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RESEARCH, VOLUME 16

**BLEEDING-EDGE
ENTREPRENEURSHIP:
DIGITALIZATION,
BLOCKCHAINS, SPACE, THE
OCEAN, AND ARTIFICIAL
INTELLIGENCE**

EDITED BY

JOÃO J. FERREIRA

University of Beira Interior, Portugal

And

PATRICK J. MURPHY

University of Alabama at Birmingham, USA



United Kingdom – North America – Japan
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ABOUT THE CONTRIBUTORS

Alamir N. Al-Alawi has worked as a Director of Admin and Finance, Assistant Dean for Academic Support Affairs, and, currently, an Assistant Dean for Academic and Scientific Research at the University of Technology and Applied Sciences-Salah, Oman. He published in several steam journals and is currently working on a project worth around \$30,000 funded by the Research Council “Ministry of Higher Education.” He has successfully supervised and examined a number of Master theses. His research interests include finance, PLS-SEM, entrepreneurship, tourism, and management.

Pablo Álamo obtained PhD and Master in Economics and Business from the University of Comillas (Madrid, Spain). He is the Partner of Invivus Consulting, Member of the Instituto de Consejeros Administradores (Madrid, Spain), and International Professor at CETYS University. He is an Expert in innovation in family businesses and also help companies and individuals to enhance their leadership and improve their productivity with human development.

Paula Arriscado is a Corporate People, Brand and Communication General Manager at Salvador Caetano Holding (since 2015), after 15 years as Brand, Marketing and Communication Manager at Toyota Caetano Portugal. Since 2007, she is a Teacher at IPAM – The Marketing School University and Affiliated Member of the IPAM Lab Research Unit (Universidade Europeia Holding). She holds a PhD in Brand Management and Integrated Communication at Santiago de Compostela University (2008), DEA (Advanced Studies Diploma) in Communication (2001), and Journalist degree (1995). Between 1991 and 2000, she developed a large activity in the Business Communication field and collaborated with several media. She was elected “Marketing professional of the year 2005 in automotive sector” by Portuguese Marketing Association APPM, and “Teacher of the year 2013” by IPAM. She is a Jury Member at Specialist Title selection process for title accreditation to university teachers.

Katarzyna Czernek-Marszałek is an Associate Professor, the Head of the Department of Management Theory, University of Economics in Katowice. Her research interests include inter-organizational relationships (especially cooperation and coopetition), its determinants (e.g., trust and social embeddedness), innovations, and knowledge transfer. Her empirical research focuses strongly on tourism sector. Her works are published in such journals, for example, *Industrial Marketing Management*, *Tourism Management*, *Journal of Destination Marketing & Management*, *Annals of Tourism Research*, *Journal of Travel Research*, and *Current Issues in Tourism*.

Brandon DeBalsi is a Cooperative Scholar and Alumnus of the University of Alabama at Birmingham Peace Studies and Human Rights Program. He studies worker cooperatives and workplace democracy by means of anthropological analysis. Economic democracy of all kinds is one of his enduring passions.

Claudia Dias has a multidisciplinary background including a degree in Economics at the Instituto Superior de Ciências do Trabalho e da Empresa (ISCTE), a Masters in Agronomics at the Escola Superior Agrária de Castelo Branco (ESACB), and a PhD in Management at the Universidade da Beira Interior (UBI). She is a Junior Researcher at NECE-UBI and a Research Fellow in the project “IIES I3Social BSE – Incubadora Itinerante para a Inovação Social das Beiras e Serra da Estrela” at UBI. In this university, she is also a Master’s Supervisor in the entrepreneurship and marketing fields. She is a Member of the Editorial Board of the *Journal of Small Business and Enterprise Development*, and an Author of several articles published in journals indexed in Scopus and WoS. Her research interests are entrepreneurship, marketing, and sustainability, especially in the agri-food sector.

Iman El-Kaffas, BA, MPA, PhD, an Egyptian Academic and International Consultant with proven expertise with international development and donor organizations as well as government agencies, public, and private enterprises, and local non-governmental organizations (NGOs) around the world. Her consultancy work, teaching, and publications focus on education transformation, youth and women entrepreneurial development, and organizational assessment and development. She has worked and consulted in sub-Sahara Africa, the Near East and North Africa, Central and Southwest Asia, and the Americas. She has obtained PhD in Higher Education Administration from Bowling Green State University, Ohio. In 2007–2008, she was a Fulbright New Century Research Scholar investigating Innovative Approaches to Financing Higher Education.

