## Modeling Economic Growth in Contemporary Greece

## **Entrepreneurship and Global Economic Growth**

Series editor: Bruno S. Sergi, Harvard University, USA & University of Messina, Italy

Entrepreneurship and Global Economic Growth is Emerald's cutting-edge Global Economic Growth book series, presenting modern examinations of economic growth at national, regional, and global levels. Each book in this series discusses different dimensions of the changing economic and industrial contexts and examines in detail their impact on the nature of growth and development. For academics and senior practitioners, this series puts forward significant new research in the global economic growth field, opening discussions regarding new topics and updating existing literature.

#### Published titles in this series:

Modeling Economic Growth in Contemporary Russia, edited by Bruno S. Sergi Modeling Economic Growth in Contemporary Belarus, edited by Bruno S. Sergi Modeling Economic Growth in Contemporary Malaysia, edited by Bruno S. Sergi and Abdul Rahman Jaaffar

Modeling Economic Growth in Contemporary Hong Kong, Edited by Michael K. Fung (emeraldinsight.com)

# Modeling Economic Growth in Contemporary Greece

## **EDITED BY**

## VASILEIOS VLACHOS

International Hellenic University, Greece

## **ARISTIDIS BITZENIS**

University of Macedonia, Greece

And

## **BRUNO S. SERGI**

Harvard University, USA & University of Messina, Italy



Emerald Publishing Limited Howard House, Wagon Lane, Bingley BD16 1WA, UK

First edition 2022

Copyright © 2022 by Emerald Publishing Limited

#### Reprints and permissions service

Contact: permissions@emeraldinsight.com

No part of this book may be reproduced, stored in a retrieval system, transmitted in any form or by any means electronic, mechanical, photocopying, recording or otherwise without either the prior written permission of the publisher or a licence permitting restricted copying issued in the UK by The Copyright Licensing Agency and in the USA by The Copyright Clearance Center. Any opinions expressed in the chapters are those of the authors. Whilst Emerald makes every effort to ensure the quality and accuracy of its content, Emerald makes no representation implied or otherwise, as to the chapters' suitability and application and disclaims any warranties, express or implied, to their use.

#### **British Library Cataloguing in Publication Data**

A catalogue record for this book is available from the British Library

ISBN: 978-1-80071-123-5 (Print) ISBN: 978-1-80071-122-8 (Online) ISBN: 978-1-80071-124-2 (Epub)



ISOQAR certified Management System, awarded to Emerald for adherence to Environmental standard ISO 14001:2004.





## **Table of Contents**

List of Figures	ix
List of Tables	xiii
List of Contributors	xvii
Foreword  Apostolos Serletis	xix
Chapter 1 Determinants of and Obstacles to Economic Growth in Contemporary Greece  Vasileios Vlachos, Aristidis Bitzenis and Bruno S. Sergi	1
Part 1 Dynamics of the Greek Economy	
Chapter 2 Competitive Position and Dynamics of the Greek Economy Vasileios Vlachos and Aristidis Bitzenis	13
Chapter 3 An Odyssey with a Happy End? Growth Challenges, Successes and Failures of Greece during COVID-19 Era Konstantinos J. Hazakis	29
Chapter 4 Forecasting Greek Real GDP Based on ARIMA Modeling Chaido Dritsaki and Melina Dritsaki	45
Chapter 5 Nominal or Real Convergence with the EMU Criteria: The Case of Greece Aristidis Bitzenis and Pyrros Papadimitriou	61

vi

## Part 2 Policies, Institutions, and Markets

Chapter 6 The Interactions between Governance Quality and Economic Development	105
Chara Vavoura, Dimitris Manolopoulos and Ioannis Vavouras	
Chapter 7 Social Policy in Dribs and Drabs for the Greek Crisis  Dimitris Venieris	119
Chapter 8 The Greek Labor Market during the Crisis: New Evidence on the Evolution of Wages, Employment, and Unemployment  Evangelia Papapetrou and Pinelopi Tsalaporta	131
Chapter 9 SME Productivity in Greece: The Role of Human Capital, ICT Adoption, and Innovation  Ioannis Giotopoulos, Pelagia Kontaxaki and Helen Louri	155
Chapter 10 The Impact of Competition Law on the Greek Economy  Mark Clough QC and Efthymios Bourtzalas	169
Part 3 Characteristics and Performance of Selected Industries	
Chapter 11 Greek Banking System during the Crisis and Beyond Fotios Pasiouras and Minas-Polyvios Tsagkarakis	191
Chapter 12 The Agri-food Sector in Greece: Prospects and Possibilities  Stathis Klonaris	221
Chapter 13 Energy Resources, Local Content Policies and Economic Growth: The Case of Hydrocarbons Exploration in Greece  Stella Tsani	245
Chapter 14 The Importance of Tourism for the Greek Economy: Traits and Development Iordanis Katemliadis and Andreas Papatheodorou	263

