ROLE OF HIGHER EDUCATION INSTITUTIONS IN SOCIO-ECONOMIC DEVELOPMENT OF THE DEVELOPED ECONOMIES: A LITERATURE REVIEW

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Abstract. This literature review aims to demonstrate and discuss the results of the studies on how higher education institutions affect the socio-economic development of developed countries and subnational entities. Applying integrative literature review methodology allowed the review of 28 selected papers published between 1993 and 2022, which helped to understand the state of current research and aggregate and discuss empirical evidence on the topic. This review addressed three questions: What theories, methodologies, and methods were used in their studies on the investigated topic in the period?; What were the authors' findings?; What characteristics and peculiarities of the investigated topic were highlighted by different researchers? Based on the answers to the questions, a fresh and nuanced perspective on understanding and examining the role of the higher education institutions in the socio-economic development of the selected cases appeared, reflecting internal and external input and output-related factors causing effects, the role of the levels of analysis, and some theoretical and methodological bias. As such, this review could benefit researchers and policymakers involved in policy analysis and implementation in developed and even developing economies, as many findings are non-idiosyncratic. The findings of this review could also serve as a proto-framework for analyzing the topic in both developed and developing contexts.

Keywords: HEI, higher education institution, socio-economic development, developed economies

Научная статья

РОЛЬ ВУЗОВ В СОЦИАЛЬНО-ЭКОНОМИЧЕСКОМ РАЗВИТИИ РАЗВИТЫХ ЭКОНОМИК: ОБЗОР ЛИТЕРАТУРЫ

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Аннотация. Целью данного обзора литературы является демонстрация и обсуждение результатов исследований, посвящённых влиянию вузов на социально-экономическое развитие развитых стран и субнациональных единиц. Применение методологии интегративного литературного обзора позволило провести анализ 28 выбранных статей, опубликованных в период с 1993 по 2022 год, что помогло установить состояние текущих работ по теме, а также обобщить и обсудить эмпирические результаты. Данный обзор даёт ответы на три вопроса: 1. Какие теории, методологии и методы использовались в работах по исследуемой теме в указанный период? 2. Каковы были результаты, полученные авторами? 3. Какие общие характеристики и особенности исследуемой темы были отмечены разными исследователями? Отвечая на данные вопросы, был выработан новый, учитывающий различные особенности, взгляд на понимание и изучение роли вузов в социально-экономическом развитии выбранных кейсов, отражающий роль внутренних и внешних факторов, связанных с входными и выходными данными, определяющими наличие тех или иных эффектов, роль уровня анализа и проблемы теоретических и методологических предубеждений. Таким образом, этот обзор может быть полезен исследователям и лицам, принимающим решения, занятым анализом и реализацией политик в развитых и развивающихся экономиках, поскольку многие результаты не являются

идиосинкразическими. Результаты обзора также могут служить прото-фреймворком для анализа темы как в развитых, так и в развивающихся контекстах.

Introduction

In the modern-day economy, higher education institutions (HEI) are the pillar organizations for educating people, producing and reproducing knowledge, developing scientific research, and promoting innovation and entrepreneurship. These activities usually lead to local, subnational, or national socio-economic development. As a result, it is often taken as given that HEIs' activities would positively affect GDP and GDP per capita, employment, income growth, entrepreneurial activities, and overall human development and quality of life. However, potentiality does not equal actuality per se. As empirical reality demonstrates, different internal and external factors in the broadest sense directly related to the life of HEIs and an economic entity's socio-economic development or indirectly affecting the causes and effects through the overall socio-political environment significantly shape whether HEIs would make significant socio-economic contributions. Moreover, considering the epistemological point of view, it adds that any results on the topic are derived from the analysis based on different presuppositions and assumptions. Therefore, considering the topic's contextually disputed character and epistemological questions, reviewing various studies in the broadest sense and considering different circumstances becomes necessary as a triangulation mechanism and a valuable instrument for the comprehensive understanding of the state of research on the topic under examination, which is the aim of this literature review.

Data and Methodology

In this study, I reviewed the literature on the HEIs' contributions to the socio-economic development of developed countries and subnational entities, as the developing economies deserve a separate investigation. I understand developed countries and subnational entities as advanced economies, classified by the IMF[1]. Regarding the topic, I consider socio-

economic contributions by HEIs through education, research and development (R&D), innovation, entrepreneurship activities, and various communication and interaction channels with individuals, business ventures, governmental institutions, and foreign actors. I exclude think tanks and research institutions to avoid misunderstandings. Also, I understand socio-economic development broadly, meaning improvements in any economic, financial, social, or political indicators at any level.

