"BABEŞ-BOLYAI" UNIVERSITY CLUJ-NAPOCA

FACULTY OF ECONOMICS AND BUSINESS ADMINISTRATION

PHD THESIS

SUMMARY

NEW GLOBAL FINANCIAL SYSTEM – GREEN GROWTH

SCIENTIFIC COORDINATOR,

Prof.univ.dr.Ioan BĂTRÂNCEA

DOCTORAL STUDENT:

Rathnaswamy Malar Maran

CLUJ-NAPOCA

2022

CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ANNEXURE

INTRODUCTION

Motivation, Contributions, Structure and Limitations of the PhD Thesis

Ben S. Bernanke, Banker, and financial Specialist, USA held that there would be troublesome for a supported financial recuperation amid the monetary emergency. The weak financial system is not the answer to the crisis, unlike the strong financial system. European Union has taken suitable measures to strengthen it. The central bank allocates resources towards a sustainable and green economy for the same it has to reorient its conventional goals and responsibilities. Climate alter makes a difference the budgetary framework for a accomplishing the change to a green economy. According to the IPCC report every year $ 2.5 to$3.5 trillion until 2035. The central banks need to restructure their priorities towards a green economy without compromising financial stability. For achieving a green economy, it has to involve the financial sector and other institutions for strong investment decisions. The COVID-19 pandemic poses a huge challenge because it comes about into the negative development rate of GDP and moderate recuperation. The efficient financial sector, expanding the finance through carbon pricing for green investment and evolving new global financial system, make the financial system stronger and dynamic.

Motivation for choosing the topic and relevance of research

Global warming has caused climate changes which result in challenges to humanity and nature. It is important to find solutions to these problems. One of them is to develop an appropriate global financial system for green growth as one of the permanent solutions. Long-term investment in the green economy is found normally difficult since their returns are very slow and late. Thus, it becomes essential to find out a solution through the new global financial system for green growth. This is the primary motivation. Another motivation has resulted from earlier research and publications. The most important of them are given below:

1. **R. Malar Maran** and Alexandru-Mircea NEDELEA (Maran 2017a). Corporate Finance Theories and Principles: Redundant, *ECO FORUM*, Volume 6, Issue 2 (11), 2017

2. R .Malar Maran and Alexandru-Mircea NEDELEA (2017 b). Green Economy: Challenges and Opportunities, *ECO FORUM*, Volume 6, Issue 3 (13), 2017

3. **R. Malar Maran** and Alexandru-Mircea NEDELEA (Maran, 2018). Long Term Investment and Sustainable Development, *ECO FORUM*, Volume 7, Issue 2 (15), 2018

4. Batrancea Larissa, **Rathnaswamy Malar Maran**, Batrancea Iaon, Nichita Anca, Rus Mircea-Losif, Tulia Horia, Fatacean Gheorghe, Masca Ema Speranta, and Morar Ioan Dan (2020 a). Adjusted Net Savings of CEE and Baltic nations in the context of Sustainable Economic Growth: A Panel Data Analysis. *Journal of Risk and financial Management,* 1 October 2020

5. Batrancea Iaon, Batrancea Larissa, **Rathnaswamy Malar Maran**, Tulai Horia, Fatacean Gheorghe, and Rus Mircea-Iosif (2020 b). Greening the Financial System in USA, Canada, and Brazil: A Panel Data Analysis. *Mathematics* 14 December 2020

6. **Malar Maran Rathnaswamy**, Malar Mozhi Rathnaswamy, Malar Kumaran Rathnaswamy and Marilena-Oana Nadelea (2021 a). Paradigm Shifts of Policy Responses to Covid-19 In Canada and USA: a Critical Review. *ECOFORUM* Volume 10, Issue 3 (26), 2021

7. Larissa Batrancea, Marcel Cyprian Pop, **Malar Maran Rathnaswamy**, Ioan Batrancea, and Mircea-Iosif Rus (2021 b). An Empirical Investigation on the Transition Process towards a Green Economy, *Sustainability* 27 November 2021

8. Larissa M. Batrancea, **Malar Maran Rathnaswamy**, Mircea-Iosif Rus and Horia Tulia (2022). Determinants of Economic Growth for the Last Half of Century: A Panel Data Analysis on Countries, *Journal of the Knowledge Economy,* 3 March 2022

Contributions

The contributions of this study to the literature are several. *It is one of the most important contributions of this study to find a solution on the reduction of global warming to 1.5 C as projected in the Paris Agreement, 2015.* Countries got to cut outflows significantly underneath 1.5^{O} C for carbon nonpartisanship by 2050 (Antonio Guterres, 2020). *The second contribution is to achieve stability of reduction of global warming through degrowth.* It recommends degrowth from presently onwards without delaying to 2040 (Simon Kuper, 2019). *The third contribution is to gain confidence of green growth and development in practi*ce. The hypothesis of green development needs experimental proof. *The fourth contribution of this study is to strengthen the OECD Environment Strategy of decoupling of ill effects of environment in the economic* *development through green growth.* The ponder recommends a changeless decoupling of common assets and carbon outflows from GDP (Hickel and Kallis, 2019). A few things about suggesting degrowth (Victor, 2008; Alier, 2009; Jackson, 2009; Kallis et al., 2012) and others recommend moving from carbon-intensive to moo or carbon divisions (Gough, 2017; Kallis, 2018). *The fifth contribution is to establish a sound link between environment and development.* The link between environment and development is achievable through empowerment of sustainable development (Rathnaswamy, 1998, 2000; Guerres, 2017). *The sixth contribution of this study identifies to augment the long term investment towards green growth.* Long term finance is the source of sustainable development and it must flow from home, firm and nation. To generate the sources of long term firms, there are three themes (BCSD, 2017). The development structure of fund advances economical money related improvement in regard of long term back for quicker development within the brief term of vulnerabilities of advertise conditions (de la Torre, Ize, and Schmukler,2012; Demirguc-Kunt and Maksimovic, 1998, 1999). The worldwide money related emergency caused declining economical financial development and bank credit, inflation, and non-performing credits (Batrancea Ioan et al., 2020). Precise contamination arrangements decrease emanations that cause low harms and costs (Hamilton, 2003). *The seventh contribution is the establishment of new global financial system for green growth.* There is a new order of global financial system to make green economy and reduction of CO_2 emissions and global warming and it is within the reach of world nations to carry out the Paris Agreement.