Marta Félix is a Researcher at the Research Unit in Business Sciences at UBI (NECE). She holds PhD (2021) and Master (2013) in Management from the University of Beira Interior, Covilhã, Portugal and a degree in Education (2004). Over the last 20 years he has always worked in the area of Management from client management to project management. She also works as a Consultant in the areas of intrapreneurship, organizational management, and culture and leadership, which are also her main areas of interest in research.

Ronnie Figueiredo is an *Academic Scientist at Centre of Applied Research in Management and Economics (CARME)*, School of Technology and Management, Polytechnic of Leiria. He is the Preferred Peer Reviewer for the Economics of Innovation Portfolio to Routledge Taylor & Francis Group and Associate Editor – Editorial Board of Innovation & Management Review (INMR), Emerald/Scopus, FEA/USP. His research interests include innovation, Geographic Information System (GIS), and Digital Business, and methods include bibliometric analysis, data mining, machine learning, spatial data mining, and spatial regression model. He is an Internationally Recognized Speaker

in Innovation and an example for Authentic Leadership in Asia, Africa, South America, and Europe. He is the Chairman of Spinner Innovation Centre, Europe, and an author of Spinner Innovation Model®, published in indexed international journals. He received two awards, Global Teacher Award and Global Innovative Teacher Award.

Sofia Gomes is an Assistant Professor at the Department of Economics and Management of University Portucalense. She holds PhD in Applied Economics. Currently she is a Researcher at REMIT – Research on Economics, Management and Information Technologies. She is also a Reviewer Board in several journals. Her research interests include entrepreneurship, digital economy, innovation, corporate finance, and sustainability with publications in several international scientific journals.

Jaime Alonso Gómez is a Dean of the University of San Diego School of Business. He has worked for a wide variety of organizations across five continents as a Scholar, Consultant, and Executive Coach in the areas of strategy, leadership, family business, and executive talent development. He obtained PhD in Applied Economics and Managerial Science at The Wharton School of The University of Pennsylvania.

Kateri Gutierrez received her MBA University of Michigan Ross School of Business. Prior to school, she Co-founded a Worker Cooperative Cafe in Southeast Los Angeles. This experience further motivated her to help bridge the gap between business school acumen and employee ownership efforts.

Felicity Healey-Benson, BSc, PGCE, MSc, MBA, is a doctoral candidate at the University of Wales Trinity St. David, and an Entrepreneurial Learning Champion in the International Institute for Creative Entrepreneurial Development. She is a Member of the Erasmus+ funded EntreCompEdu Steering Group, which aims to develop teachers' entrepreneurial education skills through global access online CPD underpinned by the European Entrepreneurship Competence Framework. She is passionate about sustainability and is a Co-founder of the Harmonious Entrepreneurship Society. She is a Writer and Academic Entrepreneur founded "Emergent Thinkers.com," and "Pirates in Education," both of which identify and share new educational and business practices to promote sustainability and support wider economic and social development. She contributed to, and supported the editing of Tay Kay Luan's 2019 book *Applying Sustainability: Principles and Practices*.

Patrycja Juszczak is an Assistant in the Department of Management Theory at the University of Economics in Katowice. Her research interests include the issues of strategic management – in particular the coopetition, cooperation, and competition, especially in non-commercial organizations (public and non-profit). As a researcher she conducts research that focuses mainly on the issues of social relationships and other sociological concepts and theories in the management

and quality studies. She is an Implementer of research projects financed by the Ministry of Education and Science. Actively also involved in work on projects subsidized by the National Science Center.

David A. Kirby, BA, PhD, FHEA, FIBC, FRSA, was Founding Dean and Vice President of the British University in Egypt from 2007 to 2017, in which capacity he introduced entrepreneurship education to the University and country. Prior to this, he had pioneered the teaching of entrepreneurship in the UK and internationally, and held the UK's first Entrepreneurship Chair at Durham University Business School from 1988 to 1996. At Surrey University (2000–2007) he not only introduced innovative new undergraduate and postgraduate programs but also the first SETsquared incubator on the Surrey Research Park. He holds Honorary Professorships at Almaty Management University in Kazakhstan and the University of Wales Trinity St. David, and is a Council Member of the International Accreditation Council for Entrepreneurial and Engaged Universities and is the Co-founder (with Felicity Healey-Benson) of the Harmonious Entrepreneurship Society. He has published 160 journal articles and 18 books and research monographs, including “Entrepreneurship” (McGraw-Hill, 2003). In 2006, he was a lifetime recipient of The Queen's Award for Enterprise Promotion.

