

Richard K. Benson  
Editor

# ECONOMIC PERFORMANCE



Economic Issues, Problems and Perspectives

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# ECONOMIC PERFORMANCE

**RICHARD K. BENSON**  
**EDITOR**



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## PREFACE

In this book, the authors present current research from across the globe in the study of economic performance. Topics discussed include systematic monitoring of the functioning of key goods and services markets; the links between internal migration and financial performance of local authorities; an evaluation of the ECB policy response to changing economic conditions in Euro area member states; environmental management accounting to support economic and environmental improvement; the world economic crisis of 2008 and its impact on housing development in sub-Saharan Africa and transportation as an integrative part of market growth economies.

Chapter 1 - The Single Market is a pillar of the European Union (EU) and has been essential in the last twenty-five years for the smooth functioning of Europe's economic and monetary policies. Besides, it is also the heart of a range of EU policies such as the Lisbon Strategy on growth and jobs. Despite these achievements, the Single Market still has untapped potential and needs to adapt to new realities. Subsequently, the European Commission set out its reviewed vision for the 21<sup>st</sup> century Single Market providing a response to the challenges of globalisation. As part of this report, the Commission's services developed a new approach for a more systematic monitoring of the functioning of key goods and services markets, which was presented at the informal European Council in October 2007. Within this context, this paper screens all the industries of the European economy to identify those key markets and sectors that are most important for growth and adjustment in the EU in terms of production, employment and income. It contributes to the literature by making a sensitivity analysis of the backward and forward impact indicators to identify the key sectors and eventually provides results for the EU as a whole

and for individual countries for selected sectors: chemicals, fabrication of motor vehicles, food industry, construction work and pulp and paper industry.

Chapter 2 - Social and economic transition of people, goods, and services constantly appears within metropolitan areas. It's also appears between the metropolitan center and peripheral localities (Blair, 1995; Wegener, 1995; Lucas, 2001; Storperand & Manville, 2006). The migration of residents and businesses affects both the 'migrant-exporting' and 'migrant-importing' municipalities. In many cases, intra-metropolitan migration flows from urban centers to suburbs and has a detrimental effect on the financial sustainability of central municipalities through the erosion of their tax base (Katz, 2000; Vaturi et al, 2004).

Chapter 3 - This paper empirically investigates the extent to which the European Central Bank has responded to evolving economic conditions in its member states as opposed to the euro area as a whole. Based on a forward-looking Taylor rule-type policy reaction function, we conduct counterfactual exercises that compare the monetary policy behavior of the ECB with the alternative hypothetical scenarios (1) were the euro member states to make individual policy decisions, and (2) were the ECB to respond to the economic conditions of individual members. The results reflect the extent of heterogeneity among the national economies in the monetary union, indicating that the ECB's monetary policy rates have been particularly close to the "counterfactual" interest rates of its largest euro members, as well as countries with similar economic conditions, which includes Germany, Austria, Belgium and France.

Chapter 4 - Environmental Management Accounting (EMA) is a methodology to help organisations identify and quantify the environmental costs of their production processes and analyse the economic benefits that result from improving their environmental performance. To do this, EMA uses appropriate accounting systems that translate the environmental impacts of industrial activity into monetary terms. The international scientific community unanimously agrees that EMA is a powerful tool to improve the environmental and economic performances of organisations, and the literature review verifies that EMA is a valid tool that improves decision making and budgeting, which results in comprehensive information and direction about the significant economic costs that are due to the environmental aspects/impacts of the organisation. However, to date, studies have only applied EMA to companies that mass produce. EMA has not been validated for companies where production is made to order.

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This study investigated the applicability and validity of using the EMA methodology for companies where production is made to order. To this end, we present the research conducted in 2009 by the Environmental Quality Research Centre at the University of Padua in collaboration with an Italian manufacturing company that allowed the EMA methodology, with the necessary assumptions and amendments, to be applied to its made-to-order production. From the case study, this article highlights the potential use and limitations of applying EMA in a made-to-order production company, confirming that EMA is able to identify and quantify the environmental cost and support management in decision making regarding environmental and economic performance improvements. This article also distinguishes the similarities and differences between the chosen case study and other case studies from literature that have studied companies that mass produce, i.e., comparing the methodology followed, results, validity and limitations of the results.

