). From motivation to impact: Academic and industrial motivational factors in the output of university-industry collaboration. *Sustainability, Organization, Business and Economic Research (SOBER)*, 3, 19-33. <https://doi.org/10.66414/sober.291158>

Selection and peer-review under responsibility of the 5th Current Issues in Business and Economic Studies Conference.

1. INTRODUCTION

U-I collaboration has become a key component of innovation systems, policy-making for increasing the quality of human capital (Mora-Valentin et al., 2004), improving employment opportunities (Ankrah & AL-Tabbaa, 2015). Universities and industry are two key actors that, through their interaction, generate new knowledge and technologies and make them applicable in practice (Guerrero et al., 2016a). U-I collaboration has yielded positive outcomes across several directions of modern societies, both economically and technologically (Etzkowitz & Leydesdorff, 2000), and has also gained great importance in the design of public policies that promote economic research and development (Perkman et al., 2013). The engagement of these actors plays a crucial role in transforming the U-I collaboration into a concrete output. This paper seeks to address the motivational challenges faced by both the academic and industrial side as well as the communication barriers that arise in a developing country such as Albania, with special opportunities for such collaborations. Through U-I collaboration, both actors gain mutual benefits and create an internal incentive cycle that stimulates further commitment to collaboration (Bruneel et al., 2010). This collaboration contributes to innovation, strengthening research capacities, improving higher education and supporting long-term economic development (OECD, 2021). In developing countries, such as Albania, U-I collaboration helps to improve competitiveness, fills funding gaps in research and integrates knowledge into the economy (Guimón, 2013). Universities benefit from collaboration by adapting curricula to the labor market needs, increasing students' employability opportunities or supporting talent development (Ankrah & AL-Tabbaa, 2015). Collaborations facilitate the creation of spin-offs and technological startups, which lead to a knowledge-based economy (Guerrero et al., 2016b). Industry also benefits from collaboration by accessing specialized knowledge, talents, and taking support in developing new products and processes (Santoro & Bierly, 2006; D'Este & Perkman, 2011). Another positive outcome from U-I collaborations is that its actors enhance reputation and credibility among stakeholders, increase the ability to attract new partners, and are more likely to generate social capital that fosters new projects (Perkman et al., 2013; Bruneel et al., 2010). The effects of successful collaborations provide a strong foundation for deeper and more sustainable development (Cohen et al., 2002). There is a lot of research on this topic, but not much empirical evidence about the specific factors that motivate academics and businesses to collaborate, in developing economies. This study seeks to answer several questions. What are the main perceived benefits that make academics and businesses want to collaborate together on U-I projects? How do these factors differ when comparing the views of academic staff and business staff? Based on PCA and Random Forest analysis, which of these perceived benefits is statistically the most significant? This study employs a mixed methodology to address these inquiries. Through a literature review, a questionnaire was designed for academic staff and business staff. The collected data is analysed according to Principal Component Analysis (PCA) and Random Forest models to look at these perceptions and to find both the underlying dimensions and the statistical significance of the benefits. This study helps by adding empirical facts and additional knowledge to the existing literature as well

as contributing with a clearer and evidence-based basis for making better collaboration plans. The study is organized according to section 1, introduction, section 2, literature review, section 3, methodology and discussion of results, and section 4, conclusions.

2. LITERATURE REVIEW

The motivation of actors involved in U-I collaboration is crucial for promoting and generating collaboration, sustaining engagement and ensuring long term collaboration. This motivation stems from a number of factors, which are related to the interests and strategic goals of both actors. It is influenced by internal and external factors, short-term or long-term. Understanding the motivational factors is essential for building and strengthening long-term and sustainable collaboration.

2.1. Academics' Motivations for Collaboration with Industry

Academic motivations for U-I collaboration are multidimensional, including scientific challenges, professional recognition, and financial benefits, as well as supporting the third mission of universities regarding knowledge transfer (Perkmann et al., 2013). Their involvement in collaboration with industry is supported by a variety of individual and institutional motivations. In terms of personal motivations, D'Este and Perkmann (2011) emphasize access to data, funding, technological equipment, and practical use of research as important drivers for academics. Lam (2011) proposes a three-dimensional division of motivations: “puzzle” (scientific challenge), “ribbon” (professional recognition), and “gold” (financial benefits), reflecting the diversity of personal goals in U-I collaboration. According to Bikard, Murray, and Gans (2014), the desire to generate real impact on society through applicable technologies motivates researchers to seek collaborations beyond academia. However, Owen-Smith and Powell (2002) warn the possibility of tensions between free research and commercial objectives. At the institutional level, collaboration supports also the third mission of universities: knowledge transfer and impact on society (Etzkowitz, 2002). Key motivators include: financial and technological benefits for applied research (Perkmann et al., 2013); securing funding for equipment and projects (Belkhdja & Landry, 2007; Geuna & Muscio, 2009); enhancing institutional reputation (Bruneel et al., 2010); developing talent, and improving students employability in the labor market (D'Este & Patel, 2007); improving curricular content, and preparing students to better align with labor market needs (Ankrah & AL-Tabbaa, 2015); increasing social and economic impact through collaborations that generate real solutions to local problems (Etzkowitz, 2003); opportunities for applicable projects, that lead to publications, patents or new technological products, increasing the research productivity of institutions (D'Este & Patel, 2007).