Patrycja Klimas is an Associate Professor at Wroclaw University of Economics and Business in the Department of Advanced Research in Management. As a Researcher, she researches within strategic management, focused on inter-organizational cooperation and cooptition considered under dyads, networks, and different types of ecosystems. Based on her research mainly on the aviation and the video game industry, she published several papers in the ranked journals (*Long Range Planning*, *Industrial Marketing Management*, *Review of Managerial Science*, *European Management Review*, and *European Management Journal*). She co-organizes the track on Cooptition–Ecosystems–Networks–Alliances at the annual EURAM conferences.

João M. Lopes obtained PhD in Management. Currently he is an Assistant Professor at the Miguel Torga Institute of Higher Education (ISMT) and University of Beira Interior (UBI), Scientific Coordinator of Undergraduate Degree in Management (ISMT) and Researcher at NECE (Research Unit for Business Sciences). He has done several publications in journals indexed to WOS and Scopus, and is part of the Topic Board Editor in the *Journal Businesses*. He is also a Reviewer Board in the Journals: *Data*, *Social Sciences*, *Resources*, *Urban Science*, *Digital*, *Smart Cities*, *Tourism and Hospitality*, and *World*. His main research interests include: regional innovation systems, RIS3, smart specialization, tourism, strategy, entrepreneurship, marketing, innovation, circular economy, and competitiveness.

Frayne Olson is the Crop Economist/Marketing Specialist with the North Dakota State University Extension and Director of the Quentin Burdick Center

for Cooperatives. He conducts educational programs focusing on crop market outlook and price analysis, evaluating alternative crop marketing strategies, and the economics of crop contracting. As Director of the Center for Cooperatives, he Teaches a senior-level course on Cooperative Business Management and Coordinates the Center's research and outreach activities. He received his PhD from the University of Missouri in Agricultural Economics, and MS and BS in Agricultural Economics from the North Dakota State University.

Marta Peris-Ortiz is a Full Professor at the Univesitat Politècnica de València and obtained PhD in Management at the University of Valencia. She is a Guest Editor of several management journals and has published numerous research papers indexed in the Journal Citation Report and Springer books in the area. She is an Expert in Innovation and Entrepreneurship and provides Consultancy Services to both public and private companies.

Raysa Geaquinto Rocha is the Project Manager of UBI's team at ENTRANCE and RE-START projects, both financed by Erasmus Plus. She teaches Management and Marketing courses at the University of Beira Interior (UBI). She is a Junior Researcher at NECE-UBI and an Associate Member of the International Association for Knowledge Management. She received her PhD with distinction in Management from UBI. During doctoral program, she was granted two awards on her PhD project, including the 2021 MSR Promising Dissertation Award given by the Management Spirituality and Religion Interest Group of the Academy of Management. She is particularly interested in studying organizational practices that lead to a humanized strategy for long-term sustainable performance.

Kristi Schweiss is an Assistant Director of the Quentin Burdick Center for Cooperatives at North Dakota State University. As Assistant Director of the Center, she works alongside Director, Dr. Frayne Olson, to coordinate and implement the Center's education, research, and outreach activities. She received MS and BS in Agribusiness and Applied Economics from the North Dakota State University.

Mohammad Soliman is currently an Assistant Professor at the University of Technology and Applied Sciences-Salalah, Oman. He has published multiple papers in reputed journals indexed in WoS and Scopus (e.g., *Journal of Destination Management & Marketing*, *Tourism Management Perspectives*, *Geoheritage, Tourism and Hospitality Research*, *Journal of Medical Systems*, *Journal of Consumer Behaviour*, *International Journal of Finance and Economics*, *International Journal of Hospitality & Tourism Administration*, *European Journal of Tourism Research*, & *Anatolia*). Additionally, he sits on the Editorial Board of some academic journals (e.g., *Journal of Tourism & Hospitality*, *Tourism & Management Studies*, *Journal of Responsible Tourism Management*, and *Journal of Global Hospitality and Tourism*), and serves as a Reviewer of some top-tier journals (e.g., *International Journal of Hospitality Management*, *Current Issues in Tourism*, *Journal of Destination Management & Marketing*, *International Journal*

of Contemporary Hospitality Management, Journal of Hospitality and Tourism Management, and Journal of Hospitality and Tourism Technology). He has successfully supervised and examined a number of Master and PhD theses. His research interests include tourism management and marketing, tourism behavior, PLS-SEM, and bibliometric studies.