The framework of the study is the integrative literature review (ILR), as described by Lubbe et al. [1]. Accordingly, the study seeks to understand the state of current research on the role of HEIs in the socio-economic development of developed economies and aggregate and discuss findings, including different characteristics and peculiarities, to get a broad understanding of the topic. Hence, following ILR and such objectives, the study aims to give a fresh perspective on the state of research and the topic that would serve as a practical proto-framework.

The aim was reached by addressing three questions: (a) What theories, methodologies, and methods were used in the reviewed studies?; (b) What were the authors' findings?; (c) What characteristics and peculiarities were highlighted in the reviewed papers?

The papers were searched through Google Scholar. The following search strategy was applied: (a) Applying four combinations of the keywords and the search operators: (a.1) *role_of_higher_education_institution_in_"socio-economic_development"_|_"growth"*, (a.2) *role_of_university_in_"socio-economic_development"_|_"growth"*, (a.3) *higher_education_institution's_role_in_"socio-economic_development"_|_"growth"*, (a.4) *university's_role_in_"socio-economic_development"_|_"growth"*; (b) Selecting different types of research papers dedicated to the developed economies until data saturation (3): (b.1) research articles (RA) with empirical evidence, (b.2–3) reports (R) published by the academic staff, (b.4) literature reviews (LR) of the empirical studies, (b.5) and monographs (M), other books, or the book chapters (C), published by the members of the academic community.

Based on those filtering criteria, 28 studies on the role of HEIs in the socio-economic development of developed economies were selected. The aggregated results of these papers are described below (Table 1).

Results and Discussion

The review allowed me to answer the research questions. Key results of each reviewed article are aggregated into the table (Table 2), while the detailed explanations addressing each question are described in the subsections below.

Table 1

Studies Identified in Literature Review

Source	Type	Reference	Source	Type	Reference
Agasisti and Bertoletti, 2022	RA	[2]	Lilles and Rõigas, 2017	RA	[16]
Aghion et al., 2009	RA	[3]	Lin, 2004	RA	[17]
Beeson and Montgomery, 1993	RA	[4]	Mathews and Hu, 2007	C	[18]
Bramwell and Wolfe, 2008	RA	[5]	NTNU, 2019	R	[19]
Brown and Heaney, 1997	LR	[6]	Pastor et al., 2016	RA	[20]
Chentukov et al., 2021	RA	[7]	Schubert and Kroll, 2016	RA	[21]
Clinch, 2019	R	[8]	Shin, 2011	RA	[22]
Crawley et al., 2020	M	[9]	Stevens, 1994	R	[23]
Drucker and Goldstein, 2007	LR	[10]	Tavoletti, 2007	RA	[24]
Drucker, 2015	RA	[11]	Vaiciukevičiūtė et al., 2019	RA	[25]
Feldman and Desrochers, 2003	RA	[12]	Valero and Van Reenen, 2019	RA	[26]
Hausman, 2012	RA	[13]	Volchik et al., 2018	RA	[27]
Kelly et al., 2004	R	[14]	Wong et al., 2007	RA	[28]
Kohoutek et al., 2017	R	[15]	Zhang et al., 2017	RA	[29]

Source: compiled by an author.

Table 2

Literature Review Results

Paper	Framework	Timeframe	Case	Results
Agasisti and Bertoletti	Dynamic panel data regression with fixed and random effects	2000–17	EU/EEA	Predominantly positive in the case of R&D, education on STEM, entrepreneurship, but depend on the timeframes, HEI's size, geographical proximity, subjects, government's, business's support
Aghion et al.	Cross-state endogenous growth regression	2000s	US	Predominantly positive in the case of R&D, education, but depend on the overall education and technological advancement of the territory, political framework
Beeson and Montgomery	Cross-sectional regression with fixed and random effects	1980s	US	Mixed due to the many internal, external factors b; predominantly positive in the case of R&D, education on STEM
Bramwell and Wolfe	Qualitative sociological analysis, descriptive statistics	2007–08	Ontario	Positive, especially in the case of the tech ventures, attracting talents, but depend on the government's, business's support
Brown and Heaney	Literature review	1980s, 1990s	US	Mixed due to the many internal, external factors b, selected data, author's bias
Chentukov et al.	Explanatory-evaluative matrix, correlation, structural-logical graphs	2012–20	Globally a	Predominantly positive in the case of education and its' competitiveness, but depend on the character of the economy
Clinch	Quantitative policy analysis under the human capital model	1986, 1989, 1996, 2006, 2011–19	Maryland	Positive, based on the calculation under the human capital model