Structure of the PhD thesis

The PhD thesis "New Global Financial System - Green Growth: A Review' is containing three chapters, including theoretical and practical approaches, examined the developed economies, the transition economies and emerging economies through econometric modelling.

The first chapter aims to find the Cointegrating relationship between financial sector investment and low carbon economy. The low carbon economy achieves a reduction in CO_2, N_2O, and GHG and it will lead to sustainable development as there is economic growth (GDP). Long term investments are those investments that last for more than one year while short term investment is for the period of one year or less than one year. Both these investments have merits and demerits. One of them is the flexible benefits that accrue to them. Inflation and fluctuation markets are other factors that influence them. Return on resources is pivotal in choosing the ventures. The Bretton

Woods framework got to be unimportant amid the worldwide monetary emergency and started unused worldwide fund. There was an around the world emergency amid the worldwide monetary emergency driving to the obligation emergency within the Euro zone. The quick activity of globalization needs redress for reestablishing maintained development social advance, and financial and monetary steadiness as there's overcompensation of the budgetary division. The financial system is not contributing to economic development. The financial sector contributes to economic growth. European Union identifies the finance and investment challenges. There are several proposals in this regard. One of them is the moo carbon economy for a long-term maintainable advancement whereas coordination moderation and adjustment. It intends to mobilise additional finance and investment for achieving 2 degrees Celsius and for the same, there is a need for improvement in technology innovation and capacity building.

The second chapter discusses that carbon pricing reducesCO2 emissions and global warming. It promotes green investment and it is compensation to the environmental damages. In reaction to Paris arrangements on climate alter, the world countries incline toward the carbon estimating for lessening greenhouse gas to lower climate dangers. Carbon estimating has sound financial standards and involvement. Carbon estimating depends on the 'polluter pays principle' to compensate for the harm caused and returns for reestablishing the environment. The polluter pays in two different instruments which are carbon price and quota-based system of emissions trading system. It incorporates the principle of fairness and fair practice. Carbon pricing policies are effective with other non-climate policies to a low-carbon economy. It indicates credibility and stability for long-term investment decisions by adjusting the carbon tax or rule-based emissions trading system (ETS). Carbon estimating advances of a low-carbon economy. It hones straightforwardness in price-fixing.

The third chapter discusses the emerging new global financial system for the green economy as the global financial system finds difficulties in promoting it. The financial system represents institutions, markets, intermediaries, and instruments to promote investment and savings while promoting economic growth development. An effective financial system establishes an effective network of financial institutions, financial markets, financial instruments, and financial services for promoting financial integration within the economy for effective production, distribution, and development. The financial system offers opportunities to transfer risks on investment and in this process; the borrowers generate funds in the financial system. The global financial system must promote sustained economic growth and social development for which three core pillars of the future of the global financial system and these pillars need to give to economic growth and financial stability. Pillar I promotes efficient capital allocation and ensuring financial stability; Pillar II recommends worldwide budgetary incorporation; and Pillar III offers development in decreasing the obstructions to monetary administration. The over the top risk-taking by the money related teach without considering the impact, caused the worldwide monetary emergency. Taking into thought of worldwide warming and other issues of climate alter there’s a require for green development, and it proposes a new modern range of global financial framework to create a green economy.

Current knowledge status within the research field

Through its three chapters, the Ph.D. thesis analyses theoretical aspects, concepts, indicators, models of analysis, and financial diagnostic values by extensive documentation through books, articles from reputed journals, reports and working papers of international financial institutions, web pages of financial entities. The results and conclusions of global financial systems of developed economies, transition economies, and emerging markets, and international researchers are in a comprehensive explanation on the theoretical and practical research with an emphasis on the weaknesses and strengths.

Defining the financial system and financial sectors rely on the authors such as Allen and Gale (1995, 1197, 2000), Antzoulates et al (2011), Franklin Allen and Douglas Gale, 1999, Levine, 2005).

The subsystems of the new order of the global financial system and the green economy refer to the following studies:

Chapter 1 Financial Sector and Low Carbon Economy: An Analysis

Merton and Bodie, (1995, p.12), Allen and Gale (2001), Dominic and Mark (2014), Quality Walden (2019),Gertner et al (1994), Grossman and Hart (1986), Naohiko Baba and Takamsa Hisada (2002), OECD (2009), OECD, IEA (2010), Ricardo De Bonis and Alberto Franco Pozzolo (2012), Stefania and Roberto (2016), Williamson (1975), World Bank, (2004), UNFCCC (2008), and Yongfu Huang and Terry Barker (2011).

Chapter 2. An Empirical Study on Carbon Pricing for Green Economy

Alper (2018), Bayer and Aklin (2020), Ceres, 2014; CPLC (2017), Chirag Gajjar (2018), Commission Regulation (EC) No 2216/2004,Daniel et al (2020), Elgie and McClay (2013), Emanuele Campiglio (2015), Governor of New Mexico (2019), ICC (2015), IEA(2012); Ioanna and Paraskevi (2018), McCollum et al.(2014), Nordhaus, (2002; Nordhaus. B (2015), Parry et al (2014), Pearce (1991), Miller et al (2013), Rathnaswamy (1995), Rio Declaration (1992), World Bank (2015), The Guardian (2012), The Kyoto Protocol (1997), WEF (2013), World Bank (2017), and World Bank (2019, 2020),

