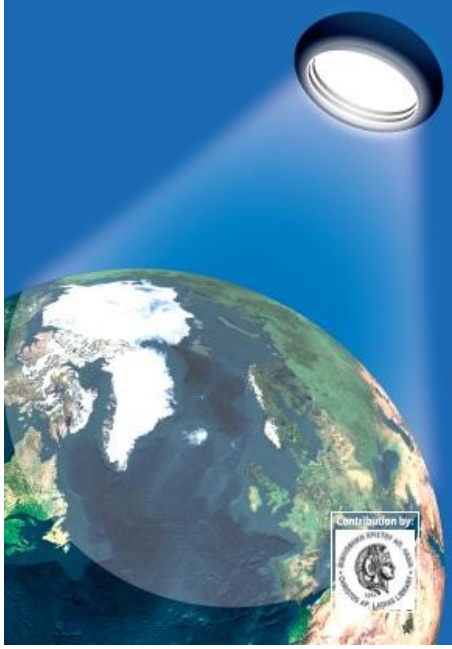
Regional Science Inquiry



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19b Navarinou Street, 15232 Chalandri, Athens, Greece Tel. / Fax: +30 210 6833700

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RSI Journal, Volume IV, Issue 1 – Editorial

Globalisation, Climate Change and the Regions of the European Union

Europe faces probably the worst recession since World War II. The current economic crisis has wiped out years of economic and social progress and exposed structural weaknesses in Europe's economy. More than 80 million people are at risk of poverty; 19 million of them are children while 8% of labour force does not earn enough to make it above the poverty threshold, defined as 60% of the average income in each Member State of the EU. Unemployment, budget deficits and divergent growth patterns result to accumulation of government debts and put uncertainty and unpredictability for the single currency (euro). Budget deficits were 7% of the GDP, on average (the target of 3% of GDP is set to be achieved by 2013) and debt levels at over of 80% of the GDP, which has fall by 4% in 2009, industrial production has dropped back to the levels of the 1990s and 23 million people (10% of active population) are unemployed. Only two-thirds of labour force in the EU is currently employed, compared to over 70% in the US and Japan. According to EUROSTAT (2010), employment rate rose from an average of 65.4% in 2007 to only 65.9% in 2008. The Lisbon employment target (70%) is set to be achieved in 2010. It is questionable, however, if, under the such circumstances, the target of the employment 75% of the population aged 20-64 set by Europe 2020 would be achieved. In 2008, only 94 NUTS-2 regions, out of 271 regions, had already achieved this target for 2010, while 50 regions were still 10 percentage points below the overall employment target. Relatively low employment rates were recorded in the south of Spain, the south of Italy, Greece, Poland, Slovakia, Hungary, Bulgaria and Romania, whereas a relatively high employment rate characterises the regions of Netherlands, United Kingdom, Denmark, Sweden and Finland.

Europe faces a moment of transformation and three factors can be taken into consideration: globalisation, energy consumption and climate change. Globalisation creates more opportunities for producers and entrepreneurs, who are in a position of enjoying larger markets and higher competitions. Consumers will benefit from higher living standards through lower prices and a wider choice of goods. A general increase in economic activity and trade will enhance labour demanded and real wages for skilled labour create employment and increase economic growth. Globalisation is driving scientific and technological progress, making the European dimension ever more important in boosting knowledge, mobility, competitiveness and innovation. The opening up of huge new markets creates vast opportunities for Europeans, but it will at the same time test Europe's capacity to further adjust to structural change and manage the social consequences of that change. The dissemination of innovation and know-how will also increase productivity. However, globalisation might also bring structural adjustment. Increasing competition can put additional pressure on local firms and, indirectly, on wages, especially for low-skilled labour. Regions are enlarging their area of influence, sometimes globally. Several regions in the EU should restructure their economic base and promote continuous innovation (in products, management and processes), as well as human and social capital – to face the challenge of globalisation. Nonetheless, the benefits of globalisation remain concentrated in a limited number of regions with advanced urban centres. Globalisation is likely to increase regional imbalances within Europe. Most regions located in the Southern and Eastern parts of the EU, stretching from Latvia, Eastern Slovakia, Hungary, Bulgaria and Romania to Greece, Italy, Spain and Portugal, appear to be much more exposed to the challenges of globalisation. This vulnerability is predominantly due to the relatively large share of low value added activities in these regions and weaknesses in workforce qualifications, which may lead to difficulties in attracting investment and creating or maintaining jobs.

The EU is characterised by a growing external energy dependency (in 2005, 53% of energy consumption in the EU was covered by imports) especially in the fossil energy sources (oil, gas, coal) and in nuclear energy sources (uranium). Agriculture and industry, especially Small-Medium Enterprises (SMEs), have been hit hard by the economic crisis and all sectors adjusting their

production processes and products to a low-carbon economy. Energy prices appear to have become ever more volatile with extreme price peaks. Peripheral regions located in Eastern and southern Member States appear to be more vulnerable. Energy consumed directed by agriculture is related to the use of machinery, such as tractors, and the heating of livestock stables and greenhouses. There is also the indirect energy use for the production of agrochemicals, farm machinery and buildings while considerable amounts of natural gas are used for the production of inorganic nitrogen fertilisers. The use of machinery and mineral fertilisers results to increases in agricultural productivity and food supply. In 2011 the world's population reached seven billion and it is expected to reach nine billion by 2050, even as the speed of population growth slackens. More than one billion people are classified officially as hungry; a way must be found to feed three billion more people over the next fifty years. Machinery use and mineral fertilisers contribute to the depletion of non-renewable energy sources and to global warming (CO_2 emissions from fossil fuel consumption). Total consumption of energy by agriculture in the EU-27 has decreased by 7% since 2005; from 29,939 kilo tonnes of oil equivalent to 27,826 in 2007 (EUROSTAT, 2010a). The share of agriculture in final energy consumption by all sectors, in the EU-27 on average has been steadily declining, from 2.7% in 2000 to 2.4% in 2007. Nevertheless, this share exhibits considerable variations across the EU-27 countries (8.1% in the Netherlands and 0.6% in the United Kingdom). This index, however, does not reveal anything about the intensity of energy use by agriculture and depends on the size of agricultural sector, the energy use and size of the remaining sectors. Therefore, a more appropriate indicator would be the final energy consumption of all energy products by agriculture in kilograms of oil equivalent per hectare of utilised agricultural area. According to EUROSTAT (2010), the average energy consumption in the EU-27 is 161 kilograms of oil equivalent per hectare. The highest energy consumption per hectare is recorded for the Netherlands (2,166 kilograms of oil equivalent) due to the high intensity of production in heated greenhouses, the most energy consuming type of crop production.

Climate change will, in the long-run, lead to an increase in average annual temperatures, alter rainfall quantities and patterns, and raise the sea level and the risk of coastal erosion. In Southern regions, climate change is projected to worsen existing conditions through declining precipitation and drought. More than 170 million people (about one third of the EU population) live in regions most affected by climate change. Regions subject to the highest pressure are generally located in the South and East of Europe, Spain, Italy, and several southern parts of France Greece, Bulgaria, Malta, Hungary and Romania. Although agriculture is of particular importance for the low-income Southern regions, nevertheless these are characterised by a low capacity for adoption to climate change. The Alpine areas with reliable snowfall will decrease and the industry will have to shift its focus to summer holidays, whereas Mediterranean regions might suffer from temperatures above the heat comfort zone and loss of biodiversity. In the energy sector, climate change will lead to changing patterns of energy demand and to greater fluctuations in energy production and demand, particularly in regions with a high share of renewable energy and varying availability of water for cooling of large-scale heating power plants. The share of renewable energy resources in consumer's energy consumption exhibits considerable variation across the EU countries. The highest percentage is recorded for Sweden (about 40% in 2005), due to geothermal and hydro energy production, while the lowest are found in the UK, Luxembourg and Malta. Increasing tendencies are evident in Latvia, Lithuania, Romania and Estonia.

These effects will impact on regional growth potential in affected regions and create disparities with those regions that are less affected by climate change. Changing weather conditions will have a negative impact on human health and well-being in several areas (the increasing number of heat-related deaths, the limited availability and quality of drinking water, constitute examples of such negative impacts). In this respect, the Mediterranean regions will suffer the most from worsening conditions, while Northern, Western and Eastern European regions will see a less serious deterioration or even a temporary improvement in conditions. Changes in temperature and precipitation will also lead to changing agricultural yields and production methods with distinct patterns throughout Europe. In fisheries, climate change will place an even greater strain on marine ecosystems subject to over fishing. This is likely to intensify the existing social and

environmental disparities between the EU regions.

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In the 1st Issue of Volume IV of the RSI Journal

This issue includes thirteen papers, all written by academics and policy-makers from all over the world. It is the intention of the editorial board of the Regional Science Inquiry Journal to present in this issue a wide range of topics, such as economics, environmental, politics, theoretical aspects of regional development, empirical case studies. Irene Casas, Maria Teresa Borzacchiello, Biagio Ciuffo and Peter Nijkamp provide an exploratory contribution to the debate on sustainable transport using data from the United States. An unusual urban land use pattern, namely the illegal settlements in urban area of Palangkaraya city, Indonesia is examined by Permana and Yuzuru Miyata. The analysis of regional economic growth has always been handicapped by the almost unavailability of data on regional capital stock. Stilianos Alexiadis and Daniel Felsenstein attempt to develop a method to obtain regional capital stock statistics using the 'flexible accelerator' model. This method is extended by the incorporation of spatial spillovers effects in the context of the stock-flow model. Carmen Bizzarri argues that new forms of personal relationships between tourist and resident are being established with economic, environmental and social consequences of utmost importance for the support of tourist development. Energy poverty and its typology in the Mediterranean countries, is the topic of the fifth paper by Anastasia Biska and Maria Giaoutsi. The authors develop the prospects for policy measures and action in the Mediterranean region. How close is Albania to Greece with respect the process of financial integration? Dorjana Nano and Teuta Llukani compare the economic characteristics and the institutional development of these two countries and propose several interesting policy implications. The assessment of Rural Development Policy and the problems and shortcomings occurred during the phases of rural development policy design, implementation and evaluation, are examined empirically by Eleni Papadopoulou, Christos Papalexiou and Nikolaos Hasanagas. Cristina Lincaru, Vasilica Ciucă, Draga Atanasiu, Cătălin Ghinararu, Gabriela Tudose and Liliana Grecu use the "employment by time since job started as proxy for "employment by job tenure" indicator in order to estimate the annual hiring flows. A decision support framework for assessing alternative wind park locations and a close examination of the wind park location in Tanagra, Boiotia is the topic of the paper by Anastasia Stratigea and Elias Grammatikogiannis. Hiroshi Sakamoto develops a multi-region computable general equilibrium model to study the influence on a regional economy of a reduction in the transportation cost. This model is applied in the Northern Kyushu region. Rosa Grazia De Paoli examines urban conditions of comfort/discomfort (safety, mobility, environment, social cohesion and utilises a methodology of urban retraining with participated procedures applied in a historical centre of a town in southern Italy. Do environmental protection measures can assist Europe to overcome the current economic crisis? Olga Gioti Papadaki argues that the European Union is able to reduce its dependence on imported energy resources and take advantage of its leadership on environmental technology. Pantelis Sklias, in the final paper of this issue, proposes 'Elaborated Realism' as an analytical framework of the impact of the Information and Communication Technology on the Arab revolution.

The present issue of the RSI Journal concludes with presenting general news and announcements related to regional science research undertake, academic profiles of worldwide distinguished academic scholars in regional science together with the presentation of selected books, useful to regional scientists.

Dr. Alexiadis Stilianos
Dr. Kokkinou Aikaterini
RSI Journal

Papers

SHORT AND LONG TERM EFFECTS OF SUSTAINABLE MOBILITY POLICY: AN EXPLORATORY CASE STUDY

Irene Casas
Department of Geography, University at Buffalo-SUNY
125 Wilkeson Quad, Buffalo, New York 14261, USA; Tel: (716) 645-2722; Fax: (716) 645-2329
icasas@buffalo.edu

Maria Teresa Borzacchiello
Department of Transportation Engineering , University of Napoli "Federico II"
Via Claudio, 21, 80125 Napoli, Italy; Tel: (+39) 081 7683770; Fax (+39) 081 7683946
mborzacchiello@unina.it

Biagio Ciuffo
Department of Transportation Engineering , University of Napoli "Federico II"
Via Claudio, 21, 80125 Napoli, Italy; Tel: (+39) 081 7683770; Fax (+39) 081 7683946
bciuffo@unina.it

Peter Nijkamp
Department of Spatial Economics, Vrije Universiteit
De Boelelaan 1105 1081 HV Amsterdam, The Netherlands; Tel: (+31) 20-598 6090; Fax: (+31) 20-598 6004
pnijkamp@feweb.vu.nl

Abstract
The aim of the present paper is to offer an exploratory contribution to the general debate on sustainable transport, in particular from the perspective of impact assessment of sustainable transport policy. Specifically, starting from data available from different public sources in the United States, two different types of analyses are conducted: (1) comparison of the declared short term results of the most practical policies applied (e.g. ramp metering, HOV lanes, etc.); and (2) an analysis of mobility data to interpret long term effects of policy previously and semi-unconsciously applied. In particular, the latter point has a more innovative character with respect to the former. It is based on the assumption that, specifically in the West Coast of the United States, at a local scale (e.g. states), policies that would be defined as sustainable today, have already been applied in the past.

KEY WORDS: sustainable mobility, Clean Air Act, transport policies, California

1. INTRODUCTION

In 1987, the Bruntland Commission report (WCED, 1987), shed light on the need for society to practice sustainable development. According to the report, sustainable development should meet the needs of the present without compromising the possibility of future generations to do the same. The debate on sustainable development is therefore, already more than two decades old. It has focussed in more recent years in particular on sustainability governance (e.g., Jordan, 2008), especially from a regional (local) and/or sectoral perspective. The transportation sector is one of the prominent sectors that is often addressed in this context. Under this context sustainable transport should work to guarantee the transport needs of future generations are met emphasizing equity. This includes the ability of individuals to reach the activities desired (Farrington and Farrington, 2005)

Transport is a necessary activity in a modern society, as it acts as the lubricant for consumption and production in the world. It is an input for production processes, but may also be an output (e.g. leisure activities). The rise in globalization has reinforced the international importance of

transportation. Transport is one of the world's largest industries and in many countries it accounts for up to 20 per cent of the nation's gross domestic product. As such transport has stirred up environmental debates throughout recorded history. The problems of reconciling the transport needs of modern society with the noise, fumes, and, often, ugliness of transport remain a major issue today which in some areas is seemingly becoming more intractable (Nakamura et al., 2004).

This should not necessarily be taken to imply that the environmental costs of transport are all rising. In many areas public policy has been extremely successful in reducing some problems. The introduction of catalytic converters has considerably reduced acid rain gas emissions in many countries and lead in gasoline has largely been removed in many states. Technology has allowed policies that now make commercial aircraft quieter and ships less likely to leak oil after a collision. However, fresh issues are emerging as new information becomes available and as the population's preferences change. Also, not all of the more traditional problems have entirely vanished and others have taken new forms; planes, for instance may be quieter but there are now more of them (Robert and Jonsson, 2006).

There is, however, a cost associated with this. The history of motorized transport is one of large scale environmental intrusion and in many respects is becoming even more harmful with its extensive use of fossil fuel. Transport poses many operational and logistic policy problems but the environmental implications of the motor car, trucks, aircraft and the like are some of the most challenging (Banister and Button, 1993; Button and Nijkamp, 1997; Button and Stough, 1998; Button et al., 1996). The projected trend in growth in motorized land-based traffic, aviation and shipping into the next century means that current policies will need refining to cope with the situation.

One problem is the diversity of impacts associated with modern transport (Button, 1993). It has local and immediate effects – noise nuisance and local atmospheric pollution – that have major public health implications as well as being unpleasant; regional effects – for example 'acid rain' gas emissions (such as sulphur and nitrogen oxides) and oil spills – that transcend the immediate areas where the transport is undertaken; and global effects – for example, greenhouse gas emissions such as CO_2 – that may affect global warming. Unlike a power generating station for example, there are therefore inevitably large numbers of environmental trade-offs that have to be made when designing policy.

Transport is also often demanded in close proximity to where people live, work and spend their leisure time. Indeed, it is the very access afforded by transport that permits the modern lifestyle found in the developed world (Button and Nijkamp, 1997). This again poses many more problems when contrasted with other major sources of environmental damage.

In developed countries, populations find limited incentive to use less environmentally intrusive modes of transport and policy makers are finding it difficult to obtain anything but minimum shifts from the use of the motor car and trucks. The car affords a number of private benefits over public transport. In practice, the lure of the motor car is much stronger than most transport forecasting models predict and many efforts to foster more environmentally-benign public transport use ignore the massive quality differences involved. Getting people to switch to public transport requires sticks as well as carrots (Banister et al., 2000).

Public policy with regard to tackling the conflict between narrow economic considerations and the environmental costs of transport differ between countries (Barde and Button, 1990) and have inevitably changed with time. In particular, many countries now realize that is not tenable in the longer term to construct the infrastructure needed to cater for projected car traffic into the next century and instead are seeking ways of restraining the growth (for example, UK Department of Environment and Transport, 1998).

These policy changes have not been entirely the result of a practical inability to cater for unrestrained demand but are also due to a combination of influences. First, more is known about the environment and with this knowledge has come the social demand for new policy initiatives aimed at meeting these freshly discovered challenges. The discovery of the implications of emission of nitrogen oxides (NO_x) on trees and water courses is an illustration of this. Equally, there have been important reassessments of social priorities, partly due to new scientific insights but also due to such factors as rising income, which bring forth demands of a better quality of environment for current and future generations. The ongoing concern with sustainable development is a

manifestation of these interacting forces (World Commission on Environment and Development, 1987).

At the micro level, where environmental concerns with noise, fumes and the like have more traditionally been focused, there is also the issue that while some policy have proved to be very successful, many problems still remain or have been created. For example, the adoption of the 'zero emissions cars' policy in California may introduce a small number of electric cars into the system but of itself it simply moves the location of much of the pollution from the streets to other power generation sites.

There are a number of detailed policy approaches that can, and have, been used to tackle the problems associated with transport. In broad terms these can be divided between technological, institutional and enlightening policies.

Technological policies are direct and consist of measures that make the vehicle or infrastructure more environmentally benign. They embrace, for example, improved vehicle/vessel technology (including improvements to the gasoline engine, electric and hybrid low emission vehicles and the development of alternative fuels), infrastructure structure, design and construction technology (including new techniques for building tunnels, bridges and earth embankment and cuttings) and infrastructure management (including air traffic control systems, urban traffic demand management, junction controls and intelligent transport systems). Technical solutions have been widely used and with considerable success. Some have got to the root cause of the problem (for example, the removal of lead from gasoline) while others represent end-of-pipeline treatments (such as catalytic converters and noise suppressers on aircraft engines). There is, however, potentially a limit to what technology can do. Also technology often involves tradeoffs (for example, catalytic converters reduce acid rain emission but increase fuel consumption with implications for greenhouse gas emission) and solving one problem can, therefore, lead to others. Finally, technology has to be implemented and there are a number of policy instruments that may do this.

The supply and management of transportation is too important to be left to the market, especially given that transportation is a sector where the free market doesn't necessarily bring the optimal social outcome. The challenges posed on transportation planning have continuously grown over the years due to mounting problems of congestion, new concerns with environmental degradation and global warming, enhanced awareness of safety, and increasing complexity of travel behaviour patterns associated with modern life. Policies have been set in place to account for these facts, some proposed by the federal government (e.g., Clean Air Act), while others by the state and local government (e.g., telecommuting, parking fees, and alternative transport modes). It is difficult to measure the resulting impact of each one of these policies given that they haven't been set in place independently. Policies have overlapped in time, creating a holistic effect that makes very difficult to disentangle how effective each policy has been. Even more, effects of enlightening policies, which have as an objective to make population aware of the effects of transport in the environment and the urban landscape, are equally difficult to isolate (e.g., recycling, public transport subsidies). Although, it should be added, that the tools available for implementing transportation plans have at the same time advanced as computerization and hence information systems (especially geographical information systems) have emerged (Shiftan et al., 2007).

Transportation system developments in past decades followed a non-sustainable trend, notwithstanding the application of several measures. This resulted in (i) air quality pollution caused by transportation infrastructures and services (directly by vehicle emissions and indirectly by vehicles that use energy produced elsewhere); (ii) an increased number of deaths and injuries provoked by accidents every year (Nijkamp and Black, 2002); (iii) a constant increase of the cost needed to make the transportation system work (during the last year the petroleum cost almost doubled) and (iv) the consumption of an enormous amount of individuals' available time (Goldman and Gorham, 2006). In addition, considering that transportation decisions strongly influence economic growth (Goldman and Gorham, 2006), it is easily arguable how much it affects all sustainability spheres (economical, social and environmental) (Van Geehhuizen et al., 2002). Moreover, due to the current transformations taking place in developing countries (it has been estimated that in China resource consumption will increase seven times by 2030 (Borken et al., 2008)), the horizon does not look too promising.

Regardless of the scenario, by using different approaches, Europe and North America, have made efforts to promote and study sustainable development. In fact, several projects have been funded on this topic and plenty of work exists in the literature proposing policies and actions (e.g. Nijkamp et al. (2007), Soderlund et al. (2008) and Zietsman et al. (2008) as recent works). Research has been mainly devoted to exploring three areas: (i) implementing new technologies for sustainable transport, (ii) carrying out sustainable mobility policies and (iii) promoting integrated transport and land use planning (Greene et Wegener, 1997).

In spite of the large volume of research available, very few policies have been actually implemented. Moreover, when implemented, results obtained have not been known to have a significant impact. As a consequence, the idea of "sustainable development" has a more theoretical than practical implication. This issue has claimed the attention of researchers on how to use the term "sustainability" in order not to weaken its meaning (Hatzopoulou et Miller, 2008 and Gudmundsson et Hojer, 1996). Recently, work on the information necessary to evaluate sustainable policies has started to emerge (May, 2008, Johnstone, 2008 and Jeon et al., 2008).

The aim of the present paper is to offer an exploratory contribution to the general debate on sustainable transport, in particular from the perspective of impact assessment of sustainable transport policy. Specifically, starting from data available from different public sources in the United States, two different types of analyses are conducted: (1) comparison of the declared short term results of the most practical policies applied (e.g. ramp metering, HOV lanes, etc.); and (2) an analysis of mobility data to interpret long term effects of policy previously and semi-unconsciously applied. In particular, the latter point has a more innovative character with respect to the former. It is based on the assumption that, specifically in the West Coast of the United States, at a local scale (e.g. states), policies that would be defined as sustainable today, have already been applied in the past.

2. SUSTAINABLE TRANSPORT AS A SOCIETAL CHALLENGE

For more than a decade, there has been a recognition that transport as it is offered today is non-sustainable. The twenty-first century will see a variety of new social and technological trends that will influence the way in which transport is supplied and utilized. At present a wide range of social phenomena, including rising incomes, increased leisure time, new communication technologies, an aging population, and a declining role for the traditional family, are changing the nature of the demands placed on transport. In response to new techniques of production, shipping, and the growth of markets, economic activities are also changing. The long-term sustainability of current transport systems is increasingly being questioned as rates of motor vehicle fatalities and injuries as well as congestion continue to rise. These trends raise questions about whether our current transport systems are sustainable beyond the next half-century (Black and Nijkamp, 2002).

Knowledge about the transport systems is still limited. A transport system may show rather unexpected turbulence as a result of interacting forces between dynamic behavior and limits to capacity. Unexpected behavior also happens as a result of policy-making. There is a shortage of insights into how actors in transport respond to policy measures, particularly costs measures, at the same time that there is a need to fine-tune goals, measures, and social acceptance.

For these reasons, transport cannot be properly analyzed in isolation from its context; on the contrary, the driving forces in mobility and communication are a direct result of broader social, economic, technological, and policy developments. Figure 1 demonstrates the integrative approach by including in a comprehensive way major direct and indirect influences on transport and communication from driving forces in the economic and social system and policy frameworks. The figure equally underlines the interaction of the spatial organization of society, transport infrastructure and industry, and new transport technology with transport and communication. Furthermore, it makes explicit reference to the natural environment, which is strongly influenced by land use, transport and transport infrastructure, and new technology solutions, but has only weak reverse impacts. The same is true for social cohesion (exclusion) on various geographical scales.

Driving forces such as individualization and preferences for suburban lifestyles are important in influencing the rising mobility of households and individuals. There seems to be an ongoing move

toward the mobile society away from the homebound society, although there still seems to be a difference between the rich and the poor.
However, the actual and accurate assessment of environmental impacts of the transportation sectors is still fraught with many uncertainties. The same holds also for the assessment of sustainable transport policies, at various geographical scales ranging from local to global.

3. METHODOLOGY

An exploratory study on the effects of sustainable policies is conducted for the State of California, USA, for which there are several data available and at the same time, different policies have been implemented in the past. One of the most important policies set in place which directly affects transportation is the Federal Clean Air Act Amendments of 1990 (CAAA) and the original Clean Air Act of 1977. These laws significantly affect transportation decision-making not only in terms of air quality, but also in relation to land use, travel mode choice, and reductions in vehicle miles traveled (Shrouds, 1995). Associated to these laws are policies implemented as mandatory controls such as transport control measures (TCM) which include restricting on-street parking, setting parking fees, establishing bus/car pool lanes, building and use of bike paths, mass transit, and others. In the case of California, besides the Clean Air Act, telecommuting (telework), and mass transit use are closely examined in this paper.
Data used to study the effects of such policies are retrieved from the extensive number of databases available on households' information and the transportation system in the United States. By using these datasets it is possible to monitor the changes not only in congestion but also in travel patterns over the years. Data available from the US Urban Mobility Study Website (http://mobility.tamu.edu/ums/ and http://www.epa.gov/air/data/index.html), which includes data from US National surveys (HPMS and other state and local agencies surveys) stores congestion trends from 1982 to 2005 for all major California cities, with different population levels such as: Bakersfield, Fresno, Los Angeles, Oxnard, Riverside, Sacramento, San Diego, San Francisco and San Jose.
Congestion data, from 1982 to 2005, includes: inventory measures, urban area information (population, density, peak travelers), private mode traffic volume indicators (Daily VMT and Lane Miles for freeway and arterial streets), public mode traffic volume indicators, and cost components (value of time, commercial cost and fuel cost). System performance measures included are: aggregate origin/destination trips, congestion indicators (e.g. congested time), excess fuel consumed indicators (e.g. annual total fuel consumed), delay indicators (e.g. total delay or delay per peak traveler), travel time index, and congestion cost.
It is possible to relate this data with data regarding air quality from the National Air Quality Database, in which Aerometric Information Retrieval System (AIRS) data is available from the U.S. Environmental Protection Agency (EPA), annually from 1996 to 2001, for various American cities. This paper will go even further and relate the two previous datasets with data from the National Household Travel Survey (NHTS) (http://nhts.ornl.gov/) to determine if these measures of congestion and emissions have had a significant impact on individuals travel patterns, and therefore are contributing to a more sustainable environment. The objective is to identify if there are any benefits in terms of congestion levels, polluting emissions, and other relevant indicators, and if so, can benefits be attributed to the sustainable mobility policies mentioned earlier or if they are just the result of a statistical trend.
In the following section the data sources considered will be described, and an analysis of the data will be presented and discussed.

4. Data analyses

4.1 The Urban Mobility Report

The Texas Transportation Institute (TTI) is an institution whose aim is to provide solutions and suggest policies to solve traffic congestion problems. Yearly, it publishes an Urban Mobility Report that captures the existing trends throughout the USA. It provides long-term congestion trends, congestion comparisons, and strategies to account for congestion problems.

The Urban Mobility Report 2007 (Shrank and Lomax, 2007) is based on 2005 data (the most recent year for which complete information is available). At a national level, it shows that traffic congestion continues to worsen in all American cities. This causes a $78 billion annual loss in the U.S. economy in the form of 4.2 billion lost hours and 2.9 billion gallons of wasted fuel. In addition it notes that congestion causes the average peak period traveler to spend an extra 38 hours of travel time and consume an additional 26 gallons of fuel, amounting to a cost of $710 per traveler. Moreover, the report also focuses on the problems presented by occasional events (crashes, stalled vehicles, work zones, weather problems other) that cause unreliable travel times and contribute significantly to the overall congestion problem.

Starting from data available on the TTI website attention is given to cities in California. Figure 2 (a)-d)) shows the trends of the "performance" indicators selected for each urban area in California. Each area is identified based on their size. In particular four groups of urban areas are considered, very large urban areas (vlg), large urban areas (lrg), medium size urban areas (med) and small size urban areas (sml).

The figures show that most of the urban areas in California suffer from congestion related problems. This was expected, since it is known that in California urban sprawl is particularly evident and thus the need for travel is very high. However there are two cases where trends have followed an opposite direction: San Francisco and Fresno (see Figure 2c for Fresno example). All the selected indicators show that, for these two areas, the absolute values are less than the ones corresponding to the other Californian areas and always less than the national average. The difference between these two cities is mainly related to the time period of trend inversion. In San Francisco, the situation started to improve in early 1990s and now they are still taking advantage of the interventions of that period (long term effect). In Fresno, on the contrary, the most important inversion trend seems to be related to policies applied during the last years (short term effects). In addition, in the San Francisco Area these effects seem to be more connected to the existing Public Transport System, while in Fresno they seem more related to demand reduction policies. The San Francisco Bay Area benefits from the existence of the BART system (Bay Area Rapid Transit) and its services to the community. In Fresno a similar system does not exist, therefore it is harder to pinpoint one particular cause for demand reduction. This could be related to a reduction in the number of trips, in the adoption of more environmentally friendly cars, or in the use of alternative modes like bikes or the bus.

Additional information in the Urban Mobility Report is reported regarding traffic calming policies applied in 85 American Urban Areas and their short term effects. Traffic measures considered are freeway ramp metering, freeway incident management, arterial signal coordination, arterial access management and the institution of HOV lanes. All these measures aim at maximizing the road system capacity by optimizing its performances. In Figure 3 the global impact of these policies is shown, in terms of hours gained by each traveler each year. It is worth noting that the effectiveness of these policies is as large as the size of the urban area considered. However, combining all the information it is possible to conclude that this kind of measures have a quite negligible impact on the congestion reduction if they are not coupled with other policies which have a bigger impact on the transportation demand or supply systems.9

4.2 The National Air Quality Database

The U.S. Environmental Protection Agency (EPA) is the American Agency devoted to monitoring the quality of the environment throughout the Nation. Regarding air quality, EPA has filtered guidelines provided by the Clean Air Act (http://epa.gov/air/caa/) setting standard limits and a uniform control procedure in the whole country. As a result, the National Air Quality Database, has been systematically updated annually by EPA, from 1996 until today, for various American cities. In particular, the database used in this study is the one derived from the Air Quality Report of 2003, available from: http://www.epa.gov/oar/aqtrnd03. Such report exploits concentration measures of polluting factors in correspondence to monitoring stations located throughout the US, using the same criteria and instruments. From the two pollution classes (criteria and hazardous pollutant) recognized by EPA, this paper focuses only on values of ordinary pollutants (i.e. CO, NH_3, NO_x, PM_x etc.).

According to EPA reports, throughout the US the quantities of emission levels of the six principal polluting factors have been decreasing since 1970 (in 48%), of course with differences among the various pollutants. This is in spite of increases in gross product and traffic congestion. One of the most common indicators used to assess air quality and its consequences on people is the Air Quality Index (AQI) classified in correspondence with different classes of pollutants. In particular the acceptance threshold of the AQI is 100, where lower values indicate good air quality. In the State of California, the number of days in which such index has been more than 100, has been decreasing in more than 50% from 1992 to 2001. Despite the overall good trend of the state, there is still an unhealthy factor that is the $PM_{2.5}$, generated mostly due to power plants and vehicle emissions.
In Figure 4 emission values related to the road transport sector are shown for three pollutants in the Californian Metropolitan Statistical Areas (MSA). It is worth noticing that data of total emissions due to the transportation sector are available at a county and not at an MSA level. For this reason where necessary, MSA statistics have been retrieved by aggregating county data. This was necessary for Riverside-San Bernardino (composed by the respective counties) and for San Francisco (composed by the counties of San Francisco, Alameda, Contra Costa, Marin, Napa, Santa Clara, Santa Cruz, San Mateo, Solano and Soloma). Trends for all the pollutants show a decrease on the global emission values confirming that even the transport sector at a local level positively follows the overall national trend. Looking at the figures in more detail it is noteworthy that the global emission values obviously depend on the size of the urban area. In addition, the similarity of the trends in all the cities show that the general reduction of pollutant emissions is more connected to a wider tendency (more general technological development that produce for example cleaner engines) than to the application of local measures that, on the contrary as stated previously, seem to have a fairly negligible impact on the sector evolution.

4.3 National Personal Travel Survey (NPTS) and National Household Travel Survey (NHTS)

The two data sets, the 1990 National Personal Travel Survey (NPTS) and the 2001 National Household Travel Survey (NHTS), are a comprehensive collection of personal travel data including information about households, individuals, vehicles, and trips conducted during a 24 hour period. It was collected by the U.S. Department of Transportation as part of an effort which started in 1969 and continued in 1977, 1983, 1990, 1995, and 2001. The years 1990 and 2001 are chosen given that they are the only ones (also 1995), which include a geographic identifier necessary to do a selection by state. This is a requirement given the focus of this analysis is on the State of California. For details on how the data was collected the reader is referred to the user's guide of the 1990 NPTS (U.S. 1990) and the 2001 NHTS (U.S. 2004).
The objective is to compare the data from the two decades in regards to their mobility characteristics. The similarity or difference between these characteristics will support or reject the hypothesis proposed that many of the measures that have been either implemented or suggested to promote a sustainable environment in California, have implicitly or unconsciously had an effect on the way people travel. Particular measures of mobility include among others the number of vehicles in the household, stage in the life cycle, number of alternative modes of transport besides the car, age of the vehicle, vehicle type, occupancy per vehicle, work from home, transport mode, number of trips made by the household, miles driven, and the length of the trips.
To set the context for the empirical analysis of the State of California it is important to present some of the national trends in regards to some of the mobility characteristics listed above. The statistics have been compiled from multiple sources and reports, which have analyzed in detail the same data sets (i.e. NPTS and NHTS) at the national level (Collia et al., 2003; COMSIS, 1994; Hu and Reuscher, 2004; Polzin, 2006; U.S., 1990, 2004). The left side of Table 1 presents a summary in terms of mode (Pucher and Renne 2003) and vehicle ownership (Hu and Reuscher 2004) for the United States. The dramatic increase in walking is attributed by various researchers to the difference in survey methodology in 2001 where questions were designed to account for walking trips that were ignored in previous surveys (Collia et al., 2003; McGuckin and Liss, 2005; Pucher and Renne, 2003, 2005). Regardless of this difference it is still important to point out that the Pacific region which California is a part off, has the highest percentage in walking (10.6%) and biking (1.1%) in the United States (Pucher and Renne 2003). Hu and Reuscher (2004) present a summary of some important mobility characteristics for the two years which are summarized in the

right side of Table 1. The numbers in this table show that there is an increase in each between years, except for transit use which under a sustainable context would be expected to increase. This does not portray a promising horizon in terms of sustainability at the national level. However, it is important to highlight that different regions in the country have different practices at the state level and can be promoting better results that are not evident when the country is examined as a whole. To examine if this is the case, the State of California is selected. It is well known that California has suffered pollution problems and has had to work harder in protecting their environment when compared to other regions in the United States. Also in terms of transportation, California has been a testing site for multiple projects and a leader in sustainable transport measures (Hughes 2004). The next section looks in detail at some of these mobility characteristics for the State of California.

4.3.1 Mobility Indicators for the State of California

Using the 1990 NPTS and the 2001 NHTS surveys the records that correspond to the State of California are extracted. The results presented are based on the analysis of these sub samples. The results are discussed based on the households, the vehicles, and the trips.

4.3.1.1 Households

California's population has increased in 13% in the last decade from 29,760,021 to 33,871,648 (source US Census Bureau). When looking at the household indicators in the sample presented in Table 2 it can be seen that the number of drivers has increased, household size has decreased, there is an increase in the number of households with children between 16 and 21, there is also an increase in the number of retired households, and vehicle ownership has substantially increased. There are on average 1.56 drivers per household for 1990 and 1.81 for 2001. In general, these indicators reflect the age increase in the population and the presence of the baby boomers, except for the number of vehicles. It is surprising to see this increase, in particular in owning 4 or more vehicles. However, it is California and given its primary industries (e.g. Cinema, wine, software development) it is clear that per capita income is very high resulting in a high purchasing power (per capita income for 1990 was $21,882 and for 2000 was $32,149, source www.hcd.ca.gov). It is important to point out in this table that the NHTS survey for 2001 considered important to record the number of bikes per household. It is not possible to make a comparison with 1990 because this data was not collected as part of that year's survey. However, it provides and indication of potential changes in transport mode. Based on these indicators it would be expected that more trips be made by households, therefore contributing to the negative effects of increased auto dependency and mobility.

4.3.1.2 Vehicles

It is assumed that older vehicles will produce more emission therefore having a more severe effect on creating a less sustainable environment. Table 3 shows the age of the vehicles and their type. It can be seen that in general Californians drive newer vehicles. For 1990 almost 50% of the vehicles are less than five years old, while for the year 2001 is around 45%. Considering the invention of catalytic converters in 1975 and their effects in contributing to a cleaner environment, the table shows a larger percent of vehicles without for 1990 (11.14%) than for 2001 (5.12%). In terms of vehicle type the survey for 2001 shows the emergence of sport utility vehicles (SUV). If automobiles are grouped with SUVs the changes in vehicle types are not substantial. The vehicle fleet has remained the same. However, SUVs are less fuel-efficient burning more gas for the same mileage than smaller vehicles.

