



Attilio Stajano

**RESEARCH,
QUALITY,
COMPETITIVENESS**

European Union Technology Policy
for the Knowledge-based Society

Second Edition

Forewords by
Brian M. Murphy and Alberta M. Sbragia

F171.2
S782
E.2

Attilio Stajano

Research, Quality, Competitiveness

European Union Technology Policy
for the Knowledge-based Society

Second edition



Springer



E2009002734

Attilio Stajano
University of Bologna, Italy
attilio.stajano@unibo.it

ISBN: 978-0-387-79264-4

e-ISBN: 978-0-387-79265-1

Library of Congress Control Number: 2008934732

© 2009 Springer Science+Business Media, LLC

All rights reserved. This work may not be translated or copied in whole or in part without the written permission of the publisher (Springer Science+Business Media, LLC, 233 Spring Street, New York, NY 10013, USA), except for brief excerpts in connection with reviews or scholarly analysis. Use in connection with any form of information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed is forbidden.

The use in this publication of trade names, trademarks, service marks, and similar terms, even if they are not identified as such, is not to be taken as an expression of opinion as to whether or not they are subject to proprietary rights.

Printed on acid-free paper

springer.com

The Recommended Reading web site
<http://stajano.deis.unibo.it/RQC.htm>
is available on line

Research, Quality, Competitiveness

Second edition

To Kathleen

Foreword

The European Union (EU) was launched as a response to the economic dominance of the United States and – to a lesser degree – the Soviet Union. The nations of Western Europe were too small to compete against large scale and diversified economies on their own. Six countries, eventually expanding to 27 (and counting), took a series of steps toward progressively deeper integration: the removal of internal tariffs, the construction of a common external tariff, the elimination of many (but not all) non-tariff barriers leading to a single market, and the adoption of a common currency by 15 of the member states. The EU today equals and even exceeds the U.S. on many key indicators of performance. In the process, two similar but nonetheless divergent models of social and economic life stand in contrast with each other. The U.S. is more committed to capitalism and does little to dilute its harsh edges while the nations of Europe support wider social safety nets and more active regulation of commercial activity to mute the crueller aspects of the free-market. Until recently, the economic dynamism of the U.S. called into question whether the so-called European social model was sustainable in an era of globalization. The EU was slipping in competitiveness and was being challenged by new global powerhouses like China and India. Although the U.S. economy has slowed, there is little indication that European countries are capable of leveraging the situation to their advantage.

This book by Attilio Stajano investigates the EU's competitiveness and the role played by research as its underlying engine. As such, it provides an important analysis on whether competition requires sacrifice of the traditional social safety net and its accompanying regulatory regime. The single market lies at the heart of the analysis.

The original proposal in 1987 was to eliminate 279 non-tariff barriers by 1992. About 95 percent of these were agreed upon by the target date. The number of barriers to be removed continued to escalate in the next decade as the member states of the EU agreed to ease the freedom of movement for goods, services, capital, and labour. The initial set of non-tariff barriers expanded from 279 to 1,475 by 2002. In its assessment on the operation of the single market after 10 years, the European Commission applauded what had been accomplished: "About 2.5 million jobs have been created in the EU thanks to the Internal Market, since the opening up of frontiers on 1 January 1993. The European Union's GDP in 2002 is 1.8 percentage

points or € 164.5 billion higher than it would be without the Internal Market. Extra prosperity to the value of € 877 billion . . . has been created. That means € 5,700 per household on average.”

This record of success masked unease about the pace at which the single market was being completed. Much had been achieved but the EU still languished in comparison to the U.S. In 2000 at the Lisbon Summit, the EU set for itself the goal of becoming the world’s economic leader by 2010. The plan – called the Lisbon Agenda – outlined several areas for action: an ‘information society’ in which all citizens had access to the Internet, research, and innovation promoted at the EU level, and the removal of most regulations on the utility and transport sectors. The desire was to create more quality jobs, not just jobs. Yet it quickly became apparent that the aspirations of the Lisbon Agenda would not be fulfilled. A report prepared for the European Commission in 2004 warned that the failure to reach the Lisbon goals by 2010 risked “nothing less than the sustainability of the society Europe has built and to that extent, the viability of its civilization.”