Dagmara Wójcik is an Assistant in the Department of Management Theory at the University of Economics in Katowice. Her research interest include the strategic management issues, that is, inter-organizational cooperation and coope-tition in particular in the creative industries such as performing arts. She is also the Researcher involved in individual and team projects subsidized by the National Science Centre, the Ministry Education and Science, or the European Commission.

FOREWORD

I like to think about entrepreneurship as an unexplainable but undeniable feeling that there must be a better way. The vagueness of that feeling complements a sharp mindset and dogged tendency to ignore the status quo. It is a mindset that compels you to walk to the edge of a cliff, look across the chasm at what could be, and then step off – not knowing exactly where you will land. Although the situation is extreme, a strong entrepreneurial disposition gives you unshakable confidence. You know you will land somewhere, and then it will be possible to build a bridge that will take you where you need to be. This illustration, I believe, conveys something about the true source of entrepreneurship.

The chasms between the “status quos” and the “better ways” are endless. As such, innovation and entrepreneurship compose a never-ending cycle. A “better way” eventually morphs into a status quo, which ultimately makes it possible for an even better way to emerge in the future. Without entrepreneurs who ignore the abyss of the chasm, and who thus take a chance, societies, and communities do not push the limits of what is possible. If human beings did not do entrepreneurial things, then we would still be making fire with sticks, and only a very select few of you would be reading this book today.

My experiences founding and leading several entrepreneurial ventures have taught me a few lessons. First, from an observer’s perspective, entrepreneurial activities appear to rise from opportunity and necessity. However, from the insider’s perspective of the entrepreneur who is taking action, opportunity, and necessity are almost invisible. Instead, for them, entrepreneurship is all about solving problems. I believe that entrepreneurs, in general, take action to engage and resolve problems. But it is also more than that. For instance, an inordinate amount of passion is instrumental to problem-solving activities. If one person feels the need to do something entrepreneurial, the effect of their passion for the underlying problem can become a force multiplier and set many things in motion. The result is an unstoppable pursuit of excellence, which continues to increase its momentum along the way.

On these grounds, I believe entrepreneurship represents a new paradigm for thinking about business, communities, and society. Pat Riley, the Famed Coach of the Los Angeles Lakers basketball team, once said that “excellence is the gradual result of always wanting to do better.” For me, the same kind of personal longing is what keeps me motivated as an entrepreneur. For scholars, I think the questions are interesting and profound. What kind of mindset compels a person or team to pursue excellence? How does passion for a problem evolve into an inner voice that yells, “no one else is going to do this, so you must!”

In entrepreneurial settings, empathy, creativity, and ego interact with one another in dynamic ways to generate performance and impact. The effect is

multiplicative; if one element is missing, then performance and impact will not occur. Empathy, ego, and creativity are the human foundations of the innovations that move our world forward. Deep empathy for people drives questions about why it is so important to solve a problem. When the answers are clear at the outset, creativity comes to life. Then, the ego says “don’t tell me this can’t be done,” which leads to more questions, more external human connections, and more ways to show empathy. Without empathy, innovation is vacuous. Without creativity, innovation falls flat. Without ego, an innovative spirit dies before it reaches success. It is vital to understand the dynamic relations among these elements. Those relations play out within individuals and within teams. In the industries and communities of our world today, entrepreneurial people and teams are creating transformational change based on these foundations.

There will always be new challenges for humanity. Thus, there is no end to the opportunities that will emerge for entrepreneurs. Change begets change. Entrepreneurship spans all the sectors of our lives: energy, food, technology, business, and finance, just to name a few. Sectors that do not yet exist will offer fertile new soil to till and yield disruptive bounties that ripen and disrupt the status quo. When natural resources dwindle, dispersed communities become closer. When the need to make decisions quickly is intense, individuals with the knowledge to act move to the vanguard.

From my perspective as an entrepreneur, I am heartened to see the field of entrepreneurship taken seriously in the world of academia, and I applaud the efforts of researchers and professors to continue to build bridges so that students – the entrepreneurs of tomorrow – will be able to build new bridges that span future chasms.