2.2. The Benefits and Motivations of the Industry

The industry's motivation to collaborate with universities has strategic, economic and operational dimensions, where the main incentive comes from the need to remain competitive in an ever-changing market. Enterprises need advanced expertise to face technological challenges (Bruneel et al., 2010). Companies are encouraged to influence research programs, to test new technologies and to create long-term collaborations that give them a competitive advantage (Ankrah & AL-Tabbaa, 2015). Another incentive for industry is to build trusted collaborations with academics to benefit from "network capital" and to participate to innovation systems (Belkhdja & Landry, 2007). Key incentives for industry include: access to advanced knowledge, new technologies, reducing R&D costs and improving innovative capacities (Santoro & Chakrabarti, 2002; Perkmann & Walsh, 2007); industry seeks collaborations that foster innovation and strengthen their competitive position in the market (Santoro & Bierly, 2006; Ankrah & AL-Tabbaa, 2015); the opportunity to benefit from public funds or fiscal incentives for research (Rothaermel et al., 2007); attracting talent through collaboration (Mora-Valentin et al., 2004; Ankrah & AL-Tabbaa, 2015); improving reputation through collaboration, improving company reputation by being perceived as innovative and socially responsible (Bruneel et al., 2010). These factors make U-I collaboration an attractive strategy for the development and success of the industry.

2.3. Motivating Factors in the Context of Developing Countries

The challenges and necessity to develop and the socio-economic framework influence how the motivations of both actors to engage in U-I cooperation appear. This cooperation is seen as a means of accelerating economic development and helping to increase technological capacities (Guimón, 2013). Lack of financial resources and limited infrastructure make access to external funding and research facilities particularly important (Görg & Strobl, 2001). U-I collaboration also improves the employability and skills of young people (Meyer-Krahmer & Schmoch, 1998), and helps in addressing social challenges and regional development (Etzkowitz & Leydesdorff, 2000). Institutional and political incentives that encourage collaboration and engagement of both actors (Perkmann et al., 2013) demonstrate that policymakers and policy leaders in many developing countries recognize not only the importance of such collaborations, but also the importance of decision-making and their impact, in realizing and building a culture of collaboration. This highlights the necessity for policymakers to allocate greater attention and priority to U-I collaborations within national strategies and policies.

3. METHODOLOGY

The study uses a mixed research methodology. It combines theoretical and empirical analysis. The study is conducted in the Albanian context. Two questionnaires were developed from the literature and distributed physically and electronically to academic staff and business representatives, to measure perceptions about the benefits of collaboration which also serve as

motivators for generating collaborations. This helps to differentiate the results according to the experiences and needs of each sector and consequently the strategies they should follow. Academic staff and business representatives have been selected as key and direct stakeholders in the collaboration process. This choice aims to bring to attention real and experience-based perceptions, thus creating a reliable basis for analysis. The empirical analysis is supported by the responses to two complete questionnaires. There are 96 questionnaires completed by businesses and 134 questionnaires completed by staff at different universities in Albania. The questionnaire was distributed online. It includes several sections, among which is the usefulness of university-industry collaborations. Each question of this section is built on a five-point Likert scale (1 = very little, 5 = very much), which allows measuring the intensity of the respondents' perceptions. From the questionnaire completion, data for the model variables were generated. In line with the questionnaire structure, the empirical dataset includes eight variables specifically designed to capture the perceived usefulness of university–industry collaboration, together with additional Likert-scale items addressing perceived barriers and the overall effectiveness of cooperation. The items used for the quantitative analysis are complete and follow the standardized measurement scale applied in the study, ensuring consistency across respondents' evaluations. These data provide sufficient variation to explore patterns in how the two stakeholder groups assess different aspects of collaboration. The samples were taken using a non-probability method, creating opportunities for inclusiveness. The analysis uses eight Likert-scale variables from the questionnaire section assessing the usefulness of university–industry collaboration. The benefits mentioned are access to knowledge, improved organizational performance, problem solving, and lower R&D costs. PCA was applied to these variables to identify underlying dimensions within respondents' perceptions and to reduce overlap among conceptually related items. In parallel, a Random Forest model was used to evaluate the relative importance of each item in predicting an overall positive perception of collaboration, using a binary indicator derived from the average usefulness score. Combining PCA with Random Forest provides complementary insights: PCA uncovers latent structures in the usefulness measures, while Random Forest highlights which specific benefits most strongly shape overall perceptions, thus reinforcing the robustness of the findings.

3.1. Discussion on the Results

In this section we will discuss the results generated using descriptive statistics, PCA and Random Forest. The analysis is done from both the university and business perspectives, and comparing them. The following is a descriptive interpretation of the data. Questions with the highest average rating "Beneficial for improving the quality of the university": the highest mean (3.60) and the lowest standard deviation (0.73), indicating high consensus and particular importance for this aspect.