*3. **New global financial system- green growth: a review***

Alier (2009), Antonio Guterres (2020), Batrancea Ioan et al (2020), BCSD, 2017, BSDC,2017; Buiter, 2012; Climate (2020),CIELP,2011,Demirguc-Kunt and Maksimovic (1998, 1999), de la Torre, Ize, and Schmukler (2012), Forster et al (2020), Gough (2017), Iaon et al (2020), Jackson (2009), Hickel and Kallis, (2019), Maran (2017, 2017a, 2018, 2020a), Maran et al. (2020, 2020b), Eurostat (2020), Simon Kuper (2019), Victor (2008), Kallis et al (2012), Kallis,2018, Giddings, 2002, Umbrella Paper (2013), WEF (2015),and World Bank (2019),

Chapter 1: Financial Sector and Low Carbon Economy: An Analysis

***Summary**: In this chapter, the Low Carbon Economy is considered an important form of economic growth in which there is sustainable economic growth with low global warming through reduction in N_2O emissions from the energy sector, and agriculture, CO_2 emissions from manufacturing and from others, and greenhouse gas (GHG). The low carbon economy aims to lessening N_2O, CO_2, and GHG towards sustainable development. There is additional f investment which may be sourced by Pension, Insurance, private Bonds, Public Bonds, and Stock Market Capitalization from the financial sector of economy. This is examined through empirical analysis.*

This chapter examines the financial sector which includes Pension, Insurance, Private Bonds, Public Bonds and Stock Market Capitalization and low carbon economy for which N2O from the energy sector, N2O from agriculture, CO2 from manufacturing, CO2 from others and greenhouse gas(GHG) are included in this think about.

The relationship between monetary division speculation and low carbon economy in five countries of Japan, China, Brazil, Germany, and India for the period 2000-2017, is explored.

In each budgetary framework, there's budgetary profundity which is picked up through private credit which incorporates managing an account and capital showcase, resources of budgetary education, private financing which joins managing an account, non-banking financing, capital advertise, residential stock capitalization, and private securities and stock exchanging esteem. The financial framework is not widespread as each country has different priorities and impediments indeed in spite of the fact that there is an inclination for steady and energetic budgetary framework to develop with changes. .

Low Carbon Development has no accepted definition, but it is commonly accepted that it refers to Low Emission Development Strategies (LEDs). The low carbon economy is discussed to narrate the challenges.

European Union identifies the finance and investment challenges. There are a few recommendations in this respect. One of them is to attain the move to a worldwide moo carbon economy and society and it leads to long-term maintainable development whereas coordination moderation and adjustment. It intends to mobilise additional finance and investment for achieving 2 degree Celsius and for the same, there is a need for improvement in technology innovation and capacity building.

The green financial system promotes green growth and carbon reduction while eliminating poverty. The efforts are pursued to achieve social and economic equity without environmental degradation.

Chapter 2: An Empirical Study on Carbon Pricing for Green Economy

Summary*: In this chapter, the Carbon pricing initiatives among other policies are considered to implement the Paris Agreement for the reduction of global warming in pursuant to achieve low carbon economy towards sustainable development. In this regard, many models are examined using empirical analysis.*

This **Chapter 2** examines Carbon pricing to achieve carbon reduction and regulating global warming. Carbon pricing increases green investment and it collects compensation for the environmental damages. In carbon pricing, there are two aspects which include carbon price which is compensated for the carbon emission and there is a price before carbon emission which can be traded under the Emission Trading System. The principles and practices of carbon tax and Emission Trading System are discussed and investigated in the econometric analysis.

Chapter 3: New global financial system- green growth: a review

Summary: *In this chapter, the need for new financial system is discussed to achieve low carbon economy towards sustainable development using econometric analysis as the existing financial system demands new thinking, institutions, approaches and resolution for practices.*

In **Chapter 3**, the new global financial system is discussed to promote a green economy. The global financial system must promote sustained economic growth and social development for which three core pillars of the future of the global financial system and these pillars need to contribute to economic growth and financial stability. An effective financial system establishes an effective network of financial institutions, financial markets, financial instruments and financial services for promoting financial integration within the economy for effective production, distribution and development. The financial system offers opportunities to transfer risks on investment and in this process, the borrowers generate funds in the financial system. The Covid Pandemics have drastically reduced the investment mechanism due to lockdown and preventive measures of Covid Protocols and social distancing.

There is a need for long term green investment to achieve sustainable economic growth for carbon reduction and eradication of poverty.

The direct interventions of government and international institutions on sustainable long-term finance have not yielded results and there must be a focus on reforms that prevent market failures and institutional weaknesses. New reforms are proposed and discussed and for the same factors which are the Profundity of Money related Teach, Depth of Financial Institutions, Access to Financial Institutions, and Efficiency of Financial Institutions. In this regard, the adjusted net savings after the calculation of damages on account of the exploitation of natural resources and carbon emissions are included in this study.