In the sample the vehicle occupancy for 1990 is 1.6 persons per vehicle, while in 2001 is 1.7. This is a slight improvement that follows the national average. The number of vehicles per household is 1.97 for 1990 and 2.04 for 2001, which is a reflection of what was discussed on Table 2.

4.3.1.3 Trips

Regarding mode choice, Table 4 on the left presents the different alternatives used by Californians in the years 1990 and 2001. As in the case of the vehicles, SUVs appear as a new mode, as do water based modes. There is a big increase in the use of passenger vans and on walking. The other modes either decrease or are very similar to the uses of 1990. As explained earlier the changes in walking

to some extent are attributed to changes in the survey design. However, it is still possible that part of this increase can be attributed to other reasons, such as people's desire to stay healthy, change transport modes, or not drive. The passenger van increase is an encouraging surprise. This means that multiple people are traveling only in one vehicle potentially reducing the number of vehicles on the road. Transit, which is an alternative in tune with environmental sustainability, in 2001 still maintains the same lower levels of use than in 1990. It is important to notice the percentage increase in the number of trips between 1990 and 2001. This is a very substantial increase especially when the number of vehicles and households did not increase at that same level (refer to tables 2 and 3). However, the table shows that these trips are not the result of privately owned automobile trips, which is a plus when considering a sustainable environment.

Just looking at the trips by mode is not enough to get a complete picture of what the scenario is in terms of sustainability. It is also important to look at the length of the trips. Table 4 on the right, shows the average trip length by mode for the two years. When looking at privately owned vehicles the average trip length in miles and in minutes are very similar, even when the SUV category is grouped with autos. When using transit, individual's trips increase in length, but more importantly in time. This means that people taking the bus, subway, commuter train, or trolley spend much more time on their trips than individuals using any other mode. This might deter the use of these modes and make people to switch to more efficient modes in terms of travel time. Obviously this is a situation that needs to be avoided. However, it is possible that individuals that have no other choice and are forced to use transit are making these trips. Other modes that are not consider often like biking and walking have decreased in the average length of the trip but increased in time. Therefore people are spending more time reaching closer destinations. This can be due to a matter of safety, where individuals cannot walk or bike at fast speed due to traffic or other obstacles they might find in their way.

The number of trips per household increases on average almost 50% for 2001 (1990: 6.56; 2001: 9.78). However, it is important to note that the number of miles driven in the last 12 months is reduced in 5%. As shown by the modes, it seems people are looking for alternatives to not drive alone. However, it is still not obvious that this is creating a big change overall. When looking at the distribution of the miles driven in the last 12 months, it is evident that the majority of individuals who owned a vehicle drove less than 24,000 miles. The length of the trip in miles when all modes are considered is reduced in 9% from 1990 to 2001, while in terms of time it increases 16%. This supports the results presented in Table 4.

Even though an analysis of the commute trip was not conducted here, it is important to note that for 2001 individuals were asked if they worked from home. This can be considered a form of telecommuting and 5% said they did.

5. CONCLUSIONS

After analyzing the data there is not enough evidence to say without doubt that people unconsciously have adopted a more sustainable approach to transportation in the decade between 1990 and 2001. There have been some slight changes that might suggest that in the decade that is coming to an end results will be more obvious. However, it is also not possible to say that the opposite has occurred. Transportation has not taken a negative turn where it is not possible to return from. The situation in 2001 is very similar to that of 1990. The increases can be attributed to changes in population and age, which is happening at the national level as well. Sustainable mobility policies are not as strong as needed to accelerate this process and as shown in the paper, it is not possible to directly derive their influence on the system. For this reason it would be advisable to have more specific measures aimed at achieving precise quantifiable objectives, whose effects could be systematically monitored both in the short and in the long term.

In this light, several efforts are being made in order to set up and organize suitable methodologies and information systems both in the American and European context (Bejleri et al. 2006 and Ballis 2006). Hence, there is still hope that in the near future a more sustainable environment can be achieved, especially given the new laws (Hughes 2004) and governmental efforts to promote change.

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Table 1: Household and mobility characteristics at the national level

	Mode of Transport*					Vehicle Ownership								
	A	**T**	**W**	**B**	**O**	**0**	**1**	**2**	**3 >**	**Vehicles per HH**	**Avg. trips per HH**	**Avg. person trip length (miles)**	**Percent that use transit**	**Vehicle occupancy**
1990	87.1	2	7.2	0.7	3	9.2	32.8	38.4	19.6	1.77	7.32	9.45	1.80%	1.51
2001	86.4	1.6	8.6	0.9	2.5	8.1	31.4	37.2	23.2	1.89	9.66	10.04	1.56%	1.63

- A: auto, T: transit, W: walking, B: bike, O: other

Source: Pucher and Renne, 2003; Hu and Reuscher, 2004.

Table 2: Household indicators

	1990	2001	Percentage Change
Number of drivers in HH			
0	8.44	3.68	-56.398
1	40.75	29.77	-26.945
2	39.86	52.85	32.589
3	8.39	9.99	19.070
4	2.06	3.14	52.427
5	0.44	0.35	-20.455
6	0.05	0.23	360.000
Average per HH	1.56	1.81	16.02
HH Size			
1	18.07	20.94	15.883
2	31.96	36.35	13.736
3	19.39	16.34	-15.730
4	16.49	15.18	-7.944
5	7.90	7.12	-9.873
6 or more	6.18	4.07	-34.142
Average per HH	2.86	2.65	-7.34
HH vehicles			
0	5.74	5.34	-6.969
1	29.01	28.34	-2.310
2	39.72	39.14	-1.460
3	17.53	16.72	-4.621
4	4.86	6.81	40.123
5 or more	3.15	3.64	15.556
Life Cycle			
Single adult, no children	12.86	12.81	-0.389
Two or more adults, no children	28.82	23.42	-18.737
Single adult, youngest child age 0-5	1.62	1.08	-33.333
Two or more adults, youngest child age 0-5	17.38	15.41	-11.335
Single adult, youngest child age 6-15	2.45	2.67	8.980
Two or more adults, youngest child age 6-15	14.09	14.91	5.820
Single adult, youngest child age 16-21	0.98	1.05	7.143
Two or more adults, youngest child age 16-21	5.50	4.49	-18.364
Single adult, retired, no children	5.65	7.98	41.239
Two or more adults, retired, no children	10.06	16.18	60.835
Not Ascertained	0.59		
Number of Bikes in HH			
0		50.91	
1		20.09	
2		18.47	
3		6.16	
4		3.06	
5		0.74	
6 or more		0.5	
Total HH	2037	2583	26.804

Table 3: Vehicle indicators

	1990	2001	Percentage Change
Vehicle Year			
1919-1959	0.84		
1960-1964	1.29	3.31	156.59
1965-1969	3.63		
1970-1974	5.38	1.81	-66.36
1975-1979	13.09	2.66	-79.68
1980-1984	21.7	4.83	-77.74
1985-1989	41.91	14.05	-66.48
1990-1994	7.03	22.48	219.77
1995-1999		31.07	
2000-2002		16.11	
Various reasons no answer	5.02		
Vehicle Type			
Automobile (including station wagon)	73.09	57.85	-20.85
Passenger Van	4.82	8.25*	71.16
Cargo Van	0.47		
SUV		12.63	
Pickup Truck	18.04	16.79	-6.93
Other truck	0.35	0.38	8.57
RV or motor home	1.17	1.21	3.42
Motorcycle	1.54	2.57	66.88
Moped (motorized bicycle)	0.22		
Other	0.20	0.3	50.00
Various reasons no answer	0.1		
Total Vehicles	4025	5288	31.38

*: includes cargo

Table 4: Mode choice

	1990	2001	Percentage Change
Mode			
Auto (including station wagon)	69.14	50.11	-27.524
Passenger van	5.7	11.33	98.772
SUV		13.53	
Cargo Van	0.16		
Pickup Truck	11.39	10.15	-10.887
Other truck	0.72	0.41	-43.056
RV or motor home	0.14	0.01	-92.857
Motorcycle	0.5	0.20	-60.000
Moped (motorized bicycle)	0.13		
Other privately owned vehicle	0		
Bus	1.47	1.42	-3.401
Amtrak	0	0.02	
Commuter train	0.10	0.07	-30.000
Streetcar / Trolley	0.06	0.07	16.667
Elevated rail/ subway	0.15	0.12	-20.000
Ship/ cruise		0	
Passenger line/ ferry		0.01	
Sailboat/ motorboat/ yacht		0.01	
Airplane	0.13	0.13	0.000
Taxi	0.15	0.14	-6.667
Limousine		0.01	
Hotel/ airport shuttle		0.04	
Bicycle	1.20	1.04	-13.333
Walk	7.59	10.13	33.465
School bus	1.02	0.72	-29.412
Other	0.19		
Total Trips	13380	25267	88.842

	Average Trip Length by Mode		
Mode	**1990**	**2001**	**% Change**
Auto	11.28*	10.15	-10.018
	17.41+	19.57	12.407
SUV		10.75	
		19.42	
Transit	8.99	10.76	19.689
	31.44	53.77	71.024
Walk	1.6	0.74	-53.750
	11.04	17.704	60.362
Bike	2.53	2.26	-10.672
	11.38	23.40	105.624

*: in miles

+: in minutes

Figure 1: An integrative view of transport

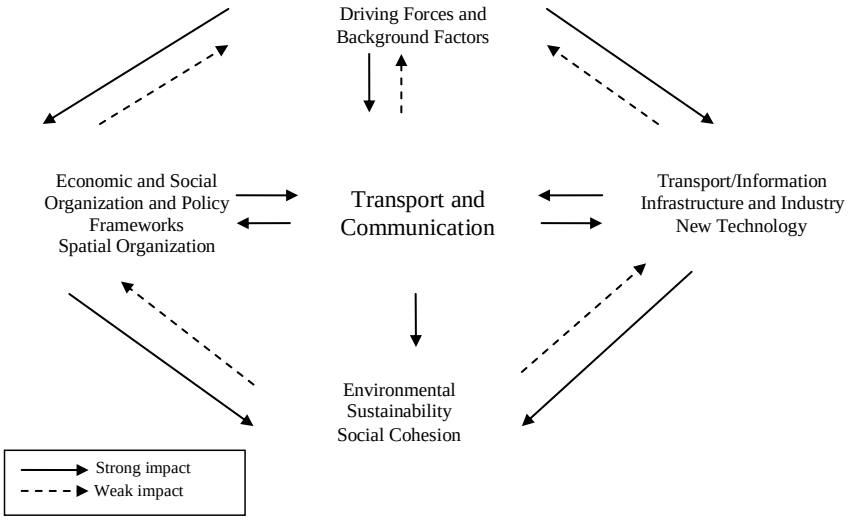


Figure 2: Summary of urban mobility indicators; a: travelers during peak period, b: vehicle miles traveled, c: vehicle miles traveled for medium size urban areas, d: passenger miles traveled

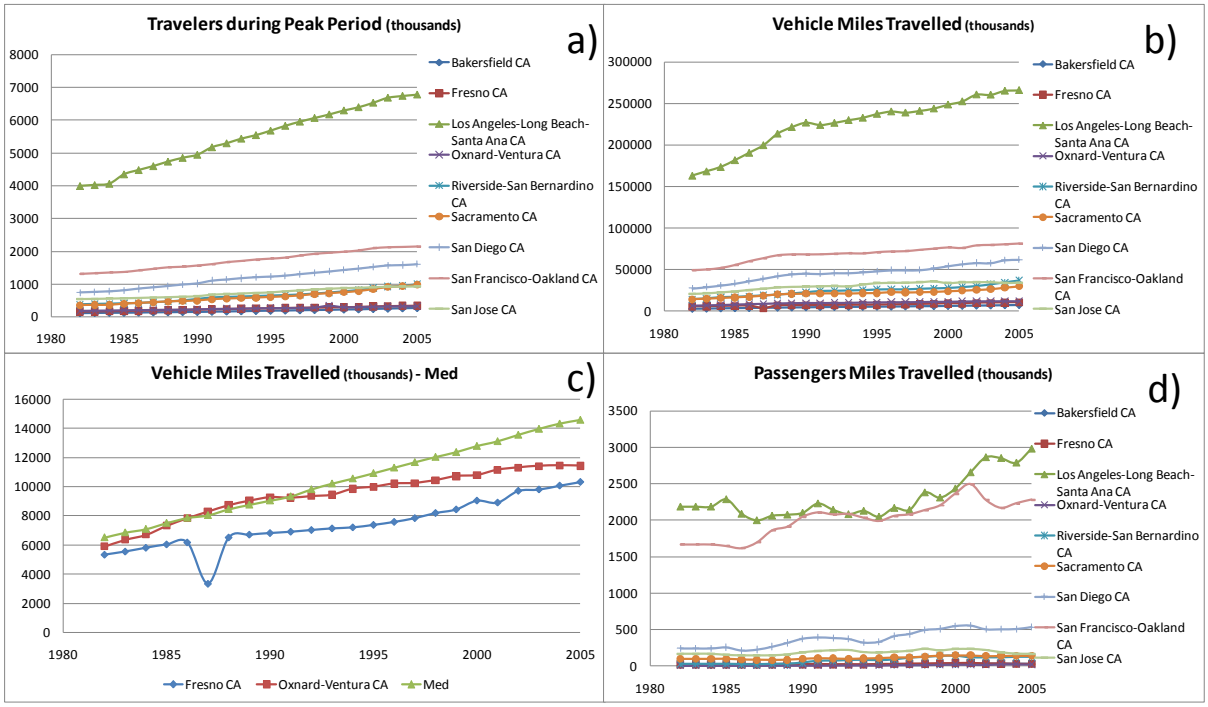


Figure 3: **California urban areas annual delay saved per peak traveler**

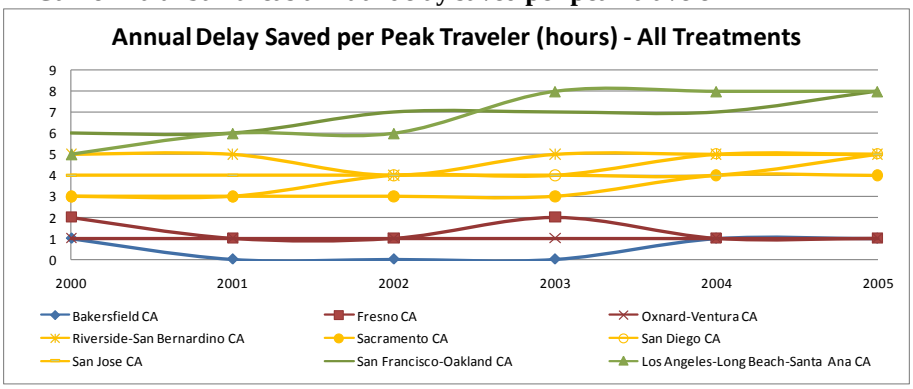
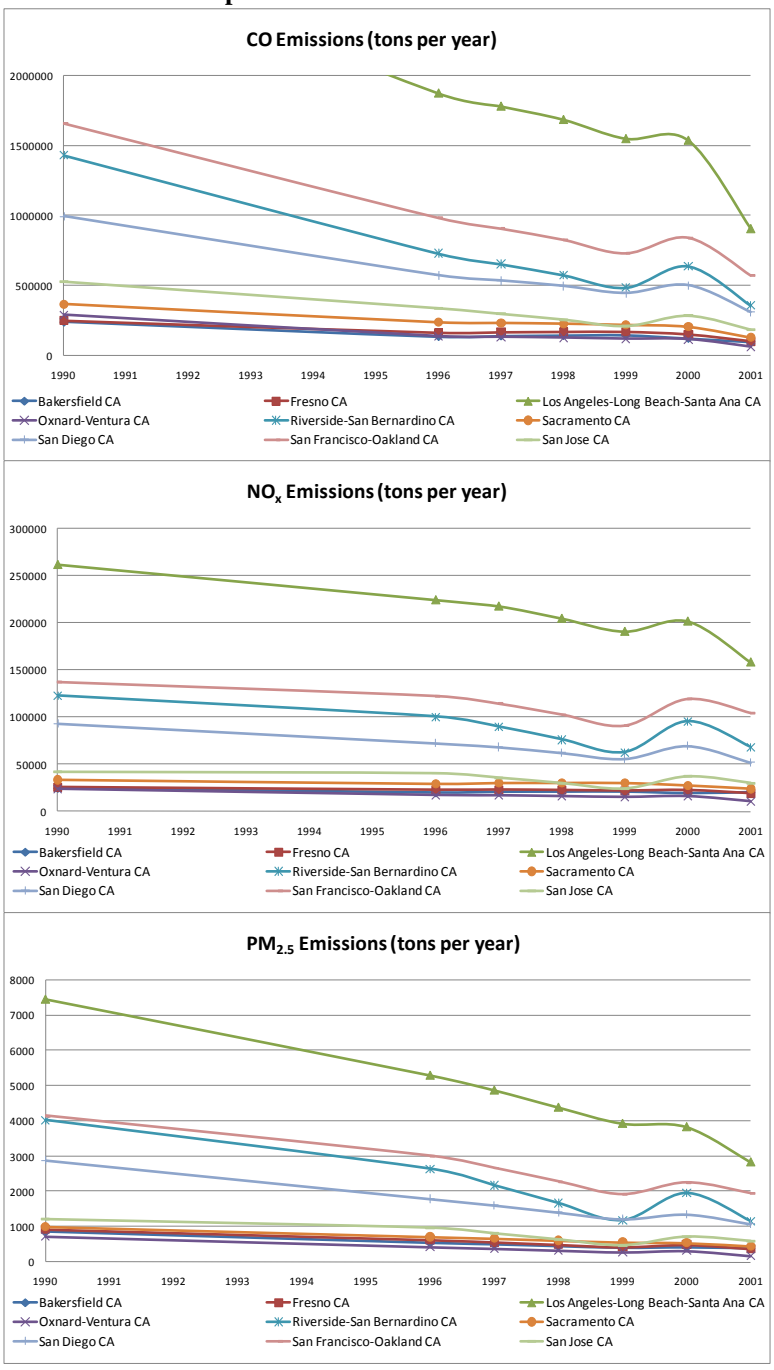


Figure 4: **California urban areas air pollutants trends**



AN URBAN ECONOMIC MODEL OF ILEGAL SETTLEMENTS IN FLOOD PRONE AREAS IN PALANGKARAYA CITY, INDONESIA -A PARTIAL EQUILIBRIUM ANALYSIS-

Indrawan PERMANA
Graduate School of Environmental and Life Science Engineering Toyohashi University of Technology
1-1 Hibarigaoka, Tempaku-Cho, Toyohashi, Aichi, 441-8580, Japan
TEL/ +81-532-44-6955 FAX/+81-532-44-6947
E-mail: permana@hse.tut.ac.jp or indrakamis@yahoo.com

and

Yuzuru MIYATA
Graduate School of Architecture and Civil Engineering Toyohashi University of Technology
1-1 Hibarigaoka, Tempaku-Cho Toyohashi, Aichi, 441-8580, Japan
TEL/ +81-532-44-6955 FAX/+81-532-44-6947
E-mail: miyata@hse.tut.ac.jp

Abstract
This paper presents a theoretical study regarding occupations of flood prone areas by illegal settlements in urban area of Palangkaraya city, Central Kalimantan province, Indonesia. Such unusual urban land use pattern has been observed in many urbanized cities particularly in developing countries. However, scientific explanations about the urban phenomena were not formulated yet as well as literatures on that topic are quite rare. We developed a partial equilibrium model employing bid rent approach to analyze such unusual urban land use pattern. The model incorporated flood damage rate corresponding to household`s assets introducing variants of bid rent function and bid max lot size function. Differently from other traditional urban economics models, our model depicts a reverse conclusion of land allocation particularly in flood prone areas. In the flood prone areas, the bid rent of representative low income households gets higher than that by the representative high income households hence as a result the flood prone areas are settled by low income households emerging colonies of illegal settlements within city areas.

Keywords: urban economics, partial equilibrium model, bid rent approach, illegal settlement, flood prone areas, Palangkaraya city, Indonesia

1. Introduction

Rapid urbanization and inadequate capability to cope with housing needs of people in urban areas often resulted to the rise of illegal settlements in urban areas. As identified in Palangkaraya city in Central Kalimantan Province, Indonesia, such the settlements have existed in flood prone areas alongside river banks. Flood prone area actually holds ecological, biological, and hydrological functions hence need to be preserved as open spaces rather than dwelled for residential use.

Basically according to environment laws and local government ordinances[1], any residential uses in flood prone areas are prohibited. However, in fact, in some flood prone areas within Palangkaraya city, the illegal settlements are mushrooming particularly in locations like *Danau Seha* neighborhood, *Flamboyan* neighborhood, and *Mendawai* neighborhood. Here, term of "illegal settlement" is referring to settlement in which housing units have been constructed outside the framework of formal law. This category also includes units built on land for which the property rights are not clear and/or are not sanctioned by law, and housing units built without a building permit, Kapoor & Blanc [3] (2008).

There are two relevant land-use theories which can be employed to analyze urban land configuration according to Walker [7] (2004). One is spatially explicit model and another is bid rent. The bid rent function approach was firstly used by von Thünen [6] (1826) in his agriculture land use model which was a cornerstone of land use theory. And later on by Alonso [1] (1964), it was extended into urban context. Alonso`s approach basically has the same essence with indirect utility function approach which has been introduced into urban land use model by Solow [5] (1973). Furthermore, Fujita [2] (1989) introduced the concept of bid rent that mimics a von Thunen`s model. He showed that by employing the bid rent function approach, urban economics models can be developed more rigorously than previous models one, hence providing deep explanations about urban land use. However, Fujita`s model did not take into account heterogeneity in land quality hence slightly lack of basis in analyzing cities with heterogeneity in land quality such as Palangkaraya city in where flood prone areas and normal land exist. Our study employed bid rent approach but differing from Fujita`s model we considered heterogeneity in land quality and damage risk by flood occurrences to household`s assets.

Palangkaraya city is not the only one city in Indonesia facing irregularity in its urban land use. Most of urbanized cities in Indonesia are encountering the same problem nowadays. Therefore, many the city authorities are seeking measurable and systematic policies to cope with the uncontrolled occupations in flood prone areas, Soegijoko,et al [4] (2005). This paper presents an urban economic model aimed at systematic explanations about such urban land use change in Palangkaraya city, Indonesia and suggests policies to preserve the flood prone areas as open spaces.

2. The Model

The model under the study is based on the following assumptions:

(1) The study area is assumed to be a monocentric city. All production activities are in the CBD.
(2) There are two types of households in the city. They are high income households and low income households. The households consume goods and land. The commodity is assumed to be the numeraire.
(3) The city is closed for the high income group but open for the low income group. Thus the number of high income households is fixed while that of low income households is internally determined depending upon the supreme utility level.
(4) Incomes of the two types of households are exogenously given. Incomes of households in the two groups are different but equal in the same group.
(5) There are two types of land in the city. Normal land is a type of land which has no flood risk, while flood prone areas are facing the flood risk. The shape of the city is graphically illustrated as follows:

[1] Law status for flood prone areas alongside rivers is basically stated in the local ordinance of Palangkaraya Municipality (PERDA No.16/1982). It is by law restricted for residential use. The PERDA itself is a derivative of national acts on environment laws such as UU No.11/1974,UU No.23/1997, PERMEN No.64/1993, etc.

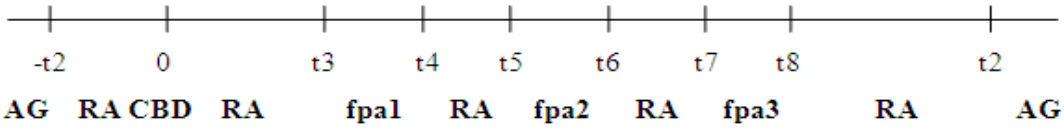


Figure 1. Linear Shape of the City

where
CBD: central business district
fpa: flood prone area
RA : residential area
AG : agriculture land

2.1 Bid Rent Function in the Normal Land

The normal land has good quality and no flood risk, thus the utility function in a household with high income in the normal land is assumed to be Cobb-Douglas type as follows :

$$u_1(z_1(t), s_1(t)) = z_1(t)^{\alpha_1} s_1(t)^{\beta_1} \tag{1}$$

$$(\alpha_1 + \beta_1 = 1)\ t \in [t_3, t_4] \cup [t_5, t_6] \cup [t_7, t_8]$$

where
u_1: utility function in a high income household at location t
$z_1(t)$: consumption by a high income household of goods at location t
$s_1(t)$: land consumption by a high income household at location t
α and β : elasticity parameters

The bid rent function in a high income household is specified as follows:

$$r_1(t) = max \frac{y_1 - z_1 - kt}{s_1(t)} \tag{2}$$

$$subject\ to\ u_1(t) = u_1^*$$

where
$r_1(t)$: bid rent by a high income household at t y_1: income of a high income household (exogenous variable)
z_1: consumption of goods
k: transportation cost in unit distance
$s_1(t)$: lot size of a high income household at t
u_1^* : equilibrium utility level

To solve the maximization problem (2), we consider the following expenditure function as follows:

$$E_1(t) = \min_{z_1, q_1} z_1(t) + r_1(t) s_1(t) \tag{3}$$

$$subject\ \ to\ \ u_1^* = z_1^{\alpha_1}(t) s_1^{\beta_1}(t)$$

Solving this minimization problem, the compensated demands for goods and land are obtained. Those are substituted into equation (3) yielding;

$$E_1 = \left(\frac{1}{\alpha_1}\right)\left(\frac{\alpha_1}{\beta_1}\right)^{\beta_1} r_1^{\beta_1} u_1^* \tag{4}$$

Since $E_1 = y_1 - kt$, equation (5) rewritten as follows:

$$y_1 - kt = \left(\frac{1}{\alpha_1}\right)\left(\frac{\alpha_1}{\beta_1}\right)^{\beta_1} r_1^{\beta_1} u_1^* \tag{5}$$

Rearranging equation (5), we obtain the bid rent function in a representative high income household as follows:

$$r_1 = \beta_1 \alpha_1^{\frac{\alpha_1}{\beta_1}} \left(\frac{y_1 - kt}{u_1^*}\right)^{\frac{1}{\beta_1}} \tag{6}$$

Then we obtain the demand for goods and the bid max lot size which are as follows:

$$z_1 = \alpha_1 (y_1 - kt) \tag{7}$$

$$s_1 = \left(\frac{1}{\alpha_1 (y_1 - kt)}\right)^{\frac{\alpha_1}{\beta_1}} u_1^{*\frac{1}{\beta_1}} \tag{8}$$

Similarly we obtain the bid rent function, commodity demand and bid max lot size in a low income household.

$$r_2 = \beta_2 \alpha_2^{\frac{\alpha_2}{\beta_2}} \left(\frac{y_2 - kt}{u_2^*}\right)^{\frac{1}{\beta_2}} \tag{9}$$

$$z_2 = \alpha_2 (y_2 - kt) \tag{10}$$

$$s_2 = \left(\frac{1}{\alpha_2 (y_2 - kt)}\right)^{\frac{\alpha_2}{\beta_2}} u_2^{*\frac{1}{\beta_2}} \tag{11}$$

Since $y_1 > y_2$ by assumption, the model suggests that the bid rent by a high income household will be greater more than that by a low income household under appropriate elasticity parameters. It implies that the normal land would be occupied by high income households rather than by low income households.

2.2 Bid Rent Function in the Flood Prone Areas

In the city located on a river basin, where during rainy season run-off often inundated some illegally occupied areas alongside river bank, flood is a real threat to household assets. To analyze such flood prone areas, we introduce an asset function. The amount and value of the assets of each household may depend on income. High income households have more assets than low income households in general. The asset possibly has value twofold or more from income depending on the kind of the assets. Therefore the asset function can be considered as an increasing function of

income. The risk of getting loss of assets of high income households during destructive flood events is higher than that of the low income households who have only small amount of assets. The asset function is specified as follows:

$$A(y) \equiv y^{\gamma} \quad (\gamma > 1) \tag{12}$$

where
y: household income
γ: elasticity parameter

In the flood prone areas where periodic floods exist, the expected damage on the asset can be expressed as follows:

$$\int_0^{\infty} P(Q)d(Q)A(y)dQ = cy^{\gamma} \tag{13}$$

where
c=0 if a household lives in the normal land and c>1 if a household lives in flood prone areas, $P(Q)$: probability of occurrence of volume of flood flow Q
$d(Q)$: correspondence of damage rate
The utility function in the both types of households in the flood prone areas is assumed to take the following formula.

$$u(z, s, cy^{\gamma}) = \frac{1}{1+cy^{\gamma}} z^{\alpha} s^{\beta} \tag{14}$$

$$\alpha + \beta = 1$$

The bid rent function in a high income household in the flood prone areas is derived from the following maximization problem.

$$r_1(t) = \max_{z_1, s_1} \frac{y_1 - kt - z_1}{s_1} \tag{15}$$

$$\textit{subject to } u_1(t) = u_1^*$$

Following the calculation procedure in the case of the normal land, the bid rent function, consumption demand and the bid max lot size in a high income household are obtained as follows:

$$r_1 = \beta_1 \alpha_1^{\frac{\alpha_1}{\beta_1}} \left(\frac{y_1 - kt}{\left(1 + cy_1^{\gamma}\right) u_1^*} \right)^{\frac{1}{\beta_1}} \tag{16}$$

$$z_1 = \alpha_1 (y_1 - kt) \tag{17}$$

$$s_1 = \left(\frac{1}{\alpha_1 (y_1 - kt)} \right)^{\frac{\alpha_1}{\beta_1}} \left(1 + cy_1^{\gamma}\right)^{\frac{1}{\beta_1}} u_1^{*\frac{1}{\beta_1}} \tag{18}$$

Conducting partial differentiation with respect to y_1 and u_1^*, we get the following inequalities as follows:

$$\frac{\partial r_1}{\partial y_1} < 0 \text{ and } \quad \frac{\partial r_1}{\partial u_1^*} < 0 \qquad t \in [t_3, t_4] \cup [t_5, t_6] \cup [t_7, t_8] \tag{19}$$

$$\frac{\partial r_1}{\partial y_1} > 0 \qquad t \notin [t_3, t_4] \cup [t_5, t_6] \cup [t_7, t_8] \tag{20}$$

Similarly the bid rent function, consumption demand and the bid max lot size in a low income household calculated as follows:

$$r_2 = \beta_2 \alpha_2^{\frac{\alpha_2}{\beta_2}} \left(\frac{y_2 - kt}{(1 + c y_2^{\gamma}) u_2^*} \right)^{\frac{1}{\beta_2}} \tag{21}$$

$$z_2 = \alpha_2 (y_2 - kt) \tag{22}$$

$$s_2 = \left(\frac{1}{\alpha_2 (y_2 - kt)} \right)^{\frac{\alpha_2}{\beta_2}} (1 + c y_2^{\gamma})^{\frac{1}{\beta_2}} u_2^{*\frac{1}{\beta_2}} \tag{23}$$

2.3 City Boundary

The city boundary is determined by the intersection between the slope of the bid rent and constant line of agricultural land rent. This is expressed by equation (24) assuming the fringe areas are populated by high income households.

$$r_1(-t_1) = rA \tag{24}$$

Thus the following equation is obtained as follows:

$$\beta_1 \alpha_1^{\frac{\alpha_1}{\beta_1}} \left(\frac{y_1 - kt}{u_1^*} \right)^{\frac{1}{\beta_1}} = rA \tag{25}$$

Solving t in equation (25), we can determine the city boundaries in the left and right hand sides in the city as follows:

$$t_1 = \frac{1}{k} \left\{ y_1 - \left(\frac{rA}{\beta_1 \alpha_1^{\frac{\alpha_1}{\beta_1}}} \right)^{\beta_1} u_1^* \right\} \tag{26}$$

$$t_2 = \frac{1}{k} \left\{ y_1 - \left(\frac{rA}{\beta_1 \alpha_1^{\frac{\alpha_1}{\beta_1}}} \right)^{\beta_1} u_1^* \right\} \tag{27}$$

2.4 The Number of Population

The number of high income households in the normal land is calculated as follows:

$$N_1 = \frac{2}{k}\alpha_1^{\frac{\alpha_1}{\beta_1}}\beta_1 y_1^{\frac{1}{\beta_1}}u_1^{*-\frac{1}{\beta_1}} - \frac{1}{k}\alpha_1^{\frac{\alpha_1}{\beta_1}}\beta_1(y_1-kt_3)^{\frac{1}{\beta_1}}u_1^{*-\frac{1}{\beta_1}} + \frac{1}{k}\alpha_1^{\frac{\alpha_1}{\beta_1}}\beta_1(y_1-kt_4)^{\frac{1}{\beta_1}}u_1^{*-\frac{1}{\beta_1}} - \frac{1}{k}\alpha_1^{\frac{\alpha_1}{\beta_1}}\beta_1(y_1-kt_5)^{\frac{1}{\beta_1}}u_1^{*-\frac{1}{\beta_1}} + \frac{1}{k}\alpha_1^{\frac{\alpha_1}{\beta_1}}\beta_1(y_1-kt_6)^{\frac{1}{\beta_1}}u_1^{*-\frac{1}{\beta_1}} - \frac{1}{k}\alpha_1^{\frac{\alpha_1}{\beta_1}}\beta_1(y_1-kt_7)^{\frac{1}{\beta_1}}u_1^{*-\frac{1}{\beta_1}} + \frac{1}{k}\alpha_1^{\frac{\alpha_1}{\beta_1}}\beta_1(y_1-kt_8)^{\frac{1}{\beta_1}}u_1^{*-\frac{1}{\beta_1}} - \frac{2rA}{k} \quad (28)$$

The equilibrium utility level in a high income household is derived as follows:

$$u_1^* = \left\{\frac{2}{k}\alpha_1^{\frac{\alpha_1}{\beta_1}}\beta_1 y_1^{\frac{1}{\beta_1}} - \frac{1}{k}\alpha_1^{\frac{\alpha_1}{\beta_1}}\beta_1(y_1-kt_3)^{\frac{1}{\beta_1}} + \frac{1}{k}\alpha_1^{\frac{\alpha_1}{\beta_1}}\beta_1(y_1-kt_4)^{\frac{1}{\beta_1}} - \frac{1}{k}\alpha_1^{\frac{\alpha_1}{\beta_1}}\beta_1(y_1-kt_5)^{\frac{1}{\beta_1}} + \frac{1}{k}\alpha_1^{\frac{\alpha_1}{\beta_1}}\beta_1(y_1-kt_6)^{\frac{1}{\beta_1}} - \frac{1}{k}\alpha_1^{\frac{\alpha_1}{\beta_1}}\beta_1(y_1-kt_7)^{\frac{1}{\beta_1}} + \frac{1}{k}\alpha_1^{\frac{\alpha_1}{\beta_1}}\beta_1(y_1-kt_8)^{\frac{1}{\beta_1}}\right\}^{\beta_1}\left(N_1+\frac{2rA}{k}\right)^{-\beta_1} \quad (29)$$

The number of the population in the flood prone areas is counted as follows:

$$N_2 = \left\{\frac{\beta_2}{\alpha_2 k}\left\{(\alpha_2(y_2-kt_3))^{\frac{1}{\beta_2}} - (\alpha_2(y_2-kt_4))^{\frac{1}{\beta_2}}\right\} + \frac{\beta_2}{\alpha_2 k}\left\{(\alpha_2(y_2-kt_5))^{\frac{1}{\beta_2}} - (\alpha_2(y_2-kt_6))^{\frac{1}{\beta_2}}\right\} + \frac{\beta_2}{\alpha_2 k}\left\{(\alpha_2(y_2-kt_7))^{\frac{1}{\beta_2}} - (\alpha_2(y_2-kt_8))^{\frac{1}{\beta_2}}\right\}\right.\left.(1+cy_2{}^{\gamma})^{-\frac{1}{\beta_2}}u_2^{*-\frac{1}{\beta_2}}\right. \quad (30)$$

3 Numerical Simulation

The following section 3 presents a numerical simulation using statistical data and field survey data of Palangkaraya city.

3.1 Estimating Parameters

There are three parameters in the model must be estimated namely parameter α and β in utility function and parameter γ in asset function. We estimated parameter α and β by using account total national income which is a sum of Gross Domestic Product (GDP) reduced by net factor income from the rest of the world, reduced by net indirect tax and consumption of fixed capital. The total national income equals to total national consumption which include total household consumption. Meanwhile, number of low income households in the whole country is calculated based on percentage of population who live under poverty line which is claimed by national government, 16.58% in 2010 (Statistical Book, Indonesia in Figure year 2010). Parameter α in utility function of both households can be calculated as follows:

$$\alpha_1 = \frac{p_1 x_1}{y_1}$$

and

$$\alpha_2 = \frac{p_2 x_2}{y_2}$$

and since

$$\alpha + \beta = 1$$

then parameter β is determined. Furthermore, parameter γ in asset function is a difficult one to be estimated, due to lack of appropriate statistical data provided by the local government. However, by using field survey data, parameter γ for both types of the households can be roughly estimated using equation as follows:

$$\ln A_1 = \gamma_1 + \ln y_1$$
$$\gamma_1 = \ln A_1 - \ln y_1$$

and

$$\ln A_2 = \gamma_2 + \ln y_2$$
$$\gamma_2 = \ln A_2 - \ln y_2$$

Values of the parameters α, β, and γ are obtained as presented in table 1.