Chapter 5 - The World Economic Crisis of 2008 appears to affect urban development systems and growth in Sub-Saharan African Cities. Particular contribution in this paper focuses on documenting physical development system in urban space in view to housing construction, changes in housing rent, space use and life style changes resulted from the crisis. This paper highlights also the housing construction habit, changes of price for building materials and urban space restoration needs in Moshi Municipality-Tanzania, one of the rapidly developing cities in Southern of Sub-Saharan African region. The question is what a take home message to be learned by different actors in urban development and growth systems for sustainable housing development and governance systems within the world economic crisis occurrence at present and in future by having fact on past implications of the crisis. Likely, roles of different actors, impacts of the crisis and country investment policy reflections are discussed, which pave the way for highlight viable strategic options for improvement in countries with unstable economy in Sub-Saharan Africa Regions, Tanzania inclusively.

Chapter 6 - This study employs a VES functional form of the production function to capture both the direct and indirect effects from transport capital on growth for the small island economy case of Mauritius. Results from the analysis yield a positive contribution of such type of capital. Further analysis based on marginal productivities of inputs tend to suggest that there exists complementarity between transport capital and private capital and thus suggests that they impact on aggregate output indirectly as well. Same is observed with the total level of public capital.

Chapter 7 - Negotiation is an every day task in economic processes; ranging from corporations to markets, from agents to nations, always there is the need to mediate between conflicting intents or expectations. Therefore, in the scientific literature and in practice, several negotiation procedures have been developed, each one elaborated to perform in a specific context and under particular assumptions, as, for example, voting systems, auction and fair division mechanisms, negotiation protocols, and so on. All these may seem disjointed from each other, as their contexts are; nevertheless they all share the same assumption that each subject pursues his own best utility. Moreover, despite their specialization, they all have some problems in practical use like, for example, the presence of a dictator, the lack of truthfulness, or the possibility of being manipulated by fictitious declarations. In this contribution we focus on the negotiation over continuous issues and in particular we analyze the jointly Improving Direction Method (IDM), which is known for its generality, since different other negotiation protocols can be seen as an its particular subclass, and also because it has the nice theoretical property of being Pareto efficient. Nevertheless it is easy to implement, which makes IDM the perfect candidate for an automated negotiation support system. Despite its theoretical properties, we show the practical inefficiency of this method (even in the simple case of just two negotiating parties), which reduces significantly its performance in the operative context. In particular we show that the main drawback of IDM is due to the possibility to retrieve information about other ones utilities during the negotiation steps and to exploit it to manipulate the negotiation itself. For better explaining this phenomenon we show the deep connection between negotiation and the social choice problem. The bridge we build allows to carry in this context the Arrow's Impossibility Theorem and the Gibbard-Satterthwaite Theorem, thus implying that each step of IDM (and of all the methods which it generalizes) may be affected by a dictatorial or a manipulatory party who can deviate the efficient Pareto frontier to get a better gain during the negotiation. In order to avoid the operative inefficiency of IDM, we propose a different negotiation paradigm, where the hypothesis that agents maximize their own utility is not modified, while the way they pursuit maximum satisfaction is substantially different, since each agent has to express a sub optimal choice, rather than his optimal one. In this context, the constraint of a sub optimal declaration by one side protects from information retrieval and by the other side it forces each party to leave to the others the possibility to improve their own gains in order to pursue his own best. The comparison of the performances with the IDM ones in different negotiation

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domains, both in terms of Pareto efficiency and manipulation resistance, shows the effectiveness of the proposed approach.



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*Chapter 1*

**THE ADJUSTMENT CAPACITY  
OF THE EUROPEAN ECONOMY EXAMINED  
WITH AN INPUT-OUTPUT BASED KEY  
SECTOR ANALYSIS**

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**ABSTRACT**

The Single Market is a pillar of the European Union (EU) and has been essential in the last twenty-five years for the smooth functioning of Europe's economic and monetary policies. Besides, it is also the heart of a range of EU policies such as the Lisbon Strategy on growth and jobs. Despite these achievements, the Single Market still has untapped potential and needs to adapt to new realities. Subsequently, the European

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Commission set out its reviewed vision for the 21<sup>st</sup> century Single Market providing a response to the challenges of globalisation. As part of this report, the Commission's services developed a new approach for a more systematic monitoring of the functioning of key goods and services markets, which was presented at the informal European Council in October 2007. Within this context, this paper screens all the industries of the European economy to identify those key markets and sectors that are most important for growth and adjustment in the EU in terms of production, employment and income. It contributes to the literature by making a sensitivity analysis of the backward and forward impact indicators to identify the key sectors and eventually provides results for the EU as a whole and for individual countries for selected sectors: chemicals, fabrication of motor vehicles, food industry, construction work and pulp and paper industry.