The European Commission soon acknowledged the futility of reaching the lofty objectives identified in Lisbon. It conceded in 2004 that “the Union cannot catch up on the United States” because member states were responsible for “inadequate implementation of the reforms.” Indeed, less than 60 percent of the Lisbon Agenda’s 40 directives had been enacted into national legislation. The EU’s effort to build a single market, in short, was undermined by national regulations that too often ran contrary to the spirit of liberalization. There was no public pressure to change anything since the European social model filtered the impact of globalization. The adverse consequences of an anaemic European economy were not experienced by people in their daily lives.

In the face of such realities, the Lisbon Agenda was refocused on three more modest goals: (1) making knowledge and innovation the engines for sustainable growth; (2) transforming Europe into a more attractive location in which to invest and work; and (3) creating more jobs. Each member state was required to develop a ‘national reform program’ to achieve these goals but in a way that protects the European social model as well as the environment. It is beginning to look like even these more relaxed goals will be difficult to meet. Under the latest projections, the target of 70 percent employment by 2010 will probably be achieved 10 years after the deadline.

Rather than viewed as the catalyst for making Europe more competitive, the EU’s effort to reduce economic regulation is considered a threat to a protected way of life. According to post-election analysis, the proposed constitution for the EU was defeated in France in 2005 to a large extent because voters regarded it as an attempt to erode the European social model. EU leaders absorbed the lesson and, in 2007, agreed to French President Nicholas Sarkozy’s demand that the Reform Treaty – a much scaled down version of the constitution – should remove ‘free and undistorted’ competition as an objectives and banish the commitment to free competition to a separate protocol. The treaty is now before the member states for ratification.

Should this history be interpreted to mean that the EU is on a course to economic decline due to the lack of competition within its marketplace? The answer is a confident “no” as delivered by Attilio Stajano. The EU has advantages in high quality manufacturing and only needs to infuse more money into research and development to maintain an economic model that works. Quite clearly, Attilio Stajano has written a book worthy of serious consideration.

Professor Brian M. Murphy, January 2008

Dean, College of Liberal & Applied Arts

Professor of Political Science

Stephen F. Austin State University, Nacogdoches, TX

Foreword to the First Edition¹

The European Union offers a profound challenge to all citizens interested in the future of Europe, while the ongoing processes of globalization and technological innovation disrupt traditional patterns of life and international commerce. The intersection between the policies of the European Union in the areas of research and industrial policy on the one hand and the increasing levels of competition faced by European industry on the other has often been ignored by traditional studies of the European Union. Yet the European Union has to be a critical actor if Europe is to meet the economic challenges presented by the United States as well as by increasingly important economies such as that of China. It is impossible to think of the European political economy without considering the role of the European Union.

In fact, Europe's political economy as we know it in 2004 has been fashioned by the European Union and her predecessor, the European Economic Community. The creation of a customs union, and granting that customs union a unitary voice in the General Agreement on Tariffs and Trade (GATT), gave the EEC a power in the world of international commercial diplomacy matched only by the United States. It is probably fair to say that the world outside of Europe was cognizant of a united Europe's economic power before Europeans themselves were. That power increased as the European Union enlarged, and the admission in 1973 of the important United Kingdom economy in particular made the integrating Europe an even more critical actor in the world of international economics. Both the United States and Europe had to agree to the multilateral rules that have shaped trade in the period since 1958; the Community essentially wielded a powerful veto at the level of multilateral commercial diplomacy.

Europe then coupled her power at the international level with the construction of a single market. The creation of the single market marked a historic turning point, for the economic forces that had been contained within national boundaries were now to be permitted to work across borders. The single market has been underestimated, for its effects were not immediately apparent in 1992, the date by which

¹This foreword was written in June 2004 for the first edition of this book, published in Italian by Clueb.

most of the relevant legislation had been adopted. The single market is in many ways equivalent to a *time release capsule*, for its effect is seen over a long period of time. Yet if we compare the nature of the European economy now with its counterpart in the 1960s, the difference is absolutely startling. Sector after sector have been liberalized so that entire sectors are nearly unrecognizable. Some of that transformation would have occurred because of the pressures of globalization, but much of it is due directly to the work of the European Union's institutions and legislation.