Paper	Framework	Timeframe	Case	Results
Crawley et al.	Qualitative sociological and historical analysis, descriptive statistics	2000s, 2010s	Globally a	Predominantly positive, but depend on the government's, business's support, HEI's, public norms, culture, values
Drucker	Cross-sectional regression with fixed and random effects	2001–11	US	Mixed due to many internal and external factors b; predominantly negative due to the economic environment and market over-saturation, partly positive in the case of government's, business's support, R&D, education on STEM
Drucker and Goldstein	Literature review	1990s, 2000s	US, Canada, Germany, Israel, Japan, Netherlands, Spain, UK	Predominantly positive, but depend on the selected frameworks, many internal, external factors b
Feldman and Desrochers	Qualitative sociological and historical analysis, descriptive statistics	2000s	US	Mixed due to the many internal, external factors b, level of analysis; predominantly negative due to the lack of government's, business's support, HEI's norms, culture, values
Hausman	Cross-sectional regression with fixed effects, cross-sectional, geographical, and time variations	1980s, 1990s, 2000s	US	Predominantly positive in the case of patenting, R&D, education, entrepreneurship, but depend on the geographical proximity, government's, business's support, legal framework
Kelly et al.	Leontief's input-output analysis	2003–04	UK	Positive, especially in the case of business ventures, attracting talent, tourism
Kohoutek et al.	Comparative policy analysis	2010s	Czechia, Norway	Mixed due to many internal and external factors b; predominantly negative due to legal environment, lacking systematic support, conflicting stakeholders' interests, public norms, culture, values, partly positive in the case of education
Lilles and Rõigas	Regression model with ordinary least squares and region-level fixed effects	1998–08	EU/EEA	Predominantly positive in the case of R&D, education, but depend on the timeframes, foreign students, government's, business's support
Lin	Cobb-Douglas production function, cointegrating time series regression	1964–00	Taiwan	Predominantly positive in the case of education on STEM, but depend on the subjects
Mathews and Hu	Qualitative sociological and historical analysis, descriptive statistics	Post-WWII	Japan, Korea, Singapore, Taiwan	Predominantly positive, but depend on the timeframes, government's, business's support, legal, political framework
NTNU	Literature review, qualitative sociological analysis, descriptive statistics	2000s, 2010s	Norway	Predominantly positive in the case of R&D, education, but depend on the economic, technological, legal, political environment, pro-education social policies, pro-life-long education, entrepreneurship, intrapreneurship policies, government's, business's support, public norms, culture, values
Pastor et al.	Counterfactual scenarios, Solow's growth accounting	1989–10	Spain	Positive, especially in the case of the tech capital, in the case of the human capital to a lesser extent

Paper	Framework	Timeframe	Case	Results
Schubert and Kroll	Panel data regression with fixed effects	2000–11	Germany	Predominantly positive in the case of R&D, education on some STEM subjects, but depend on the timeframes, geographical proximity, subjects, government's, business's support
Shin	Qualitative sociological and historical analysis, descriptive statistics	Post-WWII	Korea	Predominantly positive in the case of R&D, education, but depend on the economic, political environment, policies in support of public and private secondary and tertiary education, pro-education social policies, government's, business's support, public norms, culture, values
Stevens	Quantitative policy analysis under the skill-based approach	1980s, 1990s	Maryland	Positive, based on the calculation under the skill-based approach
Tavoletti	Keynesian multiplier, Cooke & Huggins's expenditure and knowledge impact models qualitative policy analysis	1994–95; 2000–01	Wales	Positive, especially in the case of education on STEM, journalism, media, culture, R&D, but depend on the economic environment, policies in support of tertiary education, pro-education social policies, government's, business's support
Vaiciukevičiūtė et al.	Leontief's input-output analysis	2010–16	Lithuania	Positive, especially in the case of education, R&D, but depend on the HEI's size, geographical proximity
Valero, and Van Reenen	Cross-sectional regression with fixed effects	1950–10	Globally a	Predominantly positive in the case of HEIs' expenditures, number of students, academic staff, but depend on the geographical proximity, government's, business's support
Volchik et al.	Backward stepwise regression, modified Mincer earning function	1990–17	Germany	Predominantly positive in the case of education (years spent in HEI), but depend on people's professional background, gender, economic and socio-political environment, migrant integration and social cohesion, policies in support of tertiary education, HEI's, public norms, culture, values
Wong et al.	Qualitative sociological and historical analysis, descriptive statistics	1960–00s	Singapore	Positive, especially in the case of education, R&D, attracting talent, but depend on the economic environment, government's, business's support
Zhang et al.	Leontief's input-output analysis	2010–11, other periods	Ireland	Positive, especially in the case of universities v. technical institutions

Source: Compiled by an author.

[a] Studies analyzing international contexts predominantly focusing on the developed economies were selected.