**Keywords:** Single Market, Input-output analysis, Key sector analysis, European Union.

**JEL Codes:** C67; O52.

## 1. BACKGROUND

The Single Market (EC, 2007a) is a pillar of the European Union (EU). It has turned the free movement of people, goods, services and capital into a tangible reality, delivering real benefits for Europeans. The single market has been essential for the smooth functioning of Europe's economic and monetary policies and served as a strong base for the launch of the Euro. The enlarged single market has made Europe more open, more diverse and more competitive -creating new opportunities, respecting social rights, and promoting high standards for health, safety and the environment. Besides, the single market is at the heart of a range of EU policies such as the Economic Monetary Union and the Lisbon Strategy on growth and jobs.

Despite these achievements, the single market still has untapped potential and needs to adapt to new realities. In February 2007, the Commission set out its vision for the 21st century single market: a strong, innovative and competitive market, which maximises the potential of services, directly benefits consumers and entrepreneurs and positions Europe to better respond to and shape globalisation. Also, now that the EU has become bigger and more

diverse the single market needs to: (a) deliver more results for citizens, consumers and small and medium enterprises; (b) take better advantage of globalisation; (c) open new frontiers of knowledge and innovation; and (d) encompass a strong social and environmental dimension.

All of this calls for new working methods and the use of a diverse set of instruments. Efforts have focused on removing cross border barriers, mainly through legal measures. Efforts should now be made to develop a more varied set of tools and a more impact-driven approach: making markets deliver more effectively in areas which will bring the best return for consumers, growth and job creation. To that purpose, the Review sets out a new approach to the single market. It does not include a classic legislative action programme but rather fostering flexibility and adaptability while maintaining the legal and regulatory certainty necessary to preserve a well-functioning single market.

This new approach is described in the documents on market monitoring, single market instruments and trade instruments which accompany the Review (EC, 2007a). Along with other related documents including a summary of achievements of the single market, they represent an important part of the Commission's response to the challenges of globalisation "The European interest - succeeding in an era of globalization" (EC, 2007b) which was presented at the informal European Council in October 2007.

As part of these documents, the Commission's services have developed a methodology for a more systematic monitoring of the functioning of key goods and services markets. The first stage of this methodology consisted in screening sectors offering the greatest potential benefits in terms of growth, job creation and consumer welfare. In the second stage, selected sectors will be examined in more detail in order to determine why markets are functioning poorly (lack of openness/integration, lack of choice and transparency for consumers, low degree of competition, poor regulatory environment and lack of innovation). This will give crucial insights to address the specific challenges faced in the sector(s) concerned. The Commission intends to work closely with national authorities to develop this new approach.

A staff working paper (EC, 2007c) was presented alongside the Review (EC, 2007a) to present the first findings of the first stage, which are based on the recent methodology published in the "Guiding principles for product and market monitoring" (EC, 2007d). The screening and analysis carried out allowed to: (a) identify markets and sectors which are important for growth and adjustment in the EU; (b) identify the existence of market malfunctioning within the Internal Market; and (c) offer some insights into the causes of markets malfunctioning. The sector screening could contribute to improve

efficiency and consistency in the future design of horizontal policy instruments and help address Single Market problems affecting the EU. In the staff working paper (EC, 2007c), all sectors of the economy were screened on the basis of their economic importance, their contribution to the adjustment capacity of the EU and signs of market malfunctioning.

Within this context, the JRC/IPTS and the European Commission's Directorate General for Economic and Financial Affairs (DG ECFIN) have cooperated closely in the screening of the most important sectors in each of the individual euro area and EU27 Member States by means of input-output analysis in order to assess the challenges for market based economic adjustment in the framework of the European Monetary Union and the European Union.