Table 1. The Elasticity Parameters

	Elasticity Parameters		
	α	β	γ
High Income Households	0.62	0.38	1.49
Low Income Households	0.73	0.27	1.13

3.2 Estimating Flood Occurrences

Since floods occur stochastically, it might be very difficult to select which floods bring damage to the assets of the households. Therefore instead of facing a difficulty with arbitrariness in selection of a specific past flood, we use the expected damage rate which can express damage cause by caused by a flood. We calculate probability of exceeding the average of water discharge volume in meter cubic per second as presented in table 2. In the numerical simulation we chose case 1. Applying equation (13), then the expected flood damage *c* is obtained at 0.8.

Table 2.Volume of Discharge and Probability of Exceeding

	Case				
	1	2	3	4	5
Volume of Discharge (m3/s)	69.7	84	235	500	715
Return Period (T) (year)	1	5	17	20	30
Probability of Exceeding	**1**	**0.2**	**0.06**	**0.05**	**0.03**

3.3 Results and Discussions

The bid rent by representative high income households in the normal land in the area 0-t_3, t_4-t_5, t_6-t_7, and t_8-t_2 is Rp.7,304,430.21, Rp.6,797,398.18, Rp. 6,258,676.65, Rp. 5,212,923.08 respectively which are absolutely above than that by the low income households. The high income households could earn higher wage than the low income households, and under the fixed utility level hence the high income household is able to pay land rent higher than the low income households.

Furthermore, the bid rent by the high income households in the flood prone areas in the area t_3-t_4, t_5-t_6, and t_7-t_8 is Rp. 0.000147755, Rp. 0.000137082, Rp. 0.000125475 respectively which are slightly below than that by the low income households. Due to its high income, the high income households could own more valuable assets than the low income households. The assets which consist of housing units and durable goods are vulnerable to floods. Hence in flood occurrences exceeding, the high income households face more loss than the low income households, therefore the bid rent by the high income households gets lower than that by the low income households. And since the low income households can bid higher than the high income households, the flood prone areas are then populated by the low income households. The bid rent curve resulted from the numerical simulation for Palangkaraya city is presented in figure 2.

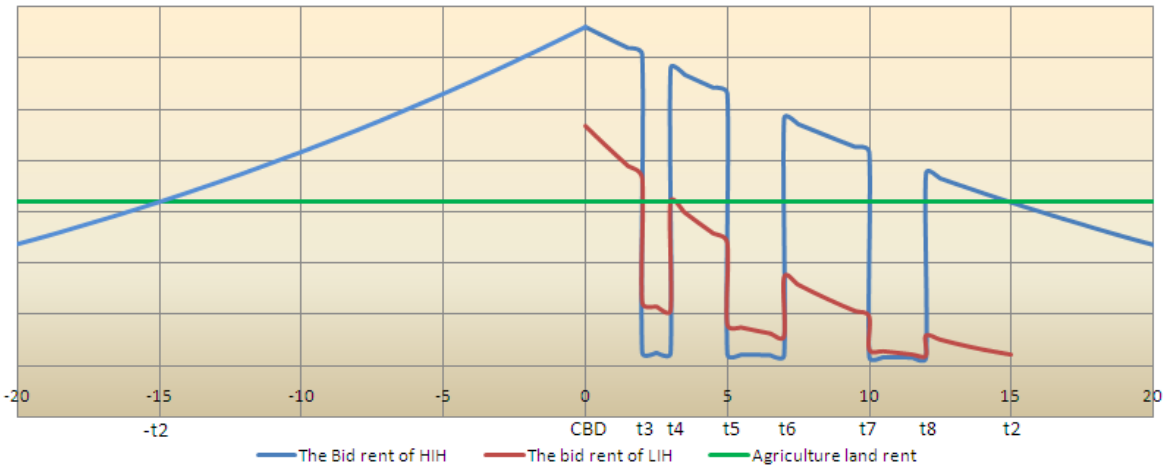


Figure 2. Bid Rent Curve in Palangkaraya City

The model indicates that the bid rent by a high income household in the flood prone areas is negatively affected by the expected damage on the asset by flood occurrence. Its magnitude is more than that in equation (21). As a result, the bid rent by a high income household is gets lower than that by a low income household in flood prone areas (see Figure 1). Therefore the flood prone areas are occupied and populated by low income households. This should be highlighted showing the reverse conclusion in the case of the normal land.

4. Concluding Remarks

This study has applied the new urban economics approach to analyze illegal settlements in flood prone areas in city of Palangka Raya in Central Kalimantan Province in Indonesia. Our model has incorporated the expected flood damage to derive lower bid rents by high income households in flood prone areas, deriving new bid rent function and bid max lot size function hence provides a systematic explanation toward the expansion of illegal settlements by low income households in the flood prone areas.

Our model has shown that if the income of low income group increases then the bid max lot size in the flood prone areas increases as well leading to less population there. Therefore the flood prone areas may have a chance to be recovered as open spaces. Similarly, if the supreme utility level increases through the development in rural areas, then the equilibrium number of low income

households in the flood prone areas decreases as indicated by equation (31). Thus the landowners may have the incentive to let the flood prone areas as open space instead of renting.

5. Policy Recommendations

Deflating the occupied flood prone areas in Palangkaraya city through measurable and systematic policies is strongly desired by local authority. Some efforts to preserve and to conserve the flood prone areas have been paid until nowadays but still outcomes were hardly identified and measured. Our model promoted some policy recommendations to protect the flood prone areas in city of Palangkaraya from the illegal occupation, which are including;

(i) Income improvement policy through an income redistribution scheme and/or raising the labor productivity in low income households by appropriate skill up. In numerical simulation, it is shown that lot size in the flood prone areas would get larger implying less density if income increasing.

(ii) Rural development policy which consists of programs such as rural infrastructure development (irrigation and road network), promoting quality of job creation by stimulating non-agriculture economic activities (rural industries), improving residents' access to production resources (land, capital, technology, information and innovation), empowering rural communities, and improving the welfare by fulfilling the residents' basic needs (education and health services). Assuming that utility level in the flood prone areas is the same as in rural areas, the policy would have significant impacts to increase utility level of the representative low income households. The numerical simulation showed that lot size gets larger leaving the flood prone areas as open space as utility level increasing.

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The Flexible Accelerator Model and the 'Regionalization' of Capital Stock Estimates

Stilianos Alexiadis*
Ministry of Rural Development & Foods, Department of Agricultural Policy & Documentation, Division of Agricultural Statistics,
Room 501, 5 Acharnon Street, 101 76, Athens, Greece, Tel: ++30 210 2125517,
Email: ax5u010@minagric.gr

and

Daniel Felsenstein
Associate Professor, Department of Geography, Hebrew University of Jerusalem,
Mount Scopus, Jerusalem 91905, Israel, Tel: 972-2-5883343
Email: msdfels@mscc.huji.ac.il

Abstract
This paper suggests a model of obtaining estimates of capital stock based on the theory of 'flexible accelerator'. However, this represents a rather 'indirect' method independently for each year and each region. Clearly this is an unrealistic condition, especially for regional economies characterized by mutual spatial dependence. To add an extra injection of realism, we illustrate how a national model of capital stock (the stock –flow model) can effectively be 'regionalized'.

Keywords: capital stock; flexible accelerator; spatial analysis, stock-flow

1. Introduction

The analysis of regional economic growth has always been handicapped by the almost unavailability of data on regional capital stock. In the absence of reliable time series, it is difficult to assess fully the contribution of investment activities (private or public) into the growth performance of regional economies. Actual capital stock data are seldom available and often inadequate, especially at the regional level of analysis. To try to sort this out, several studies (e.g. Harris, 1983; Hulten and Schwab, 1984; Gertler, 1986; Anderson and Rigby, 1989), estimate the capital stock using data on investment. In this context, a useful approach is provided by acceleration theory in its 'flexible' version, i.e. the relation between the investment activity and output (Junankar, 1973). Although this is an 'indirect' method, nevertheless, it allows the researcher to obtain estimates of the annual amount of the capital stock and depreciation independently for each year and each region. A useful extension of this method would be the incorporation of spatial spillovers effects. How this might be effects is tentatively illustrated in the context of the stock-flow model. The remainder of this paper is organised as follows. Section 2 outlines the simple version of the 'flexible' accelerator model while an attempt to 'regionalise' the stock-flow is reported in section 3. Section 4 concludes.

* Corresponding author.

The findings, interpretations and conclusions are entirely those of the authors and, do not necessarily represent the official position, policies or views of the Ministry of Rural Development & Foods and/or the Greek Government.

2. The 'Flexible Accelerator' model

One of the most common methods of estimating capital stock is the so-called *perpetual inventory* method[2]. In essence, this technique requires a time series of deflated values of capital investment as input data. These data are calculated by dividing the current value of investment ($\tilde{I}_t$) in each time period (t) by a capital goods index (P_c):

$$I_t = \frac{\tilde{I}_t}{P_c} \quad (1)$$

where I_t is the deflated value of investment in period t.

The expression in equation (1) adjusts for changes in the purchasing power of the monetary value of investment. The measurement of capital in monetary terms is justified in terms of the microeconomic theory, in which the price a firm is willing to pay for a capital good is equal to the value of the discounted flow of revenues it is expected to produce. Consequently, the productive capacity, measured in monetary terms, of two capital goods of the same vintage with equal prices must be equal. However, this is not necessarily true, given that it is possible technology and preferences to change through time. According to the perpetual inventory method, depreciation is estimated using a single parameter (μ), which is the assumed service lifetime of capital goods (Anderson and Rigby, 1989). A capital good is assumed to be completely withdrawn from the capital stock after μ years. Hence, the simplest assumption governing depreciation is that a capital good remains in full service until is withdrawn suddenly at the end of its lifetime service[3]. Under this assumption capital stock at the beginning of period t is:

$$K_t = \sum_{v=t-\mu}^{t-1} I_v \quad (2)$$

An alternative way is to assume that following its installation, an equal proportion of the services of capital is withdrawn in each of the μ periods (straight line depreciation). Therefore,

$$K_t = \left(1 - \frac{1}{\lambda}\right) K_{t-1} + I_{t-1} \quad (3)$$

Equation (3) incorporates the fact that capital goods may be removed from production at any time after they installed. In this light the parameter μ reflects the maximum service lifetime. However, most important empirical problem is to estimate the parameter μ. In the relevant literature, μ is estimated based on engineering surveys, which assess the average service lifetimes of capital goods.

Based on the notion of 'optimal' capital stock, the model of 'flexible accelerator' involves a relation between capital stock (K) and output (Y):

$$K^*_{i,t} = \alpha Y_{i,t} \text{ and } K^*_{i,t-1} = \alpha Y_{i,t-1} \quad (4)$$

where a is a parameter and the subscript i refers to a specific region.

The adjustment function is expressed as follows:

$$K_{i,t} - K_{i,t-1} = (1-\lambda)(K^*_{i,t} - K_{i,t-1}), \text{ with } 0 < \lambda < 1 \quad (5)$$

The replacement or the depreciation of capital is given by the following equation:

$$D_{i,t} = \delta K_{i,t-1}, \text{ with } 0 < \delta < 1 \quad (6)$$

Capital stock in any period t, is the sum of the existing capital stock plus the new additions by net investment in current period:

$$K_{i,t} = K_{i,t-1} + I_{i,t} - D_{i,t} \quad (7)$$

where $I_{i,t}$ is the level of gross investment.

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[2] Chenery (1952), Duesenberry (1958), Eisner (1960) and Patterson and Schott (1978) are obvious references for a more detailed analysis.

[3] Solow (1962) called this assumption as 'one hoss hay'.

Solving equation (5) for $K_{i,t}$ yields

$$K_{i,t} = (1-\lambda)K_{i,t}^{*} + \lambda K_{i,t-1} \quad (8)$$

Inserting equation (6) into equation (7) yields an expression for gross investment:

$$I_{i,t} = K_{i,t} - (1-\delta)K_{i,t-1} \quad (9)$$

Using equation (8), equation (9) is written as follows:

$$I_{i,t} = (1-\lambda)K_{i,t}^{*} - (1-\lambda-\delta)K_{i,t-1} \quad (10)$$

Lagging equations (5) and (9) by one period yields

$$K_{i,t-1} = (1-\lambda)K_{i,t-1}^{*} + \lambda K_{i,t-2} \quad (11)$$

$$K_{i,t-2} = \frac{(K_{i,t-1} - I_{i,t-1})}{(1-\delta)} \quad (12)$$

Therefore,

$$I_{i,t} = \alpha(1-\lambda)Y_{i,t} - \alpha(1-\lambda)(1-\delta)Y_{i,t-1} + \lambda I_{i,t-1} \quad (13)$$

Equation (13) has the advantage of providing an estimate of the capital stock in each region using data for output and investment[4].

Expressing equation (13) in terms of a regression equation yields:

$$I_{i,t} = c + b_1 Y_{i,t} + b_2 Y_{i,t-1} + b_3 I_{i,t-1} \quad (14)$$

where $b_1 = \alpha(1-\lambda), b_2 = -\alpha(1-\lambda)(1-\delta), b_3 = \lambda$ and c is the constant term of the regression.

Quantitatively the most important fact is that the parameters b_1, b_2 and b_3 allow to estimate the values of a and δ. Therefore,

$$\alpha = \frac{\hat{b}_1}{1-\hat{b}_3} \text{ and } \delta = \frac{\hat{b}_1 + \hat{b}_2}{\hat{b}_1} \quad (15)$$

Using the parameters a, δ and λ is possible to obtain an estimate for the capital stock for the period $t-1$. Solving equation (10) for $K_{i,t-1}$ and rearranging yields

$$K_{i,t-1} = \frac{(1-\lambda)}{(1-\lambda-\delta)} K_{i,t}^{*} - \frac{1}{(1-\lambda-\delta)} I_{i,t} \quad (16)$$

The capital stock of period in $t-1$ can be estimated as follows[5]:

$$K_{i,t-1} = \frac{\alpha(1-\lambda)}{(1-\lambda-\delta)} Y_{i,t} - \frac{1}{(1-\lambda-\delta)} I_{i,t} \quad (17)$$

Implementing equations (7) and (6) and the estimated capital stock in period $t-1$, capital stock and the amount of depreciation in each period are possible to be determined.

The analysis thus far, although refers to regions, it does not account for spatial interaction; that is to say how investment in one region impacts on the neighbouring regions. In principle, the 'flexible' accelerator model could be adapted to a regional framework for estimating capital stock. It has been argued, particularly in the case of regional economies, that the location of a region within a system of regional economies is a unique characteristic, and in the same way as other structural characteristics, has the potential to impact on growth and development. Regions are not dimensionless points but vital functional parts of an inter-dependent system of regional economies. This economic inter-dependence is partly a function of spatial inter-dependence. We now turn to how incorporating an explicitly spatial approach.

[4] Wallis (1973) and Helliwell (1976) used this indirect method of estimating the stock of capital of aggregate economy. Katos (1978) applied a similar approach to estimate the capital stock for the entire Greek economy using data covering the period 1948-1972.

[5] If $\lambda + \delta = 1$ brings indeterminacy in the model.

3. Regionalizing a national capital stock model.

As noted above, the flexible accelerator model posits a relationship between investment and output. It is based on the assumption of a stock adjustment process between a firms 'desired' level of capital stock and its actual level. The rate of change of actual capital stock will be proportional to the difference between the desired and actual stock (Lucas, 1969). As such, it can be used as a starting point for estimating capital stocks. Garofalo and Malhotra (1973) have used it to estimate the impact of changing input prices on patterns of investment and capital stock in US manufacturing investment in the 1970's.

'Regionalising' such estimates however can be challenging. The basic expression for investment in region j is;

$$I_j = a + \beta \delta Y_j + u_j \qquad (18)$$

The 'flexibility' is due to the fact that β is not fixed. Change in output drives investment. Output itself depends on capital stock and in order to keep boosting the former, investment is required in the latter. A key issue is that there is no real theory that posits investment as dependent on change in output. Thus the flexible accelerator is more of an ad hoc Keynesian behavioural construct than a fully fledged model. Additionally there is nothing inherently 'regional' in equation (18) as it is simply a national relation applied to a given region.

However, it is reasonable to claim that estimates of regional capital stock from investment and output data may not just be a case of regionally apportioning national estimates. This is because regional investment is unlikely to be independent. Just as regional models of housing construction and prices are not national models writ locally, the same can be said for other forms of regional capital stock. Additionally we can posit the existence of regional capital stock spillover effects as the stock of capital in one region is affected by the level or amount of stock in a neighbouring region (spatial lag effect)[6].

A different route to take may be by regionally invoking the 'stock-flow' asset pricing model that has been used in housing research to the issue of estimating non-residential capital stock. This model has a dynamic adjustment process that regulates prices with stocks of assets so that prices are determined as an asset while the flow of this asset is determined by investment which in turn is contingent of price levels (see for example, Smith, 1969; Bar-Nathan et al, 1998). In the stock-flow model, prices are 'weakly' exogenous because they are determined in the asset market, and capital stock is large relative to the flow of new capital construction (Topel and Rosen, 1988). In addition, the fact that capital stock does not become obsolete quickly makes for the assumption of a competitive investment environment.

This stock-flow model can be given a spatial expression that takes spillovers into account. Given two regions (A and B) in which the level of firms (Q) is fixed, Q_{At}, where Q_{At} and Q_{Bt} are naturally positive. The firm choosing to locate in A is determined through the following condition:

$$Q_{At} = \varphi_0 - \varphi_1 P_{At} + \varphi_2 P_{Bt} \qquad (19)$$

where P_A denotes price of capital stock in region A. The coefficients φ_1 and φ_2 reflect regional locational preferences across firms and imply that regions are imperfect locational substitutes for each other. (If they are perfect substitutes $\varphi_1 = \varphi_2 = \infty$. At the other extreme, if there is no substitution at all $\varphi_1 = \varphi_2 = 0$).

We assume that the capital cost for constructing stock (building materials, labour) does not differ across regions. These inputs are tradable and contractors will choose to build where it is more profitable. However, there is in general imperfect substitution between building in A and B because contractors have regional preferences too, or their expertise is region-specific. Given everything else, contractors therefore build more stock in A if they can sell for higher prices Construction of capital stock, denoted by C, is determined as follows in regions A and B:

$$C_{At} = \eta_{A0} + \eta_{A1} P_{At} - \eta_{A2} P_{Bt} \qquad (20)$$

[6] For a demand side example of regional spillover effects in a housing context, see Beenstock and Felsenstein (2010).

$$C_{Bt} = \eta_{B0} + \eta_{B1} P_{Bt} - \eta_{B2} P_{At} \quad (21)$$

where η_{A0} and η_{B0} express productivity in construction in regions A and B respectively. Capital stock at the beginning of period t in the two regions is defined as:

$S_{jt} = S_{jt-1} + C_{jt-1} - d_{jt-1}$, where $j = A, B$ and d denotes demolitions (22)

The market is in equilibrium when $Q_{jt} = S_{jt}$.

The model for stock prices can be solved under the simplifying assumption that $d = \delta S - 1$, where δ is a common demolition rate. Stock prices are dynamically and spatially correlated according to the model so that prices in region A are related to lagged prices in regions A and B, as well as current prices in region B:

$$P_{At} = \tfrac{1}{\varphi_1}\left[\varphi_0 - \eta_{A0} - \eta_{A1} P_{At-1} + \varphi_2 P_{Bt} + \eta_{A2} P_{Bt-1} - (1-\delta) S_{At-1}\right] \quad (23)$$

Current prices in region A vary inversely with the local stock and construction productivity (η_{A0}), and vary directly with the autonomous demand to locate in A (φ_0).

A crucial assumption in equations (20) and (21) is that apart from substitution effects induced by η_{A2} and η_{B2} the regions are otherwise independent in terms of supply. A further source of dependence is induced by specifying spatial lags in equations (20) and (21). Thus in equation (20) and (21) we add $\lambda_A \eta_{Bt}$, where λ denotes the spatial lag coefficient. If $\lambda > 0$, regional construction is complementary and induces mutual crowding-in. Thus, public policy to induce regional capital stock attracts further capital investment. If $\lambda < 0$, public sector regional construction induces mutual crowding-out of any further capital investment.

The operational model for estimating equations of regional capital stock including spillover effects across regions would then be:

$$B_{it} = \alpha_i + \eta(P_{it} - CN_{it}) + \phi(P^*_{it} - CN^*_{it}) + \gamma(\overline{P}_t - CN_t) + \lambda B^*_{it} + \mu Z_{it} + \pi Z^*_{it} + u_{it} \quad (24)$$

where all variables are expressed as logarithms, *CN* denotes building costs and * denote a spatial lag, e.g.:

$$B^*_i = \sum_{j \neq i}^{N} w_{ij} B_i \quad (25)$$

where w_{ij} denote exogenous spatial weights row-summed to unity. The main hypotheses are that capital stock construction varies directly with profitability, hence $\eta > 0$, and it varies directly with public sector intervention, hence $\mu > 0$. Equation (24) includes three spatial effects. First, if profitability increases among the neighbours of region i contractors will engage in spatial substitution, hence $\phi < 0$. Secondly, if regional incentives received by the neighbours of region i induce spatial substitution in construction, π will be negative. However, if construction in region i and its neighbours are complementary π may be positive. Third, if there are positive spatial spillovers in construction λ will be positive.

Apart from a spatial effect on profitability (ϕ), equation (24) includes a national effect (γ). If local and neighbouring profitability are given, an increase in national profitability might affect local capital stock construction in two ways. First, substitution may take place beyond neighbouring regions, which would make γ negative. Secondly, an increase in national profitability has a positive effect on national construction. If national and local construction are complements then γ may be positive.

4. Conclusion

While physical capital in manufacturing is a crucial variable in regional economic analysis, little attention has been given to developing accurate methods of estimating time series of regional capital stock. This paper is devoted to an inspection of methods to obtain estimates of capital stock, based on the 'flexible' accelerator and stock flow models. Of particular relevance to capital

accumulation across regions are the effects of spatial interaction which are discussed in this paper. Such estimates may be useful in a variety of regional economic analyses. For example, for estimating production-function type models in testing macroeconomic theories of regional growth, obtaining regional capital/labour ratios, technical efficiency, capital ages, etc. However, this is ultimately an empirical issue. Indeed, there is a little pretence that the foregoing analysis provides an exhaustive account of all the factors that affect the capital accumulation across regions, but this work does provide an alternative approach to the estimation of capital stock, and suggests possible avenues for future research in different contexts and examining different factors that shape the pattern of capital accumulation.

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THE IMPACTS OF NEW TOURIST FLOWS AT GLOBAL SCALE

Carmen BIZZARRI
European University of Rome – Via degli Aldobrandeschi,190 – Rome –
carmen.bizzarri@uniroma1.it

Abstract
The present globalization tends to assume in a lot of areas of our world – in particular in Mediterranean countries - some common geographical, social and cultural features.
While it assists in this homologation, there is a rediscovery of the different local value through the enforcement of the "subsidiarity principle" for determining a stronger cohesion in the local community.
Mass tourism, in a lot of traditional destinations, comes up against the limits that reduce the wellness of costumers, that lead to require new types of tourist services and aim to discover local resources and value.
In this direction, the tourists become a vehicle or tool of multicultural dialogue with residents and both communities absorb the cultural feature.
On account of this, new forms of personal relationships between tourist and resident are being established with economic, environmental and social consequences of utmost importance for the support of tourist development.
This behaviour of tourists tends to follow the innovative structures "horizontal networks", which, in this paper, are analyzed by original instruments characterized by a high level of multidisciplinary.

1- Definition of integrated relational tourism

In the present international framework, the expansion of consumption and opulence has produced an ever increasing segmentation of demand especially for some luxury goods, among which tourism.
The variation of tourism activities, if on one hand has multiplied the possibilities of resource fruition, on the other hand started a new way of use. In short, it has produced an upstanding cycle since from a compound demand arose an innovation on the supply of tourism services, aiming more and more to the personalization of service (tailor-made).
Among the forms of tourism spread out today with these characteristics, integrated relational tourism is certainly the one where we can find the original aspects and at the same time factors that fully satisfy the needs of every tourist. In fact, integrated relational tourism, is that particular type of tourism based on human relations held by the tourist during the stay on the hosting territory.
Integration between traveller and the local community creates a close tie in such a way that it is possible to have an approach, a coming together and even a "clash" with the open territorial system.
To be successful, this type of tourism supply must develop strong interlinks between environment and cultural resources with the wine-and-food, sport, naturalist and social resources of the territory.
This type of tourism gives the possibility not to fall in the vicious cycle of the tourism product marked by "everything and right away" and by "all for all", since the local community should have an acting role thanks to "bottom up" actions (from the bottom to the top) in every phase of planning, creating and carrying out the "tourism package".
Since human relations have a main role in this tourism, they convey to guests the conscious use of the resources present in the territory: the cultural and human exchange should determine that competitive advantage useful for local growth, since it would be based on the irreproducibility of the context and the relation with the local community. Every territory, every local community express different values which, being the fusion of the natural, environmental, historical, cultural, and social elements characterize the tourist's experience. Therefore, the scoring of "good experience" is determined by the satisfaction from the tourist of having taken that type of trip and by the loyalty marketing to that type of human experience.

This form of tourism, based on human relations, allows a re-territorialisation of economy, i.e., a new valorisation of "social capital" and of the mass of relations through which subjects taking part in it can pursue interests precluded from them or reachable at higher costs if they had not been part of the network or the trip. An important and useful role is given by the social responsibility of local businesses, which cooperate with the network "trustees" both to increase local production appreciated by this type of tourists and to involve more local participants is the main reason for the success of the trip. In fact, if this type of experience has good results, it's automatically repeated.
Involving all local participants, both public and private, is certainly positive since it determines a strengthening and constitution of a cultural identity which in time obviously it flakes off for the continuous external impulses received from the territorial system. If this upstanding circle takes place, relational tourism becomes a tourism "guided" by the local population, which welcomes the tourist in an environment particularly careful to the single person and for whom it is not possible to apply a "do-it-yourself tourism", i.e., an intrusive and aggressive tourism. Therefore, integrated relational tourism, needs special care from the offer.
In fact, the latter can totally satisfy the needs of the demand, since it is well aware of the necessities thanks to the relations exchanged before the trip. This awareness is very useful since the demand automatically is segmented and therefore the territory is specialized in the use of resources specific for that kind of tourism.
All components of the tourist offer can actually carry out a strategic role in the organization of resources for activities of this kind of tourists, since every element of the offer, besides the economic benefit, represents also that part of the local community that involved tourists in the trip experience.
This relation (tourists- tourist offer – local community) constitutes essentially a form of participation of tourists to the local community decision on the choice of natural, environmental, cultural and social resources to use in the course of the trip. The constant contact in the trip, not only among tourist, but also with the local community, allows a positive relation between tourists and residents bringing about a form of tourism that digresses from an aggressive approach, typical of "do-it-yourself tourism" towards locals. The confluence between tourists and the local community should generate mutual respect of the different cultures. If these two communities (residents and tourists) converge in a synergic approach , it's obvious that external economic sources can facilitate not only tourists, but also the local community and relate with the surrounding territory. These benefits can be reached when the destination and the surrounding tourist area is prepared and organized to welcome tourists. Therefore, the territory is transformed into a local tourist system. In fact, the latter is possible when there are at least three conditions: if it does not compromise the eco-system balance, the harmonic development of suburban and central areas and the continuity of the lifestyle of the local community.
The tourist that enters into such a system, is no longer a simple outsider, but becomes a traveller that meets other realities and new values without prearranged schemes and therefore ready to relate with the social reality.

2- Integrated relational tourism demand: the development of networks

In order to speak of relational tourism, good relations between tourists and residents are important. This cannot take place just from the trip itself, but the need to share mutual interests brings tourists in touch with residents before the trip. The development of social networks and networks as a virtual meeting place are a natural way to meet and be able to share and welcome with one another mutual interests. In such a context can relational tourism develop, preceded first by a virtual meeting and then the actual one to carry out activities and interests that brought them in contact with one another. This is how human relational networks are formed which are not tied just with the emotions and the tourism experience but that grow thanks to interests and not the territory, which becomes a frame. At times, the latter can become "uncomfortable" in a sense that it's difficult to model for the interests of network partners, while at other times it can be a necessary resource for the network to succeed.
Recognizing the uniqueness of human relations, in this type of journey, represents the winning card to continue this type of trip always in search of new contacts. At first the network can be formed by two or three people that enter a contact page on social networks, perhaps arising from actually

meeting another or from an event. Then the network becomes larger by having friends of friends and so on. The reasons why a network expands in the whole world are different, but there are certainly two main ones: the first one consists in the natural privacy guaranteed by the fact that one can only access indirectly. In fact, people access and register to the network easily, not just because of the many interests – sport, music, art, cuisine, etc…- but also because they are more open to "meeting" someone new precisely because virtually reached.
The second arises from the total lack of information on the social role of each single member of the network. Therefore, there is no "reverential fear", but only knowing the role within the network. After a few months or a year from the existence of the network on the web, some members, not necessarily the founders, write on the site a notice of an event where they ask members of the network to joinIn the meantime, the one who put the notice organizes the event in the place. When there are even a few confirmations, the event can take place.
Therefore, a network tourist is one with exact and specific needs for whom it's necessary to build a "fixed journey". In fact, this type of tourist directs his travel expectations in practicing and experiencing interests of that sort. But if we were to create this type of travel we would certainly offer a unique experience, but we would make of this tourist a person with no ties in the territory, we would create a "touch and go" trip with almost nothing left for the traveller and the hosting community.
An important role for the territory to become a quality destination for these networks, is held by the network member who becomes a "spokesman" in the local community, that welcomes the needs. Such a person, or group of people, represents the need of the network within the community and thus a collaboration is established among network users, who become tourists, and the residents. The ones who propose the event and the network members, besides organizing a tourist offer with attractions tied to the network, activate the needed synergies with the local community, as well as public and private authorities, for the "governance" of this type of tourism, creating shows and events related to both local traditions as well as specific network activities.
This new method of being acquainted with and creating network is becoming widespread, as it can be seen, for example, in the large and small sports and religious events, related to dance, gambling, architecture….
Among the many examples, perhaps the most evident is religious tourism: for their sojourn, pilgrims prefer being hosted in a "home" in the local community which not only shares faith, but which they have already met, even if only virtually.
Same thing applies to bridge players who are hosted in places often exclusively dedicated to playing bridge. In short, small events where a part of the local community is very involved since it deals with organizing the territory so that bridge players can fulfil their leisure activities and develop proper relations for others and future bridge matches. Even architects, in order to easily access to the dynamics of the cultural landscape, are often directed to networks where someone "alike" hosts them.
In conclusion, more private networks are being created, where every kind of hierarchy and bureaucracy disappears, while the immediacy of human relations is dominant. For this reason, the trip does not end with the simple "event" organized by the network, but what's more important is the human experience that the tourist had in contact with the hosting community.

3- Territorial, environmental, economic and socio-cultural impacts of network tourism

At first network tourism may appear as not having environmental impacts since we think more of the virtual sphere from where it's created. But, that's not the case, since at the moment that network members create the event or give the opportunity to start a constant network meeting in the territory, such network tourism may have negative environmental impacts. In fact, if this type of tourism should involve a great number of tourists concentrating the flow in a defined area, then there could be environmental imbalance in the use of resources and would strengthen conflicts in the use of resources, exceeding the capacity load of tourism.
Moreover, there could be positive environmental impacts such as: enhancing environmental, cultural and social resources, well taken care landscape thanks to the minimization of infrastructure growth. In fact, in this type of tourism accommodation structures could be in existing places, such as homes of network members, or existing buildings and hotels, that would be deliberately involved

to host tourists.
Further environmental benefits deriving from this type of tourism are both involving the local people to directly manage resources, which should take place with efficiency and skill, since precisely from those resources comes the local wealth and establishing external welfare deriving from a better organization of resources from which even the local community can benefit (external economies).
Moreover, economic impacts are positive when it's possible to register: growth of local productions, which tourists should not only appreciate, but request in large quantity and perhaps take home with them. Fundamentally, if these tourists are foreigners and spend in goods produced locally, export would increase and the added value would be distributed in the entire economy of the region, at least in the average period.
The demand for local products, in this view of integrated network tourism, should encourage producers not to increase prices, as it usually happens, but to find new ways to produce goods in a more competitive way. This innovative push arises especially when the "social capital" formed by the local community creates a feeling of trust with the network and therefore, it's not possible to raise prices, but only improve the quality of products. When a tourist sees innovation as a new tourist product and finds it useful also for the uniqueness and irreproducibility, he would be willing to pay a higher price, giving up part of his "income" of the consumer. In fact, a tourist is willing to spend and consume when innovation is seen as improving the quality of his comfort. Obviously, the elite tourist feels more attracted by innovations that tend to differentiate and segment tourist demand. The more a tourist feels satisfied for a highly personalized service, the more he would be willing to spend. For this reason innovation can become that attraction factor for the network that gladly operates in territories recognizing that value of participation to local economy growth. Subordinate areas will also benefit from this growth since it would create peripheral market and new professions that inevitably can be distributed in a more standard way for the whole touristic area.
Another important factor that enables the network to perform an economic role at a local level is the seasonal adjustment: the local community, wishing to keep the trust gained during the network formation, does not offer its area during high season and when services, especially touristic ones, are fully in use, therefore unwelcoming and degrading. Instead, it chooses the more appropriate period of the year to give the network the opportunity to come into real contact with them. Therefore, a network tourist feels protected and attended taking part in the local lifestyle.
Seasonal adjustment of touristic flow is from the environmental, but especially economic profile, a great opportunity to strengthen the system, which is then able to insource the relative diseconomies that could come about.
Integrated relational network tourism, therefore becomes a form of tourism that does not need large capital investments, but ideas which, if on one hand are easy to imitate since they are inexpensive and not particularly risky, on the other hand they cannot be reproduced since they are related to the cultural and environmental context where they were created. As a matter of fact, in tourism, innovation does not produce a new tangible product, but a new activity that changes the method of resource fruition and the service offered.
At last, but not the least important, we find the social effect that this type of tourism has on the local community. Indeed, in the short and average period the local community could lose its own cultural identity due to the contact with tourists without intermediaries. At first, the exhilarated and enthusiastic increase of flows could create an all-absorbing opening of the local community to tourists. Instead, in the long run such a close relationship between tourist and resident could generate a hospitality denial and therefore the creation of "enclave" from residents who are no longer welcoming tourists, loosing considerable shares in the market.
In short, this type of tourism could activate two different social consequences: the first is the strengthening of the local identity, with results entirely negative for this type of tourism based on relations between tourist and the community. Whereas, the second derives from the total openness to new cultures that replace the traditional ones, hence removing the local culture – i.e. cultural genocide.
From the social standpoint, another negative aspect could be the strengthening of elite, especially in developing countries. As a matter of fact, the elite that belongs to the network, by managing resources and network tourism, tend to keep away the remaining part of the local population, since

it would be considered more and more distant and far away from the needs of the touristic network. This situation could get worse causing a conflict of use of resources since the local population, being poor, sees network and tourists as the ones that take the little resources they have without giving anything in return.

4- The role of the offer: creation of external economies to develop tourism and networks

In order for networks to successfully create their activity, they should activate local stakehoders to organize an offer related as much as possible to local products and values (mountain communities, municipalities, and small and average local firms). Activating this kind of cooperation could be useful not only to increase local firms revenues and to increase local employment, but to develop the whole touristic area.

In fact, the ones that belong to the network should have a role of "primum movens" to then involve not only stakeholders, but the entire community. This participation is simply the realization of the subsidiary principle, that principle so dear to our European system, with which the local community is in the front line to organize and manage resources, since it holds the culture and the skills needed. This process, starting from the bottom up, allows the integration and sharing of objectives not only from those that have been part of the local community for some time, but especially among immigrants, resident foreigners and locals since, for example, there is a need to inform network members in several languages, or to know their customs, their needs… (see table 1)

It's not easy to offer a touristic product as designed, therefore an actual "touristic district" must be organized, capable of satisfying the needs of network tourists and locals. The more the local community is able to make an interesting offer for that type of network and the greater are the opportunities of growth and continuous trade with the network and afterwards involve more and more networks differentiating the offer according to the network, even if the organization stays more or less the same.

Thus, external economies will be created, i.e., a system of receptive services very visible and beneficial, first of all to locals who should manage the private networks of tourists.

This new fruition of tourist services becomes a real innovation, beneficial to the whole territory. Moreover, this improvement should be felt by the resident community which, on the contrary, often sees innovation as a greater pressure on resources, reducing the possibility of their use. This new form of tourism can constitute a product innovation since new resources, originally excluded from the production of tourism services, increase their value and their management and organization involve the whole touristic area. On the contrary, process innovation only rationalizes what is not efficient in each single touristic structure.

For example, if on one hand "low cost" increased considerably touristic flow, on the other hand started a negative impact on the territory. This effect is caused by the increase of the anthropic pressure of some resources, especially the frail ones, which without an estimated protection, have deteriorated and downgraded. This phenomenon has occurred in the large European capitals and in seaside destinations where the lowering of prices, since the demand is very elastic, has permitted a larger flow of tourists, causing the overcoming of the "touristic load", especially in the main areas of the above destinations and consequently the deterioration of resources and the conflict on the use of resources.

In short, the tourist services offer dedicated to the network can change the pre-existent tourist product, especially when it becomes a market competition element both for the venture and the territory, i.e., there are no conflict of interests between venture and the local community. In fact, to be accepted as a new touristic product, an innovation must be identified as such, not only in the single tourist service structures – where it often arises – but also within the destination touristic system, since both stakeholders and residents take part actively in providing tourist facilities of new resources. In fact, it's important that innovations are spread from an area of the economy to another to report the significant growth in the territory.