[b] By external and internal factors it is possible to consider external economic, social, political, cultural, behavioral, geographical, cultural, policy factors.

Theory and Methodology

The dominant theoretical paradigms in the reviewed papers were the institutionalist, Keynesian, and neoclassical paradigms. The main frameworks the authors used in the reviewed studies include the knowledge-based economy, which prioritizes education, science, and entrepreneurship as the leading socio-economic development factors, and sustainable economic development theory, prioritizing long-run growth over short-run profits. In other studies, some authors, in a neoclassical way, focused only on tangible earnings from production, ignoring broader social, political, cultural, and other implications. Going down to the lower level theories, the virtuous cycle, where the chain of positive effects reinforces itself in a loop [30], as well as the triple helix model on interactions between academia, governments, and business ventures [31], through which HEIs contribute to

the socio-economic development via communication and collaboration channels and investments, became dominant theories. Authors usually utilized such theories to their full capacity or partly while considering HEIs' education, R&D, entrepreneurship activities, and socio-economic development performance indicators of the selected localities, regions, or countries, as described below. It allowed to shed light on the broader context of the relations between HEIs and other actors and to understand what necessary and sufficient internal and external factors to consider while initiating policy changes related to the topic or analyzing the role of HEIs in socio-economic development.

While considering the methodical aspect, the reviewed papers demonstrated that the authors use quantitative and qualitative methods, while the former are prevalent. Besides general scientific methods, such as document analysis or descriptive statistics, the authors applied quantitative methods, such as statistical analysis and calculation-based models, while qualitative methods included historical and sociological institutionalisms.

Starting with quantitative methods, papers where authors applied statistical analysis predominantly used regression modeling to understand how HEI-related activities affected socio-economic development, while, in some cases, authors tailored their methodologies to allow them to use correlations. Most authors used cross-sectional and, if possible, static or dynamic panel data regression models with fixed or, less frequently, random effects. Some authors used counterfactuals, time series models, and backward stepwise regression. The main models used were the Solow growth model, Cobb-Douglas function, Mincer's earning, and Keynesian multiplier. The application of such models allowed the authors to indicate several characteristics of the reviewed studies.

First, it is worth mentioning that the authors utilizing regression and correlation models tried to apprehend the broader socio-economic effects of HEIs' activities. In contrast, other authors either focused on financial effects, which do not broadly demonstrate socio-economic change *per se*, or examined the perception or opinion on the topic, which *ipso facto* is part of economic sociology serving a different set of goals. So, in the former case of statistical modeling, the studies allowed to examine the character, direction, and significance of education, R&D, innovation, and entrepreneurship activities' socio-economic effects while also analyzing financial data. Moreover, considering different social, political, cultural, legal,

and broader macroeconomic factors and examining geographical, agglomeration, and some demographic effects shed light on various dimensions and aspects of the topic, which contributed to the more comprehensive analysis and filling research gaps. Also, applying econometric models as a Keynesian multiplier (including Cooke & Huggins's and other reviewed authors' frameworks) helped to calculate and assess negative effects, while Solow's (including Cobb-Douglas) and Mincer's models, focusing on HEIs' production activities and salary outputs as a result of education and work experience, let framing and articulating the research to receive measurable outputs. Nonetheless, the review also allowed to find some challenges in the case of regression and correlation analysis studies.

To begin with, the application of such models in reviewed papers demonstrated that building panel data regression models with fixed effects is a challenging task even for advanced economies where more data is often available. The reviewed studies showed that cause, effect, and control data were scarce and inconsistent over the years. Hence, the reduced-form regression models prevailed over structural models, even if some authors tried to build structural models. Paraphrasing it, the reviewed authors indicated threshold-level effects of individual aspects while examining the role of HEIs in socio-economic development, as a whole, was found to be a metric black hole: backward stepwise regression allowed narrowing down variable options, but some aspects remained ignored; time series models, including cointegration cases, shed light on data from one unit over a more extensive period and other units were ignored; cross-sectional regression allowed to understand cross-sectoral, geographical and other effects, but such models focused on fixed time points, while analyzed effects' long-run impact could have been more reasonable; and developing counterfactual scenarios allowed to calculate socio-economic impact but the model was a hypothetical scenario with various strong assumptions.

The second point of concern is related to statistical testing. While most reviewed studies predominantly demonstrated credible results based on coherent analysis with different validation techniques, some reviewed papers with panel data regression models used confidence intervals and p-values of 90 % and .1, respectively, which could lead to Type I or II errors. Also, in the case of cross-sectional regression models, as was briefly mentioned above, ignoring temporal limitations was found to be frequent. However, considering the evolving debate on p-value and other statistical indicators [32], in the case of the reviewed studies, such criticism could be partly overturned

by indicating that the p-value and other statistical indicators are usually not interpreted on a groundless basis. On the contrary, arguably, a phenomenon when the authors engage in p-hacking and provide publicly accessible yet false results shall be under more serious scrutiny.