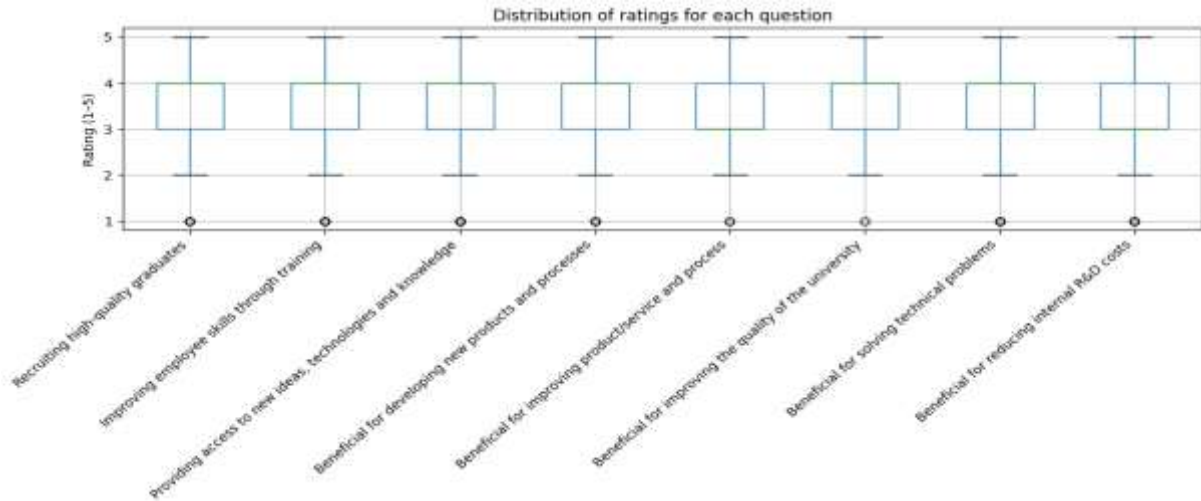


Figure 1. Distribution of ratings for each question

Mean of "Improving employee skills through training's 3.49 but with a higher deviation (0.87), indicating more variation in opinions. "Beneficial for reducing internal R&D costs" reflects the lowest average (3.33) and a relatively high standard deviation (0.85). This can happen because this aspect is not perceived as that important or there are divided opinions. Distribution of ratings explains that all questions have ratings ranging from 1 to 5, indicating that there is diversity in perceptions, but most ratings are concentrated in levels 3 and 4. For most questions, the median is 4, and quartiles 25%-75% at 3-4 indicating a trend towards positive ratings. Comparison with importance in the Random Forest model is interesting to note that: The question with the highest importance in the Random Forest model (Providing access to new ideas...) has a mean of 3.44, which is not the highest in subjective ratings. This indicates that participant perception and statistical significance in the model Random Forest do not always match, which is common in data analysis.

In academically perception results of the "weight of each question on the principal components" from Principal Component Analysis (PCA) the values, called "loadings", indicate how strongly and in what direction (positive or negative) each original variable is associated with each principal component. The PCA results provide us with two Principal Components (PC1 and PC2) and show the contribution of each question in shaping these components. This helps us identify the essential dimensions of the perception of cooperation with universities.

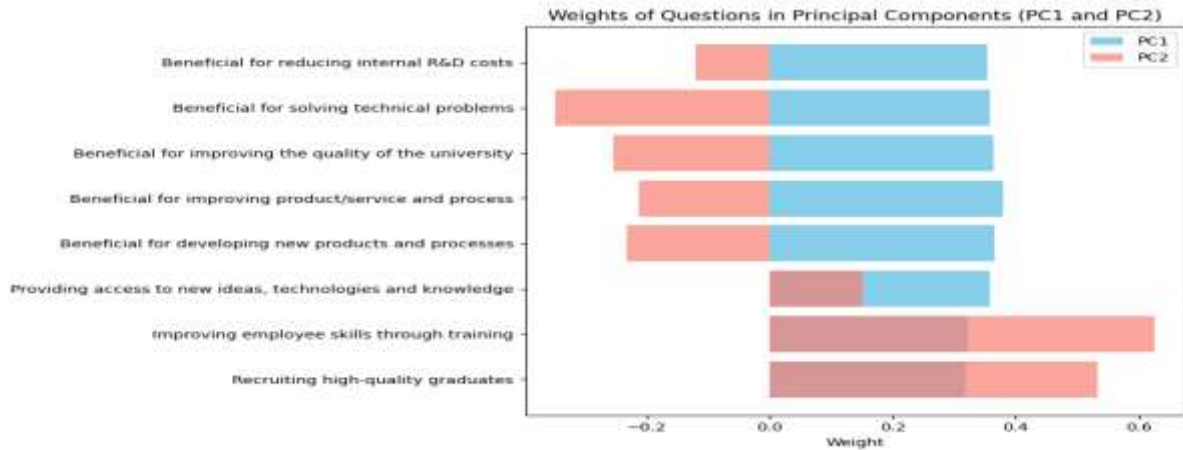


Figure 2. Weights of questions in Principal Components (PC1 and PC2)

In Principal Component 1 (PC1) all variables have positive loadings on PC1, and these loadings are relatively high and similar to each other (ranging from 0.318 for "Recruiting high-quality graduates" to 0.380 for "Beneficial for improving product/service and process"). When all questions have a positive and significant loading in PC1, it suggests that the component indicates the usefulness or "general importance" of university-industry collaboration. Thus, PC1 captures the common variance across all questions, indicating that in a broad sense, collaboration is very useful. The question "Beneficial for improving product/service and process" has the highest loading on PC1, suggesting that it is perhaps the strongest indicator of this general benefit. In Principal Component 2 (PC2) the loadings on PC2 show a more contrasting pattern, with high positive values and high negative values.