The localization choice for certain areas becomes strategic for operating the network and for the success of the touristic initiative. In the chosen areas, cooperation among institutions and interpersonal relations get into action to integrate tourism to the life of residents. For this kind of tourism, the best destinations are those with small and medium businesses. In fact, there is a greater number of the latter where there are strong relations with the territory and their traditional culture.

This situation tends to privilege those areas where, besides being physically close, one may access and easily benefit, in a direct and transparent manner, of all the needed information to organize events.

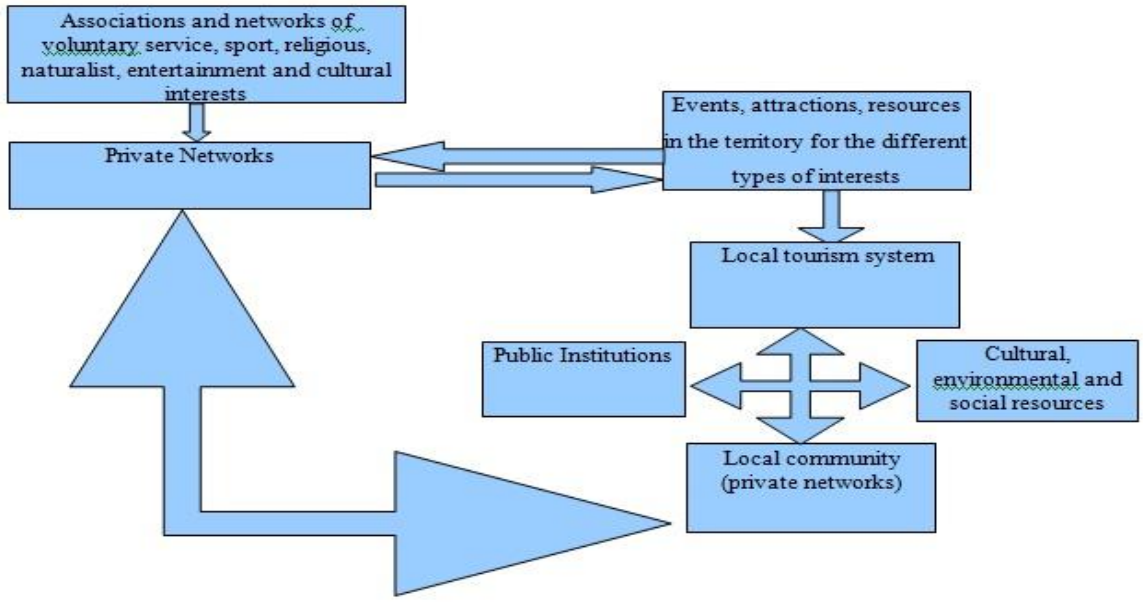
In these areas any type of innovation (both technologic and social) spreads out, thanks also to the activation of horizontal (between tourism ventures) and vertical (between ventures and local community) networks, especially when the territory has a "vocational" potential of high intensity natural resources tourism. Moreover, the choice of location for touristic events is made on the basis of two main requisites that the territory holds: relation between the local community and ventures, and therefore the existence of an organized and collaborative territorial context. For this reason the choice of venture location is directed to "suburban" areas where the repetition of knowledge is immediate and consequently some external economies are easily attended, such as contact with suppliers and public and private bodies.

Moreover, such characteristics are spread in the various contexts of the tourist region, where, in order to establish important economies of accumulation and external effects for reducing company costs, stakeholders check on the possibility to adapt this type of tourism to the local characteristics (cultural, social, environmental). This characteristic is the reason why often an event organized by the network becomes a progressive tourist product. The latter one is just a different service of welcome made up of a series of elements that together create the uniqueness of the progressive service. Therefore, a progressive tourism product can be developed in all cycles of production and directly in the area, but at the same time the present standardization of services offered, and especially those offered by the large tourism ventures, have often misguided tourists in considering the services received as an industrial product.

The availability and possibility to access to information, as well as technological networking, established between ventures and the territory, create an inclination to extend the sector and space of innovation and consequently of quality – especially of the qualified highly skilled work – within the economic system.

If, in fact, it is true that in the past the territory centrality helped the tourist flow with a high purchasing power, today, thanks to technologies and the development of transportation, the same type of tourists discover the suburban area for the opportunity of finding spaces of "free time" and services differentiated and segmented to their own needs

Table 1: The process of networks "tourist governance"



Conclusions

Network integrated relational tourism seems a new way to generate touristic flows with great growth perspectives, though remaining a niche. This new type of tourism expands and diversifies the present touristic demand acquiring a global dimension, since it refers to networks that know no boundaries.

A network integrated relational tourist, being someone who constantly establishes social relations in the locality he visits, is not closed in its "enclave", contrary to what generally mass tourism proposes with holiday villages. Therefore, the main background given by a network relational tourist is the cultural openness needed to arouse integration with the local reality and subsequently acknowledging the new local reality as a wealth both for the tourist and the locals. Relational trade between tourist and locals takes place both on the network before the trip and also during the stay. Naturally, during the stay in the locality, the network relational tourist deepens and compares the cultural aspects previously examined on the web and for this reason the stay has a slower time frame than "mass tourism". For this reason, network integrated relational tourism becomes sort of a "niche tourism" with different characteristics of "hit and run" tourism, which in the present historical time prevails.

Therefore, from the demand point of view, network integrated relational tourism can be defined as affordable. This aspect can also be found in the type of offer required by such tourism.

In fact, the destination welcomes tourists in the community without large infrastructures, in a "friendly" manner, so that environmental costs supported by the local community can be minimized. This peculiarity is certainly a positive factor for the territory since tourism as started off can become a dynamic economic sector and as such does not change in time in terms of profitability for the entire economic system.

Network integrated relational tourism constitutes an important activity for the local economy, particularly when the confidence between tourists and locals is proven so that the latter are willing to spend in local goods to the point that it is possible, thanks to the multiplying aspect, that the trust is reflected in the economic system for future investment. Moreover, participation of small and medium businesses guarantees both tourists shopping for these products with the subsequent increase of added value for the entire community, but especially the creation of a differentiated economy without a touristic monoculture.

From the social standpoint, this type of tourism, strongly based on human relations, has two totally contradictory consequences: the first, positive, is represented by strengthening the local identity that allows the community to be closer and rooted in the territory; while the second can appear as negative since it increases conflicts and social gaps both between tourists and residents, as well as between residents of the same community – i.e. between the poor and the rich and immigrants and residents – flaking the social unity, especially in those areas where there are already strong conflicts between the rich and the poor.

Therefore, this kind of tourism most probably will expand since it arises from the cooperation of the different public and private stakeholders for welcoming tourists. Consequently, there will be more efficiency in the territorial system and an attentive use of resources, thanks also to the creation of positive external effects created precisely by this tourism.

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TYPOLOGY OF EMERGING PATTERNS OF THE MEDITERRANEAN AREA IN THE ENERGY SECTOR: A TWO TIER APPROACH

Anastasia BISKA
PhD Candidate, National Technical University of Athens, School of Rural and Surveying Engineering, Department of Geography and Regional Planning, Iroon Polytechniou 9, Campus Zografou, 15780 Athens, Greece, Tel.: +30 210 7722756, E-mail: abiska@survey.ntua.gr

and

Maria GIAOUTZI
Professor, National Technical University of Athens, School of Rural and Surveying Engineering, Department of Geography and Regional Planning, Iroon Polytechniou 9, Campus Zografou, 15780 Athens, Greece, Tel.: +30 210 7722749, E-mail: giaoutsi@central.ntua.gr

Abstract
Energy poverty is intensely debated lately, mainly at the political level, both in the developed and developing world. The concept of energy poverty refers to issues such as lack of the necessary infrastructure that prevents citizens from having access to various sources of energy.
In the Mediterranean region, there is a divergence among countries, regarding both the energy poverty patterns and the related policy framework. Apparent differences also appear between the EU countries and non-EU countries, concerning the existing infrastructure, the energy demand, the availability of natural resources and energy sources and the related policy measures.
The aim of this paper is to develop a typology of the energy poverty patterns in the Mediterranean countries and elaborate on the prospects for policy measures.
The first part provides the definition of energy poverty and the patterns appearing in the Mediterranean region. The second part presents data issues on the energy consumption and production patterns in the study region. In the third part, the available data and their sources are presented, while the fourth part presents the methodological framework and the tools used in a clustering exercise in order to identify groups of countries with similar characteristics which may be addressed by a common set of policies. The clustering process consists of two separate parts, one including all the Mediterranean countries and a second clustering separately the EU and the non-EU countries in order to identify differences among the two clusters. The fifth part presents the results of the clustering process and the visualization of the new typologies. Finally, in the sixth part, follows a set of conclusions drawn from the resulting typologies, but also the prospects for policy action in the Mediterranean region.

KEYWORDS
Energy poverty, Spatial disparities, Mediterranean energy patterns, classification, typologies

1. INTRODUCTION

The Mediterranean Sea unites countries with different demographic, socioeconomic and cultural characteristics, including both EU and non-EU countries as parts of this "entity". Mediterranean countries exhibit rather diversified patterns, as to their energy poverty and related policy framework. These are mainly due to the existing infrastructure, energy demand, availability of natural resources and energy sources as well as the related policy measures, which are considerably different between the EU and non-EU countries.
The aim of this paper is to develop a typology of the energy poverty patterns in the mediterranean countries and elaborate on the prospects for policy measures, based on energy efficiency.

2. THE MEDITERRANEAN AREA

The study region is the Mediterranean area, which consists of 21 countries, from different continents. More precisely it includes European countries, such as Spain, France, Monaco, Italy, Malta, Croatia, Slovenia, Bosnia and Herzegovina, Montenegro, Albania and Greece; Eurasian countries namely Cyprus and Turkey; Asian countries such as Syria, Lebanon and Israel, but also African countries, such as Egypt, Libya, Tunisia, Algeria and Morocco.
All the Mediterranean countries apart from Monaco, are member countries of the International Energy Agency (IEA) and seek to create conditions for their energy sectors which can make the fullest possible contribution to their sustainable economic development, the well-being of their people but also of the environment (IEA, 2011).
Seven out of the fourteen European and Eurasian countries are EU members. These are Cyprus, France, Greece, Italy, Malta, Slovenia and Spain. Relating to the energy sector, EU has set policy targets and strategies in order to promote energy efficiency in its member states.
Additionally, six out of the twenty one Mediterranean countries are OECD Members. These countries are France, Greece, Italy, Slovenia, Spain and Turkey.
The energy profiles of the Mediterranean countries vary significantly. It is noteworthy that all the EU countries apart from Malta rank at the top as far as per capita final energy consumption concerns, while France, Italy and Spain possess also the first places in the net quantities of final energy consumption.
Concerning the energy primary production, the difference noticed among the Mediterranean countries, refers mostly to both the renewable and the conventional energy sources. The EU countries have a great potential in renewable energy while many of the non-EU countries have subsoil rich in conventional energy sources (oil and natural gas).

3. ENERGY POVERTY

Energy is a basic necessity for economic and social development. Nevertheless, appropriate global strategies for meeting the energy needs, of the world's rapidly growing population, are lacking (Baker Institute Energy Forum, 2011).
According to the Population Resource Center, consumption of fossil fuels has increased steadily in recent decades, mainly due to the rising standards of living, but also to the increased demand from population growth. A growing number of energy analysts claim that the absolute amount of the yearly oil production, all over the world, is likely to reach a peak sometime in the next two decades. A small but growing number of experts also predict that the world is already at or near the "peak oil" (Population Resource Center, 2011).
Energy demand is proportional both to the population growth and the income rise. As income per capita rises, so does per capita energy use. The reason is evident. Energy (electricity to run motors, fuels for transport, and hundreds of other applications) is a vital complement to other investments for boosting productivity and stimulating economic growth. In turn, that very growth gives rise to increase of household necessities and creates comforts associated with such increased energy usage (Resources of the Future, 2011).
In 2009, world energy consumption decreased for the first time in 30 years (-1.1%) or 130 Mtoe (Megaton oil equivalent), as a result of the financial and economic crisis (GDP drop by 0.6% in 2009). In OECD, countries consumption was severely cut by 4.7% in 2009 and was almost down to its 2000 levels. Oil has remained the largest energy source (33%) despite the fact that its share has been decreasing over time. Coal has played a growing role in the world's energy consumption: in 2009, it accounted for 27% of the total (Enerdata, 2011).

3.1. Energy Poverty

Energy poverty refers to issues dealing with the lack of the necessary infrastructure that prevents citizens from having access to various sources of energy. At a household level, energy poverty takes another dimension. It reflects the inability of households to satisfy their energy needs as they cannot afford to pay for it. This situation occurs mostly in the low-income households (ESPON ReRisk, 2010).

Several agencies dealing with energy poverty issues have expressed their views on the lack of access to energy as follows:
"The access in sustainable modern energy services and products is a key aspect of human development and growth. Across the globe an estimated 3 billion people continue to lack access to sustainable and affordable modern energy. Most remain dependent on traditional fuels, often adding to stresses on natural resources and undermining the sustainability of rural livelihoods" (Energy Poverty Action[7], 2011)
"Access to energy services is a key component of alleviating poverty and an "indispensable element of sustainable human development" (Baker Institute Energy Forum[8], 2011)
"Without access to modern, commercial energy, poor countries can be trapped in a vicious circle of poverty, social instability and underdevelopment" (International Energy Agency[9], 2011)

3.2. Energy Poverty in the Mediterranean Countries

The volume of energy use differs among the world countries and regions, even at comparable levels of per capita GDP, depending on the structural characteristics of their economies, spatial features, climate, fuel and power prices, government conservation policies, and other related factors. Similarly, changes in per capita income need not signify commensurate rates of energy use; for example, shrinkage of energy-intensive manufacturing and expansion of lower energy-use service activities can contribute to de-coupling growth of GDP and energy use (Resources of the Future, 2011).
Energy poverty has a different aspect among the Mediterranean countries and although it cannot be clearly defined in each country, similar problems are noticed among countries i.e. unpaid energy bills, disease, self-disconnecting, etc (EPEE, 2011).
The reason for the differentiation among Mediterranean countries is basically due to the socioeconomic and energy data, in each country, which are much diverse. Some of these countries are oil producers, supplying the world energy market, while others have a large potential in renewable energy production. On the other hand, a great diversification appears also on their socioeconomic base, population characteristics and the GDP per capita. Issues like energy efficiency, energy use, energy resources, income per capita, differ also to a large extend.
The EU countries have great potential in renewable energy production. Apart from this potential, EU set targets for the years 2010 and 2020 through Directives concerning the renewable energy. While the 2010 targets were driven out of a loose legislative framework, the 2020 targets are mandatory for the member countries (Stratigea et al., 2011). Concerning both the renewable energy primary production and final consumption, France holds the first place among the EU countries, followed by Italy and Spain. However, it is noteworthy that Slovenia comes first at the per capita production and consumption.
Additionally, among the non-EU countries, there are some of the main oil and natural gas producers at global level. Concerning oil production, Libya and Algeria rank in the top positions, followed by Egypt and Syria. As to the natural gas production, Algeria and Egypt come first, followed by Libya and Syria. While on the other hand, Turkey ranks first in oil and natural gas consumption.

[7] Energy Poverty Action is a joint initiative of the World Business Council for Sustainable Development (WBCSD), the World Energy Council and the World Economic Forum
[8] The mission of the Energy Forum is to promote the development of informed and realistic public policy choices in the energy area by educating policymakers and the public about important trends — both regional and global — that shape the nature of global energy markets and influence the quantity and security of vital supplies needed to fuel world economic growth and prosperity.
[9] The International Energy Agency (IEA) is an autonomous organisation which works to ensure reliable, affordable and clean energy for its 28 member countries and beyond. Founded in response to the 1973/4 oil crisis, the IEA's initial role was to help countries co-ordinate a collective response to major disruptions in oil supply through the release of emergency oil stocks to the markets.

4. DATA ASPECTS

The study region consists of 19 out of the 21 Mediterranean countries. These countries can be further subdivided in EU and non-EU countries. The EU countries include Cyprus, France, Greece, Italy, Malta, Slovenia and Spain.

The non-EU countries refer to European, Eurasian, Asian and African countries. These countries are Albania, Bosnia and Herzegovina, Turkey, Syria, Lebanon, Israel, Egypt, Libya, Tunisia, Algeria and Morocco. Monaco and Montenegro, are not included in the study area because of data availability for the energy sector.

4.1. Data Sources

In order to study the energy poverty patterns in the Mediterranean area, energy data were collected from the International Energy Agency (IEA), which provides energy data on a common basis which is necessary for the clustering process.
Four main categories of energy variables were used in this respect. Primary energy production[10], energy imports, energy exports and total final energy consumption[11]. For the clustering purposes, also population data were used. All data are presented in tables 1, 2 and 3 below.
Two clustering exercises are used below using different types of data. In the first clustering process, which includes all the 19 Mediterranean countries for which data were available, the energy data refer to the agreegate data of each category. This means that each category includes all types of energy. More concretely, they include coal, crude oil, natural gas liquids, refinery feedstocks, additives, petroleum products, gases, combustible renewables and waste, electricity and heat (IEA, 2011).
In the second clustering process, EU and non-EU countries are separately studied. The energy data used for the EU countries concern the previous energy categories including only renewable energy types while the non-EU countries are studied under these categories for oil and natural gas energy types.

[10] Primary production of energy is any extraction of energy products in a useable form from natural sources. This occurs either when natural sources are exploited (for example, in coal mines, crude oil fields, hydro power plants) or in the fabrication of biofuels. Transforming energy from one form into another, such as electricity or heat generation in thermal power plants (where primary energy sources are burned), or coke production in coke ovens, is not primary production (Eurostat, 2011).
[11] Total Final Energy Consumption is the total energy consumed by end users, such as households, industry and agriculture. It is the energy which reaches the final consumer's door and excludes that which is used by the energy sector itself. Energy end user categories include private households, agriculture, industry, road transport, air transport (aviation), other transport (rail, inland navigation), services, other (Eurostat, 2011).

Table 1. Energy[12] and population[13] data in the Mediterranean countries

Country	Primary Energy Production	Energy Imports	Energy Exports	Total Final Energy Consumption	Population
Albania	1,153	1,350	223	1,820	3.14
Algeria	162,044	1,857	125,622	23,447	34.36
Bosnia& Herzegovina	4,340	2,506	872	2,961	3.77
Croatia	3,946	8,061	2,549	7,285	4.43
Cyprus	83	3,048	0	1,743	0.80
Egypt	87,487	8,375	23,900	48,300	81.53
France	136,626	175,863	36,526	165,545	64.12
Greece	9,862	32,775	7,611	21,187	11.24
Israel	3,270	23,328	3,774	13,149	7.31
Italy	26,940	185,976	30,382	133,397	59.89
Lebanon	194	5,227	0	3,561	4.14
Libya	103,743	36	85,273	8,952	6.28
Malta	1	1,856	0	362	0.41
Morocco	637	14,980	742	11,313	31.23
Slovenia	3,672	5,534	1,230	5,496	2.02
Spain	30,423	136,313	13,324	99,065	45.59
Syria	23,482	2,892	6,604	12,100	21.23
Tunisia	7,534	6,203	4,420	6,577	10.33
Turkey	28,979	79,503	6,982	74,380	71.08

Source: International Energy Agency, 2011

5. METHODOLOGICAL FRAMEWORK

The scope of this Chapter is to identify the prevailing energy poverty patterns by use of a classification approach indicating clustering of countries with similar characteristics in order to provide the appropriate policy framework for resolving energy poverty issues.

The classification of the Mediterranean countries into groups of regions with similar characteristics is a helpful tool in the study of the risk of energy poverty in the Mediterranean area. This classification may result in regional typologies that will assist policy makers to understand the picture of Mediterranean in various aspects and adjust their policy agenda accordingly.

The production of an area classification / typology is a process that consists of several steps. These steps are presented in diagram 1 below.

Several algorithms and software has been used for the clustering. K-means and hierarchical clustering are the main functions available both in commercial (such as SPSS) and open source statistical software.

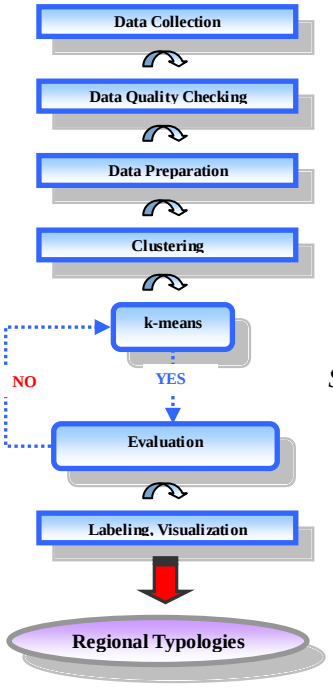
[12] Energy data are calculated in ktoe

[13] Population is calculated in millions of people

5.1. Clustering Methodology

The clustering methodology applied in this paper is a six step approach shown in the following diagram.

Diagram 1. Clustering Methodology



Source: ESPON ReRisk, 2010

5.2. Tools

The k-means procedure adopted attempts to identify relatively homogeneous groups of cases based on selected characteristics, using an algorithm that can handle large numbers of cases. The procedure tries to form groups that do differ among each other. The reason for choosing to apply a k-means cluster analysis is that it allows for the grouping of regions into categories of similar rates for a set of variables. It is a quick algorithm the results of which can be easily mapped (ESPON ReRisk, 2010).
The k-means used here is an efficient version of the algorithm presented by Hartigan and Wong (1979). The aim of the K-means algorithm is to divide M points in N dimensions into K clusters so that the within-cluster sum of squares is minimized. It is not practical to require that the solution has minimal sum of squares against all partitions, except when M, N are small and K=2. We seek instead "local" optima, solutions such that no movement of a point from one cluster to another will reduce the within-cluster sum of squares (Hartigan et al., 1979).

6. MEDITERRANEAN TYPOLOGIES

The clustering approach consists of two separate parts. The first part includes all the 19 Mediterranean countries using production and consumption energy data. The second part the clustering process includes a different approach for the EU and non-EU countries. In this part of the clustering process, the EU countries are classified in groups with similar characteristics, based on data for renewable energy production and consumption, while the non-EU countries are classified based on data about energy production and consumption regarding the conventional energy sources.
This division in this clustering approach is due to the different energy policies introduced in the EU and non- EU countries.
The clustering analysis showed that many variables had skewness and kurtosis statistics that indicate a problematic normal distribution. For these reason, the variables were divided according to each country's population. The new standardized variables were included in a new clustering

procedure without any problematic distribution.

6.1. First Clustering Results: all Mediterranean countries

The clustering procedure included the 19 Mediterranean countries for which there are available data. The clustering results showed that four main groups are defined. These groups can be identified in Map 1 below.

Group 1: Non-EU Countries

This group includes Albania, Bosnia and Herzegovina, Turkey, Egypt, Lebanon, Morocco, Syria and Tunisia. The primary energy production and final energy consumption per capita is very low (vary from 0,4 to 1,0 toe in both categories), energy imports remain also at very low levels, while energy exports are practically zero.

Group 2: Libya

This group includes only Libya. Energy statistics for Libya are much different from the other countries' statistics. The primary energy production and final energy consumption per capita are the highest from the rest of the countries (16,5 toe and 1,4 respectively). Libya needs almost zero energy imports while the energy exports per capita have the highest score among the Mediterranean countries. All energy production is exported, making Libya one of the main oil producers in the Mediterranean area.

Group 3: Algeria

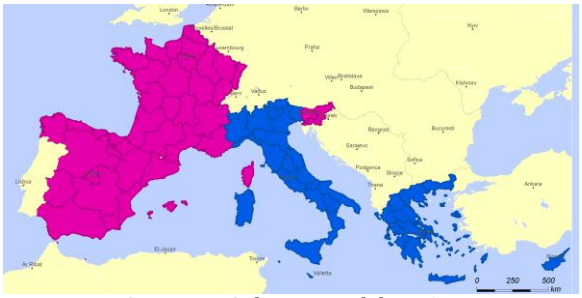
The third group includes Algeria. Energy statistics for Algeria also differ from the other countries' statistics. The primary energy production exhibits very high levels but only at one fourth compared to Libya's per capita primary production. Algeria's final energy consumption per capita is rather low compared to the average of the countries (0,5 toe) and most of the energy production is exported, placing Algeria in the second place of the oil producer countries in the Mediterranean area.

Group 4: EU Countries + 2

Countries in this group are Cyprus, France, Greece, Italy Malta, Slovenia, Spain, Croatia and Israel. In other words, this group includes all the EU countries of Mediterranean plus two more countries (Croatia and Israel). The main characteristics of this group is that while the primary energy production per capita is rather low, the needs for consumption are significantly high, a fact reflected also by the energy imports (vary from 1,8 to 4,5 toe per capita)

6.2. Second Clustering Results: EU countries vs non-EU countries

In this section, EU and non-EU countries are studied separately. Apart from the fact that EU and non-EU Mediterranean countries have different policies concerning energy, the need for a separate study also result from the previous clustering process where all EU countries consists a group on their own. While EU countries are studied concerning the renewable energy data, the non-EU countries are studied concerning the oil and natural gas energy data.



Source: IEA data, own elaboration

6.2.1 Mediterranean EU countries

The groups identified in this clustering process are presented in Map 2 and their main characteristics have as follows.

Group 1: Renewable Energy Consumers

This group of countries includes Cyprus, Greece, Italy and Malta. The per capita primary production of renewable energy is low compared to the total final consumption. As a result, the needs in renewable energy cannot be covered. A significant sum of renewable energy imports is required in order to achieve energy efficiency levels in these countries.

Group 2: Renewable Energy Producers

In the second group, three countries are identified: France, Slovenia and Spain. Unlike the first group, these three countries are the main renewable energy producers in the Mediterranean area. They cover their needs in renewable energy consumption and also export significant sum of renewable energy in other countries.

6.2.2 Mediterranean non-EU countries

In this final clustering process, four main groups are identified, presented in Map 3 below and their main characteristics have as follows.

Group 1: Algeria

The first group includes Algeria. Energy statistics for Algeria also differ from the other countries' statistics. The primary energy production exhibits very high levels but only at one fourth compared to Libya's per capita primary production. Algeria's final energy consumption per capita is rather low compared to the average of the countries (0,5 toe) and most of the energy production is exported, placing Algeria in the second place of the oil producer countries in the Mediterranean area.

Group 2: Libya

This group includes only Libya. Energy statistics for Libya are much different from the other countries' statistics. The primary energy production and final energy consumption per capita are the highest from all the rest countries (16,5 toe and 1,4 respectively). Libya needs almost zero energy imports while the energy exports per capita have also the highest score among the Mediterranean countries. All energy production is exported, making Libya one of the main oil producers in the Mediterranean area.

Group 3: Main Oil Importers

This group includes Albania, Bosnia and Herzegovina, Egypt, Morocco, Syria, Tunisia and Turkey. The per capita primary oil and oil products production are practically zero. This means that these countries cover their needs in oil consumption through imports. Energy imports in these countries place them in the first position among non-EU countries.

Group 4: Low Level Gas and High Level Oil Consumers

The countries in this group are Croatia, Israel and Lebanon. The main characteristic of this group is the low level of per capita oil and gas consumption.

7. CONCLUSIONS

Energy poverty strategies should in principle provide some form of financial assistance concerning the households' energy bills but also forms of negotiation between consumer and supplier (EPEE, 2011).

The Mediterranean countries take different approaches to address fuel poverty. While the EU countries promote the use of renewable energy sources, the non-EU countries orient themselves in reducing energy consumption.

The International Energy Agency (IEA) seeks to create conditions in which the energy sectors of their Member countries' economies can make the fullest possible contribution to sustainable economic development by giving particular emphasis to energy security and environmental protection and also by recognizing the significance of the increasing global interdependence in energy. IEA's objective is to create an international common policy framework based on energy efficiency and energy security in a cost-effective manner, flexibility to energy emergencies, environmental protection (decrease of fossil fuels and use of more environmentally accepted energy sources), improvement of energy technologies and cooperation among all energy market participants (IEA, 2011).

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THRESHOLDS IN THE PROCESS OF FINANCIAL INTEGRATION OF ALBANIA - HOW FAR AWAY IS ALBANIA FROM GREECE?

Msc. Dorjana NANO
Faculty of Education and Social Sciences,
University "Eqrem Cabej" Gjirokaster, Albania
Email: dorianananano@yahoo.com

and

Msc. Teuta LLUKANI
Faculty of Education and Social Sciences,
University "Eqrem Cabej" Gjirokaster, Albania
Email: t.llukani@gmail.com

Abstract
Recent global financial crises have caused immense debate about costs and benefits of financial integration. Overall, evidences show that industrial economies utilize benefits of financial openness and export their problems to the emerging and less developed countries. There is a substantial and empirical literature that define certain thresholds levels of financial and institutional characteristics beyond which the trade – off improves and makes opening of the capital account beneficial and less risky, especially for a developing country like Albania.
***The main aim of this study** is to analyse institutional quality, financial sector development, macroeconomic policies and trade openness as thresholds that must be satisfied in order to foster further financial integration and making it work for good, in particular for Albania and Greece. In addition, the comparison of economic characteristics and institutional development between these countries and the minimum standard will be also estimated, in order to reveal their discrepancy and deficiencies and as well to develop several policy proposals.*
***The main objectives** of this study are:*
- *To analyse the importance of institutional quality, financial sector development, macroeconomic policies and trade openness in the process of financial integration.*
- *To estimate the above mentioned economic and institutional indicators for Albania and Greece and to use the standards level of this indicators (Prasad 2009) as a benchmark in order to reveal deficiencies, the most problematic aspects, and as well future challenges for each country.*
- *To draw and assess policy implications and recommendations for improving economic characteristics in Albania and Greece, in order to fully utilise the benefits of financial integration.*

Keywords: institutional development, threshold, economic characteristics, Albania, Greece.

1. Introduction

The financial crisis has re-ignited the fierce debate about pain and gain of financial integration. Financial integration has the potential to play a catalytic role in generating an array of collateral benefits that may help boost long-run growth. Meanwhile, premature opening of the capital account in the absence of some basic supporting conditions can delay the realization of these benefits, while making a country, especially a developing one, more vulnerable to sudden stops of capital flows.

In theory, financial globalization should catalyze domestic financial market development, improve corporate and public governance, and provide incentives for greater macroeconomic policy discipline. Such indirect benefits may be more important than the traditional financing channel. It is supposed that these benefits should be much greater for emerging economies. These countries are

relatively capital scarce and labor rich, so far access to foreign capital should help them increase investment and grow faster. Developing countries also have more volatile output growth than advanced industrial economies, which makes their potential welfare gains from international risk sharing much greater.

Although the great impact of financial integration on the developing countries in theory, evidences demonstrate quite different results. There is a substantial and empirical literature that define certain threshold levels of financial and institutional characteristics beyond which the trade – off improves and makes opening of the capital account beneficial and less risky for a developing country. Financial sector development, institutional quality, trade openness and the quality of macroeconomic policies are defined to be as threshold conditions, above of which financial integration can lead to better macroeconomic outcomes. Apparently, developing countries, different from the developed ones, lack in fulfilling these conditions. A concrete evidence of this fact is the case of Albania.

Albania, as many other developing economies is still in the process of financial integration. It is consider as a country of small barriers towards the foreign capital and direct investments. An index of the "Economic Freedom" created by The Wall Street newspaper, ranks Albania above countries like Japan, Canada, France, Slovenia, Bulgaria, Malta, Cyprus, and all other countries of the former Soviet Union. Despite, the high degree of liberalization, the outer position of Albania is still fragile and it is not experiencing the full benefits of financial globalization. In this sense, Albania is a peculiar case. On the other hand, Greece the closest neighbor economy and the major trade partner of Albania outperforms the latter in many aspects. It is a longstanding member of EU, and it has a more developed financial system and institutional quality compared to Albania. However, it seems that both countries suffer from the same illness, that of corruption. It represents a serious obstacle for the overall development and the integration of the economy. In addition Albania and Greece seems to have significant low level of trade integration to the foreign economies.

On one hand, low level of openness serves as a shield that protects from the costs of financial integration, but on the other hand it is not the best solution in the contemporary times of globalisation. To think otherwise is wrongheaded and dangerous. Framing the issue this way generates a key question: Does Albania and Greece fulfil the threshold conditions in order to fully benefit from the financial integration? How far away stands Albania from Greece? This study provides the answer.

2. Methodology and Data Sources

Our methodology is based on estimating and analyzing the following indicators:

1. ***Financial sector development*** the brain of the economy that performs the essential coordinating function of channelling the funds and making productive investment. The ratio of private credit to GDP is used as a proxy for financial depth.
2. ***Quality of domestic macroeconomic*** is identified by the monetary and fiscal policy. To measure the quality of monetary policy we employ the logarithm of inflation, whereas to assess the quality of fiscal policy we calculate the average ratio of budget deficit (government revenues minus government expenditures) to GDP. In addition the Ln of initial GDP per capita will also be estimated in order to reveal the difference between Albania and Greece and deficiencies.
3. ***Trade integration***: we use the sum of exports and imports of goods and services for each country, expressed as a ratio to the appropriate GDP.
4. ***Governance quality***, which is defined as the traditions and institutions by which authority in a country is exercised[14]. This includes the process by which governments are selected, monitored and replaced; the capacity of the government to effectively formulate and implement sound policies, and the respect of citizens and the state for the institutions that

[14] World Bank Governance Matters

5. govern economic and social interactions among them. The six dimensions of governance corresponding to this definition that we measure are:
   a. *Voice and Accountability* – capturing perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media.
   b. *Political Stability and Absence of Violence* – capturing perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism.
   c. *Government effectiveness* – capturing perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.
   d. *Regulatory quality* – capturing perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.
   e. *Rule of Law* – capturing perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.
   f. *Control of corruption* – capturing perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.

To assess the average governance quality index, we calculate a simple average of the above individual six governance indicators.

Data on assessment financial sector development, trade integration, fiscal and monetary policies are mainly obtained from the International Monetary Fund (IMF), World Economic Outlook Database April 2010, and Greek Ministry of Economic and Finance 2009, whereas the individual indexes of six governance indicators are provided from World Bank Governance Indicators.

3. Does financial sector development really matter to maximize the benefits of the financial integration? Albania versus Greece

Financial sector development is a key determinant of the extent of growth and stability benefits associated with financial integration. Inappropriate or mismanagement domestic financial sector liberalizations have proven to be a major factor of crises that may be associated with financial integration. Alfaro et al., (2004) and BHL find that the growth impact of FDI and equity flows is considerably stronger in economies with well developed financial sector. In addition, financial sector development has a significant positive impact on macroeconomic stability, which in turn has implications for the volume and composition of capital flows. By expanding the scope of diversification possibilities, developed financial market moderate the effects of shocks and help reduce macroeconomic volatility. Are Albanian and Greek financial sector developed enough for fostering benefits of financial integration?

The financial system in Albania passed the empirical stage, and is experiencing the credit one. Banking sector is the most relatively developed part of the financial system. This sector dominates the financial sector with over 90% of all intermediaries' assets. The prudential regulatory framework has been strengthened and modernized in recent years, although there are still substantial shortages in terms of information quality, banking supervision and risk management. Albanian financial system is highly based on foreign currency assets and liabilities, and so far this is a reason of being sensitive to various shifts in exchange rates and interest rate yield curves for different currencies. In addition, risk is also coming from the credit growth because of the competition, which forces banks to be more flexible and more aggressive on lending.

The non-bank financial sector is less developed than the former. However, the establishment of the Financial Supervisory Authority, that supervises the markets of insurance, pensions and treasury

bonds, constitutes a definite signal of consolidation and standardization of the supervisory and regulating regime. The insurance companies are implementing a very aggressive strategy by expanding in Kosovo, Macedonia and becoming as well important players in regional insurance markets.

Different from the Albanian financial system, the Greek financial sector appears to be largely sound and deep. The banking system is well capitalized and profitable, but faces challenges arising from the global financial crisis. Although the significantly depth of the capital markets, they play only a limited role in the economy. The insurance sector remains small by EU standards, and the financial condition of many insurance firms is weak.

Risk management capabilities are being strengthened in response to regulatory change and rapid credit growth, but their application is still uneven across sub sectors and institutions. Supervision and regulation is also uneven across different segments of the financial sector. The bank supervisory authorities have been considerably effective. The Hellenic Capital Market Commission (HCMC) has been strengthen and is playing an increasing role in oversight and regulation. The insurance sector is more weakly supervised.

The most important challenges that Greek financial sector faces are: (i) managing credit risk; (ii) managing competitive pressures; (iii) diversifying funding sources; (IV) limiting state influence on the banking system; and (v) strengthening risk management.

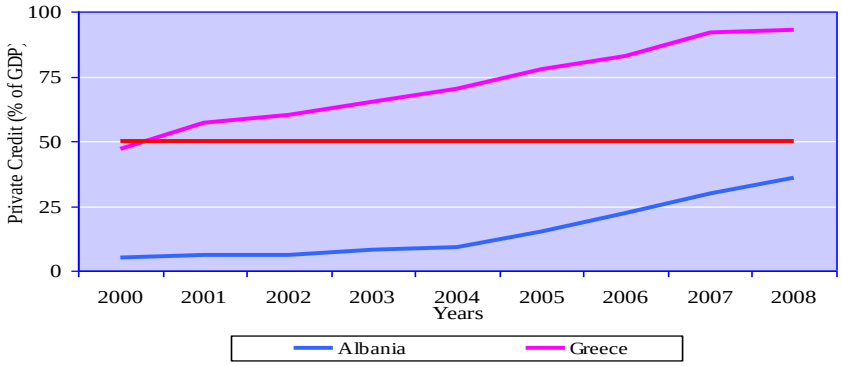
To quantify and evaluate the financial depth in Albania and Greece we use the ratio of private credit to GDP over a period of 9 years (see data on table 1) and the threshold standard of financial depth as a benchmark in order to reveal any deficiency in the financial sector development. Based on the GMM estimates calculated from Eswar S. Prasad 2009, the threshold levels of financial depth for a successful financial integration are approximately 50 percent minimum and 126 percent maximum. The progress of the financial depth in Albania in comparison with that of Greece is illustrated in the table and the line graph below.