BIBLIOGRAPHY

SPECIALTY BOOKS

1. Acha, L. Susan. L, Roxburgh, C., Wamelen, A.V. (2010). *What is driving Africa's growth*, McKinsey & Company
2. Allen, F. and Gale, D. (1999). *Comparing Financial Systems*. MIT Press, USA
3. Allen, F., Gale, D. (2000). *Comparative Financial Systems: A Survey*, Working Paper, Wharton School, Philadelphia
4. Allen, F., Gale, D. (2000). *Comparing Financial Systems*. Cambridge, MA: The MIT Press
5. Allen, F., Gale, D. (2001). *Comparative Financial Systems: A Survey*. Center for Financial Institutions Working Papers, Wharton School Center for Financial Institutions, University of Pennsylvania
6. Asian Development Bank Institute (2012). *Policies and Practices for low-carbon green growth in Asia*. ADBI
7. Atiyas, I. (1991). *'Efficiency, corporate indebtedness, and Directed Credit in Colombia'*. Working paper 54, World Bank, Industry and Energy Department, Washington, D.C. processed
8. Beate, T. (2020). *The growing urgency of shifting to a low carbon economy*. May 29
9. Bemanke, B. (2005). '*The Global saving glut and the US current account deficit*, No.77, speech from the Board of Governors of the Federal Reserve System (US). April 14
10. Bemanke, B. (2005). *The global savings glut and the US current account deficit, remarks made at the Sandridge* Lecture, 19 March
11. Bonis, R. De and Pozzolo, A. F. (Eds, 2012). *The Financial Systems of Industrial Countries*, Springer Heidelberg Dordrecht, London
12. Business and Sustainable Development Commission (2017). *Ideas for Action for a Long- Term and Sustainable Financial System*, January
13. Business Climate Leaders (2020*). Endorse Carbon Pricing Principles*
14. Canadian Institute of Environmental Law and Policy (2011). *A Green Economy for Canada*
15. Caprio, Jr. G., Demirguc-Kunt, A. (1998). *The role of long term finance: theory and evidence*. The World Bank Research Observer, vol. 13, no. 2 (August 1998), pp. 171-89
16. Cardona, M. and Berenguer, M. E. (2020). *What role for financial regulation to help the low-carbon transition?* Institute for Climate Economics
17. Ceres (2014). *Investing in the Clean Trillion: Closing the clean energy investment gap*. Ceres, Boston
18. Climate 2020 (2015). *Facing the future*, UNA-AK, London
19. Committee for the Coordination of Statistical Activities (2020). How COVID-19 is changing the world: a statistical perspective Volume II, UN DESA
20. Davidson, P. (2009). *The Keynes Solution: The Path to Global Economic Prosperity*. New York: Palgrave MacMillan
21. de la T, Augusto, A I., and Sergio, S. (2012). *'Financial Development in Latin America and the Caribbean: The Road Ahead.' Policy* Research Working Paper 2380, World Bank, Washington, D.C
22. DECC (2012). *Annual Statement of Emission Tax for 2010, Department for Business*, Energy & Industrial Strategy, March
23. Decision (2009). *Decision No.406/2009/EU of the European Parliament and the Council,* Official Journal of European Union
24. Ellis, K. (2009). *Must developing countries sacrifice growth to save the planet? Opinion*, December, Overseas Development Institute
25. Environmental Defense Fund (2020). *Carbon Credit*, Environmental Defense Fund, Washington DC
26. Eryilmaz, F., Bakir, H., ve Mercan, M. (2015). Financial Development and economic growth: a panel data analysis, Handbook of Research on Strategic Developments and Regulatory Practice in Global Finance (Ed. Ozlem Olgu), USA -Global Publishing 233-245
27. European Parliament (2020). *News: EU defines green investments to boost sustainable finance*. 18 June
28. Eurostat (2020). *Impact of Covid-19 crisis on industrial production*. 15, September
29. Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (2019). *Climate Action Plan 2050-Germany's long-term low greenhouse gas emission development strategy*.
30. Fuller, W. (1996). *Introduction to Statistical Time Series*, Second Edition, John Wiley, New York

31. G-20 (Group of 20), 2013, "Long term investment financing for growth and development: Umbrella Paper", February
32. Gajjar, C. (2018). *4 Ways Companies can price Carbon: lessons from India*. World Resource Institute, April 4
33. Geoffrey, D, Pollitt, M. G. and Newbery, D. M. (2019). *The Political economy of carbon pricing: a panel analysis.* Oxford Economic Papers, Oxford University Press, Vol. 72 (2), Pages 472-500
34. Georgia, K. (2019). *CEO, The World Bank speech at the Carbon Pricing Leadership Coalition* (CLPC) Fourth Annual High Level Assembly (HLA) during the World Bank and International Monetary Fund Spring Meetings, CPLC, April 26
35. Goldfajin, I., Hennings, K., and Mori, H. (2003). *Brazil's Financial System: Resilience to Shocks, no Currency Substitution, but Struggling to Promote Growth.* Working Papers Series 75, Central Bank of Brazil, Research Department.
36. Goldsmith, R. W. (1969). *Financial structure and development*, New Haven, CT: Yale University Press
37. Gough, I (2017). *Heat, greed and human need: climate change, capitalism and sustainable wellbeing*. Cheltenham: Edward Elgar Publishing
38. Government of British Colombia (2008a). *Carbon Tax Act*. SBC 2008, Ch. 42
39. Governor of New Mexico (2019). *Executive Order committing New Mexico to Essential climate Change Action*, January 29.
40. Guterres, A. (2020) Secretary-General UN. *Foreword to United in Science*
41. IEA (2012). *Energy technology perspectives 2012*. International Energy Agency, 2012
42. ILO office for China and Mangolia (2010). *A study on low carbon development and green employment in China.* April
43. Im, K., Pesaran, M.H (2003). '*On the Panel Unit Root Tests Using Nonlinear Instrumental Variables*, Manuscript, UC Berkeley
44. IMF Blog (2017). *Non-Performing Loans*, October 16
45. International Chambers of Commerce (2015). *Carbon Pricing Principles*. Document No. 213/116, ABH-June
46. Jackson, T.(2009). *Prosperity without growth: the transition to a sustainable economy*
47. Jacobs, M. and Mazzucato, M. (Eds, 2016). *Rethinking Capitalism*, Wiley-Blackwell, USA
48. Kallis, G. (2018). *Degrowth*. New-Castle-upon-Tyne: Agenda Publishing
49. Kim, K.H. and Lee, Y. (2015). *Lessons learned from carbon certificates program Korea and suggestions for the future*. Republic of Korea
50. Levine, R (2005). *Finance and Growth: Theory and Evidence* in P. Aghion & S. Durlauf, eds., Handbook of Economic Growth, 1st ed. Vol. 1, Chap. 12, 537-58
51. Levine, R. (2000). *Bank-Based or market-Based Financial Systems: Which is Better?* World Bank
52. Levine, R. (2003). *Finance and Growth: Theory, Evidence, and Mechanisms*, National Bureau of Economic Research, Inc, NBER Working Papers
53. Low Carbon Power (2021). *Ranking of countries and territories by low-carbon electricity*. Low CarbonPower.org News, January 21
54. Maddala, G.S I. M. and Kim (1998). *Unit Roots, Cointegration and Structural Change*. Oxford University Press, Oxford
55. McCollum, D., Nagai, Y., Riahi, K., Marangoni, G., Calvin, k., Pietzcker, R., van Vliet, J., van der Zwaan, B.,(2014). *Greenhouse Gas Abatement Cost Curve*. McKinsey & Company
56. McKinsey & Company (2020). Carbon-neutral Poland 2050
57. Meier, G and Seers, D (1984). *Pioneers in Development*. Oxford University Press
58. Merton, R.C and Bodie, Z. (1995*). 'A Conceptual Framework for Analyzing the Financial Environment'*, In: the Global Financial System: A Functional Perspective, Eds: D. B Crane, et al., Boston, MA: Harvard Business School Press: 3-31
59. Metcalf, G. E. and Stock, J. H. (2020). *Measuring the macroeconomic impact of carbon taxes*. AEA Papers and Proceedings, 110: 101-06
60. Miller, S. J., Vela, M. A. (2013). *Are Environmentally Related Taxes Effective?* IDB Working Paper Series No. IDB-WP-467 Inter-American Development Bank November
61. Ministry of Finance (2017). *Ministry of Finance*, Sweden
62. Ministry of Statistics and Programme Implementation (2020*). India Industrial production*, 11, September 2020, Government of India