The Communication 'A Single Market for the 21st century Europe' (EC, 2007a) and to the accompanying Commission Staff working document "Implementation of the new methodology for product market and sector monitoring" have drawn extensively on the work carried out by JRC/IPTS on behalf of DG ECFIN on the identification of the sectors that most contribute to the adjustment capacity of the EU economy. The work of the JRC/IPTS on methodology development and the results obtained are explicitly reflected in many places of the latter document (cf. pages 12 to 18 in EC, 2007c) and in the Communication. Eventually, the complete analysis, initiated as a policy support study, was subsequently generalised and extended into this paper.

## **2. LAYOUT, DATA AND METHODS**

This paper identifies the sectors that most contribute to the adjustment capacity of the EU economy, regarding the supply of essential inputs to the rest of the economy. The objective is to assess the extent to which the functioning of markets is sufficiently flexible to allow an endogenous and smooth adjustment to changing economic conditions (EC, 2007c). This is done on the basis of a key sector analysis by using interlinkages of sectors with the rest of the economy, since the stronger these linkages, the more important are the repercussions of the performance of the sector on the rest of the economy. Complementarily, the EC (2007c) also includes in the study an analysis of (a) the contribution of the sectors to the development, absorption and diffusion of new technologies, as this helps to promote greater economic efficiency and competitiveness; and (b) the contribution of the sectors to price adjustment, as price stickiness hampers the reallocation of resources across activities and

reduces the pass through of cost reductions to consumers. Nonetheless, the discussion of the latter two issues would go beyond this paper and therefore it is not included.

The identification of key sectors can be addressed from the demand side, the supply side or from both angles. From the demand side, we can identify those sectors for which a one-unit increase in the final demand of their primary outputs would drive other sectors either in terms of total output, employment or income, by increasing their corresponding intermediate inputs, i.e.: backward oriented sectors. The analysis from the supply side reveals those sectors providing the inputs supplied to other sectors as a result of one-unit increase in their gross value added or, generally speaking, gross domestic product, i.e.: forward oriented sectors.

The identification of key sectors is a well-known subject in the literature<sup>\*</sup> and it can be addressed with input-output analysis using a single symmetric input-output table<sup>†</sup> (SIOT). The JRC/IPTS has recently estimated a SIOT of the EU27 for the year 2000 (Rueda-Cantucho et al., 2009), which is adequate to apply standard input-output analysis with that purpose. By taking the two impact multipliers together, the key sectors can be identified as those with highest backward and forward multipliers. To this purpose, the analysis will be developed for output, employment and income multipliers. All primary data is from Eurostat (Eurostat, 2010); further estimations, where necessary, were developed by JRC/IPTS<sup>‡</sup>. The analysis is made at a fairly aggregated level, at the two-digit level of the NACE industrial classification.

However, the key sector analysis is not a straightforward task. Firstly, the analysis shall account for domestic intermediate uses. Otherwise, policy-oriented impacts in final demand may lead to output growth in the exporting countries rather than in domestic industries. Secondly, forward and backward multipliers shall be weighted according to gross value added and final demand

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<sup>\*</sup> The key sector analysis has prompted out a huge literature. To mention some examples: Beyers (1976), Bon (1986), Cella (1984), Chenery and Watanabe (1958), Dietzenbacher (1997, 2002), Ghosh (1958), Hazari (1970), Hirschman (1958), Jones (1976), Laumas (1975, 1976), McGilvray (1977), Oosterhaven (1988, 1989), Oosterhaven and Stelder (2002), Rasmussen (1956) and Sonis, Hewings and Guo (2000).

<sup>†</sup> For simplicity, we will use "sectors" throughout the document albeit the EU27 SIOT is on a product by product basis. Roughly speaking, results would not be significantly different as long as the amount of secondary outputs was not comparable to the primary outputs.

<sup>‡</sup> Since the main interest of this paper relies on the Single Market Review, the discussion hereafter will be focused on primarily market based sectors. That is, all industries except the primary sectors and mining (1 to 8); real estate (47); public administration and defence (52); education (53); and health and social work (54). This distinction is taken from the EUKLEMS consortium: [www.euklems.net](http://www.euklems.net).

shares of sectors, respectively, in order to discriminate against sectors that are too small, in the EU, to ever have any relevance on macroeconomic observations. Finally, one should take into consideration that the total effects on the whole system as a result of variations in the final demand of a product might be spread throughout many sectors or just be concentrated on a single one.