Table 1
Source: World Bank

Year	Albania	Greece
	Private credit (% of GDP)	Private credit (% of GDP)
2000	5	47
2001	6	57
2002	6	60
2003	8	65
2004	9	70
2005	15	78
2006	22	83
2007	30	92
2008	36	93

From the table of statistics and the line graph below it can be observed a noteworthy rise in the ratio of private credit to GDP in both countries. Despite the significant increase, the data for the Albanian financial depth lie below than the minimum level, showing that Albanian financial development doesn't match the necessary condition to utilize the benefits of financial integration of Albania. Different from Albania, financial depth in Greece, overcomes considerably the former and represent a matured condition to maximize the benefits of financial integration.

Graph 1: Financial Depth
Source: World Bank



4. Institutional quality and its implication in the process of financial integration of Albania - Comparison with Greece

The quality of institutions appears to play a substantial role in determining the outcomes of financial integration. It defines the game-laws in a society. There are these laws that establish an efficient legal system, a stable financial system and also an effective regulation of the financial sector, which in turn affect the structure of a country's capital inflows. This has significant consequences since the composition of inflows appears to have considerable predictive influence for currency crashes. Frankel and Rose (1996) have proven that the share of FDI in a country's total capital inflows is negatively connected with the probability of currency crises. But, the level of FDI is highly correlated with the quality of institutions in the host country. Weak institutions affect harmfully the attraction of FDI and hamper the integration of a country since it creates uncertainty for the other ones. Furthermore, a high level of corruption will affect the overall economy. Without major anti-corruption reform; fiscal policy adjustment must rely on expenditure cuts alone to achieve budgetary balance. With respect to those government spending cuts, however, it is also considerably hard to be optimistic. High corruption is associated with excessive and wasteful spending that is hard to reverse. The existence of corruption reflects a deep inability to coordinate political action in pursuit of policies that would benefit the nation, including reducing wasteful spending. This fact is clearly demonstrates in the case of Albania.
Albania in an international comparative perspective is rated extremely low compared to other transition economies.[15] International risk assessment agencies assess Albania as a country where foreign investors risk to lose their investment due to extremely high corrupt practices. Corruption is like a cancer in the Albanian economy. It has created so much uncertainty for entrepreneurs: almost one-half of private firms admit to pay bribes to public officials and they can never be sure when the bribe is enough or whether the corrupt official will keep coming back again to demand more money. The most common forms of corruption faced in Albania are theft of public assets and the fact that the majority of public jobs are "purchased". International organizations like World Bank and IMF have to think twice to lend or grant money to the Albanian economy, because of uncertainty whether this money will be used in productive investment or will be destine in the politicians' pockets. Higher corruption in Albania has weakened the quality of institutions since good legal framework without enforcement translates into nothing. How much does the Albanian institutional quality differ from the Greece institutional quality?

To quantify the institutional quality in Albania and to identify the discrepancy from that of Greece, we use the average of six aspects of the institutional development: voice and accountability, political instability and violence, government effectiveness, regulatory quality, rule of law, and control of corruption for each country for the period from 1996 to 2008. Detailed data for each institutional indicator for both countries are represented below in the tables 2,3,4,5, 6, and 7).

[15] World Bank Governance Indicators, Percentile Rank comparison

Table 2: Voice and Accountability
Source: World Bank Governance Indicators

Year	Albania			Greece		
	Percentile Rank	Governance Score	Standard Error	Percentile Rank	Governance Score	Standard Error
	(0-100)	(-2.5 to +2.5)		(0-100)	(-2.5 to +2.5)	
2008	51.4	+0.13	0.13	73.6	+0.88	0.15
2007	49.0	+0.03	0.14	76.0	+0.96	0.15
2006	48.1	+0.02	0.16	77.9	+0.98	0.18
2005	48.6	-0.03	0.17	83.7	+1.09	0.19
2004	49.0	+0.03	0.18	85.1	+1.12	0.19
2003	49.0	+0.02	0.16	76.4	+0.99	0.20
2002	45.7	-0.09	0.17	79.3	+1.02	0.20
2000	38.9	-0.32	0.25	78.4	+0.93	0.21
1998	36.5	-0.44	0.26	83.7	+1.12	0.23
1996	30.1	-0.57	0.26	67.9	+0.72	0.23

Table 3: Political Stability and Absence of Violence
Source: World Bank Governance Indicators

Year	Albania			Greece		
	Percentile Rank	Governance Score	Standard Error	Percentile Rank	Governance Score	Standard Error
	(0-100)	(-2.5 to +2.5)		(0-100)	(-2.5 to +2.5)	
2008	45.5	+0.01	0.23	56.9	+0.32	0.20
2007	35.1	-0.22	0.24	63.9	+0.50	0.20
2006	32.2	-0.41	0.24	63.5	+0.53	0.20
2005	27.4	-0.61	0.26	63.0	+0.48	0.21
2004	23.1	-0.81	0.28	62.0	+0.44	0.22
2003	31.3	-0.43	0.30	64.4	+0.64	0.23
2002	27.4	-0.60	0.30	71.2	+0.72	0.22
2000	16.8	-0.95	0.30	66.3	+0.63	0.23
1998	19.7	-0.86	0.28	55.3	+0.26	0.24
1996	40.9	-0.12	0.39	57.7	+0.40	0.32

Table 4: Government Effectiveness
Source: World Bank Governance Indicators

Year	Albania			Greece		
	Percentile Rank	Governance Score	Standard Error	Percentile Rank	Governance Score	Standard Error
	(0-100)	(-2.5 to +2.5)		(0-100)	(-2.5 to +2.5)	
2008	44.5	-0.34	0.19	70.6	+0.56	0.19
2007	43.1	-0.36	0.19	70.1	+0.46	0.18
2006	35.5	-0.50	0.18	72.0	+0.61	0.17
2005	31.3	-0.62	0.18	73.5	+0.68	0.17
2004	41.7	-0.38	0.22	77.7	+0.83	0.17
2003	32.7	-0.56	0.21	77.3	+0.83	0.17
2002	32.2	-0.59	0.21	77.3	+0.84	0.17
2000	20.9	-0.81	0.21	76.3	+0.74	0.18
1998	23.2	-0.71	0.14	78.7	+0.90	0.13
1996	55.0	-0.18	0.35	78.2	+0.67	0.26

Table 5: Regulatory Quality
Source: World Bank Governance Indicators

Year	Albania			Greece		
	Percentile Rank	Governance Score	Standard Error	Percentile Rank	Governance Score	Standard Error
	(0-100)	(-2.5 to +2.5)		(0-100)	(-2.5 to +2.5)	
2008	57.0	+0.16	0.16	74.9	+0.81	0.20
2007	55.8	+0.10	0.18	75.2	+0.83	0.21
2006	51.7	-0.11	0.18	73.2	+0.79	0.20
2005	46.8	-0.25	0.18	76.1	+0.88	0.20
2004	48.8	-0.17	0.19	77.6	+0.86	0.20
2003	36.6	-0.44	0.19	80.0	+1.01	0.19
2002	43.4	-0.25	0.22	80.0	+0.99	0.21
2000	39.5	-0.25	0.26	79.0	+0.88	0.22
1998	38.5	-0.28	0.28	73.2	+0.72	0.25
1996	44.9	+0.02	0.35	76.1	+0.74	0.24

Table 6: Rule of Law
Source: World Bank Governance Indicators

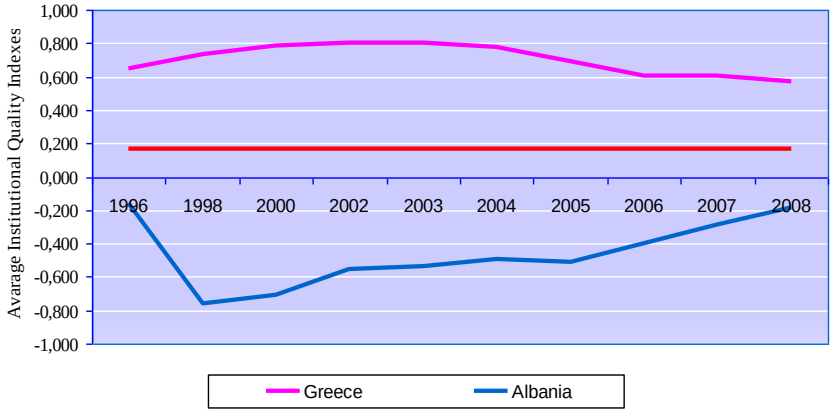
Year	Albania			Greece		
	Percentile Rank	Governance Score	Standard Error	Percentile Rank	Governance Score	Standard Error
	(0-100)	(-2.5 to +2.5)		(0-100)	(-2.5 to +2.5)	
2008	32.5	-0.60	0.14	73.2	+0.75	0.15
2007	28.1	-0.69	0.15	71.9	+0.69	0.14
2006	26.7	-0.73	0.15	71.4	+0.74	0.14
2005	24.3	-0.80	0.16	71.0	+0.70	0.15
2004	20.0	-0.88	0.16	80.5	+0.88	0.14
2003	15.7	-1.02	0.17	75.7	+0.82	0.15
2002	19.5	-0.94	0.18	72.4	+0.77	0.15
2000	13.8	-1.09	0.18	76.7	+0.86	0.14
1998	9.5	-1.21	0.21	70.5	+0.72	0.17
1996	53.3	-0.14	0.26	83.8	+1.01	0.21

Table 7: Control of Corruption
Source: World Bank Governance Indicators

Year	Albania			Greece		
	Percentile Rank	Governance Score	Standard Error	Percentile Rank	Governance Score	Standard Error
	(0-100)	(-2.5 to +2.5)		(0-100)	(-2.5 to +2.5)	
2008	39.1	-0.45	0.13	60.9	+0.10	0.15
2007	35.7	-0.59	0.14	62.8	+0.21	0.14
2006	28.6	-0.69	0.13	65.0	+0.33	0.14
2005	29.1	-0.73	0.14	65.0	+0.32	0.15
2004	26.2	-0.75	0.15	71.4	+0.52	0.15
2003	26.2	-0.79	0.16	71.4	+0.51	0.17
2002	23.3	-0.85	0.19	70.4	+0.49	0.17
2000	23.3	-0.82	0.19	75.2	+0.68	0.19
1998	13.1	-1.07	0.20	75.2	+0.69	0.19
1996	59.2	+0.03	0.48	64.6	+0.36	0.21

The line graph below provides information about the simple averages of institutional quality's governance score for Albania and Greece. At a glance it can be seen that Albanian institutional development index lies below the red line – which represents the minimal level that must be met, whereas Greece institutional quality index lies above this standard. This is a clearly evidence which demonstrates that Albania is significantly less developed institutionally when measured by the standard level (which stands at 0.171) and lags considerably behind the development of institutional quality of Greece.

Graph 2: Average Institutional Quality
Source: World Bank Governance Indicators



Anyway, although Greece outperforms Albania in the overall institutional development, there are three main points that must be highlighted:
Firstly, the discrepancy between the institutional quality indexes of these countries is decreasing continuously due to the improvement on the average Albanian index and the worsening on that of Greece.
Secondly, both countries suffer from the same illness – corruption. According to a recently published study by Katsios (2006), Greece has the largest "shadow economy" (untaxed income base) of any OECD country, which the author argues is related to the corruption of the Greek government through various channels. In 2006, Katsios estimates the Greek shadow economy at 28% of GDP. Tax avoidance, which relies on bribery to avoid prosecution, is a national pastime in Greece – the envelope used in the bribe even has its own name, the *"fakelaki,"* confirming the age-old adage that the Greeks "have a word for it." In addition, it is not a coincidence that Greece employed fraudulent accounting practices and derivatives trades to mask the size of its growing government debts (which is now far in excess of the debt-to-GDP ratios of other Euro zone countries).
Thirdly, both countries are able to address the challenge of corruption if they want to.

5. Does macroeconomic policy affect the outcomes of financial integration of Albania? Comparison with Greek macroeconomic quality and lessons drawn from the Greek crisis

The quality of domestic macroeconomic policies is significantly associated with the level and composition of inflows and exposure to crises. The Argentine crisis of 2001-02 demonstrates that even a prudential regulatory and supervisory system that effectively restricts risk taking may not be enough to prevent devastating crises if fiscal policy spins out of control. If fiscal imbalances become too large, governments resort to printing money to finance their deficits, and inflation will take off. When an economy experiences a high level of inflation, debt contracts that are often denominated in foreign currencies, will make the financial system more fragile because currency depreciation can trigger a financial crises. How effective are the macroeconomic policies in Albania and Greece to cope with the global financial crises?

The deep global economic crisis, which represents the major cost of financial integration, was felt in Albania testing the macroeconomic balances. Although the Bank of Albania pretend to have

pursued a prudent monetary policy by cutting the key interest rate by one percentage point, and increased liquidity injection, the macroeconomic fundamentals doesn't seem to be quite solid. In spite of the improvement in the ratio of budget deficit to GDP since the beginning of the period the current account to GDP has abruptly deteriorated from -10.38% in 2007 to -14.026% in 2009.[16]

In most general terms, this means that Albania has outlays on imports that are larger that its receipts from exports. This negative cash flow has to be financed by inflows of foreign capital, which in the current global situation risks vulnerability. It is often proven that developing economies suffer the costs of the crisis later than the developed one. Fortunately, the relatively low exposure of the Albanian financial system to international financial institutions, and to products that instigated the financial crises, has served up to the present as a shield for the Albanian economy. But, the future seems to be uncertain. Greece, one of the countries that have a great impact on the Albanian economy, is dramatically shrinking into an unavoidable economical regress. After years of discretionary fiscal policy and statistical frauds, Greece now faces $303 billion foreign debt, a deteriorating macroeconomic outlook and benign economic growth prospects. Have the Greek macroeconomic policy helped to minimize the costs of the crisis or did it help to plant the seed that engendered the critical situation on the Greek economy?

Since the accession to the European Monetary Union, Greece's macroeconomic outlook has been deteriorated by volatile rates of inflation, high fiscal deficit and the extremely high public debt Even, compared to the other member of the EU, the ratio of public debt accounted for the highest figure. In 1996, Greece's inflationary outlook was improved since the central bank managed to target the inflation which, for the first time, decreased below two-digit level. Since the accession to the EMU, Greece failed to curb the ailing fiscal deficit and very high public debt. The convergence criteria require each country of the euro zone not to exceed the fiscal deficit by more than 3 percent of the GDP. In particular, Greece's terrible state of fiscal health was reflected in the high levels of current account deficit. According to the International Monetary Fund (IMF), the situation is expected to worsen with the current account balance deteriorated in (-9) percent of the GDP by the end of this year.

In the course of 2008, the annual GDP growth rate down to 2.9%, while in the first quarter of 2009 Greece's GDP expanded by only 0.3% compared to the previous quarter. For 2009 as a whole growth prospects appear gloomy, with recent forecasts ranging from a positive growth rate of 1.1% (Greek Ministry of the Economy and Finance, 2009) to a GDP contraction of 0.9% (European Commission, 2009). In the labour marker front, the unemployment rate picked up to 8.7% by March 2009 versus 7.2% in mid 2008 and is expected to increase further in the near future, in line with the slowdown in economic activity. In addition to one of the world's most terrible pension systems, Greece faces high burden of taxation, high government spending, burdensome corruption and highly regulated labour market. The country is likely to face a slow and cumbersome economic recovery that could probably last several years.

To quantify Albanian macroeconomic policy and to make comparison with that of Greece we employed the logarithm of inflation rate, Ln of GDP per capita (in USD unit), and budget deficits as a proxy of GDP for each country, based on statistics from 2000 to 2009. (See data on table 8, 9 and 10 and the line graphs below).

[16] IMF, World Economic Outlook Database, April 2010

Table 8
Source: IMF, World Economic Outlook Database, April 2010

Years	Albania			Greece		
	Inflation	Annual Inflation Rate	Log Inflation	Inflation	Annual Inflation Rate	Log Inflation
2000	100	0.04	**2**	100	2.89	**2**
2001	103.121	3.12	**2.013**	103.654	3.65	**2.016**
2002	108.502	5.22	**2.035**	107.712	3.92	**2.032**
2003	111.045	2.34	**2.045**	111.412	3.44	**2.047**
2004	114.232	2.87	**2.058**	114.779	3.02	**2.060**
2005	116.930	2.36	**2.068**	118.778	3.48	**2.075**
2006	119.702	2.37	**2.078**	122.714	3.31	**2.089**
2007	123.218	2.94	**2.091**	126.385	2.99	**2.102**
2008	127.357	3.36	**2.105**	131.738	4.24	**2.120**
**2009*	*130.188**	2.22	***2.115****	*133.231**	*1.13**	***2.125***

**2009 forecasting from IMF*

Inflation statistics are provided from IMF, World Economic Outlook Database, April 2010. Log inflation is calculated by the authors.

Graph 3: Monetary Policy

Source: IMF

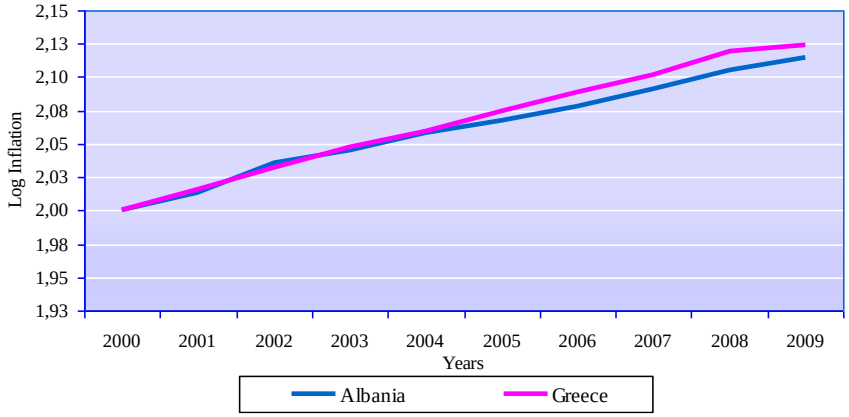


Table 9
Source: IMF

	Albania	Greece
	General government balance (in percent of GDP)	General government balance (in percent of GDP)
2001	-13,7	-4,5
2002	-13,7	-4,8
2003	-5,05	-5,7
2004	-8,33	-7,5
2005	-3,46	-5,1
2006	-4,32	-2,8
2007	-3,51	-3,6
2008	-2,49	-5
*2009**	*-3,51**	*-6,4**

**2009 forecasting from IMF*

Graph 4: Fiscal Policy
Source: IMF

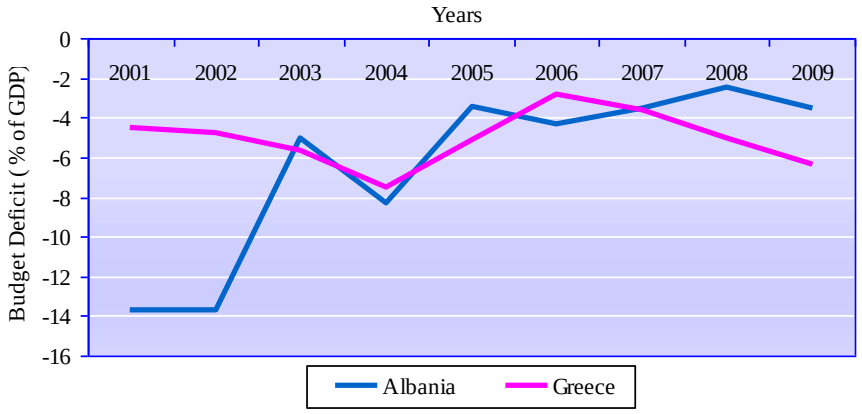


Table 10
Source: IMF

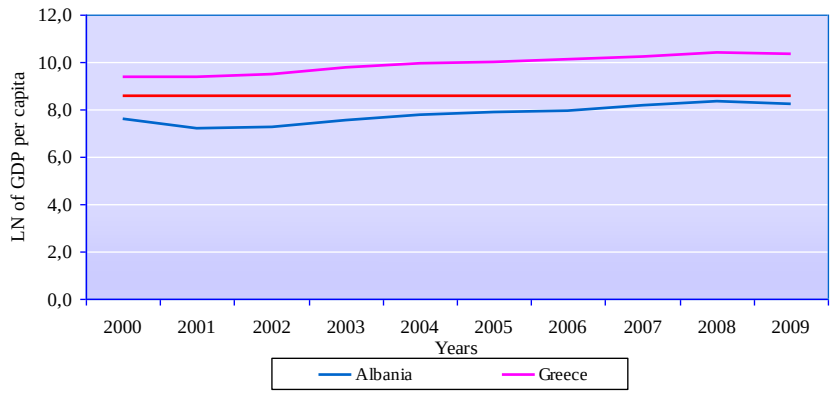
	Albania		Greece	
Years	GDP per capita	Ln of GDP per capita	GDP per capita	Ln of GDP per capita
2000	1990	7.6	11661	9.4
2001	1327	7.2	11950	9.4
2002	1440	7.3	13446	9.5
2003	1835	7.5	17587	9.8
2004	2341	7.8	20926	9.9
2005	2611	7.9	22253	10.0
2006	2893	8.0	24146	10.1
2007	3446	8.1	28145	10.2
2008	4089	8.3	32105	10.4
*2009**	*3680**	*8.2*	*30304**	*10.3*

*Unit: USD*Forecasting from IMF*

GDP per capita statistics are provided from IMF. Ln GDP per capita is calculated by the authors

Graph 5: LN of GDP per capita

Source: IMF



At a glance we can see that there is an overall upward trend of the log inflation and Ln of GDP per capita, and as well a fluctuating tendency in the rate of budget deficits. On closer inspection of the data it can be observed that there is a significant discrepancy between the macroeconomic indicators of Albania and Greece, which is summarized and explained as follows:

Firstly, although the annual inflation rate is maintained at around 3% in both countries, the line graph shows that the inflation rate in Greece exceeded that of Albania in 2003 and stands higher with approximately three points. Secondly, budget deficit in Albania has experienced high fluctuations; but the overall trend seems to be abruptly increased, that is a good sign. Different from Albania, the ratio of budget deficit to GDP in Greece peaked at about minus 3% in 2006, after reaching an all time low of approximately -7.5% in 2004 and is experiencing a sharp deterioration up to the present. This drastically worsening is caused mainly from the average increases in unit

labour costs and prices, that diminished substantially Greek current account and from the dramatically rise in the interest cost burden as genuine concerns about fiscal sustainability combined with speculation and misinformation to dramatically raise the rate of interest on new Greek government bonds. Thirdly, Ln GDP per capita lies above the minimum threshold level, which stands at 8.569, whereas the Albanian figures do not meet this standard.

Apparently, one of the main causes of Greek catastrophe is the macroeconomic weakness. An old Greek proverb says: "Shame to those that cry and do not know the reason why." As Greek "cry" and Albania and all the Europe feel the threat from the economic crisis of Greece, let us not forget that the macroeconomic quality really matters for determining the outcomes of the integration process.

6. Trade openness as a threshold in the process of financial integration of Albania and Greece.

Trade integration seems to play a significant role in mitigating the adverse growth effects of financial crises and in facilitating recoveries from crises. The costs of financial crises depend on the degree of openness of an economy since less open economies have to go through larger contractions of aggregate demand and larger changes to the real exchange rate change to adjust to large shocks. Trade integration could help a developing economy to export its way of recession since the depreciation of the exchange rate will lead to more incomes from exports. How efficient is the trade integration of Albania in utilising benefits of its financial integration?

Albania was admitted as a member of World Trade Organisation, within the frame of multilateral commercial system, in September 2000. So, in this way, the country trading policies are presently anchored by the regulator system of the global trade, which makes these policies more transparent and reliable. The Free Trade Agreement with the Region countries have facilitated and liberalised the trade between Albania and these countries. Within the frame of European integration in 2003, Albania initiated the negotiations in order to endorse the Association Stabilisation Agreement and on 12-th December this agreement was endorsed in Luxemburg. Consequently, trade integration between Albania and the EU has increased considerably. The value of exports and imports of goods and services soared to 90.6% of GDP in 2008, compared to 56.6% of GDP in 2000 (see table 11). Albania continues to be an import-oriented economy with total imports accounting for 59.4% of GDP, almost twice as much as the percentage of exports. The export remains small, narrow, and undiversified, based mainly on raw or rough materials, due to a lack of price competitiveness, poor infrastructure, and a challenging business environment. How far away is trade integration of Albania from that of Greece, which is a member of the EU?

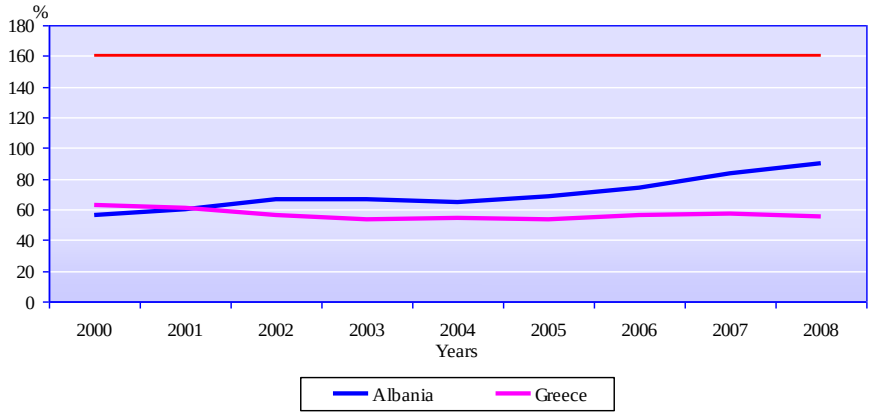
In spite of the participation in the EU, the openness of the Greek economy remains relatively low. This is largely attributable to the relatively poor export of goods performance of the country. The difficulty of Greek exports of goods to penetrate foreign markets, on the one hand, and the easy penetration of foreign goods into the domestic market on the other, constitute problems that may have many explanations. They both reflect the persistence of structural weaknesses of the Greek economy, which have been primarily responsible for keeping the competitiveness of Greek products rather low. This, in turn, means that Greece's participation in the EU and the creation of the single market did not lead to substantial structural changes as to make the combination of quality and price of Greek exports of goods attractive to international markets. This might be the result of: (a) adverse relative factor cost developments per unit of output, (b) inadequate intra-industry trade flows which are usually related to higher specialization, product diversification and economies of scale, (c) inadequate inward foreign direct investment which usually transfers new technology, (d) long term problems of the educational system and its relationship to the needs of the economy, (d) problems related to goods and labour market structure, and (e) an interventionist public sector which inhibits innovation and entrepreneurship.
Table 11 and the line graph below represents trade openness of Albania and Greece assessed as the ratio of the sum of imports and exports of goods and services to the relevant GDP, covering a period from 2000 to 2008.

Table 11
Source: World Bank

Year	Albania			Greece		
	Exports of goods and services (% of GDP)	Imports of goods and services (% of GDP)	Trade Integration (Exports + Imports)/GDP	Exports of goods and services (% of GDP)	Imports of goods and services (% of GDP)	Trade Integration (Exports + Imports)/GDP
2000	19	37	56	25	38	63
2001	21	39	60	24	37	61
2002	20	47	67	21	35	56
2003	21	46	67	20	33	53
2004	22	43	65	22	32	54
2005	22	46	68	22	31	53
2006	25	49	74	23	33	56
2007	28	55	83	23	34	57
2008	31	59	90	23	32	55

Although the significant rise in the trade openness of Albania compared to the level of Greece, they both stand noticeably far below from the minimal threshold condition which accounts for 160.2%.

Graph 6: Trade Openness
Source: World Bank



Obviously, trade integration of Albania and Greece represents an unrealised condition for a successful financial integration. Low exports will not fully benefit from the domestic currency depreciation, and so far can not outweigh any economic deficit created in crises situation like the current one.

7. Conclusions and Policy Recommendations

Utilising the benefits of financial integration is one of the greatest challenges that emerging and developed economies are facing today. Financial sector development, institutional quality, trade openness and the quality of macroeconomic policies seem to be represented as threshold conditions that must be satisfied in order to fully utilise the outcomes of financial integration. Albania, as many other emerging economies, appears to not meet these certain conditions, whereas Greece

outperforms Albania regarding financial sector development, institutional quality and macroeconomic development, but lags behind it in the level of trade integration. Hence, it should be admitted that:

i) Firstly, Albania is "institutionally challenged". Deficiencies in the institutional quality, due mainly to the prevalence of the corruption, have weakened the quality of the Albanian institutions. In this way it is necessary to build a political will to support institutional development. Apparently, institutional development remains future challenge for Albania in order to make financial integration a force for good. It is necessary for the Albanian Government to foster public interest instead of politician's ones, and to really implement its well-known policy "with clean hands". Meanwhile, reducing "the shadow economy" in the Greece by declining corruption and promoting transparency and strong supervision represent great challenges for this EU member country.
ii) Secondly, Albanian financial depth is considerably far away of the minimal financial threshold, demonstrating that financial sector development is not capable to promote the best of financial integration. Opening up financial market to the outside world will not magically makes Albania rich. It requires effective prudential and supervision. Regarding future financial development of Greece, it is really important to manage credit risk and competitive pressures, to diversify funding sources, and also to limit state influence on the banking system.
iii) Thirdly, macroeconomic policies pretend to be cautious in both countries, but the evidences do not promise the same. Significant increase in the deficit of the current account and the rise in the logarithm of the inflation don't demonstrate strong macroeconomic fundamentals. Establishing budget rules that increase transparency and promoting price stability should be the main focus on the macroeconomic policies in both countries.
iv) Finally, trade openness of Albania and Greece represents an unrealised condition for a successful financial integration. Low exports will not fully benefit from the financial integration. An export orientation policy will be highly beneficial to the overall economy. It is highly recommendable especially for Greece to be able to raise competition, in order to stimulate higher productivity and subsequently higher growth rates.

To conclude, Albania and Greece must take responsibility for their own fate in this integrated world.

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PARTICIPATORY EVALUATION OF RURAL DEVELOPMENT PROGRAMMES: A QUALITATIVE APPROACH IN THE CASE OF MODERNISATION OF AGRICULTURAL HOLDINGS IN GREECE

Eleni PAPADOPOULOU
Assistant Professor, Aristotle University of Thessaloniki, School of Engineering, Department of Spatial Planning and Development
Tel.: 0030 2310 991431
E-mail address: epapa@auth.gr

Christos PAPALEXIOU
PhD Candidate, Aristotle University of Thessaloniki, Faculty of Agriculture, Department of Agricultural Economics
Tel.: 0030 6944778414
E-mail address: chpapale@agro.auth.gr

Nikolaos HASANAGAS
University Forest Administration, District Forester of Pertouli
Tel.: 00306977381637
E-mail address: n.hasanagas@gmail.com

Abstract
The assessment of Rural Development Policy results and impacts is a very difficult and complicated process owing to the compound and multisectoral nature of the countryside. It is assumed that the assessment of Rural Development Programme impacts, in the way it is applied nowadays, is not able to satisfy the need for a deep and useful evaluation. The outcomes of evaluation should be a major tool for policy design. The Common Monitoring and Evaluation Framework (CMEF), which was introduced by the EU for the evaluation of Rural Development Programmes is criticized as a very "economic indicator" oriented system. Many data are required for the calculation of CMEF indicators, which are not available in a lot of EU member states. This research aims to identify problems and shortcomings occurred during the phases of rural development policy design, implementation and evaluation, which influence the success of such policy programmes. Based on a previous research, where network analysis was applied, the researchers made an attempt to examine the problems with the use of in-depth interviews and focus group. Measure for the modernisation of agricultural holdings in Greece was used as a case study. Complexity in processes, bureaucracy, delays, lack of data at regional and national level, lack "evaluation culture" seem to be the most crucial factors of failure.

Keywords: Rural Development Policy, Regional Development, Evaluation, Stakeholders' participation, In-depth interviews, Focus groups

1. Introduction

The agricultural sector played a key role in the establishment of the EEC. The implementation of the Common Agricultural Policy (CAP) begun simultaneously with the establishment of the EEC in 1957 and it was the first common policy implemented (European Institute of Public Administration [12]). Furthermore, over 56% of the total EU27 population lives rural areas, which cover 91% of the total land (European Commission [10]). Greece covers an area of 13.196.887 Ha, 97.1% of which are classified as rural areas (73.9% predominantly rural and 23.2% intermediate rural). About 2/3 of the Country's total population resides in rural areas (37.2% predominantly rural and 27.2% intermediate rural) (European Commission [10]).

The last years, the focus of the EU Rural Development Policy tends to shift from the competitiveness of agriculture and forestry, to the improvement of the quality of life and diversification into a wider rural economy, emphasising in policies' environmental impacts. According to Papadopoulos and Liarikos [38], the EU adopts a spatial (regional) rather than a rural (sectoral) approach for rural development. It also seeks to provide more options and greater flexibility at national and local level (Midmore et al. [31]).

Agricultural activities cause numerous positive and negative impacts on the natural and residential environment, local communities and national economy. However, these effects are sometimes very difficult to be measured (Legg [24]). This is the main problem facing evaluators and policy makers when they try to assess agro-environmental policies impacts.

The purpose of the evaluation is to examine the reason for an intervention or policy in order to guarantee the repetition of successful examples and the avoidance of failed ones. It uses systematic scientific methods of economy and sociology, social psychology, economic geography, anthropology and other sciences. Crucial factor for the proper implementation of evaluation methods is the availability and reliability of socio-demographic and economic data (European Commission, EC Structural Funds, Vol.1 [11]). Evaluation provides valuable information to decision makers about the consequences of their policies and is also a key mechanism for the improvement of the quality of regulation (Tscherning et al. [50]; Jacob et al. [19]). Additionally, it justifies and controls public money spending (Huelemayer and Schiller [18]). Proper collection of data in a regular basis would facilitate the processes of evaluation and may lead to safer and more useful outcomes.

According to Greek Rural Development Programme 2007-2013 [45], "Evaluation examines the outcomes and impacts of the Program, evaluating the effectiveness, efficiency and appropriateness of the measures, in order to contribute to shaping and redirecting of policies. For this purpose, the assessment is based largely on data and information collected through monitoring, which means these two activities are interdependent on principle."

Ray [44] argues that evaluation should be viewed as a periodic or continuous process of data or potential actors in local development input and not as a judgment of an objective external "expert". Rural development is becoming more participatory at all stages. A typical example is the LEADER "bottom-up" approach. Participatory development requires a participatory evaluation system.

Evaluation is an important process for understanding the current situation for all stakeholders (High and Nemes [17]). Active participation is important for the success of the system of multilevel governance. The involvement of people and organizations from all levels of rural development leads to the mixture of different personalities, opinions, experiences, culture and general other characteristics. Such a mixture could help for a more integrated and holistic approach to reality.

Evaluation should be considered as an integral part of the implementation of actions and programs and not as a separate process (High and Nemes [17]). Casley and Kumar [5] define evaluation as a periodic assessment of the efficiency, effectiveness and impact of an action under the defined objectives. In other words, evaluation answers two basic questions: "will the action achieve its objectives?" and "how the implementation of an action could be improved in relation to the original objectives?" (High and Nemes [17]).

Patton [41] argues that evaluation is culture that is shared between the evaluators and all those who are involved in rural development processes. Culture, in anthropology is defined as a system of shared beliefs, values, norms, traditions, attitudes, knowledge and language used by members of a society to survive and create ways of thinking and shared understanding (Díaz-Puente et al. [8]) .

Policy programs evaluation was firstly introduced in the U.S. in the 1950s, when the effectiveness and transparency of government were put into question. It was disseminated in the 1960s focusing

primarily on innovations in the areas of education, social services, public health and crime prevention (European Commission, EC Structural Funds, Vol.1 [11]).

During 1970s the first evaluations of regional policies took place, especially in the United Kingdom, Sweden and Germany. These three European countries with the United States and Canada were pioneers in the adoption of the assessment. In 1980s, Denmark, Netherlands, Norway and Switzerland also started adopting the assessment of regional policies (Díaz-Puente et al. [8]).

Southern and central European Union countries had not tradition of evaluation. The legislative reform of the European Structural Funds in 1988 introduced program evaluation. This does not mean that there was no evaluation of EU programs before 1988, however, the structural funds made it mandatory for all structural projects financed by European funds. This led to the institutionalization of evaluation especially in southern and central European Union countries (Díaz-Puente et al. [8]).

In 1994 the Commission launched the "Means for Evaluating Actions of Structural Nature (MEANS)" to support Member States in evaluating their activities. The real purpose of this project was to encourage the development of a coherent, at European level, uniform approach to documenting the assessment methods used in most Member States and contribute to the dissemination of more reliable operating examples (Díaz-Puente et al. [8]).

The European Commission launched in 1995 a program aimed at improving the ultimate resource management, called "Sound and Efficient Management - SEM 2000". This assessment included all policies impacting on its budget. Furthermore, the European Commission Directorates were asked to adopt the continuous evaluation of programs and the creation of evaluation units (European Commission, EC Structural Funds, Vol.1 [11]). Since 1997, the Commission began to publish guidance on methodological approaches for evaluation, which were usually specific to each program (Díaz-Puente et al. [8]).