63. Muller, A. (2006). *Risk management in the Clean Development Mechanism (CDM)-The Potential Sustainability Labels.* Working Papers in Economics 228, University of Gothenburg, Department of Economics
64. OECD (2001). *The DAC Guidelines: Strategies for Sustainable Development*. OECD, Paris
65. OECD (2009). *Climate Change and Development: key Principles to Inform Climate Change Financing*, OECD Fact Sheet, April
66. OECD, IEA (2010). *Low-Emission Development Strategies (LEDS): Technical, Institutional and Policy Lessons*
67. OECD, IEA (2010). Organisation for Economic Co-operation and Development, 22 November
68. Owid-co2-data (2020). *Our World in Data CO2 and Greenhouse Gas Emissions dataset*. August 7
69. Pamposh Bhat (2006). *CDM in India Challenges and Success*, 23 December
70. Parry, I., Veung, C. and Heine, D. (2014). *How much carbon pricing is in countries, own interests? The critical role of co-benefits.* IMF Working Paper, WP/14/174 International Monetary Fund September
71. Pearce, D., Markandya, A., Barbier, E.B. (1994). *Blueprint for a Green Economy*, Earthscan Publications Ltd, London
72. Pinto, A. De., Man Li, Haruna ,A., Hyman ,G. G., Andres ,M., Martinez ,L., Creamer, B. , Ho-Young, K., Garcia, V. , Brayan, J., Tapasco, J., and Martinez ,J. D. (2016*). Low Emission Development Strategies in Agriculture. Agriculture, Forestry, and other Land uses (AFOLU) Perspective*. World Development Volume 87 pp. 180-203
73. Rathnaswamy, P. (1995). *Marriage, Divorce and Morality*. Deep and Deep Publications, New Delhi, India
74. Rathnaswamy, P. (1998). *International Environment Management*. Manas Publications, New Delhi, India
75. Rathnaswamy, P. (2000). *Empowerment of Sustainable Development*, Bookwell Publications, New Delhi, India
76. Rio Declaration (1992). *Rio Declaration on Environment and Development*
77. Schmidt, J. (2021). *America is back in the International Climate Effort*, NRDC
78. Sheldrick, A. (2020). *Japan companies call on government to accelerate low-carbon shift in Coronavirus recovery*. ESG Environment
79. Stefania P., Rossi, S., and Malavasi, R. (Eds. 2016). Financial Crisis, Bank Behaviour and Credit Crunch. Springer Cham Heidelberg, New York
80. Stock, J.H (1994). *'Unit Roots, Structural Breaks and Trends'*, in R.F. Engle and D.L. McFadden (eds), Handbook of Econometrics, Volume IV. North-Holland, New York
81. UK Green Investment Bank (2016). , *UK Green Investment Bank*
82. Umbrella Paper (2013). *Long-Term Investment Financing for Growth and Development*, February 2013
83. UN (2018). *Achievements of the Clean Development Mechanism 2001-2018*. United Nations Climate change
84. UNCTAD (2015). *Investment Policy Framework for Sustainable Development*
85. UNEP (2009). *Catalyzing low-carbon growth in developing economies. UNEP and Partners*
86. UNFCCC (2008). *United Nations Framework Convention on Climate Change*
87. UNO (2006). *United Nations for UN Climate Change*, Conference Nairobi
88. Veysov, A., Stolbov, M. (2012). *Financial System Classification: From conventional dichotomy to a more modern view*. MGIMO University MPRA
89. Victor, P. (2008). *Managing without growth: slower by design, not disaster*. Cheltenham: Edward Elgar Publishing Alier
90. Wagner, M (2008). *The carbon Kuznets curve: a cloudy picture emitted by bad econometrics?* Resour. Energy Econ. 30 (3), 388-408
91. Walden, G. (2019). *Top 4 Long-Term Investment Strategies to help Increase Gains*, Thrivent Mutual funds,
92. Watson, C and Fankhauser, S (2009). *The Clean Development mechanism: too flexible to produce development benefits?* Centre for Climate Change Economics and Policy, Working Paper No. 3, 26 June
93. WHO (2016). *WHO Global Urban Ambient Air Pollution Database* (update 2016).
94. Williamson, O (1975). *Markets and Hierarchies: Analysis and Antitrust Implications*. New York: Collier Macmillan
95. WMO (2020). *United in Science Report: Climate change has not stopped for COVID-19.* 9 September
96. World Bank (2004). *Brazil, Financial Systems Review*, IMF and World Bank
97. World Bank (2015). *The faster principles for successful carbon pricing: an approach based on initial experience.* OECD and World Bank
98. World Bank (2019). *State and Trends of Carbon Pricing*. World Bank Washington DC June