In addition, it might be interesting to account for the shares of intermediate uses over both the total intermediate inputs and the total intermediate outputs. Their average would serve as a measure of the direct relationship between buying and supplying sectors. Accordingly, this report will map the production networks of the EU economy on the basis of the aggregate symmetric input-output table for 2000, and thus providing the main direct sectoral interlinkages within the EU.

In the next section, we present a brief description of the EU economy in terms of output, income and employment; Section 4 maps the production networks on the basis of direct linkages while Section 5 introduces the key sector analysis and identifies the sectors that most contribute to the adjustment capacity of the EU economy through total linkages. Subsequently (Section 6), we compare the results taking into account their contribution to output, employment and income and made a sensitivity analysis (Section 7) to check the robustness of the results. There, the threshold used to identify key sectors (average vs. median) together with the choice of either including or excluding from the analysis the corresponding main diagonals of each matrix of backward and forward linkages will be discussed. In Section 8, we have selected five key sectors considered with the greatest environmental impact (JRC/IPTS and ESTO, 2006) and we explore where in Europe these sectors are so crucial in terms of growth, income and jobs. Finally, Section 9 concludes. The formal aspects of the methodology used are reported in the Appendix.

### 3. DESCRIPTIVE ANALYSIS

Figure 1 shows six of the top eight sectors in terms of output, gross value added and employment in the EU for the year 2000. *Public administration* and *health and social work* would complete the list but they are not considered here since they are not primarily market based sectors. Percentages stand for the shares of output, gross value added or employment over their totals in the whole economy.

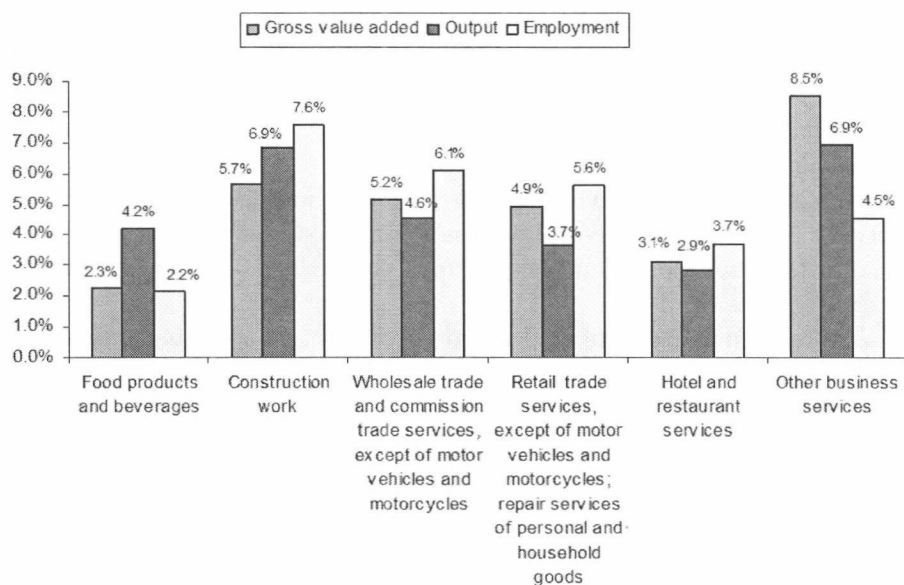


As shown in Figure 1, construction work and other business services (i.e. accounting and law activity services, engineering and architecture technical services, marketing services, among others) represent each one nearly 7% of total output, followed by wholesale trade and the food manufacturing industry with 4.6% and 4.2%, respectively.

In terms of gross value added, other business services goes up to 8.5% while construction work and wholesale trade only reach 5.7% and 5.2%, respectively.

As for employment, construction work represents 7.6%, followed by wholesale and retail trade services with 6.1% and 5.6%, respectively.

Figure 1.- Sectoral structure of the EU 2000



#### 4. MAPPING DIRECT LINKAGES

Figure 2 depicts the main links of the production structure network in the EU for the year 2000. By taking the average of the shares of intermediate uses over the total intermediate inputs and over the total intermediate outputs, a flow index was defined in order to measure the degree of direct relationship between sectors (see the Appendix for a formal definition).