Until 2007, evaluation at EU level had mainly focused on results and not on impacts (Keenleyside [20]). In the fourth programming period (2007-2013) the requirements for evaluation increased. A Common Monitoring and Evaluation Framework (CMEF) introduced to guide Member States towards a more effective system of Rural Development Policy assessment regarding the achievement of national and Community objectives. CMEF also aims to ensure the accountability Rural Development Programmes public expenditure and improve program results. CMEF is a set of documents prepared by the European Commission and approved by Member States (Castellno [6]) that includes a series of evaluation guidelines and a list of input, output, result and impact indicators. Additionally, the European Evaluation Network for Rural Development was founded in the fourth programming period.

The assessment of impacts was introduced by the European Commission in 2002 to ensure greater transparency and to improve the quality of EU policies. Inter-sectoral consultation, broad participation and quantitative assessment of policy impacts are the main characteristics of this process (Thiel [49]).

Article 86 of the 1698/2005 EC Regulation [37] suggest the establishment of an ongoing evaluation system for each rural development programme in all Member States. The main role of ongoing evaluation is to "examine the progress of the programme in relation to its goals by means of result and, where appropriate, impact indicators, improve the quality of programmes and their implementation, examine proposals for substantive changes to programmes and, prepare for mid-term and ex post evaluation."

The policy cycle model, as presented by Anderson et al. [1], is widely used to describe the four main stages of policy process, which are the following:

- Agenda Setting
- Policy Formulation

- Policy Implementation
- Policy Evaluation

Although the "typical" evaluation places the peak of organizational learning at the last stage of the policy cycle, the other three stages provide important opportunities for monitoring and evaluation. There is an interaction between all stages and evaluation is the link among them. It constitutes an element of reflexivity in the policy process and it plays a major role in the policy (re-) formulation (Laschewski & Schmidt [23]). Moreover, during policy implementation, a kind of "formative" evaluation can examine the way the policy is implemented, the achievement of objectives and possible changes or improvements that could influence its effectiveness. This type of evaluation mostly appears early in the implementation of the policy, when the development or change is possible (Midmore et al. [31]).

Evaluation, as dictated by the Common Monitoring and Evaluation Framework (CMEF) [9], can only examine the achievement of policy objectives set at the beginning of the programming period in terms of outputs, results and impacts. The CMEF indicators emphasise on environmental and economic impacts while no common social indicators have been suggested so far (Huelemeyer and Schiller [19]). Evaluation experience has also raised major shortcomings of the current system. Huelemeyer and Schiller [19] mention the difficulties to capture less obvious and less tangible effects of Rural Development programmes and especially when synergies among measure objectives occur. Additionally, they mention the difficulty to assess deadweight and displacement as required by the CMEF, the lack of qualitative methods to capture negative impacts, the lack, usefulness and accessibility of data and, finally timing of evaluation. Marquardt and Möllers [26] state that answering the CMEF common evaluation questions within midterm evaluation period might be meaningful as most of impacts need time to become visible.

High and Nemes [17] call the type of policy evaluation as it is applied by now "exogenous evaluation" carried out by an independent external evaluator, who is obliged to follow specific quantitative methods and a system of indicators. The same authors, referring to the evaluation of LEADER, argue that the conventional processes of exogenous evaluation fail to measure most of the value-added provided LEADER approach.

As already mentioned, between agenda setting (targeting) and performance (outputs, results and impacts) there is a set of processes: design (or formulation), implementation / delivery and evaluation. These procedures which are in red box in the center of Figure 1, were called the "forgotten middle" as they have never been evaluated, although they are full of changes, challenges and real-life information.

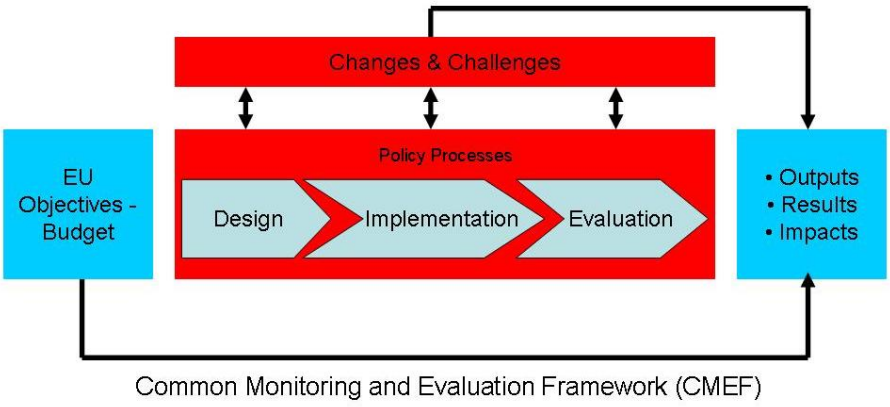

Figure 1: Interaction among policy stages: the "forgotten middle"
Source: RuDI Policy Brief [47]

The evaluation of the "forgotten middle" processes can provide answers and information about policy from design to outputs, results and impact. Endogenous evaluation could ideally assess the processes of the "forgotten middle", based on the participation of local institutions and indigenous knowledge systems, providing an opportunity for the enhancement of local society and experience. Moseley [36] argues that the appropriate methodology for the evaluation of rural development should be highly participatory.

High and Nemes [17] propose a hybrid system that combines the objectivity of exogenous evaluation which achieves objectivity through the use quantitative methods and a set of indicators, with the use of local knowledge and participation of all stakeholders under endogenous evaluation. More democratic evaluation methods are required (Gore and Wells [15]). Moseley [36] argues that the appropriate methodology for evaluation of rural development programmes should be highly participatory.

Baslé [2] and Midmore et al. [32] argue that methods of policy evaluation, as they are suggested by the European Union, have inherent weaknesses in tracing the chain of causality between actions and impacts. Traditional evaluation techniques are only able to explore the extent to which the objectives of the policy are satisfied. They fail, however, to engage with more important issues for policy improvement, such as how and why they operate work the way they do.

The quantitative evaluation of rural development programmes as provided by the CMEF for the fourth programming period (2007-2013) should be supported by the observation of the processes of rural development with a system of qualitative evaluation. This would help to better interpret the interactions among different actors involved in rural development (Midmore et al. [32]). Furthermore, rural areas complexity and diversity requires the consideration of special local characteristics during the evaluation process.

Owing to the nature of CAP Pillar II measures the evaluation process becomes even more complicated. In many cases the results and effects are indirect, which makes it difficult or impossible to estimate them. A typical example is the measures that significantly affect landscape, biodiversity, improvement of income from tourism or development of diversified traditional agricultural products. Natural, social and economic environment are effective at the same time by such measures. Additionally, there are parallel national or EU policies implemented in the countryside. How complicated is to evaluate each policy's impacts in a lake for instance?

In the current research there is an attempt to analyse the politico-administrative system of Measure 121 in order to examine and evaluate its design, implementation and evaluation processes. Measure 121 "Modernization of agricultural holdings" was chosen because it is the third most strongly financed measure in the 4th programming period (2007-2013) in the Greek Rural Development Programme. It was planned to absorb 9.04% of the total funds. It is also one of the most popular measures. It aims at strengthening the competitiveness of agricultural holdings through a more effective use of inputs, including the development of new technologies, through diversification of agricultural holdings by encouraging investments for non-food and energy plants, by making the farms more "friendly" to the environment, by improving work safety, health and animal welfare. Emphasis will be laid on the animal production, while in the crop section priority is given to investments for restructuring the production of the tobacco and cotton.

The implementation of Measure 121 was in a very early stage at the primary data collection period. Thus, the research was conducted by the analysis of data collected from experts who were involved in the implementation of the relevant Measure "Investments in agricultural holdings" in the previous (3rd) programming period. Most of them are also involved in the 4th programming period. This was a major problem which was transformed into a big research challenge because it gave the researchers the chance to examine, compare and contrast possible and real differences and similarities between the two programming periods.

The main purpose of this research is to develop a discussion with people who are involved in the three policy stages of policy cycle, the so called "forgotten middle", policy design, implementation and evaluation of the Greek Rural Development Programme. More specifically it aims to examine the arising problems and shortcomings of each stage and recommend possible ways to overcome them.

2. Methodology

Extended literature review and desk research of relevant public documents were carried out in order to achieve a satisfactory understanding of the theoretical background. Primary data were collected at two stages. At first stage, qualitative in-depth interviews were applied. At second stage, based on the results of the in-depth interviews and the outcomes of Papadopoulou et al. [40] previous research, experts from the institutions, which appeared to play crucial role in rural development, were invited to participate in a focus group. Papadopoulou et al. [40] proceed primary data from experts in-depth interviews with the use of Quantitative Network Analysis.

At first stage, after the use of a pilot questionnaire, two semi-structured interviews were employed with people involved in the implementation of Measure about "Modernisation of agricultural holdings". The final questionnaire included 30 questions and interviews lasted about 120-180 minutes each. After contacting interviewees, he interviewers visited them. No interview was conducted by phone. Both written notes as well as digital recorder were used during the interviews in order to save and process their content. The questionnaire was at the disposal of the interviewees before the meeting so as to able to find out details and was better prepared for answering the questions.

Interviewing aims to observe personal views of the interviewees (Patton [42]). Qualitative research provides the opportunity to the researcher to see the pluralisation of the observed topic (Mason [29]). Patton [42] underlines the strength of the qualitative methods to investigate issues in depth. The qualitative researcher considers interviewee's views as valuable and respects "how the participant frames and structures the responses" (Marsall and Rossman [27]). The four analytical strengths of qualitative methods are: complexity, depth, context and dynamics (Milburn [33]). Qualitative research enables the investigator to appreciate "how things work in a particular context" (Mason [29]). According to Denzin and Lincoln [7] "qualitative researchers study things in their natural setting" and interpret the everyday social world. Morse [35] supports that "the laboratory of the qualitative researcher is everyday life".

At second stage, the outcomes of Papadopoulou et al. [40] research were also used for the selection of the focus groups participants. Papadopoulou et al. [40] conducted Quantitative Network Analysis and provided information about the politico-administrative network of the measure for modernization of agricultural holdings of the Greek Rural Development Programme. In total, they found that the network consists of 15 key actors:

- 4 Ministerial departments
- 4 Farmer associations of 1st degree (local associations) and 2nd degree (farmer unions including the local associations) as well as the umbrella organizations of farmers at national level
- 3 Private consultant and development agencies
- 1 semi-state organisation concerning financing in agriculture
- 1 Regional Authority
- 1 Prefectural department
- 1 farmer-related chamber

That analysis was based on the concept of social-policy networks (Buskens [4], Brandes et al. [3], Evans [13], Knoke and Kuklinski [21], Marsh and Rhodes [28]). A network is a system of interactions or relations among actors (agencies, interest groups, investors etc). Papadopoulou et al. [40] research was concentrated on the inter-personal relations known as "complete network analysis", as opposed to "ego network analysis", which concentrates on the emergent character and behavior of specific actors within their social-policy networks. A complete network is the

multiplicity of relations among a given set of actors, which in that research were composed of trust relations, institutional pressure, conflicts, general and scientific information flow, ascription of dogmatism and expectance of flexibility

At third stage, 27 representatives from the institutions, which were found to play a crucial role in rural development policy, were invited to participate in a focus group. The participants were originated from local, regional and national institutions involved in rural development. Private, semi-public and public authorities were included in the focus group sample. Focus groups are usually conducted with 7 to 10 participants but according to Fong Chiu [14] the size of groups varies according to the key research problems and conditions. In this research the aim was to have representatives from as many as possible institutions involved in rural development. The main purpose of the focus group was to identify the main problems they face at the stages of Rural Development Policy design, implementation/delivery and evaluation.

A semi-structured discussion guide with open-ended questions was prepared before the meeting in order to keep the focus on the topic, as suggested by Makosky Daley et al. [25] and the whole process was digital recorded for later processing. The discussion was separated into three thematic units, one for each phase of rural development policy; design, implementation/delivery and evaluation. Before the end of the focus group, participants were asked to play an "interactive game" in order to identify the main problems of each one of the above phases. Participants were given coloured cards according to the administrative level to which they belonged (national, regional or local) and they were asked to write in the cards the most crucial problems, according to their opinion and experience, at the phase of rural development policy implementation and to stick the cards in a big "paper board", which was separated at national, regional and local level, pointing out the administrative level/s the problem appeared. The same process was followed for the phase of evaluation. All points made were also orally presented and explained.

This process looks like framework analysis as described by Krueger's [22], Ritchie & Spencer [46] and Rabiee [43]. Framework analysis is a way to analyse focus group data and it is 'an analytical process which involves a number of distinct though highly interconnected stages'. The five key stages outlined are: familiarization; identifying a thematic framework; indexing; charting; mapping and interpretation. Normally data processing is done by the researcher but in the current study it was done in a participatory and more interactive way during the focus group so as to achieve deeper and richer outcomes.

Focus groups are a qualitative research technique, defined as group discussions organized to explore a set of specific issues or to confirm a hypothesis (Greenbaum [16]; Krueger [22]; Stewart & Shamdasani [48]). The main purpose is to understand and explain the meanings, beliefs and cultures that influence each participant's feelings, attitudes and behaviours (Rabiee [43]). According to Massey [30], focus groups offer an opportunity to obtain significant insight regarding the experiences, observations and opinions of group members. The researcher, who has an active role in the discussion, collects data through group interaction on a determined topic (Morgan [34]). Focus groups are usually conducted to formulate solutions and to identify gaps in capacities for the implementation of policy programmes and they are able to generate large amounts of data and useful information in a relatively short time. The interaction of the group leads to richer and deeper results than those obtained from one-to-one interviews (Fong Chiu [14]).

Focus groups' multiple applicability has been underlined by many researchers. Fong Chiu [14] mentions aging, criminology, medical sociology, political sociology, social movements and the sociology of word in the field of social sciences. Both qualitative and quantitative methods are used by evaluation researchers the last years. Massey [30] claims that focus group techniques are included among the more common qualitative methods of obtaining data.

In the current research, focus group is directly combined with other qualitative (in-depth interviews) and indirectly with quantitative (Network Analysis) methodologies. Focus groups can be used both

as a self-contained method and in combination with surveys or other research methods. Morgan [34] identifies four ways of combining focus groups with surveys:

1. Surveys are the primary methods and focus groups serve in a preliminary capacity (developing the content of quantitative questionnaires)
2. Focus groups are the primary method while surveys provide preliminary inputs that guide their application
3. Surveys are the primary method, but the focus groups act as a follow-up that assists in interpreting the survey results (clarifying poorly understood results and go deeper)
4. Focus groups are the primary method and surveys are used as a source of follow-up data

In this research, focus group is the primary method. One could claim that it is between case 2 and 3. The focus group clarifies and goes deeper into in-depth interviews results about the major problems of the rural development policy processes and Quantitative Network Analysis provides inputs mainly for the selection of the participants in the focus group as it illustrates the actual roles in the rural development policy network.

3. Results and discussion

3.1. Desk research results

In the third programming period 2000-2006 Measure "Investments in agricultural holdings" was separated into two sub measures: 1.1 concerning investments in animal production units and 4.1 concerning investments in crop production units. Until 2005 the implementation politico-administrative system of Measure 1.1 was centralised while Measure 4.1 was implemented by a more decentralised system. Responsible for the implementation of animal production units' investments was the Ministry of Rural Development and Food. Thirteen Regional Directorates of Agricultural Development were in charge of the implementation of crop production units' investments. After 2005 the responsibility for the implementation of both 1.1 and 4.1 passed in the Ministry of Rural Development and Food. In the fourth programming period 2007-2013 the implementation politico-administrative system of the corresponding Measure 121 "Modernisation of agricultural holdings" is characterised as centralised, although regional and local authorities play a crucial role especially in the stages of the collection of applications and in the early stage of the approval of applications. Nevertheless, regional and local authorities still participate in the implementation procedures but they do not participate in the decision making processes. The institutional maps of the politico-administrative systems in the third and fourth programming periods are illustrated in Figures 2 and 3 respectively.

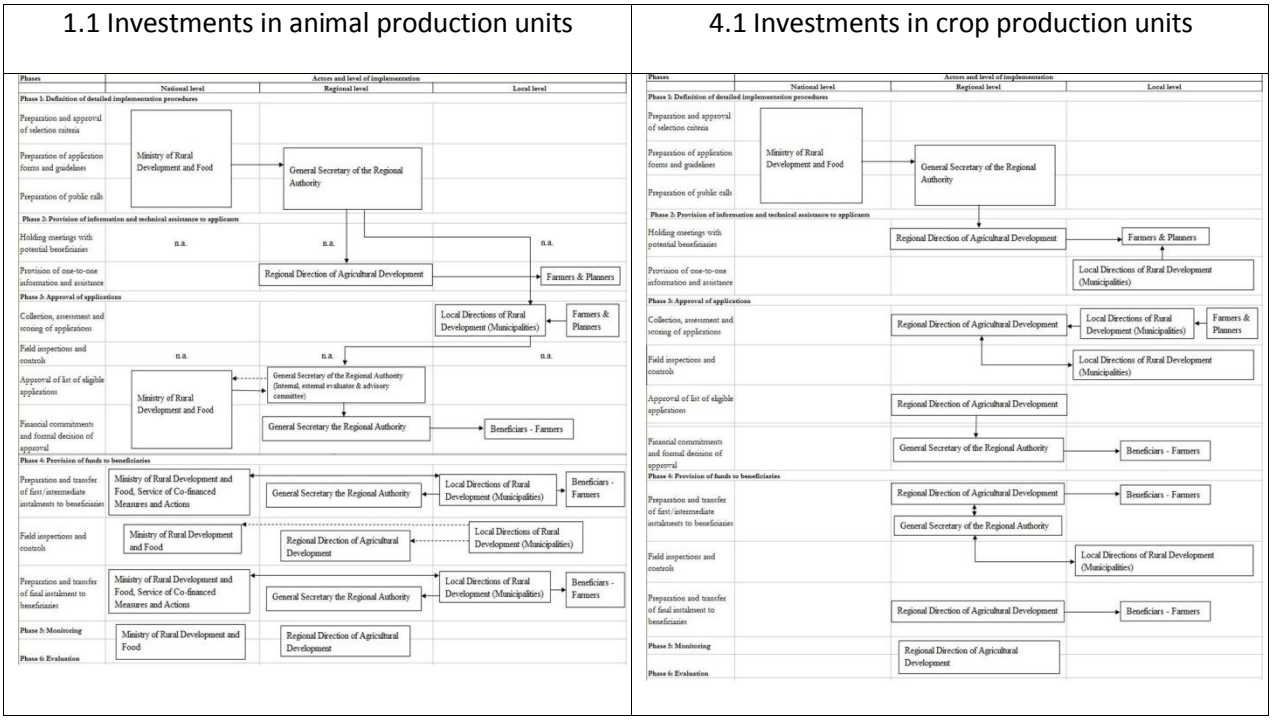

Figure 2: Institutional map of Measure "Investments on agricultural holdings" 2000-2006
Source: Papadopoulou et al. [39]

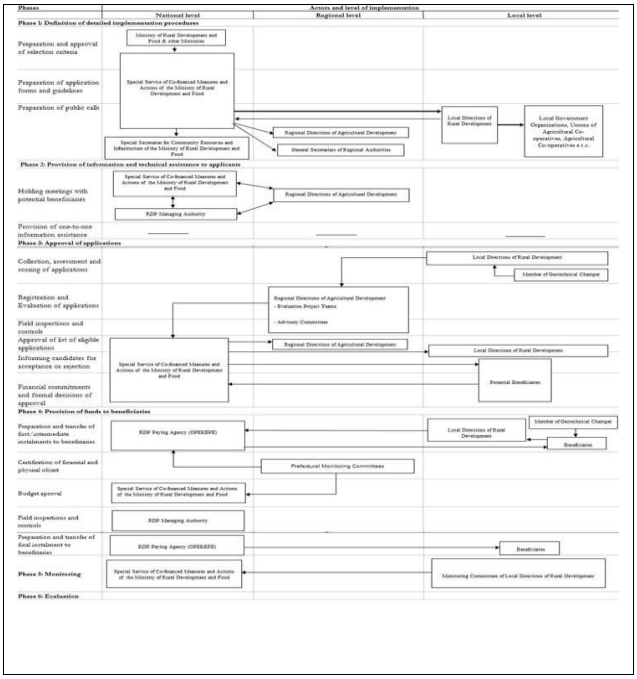

Figure 3: Institutional map of Measure "Modernisation of agricultural holdings" 2007-2013
Source: Data from the research

3.2. In-depth interviews results

Most of the interviewees agreed that the most important problems appear in phase 3 (Approval of applications) and phase 4 (Provision of funds to beneficiaries) of Figures 2 and 3. The most critical issue is work overload during peak periods in application processing and the non-continuous row of application submissions. The fact that different actors are responsible for approval and payment causes difficulties in evaluations and payments. More external experts and staff members could improve these processes. Human resources should also be more and better skilled in technical terms.

A lot of useless documents and repeated information enhance bureaucracy and complexity of procedures. Administrative and legal obligations are too many (certificates, permissions, contracts, lawyers, development agents, planners, engineers etc), very time-consuming and expensive for the applicants. Apart from this, there is no adequate motivation for the administrative personnel, which is few especially during intensive periods. In phase 5 (monitoring) the collection of information at single project level is not efficient. There are many indicators in the existing information system that nobody uses. Main critical issue in managing the monitoring activities is clear definition of the process and of the required data.

3.3. Focus group outcomes

As mentioned above, the selection of the focus group participants was based not only on the in-depth interviews but also on the outcomes of a previous research, conducted by Papadopoulou et al. [40] in 2010, published in the 118th Seminar of the EAAE.

Like one-to-one interviews, the results of focus-group interviews can be presented in uncomplicated ways using lay terminology supported by quotations from the participants Fong Chiu [14]. There were interesting results coming out of the focus group.

Participants believe that the experience and knowledge of regional both public and private authorities was not taken into consideration in the RDP design stage processes. Only a few conferences and meetings were organised by the Managing Authority as part of the consultation procedure but their purpose was not always clear to the participants involved. A restricted number of researches and case studies was undertaken at regional level, but owing to time limitations their results are almost useless. All participants agreed that more funds could be allocated in Axes 3 and 4 in the Greek Rural Development Programme 2007-2013.

As far as RDP implementation stage is concerned, centralisation is not desirable but it seems that it is not avoidable in the current programming period. The main reason is that all Regions are not at the same level of human and institutional capacity. One participant claimed that *"most of regional authorities are ready to undertake more responsibilities, but at the same time, in many cases there are problems related to the lack of personnel and expertise"*. Another one said *"if LEADER had a better and more clearly defined strategy, it could be used as a model for the implementation of other measures or Axis".* This refers to LEADER's design and implementation bottom-up approach.

Crucial delays and lack of communication among public authorities at all national, regional and local level were mentions as critical failure factors. Insufficient information flow and dissemination can lead to unreasonable delays and bureaucracy. It is generally accepted that the existing implementation system is centralised and in many cases responsibilities are not clearly distributed among authorities. Decentralisation is desirable but it should be applied gradually and in the right way. *"The involvement of too many authorities in the implementation of Rural Development Programme could make the system more complicated"* one participant claimed.

Currently, there is low self-esteem of some local authorities' personnel and training programmes are not curried out. Additionally capacity building and institutional learning are not utilised. The expertise and knowledge of particular employees or authorities, especially at regional and local level, are not taken into account. Personnel evaluation could also be helpful in the improvement of processes. Emphasis should be given to the mobilisation and encouragement of local community actors because potential investors have not "entrepreneurial culture".

Most of the participants agreed that the development of a new Integrated Information System/database for monitoring purposes was not necessary. They believe that the already existing system from the previous programming period could have been improved. Regional Authorities have not access to a "functional" database system. According to one participant *"the existing*

Integrated Information System is only useful for the Managing Authority. We need an access instead of a 'data input' database".

About the stage of evaluation, participants agreed that "evaluation culture" is missing from Greece at all stages and evaluation "know how" is missing. Regional and local actors usually consider themselves as "non participants" in the evaluation processes. Lack of data, required for the calculation of the CMEF indicators, is the main problem of evaluation. The CMEF is strongly based on indicators and mainly the economic ones. But focus group participants underlined the need to *"take into account other qualitative criteria in evaluation procedures apart from CMEF indicators. Qualitative evaluation criteria and methods should be combined with qualitative ones. Indicators are unable to describe the real results and impacts of Rural Development Programme"*.

According to participants *"the choice of the time of the mid-term evaluation should be a member-state decision. Each member state should have been given the flexibility to choose the time when the mid-term evaluation should take place, related to the program absorption rate (~50%) rather than the time period (year 2010 for the fourth programming period)".* Thus, evaluation outcomes and results will be better used in the design process. Participants also mentioned the difficulty to assess the impacts of the RDP, particularly environmental ones. In some cases evaluation should be carried out at "area" and not at axis or measure level in order to capture the environmental impacts of a particular ecosystem.

4. Conclusions

The current research aims to help the understanding of the politico-administrative system of Measure 121 for the modernisation of agricultural holding of Axis 1 of the Greek Rural Development Programme in the fourth programming period and to identify the most crucial problems appeared during the stages of its design, implementation and evaluation.

According to research outcomes, Rural Development Policy design processes must be more participatory. All stakeholders' interests should be taken into consideration. First critical point during the stage of implementation is complexity. The current implementation system is considered as centralised. Although decentralisation is desirable it seems that it can only be applied after major changes and adoptions in the entire system.

Important points are also the weak motivation and training of personnel and sometimes the quantitative or qualitative inadequacy, the analysis of data collected, the work overload caused by too many legal and administrative obligations like permissions, certificates and other documents or controls which may be not necessary. Peak periods caused by deadline-calls lead also to overload.

A central integrated database with all information should be designed for saving and "filtering" all information derived from any document. This will decrease bureaucracy in the stage of implementation and improve data collection for evaluation needs.

Institutional learning, capacity building and networking at all stages would help in the better utilisation of past experience in order to improve current and future rural development policy design, implementation and evaluation. Emphasis should be given to regional and mainly local authorities and stakeholders involved in rural development because they are the ones who are directly influenced by those measures. They should have the feeling of "ownership". Communication among actors is also very important. The National Rural Network could play a crucial role for a more effective communication at national and EU level.

It is important to motivate local stakeholders and to utilize the general endogenous development potential of rural areas. Moreover, these are the ones who are directly affected by the implementation of the Rural Development Programme. Incentives for greater participation should be therefore provided for all actors who are involved and affected by Rural Development Programme in the countryside in order to achieve a more integrated Regional Development.

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GROSS WORKER FLOWS ESTIMATION AT EUROPEAN LEVEL

Dr. Cristina LINKARU
National Scientific Research Institute for Labor and Social Protection - INCSMPS, Bucharest, Povernei 6-8, Bucharest, Sector 1, Romania, 010643 Romania,
Telephone(s) +40-21-3124069/3172431, Fax(es) +40-21-3127595, cristina.lincaru@yahoo.de

Dr. Vasilica CIUCĂ
silviaciuca@incsmps.ro

Mat. Draga ATANASIU
incsmps1@incsmps.ro

Dr. Cătălin GHINARARU
ghinararu@incsmps.ro

Dr. Gabriela TUDOSE
gabriela_tudose@yahoo.com

Liliana GRECU
grecu_liliana@yahoo.com

Abstract

*The European single market makes progress in view to become a single economic area. This process induces some tendencies regarding the crystallizing of the European single labour market. Following the first stage of our model (presented in detail in a previous article), based on OECD Employment Outlook 2009 and 2010 methodology consistent with Davis and Haltiwanger (1999) we use the "employment by time since job started"[17] using EUROSTAT indicators provided in quarterly data as proxy for "employment by **job tenure"**[18] indicator in view to calculate the annual hiring flows (number of hiring into an year). This method could be applied under some characteristics like: age groups (15-64 years, 15-24 years, 25-49 years, 50-64 years), gender (total, masculine, feminine), citizenship (citizen, non citizen based on lfsa_etpga Eurostat indicator). Our analysis is focused on the quantitative estimation of the labour force circulation at UE27 level, measured through the quantification of the individual labour contracts; contracts closed between noncitizen workers with an employer located in the European host state (different state from the worker state origin), regardless the negotiation process, employment process, the level of negotiated salaries. We assume that the working contract closing/initiating is equivalent with the "hiring" event and its ending is equivalent with "separation". Our main result is represented by the total non citizen worker flows estimation at European aggregate level as a measure of European single market development.*

1. Introduction

The European single market makes progress in view to become a single economic area[19]. This process induces some tendencies regarding the crystallizing of the European single labour market. "Freedom of movement for workers" represents one of the fundamental values of the European community, since its foundation represented by the establishing the European Economic Community,

[17] **lfsq_egdn2**-Employment by sex, age groups, time since job started and economic activity (from 2008, NACE Rev.2) (1000)

[18] **Definition:** Total employment is broken down by job tenure intervals http://www.oecd.org/document/34/0,3746,en_2649_37457_40917154_1_1_1_37457,00.html#jobduration

[19] http://europa.eu/abc/12lessons/lesson_6/index_ro.htm

EEC Treaty - signed in Rome in 1957, 25 March, with special reference to its 39 article[20]. This freedom is concerning the workers (including professionals' sportive persons) and is not applied to persons working on own account, students, retried people or inactive people. This right is limited in domains like the public security, public policy and in public heath area, with specific restrictions in employment in some public services in the Host Member State[21]. Based on the Treaty of Rome perspective, the European Court of Law define the "worker" as concept as the person that (1) develop an real and efficacy activity, (2) under the guidance of other person (3) and is paid for it.

Under the freedom o movements for workers right is **becoming evident the importance action of citizenship on the labour market (in both its dimensions: European single labour market and national/regional labour markets), focused on dependent employment, mainly salaried employment.** Under this angle is possible to analyse the employment under two main perspectives: internal employment and national employment. The national employment corresponds to the employment realised by the national citizens. The internal employment includes the employment regardless the national citizenship owing, without any differentiation between the workers employed (with contract) in report with citizenship: national or non-national citizenship employment. One measure of the advance of the "free movement for workers, considering "that every EU national has the right to work, and at the same time live, in any other EU country" is still under construction, the temporary restrictions on working announcing as an liberalisation dead line 2014[22].

Our interest is focused on the worker flows at European level estimation, for the persons with working contracts, regardless the status of the person as looking for a job in another country, living in another country in view to find there a job or staying in another country even after his/her employment has finished. Our main result is represented by the total non citizen worker flows estimation at European aggregate level as a measure of European single market development.

2. The Model

Our model[23] is adapted from OECD Employment Outlook 2009[24] and 2010[25]. Under this model "job flows essentially reflect reallocation driven by labour demand (the expansion and contraction of employment by firms) and worker flows are the result of a mix of demand, supply and purely matching factors, which depend on both firm and worker characteristics" (OECD 2009 pg.119). Using the flow indicators is the worker flows is formalised through processes simplified (events that are produced in a time interval) of input /output type. Consequently, the simplified processes consider that hiring and separations as transition from any status to employment for hiring and transition from employment to any status in the case of separations *(for the case of transition employment to employment there is a different establishment) between two moment t-1 and t.*

The number of a specific event (like hiring/separation or job creation /destruction) during a specific time interval permit to describe to following relations between the moments t-1 and t (figure2) allow us to synthesise the following relations:

[20] 12002E039, Treaty establishing the European Community (Nice consolidated version) - Part Three: Community policies - Title III: Free movement of persons, services and capital - Chapter 1: Workers - Article 39 - Article 48 - EC Treaty (Maastricht consolidated version) - Article 48 - EEC Treaty

[21] http://ec.europa.eu/employment_social/free_movement/index_en.htm

[22] Nationals of Bulgaria, the Czech Republic, Estonia, Latvia, Lithuania, Hungary, Poland, Romania, Slovenia and Slovakia may face temporary restrictions on working in another country, but for no more than 7 years after their countries joined the EU (Bulgaria and Romania joined on 1 January 2007, all the others on 1 May 2004).[22] ***http://europa.eu/abc/12lessons/lesson_6/index_ro.htm***

[23] Is presented in detail in the paper: Cristina Lincaru', Vasilica Ciucă, Speranţa Pîrciog, Alternative method of Gross worker flows measurement - Study case Romania : Paper submitted at EALE Conference Cyprus 2011;

[24] OECD Employment Outlook TACKLING THE JOBS CRISIS, 2009, Chapter 2. How Do Industry, Firm and Worker Characteristics Shape Job and Worker Flows? ., pg.121;

[25] OECD Employment outlook MOVING BEYOUND THE JOB CRISIS, 2010, Chapter 3, Institutional and Policy Determinants of labour Market Flows, pg.167;

a. Where workers mobility is described through **absolute indicators**:

$\mathbf{H_{t-1;t}}$ ***Hiring or workers hirings*** *represents the number of hired workers during a year interval. The reference interval fixing is essential in view to compensate the seasoned cyclical variation but it doesn't eliminate the effect of long cycles. This effect is visible in the Romania's case for the construction sector.* (1)

Where hiring as a flow indicator, then:

H/year=HQ1+HQ2+HQ3+HQ4 (1.1.)

The proxy for the indicator „job tenure"/ worker employed in the same job, for the interval represents the number of persons hired[26]:

HQ1 in the first quarter or the number of persons with the "maximum tenure of employment" [9months; 12 months].

HQ2 in the first quarter or the number of persons with the "maximum tenure of employment" [6months; 9 months].

HQ3 in the first quarter or the number of persons with the "maximum tenure of employment" [3months; 6 months].

HQ4 in the first quarter or the number of persons with the "maximum tenure of employment" [0 months; 3 months].

$\mathbf{S_{t-1;t}}$ ***Separation or workers separations*** *represents the number of separated workers during a year interval (regardless the objective/subjective reason, individual or collective redundancies effects).* (2)

$\mathbf{TR_{Nt-1;t}}$ ***Workers total reallocation*** *represents the sum of worker's number with events of hirings and separations during a year interval*

$$\mathbf{TRNt\text{-}1;t = H_{t-1;t} + S_{t-1;t}} \quad (3)$$

$\mathbf{ER_{Nt-1;t}}$ ***Workers excess reallocation*** *represents the workers reallocation between firms from the same industry"* (*OECD 2009, pg.122) and the absolute modification of the net employment indicates the reallocation measure between different groups of firms / different industries, during a year interval*

$$\mathbf{ER_{Nt-1;t} = TRN_{t-1;t} - |\Delta N_{t-1;t}|} \quad (4)$$

$\mathbf{N_{mean\ t-1;t}}$ ***The mean number of employed people*** *during one year*

$$\mathbf{N_{meean\ t-1;t} = (N_{t-1}+N_t)/2} \quad (5)$$

$\Delta\mathbf{N_{t-1;t}}$ *Annual* ***employment growth***

$$\mathbf{\Delta N_{t-1;t} = H_{t-1;t} - S_{t-1;t} = N_t - N_{t-1}} \quad (6)$$

a. Where workers mobility is described through **relative indicators**:

rH **annual rate of workers hirings:**

$$\mathbf{rH_{t-1;t} = H_{t-1;t}/ Nmean\ _{t-1;t}} \quad (1a)$$

rS **annual rate of workers separations**

$$\mathbf{rSt\text{-}1;t = St\text{-}1;t/ Nmediu\ t\text{-}1;t = rHt\text{-}1;t - r\Delta N_{t-1;t}} \quad (2a)$$

$$\mathbf{r\Delta N_{t-1;t} = (H_{t-1;t} - S_{t-1;t})/Nmediu\ _{t-1;t}} \quad (2b)$$

$$\mathbf{r\Delta N_{t-1;t} = rH_{t-1;t} - rS_{t-1;t}} \Longrightarrow \mathbf{rS_{t-1;t} = rH_{t-1;t} - r\Delta N_{t-1;t}}$$

rTR **annual rate of workers total reallocation**

$$\mathbf{rTR_{Nt-1;t} = TR_{Nt-1;t}/N_{mediu\ t-1;t}}\ [\%] \quad (3a)$$

rER **annual rate of workers excess reallocation**

$$\mathbf{rER_{Nt-1;t} = ER_{Nt-1;t}/N_{mediu\ t-1;t}}\ [\%] \quad (4a)$$

[26] In this point we assume our methodological limit: we could loose the precision in estimating the job tenure. We know for sure only the number of events named "hiring" because for every 3 months interval the events are counted as subjective function for each person - every worker could experience more then one "hiring" events in the reference interval. In conclusion it is impossible to distinguish in longitudinal sense the number worker employed in the same job, for the reference interval but we could count, **aggregate the hiring events that occurs in the reference interval.**

3. Data and methods

From the dynamic perspective of the phenomenon, as well the case of the worker flows, the employment evolution have to be described through chronological series of interval (series builded from flow items, with additional, cumulative and aggregation data relatively to some time intervals[27]).