99. World Bank (2020). *State and Trends of Carbon pricing 2020*. World Bank, Washington DC, May
100. World Bank, The (2020). *World Bank Group's Operational Response to COVID-19* (coronavirus)-Projects, September 11
101. World Economic Forum (2015). *Future of the global financial system.* WEF
102. World Resources Institute (2020). *Going Low-Carbon can help Brazil build back better*. August 13
103. Yamide Dagnet and David Waskow(2020). *Explaining the Paris Rulebook*, World Resources Institute
104. Yu Ping, Huang Meifang (2010). *Research on China's Low Carbon Economy Development*. Proceedings of the 7th International Conference on Innovation and Management, 2010

SPEACIALITY ARTICLES

1. Allen, F., and Gale, D. (1997). Financial markets, Intermediaries, and Intertemporal Smoothing, Journal of Political Economy, pp. 523-546
2. Allen, F., Gale, D. (1995). A Welfare Comparison of Intermediaries and Financial markets in Germany and the US, *European Economic Review*, pp. 179-209
3. Allen, F., Gale, D. (1995). A Welfare Comparison of Intermediaries and Financial markets in Germany and the US, *European Economic Review*, pp. 179-209
4. Allen, F., Qian, J., and Qian, M. (2007). China's Financial System: Past, Present, and Future. *SSRN Electronic Journal*, March
5. Alper, A. E.(2017). Analysis of Carbon Tax on selected European countries: Does Carbon Tax Reduce emissions? *Applied Economics and Finance*, Vol. 5, No.1: January
6. Asici, A.A. (2011). Economic growth and its impact on environment: A panel data analysis. MPRA, 2011
7. B. Ioan, Kumaran, R. M., B. Larissa, Anca, N, Lucian, G., Fatacean, G., Horia, T., Bircea, I. (2020). A Panel Data Analysis on Sustainable Economic Growth in India, Brazil, and Romania. Journal of Risk and Financial Management 2020, 13, 170 1 August
8. B. Larissa, Maran, R. M., B. Ioan., Anca, N., Mircea-losif, R., Horia, T., Fatacean, G., Speranta, M. E., and Dan , M. I. (2020). Adjusted Net Savings of CEE and Baltic Nations in the Context of Sustainable Economic Growth: A Panel Data Analysis. Journal of Risk and Financial Management 1 October
9. B. Larissa, Pop, M. C., Maran, R. M., B. Ioan, Mircea-losif, R. (2021). An Empirical Investigation on the Transition Process Towards a Green Economy, *Sustainability* 13, 13151
10. Baba, N., and Hisada, T. (2002). Japan's Financial system: It's Perspective and the Authorities' Roles and Administering the System. *Monetary and Economic Studies*, April
11. Babu, S. (2018). Role of Financial system in economic development of a country. *International Journal of Multidisciplinary Research and Development*, Volume 5 Issue 8: August ; page no. 100-107
12. Barton, D. and Wiseman, M.(2014). Focusing Capital on the Long Term. *Harvard Business Review*, January-February Issue
13. Batrancea, I., Maran, R. M., Iosif, R.M., Horia, T., Fatacean, G., I, Bircea., and Lucian, G (2020). Adjusted Net Savings of CEE and Baltic Nations in Sustainable Economic Growth: A Panel Data Analysis. *Journal of Risk and Financial Management* MDPI, October 1
14. Batrancea, I., Maran, R. M., Lucian, G., Fatacean, G., and Iosif, R.M. (2020). Green growth: the Essence of Sustainable Green Economy (Under Publication).
15. Batrancea, I., Maran, R. M., Lucian, G., Fatacean, G., Dan, T. I., Sorinel, C., Ioan, B., Iosif, R. M., and Liviu, B. (2020). Greening the Financial System in USA, Canada, Brazil: A Panel Data Analysis, *Mathematics*, December 14
16. Bayer, P. and Aklin, M. (2020). The European Union Emissions Trading System reduced CO2 emissions despite low prices. PNAS April 21, 117 (14)
17. BBC (2020). News August 7, 2020. WWW.bbc.com news. Science -environment -53681096
18. Ben Pearson (2007). Market failure: why the Clean Development Mechanism won't promote clean development. *Journal of Cleaner Production* 15 (2) December
19. Buiter, W.H (2012). The Role of Central Banks in Financial Stability: How has it changed, *CEPR Discussion Paper No 8780*, London: Centre for Economic Policy Research
20. Caballero R J and Krishnamurthy, A. (2009). Global imbalances and financial fragility. *American Economic Review* 99 (2): 584-588