Table of Contents

vii

This page intentionally left blank

## **List of Figures**

Figure 1.1.	Greece: GDP, 1995–2019.	3
Figure 1.2.	Greece: Changes in GDP per Capita and Labor Productivity, 1995–2019.	4
Figure 1.3.	Greece: Gross Value Added by 10 Industries, 2001–2019.	5
Figure 2.1.	Macroeconomic Indicators: Greece and Euro Area, 1999–2019.	14
Figure 4.1.	Correlogram of Real GDP Series (First Differences).	53
Figure 4.2.	Diagnostic Residuals' Autocorrelation Test of ARIMA (1,1,1) Model.	55
Figure 4.3.	ARCH(q) Test.	56
Figure 4.4.	Static and Dynamic Forecast of DGDP.	58
Figure 8.1.	Hourly Wages in Selected Industries, Structure of Earnings Survey, 2010–2014.	13′
Figure 9.1.	Productivity Distribution (In Logs) of Greek SMEs, 2012.	159
Figure 9.2.	Driving Forces of SME Productivity per Quantile in Greece.	16:
Figure 11.1.	The Chronology of the Greek Crisis.	194

## x List of Figures

Figure 12.1.	Agricultural Entrepreneurial and Factor Income per AWU (in Real Values) in Greece and EU.	224
Figure 12.2.	Evolution of Agricultural Incomes.	226
Figure 12.3.	Evolution of Trade Balance for Agri-food Products for the Period 2010–2020.	228
Figure 12.4.	Trade Balance in Terms of Volume and Terms of Trade.	229
Figure 12.5.	Relationship between Trade of Balance (in Terms of Volume) and Terms of Trade.	229
Figure 12.6.	Derivation of the Lorenz Curve and Gini Coefficient for Direct Payments in Greece and EU in 2015.	232
Figure 12.7.	Gross Value Added, Agriculture and Agri-food Sector in Greece (2000–2019).	234
Figure 12.8.	Evolution of Agri-food Sector in Greece (2008–2017).	235
Figure 14.1.	Performance Overview of the Travel and Tourism Sector for 2019.	267
Figure 14.2.	Monthly Distribution of Nights Spent in Tourist Accommodation Establishments (Countries with High Seasonality) 2019 (%).	269
Figure 14.3.	The Evolution of the Hotel Occupancy 2016–2019.	272
Figure 15.1.	Share of ICT Infrastructure (ICT Equipment and Computer Software and Databases) to Total Fixed Assets (Stock) for the Major Sectors in the Greek Economy (2009–2017).	288

Figure 15.2.	Direct, Indirect and Induced Effects of the ICT Sector in Terms of GDP (at Producer Prices) for 2015.	292
Figure 15.3.	Backward and Forward Indices of Variability per Sector of the Economy Including the ICT Sector for 2015.	295