Table 1. The weights of each question in the principal components

	PC1	PC2
Recruiting high-quality graduates	0.318879	0.532953
Improving employee skills through training	0.323024	0.626757
Providing access to new ideas, technologies and...	0.357642	0.151427
Beneficial for developing new products and proc.	0.367009	-0.233172
Beneficial for improving product/service and pr...	0.380413	-0.213315
Beneficial for improving the quality of the uni...	0.364467	-0.254243
Beneficial for solving technical problems	0.357819	-0.348276
Beneficial for reducing internal R&D costs	0.354660	-0.119988

High positive loadings: "Improving employee skills through training" (0.626757), "Recruiting high-quality graduates" (0.532953). These two variables are the strongest positive contributors to PC2. The high negative loadings: "Beneficial for solving technical problems" (-0.348276), "Beneficial for improving the quality of the university" (-0.254243), "Beneficial for developing new products and processes" (-0.233172), "Beneficial for improving product/service and process" (-0.213315). These variables show negative loadings, indicating that they are on the opposite side of the dimension captured by PC2. PC2 seems to represent a contrast between two main dimensions of benefits. On the one hand, the importance of cooperation for the development of human capital (recruitment and training of employees) is dimensioned. On the

other hand, this component contrasts this with the benefits related to innovation, solving technical problems and improving the quality of the university. This can be interpreted as a split between perceptions that focus on human resources and those that focus on concrete results of research and development, as well as institutional improvement. Thus, individuals who value recruitment and training highly (positively on PC2) may tend to value the importance of solving technical problems less, or vice versa. PCA Overview: The PCA reveals that while there is a general consensus on the benefits of university collaboration (PC1), there is a second dimension (PC2) that distinguishes benefits related to workforce development from those related to innovation, problem solving, and impact on the academic institution itself. This suggests that stakeholders may have different priorities or focuses when engaging in collaborations with universities.

The figure 3 below shows the importance of questions according to the Random Forest model. This is a visual way to understand which questions contribute the most to the model's predictions.

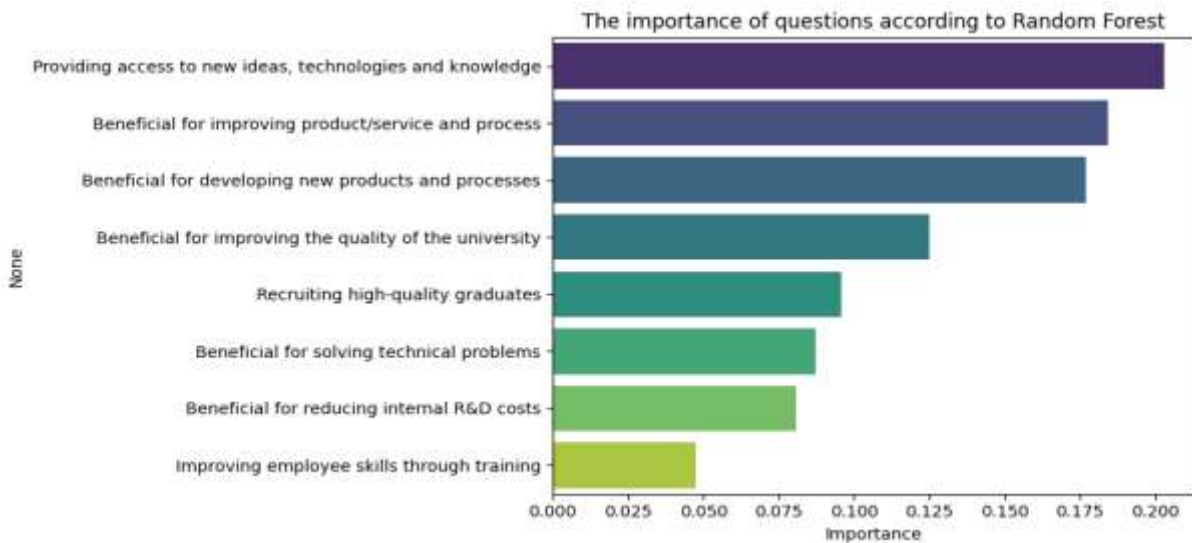


Figure 3. The importance of questions according to Random Forest (university sector)

The most important question in academic perception is "Providing access to new ideas, technologies, and knowledge," which has a value of about 0.200. This means that this question has the biggest effect on the Random Forest model. Questions about how to make the university's products, processes, and quality better also have high values, which means they are important parts of the model's analysis. Questions like "Improving employee skills through training" aren't very important, which could mean they don't help the model's predictions very much. As part of a study on academic-industrial collaboration, questions related to access to new ideas and product improvement are the most important to understand the success in aspect of positive impact of collaborations. This can help in optimizing questionnaires and improving research strategies.

Based on the statistical analysis of the second (industry) set of questions, here is a structured academic commentary for the utility model in the industry questionnaire.