21. Caballero, R., J and Krishnamurthy, A. (2009). Global Imbalances and Financial Fragility'. *American Economic Review*, American Economic Association, vol. 99(2), pages 584-88
22. Choi, I. (2001). 'Unit Root Tests for Panel Data'. *Journal of International Money and Finance*, 20, 249-272
23. Davidson, O., Kok, K., Sokona, M., and Verhagen, Y. (2003). 'The development and climate nexus: the case of Sub-Saharan Africa'. *Climate Policy* 3S1: 97-113
24. Demirguc-Kunt and Maksimovic (1999). 'Institutions, Financial markets and Firm Debt maturity'. Journal of Financial Economics 54 (3): 295-336
25. Demirguc-Kunt, A and Maksimovic, V (1998). Law, finance, firm growth. Journal of Finance 53, 2107-2138.
26. Dritsakis, N. and Adamopoulos, A. (2004). Financial Development and Economic Growth: An Empirical Investigation with Granger Causality Analysis. *International Economic Journal, Vol.18, No. 4, 547-559, December*
27. Elgie, S. and McClay, J. (2013). BC's Carbon Tax Shift Is Working Well after Four Years- Policy Commentary. *Canadian Public Policy*, Vol. XXXIX Special 2
28. Emanuele, C.(2015). Beyond carbon pricing: the role of banking and monetary policy in financing the transition to a low-carbon economy. *Ecological Economics* 121. pp.220-230
29. Engle, R.F., Granger, C.W. J. (1987). Co-integration and Error Correction: Representation, Estimation, and Testing. *Mathematics. Econometrica* 55, 251-276
30. European Union (2020). UN-backed principles for responsible investment. (UNPRI), *European Parliamentary Research Service*, EU
31. Fisher, P. (2019). What are the challenges of green finance? *The London Institute of Banking and Finance, 10 October*
32. Folorunsho, A. (2016). Financial innovation and sustainable development in selected countries in West Africa. *Journal of Entrepreneurship, Management and Innovation, 12 (3), 85-112*
33. Forster, P.M., Forster, H.I., Evans, M.J., Gidden, M.J., Jones, C.D., Keller, C.A., Lamboll, R.D., Quere ,L.C., Rogelj, J., Roson, D., Schleussner, C.F., Richardson, T.B., Smith, C.J., Turnock, S.T. (2020). Current and future global climate impacts resulting from COVID-19. *Nature Climate Change ARTICLES*, 7, August 2020
34. Garrity, J. E. (2012). Tragedy of the Commons, Business Growth and the Fundamental Sustainability Problem. *Sustainability* , 4, 2443-2471
35. Gertner, R, Scharfstein, D and Stein, J (1994). Internal Versus External Capital Markets. *Quarterly Journal of Economics* 109, 1211-1230
36. Giddings, B., Hopwood, B., O'Brien, G.(2002). Environment, Economy and Society: Fitting Them Together into Sustainable Development, *Sustainable Development*, Sus. Dev. 10, 187-196
37. Grossman, S and O. Hart (1986). The Costs and Benefits of Ownership. *The Journal of Political Economy* 94, 691-719
38. Hickel, J. and Kallis, G. (2019). Is Green Growth Possible? *New Political Economy*, 17 April
39. Huang, Y., and Barker, T (2011). The Clean Development Mechanism and low carbon development: a panel data analysis. *Energy Economics*
40. Ishtiaq, M., and Majeed, M.T. (2016). Financial Sector, Democracy and Economic Growth: A Panel Data Analysis, *Pakistan Development Review*, December
41. Ishtiaq, M., Majeed, M.T., and Sohail, M. (2016). Financial Sector, Democracy, and Economic Growth. *Pakistan Development Review 55 (4) : 437-453*
42. Jayaratne, J., and Strahan, E. P. (1996). The Finance -Growth nexus: Evidence from Bank Branch Deregulation. *The Quarterly Journal of Economics*, Vol.111, Issue 3, 639-670
43. Jeron van den Bergh and Wouter (2020) Low-carbon transition is improbable without carbon pricing. *PNAS* September 22 117 (38) 23219-232220
44. Jiang, R., Zhou, Y., and Li, R. (2018). Moving to a low-carbon economy in China: decoupling and Decomposition Analysis of Emission and Economy from a Sector Perspective. *Sustainability*, 27 March 2018
45. Johansen, S. (1988). Statistical analysis of cointegration vectors. *Journal of Economic Dynamics and Control*, vol. 12, issue 2-3, 231-254
46. Johansen, S., and Juselius, K. (1990). Maximum likelihood estimation and interference on cointegration-with applications to the demand for money. *Oxford Bulletin of Economics and Statistics*, vol. 52, issue 2, 169-210
47. Kallis, G, Kerschner, C, and Martinez-Alier. J (2012). The economics of degrowth. *Ecological Economics*, 84, 172-180

48. Katan, L., Dobovolska, O., and Espejo, J. M. R. (2018). Economic growth and environmental health: a dual interaction. *Journal of Problems and Perspectives in Management,* 9 August
49. KEDIA, S. (2016). Approaches to low carbon development in China and India. *Advances in Climate Change Research 7 (2016) 213-221*
50. King R. G. and Levine, R. (1993). Financial intermediation and economic development. In: Financial Intermediation in the Construction of Europe. Eds: C. Mayer and X. Vives, London: *Centre for Economic Policy Research*, pp. 156-189
51. Kumaran, R.M. (2017). Monetary Policy of Romania: A Critical Review, *Eco forum*, 6(2).
52. Kuper, S. (2019). The myth of green growth. *Financial Times,* October 24
53. LEITAO, N. C. (2010). Financial Development and Economic Growth: A Panel Data Approach, *Theoretical and Applied Economics, Volume XVII (2010), No. 10 (551). pp.15-24*
54. Levin A. Lin, C.F., Chu, C.S.J. (2002). Unit root tests in panel data: asymptotic and finite- sample properties. *Journal of Econometrics*
55. Lin, W., Zheng, Yi. Dai, Y. (2017). Influence of a Carbon Tax on low -Carbon Trade Competitiveness of the Paper-Making Industry *Forest Product Journal (2017) 67(1-2): 101-111*
56. Lucas, R (1988). On the mechanics of Economic Development. *Journal of Monetary Economics* 22: 3-42.
57. Maran, R. M.(2017b). Green Economy: Challenges and Opportunities, *Ecoforum*, Volume 6, Issue (3), 2
58. Maran, R.M. (2018). Long Term Investments and Sustainable Development, *Ecoforum* volume 7, Issue 2, 15
59. Maran, R.M., and Nedelea, A. M. (2017). Corporate Finance Theories and Principles: Redundant. *ECOFORUM*, volume 6, Issues2 (11)
60. McMichael, A.J., Powles, J. W., Butler, C.D., Uauy, R.(2007). Food, livestock production, energy, climate change, and health. *Lancet* , 370, 1253
61. Moon, H. R. and Perron, P. (2003). 'Testing for a Unit Root in Panels with Dynamic Factors' forthcoming in *Journal of Econometrics*
62. Moon, H.R., and Perron, P. (2003). 'Testing for a Unit Root in Panels with Dynamic Factors' forthcoming in *Journal of Econometrics*
63. Muller-Furtenberger and Wagner (2007). Exploring the environmental Kuznets hypothesis: theoretical and econometric problems. *Ecol. Econ*. 62, 648-660
64. Najarzadeh, R., Reed, M., and Tasan, M. (2014). Relationship between savings and economic growth: the case for fun. *Journal of International Business and Economics, December , Vol. 2, No. 4, pp.107-124*
65. Nordhaus, B (2015). Climate Clubs: Overcoming Freeriding in International Climate Policy. *American Economic Review*, 105 (4): 1339-1370
66. Nordhaus, William. D (2002). Productivity Growth and the New Economy. *Brookings Papers and Economic Activity*, Vol. 2002, No. 2. (2002), pp. 211-244
67. Olsen, K. H. (2007). The Clean Development Mechanism's Contribution to Sustainable Development A review of the literature. *Climate Change*, January
68. Olsen, K.H and Fenhann, J (2008). Sustainable development of clean development mechanism projects. A new methodology for sustainability assessment based on text analysis of the project design documents submitted for validation. *Energy Policy,* 36, 2819-2830
69. Pagoni, I., and Kalouptsidi, P. P. (2018). Econometric Supply-and -demand models to analyse carbon pricing policies. *International Journal of Transportation Science and Technology* 7 (2018) 274-282
70. Parry M.C., Rosenzweig, and M. Livermore (2005). Climate change, global food supply and risk of hunger, *Phil. Trans. Roy. Soc*. B. 360, 2125-2138, DOI: 10. 1098/rstb.1751
71. Pataki, M., Shukla, P. R. Dhar, S. (2020). Transformation of India's steel and cement industry in a sustainable 1.5 degree Celsius world. *Energy Policy*, Elsevier, vol. 137
72. Pearce, D (1991). The role of carbon taxes in adjusting to global warming. *The Economic Journal*, 101 (407), 938-948
73. Perman, R and Stern, D.I (2003). Evidence from panel unit root and cointegration tests that the environmental Kuznets curve does not exist. *Aust. J. Agric. Resour. Econ*. 47 (3), 325 -497
74. Pesaran, M.H., Y. Shin, and R. Smith (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics,* 16, pp. 289-326
75. Philips, P.C.B and Z. Xiao (1998). 'A Premier on Unit Root Testing', *Journal of Economic Surveys,* 12 423-470
76. Philips, P.C.B and Z. Xiao (1998). 'A Premier on Unit Root Testing', *Journal of Economic Surveys,* 12 423-470