This page intentionally left blank

## **List of Tables**

Table 3.1.	Selected Indicators for Greece: Restoring Fiscal Sustainability, 2010–2021.	36
Table 3.2.	Selected Indicators for Greece: Safeguarding Financial Stability Administration, 2010–2021.	38
Table 3.3.	Selected Indicators for Greece: Growth, Competitiveness and Investment, 2010–2021.	38
Table 3.4.	Selected Indicators for Greece: Social Inequalities, 2010–2021.	39
Table 4.1.	GDP Descriptive Statistics in Levels and First Differences.	51
Table 4.2.	ADF and Phillip-Perron's Test.	51
Table 4.3.	Comparison of Models within the Range of Exploration Using AIC, SIC, and HQ.	52
Table 4.4.	Comparison of Models within the Range of Exploration Using AIC, SIC, and HQ.	53
Table 4.5.	Estimation Model ARIMA (1,1,1).	54
Table 4.6.	ARCH(1) Model Estimation.	56
Table 4.7.	Estimation of ARIMA(1,1,1)-ARCH(1) Model.	57
Table 5.1.	Real GDP Growth Rate, 2009–2020.	74
Table 5.2.	Monthly Minimum Wages in Europe (Bi-annual Data), 2016–2020.	81
Table 5.3.	Human Development Index (HDI) Ranking 2019.	84
Table 5.4.	Total Unemployment Rate [TPS00203], Annual, 2008–2019, from 15 to 74 Years, Percentage of Active Population.	89
Table 5.5.	GDP per Capita in PPS [TEC00114], 2009–2019.	92
Table 6.1.	Regression Estimates of the Effects of the Specified Independent Variables on the Level of Real GDP	
	per Capita at the World Level.	114

Table 6.2.	Regression Estimates of the Effects of the Specified Independent Variables on the Level of Real GDP per Capita for Greece.	115
Table 8.1.	Mean Wages by Industry, Structure of Earnings Survey, 2010–2014.	134
Table 8.2.	Industry Wage Differentials along the Distribution, Structure of Earnings Survey, 2010–2014.	139
Table 9.1.	Summary Statistics: Productivity of Greek SMEs.	159
Table 9.2.	Description of Variables and Frequency Distributions: Human Capital, ICT Adoption and Innovation of Greek SMEs.	161
Table 9.3.	Correlation Matrix: Human Capital, ICT Adoption and Innovation of Greek SMEs.	163
Table 9.4.	Determinants of SME Productivity in Greece: OLS and Quantile Regression Estimation Results.	164
Table 11.1.	Evolution of Greek Loans and Non-performing Loans.	199
Table 11.2.	Net Credit Flows to Greek Public and Private Sectors by Domestic MFIs.	203
Table 11.3.	Credit to the Greek Economy by Domestic MFIs.	204
Table 11.4.	Foreign Direct Investment in Greece by Country of Origin.	206
Table 11.5.	Foreign Direct Investment in Greece by Sector of Economic Activity.	209
Table 11.6.	Key Financial Data of the Greek Banking Sector.	211
Table 12.1.	Greek versus EU-27 Agriculture's Fundamentals.	223
Table 13.1.	Hydrocarbons Exploration and Production Agreements Ratified by the Greek Parliament between 2014 and 2019.	248
Table 13.2.	Royalty Percentage by R Factor as Stipulated in the Lease Agreements Ratified by the Greek Parliament between 2014 and 2019.	249
Table 13.3.	Surface Fees as Stipulated in the Lease Agreements Ratified by the Greek Parliament between 2014 and 2019.	250
Table 13.4.	Economic Terms of Lease Agreements Signed in Greece between 2014 and 2019.	251

Table 14.1.	International Tourism Arrivals in Greece 2014–2019.	270
Table 14.2.	Increase of Arrival versus Increase in Revenues between 2015 and 2021.	271
Table 14.3.	Scenarios on the Impact of COVID-19 on Greece's GDP for 2020.	274
Table 15.1.	Basic Indicators for the ICT Sector (2011, 2015, and 2018).	284
Table 15.2.	The Economic Footprint of the Greek ICT Sector.	291
Table 15.3.	Impact of Greek ICT Sector by Affected Economic Sector and Economic Aspect of Interest, for Total Effects and Excluding Internal ICT Consumption for 2015.	293
Table 16.1.	Transportation and Storage Industry GVA, Employment and Fixed Assets in Greece and EU	
	(Percent of Total).	303

This page intentionally left blank

## **List of Contributors**

Aristidis Bitzenis University of Macedonia, Greece

Efthymios Bourtzalas MSB Associates, Belgium

Mark Clough QC Dentons Europe LLP, Belgium

Petros Dimas National Technical University of Athens,

Greece

Chaido Dritsaki University of Western Macedonia, Greece

Melina Dritsaki University of Oxford, UK and University of

Western Macedonia, Greece

Ioannis Giotopoulos University of Peloponnese, Greece

Konstantinos J. Hazakis Democritus University of Thrace, Greece

Iordanis Katemliadis City Unity College Nicosia, Cyprus

Stathis Klonaris Agricultural University of Athens, Greece

Pelagia Kontaxaki University of Peloponnese, Greece

Helen Louri Athens University of Economics and Business,

Greece

Dimitris Manolopoulos Athens University of Economics and Business,

Greece

Tania Pantazi University of the Aegean, Greece
Pyrros Papadimitriou University of Peloponnese, Greece