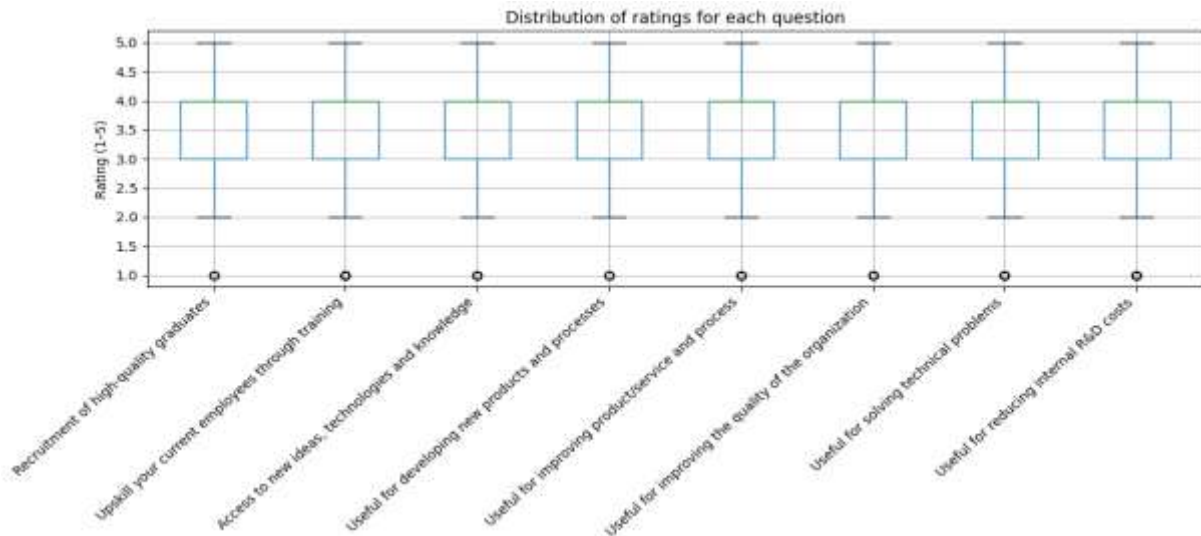


Figure 4. Distribution of ratings for each question

All questions have an average of over 3.3, indicating that participants consider these aspects to be important in the context of academic-industrial collaboration. Questions such as "Improving the quality of the organization" and "Access to new ideas..." are the most highly rated, and this reflects the importance of qualitative improvement of the institution and innovation processes. High variation in opinions among participants reflect the questions "Upskill your current employees" and "Reducing internal R&D costs", with higher standard deviation. All questions have a median of 4 and quartiles 25%-75% at 3-4, indicating a trend towards positive, but not extreme, ratings.

Table 2. Average and variance

Question	Mean	SD
Useful for improving the quality of the organization	3.53	0.86
Access to new ideas, technologies and knowledge	3.52	0.87
Useful for developing new products and processes	3.49	0.81
Recruitment of high-quality graduates	3.47	0.86
Useful for improving product/service and process	3.47	0.90
Upskill your current employees through training	3.45	0.94
Useful for solving technical problems	3.41	0.95
Useful for reducing internal R&D costs	3.37	0.97

Here is a figure 5 showing the average scores for each question, along with the standard deviation as errors:

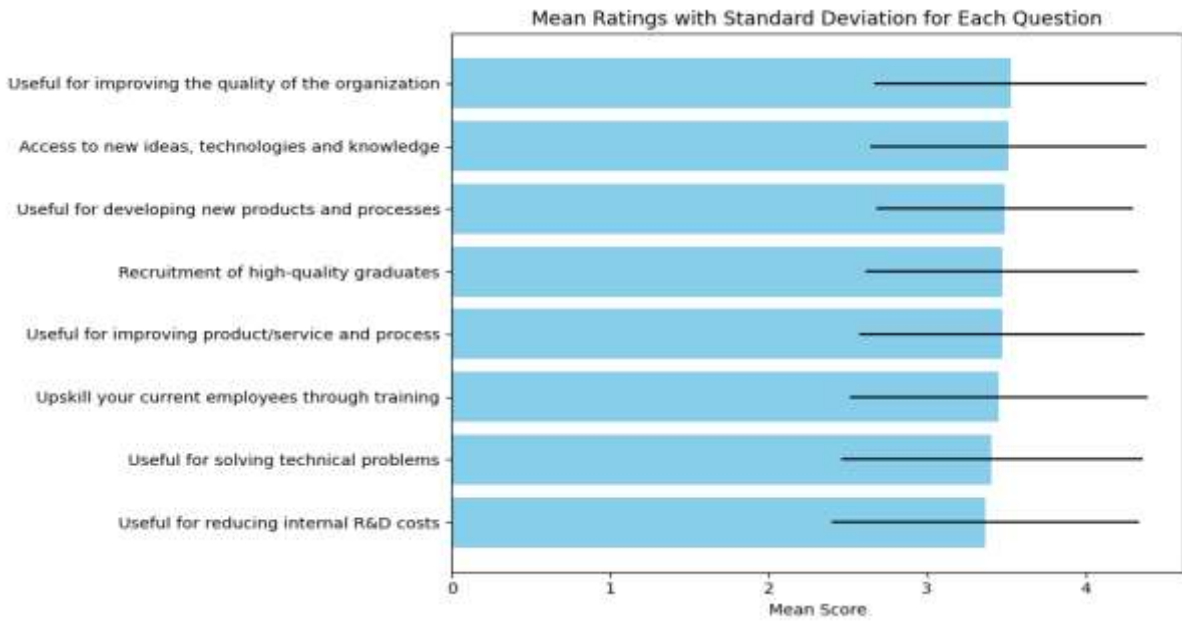


Figure 5. Main ratings with standard deviation for each question

The weights of the questions in the principal components (PCA) help us understand which questions contribute the most to the main dimensions of variation in the data.