Over the course of this book, you’ll be introduced to powerful ideas from the minds of scholars and successful practitioners. The implications of these chapters lead to challenging the status quo in some of the most progressive and *avant-garde* entrepreneurial sectors in the world. This is a scholarly book. However, the same principal question of “how can this be better?” still applies, just as it applies to entrepreneurs like myself.

Trent Kocurek
CEO and Co-founder, Airship
teamairship.com

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We acknowledge the strong and reliable support that we receive from our universities and colleagues, which has made it possible for us to complete this book. We are grateful to the scholars who contributed to this volume. We dedicate this book to entrepreneurs around the world who enter radically uncertain realms and undertake the boldest actions in order to improve human society.

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INTRODUCTION

João J. Ferreira and Patrick J. Murphy

Entrepreneurship begins and ends with both problems and uncertainties. Discovering an opportunity to resolve a problem, or to lessen the uncertainty associated with a problem, sets the context for entrepreneurial action. The power of this action is commensurate with the size of the problems to be resolved and the depth of the uncertainties to be lessened. When entrepreneurs undertake these risky pursuits, they can succeed or fail. Either way, their actions give rise to new problems and uncertainties that lead to new entrepreneurial opportunities. The differences between discovery and creation thus become arbitrary in entrepreneurial contexts. The pursuits of entrepreneurial action evolve, but the underlying logic does not change, and the program never ends.

History is relativized in entrepreneurial settings. Traveling across the vast ocean for trade and exploration in 1500 yielded the discovery (and creation) of new commercial channels, even as the uncertainties of the ocean gave rise to navigational problems and the need for stronger ships and better technologies. Fear-inducing plagues of the dark ages stimulated entrepreneurial actions not unlike the effects of epidemics in later centuries. New implements of war and advances in weaponry led to new forms of defense, just as new forms of currency and transaction mechanisms have led to new regulatory channels for business and exchange that protect the weak from the strong. Today's human beings gaze upon the infinity of space similarly to how we gazed upon the ocean hundreds of years ago. It took many centuries to complete the oceanic trek. During that era, its uncertainties inspired an epoch of fantastic stories and myths. From an entrepreneurial perspective, how meaningfully different is the exploration of outer space?

In the domain of business studies, the entrepreneurship field is the best at engaging these kinds of large questions. It is the only field that utilizes a coherent paradigm to make sense out of problems, the growth of many different kinds of resources, and positive impact that goes beyond mere organizational performance. Human beings have always worked to make our world a better place through the pursuit of incredible entrepreneurial actions. Again, the underlying logic does not change, and the program never ends. This book focuses on current entrepreneurial pursuits that capture the timelessness of entrepreneurship.

Bleeding-Edge Entrepreneurship: Digitalization, Blockchains, Space, the Ocean, and Artificial Intelligence
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We refer to this focus as “bleeding-edge” because the size of the problems and the depth of the uncertainties are extreme. Similarly to the past, the risks associated with today’s most progressive entrepreneurial pursuits are considerable and can also be dangerous.

The contributions to this book illustrate bleeding-edge entrepreneurship with rigorous conceptual arguments, theoretic formulations, empirical research, and studies of actual cases. In the Foreword, Co-founder and CEO of Airship, Trent Kocurek, writes from the truth of his own experiences. As a software engineer and successful technology entrepreneur, he has spent his career close to the bleeding-edge of radical entrepreneurial action. He conveys the human side of entrepreneurship by balancing its uncertainties with a sense of the unshakeable faith that successful founders like him must exhibit when leading successful entrepreneurial ventures. It is a perfect framing for the book’s eight chapters.

In Chapter 1, Ronnie Figueiredo, Mohammad Soliman and Alamir N. Al-Alawi explain the unbounded entrepreneurial opportunities offered by the ocean, a sector they define in terms of “deep blue entrepreneurship.” This landmark contribution proposes a paradigm for sustainable marine activities that consider the oceans, seas, and coastal areas as integral elements of a “blue economy.” The authors illustrate the relations between sustainable maritime activities and economic interpretations in an application spanning the 28 states of the European Union.