Many of the readers of this volume will have recently taken a flight on a low-cost airline. That reduced cost is a consequence of the European Union's policies. Whether one studies the beer business or airlines or telecommunications or financial services, the impact of the single market is clear. A decade from now its impact will be even more so.

The decision to create a common currency, the first in Europe since the Roman Empire, reinforced the economic effects of the single market. Membership in the Euro-zone has created new pressures and tensions, but in general the existence of a single currency has given citizens in the member-states that have adopted it an economic instrument that facilitates economic exchange and heralds the creation of a true European economic space.

Yet the remarkable achievements of Europe's new political economy have not solved all of Europe's problems. In fact, Europe faces a set of challenges that the founders of the European experiment could not have imagined. Most dramatic of all, perhaps, is Europe's demographic profile. Other challenges, however, are directly related to features of Europe's political economy that are more amenable to policy interventions. The Union's activities in the area of research are particularly noteworthy, for it is through the EU's programs that Europe has in fact created what might be termed a European research community. Those programs have tried to produce the conditions that would lead to an increase in competitiveness for European goods and services. Yet there is still much to be done if Europe is to compete with the United States and Japan.

Italy's future in an integrating Europe will be shaped by how it responds to the challenges of Europe's political economy and the opportunities presented by the European Union's policies dealing with competitiveness. Scholars have long been fascinated by the flexibility and attention to design and quality that are hallmarks of Italy's small firms. Yet as the nature of the global economy shifts and the role of technological innovation become ever more important for the advanced industrial economies, the ability of Italian industry to compete will depend far more than in the past on its ability to make use of the resources and networks provided by the European Union. An enlarged Union now provides more opportunities for Italian firms but also increased competition for access to those EU programs that can help firms and governments provide the foundations for future economic growth and international competitiveness.

The European Union has become and will remain a critical actor for all those in any member state concerned with the competitiveness of firms and the creation of wealth within the framework of sustainable development in an increasingly competitive global economy. The European Union is of special importance, however,

for Italy. As this volume explains so well, Italy's challenge is a particularly difficult one. Policymakers, academics, and businesspeople all will need to participate in EU programs in new ways in order to maximize the opportunities that the EU provides. Italy's future is inextricably tied to that of the European Union, and her leaders in all sectors of life must grasp the opportunities provided by the EU in order to meet their own home-grown challenges.

Professor Alberta M. Sbragia, June 2004

Director, European Union Center and Center for West European Studies
UCIS Research Professor of Political Science
University of Pittsburgh, Pittsburgh, PA

Preface

At the end of the Second World War, the creation of the European Economic Community was seen as the answer to the quest for peace, freedom, and prosperity by the citizens of the European countries wracked by the war. In the year 2007 the European Union celebrated the 50th anniversary of the signing of the founding Treaties of Rome. On that occasion, Angela Merkel, Chancellor of the Federal Republic of Germany and President of the European Council, said: “Half a century ago a number of Europe’s political leaders set about building a European peace project the like of which had never been seen before. [...] For centuries Europe had been an idea, no more than a hope of peace and understanding. Today we, the citizens of Europe, know that hope has been fulfilled. It has been fulfilled because the founding fathers of Europe were thinking in terms well beyond their own generation.”

The European Union is an ever-changing political reality in the making: the European Economic Community with six founding members has grown from 1957 to 2007, into the European Union of 27 member states, whose prime ministers committed, by signing the Lisbon Treaty in December 2007, to continue promoting peace, democracy, stability, and prosperity in a Union facing the 21st century challenges. To cope with the new challenges the European people need more than ever, political leaders that – like the founding fathers – think in terms well beyond their own time.

In this book we deal with the challenge of competitiveness. In the initial decades after the signing of the Treaty of Rome, European competitors were mainly in the U.S., and later within the Triad. Starting in the 1990s, it became apparent that economies of emerging Asian countries would change the name of the game, initially competing on products and services that could take advantage of cheap labour, but more recently also in businesses requiring advanced technologies and qualified workforce.