Thirdly, while focusing on correlations (without excluding regressions), there are concerns related to conscious and unconscious bias and distortions. The problem appears more acute in the cases of correlations, as, in such studies, the reviewed authors only test the strength of the relationship between two variables. Thus, it becomes unclear whether HEIs lead to socio-economic development or vice versa. This question becomes significant as the connection between HEI activities and an examined entity's socio-economic development is often within the "virtuous" cycle framework discussed above. However, this concern is fixable by developing models with specific statistical techniques and tests: e.g., lagging regressors by a year.

Besides the above-mentioned advanced statistical analysis, some authors used calculative models, such as Leontief's input-output models, and different economic base modes, such as economic, skill-based, and human capital approaches. On the one hand, these calculative models allowed authors to obtain more precise results than in studies with complex statistical methodology, as the reviewed calculative studies predominantly reflected changes in financial outputs based on the existing less scarce financial data. On the other hand, such calculative models had several downsides, the most noteworthy of which was disregarding or diminishing the case of lacking impact or negative impacts, even though the evidence for such occurrences was substantial in various reviewed papers. Furthermore, the features of economic base models allowed not only to shadow insignificant or negative effects but arguably also to overestimate positive effects, as the results were unusually idealistic, which even more seriously raised questions related to reviewed authors' bias and distortions. The input-output models became a solution to some extent, as the matrices focused on sectoral interdependencies, allowing exploration of the role of the higher education sector (or individual HEIs) in other economic sectors in a more mathematically and statistically rigorous way while permitting testing possibilities of different outcomes: strong and weak, overall and sectoral. Yet, the narrowness of the method's application remains a problem in such models, as many HEIs' contributions to socio-economic development would be omitted, even if such matrices

were used. By developing more complex models and frameworks applying "heavier" statistical analysis, it is possible to solve many of the problems of the calculative methods ad hoc for the studies on the role of HEIs in socio-economic development. Besides, arguably, the historical and sociological institutionalist analysis could partly serve as a solution.

Excluding rational choice institutionalism, which is relatively well demonstrated in statistical and calculative studies, historical and sociological institutionalisms played noteworthy roles in the studies on the topic as path dependency and critical juncture concepts, in the former case, and considering social norms, macroeconomic conditioning, socio-political and cultural framework, in the latter one, significantly contributed to shedding light on different uneasily quantifiable institutional characteristics and peculiarities. Applying methods of historical analysis and narratives in historical institutionalism, as well as surveys, interviews, and observations in sociological institutionalist studies, the reviewed authors shed light on understanding how characteristics and peculiarities of formal and informal institutions and norms, including laws, customs, macroeconomic context, and social, political, and cultural traits, shaped the role of HEIs in the socio-economic development of the developed economies and how changes in such institutions and norms affected HEIs' performance. In particular, the reviewed papers revealed the effects of formal and informal goals and purposes of the higher education facilities and governments, relevant economic and policy distinctions of "old" developed economies and new economic "tigers," effects of the macroeconomic periods and trends such as recession and growth, differences in more and less democratic political regimes, and the role of social and cultural aspects such as social norms related to competitiveness, and valuing education or innovation in the society. However, following Thelen's [33] argumentation, it is possible to critique such approaches as overly deterministic. When explaining different traits through systemic embeddedness, the authors could use it as an instrument of *a posteriori* justification of certain HEIs' performance. As another option, the reviewed authors' application of such methods could create a perception of making any positive changes as unrealistic and phantom, even though, as many authors demonstrated, it is also false. Besides determinism, a point of criticism is made of the fact that the authors were usually analyzing significantly more value-laden data. In turn, it could exacerbate the problem of bias and distortions: spreading authors' views and values, cherry-picking data and periods of analysis, etc. Separately, review-

ing such papers made it challenging to differentiate between the results measuring the socio-economic effects of HEIs' activities *per se* and the surveyed or interviewed people's views on the topic. Finally, not paying enough attention to the financial and quantitative economic dimensions is a point of critique. Thus, similarly to other methodologies, the room for improvement remains expansive. It is possible, as an option, to address the issues by applying calculative or statistical econometric models, focusing on the aspects that remained shadowed.