Big data as it applies to entrepreneurship in the food industry is the topic of Chapter 2, in which Claudia Dias and Raysa Geaquinto Rocha make a valuable contribution to analytics. As one of the hottest areas in the domain of business studies, analytics and digital expertise are a powerful combination for entrepreneurial performance in this sector. Using data from Eurostat Digital Economy and Society, the authors analyze and illustrate how digital entrepreneurship is transforming the food industry. They show how digital skills and big data capabilities can contribute to superior entrepreneurial performance.

David A. Kirby, Iman El-Kaffass, and Felicity Healey-Benson engage a long-standing vital area of entrepreneurship with a progressive approach to sustainability. Their evolutionary approach embraces ecology to propose a new model of entrepreneurship that harmonizes more traditional entrepreneurial models. Based on an intensive case study, the authors discuss how the model’s applications in different geographical and sectoral contexts. The authors explain that their approach heralds a new paradigm, based on systems that think and function ethically, which helps ensure that profit, people, and planet harmonize together.

An *avant-garde* approach to social relationships as the key to synergy in venture cooperation and coordination is the focus of Chapter 4. Katarzyna Czernek-Marszałek, Patrycja Klimas, Patrycja Juszczuk, and Dagmara Wójcik examine a traditional topic in a non-traditional context with a systematic literature review of social relationships and inter-organizational cooperation. The authors offer new classifications of these complex theoretical constructs and contribute to what is known about the bi-directional and paradoxical nature of interconnectivity and cooperation in entrepreneurial settings.

A macro-approach to conceptualizing entrepreneurship is also included in this book. Chapter 5 focuses on entrepreneurial ecosystems in Europe with a special

emphasis on the role of digital entrepreneurship and advanced technologies. Sofia Gomes and João M. Lopes analyze the influence of digitalization on entrepreneurial ecosystems. The authors show that informal and formal institutions, market conditions, infrastructure, human capital, and networking all positively influence entrepreneurial activity. Moreover, the authors delineate how digitally powered entrepreneurial ecosystems bolster this positive influence and transform traditional business models.

Frayne Olson, Kristi Schweiss, Kateri Gutierrez, and Brandon DeBalsi rethink cooperatives as a novel venture form in Chapter 6, with a contribution showing that radical entrepreneurship thrives in the cooperative sector. The authors argue that cooperatives open up new opportunities to leverage technological tools that promote performance and inclusion. Their contribution shows that cooperatives address behavioral challenges of technological change and stimulate new ways to think about organizational design.

With a unique and powerful focus on the dynamics and logical parameters of human interactions in Chapter 7, Marta Félix and Paula Arriscado present how human resource functions can promote innovation and entrepreneurial outcomes by engaging advanced technologies. The contributions of this chapter apply to organizational learning activities and programs. The authors address the needs for more innovative orientations, new ways to build novel competencies, and unique organizational structures. This chapter expands current conceptualizations of human resource management to improve its application to the entrepreneurial sector.

Finally, the book concludes with a *tour-de-force* treatment of one of the most important areas of radical technology-enabled entrepreneurship. Blockchain and its challenges and opportunities are laid out explicitly for entrepreneurs based on the lessons of experience. Marta Peris-Ortiz, Pablo Álamo, and Jaime Alonso Gómez contribute an array of important implications for scholars and practitioners alike. From a practical perspective, the authors show that basic technology entrepreneurship requires particular strategies based on leadership that is not often found in the local market such entrepreneurship occurs. They illustrate the unique nature of entrepreneurship strategy in the blockchain sector, and detail its implications for novel venture models.

It is our hope that this book and its contributions will assist entrepreneurship scholars for decades to come. By taking an intense scholarly perspective, we have edited this volume with a view that is designed to see past the ephemeral and topical aspects of entrepreneurial topics.

The hallmark of good theory is its long-term usefulness, even when its applications are in the most current and trendy realms of practice. In this way, we wish to serve the scholar entrepreneurial community, as it continues to grow and revolutionize colleges and universities worldwide by training the entrepreneurs of future eras. Those entrepreneurs shall undertake their own bleeding-edge work that benefits from the past as it carves out the future. As such, like the entrepreneurial ventures of today, the entrepreneurial ventures of the future will take up the mantle of transforming the world in positive ways, by navigating its deepest uncertainties, and resolving its largest problems.