The model application requires a flow data set that reflects the number of hiring made in a year. In the OECD employment statistics is used the „job tenure" [28] indicator (with the significance of the time duration since the hiring event). Starting from the idea that is important the way of "reading" the data, as an "individuality" with many facets we changed the angle analyse perspective from the perspective that **"in stock an event take place "instantaneously" to the perspective: "in a flow an event take place in an time interval"**. The **alternative method developed in the first stage permit us to evaluate the gross worker flows using aggregate data (quarterly and annual frequency) provided by EUROSTAT in view to describe aggregate employment dynamics in a comparative manner at European level** (including data for Romania also). B*ased on OECD Employment Outlook 2009 and 2010 methodology consistent with Davis and Haltiwanger (1999) we use the "*employment by time since job started"[29] indicator provided in quarterly data as proxy for "employment by **job tenure"**[30] indicator in view to calculate the annual hiring flows (number of hiring into an year). This new indicator, **lfsq_egdn2**, provided by Eurostat since 2008, is derived from national Labour Force Survey and opens new opportunities to explore the labour market characteristics including the dynamics perspective. The special features of the flow indicator **lfsq_egdn2** is shaped at this moment by its content - the number of persons that make the transition in employment in an 3 month/an quarter time period or, in other words represents the number of "hirings"/events of transitions from any other status into employment realised in the reference interval of tree months (in the reference quarter). Our specific case is focused on hiring as transition from any status at (t-1 moment/ initial moment) to employment at t moment as final moment *(for the case of transition employment to employment there is a different establishment).*

Among the EUROSTAT indicators available for UE27 member states and compatible with our methodology (based on OECD 2009/2010 methodology) we used the indicators with quarterly variation: „**lfsq_egdn2**-Employment by sex, age groups, time since job started and economic activity (from 2008, NACE rev.2) (1000)" and „**lfsq_egan** - Employment by sex, age groups and nationality (1000)", data are not seasonally adjusted.

3.1. European Internal Employment as a measure of the free labour force movement

The European dimension of the labour market as a representation of the single European market development and functioning motivate the interest for worker flows estimation at European level as an expression of the international circulation of the labour force.

Our analysis cover the individual labour contracts closed between noncitizen workers with an employer located in the European host state (different state from the worker state origin), regardless the negotiation process, employment process, the level of negotiated salaries. The indicator **lfsa_etpga** represents an indicator relatively recent provided by EUROSTAT, in a quarterly frequency starting with the third term Q3 2007 until (our last data) second term Q2 2010. The analysis potential of this approach is at the beginning, the perspective to valorise it in worker flows modelling at European level is sustained also by the already and projected characteristics of this indicator (see table 1):

[27] http://facultate.regielive.ro/cursuri/statistica/analiza_statistica_a_seriilor_cronologice-87307.html

[28] http://www.oecd.org/document/34/0,3746,en_2649_37457_40917154_1_1_1_37457,00.html#jobduration

[29] **lfsq_egdn2**-Employment by sex, age groups, time since job started and economic activity (from 2008, NACE Rev.2) (1000)

[30] **Definition:** Total employment is broken down by job tenure intervals
http://www.oecd.org/document/34/0,3746,en_2649_37457_40917154_1_1_1_37457,00.html#jobduration

Table 1

	Eurostat - name	Available (Octomber 2010)
NAT	**Nationals**	yes
FOR	**Foreigners - Total**	yes
EU27_FOR	Non nationals but citizens of other EU-27 count...	no
EU25_FOR	Non nationals but citizens of other EU-25 count...	no
EU15_FOR	Non nationals but citizens of other EU-15 count...	no
EXT_EU27	Citizens of countries outside the EU-27	no
EXT_EU25	Citizens of countries outside the EU-25	no
EXT_EU15	Citizens of countries outside the EU-15	no
NRESP	No answer	no

Based on this indicator we sketch the following definitions:
Internal employment ($\mathbf{N_{intern}}$)= the total employment registered on a national territory / area of a state (in our case with specific reference to the EU Member States) = Number of the employed people national citizens of the respective state($\mathbf{N_{nat}}$)+ Number of employed people without the national citizenship / foreigners ($\mathbf{N_{for}}$).

$$\mathbf{N_{internTi}=N_{natTi}+N_{forTi}} \quad (7)$$

$N_{internTi}$ - the total employment registered on a national territory / area of a state at time Ti;
N_{natTi} - Number of the employed people national citizens of the respective state at time Ti;
N_{forTi} – Number of employed people without the national citizenship / foreigners Ti;

The worker flows are described by the worker characteristic to be an EU27 citizen or to be an citizen of the space non EU27. The perspective to analyse the citizenship to EU25 and EU15 are essential in function the analysis objectives (EMU participation, Shengen space). In view to simplify, in this stage of analysis we ignore those details and we consider only the two states: national and foreigner in reference with each EU27 state national space.

3.2. The gross worker flows of foreigners' estimation at EU27

The gross worker flows of foreigners' estimation at EU27 are contextualised by the data availability for the years 2008 and 2009 for characteristics like: age groups (15-64 years, 15-24 years, 25-49 years, 50-64 years), gen (total, masculine and feminine), citizenship (citizen, non citizen based on **lfsa_etpga**) where the gross flows values are projected using the probabilities distributed by characteristics using the relation:

$$\mathbf{H_{for}=N_{for}/N_{int}=(N_{int}-Nn_{at})/N_{int}*H_{int}} \ \forall \text{ characteristic} \quad (8)$$

$$\mathbf{p_i=H_{for}/H_{int}} \quad (8\ a)$$

$$\mathbf{S_{for}=S_{int}*p_i} \quad (8b)$$

$\mathbf{H_{for}}$ *the number of hired workers(foreigners an the respective state territory) during a year interval*

$\mathbf{H_{int}}$ *the number of hired workers(national and foreigners an the respective state territory) during a year interval*

(pi) probabilities *distributed by characteristics 15-24 years, 25-49 years, 50-64 years), gen (total, masculine and feminine) calculated Hfor/Hint(see Table2)*

$\mathbf{S_{for}}$ *the number of separated workers(foreigners an the respective state territory) during a year interval*

$\mathbf{S_{int}}$ *the number of separated workers(national and foreigners an the respective state territory) during a year interval*

Table 2

The gross worker flows of foreigners' estimation at EU27 where the gross flows values are projected using the probabilities (pi)

distributed by characteristics 15-24 years, 25-49 years, 50-64 years), gen (total, masculine and feminine)

	p12008	p22009	p3m2008	p4m2009	p5f2008	p6f2009
UE27 15_64	0,07	0,07	0,07	0,07	0,06	0,06
UE27 15_24	0,07	0,07	0,07	0,07	0,07	0,06
UE27 25_49	0,07	0,07	0,08	0,08	0,06	0,07
UE27 50_64	0,04	0,04	0,04	0,04	0,04	0,04

4. Results

We applied this method for some characteristics like: age groups (15-64 years, 15-24 years, 25-49 years, 50-64 years), gen (total, masculine, feminine), citizenship (citizen, non citizen based on **lfsa_etpga**) see Table 3a and Table 3b.

Considering "our hiring" indicator as a flow indicator (that explains the aggregate fluctuations) expressed through number of events in a specific interval of time we calculate (using the relations (1) to (6) for absolute values and (1a) –(4a) for relative values) the annual values for: workers hiring flows, workers separation flows, workers total reallocation flows and workers excess reallocation flows in both its relative and absolute (levels) dimensions.

The provided data permit us to calculate these values for the years 2008 and 2009, years for Romania as well for other European countries with labour market dynamics values provided by OECD. If at internal level the volume of employment keeps the tendency to decrease in hirings number and the increase in separations for the 2 years analysed. Also is visible that the worker flows of the foreign suffer an accentuated contraction in volume - hirings drops with almost 1/3, impossible to alleviate the maintained trend of separations. Another general observation is given by the general tendency of decreasing the total workers reallocation flow as a measure of the speed o intersectoral worker allocation, as well as the workers excess reallocation volume and intensity decreasing tendency, indicating an decrease of the intrasectoral reallocation speed.

Table 3a

The gross worker flows of foreigners' estimation at EU27 contextualised by the data availability for the years 2008 and 2009 for characteristics like: age groups (15-64 years, 15-24 years, 25-49 years, 50-64 years), gen (total, masculine and feminine), citizenship (citizen, non citizen), in absolute and relative values

Workers hirings flows - internal employment

thousands of workers

	HintT2008	HintT2009	HintM2008	HintM2009	HintF2008	HintF2009
UE27 15_64	39635	33391	20747	17290	18888	13963
UE27 15_24	13304	10917	6929	5549	6375	5368
UE27 25_49	22571	19089	11721	9880	10850	7071
UE27 50_64	3759	3385	2096	1861	1662	1524

Workers separations flows -internal employment

thousands of workers

	SintT2008	SintT2009	SintM2008	SintM2009	SintF2008	SintF2009
UE27 15_64	38714	37890	20908	20775	17805	14977
UE27 15_24	13868	12676	7257	6692	6611	5984
UE27 25_49	22623	22397	12283	12238	10340	8021
UE27 50_64	2223	2817	1368	1844	854	972

rH annual rate of workers hirings - internal employment

%

	rHintT2008	rHintT2009	rHintM2008	rHintM2009	rHintF2008	rHintF2009
UE27 15_64	18,2	15,6	21,2	14,8	19,3	14,4
UE27 15_24	59,0	52,3	67,8	49,5	62,4	55,6
UE27 25_49	15,8	13,6	18,1	13,0	16,7	11,0
UE27 50_64	7,2	6,4	9,2	6,3	7,3	6,5

rS annual rate of workers hirings - internal employment

%

	rSintT2008	rSintT2009	rSintM2008	rSintM2009	rSintF2008	rSintF2009
UE27 15_64	17,8	17,7	17,4	17,8	18,2	15,4
UE27 15_24	61,5	60,7	58,8	59,7	64,7	62,0
UE27 25_49	15,8	16,0	15,7	16,1	16,0	12,5
UE27 50_64	4,3	5,3	4,7	6,2	3,7	4,1

Workers hirings flows - foreigner employment

thousands of workers

	HforT2008	HforT2009	HforM2008	HforM2009	HsF2008	HforF2009
UE27 15_64	2675	2252	1470	1204	1197	905
UE27 15_24	922	714	489	367	431	347
UE27 25_49	1599	1399	894	761	698	495
UE27 50_64	154	139	87	77	67	63

Workers separations flows -foreigner employment

thousands of workers

	SforT2008	SforT2009	SforM2008	SforM2009	SsF2008	SforF2009
UE27 15_64	2613	2556	1481	1447	1128	971
UE27 15_24	961	829	512	442	447	387
UE27 25_49	1603	1641	937	943	665	561
UE27 50_64	91	116	57	76	35	40

rH annual rate of workers hirings foreigner employment

%

	rHforT2008	rHforT2009	rHforM2008	rHforM2009	rHsF2008	rHforF2009
UE27 15_64	1,2	1,1	1,2	1,2	1,2	1,0
UE27 15_24	4,1	3,4	4,2	3,9	4,4	4,0
UE27 25_49	1,1	1,0	1,2	1,2	1,0	0,9
UE27 50_64	0,3	0,3	0,2	0,3	0,2	0,2

rS annual rate of workers hirings foreigner employment

%

	rSforT2008	rHforT2009	rSforM2008	rSforM2009	rSsF2008	rSforF2009
UE27 15_64	1,2	1,2	1,2	1,2	1,2	1,0
UE27 15_24	4,3	4,0	4,2	3,9	4,4	4,0
UE27 25_49	1,1	1,2	1,2	1,2	1,0	0,9
UE27 50_64	0,2	0,2	0,2	0,3	0,2	0,2

Table 3b

The gross worker flows of foreigners' estimation at EU27 contextualised by the data availability for the years 2008 and 2009 for characteristics like: age groups (15-64 years, 15-24 years, 25-49 years, 50-64 years), gen (total, masculine and feminine), citizenship (citizen, non citizen), in absolute and relative values

Workers total reallocation flows - internal employment

thousands of workers

	TRintT2008	TRintT2009	TRintM2008	TRintM2009	TRintF2008	TRintF2009
UE27 15_64	78348	71281	41655	38065	36693	28940
UE27 15_24	27172	23593	14186	12241	12986	11352
UE27 25_49	45194	41486	24004	22119	21190	15092
UE27 50_64	5982	6202	3465	3706	2517	2496

Workers excess reallocation flows -internal employment

thousands of workers

	ERintT2008	ERintT2009	ERintM2008	ERintM2009	ERintF2008	ERintF2009
UE27 15_64	77427	66782	41493	34581	35610	27926
UE27 15_24	26609	21834	13858	11098	12751	10736
UE27 25_49	45143	38178	23442	19760	20680	14143
UE27 50_64	4446	5633	2737	3689	1709	1945

rTR annual rate of workers total reallocation flows - internal employment

%

	rTRintT2008	rTRintT2009	rTRintM2008	rTRintM2009	rTRintF2008	rTRintF2009
UE27 15_64	36,0	33,3	34,7	32,6	37,5	29,8
UE27 15_24	120,5	113,0	115,0	109,1	127,1	117,5
UE27 25_49	31,6	29,6	30,7	29,1	32,7	23,6
UE27 50_64	11,5	11,7	11,8	12,5	11,0	10,7

rER annual rate of workers excess reallocation flows - internal employment

%

	rERintT2008	rERintT2009	rERintM2008	rERintM2009	rERintF2008	rERintF2009
UE27 15_64	35,6	31,2	34,6	29,6	36,4	28,7
UE27 15_24	118,0	104,6	112,4	99,0	124,7	111,2
UE27 25_49	31,6	27,3	30,0	26,0	31,9	22,1
UE27 50_64	8,5	10,6	9,3	12,5	7,5	8,3

Workers reallocation flows - internal employment

thousands of workers

	TRforT2008	TRforT2009	TRforM2008	TRforM2009	TRforF2008	TRforF2009
UE27 15_64	5287	4808	2951	2651	2325	1876
UE27 15_24	1882	1544	1002	809	879	734
UE27 25_49	3202	3039	1831	1704	1363	1056
UE27 50_64	245	255	144	152	102	103

Workers excess reallocation flows -internal employment

thousands of workers

	ERforT2008	ERforT2009	ERforM2008	ERforM2009	ERsF2008	ERforF2009
UE27 15_64	52	45	29	24	23	18
UE27 15_24	18	14	10	7	9	7
UE27 25_49	32	28	18	15	13	10
UE27 50_64	2	2	1	2	1	1

rTR annual rate of workers total reallocation flows - foreigner employment

%

	rTRforT2008	rTRforT2009	rTRforM2008	rTRforM2009	rTRforF2008	rTRforF2009
UE27 15_64	2,4	2,2	2,5	2,3	2,4	1,9
UE27 15_24	8,3	7,4	8,1	7,2	8,6	7,6
UE27 25_49	2,2	2,2	2,3	2,2	2,1	1,6
UE27 50_64	0,5	0,5	0,5	0,5	0,4	0,4

rER annual rate of workers excess reallocation flows - foreigner employment

%

	rERforT2008	rERforT2009	rERforM2008	rERforM2009	rERsF2008	rERforF2009
UE27 15_64	0,02	0,02	0,02	0,02	0,02	0,02
UE27 15_24	0,08	0,07	0,08	0,07	0,08	0,07
UE27 25_49	0,02	0,02	0,02	0,02	0,02	0,02
UE27 50_64	0,00	0,00	0,00	0,01	0,00	0,00

5. Final remarks

Our analysis is focused on the quantitative estimation of the labour force circulation at UE27 level, measured through the quantification of the individual labour contracts quantification; contracts closed between noncitizen workers with an employer located in the European host state (different state from the worker state origin), regardless the negotiation process, employment process, the level of negotiated salaries. We assume that the working contract closing/initiating is equivalent with the "hiring" event and its ending is equivalent with "separation". Even if we made important simplifying assumption, ignoring essential features the result offer an guidance and monitoring support reference perspective, useful to shape some tendencies. The main value added of this paper is the tendencies emphasized for the total non citizen worker flows estimation at European aggregate level as a measure of European single market development.

The analysis potential of this approach is at the beginning, thanks to the huge progress of the indicators development, strengthened by the spatial perspective building of the worker flows as a part of the labour market dynamics development.

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A MULTICRITERIA DECISION SUPPORT FRAMEWORK FOR ASSESSING ALTERNATIVE WIND PARK LOCATIONS: THE CASE OF TANAGRA - BOIOTIA

Anastasia STRATIGEA and **Elias GRAMMATIKOGIANNIS**
National Technical University of Athens, School of Rural and Surveying Engineering, Department of Geography and Regional Planning, Iroon Polytechniou 9, Campus Zografou, 15780 Athens, Greece, Tel.: +30 210 7722749
E – mails: stratige@central.ntua.gr, egrammis@survey.ntua.gr

Abstract
The focus of the present paper is on the development of a decision support framework for assessing alternative wind park locations using MCA tools. In the first part, it elaborates on the development of such a framework, with emphasis placed on the evaluation stage. More specifically, two multicriteria evaluation techniques are used (ELECTRE I and REGIME) as tools that can relief 'method uncertainty' and deal with conflicts and different perspectives in the decision making process. In the second part, this decision support framework is applied in a real world decision problem, namely the selection of wind park location in a Greek region (Tanagra-Boiotia) for the installation of a wind park that will partly serve the energy demand of a newly planned industrial area. Finally, some conclusions are drawn as to the empirical results obtained by the two multicriteria methods as well as their capacity to deal with multiobjective evaluation problems.

Keywords: *decision making, multicriteria evaluation, quantitative and qualitative data, conflicting objectives, wind park location*

1. Introduction

Planning deals with problems exhibiting many different dimensions e.g. social, cultural, environmental etc. in seeking for sustainable development solutions in support of policy makers. In such a context, clear cut solutions to planning problems do not exist. Instead, various alternative options are available, which need to be further evaluated as to their performance in respect to certain evaluation criteria that largely reflect the values and priorities of the study system at hand. Evaluation thus consists of an integral part of the planning process (Khakee, 1998), aiming at the assessment and appraisal of alternative policy options in order to reach optimal, transparent and resource-preserving policy decisions. It is considered as a process, within which conflicts and different perspectives and interests of various stakeholders balance for a compromise in a coherent and transparent way, ending up with an optimal decision, which reflects as much as possible different stakeholders' interests. Moreover, evaluation is considered as part of a decision support system that supports both the development and the selection stage of the decision making process (Janssen, 1994).

Complex and unstructured decision problems, involving a number of conflicting objectives and a variety of stakeholders need to be dealt with in planning exercises. These call for proper evaluation tools. Multicriteria Decision Analysis (MCA), in this respect, is a useful tool in support of decision-makers in planning problems, as it can incorporate both conflicting objectives and different views involved. As Nikamp and Torrieri (2000) point out, it is a tool combining both assessment techniques and judgment methods, offering thus a solid analytical basis for modern decision analysis.

Key advantages of multicriteria analysis mainly relate to its potential to (Finco and Nijkamp, 1997):

- take into account a diverse set of different criteria that are important for the evaluation problem at hand;
- take into account both quantitative and qualitative aspects, even of a fuzzy nature (see Munda 1995);

- establish a structured communication with decision-makers and policy-making bodies through the use of a range of policy weights for respective evaluation criteria; and
- address future uncertainties by including also scenario experiments in the analysis.

Evaluation methods - in particular, multicriteria methods - aim to identify the best possible alternative or the most plausible ranking of alternatives out of a set of distinct choice possibilities (Janssen, 1992). A variety of MCA methods have been developed during the last decade, rendering the choice of an MCA method for a specific evaluation problem a very tricky task. These are differentiating as to: the nature of the data handled (quantitative, qualitative or mixed data); the formal relationship between policy objectives and choice attributes; the nature of weights attached to the evaluation criteria (quantitative or qualitative); the treatment of outcomes of alternatives in an impact matrix (e.g. pairwise comparison); the specification of decision rules; the type of standardization used for the criteria outcomes; etc.

Use of different methods can sometimes lead to divergent results, in particular when a complete ranking of alternatives is needed (Finco and Nijkamp, 1997). This implies the need for a careful selection of the MCA method to be used in each single evaluation problem, based on the specific characteristics of the method and the problem at hand. To deal with the method uncertainty, many authors suggest the use of two or more MCA methods in a certain evaluation problem in order to validate results obtained. Such a multi-method approach can enrich policy making by reviewing preferences and judgments derived from more than one MCA method (Voogd, 1983; Mysiak, 2006).

The scope of the present paper is to present a decision support framework supporting both the development and the selection phase of wind park location. In the first part, it elaborates on the development of such a framework, with emphasis placed on the evaluation stage. More specifically, two multicriteria evaluation techniques are used (ELECTRE I and REGIME) as tools that can relief 'method uncertainty' and deal with conflicts and different perspectives in the decision making process. In the second part, this framework is applied in a real world decision problem, namely the selection of wind park location in a Greek region (Tanagra-Boiotia) for the installation of a wind park that will partly serve the energy demand of a new industrial area. Finally, some conclusions are drawn as to the empirical results obtained by the two multicriteria methods as well as their capacity to deal with multi-objective evaluation problems.

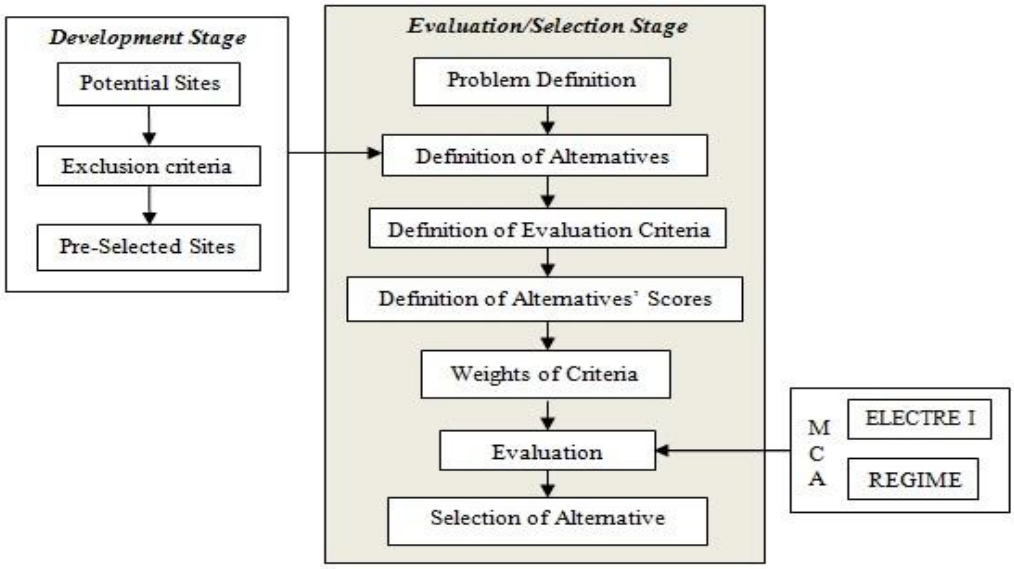
2. The Methodological Framework

The methodological framework presented in the following aims at elaborating on the *development* and *selection* of wind park location for policy purposes. It consists of two distinct stages, where (see Fig. 1 below):

- The first stage - *development stage* - focuses on the development of alternative solutions, implying a process of collection and evaluation of various types of data on potential sites for wind park location and a process of partial elimination of certain sites on the basis of certain exclusion criteria. The output of this stage is a limited number of pre-selected sites, best fitting wind part location in the region at hand; and
- The second stage – *evaluation/selection stage* - proceeds to the evaluation of the pre-selected sites by means of MCA methods, on the basis of certain evaluation criteria, relevant to the problem at hand. The core of the evaluation / selection stage is based on the multicriteria evaluation, as an approach that best fits to planning exercises (Voogd, 1983). Towards this end, two MCA techniques are used, namely ELECTRE I and REGIME, in order to deal with 'method uncertainty' and support a more confident decision in the problem at hand.

In the following are discussed the two stages of the above presented methodological framework.

Fig. 1: The decision support framework



2.1 The Development Stage

The development stage aims at defining a set of pre-selected alternative solutions, to be further evaluated at the second stage (evaluation / selection stage). It includes the following steps (see Fig. 1 above):

- *Delineation of potential sites*: involves the collection and analysis of data as to the whole set of options available for wind park location in the study region. Such information may refer to: characteristics of potential locations e.g. topography, wind potential, land use patterns; social characteristics e.g. adjacent settlements; environmental characteristics e.g. valuable ecosystems, landscape; and existing legislative framework, defining policy priorities for wind parks' location.
- *Definition of exclusion criteria*: the emerging set of potential options is roughly evaluated, in a first round, on the basis of certain exclusion criteria. Depending on the problem at hand, as exclusion criteria can be considered the: wind potential in each specific site; number (density) of potential wind mills; spatial characteristics of potential sites, e.g. morphology, accessibility; environmental, social and cultural attributes of potential sites; closeness of potential sites to settlements; distance from energy distribution networks; legislative constraints as to wind park location patterns; etc.
- *Choice of pre-selected sites*: The output of this stage is a limited number of dominant potential sites, candidate for a more in depth evaluation at the evaluation/selection stage.

2.2 The Evaluation / Selection Stage

This stage aims at evaluating the pre-selected alternative solutions in order to support decision making in the problem at hand. It makes use of multicriteria evaluation techniques, capable of dealing with such kind of decision problems.

The steps followed (see Fig. 1) have as follows:

- Problem definition: referring to the description of the evaluation problem at hand;
- Definition of alternatives: set of pre-selected sites, as defined at the development stage;
- Definition of evaluation criteria: set of criteria, according to which the pre-selected set of alternatives is evaluated;
- Definition of scores of alternatives: structuring of the evaluation matrix for the problem at hand, by defining the impact of each alternative in respect to each evaluation criterion;
- Definition of weights of criteria: attaching relative importance to each evaluation criterion;

- Evaluation: use of multicriteria techniques for carrying out the evaluation of the set of the pre-selected sites; and
- Choice of the alternative option best performing as to the evaluation criteria considered.

Based on the nature of data used in a specific evaluation problem, measuring the impact of alternatives as to the evaluation criteria (i.e. quantitative or qualitative), the following multicriteria methods are disposable:

- Quantitative data, where the impacts are measured on a cardinal scale. The multicriteria methods that can be used in this respect are weighted summation, multi-attribute utility approach, ideal point method, concordance (or ELECTRE) method (see Janssen, 1992; Nijkamp et al, 1995) etc.
- Qualitative data, where the impacts are measured on an ordinal or binary scale. Methods that can be applied are: permutation method, extreme expected and random value method (Kmietowicz and Pearman, 1981; Rietveld, 1980), etc.
- Mixed data, where the impacts are measured on both quantitative and qualitative scales. The REGIME MCA method is relevant in such a context (Hinloopen et al., 1983; Hinloopen and Nijkamp, 1986).

In the present study, were chosen two of the above MCA methods, namely the ELECTRE I and the REGIME method, which are shortly described in the following.

2.2.1. The ELECTRE I multicriteria evaluation method

The ELECTRE I method, also known as concordance analysis, is based on a pairwise comparison of all alternatives, using only the interval character of the scores presented in the effects table. It is principally designed for selection problems (Buchanan et al, 1999) and aims at solving a decision problem consisting of:

m alternatives M_i, i = 1, . . . , m;
n evaluation criteria g_j , j = 1, . . . , n; and
n weighting factors ω_j , j = 1, . . . , n
with $\sum_{j=1}^{n} \omega_j = 1$

On the basis of the above elements, an *m x n decision (impact) matrix* is built (Table 1 below). The goal of the method is to select the best alternative on the basis of its performance with respect to all evaluation criteria concerned.

The core of the method is the *outranking relationship* or *dominance relationship* between two alternatives M_i and M_k, examining whether M_i is preferred to M_k ($M_i \rightarrow M_k$ or $M_i S M_k$). M_i is considered as being preferred to M_k in case that M_i is at least as good as M_k on the majority of the evaluation criteria and M_i is not significantly bad than M_k on the rest of the criteria. To identify this relationship, a pair wise comparison of each and every pair of alternatives is carried out for the whole set of the evaluation criteria. Such identification requires two sets of comparisons: one among the criteria in which $g_j(M_i)$ is superior to $g_j(M_k)$ and one among the criteria in which $g_j(M_i)$ is not superior to $g_j(M_k)$. This implies that the ELECTRE I method examines separately the criteria for which M_i is preferred to M_k and those for which M_i is not preferred to M_k. Taking also into account the priorities of the evaluation criteria, the method aims at estimating the level to which scores and their associated weights confirm or contradict the dominant pair wise relationships among alternatives (Jansen, 1994).

Table 1**: The impact matrix**

Alternatives / Criteria	Alternative 1	Alternative 2	….	Alternative I
Criterion 1	$Score_{11}$	$Score_{21}$		$Score_{I1}$
Criterion 2	$Score_{12}$	$Score_{22}$		$Score_{I2}$
...	...	...		...
Criterion J	$Score_{1J}$	$Score_{2J}$		$Score_{IJ}$*

** $Score_{IJ}$: performance of the alternative I in respect to the criterion J*

The two sets of comparisons are performed by means of *concordance* and *discordance* tests.

The *concordance test* allows the decision maker to verify whether M_i is at least as good as M_k, with the difference between the two within a predefined threshold. This test is carried out for those evaluation criteria for which M_i performs better than M_k. In ELECTRE I and II the concordance test is binary in nature, with the index taking the value of 1 in case that M_iSM_k is true and 0 in the opposite case. In ELECTRE III and IV the concordance test uses a *fuzzy* outranking relation, with the index taking values which range from 0 to 1, depending on how far $g_j(M_i)$ is better than $g_j(M_k)$.

For the rest of the criteria, namely those for which M_i performs worse than M_k, a *discordance test* is performed, testing whether there is a high opposition to the outranking relationship M_iSM_k. Failure of discordance test implies that outranking relationship M_iSM_k does not hold.

Generally, in order to verify an outranking relationship M_iSM_k (dominance relationship of alternative M_i on M_k), *both* the concordance and discordance tests should be passed.

The application of ELECTRE I, used in the present study, implies the definition of a concordance and a discordance set for each and every pair of alternatives M_i and M_k i,k=1,2,…m, i≠k, of the following form (Milani et al, 2006):

$$\text{Concordance set} = J_{ik}^{+} = \{j \mid r_{ij} \geq r_{kj}\},$$

$$\text{Discordance set} = J_{ik}^{-} = \{j \mid r_{ij} < r_{kj}\}, \qquad (2.1)$$

where r_{ij}, r_{kj} refer to scores of the impact matrix (Table 1), i.e. impact of the i,k alternatives in respect to the evaluation criterion j.

On the basis of the concordance and discordance indexes for each pair of alternatives, the concordance and discordance tables are constructed.

For each pair of alternatives i and k, the weights set by the decision maker for the corresponding concordance set are summed to arrive at a *global concordance index* C_{ik} ($0 \leq C_{ik} \leq 1$),

$$C_{ik} = \frac{\sum j \in J_{ik}^{+} \omega_j}{\sum_{j=1}^{n} \omega_j} \qquad (2.2)$$

Similarly, the *global discordance* D_{ik} index for each pair of alternatives is defined ($0 \leq D_{ik} \leq 1$) by the following analytical relationship:

$$D_{ik} = \frac{\max_{j \in J_{ik}^{-}} \left| \omega_j (r_{ij} - r_{kj}) \right|}{\max_{j \in J \{1,\ldots n\}} \left| \omega_j (r_{ij} - r_{kj}) \right|} \qquad (2.3)$$

A *global concordance threshold c* and a *global discordance threshold d* are chosen to perform the global concordance and discordance tests. These are exogenously determined values. The more severe the global threshold values the more difficult is to pass the tests (Milani et al, 2006). As Collette and Siarry (2003) claim, thresholds of $c = 0.7$ and $d = 0.3$ are often sufficient for performing such kind of tests.

For an outranking relation M_iSM_k to be judged as true, both global concordance C_{ik} and discordance D_{ik} indices should not violate the corresponding threshold that is:

$$\begin{cases} C_{ik} \geq c \\ D_{ik} \leq d \end{cases} \qquad (2.4)$$

Once the two tests are completed for all pairs of alternatives, the preferred alternatives are those that outrank more than being outranked.

Given the threshold values, a *final appraisal score* s_i for each *alternative i* can be calculated by the following formula (Voogd, 1983):

$$s_i = \sum_{\substack{k=1 \\ k \neq i}} z_{ik} - \sum_{\substack{i=1 \\ i \neq k}} z_{ik} \qquad (2.5)$$

where z_{ik} is defined as follows:

$$z_{ik} = \begin{cases} = 0 \text{ if } c_{ik} < c \text{ and } d_{ik} > d \\ = 1 \text{ if } c_{ik} \geq c \text{ and } d_{ik} \leq d \end{cases} \qquad (2.6)$$

The choice option with the highest score can then be considered as the *most attractive (preferred) choice option*.

2.2.2. The REGIME multicriteria evaluation method

The REGIME analysis is a discrete multicriteria method, used to evaluate both projects and policies (Nijkamp et al., 1990; Vreeker et al, 2001). The advantage of the method lies on its capacity to deal with mixed (quantitative and qualitative) data as to the effects and criteria priorities considered in the evaluation problem at hand.

The application of the method is based upon two kinds of input data: the *evaluation (impact) matrix* and a *set of political weights*. The evaluation matrix is composed of elements that measure the effect of each alternative i, i=1,2,…,I in respect to each judgement criterion j, j=1,2,…,J (see Table 1 above). The set of political weights provides information on the relative importance of criteria to be considered in the evaluation context (Nijkamp and Torrieri, 2000).

Each value e_{ij} with i= 1,2,..I (set of alternatives) and j= 1,2, ..., J (set of evaluation criteria) (see Table 1 above), represents the score of alternative i as to the criterion j, but also a short of rank order of alternative i in respect to the criterion j. It could then be assumed that if $e_{ij} > e_{i'j}$, the choice option i is more preferred than i' for the evaluation criterion j (Nijkamp, 1987).

The REGIME method is based on a pairwise comparison of all alternatives, where the comparison of each specific set of alternatives is not influenced by the presence and effects of other alternatives, while the potential rank order of a certain alternative is conditioned by the remaining alternatives (Hinloopen and Nijkamp, 1986).

The development of the REGIME method is based on the concept of the 'regime'. As such is defined the $s_{ii'j} = e_{ij} - e_{i'j}$. In case of ordinal information, the magnitude of the 'regime' is not relevant but only its sign, where $\sigma_{ii'j} = \text{sign } s_{ii'j} = +$ implies that alternative i is better than i' as to the criterion j, while $\sigma_{ii'j} = \text{sign } s_{ii'j} = -$ implies that alternative i is worse than i' as to the criterion j. By carrying out comparisons between alternatives i and i' for all j=1,2, ..., J judgement criteria, a Jx1 regime vector $r_{ii'}$ can be constructed, taking the following form (Nijkamp, 1987):

$$r_{ii'} = (\sigma_{ii'1}, \sigma_{ii'2}, \ldots, \sigma_{ii'J})^T, \quad \forall\ i, i', i' \neq i \qquad (2.7)$$

This vector contains only + and – signs and reflects a certain degree of dominance of option i over i' for the unweighted effects of all J criteria (Nijkamp, 1987). For all I(I-1) pairwise comparisons, I(I-1) regime vectors can be created, which can be combined into the JxI(I-1) regime matrix R of the following form (Hinloopen and Nijkamp, 1986):

$$R = \left[\underbrace{r12\ r13\ \ldots\ r1I}\ ,,,,\ \underbrace{rI1\ rI2\ \ldots\ rI(I-1)} \right] \qquad (2.8)$$

As there is usually not a single dominating alternative, additional information is needed on the relative importance of the set of evaluation criteria. Such information is usually provided by means of preference weights, attached to the judgement criteria.

In case of ordinal information, the weights are represented by means of rank orders w_j (j=1,2, .., J) in a weight vector of the following form (Hinloopen and Nijkamp, 1986):

$$w = (w_1, w_2, ..., w_j)^T \quad (2.9)$$

where if $w_j > w_{j'}$, criterion j is regarded as more important than j' (Nijkamp, 1987).

These are considered as a rank order representation of the cardinal weights:

$$\underline{w}^* = (\underline{w_1}^*, \underline{w_2}^*, ..., \underline{w_j}^*)^T \text{ with } \max \underline{w_j}^* = 1,\ w_j^* > 0, \text{ for every } j=1,2,\ldots,J \quad (2.10)$$

The ordinal ranking of weights is supposed to be consistent with the quantitative information incorporated in the unknown cardinal vector w^*, that is (Hinloopen and Nijkamp, 1986):

$$\text{if } w_j > w_{j'} \rightarrow w_j^* > w_{j'}^* \quad (2.11)$$

Then the weighted dominance of alternative i with regard to i' can be represented by the following stochastic expression (Hinloopen and Nijkamp, 1986):

$$v_{ii'} = \sum_{j=1}^{J} \sigma_{ii'j}\, \underline{w_j}^* \quad (2.12)$$

If $v_{ii'} > 0$, alternative i is dominant with respect to i'. But $\underline{w_j}^*$ is not known. What is known is only the ordinal value w_j, which is assumed to be consistent with $\underline{w_j}^*$. Therefore, a certain probability can be introduced for the dominance of alternative i with regard to i':

$$P_{ii'} = \text{prob}\,(v_{ii'} > 0) \quad (2.13)$$

Then the probability of alternative i to rank higher than the rest of the alternatives can be calculated by the following formula (Hinloopen and Nijkamp, 1986):

$$P_i = \frac{1}{I-1} \sum_{i \neq i'} P_{ii'} \quad (2.14)$$

i.e. P_i is the average probability that alternative i is higher valued than any other alternative (Hinloopen and Nijkamp, 1986). Rank order of P_i's is then defining the ranking of respective alternative choice options.

3. Application of the Decision Support Framework in the Area of Tanagra -Boiotia

The focus of this chapter is on the application of the above presented decision support framework. It provides a short description of the study region, the evaluation problem at hand and the empirical results obtained.

3.1 The Study Region

The study region refers to the nomos[31] of Boiotia, which is part of the Region of Sterea Ellada. Boiotia is an area endowed by nature in terms of land morphology, water, mineral, landscape and renewable energy resources.

The industrial sector - heavy industry and manufacturing - prevails in the local economic structure due to its *proximity* to the Athens metropolitan region; its *good accessibility*; and a strong *policy incentives framework*, rendering the region a quite attractive location for industrial development.