Characteristics and Peculiarities

The results were more positive than negative in most reviewed studies on the role of HEIs in the socio-economic development of developed economies. The authors fully or partially applied the triple helix model, which in some cases enabled a virtuous cycle between education and socio-economic development. However, as demonstrated, the impact and its strength vary significantly. Such variations were conditioned by several research design characteristics of the reviewed studies: theoretical and methodological foundations, timeframes, levels of analysis, contextual factors, and the selected data.

To begin with theoretical and methodological foundations, this review allowed to find particularly positive results in the studies under the neoclassical paradigm and rational choice institutionalism, where authors focused on analyzing how financial activities or educational, R&D-related, and innovational and entrepreneurial efforts affected economic growth in monetary terms or any other narrow sense (i.e., employment, incomes, GDP, financial interdependence) when applying calculative methods. On the contrary, Keynesian or historical and sociological institutionalist mixed-method statistical and qualitative models revealed mixed results demonstrating nuanced and non-positive effects that were identifiable by considering both communication and interaction effects within the triple helix model, analyzing socio-political, cultural, legal, and other aspects that promoted in some instances not a virtuous cycle, but rather a vicious cycle. Such findings of this review reaffirmed the weaknesses of calculative models without advanced statistical tests: bias and distortions, omission of different aspects and effects.

Another one of the most significant findings in this review was about the timeframes. When the authors tested HEIs' socio-economic effects in shorter periods, the positive effects were usually weaker or non-existent. On the contrary, extending tempo-

ral limitations allowed the reviewed authors to detect some positive effects while keeping methodological rigorousness. Some of the reviewed authors, applying "heavy" statistical modeling or qualitative institutionalist analysis, found that extending the period of testing HEI-related socio-economic effects to several years (i.e., 3–5 year effects of individual HEIs' activities) or even decades (i.e., postwar studies, contemplating policy changes) enables more complex understanding of HEIs' socio-economic impact, as it allows exploration of different outcomes, that remain untraceable if shorter periods were taken (i.e., the same year or less than a year gap). Thus, the findings of this review confirm the widely discussed point in the literature on delayed positive effects and the long-run impact of higher education facilities and their activities, especially in the case of education and R&D activities or financial investments.

Considering the levels of analysis, it was possible to find exclusively positive results with different effect sizes in the large-n cross-national studies, while moving down the ladder of abstraction and generalization allowed to obtain mixed results in the studies at the national level and even find negative HEIs' effects on socio-economic development at the subnational and local levels. This pattern was found in the reviewed studies under various theoretical and methodological foundations. Thus, it became possible to note that, *ceteris paribus*, the higher the level of abstraction and generalization, the fewer non-positive effects could be detected, while effect sizes would not vary significantly. It demonstrates scarcity in cross-national data and the limitations of contemporary analytical models, as the cross-national models neither have the necessary nor sufficient inputs to comprehensively assess HEIs' role in socio-economic development (while local, subnational, and sometimes national-level case studies can do so), nor such models can thin-slice available data. Arguably, such differences remind us of the Sartorian rule that the analysis and application of the theoretical or methodological basis must be suitable for a certain level of abstraction.

Moreover, the economic context was essential for analysis and interpretation purposes: Its' health, structure, advancement, and geographical factors were demonstrated as the most significant characteristics. A few authors, applying different theories and methods, found that recessions significantly negatively impact the role of HEIs in socio-economic development. If a recessionary period continued for an extensive period or an economy had no prominent high-skill sectors, it would usually lead to shortages in financing HEIs' R&D and innovation and

entrepreneurship activities. Furthermore, some educated graduates would remain unemployed, creating unusual conditions where HEIs negatively affect socio-economic development. In contrast, discussing positive effects, the structure of the economy and the HEI-government relations demonstrated that in the case of a state-coordinated market economy, financial support and favorable policy and legal regulations for education, R&D, and entrepreneurship are detrimental to HEIs' socio-economic impact performance (i.e., state support for education, publications, patents, and licenses), while the role of private business was more significant in more market-driven economies. Besides such a notion, the state of investment climate, including the international attractiveness of the entity's economy and higher education sector, were also found to be prominent contextual elements shaping the positive results. Finally, various other economic contexts positively affected HEIs' socio-economic impact: availability of knowledge-intensive sectors and industries, especially the digital technology sector, high-quality human capital, especially in the case of the workforce, stable growing local consumption and a stable real estate market, especially in the case of renting, substantial international economic contacts, trade indicators' performance, and high urbanization with various prominent agglomerations.