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CHAPTER 1

DEEP BLUE ENTREPRENEURSHIP: OCEAN VENTURING AND INFINITE OPPORTUNITY

Ronnie Figueiredo, Mohammad Soliman and
Alamir N. Al-Alawi

ABSTRACT

The “Blue Economy” is a recent topic of study that spans those economic activities which depend on ecosystem services, thereby including such sectors as tourism, maritime transport, energy, water, fishing, among others. However, there is only limited research approaching the added value produced by marine activities connected with these sectors. This research contributes to the literature by providing interpretations of blue economy factors in terms of their added economic value. The authors deployed secondary data from 2009 to 2020 from the European Union Economy Database to analyze six sectors involving maritime activities: coastal tourism, living marine resources, non-living marine resources, port activities, ship-building and repair, and maritime transport. This study highlights how the sustainability of countries depends on the ability to manage their natural resources, especially maritime resources. Furthermore, sustainability depends on the economic interpretation of countries and sectors over time with regard to creating value and managing the activities derived from ecosystem services.

Keywords: Innovation; blue economy; entrepreneurship; marine; management; digital

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1. INTRODUCTION

Over recent decades, there have been substantial developments in the field of the blue economy as an innovative approach to ocean governance (Childs & Hicks, 2019). The blue economy emerged as a concept describing the wide range of policies that aim to support economic activities associated with the oceans that, in turn, also produce concurrent improvements to the economic, social, and environmental dimensions (Schutter, Hicks, Phelps, & Waterton, 2021). The Rio+20 summit in 2012 witnessed the proposition of the blue economy concept as a derivative of the green economy concept (Schutter & Hicks, 2019) and exceedingly consistent with sustainable development (Childs & Hicks, 2019).

In their studies, Senaratne, Zimbhoff, and Stevens (2021) argued there is no clear and consensual definition of the “Blue Economy” term or its related economic sectors. However, they specify a number of common sectors and industries interconnecting with the blue economy, such as marine resource extraction, ocean-dependent tourism and leisure, shipping and goods transportation, and other sectors.

Based upon prior studies (e.g., Silver et al., 2015; Voyer, Quirk, McIlgorm, & Azmi, 2018), the business and economic growth concentrated in the blue economy drive the prominence of certainly major aspects, including innovation, entrepreneurship, and substantial cooperation with private sector entities. According to Senaratne et al. (2021), blue economy entrepreneurship has emerged as a distinctive and up-and-coming means of supporting sustainable economy associated growth.

This clearly conveys the substantial interest in the field of blue economy entrepreneurship and the factors enabling sustainable economies. Based on the existing gap in literature, this study analyzes the contribution of blue economy factors to the added value generated by maritime activities within the scope of responding to the research question: *What is the added value of blue economy marine activities and how can we measure them?* This research contributes to the science putting forward interpretations of blue economy factors in terms of their sustainable economic value.

Within this framework, we deployed secondary data from the European Union (EU) Economy Database for the period 2009–2020 to analyze six sectors involved in maritime activities: coastal tourism, living marine resources, non-living marine resources, port activities, shipbuilding and repair, and maritime transport.

This study highlights how the sustainability of countries depends on their ability to manage natural resources, especially maritime resources. Furthermore, this in turn depends on the economic interpretation of countries and sectors over time with regard to creating value and managing the activities deriving from ecosystem services.

This chapter makes contributions to this field in terms of its definitions and meeting eventually existing gaps in the literature. In addition, this proposes a support model for sustainable marine activities that takes into consideration the significance of the oceans, seas, and coastal areas as an integral and vital element of earth’s ecosystem. Moreover, another contribution arises from the specific interpretations of blue economy factors within the framework of the added economic value in 28 member states (MS). Finally, this sets out a new approach to understanding the factors contributing to the value added by the blue economy.

2. BACKGROUND

The “blue world” that comprises the oceans and coasts makes our earth a blue planet. The term “blue economy” traces its origin to the 1990s, however, it appeared substantially later in the scientific literature. One of the first users, [Pauli \(2010\)](#) mentioned the term within the context of sustainable ocean development.

Similar to the “green economy,” the “blue economy” also focuses on extracting the aquatic opportunities while taking the best care of biodiversity ([Corson, MacDonald, & Neimark, 2013](#)). The United Nations Conference on Sustainable Development (2012) further highlighted its significance by stating that the oceans, seas, and coastal areas are integral and vital elements of the earth’s ecosystem and therefore deemed critical to its sustenance.