The sectors where European industry beats competition are mostly mature sectors where the challenges concern quality rather than price: the European Union is a region with high labour costs and can hardly compete on price. The social costs for the European welfare state and the high European salaries can be only partly compensated by efficiency in the public administration and the benefits of the internal market and the monetary union. The possibility of competing in world markets

depends on the capacity to characterize European products and services as superior in their quality, design, innovativeness, and ability to satisfy the requirements of a diversified and ever-changing market. The superior quality of European products and services can make them competitive despite the high labour costs and standard of living within the EU.

The whole world is faced with the challenge of sustainability of development in today's globalized society. Energy and technology continue to be essential for economic growth but growth is now conditioned by two other factors: information and knowledge. While energy is limited and can be used only once, information is widely available and overabundant and can be used by several users at the same time. The new challenge is managing and exploiting information and structuring it into knowledge that can support a new approach to sustainable development and trigger an improvement in the quality of life.

This book shows that the future competitiveness of the European economy with respect to both traditional competitors and the new great economies of emerging Asian countries depends on the European capacity to seize the opportunities of the knowledge society and to ensure a competitive advantage in terms of quality. This could be achieved through a series of strategic actions, the most relevant of which are the increase in public and private investments in education, lifelong learning, research, and innovation.

These actions cannot be implemented at member state level, since their success depends upon the complementarity and synergy across the Union. A move in the right direction was made in the year 2000 by the European Council by formulating the Lisbon strategy, meant to build in Europe the most competitive economy of the world, based on the knowledge society. However, the move started with the wrong foot, as we discuss in Chapter 8 'Competitiveness in the Knowledge-based Society', and the pace of the member states towards the partial results achieved so far suggest that they are not moving cohesively towards the Lisbon strategy objectives.

In this book we focus on *research policy* and we prove that it does not only strengthen the scientific and technological base of EU industrial activities while qualifying the workforce, but it also contributes to the realization of other EU policies beyond industrial competitiveness: internal market, cohesion and integration of member states, sustainable growth, and enlargement, to name a few. We advocate the need for higher investments in education, lifelong learning, research and innovation. This need is ever so much pressing for the accession and candidate countries, where the ongoing changes in the societal structure are creating redundancies and skills mismatches in the labour market that demand for a strong focus on education at all levels, vocational training, life long learning, and research to help the young people as well as the adults and the elderly fit in the new fabric of the society as it converts to market economy. We acknowledge, however, that investments in education and research can lead to beneficial effects only in the very long term, that is, in no less than 20 or 30 years (see Fig 1). And this is precisely the reason why these actions should be carried out as soon as possible, before the positioning of the European economy is irremediably compromised by the aggressive presence



Fig. 1 A primary school class in the Montessori School in Waterloo, Belgium. The building of Europe's future starts from school. But education, as well as research, generates visible benefits in terms of a competitive presence in the international marketplace only in the long term. Education and research programs demand farsighted policymakers

of other actors. Political leaders must be farsighted and not conditioned only by the ephemeral pressures linked to the next elections. Each administration should be able to assure the children who today are attending their first classes in primary school that it is preparing for them a peaceful, multiethnic, multicultural, and competitive Europe with a high standard of living and a high employment rate.

This book is not a scholarly monograph on political science, but rather a pragmatic description of EU R&D policy and its implications on competitiveness. It aims at making readers aware that European citizens belong to a wider community than that of their own country, highlighting some aspects of the evolution of the European society transformed by technology, globalization, and networking.

The book is divided into three parts: the first part is an overview of the EU member states from the point of view of the competitiveness of their economies; the second part addresses EU research and innovation policy within the context of the knowledge society; the third part is written for readers looking for basic information on the institutional structure of the European Union: it introduces the reader to the origins of the EU, her ongoing enlargement to 30 members, her institutions, and her policies for sustainable development, mainly the internal market (including the economic and monetary union) and competition. Readers familiar with the Union's organization and its latest changes may want to only browse the third part and restrict their reading the Section 11.5 'The 2004 Enlargement Three Years on' addressing successes and challenges faced by the new members and the Section 11.8.3 'Turkey' covering the accession negotiations with Turkey, a process

that unveils different visions on future and role of the Union as expressed by the various political leaders.