Evangelia Papapetrou National and Kapodistrian University of

Athens and Bank of Greece, Greece

Andreas Papatheodorou University of the Aegean, Greece Fotios Pasiouras Montpellier Business School, France

Bruno S. Sergi Harvard University, USA & University of

Messina, Italy

Dimitrios Stamopoulos National Technical University of Athens,

Greece

### xviii List of Contributors

Minas-Polyvios

Tsagkarakis Technical University of Crete, Greece
Aggelos Tsakanikas National Technical University of Athens

(NTUA), Greece

Pinelopi Tsalaporta National and Kapodistrian University of

Athens and Bank of Greece, Greece

Stella Tsani University of Ioannina, Greece

Chara Vavoura National and Kapodistrian University of

Athens, Greece

Ioannis Vavouras Panteion University of Social and Political

Sciences, Greece

Dimitris Venieris University of the Peloponnese, Greece Vasileios Vlachos International Hellenic University, Greece

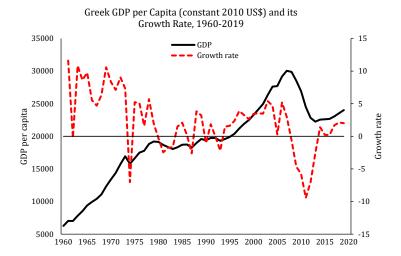
## **Foreword**

Apostolos Serletis University of Calgary

As Alogoskoufis (2021) puts it in his Abstract, during the past two centuries (from the war for independence in 1821 to the present day), Greece and its economy "have been radically transformed. Compared to the first Greek state, Greece managed to almost triple its national territory, to increase its population by almost 15 times and to increase its real GDP per capita by another 15 times. From the margins of south-eastern Europe, it has moved to the core of today's European Union." Today, Greece is the 16th largest economy in the European Union and the 51st largest economy in the world.

Alogoskoufis argues that the evolution of Greece and its economy during the past 200 years can be analyzed in the context of three major historical cycles. The first cycle is that of "state and nation building," and covers the period from the declaration of the war of Greek independence in 1821 to the establishment of the International Financial Audit Commission in 1898. The second cycle covers the period from 1898 to the end of the civil war in 1949 and is characterized by "national expansion and consolidation." This cycle is also characterized by persistent instability due to continuous wars and internal conflicts. The third cycle, from 1950 to the present, is the cycle of "economic and social development."

The figure below shows the evolution of Greek GDP per capita (in constant 2010 US\$) and its growth rate, from 1960 to 2019, using data from the World Bank (see https://data.worldbank.org/indicator/NY.GDP.PCAP.KD?locations=GR). As can be seen, per capita GDP increased (by more than a factor of five) from \$6,259 in 1960 to \$30,054 in the beginning of the global economic recession in 2007. However, per capita GDP increased unevenly during this period, with the average annual percentage growth rate being 9% from 1960 to 1973, 4% from 1994 to 2007, and -4% from 2008 to 2016. During this period, Greece experienced an economic growth miracle from the end of the civil war in 1950–1973, a long economic slowdown from 1979 to 1993, the restoration of democracy in 1974, full participation in the European Union in 1981, a major external debt crisis in 2010 and the "great depression" of 2008–2016, and the most recent COVID-19 crisis.



There is no need to go into more detail in this brief *Foreword* about the determinants of the economic and social transformations of modern Greece. In what follows, the editors, Vasileios Vlachos, Aristidis Bitzenis, and Bruno Sergi, present a collection of papers related to the forces that shaped the Greek state and its economy during the third historical cycle of economic and social development. Whether you are an academic economist or simply interested in understanding the forces shaping economic growth around the world, you will find *Modeling Economic Growth in Contemporary Greece* timely and relevant.

### Reference

Alogoskoufis, G. (2021). Historical cycles of the economy of modern Greece: From 1821 to the present. Hellenic Observatory Papers on Greece and Southeast Europe, GreeSE Paper No. 158.