The figure 6 presents the weights of each question in the two main components: PC1 represents a general dimension of benefits from collaboration. PC2 separates external benefits (such as recruitment) from internal benefits (such as reduced R&D costs). This analysis is useful for understanding the structure of participants’ opinions and for helping to segment collaboration strategies.

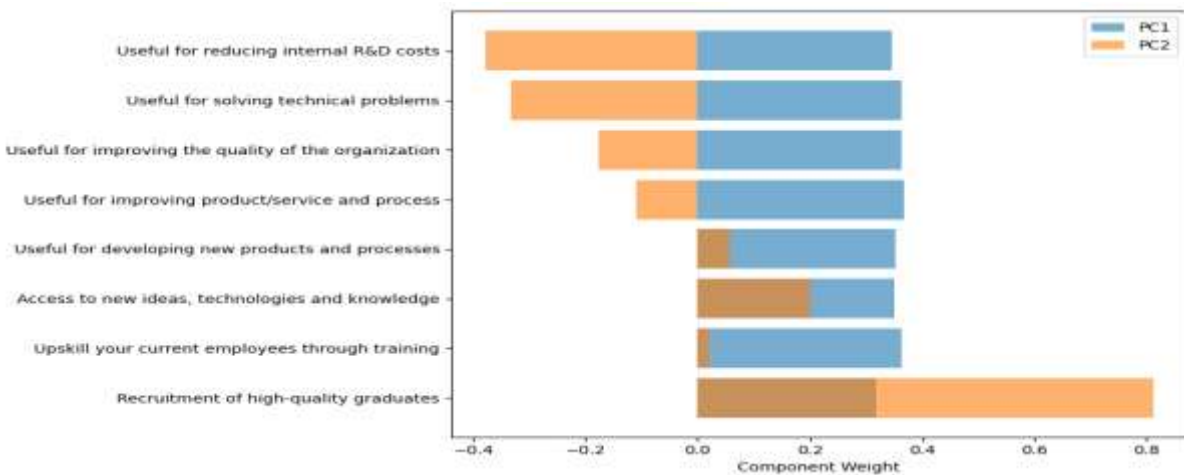


Figure 6. Weights of questions in Main Components (PC)

All questions have positive and similar values in PC1 (around 0.35), indicating that this component represents a general dimension of positive perception of the benefits of collaboration. The three most important like Useful for improving product/service and process (0.367), Useful for improving the quality of the organization (0.364), Upskill your current employees through training (0.364) are related to the internal improvement of the organization,

suggesting that PC1 represents an axis of internal development and innovation. Component Two (PC2) – The dimension of differentiation between external and internal aspects. PC2 has positive and negative values, indicating a separation between the two types of benefits., Top 3 contributors to PC2: Recruitment of high-quality graduates (0.812) – the strongest positive contributor. Useful for reducing internal R&D costs (-0.379) – the strongest negative contributor. Useful for solving technical problems (-0.333) This suggests that PC2 separates external benefits (recruitment) from internal technical and financial benefits.

The figure 7 shows the importance of questions according to the Random Forest model, for the impact of questions on a predictive model. The most important question is: "Improve the skills of your current employees with training", by providing training lessons to existing employees. The least important question is: "Recruitment of high-quality graduates", which suggests that recruiting young talent has the least impact in this specific context.

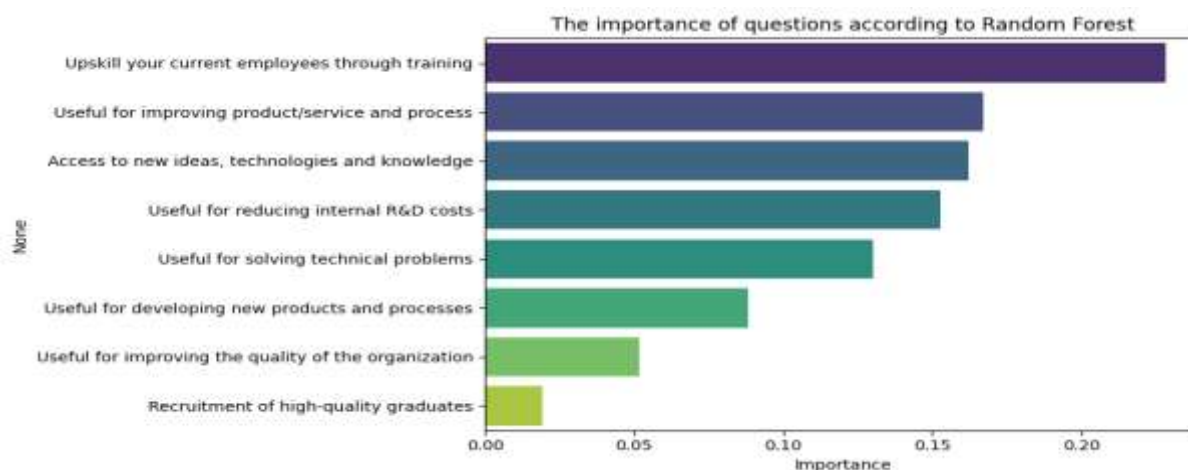


Figure 7. The importance of questions according to Random Forest (industry sector)

Comparison with subjective perceptions In previous analyses, the question on recruitment had a high mean subjective rating, but here it has low statistical significance, indicating a discrepancy between perception and real impact in the model. Internal development such as process improvement and innovation are of high importance when organizations aiming to improve performance through academic collaboration.