Discussing socio-political context, various reviewed authors who conducted their studies under different theoretical frameworks and methodologies stressed the importance of various institutional, cultural, and regime-related factors. At first, the culture of pluralism and acceptance in society was found as a significant positive context. While considering it, different authors implied different ideas behind it: academic pluralism and freedoms, general tolerance to the diversity of ideas and people of diverse backgrounds, and pro-female employment and anti-discrimination policies in academia and education. Also, accepting migrants and introducing effective policies for their integration and socialization were identified as substantial positive social and policy contexts. Continuing with policy and legal context, a few authors highlighted that global cooperation and abidance by international standards and laws were significant elements of a positive context. However, establishing a legal and policy framework to allow HEIs, scholars, and students to actively engage in R&D, entrepreneurship, and intrapreneurship and protect their intellectual rights, even if the public bodies fund such R&D, was found to be even more substantial, as mentioned in several statistical and institutionalist reviewed papers. Finally, some institutionalist authors

paid attention to social norms, cultural values, and behavior of individuals in different societies: the high value of education, including life-learning education, the culture of competitiveness, and entrepreneurial and intrapreneurial values among the workforce were particularly influential "boosters" for turning HEIs into valuable socio-economic contributors. Also, the alignment of pro-innovation goals within HEIs and between HEIs, governments, and businesses were positively associated with higher socio-economic impact from HEIs' activities.

Most reviewed papers with different theoretical and methodological foundations also emphasized that regular and stable formal and informal communication and interaction are needed within HEIs and between them and other actors, as their intensity and broadness are among the most significant factors leading to HEIs' high socio-economic impact. A few authors mentioned that interdisciplinary research, innovation, and deliberation about aligning commonly shared visions, goals, and objectives between various departments, academic staff, students, and management led to better socio-economic effects of the HEIs' activities. Meanwhile, the triple-helix model-based regular and stable interactions were significant contextual traits in most reviewed studies, as governments and businesses were repeatedly demonstrated in the papers as the bodies determining HEIs' socio-economic success through funding and shaping legal and policy framework. Discussing the triple-helix model even more, several authors stated that communication and interaction between HEIs and the think tanks, research centers, and institutes must not be diminished in this context, while some other reviewed authors cautioned readers from interpreting such communication and interactions only at the local levels, as the national and international cooperation and interactions frameworks were particularly valuable contexts in many reviewed cases. Thus, the contextual factors demonstrated the importance of exogenous and endogenous factors of the various micro and macro contexts and reaffirmed the high relevance of institutionalism and behavioral approach, considering many non-financial aspects as prominent characteristics affecting HEIs' role in socio-economic development.

By moving to the findings on selected data, as mentioned before, it is possible to identify that purely financial data was associated with calculative methods and positive results. Discussing HEIs' activities, the R&D, innovation, and entrepreneurship-related data predominantly revealed positive results likewise, while most such papers were conducted under

statistical or institutionalist frameworks, maintaining theoretical and methodological rigorousness. On the contrary, the data related to education activities was more ambiguous. The reviewed authors often selected data on publications and patents for R&D, and some authors used various other indicators for examining innovation and entrepreneurship-related activities: citations, mentions, licenses, invention disclosures, global ranking performances, spinoff enterprises' activities, local, national, and international cooperation, collaborative projects with private ventures, and interdisciplinary research activities. Usually, data units on such variables are available for extensive periods within the same datasets under the same theoretical and methodological basis. Also, they are more rigorous in terms of conceptualizability and operationalizability, which arguably led to more positive effects in the case of such variables. At the same time, in the case of education activities, the most frequently used explanatory variables were graduation degree, years of studying in HEIs, and the role of different subjects in socio-economic contributions. Such variables are not so often available for the cases under scrutiny over a long period, usually leading to conducting shorter-term studies that could have potentially overlooked some long-run positive effects. Moreover, education-related activities are vaguer and contain contextually disputed definitions, which arguably could have affected more ambiguous performance. Besides the most frequent three, some authors also used a few other variables, which also could be critiqued for the same reasons: admission criteria, student performance, student-per-faculty member ratio, information on education approaches, interdisciplinarity, academic ranking, exchange programs, curriculum, and availability of soft skills, entrepreneurial, and intrapreneurial training.

Considering the selected data in more detail, this review also allowed to find other distinct characteristics and peculiarities. In the case of publications with predominantly positive effects, the authors usually used data exclusively from publications in internationally recognized repositories (i.e., Scopus and WoS). Furthermore, in such studies, patenting, licensing, and other innovation, entrepreneurial, and cooperation-related activities were usually measured in monetary terms. In other words, the reviewed papers often ignored publications outside these repositories and entrepreneurial activities without monetary returns. Similarly, concerning precisely quantifiable education-related graduation degree information, such as years in HEIs and other rarely used variables, the reviewed papers

also demonstrated predominantly positive mixed results, while a considerable amount of ambiguous results were on education subject-related aspects. Multiple authors claimed that positive effects were found exclusively or predominantly in the case of STEM disciplines, and some other scholars found that some other disciplines could benefit socio-economic development due to their prestige, attractiveness in certain academic institutions for outsiders, and various policies supporting studying activities: medicine, journalism, media and communication, cultural studies, and arts and social sciences. Finally, some authors applying statistical methods found that secondary professional education could benefit socio-economic advancement more than higher education in STEM subjects if the economic context is troublesome, demonstrating that the problem of contextual dependence is substantial in the case of education activities, besides the temporal and concept-related issues.