This book originates from the lecture notes for the courses on research policy in the European Union given by the author at the Georgia Institute of Technology in Atlanta, Georgia, in 1999; at the Faculties of Political Science and Engineering of the University of Bologna, Italy, from 1999 to 2007; and at the Faculty of Economics of the University of Ferrara, Italy, from 2001 to 2005. This book was initially published in Italian by Clueb in 2004. Springer published a first edition in 2006. The present edition is a cover-to-cover rewrite, with updates and extensions in particular on: the reform of the Treaty on European Union; enlargement; internal market and competition; the seventh Framework Program for Research and Development; the knowledge society and the Lisbon strategy.

The primarily audience of this book are teachers of courses on EU sustainable growth policy and on research and technology policy; they may use the book as textbook. Other categories of potential readers include economists and policy makers interested in competitiveness, and industrial and academic researchers who are planning to submit research proposals for Community funding under the Framework Program for research and technological development. By fully understanding the final objectives of the programs and the proposal selection criteria, they should be able to develop and draw up research proposals that have a better chance of being considered for funding. The book is also addressed to scholars of EU policies, particularly policies relating to research and competitiveness, who will find in the book not an abstract academic discourse but rather a pragmatic description of the current situation by a former EU officer with extensive industrial experience.

The courses held by the author at the Faculty of Engineering of the University of Bologna are part of a series of courses described at the URL <http://www.elearning.unibo.it> exploring the potentialities of e-learning. They are organized in such a way as to create a learning and training community in a situation where face-to-face lessons are integrated by online asynchronous activities. Students play an active role, empowered to the creation of contents and to the development of skills. The use of this book and of an e-learning platform for a university course on research policy is presented in Appendix B.

The first edition of this book included a cd-rom of recommended reading, which is substituted in this edition by a companion web site at the URL <http://stajano.deis.unibo.it/RQC.htm> containing reference papers, landmark papers, recommended reading, updates, an *ERRATA*, book reviews, tables and figures to build course materials, examples of slides for a course, and other materials as described in Appendix C.

The author welcomes any comments or notifications of errors to be sent to the following e-mail address: <attilio.stajano@unibo.it>.

Bologna, Italy

Attilio Stajano

Acknowledgments

The author thanks Professor Alberta Sbragia, Professor Patrizio Bianchi, and Professor Tibor Palankai, who read some early drafts of this book at different stages of its development, providing suggestions and criticisms; and the many colleagues and friends who read the first edition, offering valuable and appreciated comments. The author is deeply indebted to Leyla Tunç Yeltin, Secretary General of İktisadi Kalkınma Vakfı (Economic Development Foundation) in Istanbul, Turkey, who read a draft of the section on Turkey and offered comments and valuable input. Obviously, the author takes personal responsibility for any content of the book. The author also thanks his students, whose interest and involvement have greatly stimulated him.

The author expresses his deepest thanks to all those who, with patience, accuracy, and high professionalism, helped him with the language, style, layout, and production of the book: Ms. Leslie Haigh of Actionline; and Ms. Marilea Polk Fried, Ms. Barbara Fess, Ms. Marian Scott, Ms. Gillian Greenough, Ms. Deborah Doherty, and Mr. Gerry Geer from the Springer staff.

Finally, the author thanks the *Financial Times*, *Il Sole 24 Ore*, *La Repubblica*, and *The Economist*, which, as owners of the copyright on images and texts reproduced in the book and on the recommended reading web site, have allowed him to reproduce such materials.

The Author

At the moment, Attilio Stajano is holding a course on Research and Technology Policies of the European Union at the Faculty of Engineering at the University of Bologna. He has lectured on these topics also in other Italian universities and at the Georgia Institute of Technology of Atlanta. Previously he worked for 13 years as a civil servant of the European Commission. At first he was responsible for business applications in the information technology research and development program and then for the technological transfer of the whole program. He has also worked for over 20 years in the information technology industry, both in Italy and in several European countries as well as in America, dealing with software development, research, and training.