4. CONCLUSION

U-I collaboration is important in promoting innovation, technological development and increasing economic competitiveness (Perkmann et al., 2013). Their success hinges on motivational factors that inspire the parties to allocate resources and exert efforts towards collaborative initiatives. From the point of view of universities, motivation includes the desire for scientific progress, publications, research funding, and the growth of research skills (Bruneel et al., 2010). From the perspective of industry, the primary motivators are material advantages, access to novel technologies, enhanced products, and innovative methodologies (Santoro & Bierly, 2006). Another important dimension is the alignment of expectations and

interests of both parties (Cohen et al., 2002). U–I collaboration can facilitate integration into global technology markets, the development of workforce skills and the resolution of regional challenges (Etzkowitz & Leydesdorff, 2000; Meyer-Krahmer & Schmoch, 1998). Positive effects of collaborations include building research capacities, improving the quality of education, developing new products and processes, and creating lasting relationships and social capital that foster further collaborations (OECD, 2021; D’Este & Perkmann, 2011). In the empirical view improving the quality of the university is considered the biggest benefit subjectively with high consensus among academic participants. This shows a strong perception that collaboration with industry helps the institutional and qualitative development of universities also of organization Exchange of knowledge, ideas and technologies has the highest importance in statistical analyses (Random Forest), making this a real benefit with a measurable impact on academic development and scientific research. The creation of new products and processes, as well as the solution of technical problems, are also positively perceived benefits and have high values in statistical models (PCA and Random Forest), Promoting innovation in academic environments. Improving the quality of the organization and internal processes emerges as the highest benefit from the industry perspective. This highlights that firms see collaboration as a tool for internal development and performance optimization. Access to new ideas, technology and knowledge is also one of the most valued and highly influential benefits in statistical models, reflecting the role of universities as a source of innovation for the private sector. Training of existing employees (Upskilling) is the most important factor in the Random Forest model for industry, which shows that companies benefit significantly from building the capacities of their staff through collaborations. Recruitment of quality graduates is perceived positively, but has a lower impact in statistical models, which shows that although valued, it is not always a determinant of concrete benefits.

The PCA highlights empirical differences between the perceived benefits of university-industry collaboration in human capital development and those focused on innovation and access to technology. This leaves room for important policy-makers to engage with policy-making, both in terms of adequacy and managerial practices. From a policy perspective, the results suggest that it is necessary to design and implement national and institutional strategies that focus on strengthening and developing the workforce and expanding innovation capacity. The benefits are reflected in a dual structure identified in PC2, and in this context, policymakers in Albania can design schemes that encourage support for joint training programs, laboratory centers that apply R&D, and co-financed innovation projects.

Moreover, focusing on one of the highly valued benefits of knowledge and technology exchange, it is necessary to strengthen intermediary structures, technology transfer offices or innovation centers. The latter can facilitate the access of knowledge of the university system to the needs of industry. From a management perspective, university leaders can use the results to define objectives and actions that increase the compatibility between university curricula and labor market needs. In this way, staff training can be stimulated, considering the strong

dimension of human capital. Business leaders should also focus on using access to new ideas and technologies - identified as the most influential predictor in the Random Forest model - to promote product development and improve organizational performance. Together, these implications suggest that strategic alignment and coordinated investments across institutions and firms are essential for maximizing the impact of U-I collaboration in developing contexts. The study is limited in several aspects. Empirical analysis based on questionnaire data that capture respondents' perceptions of the benefits of collaboration creates room for bias in responses, or subjectivity of the benefits of collaboration. Also, the study is conducted over a specific period of time and does not take into account the dynamics of development over time. The inclusion of these variables could be improved in the future by also taking into account factors related to organizational culture, experience in previous collaborations, institutional capacity or the policy environment. Furthermore, the specific nature of the Albanian context limits the applicability of the findings to other countries. This is an incentive to expand our work in the future by studying this phenomenon also in other developing countries.