In the case of the response variables, in the quantitative and partly qualitative studies, the most frequently used were GDP and GDP per capita, employment, and income, followed by ROI and human capital data. Besides, some authors utilized tech capital or local innovation data, start-up ventures and entrepreneurship reports, immigration data, and closing the gap in economic disparities. Among the qualitative traits, a few scholars noted the effects of HEIs' activities on democracy, tolerance, and inclusiveness, as well as their contribution to the societal culture of innovation, general attractiveness, and tourism. Thus, similar to explanatory variables, the problems of lacking data for an extended period, conceptualization, and operationalization were found in the case of qualitative data, which empirically favored applying quantifiable data more often.

Proto-Framework

Based on the results of this literature review, it became possible to introduce a proto-framework reflecting a fresh perspective on the role of HEIs in socio-economic development (Figure 1). According to the results, it would be wise to use statistical regression modeling with various calculative econometric models and theories and sociological and historical institutionalist examinations while following five steps: (1) While working on a research design, focus on the theoretical and methodological foundations, case to study, level of abstraction and generalization, and the timeframes; (2) Include primary and secondary quantifiable and unquantifiable data on various activities of HEIs (HEI box), their relations with

other actors (punctuated lines), and socio-economic development (SED box) and various economic and socio-political contexts for controls and explanations (context figures); (3) While analyzing, build models of causes and effects with control variables (continuous line between HEI box and SED box), and test spillover effects within the agglomeration area, region, or another geographic area, if necessary (punctuated line between HEI and SED); (4) Analyze and use data on communication and interaction data either as a discount factor or interpretation purposes (punctuated lines from HEI box to other institutions in circles); (5) Utilize qualitative data and qualitative historical or sociological institutionalist analysis for interpretation, validation, and triangulation.

Conclusion

Thus, considering a three-decade-long timeframe demonstrated expanded complexity in the studies of the topic from purely calculative to institutional qualitative and advanced statistical studies that revealed predominantly mixed findings. Even though the role of HEIs in socio-economic development was found to be more positive than negative, its assertive conditionality was demonstrated: selected theories, methodologies, timeframes, levels of analysis, contexts, data, and interpretations by authors were found to be significant determinants shaping the authors' assessment. The lack of data, especially at the higher levels of generalization, also showed that the topic could be a metric black hole, as any precise measurements are impossible because the HEIs' impacts, including many direct
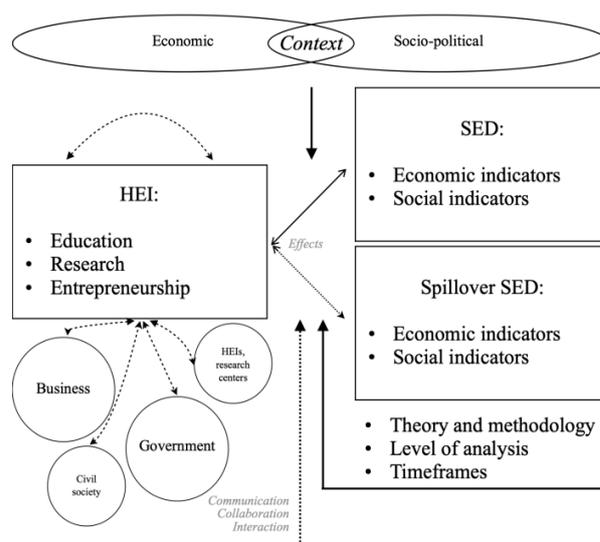

Fig. 1. Model of an Analytical Framework
Source: Compiled by an author.
Abbreviation: SED = Socio-Economic Development

and indirect ones, and socio-economic development are contextually disputed terms. However, the papers demonstrated that the threshold-level impact is adequately measurable: in the case studies and comparative small-n studies, the long-term available data allows analysis on the topic at a certain level of depth, while in large-n studies, it could allow one to grasp the general changes and trends on a large scale. However, developing more advanced data mining and thin-slicing analytical methods and introducing more statistical techniques and institutionalist explanations appear to be needed. Yet, these matters are essential prospects for future research.

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