77. Rajan, G. R. and Zingales, L. (1998a). Financial Dependence and Growth. *American Economic Review*, Vol. 88, No. 3 (Jun. 1998). Pp. 559-586
78. Reddy, Y. V (2004). "Credit Policy, Systems, and Culture", *Reserve Bank of India Bulletin, March 2004*
79. Romeo-Avila, D (2008). Questioning the empirical basis of the environmental Kuznets curve for CO2: new evidence from a panel stationarity test robust to multiple breaks and cross dependence. *Ecol. Econ*. 64, 559-574
80. Rosenbloom, D., Markard, J., Geels, F. W., and Fuenfschilling, L. (2020). *PNAS* April 21, 2020 vol. 117, no. 16
81. Saran, S. (2015). Paris climate talks: Developed countries must do more than reduce emissions. The Guardian, 23 November
82. Setiawan, S. (2015). Financial depth and financial access in Indonesia. *Journal of Indonesian Economy and Business*, Volume 30, Number 2, 139-158
83. Solow, R. (1956). A Contribution to the Theory of Economic Growth. *Quarterly Journal of Economics* 70: 65-94
84. Stjepanovic, S., Tomic, D., and Skare, M. (2019). Green GDP: an analysis for developing and developed nations. *Economics*, XXII, 4
85. Swart, R., Robinson, J. and Cohen, S (2003). 'Climate change and sustainable development: expanding the options. *Climate Policy* 3, Supplement 1: S19-S40
86. The Guardian (2012). What is the polluter pays principle? London 2 July
87. The New York Times (2020). Coronavirus Briefing. October 5
88. Wang, Q, Chen, X. (2015). Energy policies for managing China's carbon emission. Renew sustain, *Energy Review*, 50, 470-479
89. Wang, W., Li, M., Zhang, M (2017). Study on the changes of the decoupling indicator between energy-related CO2 emission and GDP in China. *Energy*, 128, 11-18
90. Wilbanks, T. J (2003). Integrating climate change and sustainable development in a place-based context'. *Climate Policy* 3, Supplement 1: S146-S154
91. Winters, C (2008). Origin and Spread of Dravidian Speakers, *Int. J Hum Genet*, 8 (4), 325-329
92. Wolde-Rufael, Y. (2009). Re-examining the financial development and economic growth nexus in Kenya. *Economic Modelling* 26(6): 1140-1146
93. World Map (2020). *Coronavirus World Meter*, 13 April
94. Xu, Shi-Chun (2014). Empirical research on the effects of carbon taxes on the economy and carbon emissions in China. *Environmental Engineering and Management Journal* 13(5): 1071-1078

REPORT

1. Carbon Pricing Leadership Coalition (CPLC), 2017. *Report of the High-Level Commission on Carbon Prices* May 29
2. Climate (2020). *Climate change has not stopped despite COVID-19 pandemic*: Report. 10, September
3. Coburn J., Cook, J (2014). *Cool Response: The Sec & Corporate Climate Change Reporting*, Ceres
4. Earth.Org (2020). *Green Finance will help China Achieve its low-Carbon Goals-Report*, Earth. Org November 10
5. Global Financial Development Report (2015). *Long Term Finance*. World Bank
6. Siraj, Khalid (1983). *Report of the Task Force on Portfolio Problems on Development Finance Companies*. World Bank Washington, D.C
7. WEF (2013). The Green Investment Report. World Economic Forum, Geneva
8. World Bank (1989). *'Report of the Task Force on Financial sector Operations '.* Financial Sector Development Department. Washington, D.C.

LEGISLATION

1. Commission Regulation (EC) No 2216/2004,Article 47 (2004)., 21 December
2. Commission Regulation (EC) No 2216/2004,Article 48 (2004)., 21 December

3. Commission Regulation (EC) No 2216/2004, Articles 46 (2004). Commission Regulation (EC) No 2216/2004, 21 December
4. Directive of the European Parliament and the Council, Article 5 (2002)., Official Journal 075 E

KEY WORDS

low carbon economy; carbon tax; carbon pricing initiatives; sustainable economic growth; green economy; carbon revenue; emission trading system