REFERENCES

- Ankrah, S., & Al-Tabbaa, O. (2015). Universities–industry collaboration: A systematic review. *Scandinavian Journal of Management*, 31(3), 387-408. <https://doi.org/10.1016/j.scaman.2015.02.003>
- Belkhdja, O., & Landry, R. (2007). The Triple-Helix collaboration: Why do researchers collaborate with industry and the government? What are the factors that influence the perceived barriers?. *Scientometrics*, 70(2), 301-332 <https://doi.org/10.1007/s11192-007-0205-6>
- Bikard, M., Murray, F., & Gans, J. S. (2014). *Exploring tradeoffs in the organization of scientific work: Collaboration and scientific reward*. SSRN. <https://dx.doi.org/10.2139/ssrn.2244913>
- Bruneel, J., D'Este, P., & Salter, A. (2010). Investigating the factors that diminish the barriers to university–industry collaboration. *Research Policy*, 39(7), 858-868. <https://doi.org/10.1016/j.respol.2010.03.006>
- Cohen, W. M., Nelson, R. R., & Walsh, J. P. (2002). Links and impacts: The influence of public research on industrial R&D. *Management Science*, 48(1), 1-23. <https://doi.org/10.1287/mnsc.48.1.1.14273>
- D'Este, P., & Patel, P. (2007). University–industry linkages in the UK: What are the factors underlying the variety of interactions with industry? *Research Policy*, 36(9), 1295-1313. <https://doi.org/10.1016/j.respol.2007.05.002>
- D'Este, P., & Perkmann, M. (2011). Why do academics engage with industry? The entrepreneurial university and individual motivations. *The Journal of Technology Transfer*, 36(3), 316-339. <https://doi.org/10.1007/s10961-010-9153-z>
- Etzkowitz, H. (2002). Incubation of incubators: Innovation as a triple helix of university–industry–government networks. *Science and Public Policy*, 29(2), 115-128. <https://doi.org/10.3152/147154302781781056>

- Etzkowitz, H. (2003). Innovation in innovation: The triple helix of university-industry-government relations. *Social Science Information*, 42(3), 293-337. <https://doi.org/10.1177/05390184030423002>
- Etzkowitz, H., & Leydesdorff, L. (2000). The dynamics of innovation: From National Systems and “Mode 2” to a Triple Helix of university–industry–government relations. *Research Policy*, 29(2), 109-123. [https://doi.org/10.1016/S0048-7333\(99\)00055-4](https://doi.org/10.1016/S0048-7333(99)00055-4)
- Geuna, A., & Muscio A., (2009). The governance of university knowledge transfer: A critical review of the literature. *Minerva*, 47(1), 93-114. <https://doi.org/10.1007/s11024-009-9118-2>
- Görg, H., & Strobl, E. (2001). Multinational companies and productivity spillovers: A meta-analysis. *Economic Journal*, 111(475), 723-740. <https://doi.org/10.1111/1468-0297.00669>
- Guerrero M., Urbano D., Fayolle A., Klofsten M., & Mian S. (2016a). Entrepreneurial universities: Emerging models in the new social and economic landscape. *Small Business Economics*, 47(3), 551-563. <https://doi.org/10.1007/s11187-016-9755-4>
- Guerrero, M., Urbano, D., & Fayolle, A. (2016b). Entrepreneurial activity and regional competitiveness: Evidence from European entrepreneurial universities. *The Journal of Technology Transfer*, 41(1), 105-131. <https://doi.org/10.1007/s10961-014-9377-4>
- Guimón, J. (2013). *Promoting university-industry collaboration in developing countries* [Policy brief]. World Bank.
- Lam, A. (2011). What motivates academic scientists to engage in research commercialization: ‘Gold’, ‘ribbon’ or ‘puzzle’?. *Research Policy*, 40(10), 1354-1368. <https://doi.org/10.1016/j.respol.2011.09.002>
- Meyer-Krahmer, F., & Schmoch, U. (1998). Science-based technologies: University-industry interactions in four fields. *Research Policy*, 27(8), 835-851. [https://doi.org/10.1016/S0048-7333\(98\)00094-8](https://doi.org/10.1016/S0048-7333(98)00094-8)
- Mora-Valentin, E. M., Montoro-Sanchez, A., & Guerras-Martin, L. A. (2004). Determining factors in the success of R&D cooperative agreements between firms and research organizations. *Research Policy*, 33(1), 17-40. [https://doi.org/10.1016/S0048-7333\(03\)00087-8](https://doi.org/10.1016/S0048-7333(03)00087-8)
- OECD. (2021). *OECD economic outlook, volume 2021 issue 2*. OECD Publishing. <https://doi.org/10.1787/66c5ac2c-en>.
- Owen-Smith, J., & Powell, W. W. (2002). Standing on shifting terrain: Faculty responses to the transformation of knowledge and its uses in the life sciences. *Science & Technology Studies*, 15(1), 3-28. <https://doi.org/10.23987/sts.55148>
- Perkmann, M., & Walsh, K. (2007). University–industry relationships and open innovation: Towards a research agenda. *International Journal of Management Reviews*, 9(4), 259-280. <https://doi.org/10.1111/j.1468-2370.2007.00225.x>
- Perkmann, M., Tartari, V., McKelvey, M., Autio, E., Broström, A., D’este, P., ... & Sobrero, M. (2013). Academic engagement and university–industry collaboration. *Research Policy*, 42(2), 423-442. <https://doi.org/10.1016/j.respol.2012.09.007>

- Santoro, M. D., & Bierly, P. E. (2006). Facilitators of knowledge transfer in university-industry collaborations: A knowledge-based perspective. *IEEE Transactions on Engineering Management*, 53(4), 495-507. <https://doi.org/10.1109/TEM.2006.883707>
- Santoro, M. D., & Chakrabarti, A. K. (2002). Firm size and technology centrality in industry-university interactions. *Research Policy*, 31(7), 1163-1180. [https://doi.org/10.1016/S0048-7333\(01\)00190-1](https://doi.org/10.1016/S0048-7333(01)00190-1)