Currently, the 14th goal in the United Nations Sustainable Development Goals pledges to conserve and ensure sustainable usage of the oceans, seas, and marine resources in such ways that they lead to sustainable development. [Park, Seo, Kildow, and Judith \(2014\)](#) noted that there is neither any single definition for the “blue economy” term nor is there any consensus as to which specific sectors it covers.

As such, there is a high degree of ambiguity as to what constitutes the blue economy ([Silver et al., 2015](#)). However, in the light of the extant literature, fisheries and aquaculture, marine resource extraction, shipping and transportation, ocean-dependent leisure and tourism, safeguarding of biodiversity, their ocean-based interconnections, and government actions to manage these economic sectors broadly define the blue economy.

Furthermore, their interconnections leave them prone to mutually adverse impacts from the actions of others, thus requiring a common approach to the sustainable utilization of aquatic resources ([Llewellyn, English, & Barnwell, 2016](#)).

The depletion of earthly resources and limitations pertaining to terrestrial economic activities have convinced nations to explore the economic opportunities in and around the seas and oceans ([OECD, 2016](#)); the blue economy.

[The Economist \(2015\)](#) classified the major contributors to the ocean economy into four broader groups; specifically, the extraction or generation of non-living resources, harvesting of living resources, commerce and trade in and around oceans, and ecosystem protection and management.

Seabed mining, extracting energy resources such as oil and gas, water and desalination, dredging and securing energy from tides and waves, and similar activities constitute the first group. The second is comprised of marine biotech, boating, and fishing for the purpose of recreation, fisheries, seafood processing, and aquaculture.

Marine transportation (shipping), marine construction, marine services including marine insurance, marine research and development, marine and coastal tourism, shipbuilding and reparation, and defense make up the third major group. The fourth group incorporates sectors such as waste treatment and disposal, hazard protection, blue carbon, surveillance and maritime security, ecological and ecosystem research, and so forth.

In contrast to this classification, to outline the structure of the marine economy, [Suris-Regueiro, Garza-Gil, and Varela-Lafuente \(2013\)](#) grouped all

pertinent activities into three categories; specifically, completely marine, mainly marine and partially marine.

Many of these sectors open the doors for small and budding entrepreneurs to advance with their ventures. For instance, coastal and marine tourism is one of the largest and most thriving components of the blue economy (Cerqua, 2017).

Coastal tourism represents the means of sustenance for many rural and underprivileged communities. With fishing and farming as the seasonal occupations for local inhabitants, coastal ecotourism proves a boon as a means of a support source of income (Ford & Acott, 2015). In addition to their routine, daily life activities, they may develop novel tourist services, attractions, and community-based ecotourism (CBET). CBET empowers and preserves the sociocultural as well as the natural resources of a community (Mitchell & Muckosy, 2008).

For instance, homestays as one form of CBET require the least financial commitment and help contain rural poverty in keeping with how they offer alternative and affordable lodging in exchange for a good degree of exposure to the sociocultural milieu of the hosts (Imran & Nguyen, 2018).

A well established and supported network of homestays along with appealing promotional campaigns about the traditional goods, handicrafts, local dishes, seafood, and other products may lead to the development of small and medium enterprises. By the end of 2030, coastal and marine tourism services are forecast to account for the largest contributor to the blue economy (Brumbaugh, 2017).

A clustering strategy may work best in most situations. For instance, Markusen, Lee, and DiGiovanna (1999) proposed three-pronged industry clustering approach, including hub and spoke industrial districts, satellite platform districts, and state-anchored industrial districts.

Chorincas, Marques, and Ribeiro (2001) later proposed another typology which rests on four clusters are: micro, industrial, regional, and mega clusters. In any case, maritime clusters blossom on the basis of entrepreneurial talents, intellectual capital, the exchange of tacit knowledge, and, obviously, terrestrial proximity (Cooke, 2001).

Subsequently, the European Commission (2013) identified the economic indicators applied to established blue economy sectors as “coastal tourism, marine living resources, marine non-living resources, port activities, shipbuilding and repair, and maritime transport.” Some of the activities incorporated into these sectors are likely to hold the potential capacity for development in the years ahead. In keeping with this direction, we developed the following hypothesis:

H1. The blue entrepreneurship factors positively influence the sustainable economic maritime activities of European countries.

3. DATA DESCRIPTION

This research analyzes the contribution of blue economy factors to the added value of entrepreneurship in maritime activities according to 28 EU MS: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, and the UK. We applied data collected from the EU Economy Database