The region is considered as an important *energy distribution node*, based on the energy distribution networks crossing its territory and its proximity to the largest refineries of the Greek state. Moreover, there is a growing interest in energy investments in the region, based on the abundance of renewable (wind, water) and non-renewable (lignite deposits) energy resources.

The *energy consumption pattern* of the region is largely reflecting its industrial development pattern. The industrial sector is the most energy-consuming sector, with a share which exceeds 85% for the years 1998, 1999 and 2000, while the rest of the sectors are exhibiting a considerably lower share of energy demand.

At the national level, the region occupies the third position in terms of energy demand, while in terms of industrial energy consumption it occupies the first position, where more than $1/5^{th}$ of the national energy consumption in the industrial sector is consumed in the study region.

[31] Administrative unit corresponding to NUTS3 level.

3.2 The Evaluation Problem

The planned location of a new industrial area in Tanagra-Boiotia region is placed along the efforts of supporting the rational organization and spatial development of the industrial sector in the study region. The new industrial region is expected to act as a local/regional development pole, attracting investments and further contributing to the employment opportunities and development of the region.

The location of the new industrial infrastructure is expected to increase the energy demand in the region. Since it is already a highly industrialized area, this may further deteriorate environmental quality and assets. Along these lines, the *goal* of the present study is to support decision making as to the location of a wind park installation, which will provide part of the energy consumed in the new industrial area by exploiting renewable energy (wind), serving thus sustainability aspects in the region.

The evaluation problem at hand is the selection of the most proper location for the wind park installation. This is accomplished by the application of the above presented methodological framework, described in the following.

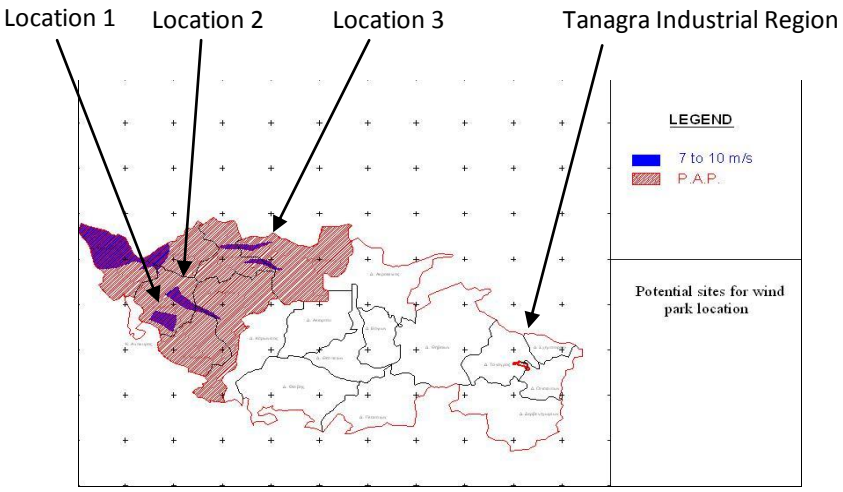
3.2.1. The development stage

At this stage, a set of potential sites (five sites) for wind park location were examined. A first round evaluation was carried out, concluding to a limited number of alternative solutions – the pre-selected sites. The evaluation was based on the following *exclusion criteria*:

- *wind velocity*, where sites disposing wind velocity less than 7 m/s were excluded.
- *proximity* to the *energy distribution network*, where sites far away from the network were discarded; and
- *proximity* to *vulnerable sites or urban constellations*, conditioning the density of windmills' installation according to the Greek legislative framework (Ecotechnica, 2007), where sites with low density windmills' installation potential (e.g. tourist sites in the area) were excluded.

On the basis of the above exclusion criteria, three potential sites were pre-selected for further evaluation (see Fig. 2 below). All of them lie on the mountainous part of the region, which ensures both high wind speed (7-10 m/s) as well as lower competition in terms of land use. Two sites lie on the southern part of the region of Boiotia, while the third on the northern part. The latter is comprised of two smaller sub-regions, at a distance of 3 km.

Fig. 2: Pre-selected sites for wind park location



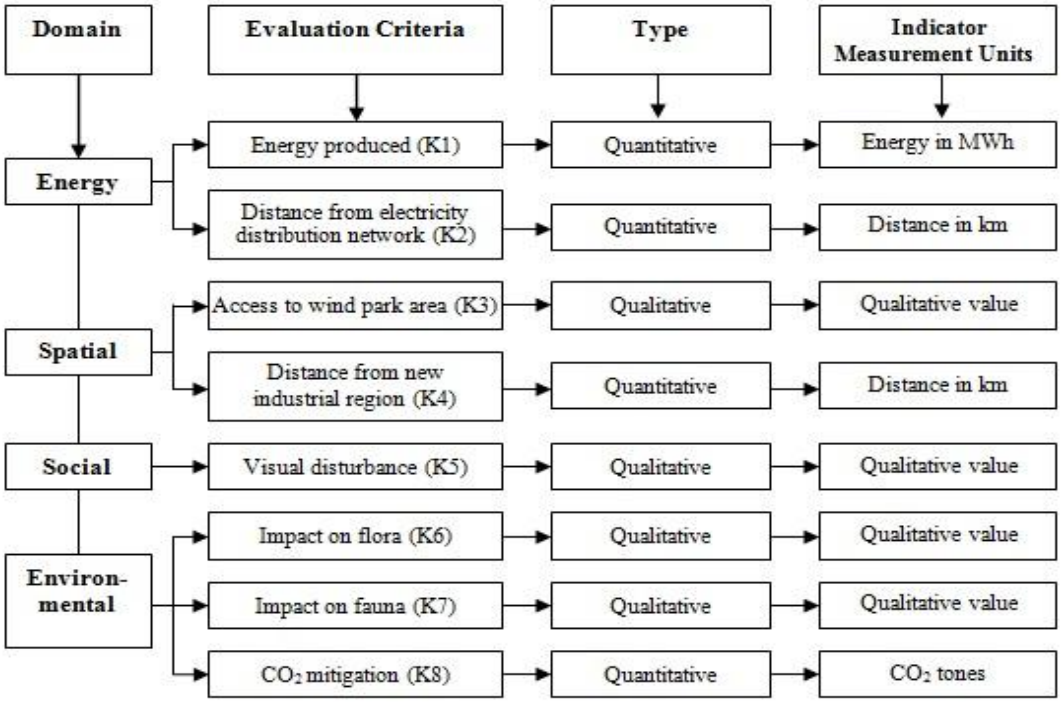
3.2.2. The evaluation / selection stage

In the following are presented the evaluation criteria, considered in the present study, their priorities as well as the impact matrix of the decision problem at hand.

⇒ *The evaluation criteria*

For the evaluation problem at hand, a set of qualitative and quantitative evaluation criteria were considered (Fig. 3 below) falling into the energy, spatial, social and environmental domains.

Fig. 3: Evaluation criteria (evaluation / selection stage)



These were used for the evaluation of the pre-selected sites by means of two multicriteria evaluation methods, namely the ELECTRE I and the REGIME method.

⇒ *Criteria priorities*

Defining weights in an evaluation problem, i.e. attaching priorities between different criteria, is fundamentally a political problem (Nijkamp and Torrieri, 2000).

The criteria priorities set in the present study (Table 2 below) reflect the preferences of local administrative bodies, in alignment with the goal of the study. These are based on the following rationale:

- Of first priority is considered the *energy domain*. The area at hand is a highly industrialized region, which has resulted to a certain deterioration of its environmental quality. At the same time, the region is very attractive for the location of new productive activities, due to its proximity to the Athens metropolitan region. Moreover, current industrial policy is expected to further stimulate the location of industry in the region. In order to keep or even improve the environmental assets of the area at hand, energy consumption patterns of the industrial sector are crucial. In this respect, there is a need to ensure that each new productive infrastructure will assure the production of at least a certain part of its energy demand by RES exploitation, serving thus local environmental objectives. Along these lines, energy domain criteria are considered as of highest priority, where the more the energy (K1) produced by the wind park installation the better for the region's environmental objectives; while the least the distance (K2) from the electricity distribution network the less the losses of electricity from the production site (wind park) to the network.

- Second highest priority is attached to *environmental criteria* and more specifically the CO_2 mitigation potential (K8) as well as flora (K6) and fauna (K7) protection due to the functioning of the wind park installation. Environmental benefits are strongly depended on the amount of energy produced by the wind park. The more the energy produced the larger the CO_2 mitigation potential, compared to the use of fossil fuels by the industrial firms located in the industrial region; and the lower the impact on the flora and fauna of the region.
- *Social criteria* are considered as third priority in respect to energy and environmental criteria, since the proposed wind park location areas entail a low visual disturbance (K5) for the surrounding local communities; while *spatial criteria*, relating to the accessibility (K3) of wind park areas as well as the distance (K4) from the industrial region are considered of equal priority to social criteria in the evaluation problem at hand.

Table 2: Criteria priorities

Criteria Priorities	Groups of criteria of equal priority
a. Energy	K1, K2
b. Environmental	K6, K7, K8
c. Social - spatial	K3, K4, K5

$\Rightarrow$ *Impact matrix*

On the basis of the evaluation criteria and the scores of the alternative sites i.e. the performance of each alternative site in respect to each single evaluation criterion, the following *impact matrix* is constructed, presenting the evaluation problem at hand (see Table 3 below).

Table 3: Impact matrix - Input to the evaluation / selection stage

Alternative / **Criterion**	**Alternative 1**	**Alternative 2**	**Alternative 3**
K1[32]	41.004 MWh	51.187 MWh	39.807 MWh
K2	3.7 Km	0 Km	2.9 Km
K3	- - -	+ + +	-
K4	77 Km	73 Km	60 Km
K5	5	3	1
K6	- - -	- - -	-
K7	- - -	- - -	-
K8	34853 ton.	43509 ton.	33836 ton.

3.3 Evaluation of Potential Sites – Empirical Results

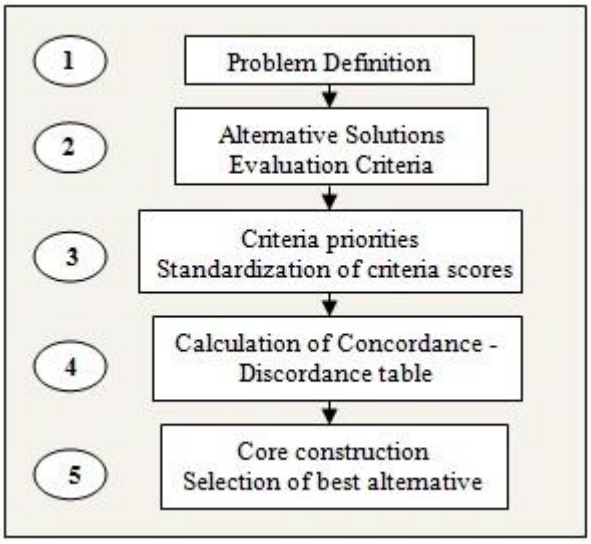
In this section, are presented the results obtained from the application of the ELECTRE I and REGIME multicriteria methods in the evaluation problem at hand.

3.3.1. Empirical results by use of ELECTRE I method

The steps undertaken in the ELECTRE I MCA method are presented in Fig. 4 below. Steps 1 and 2 of this process are already presented in previous sections. In Step 3, two very important issues of the ELECTRE I evaluation process are defined, namely the criteria priorities as well as the standardized scores of criteria.

[32] Calculated by the RETScreen Wind Energy model, RETScreen (2004).

Fig. 4: Steps in the ELECTRE I evaluation process



Criteria priorities are presented in Table 4 below and are following the previously described rationale.

Table 4: Criteria priorities and respective weights in the application of ELECTRE I

Criteria priorities	Groups of criteria	Weight (%)
Energy	K1, K2	45
Environment	K6, K7, K8	35
Social - Spatial	K3, K4, K5	20

Next step concerns the *standardization* of criteria scores. As scores presented in the impact matrix (Table 3 above) are mutually incomparable due to the different nature of criteria (quantitative and qualitative) and respective measurement units, a certain transformation of scores has to be carried out in order to standardize score values.

By considering a range of scores from 0 to 20, the following formula was used for the standardization *of quantitative* scores:

$$\textit{Standardized raw score } i = [\text{'raw' score } i \,/\, \text{maximum 'raw' score}] * 20 \quad (3.1)$$ [33]

Table 5: Concessions for the transformation of quantitative scores into 0-20 scale

α/α	Criterion	Minimum – maximum range
K1	Energy produced	Minimum is 0 MWh – maximum value is considered the 60.000 MWh, corresponding to the value of 20.
K3	Distance from electricity network (400 kv dc)	Least distance is considered as the best (value of 20) while maximum distance of 15km is grading to 0.
K4	Distance from industrial region	Least distance is considered as the maximum (best - value of 20), while maximum distance of 200 km is grading to 0.
K8	Decrease of CO_2 emissions	Maximum value is considered a decrease of CO_2 emissions of 50.000 tones (best value corresponding to 20).

Ratio-scale properties of quantitative scores still hold in the transformation of formula 3.1. For arithmetic reasons, instead of the maximum raw score, a hypothetical maximum score was used. As Voogd (1983) notices, such a score can be considered as a kind of *achievement level* e.g.

[33] Multiplication by 20 transforms range of scores from '0 to 1' to '0 to 20'.

maximum energy production of 60.000 KWh or *constraint* e.g. maximum distance from electricity network 15 km (see Table 5 above).

With regard to the transformation of the *qualitative scores*, standardization is accomplished by defining the *step* for each ordinal scale in respect to the range of 0 to 20. In such a context, in the first ordinal scale[34] (--- to +++, 6 classes, 5 steps), --- corresponds to 0, -- to 4, - to 8, + to 12, ++ to 16 and +++ to 20; while in the second ordinal scale[35] (1 to 5, 5 classes, 4 steps), 1 corresponds to 20, 2 to 15, 3 to 10, 4 to 5 and 5 to 0.

Table 6: Impact matrix with standardized criteria scores

Criterion / Alternative		Alternative E1	Alternative E2	Alternative E3	Criterion weight
K1	Energy produced	13.67~14.00	17.06~17.00	13.27~13.00	45/2 = 22.5
K2	Distance from the electricity network (400kv dc)	15.07~15.00	20.00	16.13~16.00	45/2 = 22.5
K3	Access to wind park area	0.00	20.00	8.00	20/3 = 6.67
K4	Distance from industrial region	12.30~12.00	12.70~13.00	14.00	20/3 = 6.67
K5	Visual disturbance	0.00	10.00	20.00	20/3 = 6.67
K6	Impact on flora	0.00	0.00	8.00	35/3 = 11.67
K7	Impact on fauna	0.00	0.00	8.00	35/3 = 11.67
K8	Decrease of CO_2 emissions	13.94~14.00	17.40~17.00	13.53~13.50	35/3 = 11.67

Moreover, within each criteria domain, criteria are considered to get the same weight. In such a context, in the 'energy' domain, criteria K1 and K2 are getting an equal weight of 22.5 (45/2); in the 'environment' domain, criteria K6, K7 and K8 are getting a weight of 11.67 (35/3); while in the 'social-spatial' domain, criteria K3, K4 and K5 are getting a weight of 6.67 (20/3).

Based on the above described transformations, the impact matrix takes the form presented in Table 6 above.

It follows Step 4, where the concordance and discordance tables are constructed (see Fig. 4 above).

The elements of the *concordance table* are calculated by use of the following analytical formulas (Psarras, 2008):

$$C(a,b) = \frac{1}{W} \sum_{gj(a) \geq gj(b)} w_j \qquad (3.2)$$

$$0 \leq C(a,b) \leq 1 \qquad (3.3)$$

where w_j, j=1, 2,…,n, is the weight of those criteria for which $g_j(\alpha) S g_j(b)$ with $g_j(\alpha)$ and $g_j(b)$ the scores of alternatives a and b in respect to the criterion j.

Table 7: Concordance table

	NaN	0.23	0.34
c =	1.00	NaN	0.63
	0.66	0.37	NaN

The output is an *mxm concordance table*, with m the number of choice options. The concordance table of the evaluation problem at hand has as follows (Table 7 above):

The *discordance table* is calculated by use of the following analytical formula (Psarras, 2008) (Table 8):

[34] - - - very high negative effect, - - high negative effect, - low negative effect, + low positive effect, ++ high positive effect, +++ very high positive effect,

[35] 1:very good, 2:good, 3:neutral (no impact), 4:bad 5:very bad

$$D(a,b) = \frac{1}{\delta} \max_j (g_j(b) - g_j(a)) \tag{3.4}$$

$$0 \le D(a,b) \le 1 \tag{3.5}$$

where $$\delta = \max_{a,b,j} (g_j(a) - g_j(b)) \tag{3.6}$$

Table 8: Discordance table

	NaN	1.00	1.00
c =	0	NaN	0.50
	0.05	0.60	NaN

In Step 5 (see Fig. 4 above), the core is identified as the set of alternatives that pass both concordance and discordance tests. For that purpose, every pair of *alternatives a and b* is tested on the basis of concordance $\hat{c}$ and veto $\hat{d}$ thresholds, verifying whether the outranking relation aSb is true (Psarras, 2008):

$$aSb \Leftrightarrow \begin{cases} C(a,b) \ge \hat{c} & (3.7) \\ D(a,b) \le \hat{d} & (3.8) \end{cases}$$

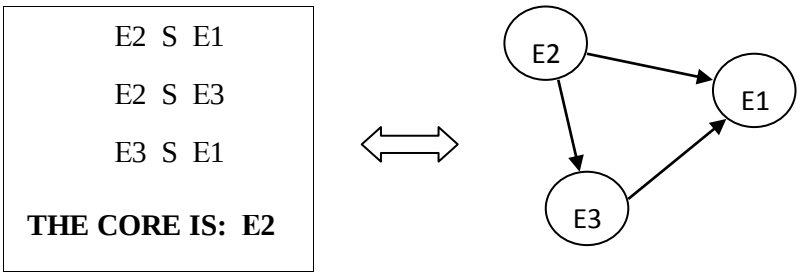
where $\hat{c}$ the concordance and $\hat{d}$ the discordance (veto) thresholds.

The identification of the core consists of an iterative process, starting with values of $\hat{c}$ close to 1 and $\hat{d}$ close to 0. The whole process is repeated by use of different threshold values, where concordance threshold decreases, while veto threshold increases gradually.

The following tests were carried out in the present evaluation study:

- *Concordance threshold* $\hat{c}$ *= 0.9 and veto threshold* $\hat{d}$ *= 0.1.* Alternative E2 prevails over E1, while the relationship between E1 and E3 is not known. Core is Π = {E2, E3}.
- *Concordance threshold* $\hat{c}$ *= 0.6 and veto threshold* $\hat{d}$ *= 0.3.* Alternative E2 prevails over E1 and E3 prevails over E1. Core is Π = {E2, E3}.
- *Concordance threshold* $\hat{c}$ *= 0.6 and veto threshold* $\hat{d}$ *= 0.5.* Alternative E2 prevails over E1 and E3. Core is Π = {E2} (see Fig. 5 below).

Fig. 5: Concordance – discordance tests for $\hat{c}$ = 0.6 and $\hat{d}$ = 0.5.

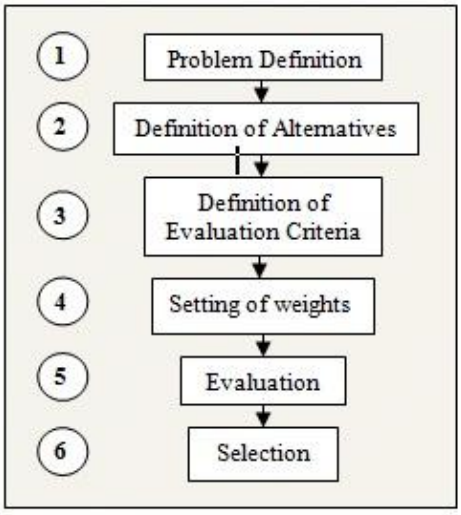


The above analysis supports the selection of alternative 2 (E2) as the prevailing one in the evaluation problem at hand.

3.3.2. Empirical results by use of REGIME method

The steps followed in the REGIME method are shown in Fig. 6 below. The impact matrix is the main input to the REGIME[36] MCA method (see Table 3), together with information on the nature, scale and direction of the evaluation criteria (see Fig. 3) and their priorities (Table 2).

Fig. 6: Steps of the evaluation process in the REGIME method



The probability table (Table 9) calculated by the REGIME method shows the relative success indices of each alternative. Each element of the probability table presents the probability a certain alternative (row alternative) to prevail over another alternative (column alternative).

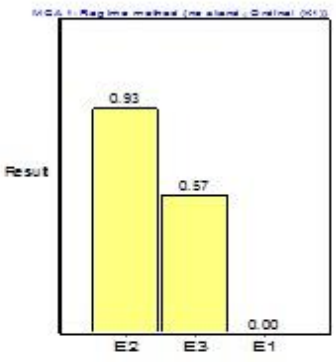
Table 9: Probability table

	E1	**E2**	**E3**
E1	-	0.00	0.00
E2	1.00	-	0.86
E3	1.00	0.14	-

Figure 7: Results obtained by the REGIME method

Criteria priorities	
1st	K1: energy produced K2: distance from electricity network
2nd	K6: impact on flora K7: impact on fauna K8: decrease of CO_2 emissions
3rd	K3: access to wind park area K4: distance from industrial region K5: visual disturbance

Alterna-tive	Total score
E1	0.00
E2	0.93
E3	0.57



The overall score of each alternative is then calculated as the *row average* of the relative success indices. As shown in Fig. 7, the highest score is attained by alternative E2, getting a row

[36] Use of DEFINITE Software (DEcisions on a FINITE Set of Alternatives), Janssen et al (2001).

average of 0.93, followed by E3 with a row average of 0.54, while E1 ranks at the bottom, getting a raw average of 0.00.

The above analysis results to the selection of alternative 2 (E2) as the prevailing option, which further reinforces the results obtained by the ELECTRE I multicriteria analysis.

4. Conclusions

The focus of the present paper is on the development of a methodological framework for the assessment of alternative wind park locations. Such a framework needs to take into account technical, economic, environmental, cultural and other aspects involved in the development of renewable energy installations, which imply the need to deal effectively with both qualitative and quantitative data. Moreover, it needs to take into consideration the different views/priorities set by the variety of stakeholders involved.

Towards this end, multicriteria evaluation has proved to be a useful tool, as it may offer a flexible and multidisciplinary assessment framework that is capable of: capturing the plurality of dimensions involved in such planning problems; prioritizing alternative solutions and supporting decision making in a coherent and transparent way; increasing participatory potential by involving priorities of a range of stakeholders, associated with the particular decision problem at hand; offering a platform for a structured debate with stakeholders; and making better use of available data resources, both quantitative and qualitative.

The empirical study, presented in this paper, has applied the proposed methodology in a real world example, namely the assessment of alternative wind park locations, using MCA tools. Two MCA techniques were used in this respect, namely the ELECTRE I method and the REGIME method, in order to deal with method uncertainty and validate evaluation results obtained. The two methods exhibit certain differences as to the: *data handled*, where ELECTRE I deals only with quantitative data on both criteria scores and priorities, while REGIME deals with both quantitative and qualitative (mixed) data on criteria scores and priorities; and the *output*, where ELECTRE I provides the prevailing choice option, but not a clear picture on the prioritization of the rest of the alternatives, while REGIME provides a more clear cut picture, by prioritizing all choice options. This consists of the main advantage of the REGIME method over the ELECTRE I, which, unlike the REGIME method, does not always lead to an unambiguous solution. Finally, the convergence of empirical results, obtained by both techniques, on the prevailing choice option supports a more confident decision in the evaluation problem at hand.

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CGE Analysis of Transportation Cost and Regional Economy: East Asia and Northern Kyushu

Hiroshi SAKAMOTO♦
Research Associate Professor
The International Centre for the Study of East Asian Development (ICSEAD)
11-4 Otemachi, Kokurakita, Kitakyushu, 803-0814 JAPAN
Tel: +81 93 583 6202; Fax: +81 93 583 4602
E-mail address: sakamoto@icsead.or.jp

Abstract

This study develops a multi-region computable general equilibrium model (CGE model), which analyzes the influence on a regional economy of a reduction in the transportation cost. The reduction in transportation cost is, in a word, reduction of the logistics cost. Logistic competition has accelerated with recent economic development. The Northern Kyushu region, which is the focal region of this study, is located near East Asian countries, including China and South Korea, but this area has fallen behind in the logistic competition. Therefore, immediate countermeasures are needed.

This study analyzes the economic effect on the Northern Kyushu region and on surrounding regions of the cost reduction caused by the logistic policy of the Northern Kyushu region. To achieve this purpose, several assumptions were made in the CGE model. First, the study analyzes 10 regions, namely Fukuoka City, Kitakyushu City, the rest of Fukuoka Prefecture, and Yamaguchi Prefecture (the northern Kyushu area consists of these regions), the rest of Japan, China, South Korea, Taiwan, ASEAN countries, and the USA. Second, in the production system, the transportation industry engenders transportation costs and these are added to the price of the commodity. Third, increasing returns to scale which Fujita et al. (1999) suggest was utilized for the manufacturing industry. Fourth, the number of firms belonging to industries with increasing returns was calculated endogenously based on the above assumption.

As a result, the logistic improvement will be shown to have had an economic effect, including an increase in the number of firms in the Northern Kyushu region.

JEL classification: C68, D58, O53, R15, R39, R49
Keywords: Northern Kyushu, Transportation cost, Regional economy, CGE model

1. Introduction

Logistics became important as the world economy developed. There was a time when Japan's logistic competitiveness as a trading nation was high. However, that competitiveness has decreased relative to Japan's stagnating economy and the increasing power of newly industrializing economies, including China's. To recover the competitiveness, first of all, it is important to recover the Japanese economy itself. On the other hand, it is necessary to improve the logistic competitiveness. This study examines the economic effect when logistic competitiveness rises. There has been considerable discussion on how to raise the competitiveness. However, it is important to know beforehand what economic effect would be realized as a result of improving competitiveness. This study analyzes the improvement of logistic competitiveness in the form of the reduction of logistics cost.

In an analysis of the regional economy, the transportation cost is an important variable. Although this viewpoint goes back as far as Von Thünen, Krugman and others advocate it as the new economic geography theory (Krugman, 1991, and Fujita et al., 1999). On the other hand, it is

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necessary to replace these theories with a more realistic model. In this regard, the computable general equilibrium model (CGE model) by which the general equilibrium theory is applied to economic statistical reality is employed. Therefore, the study analyzes the improvement of logistic competitiveness by using the CGE model.

Because the CGE model is used to analyze the transportation cost in the region, a multi-region model is necessary.[37] The Northern Kyushu region in Japan was the fourth region known for its steel, and follows Tokyo, Osaka, and Nagoya in economic importance; these four form an economic bloc. Moreover, it is geographically close to East Asia, including China and South Korea. Hence, its geographic situation can be exploited, and improvement of the logistic competitiveness has been identified as a key policy to activate the economy.

This study analyzes the economic effect on the region itself and on the surrounding region of the cost reduction engendered by the logistic policy of the Northern Kyushu region. To achieve this purpose, several assumptions were made in the CGE model. First, 10 regions were analyzed including Fukuoka City, Kitakyushu City, the rest of Fukuoka Prefecture, and Yamaguchi Prefecture (the Northern Kyushu region consists of these regions), the rest of Japan, China, South Korea, Taiwan, ASEAN countries (Indonesia, Malaysia, Philippines, Singapore, Thailand), and the USA. Figures 1 to 4 show the economies of those countries. The USA is the largest economy in Figure 1, Japan is second, but China has recently caught up with Japan.[38] All the countries have seen expanding international trade, except in 2009 (due to the financial crisis) (see Figures 2 and 3). Because the populations of China and ASEAN are large, their per capita GDP is extremely low (see Figure 4).

Fukuoka Prefecture has two government-designated major cities. One is Fukuoka City, which is the central city in Fukuoka Prefecture. The other is Kitakyushu City, which is a large city with a population of about one million. The administrative relationship between Fukuoka City and Kitakyushu City is not without problem. Because the two cities are being independently administered, it is possible for each city's government to execute a policy that would benefit its city the most. Figures 5 to 8 show the economy of the Northern Kyushu region. The 2000 price of gross regional product (GRP) of Fukuoka Prefecture shows an increasing trend during the period; however, its share in Japan's GRP is only about 3.5%. That of Yamaguchi Prefecture is only 1.1%, less than that of Fukuoka City. The GRP of Kitakyushu City is half or more than half that of Fukuoka City (see Figure 5). Yamaguchi Prefecture's GRP per capita falls below the national average, but is higher than Fukuoka Prefecture's. That of Kitakyushu City is lower than that of Yamaguchi Prefecture, though Fukuoka City's is higher than Yamaguchi Prefecture's (see Figure 6). Fukuoka Prefecture's population shows an increasing tendency and that of Yamaguchi Prefecture a decreasing one (see Figure 7). In Fukuoka City, the ratio of manufacturing is extremely low and indicates an economic structure of the city type. The ratio of manufacturing in Kitakyushu City is the same as for the national economy, and Yamaguchi Prefecture's ratio of manufacturing is higher than that of the national economy (see Figure 8). It is understood that there are some differences in the economic structure and these economy are very small.

Second, in the production system, the transportation industry engenders transportation costs and they are added to the price of the commodity. Third, increasing returns to scale which Fujita et al. (1999) suggest is applied to the manufacturing industry. Fourth, the number of firms due to the increasing returns in industry is calculated endogenously on the basis of the above assumption. Although these are related to the Fujita et al. (1999) model, some improvements are made to make it applicable to the CGE model.

The model and data are explained in the next section. Section 3 explains the simulation design. Section 4 gives the results of the simulation, and the last section states the conclusion.

[37] The representative of the CGE model for multi-region (multi-country) analysis is the GTAP (Global Trade Analysis Project) model (Hertel, 1997). Dozens of multi-region models have been developed (for example, Adelman and Yeldan, 2000; Böhringer and Welsch, 2004; Bröcker et al., 2010; Das et al., 2005; Horridge and Wittwer, 2008; Ishiguro and Inamura, 2005; Kilkenny, 1998; Kim and Kim, 2002; Latorre et al., 2009; Li et al., 2009; Miyagi, 1996 and Ueda et al., 2005) and Donaghy (2009) is carrying out the survey of the literature of this direction.

[38] Japan was second but China has now outstripped Japan to become the second largest.

2. Model structure

This model utilizes 10 regions, two factors of production (labor and capital), and 18 sectors (1 agriculture, 8 manufactures, 1 construction and 8 services). The background of this model in large measure rests on the new economic geography theory (Fujita et al., 1999). Incidentally, of the theory, (1) the iceberg style transportation cost, (2) the Dixit and Stiglitz (1977) type utility function, and (3) the production function of manufacturing sector equipped with increasing return technology are adopted into the model.[39] In this paper, we devise a method for treating these assumptions that makes it easy to incorporate them into the CGE model. All the mathematical notations of this model are described in the appendix.

2-1. Transportation costs

The iceberg style transportation cost is assumed in the most of the new economic geography literature. Although this refers to goods moving between different regions, it reflects reality in that it takes into consideration the melting down in time and is an assumption that is easy to treat as a theoretical model. Adopting the iceberg cost in the CGE model is possible: one example of this is Kilkenny's (1998) prototype model; the other is in the SCGE literature (Bröcker et al., 2010; Ishiguro and Inamura, 2005 and Ueda et al., 2005). However, since the CGE model deals with the actual social accounting matrix (SAM) using an input-output table, on the premise that the whole economy is balanced in value, the treatment of diminishing value may make construction of the model difficult. Moreover, while the model applies the transportation cost to the dealings between regions, it does not take into account the transportation cost within a region. It is not appropriate to apply the transportation cost to the dealings between regions only, either. Therefore, it is necessary to consider another assumption that extends the iceberg style regarding the transportation cost.

The transportation industry of each region produces a transportation service and adds it to the purchase price. Since the purchasing sector covers not only its own region but other regions, the transportation industry can impose transportation costs on both local and external dealings. Therefore, the purchase price (for example, purchase by a private consumer) which is added to transportation costs is as follows:

$$PPC_{r,s,ii} = PD_{r,ii}\left(1 + tpc_{r,s}\right) \quad (1)^{40}$$

where *tpc* is the exogenous transportation cost parameter that decides the rate of the transportation cost, and is calculated from the SAM database as follows:

$$tpc_{r,s} = \frac{PD_{r,trans}PC_{r,s,trans}}{\sum_{ii} PD_{r,ii}PC_{r,s,ii}}. \quad (2)^{41}$$

These parameters differ according to each region and purchasing sector and the demand for the transportation service that the transportation industry should produce is decided by summing all transportation costs.

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[39] About the point which assumes only the manufacturing sector to be increasing returns industry, one applies a simple model setup of Krugman (1991). In Krugman (1991), agriculture is considered as constant returns to scale and the manufacturing sector is made into increase returns to scale. It is because another can be said for the manufacturing sector to be capital-intensive industry unlike agriculture or a service sector.

[40] Suffix "*ii*" means all sectors except the transportation sector. Also "*i1*" means the sector that has a constant return in production and "*i2*" means the sector that has an increasing return in production (see appendix).

[41] The row data of the transportation sector in the SAM are used.

2-2. Consumer demand

The consumer demand has the Cobb-Douglas type utility function for the 17 final products. However, since the 8 final products of the manufacturing sector are implicitly several different small products, the sub-utility function for those small products is assumed tentatively to be the following Dixit and Stiglitz (1977) type CES function:

$$X_{i2} = \left[\int_0^{n_{i2}} x(j)_{i2}^{\rho_{i2}} dj \right]^{\frac{1}{\rho_{i2}}},\ \rho_{i2} = 1 + \frac{1}{\sigma_{i2}},\ \sigma_{i2} < -1 \quad (3)$$

σ is the elasticity of substitution between each small product, and n is the number of small products. Based on this assumption, the utility function of each consumer is as follows:[42]

$$U = \prod_{ii}^{17} X_{ii}^{\alpha_{ii}} = \prod_{i1}^{9} X_{i1}^{\alpha_{i1}} \prod_{i2}^{8} \left[\int_0^{n_{i2}} x(j)_{i2}^{\rho_{i2}} dj \right]^{\frac{\alpha_{i2}}{\rho_{i2}}}. \quad (4)$$

Adopting the consumer problem for maximizing its utility subject to budget constraints, the demand function is solved as follows:

$$X_{ii} = \frac{\alpha_{ii} DISINCOME}{PD_{ii}}. \quad (5)$$

As regards the demand for small goods, it is as follows:

$$x_{i2} = \frac{\alpha_{i2} DISINCOME}{N_{i2} PA_{i2}}. \quad (6)$$

This is because the demand for small goods is the same at the equilibrium.[43]

When the consumer carries out demand for the same quantity of each small good, each small firm that produces will also attach the same price at the equilibrium. In this case, the relation between the price that a small firm attaches and the price index that is made is as follows:

$$PD_{r,j2} = PA_{r,j2} N^{\frac{1}{1+\sigma_{r,j2}}} \left(1 + ntax_{r,j2}\right). \quad (7)$$

It turns out that the price index of the industry to which the small firm belongs depends on the number of firms producing similar goods and the elasticity of substitution of small goods.

2-3. Firm's production

As regards the production structure of the firms, the composite factor (value added) of production uses two factors of production, the intermediate goods produced locally and externally, the composite goods by factor and the intermediate goods, and the final goods with the imported goods from the rest of the world through a nested type production structure. Such a multi-tier production function system imitates the context of a certain CGE model. It assumes the (A-5-1) CES type production function for producing composite factors using two factors of production, the (A-5-2) CES type for intermediate goods produced locally and externally, the (A-5-3) Leontief type with composite factor and intermediate goods, and the (A-5-4) CES type for adding the imported goods from the rest of the world. The "Armington" assumption is used, which adopts the CES type in tier (A-5-2) and (A-5-4) (Armington, 1969). The final goods are

[42] Flôres (1997) also uses this type of utility function for assuming increasing return.

[43] *X*, *x* and *DISINCOME* in eq(3) to eq(6) are tentative notations for explaining the model. Actual demand function is defined as equations E-29, E-33, and E-37 in the appendix.

divided according to each demand (private consumption, government consumption, private investment, inventory, intermediate goods sold locally and externally, and goods exported to the rest of the world) by perfect substitution. The demand and price of exported goods are assumed exogenously.

As regards the production in 8 manufacturing sectors to which many small firms belong, each small firm produces unique products. To achieve this, the firm needs a fixed cost for its production, but it can use the technology of increasing returns to scale and can decide on a sales price under the maximizing profit condition. In this model, the fixed cost is set in the final tier of the nested system. Therefore, the production function of each small firm facing fixed setup costs is as follows:

$$Q_{r,j2} + FIX^{*}_{r,j2} = \gamma^{Q}_{r,j2}\left[\alpha^{QY}_{r,j2} Y^{\rho^{M}_{j2}}_{r,j2} + \alpha^{QM}_{r,j2} M^{\rho^{M}_{j2}}_{r,j2}\right]^{\frac{1}{\rho^{M}_{j2}}},\ \alpha^{QY}_{r,j2} + \alpha^{QM}_{r,j2} = 1. \quad (8)$$

As mentioned before, each small firm can decide on its sales price as a monopolistic enterprise, and the markup price that a firm determines becomes the following:

$$PA_{r,j2} = \frac{1}{\rho_{i2}} PQ_{r,j2} = \frac{\sigma_{r,j2}}{1+\sigma_{r,j2}} PQ_{r,j2}. \quad (9)$$

The base price of the products before markup is assumed as numeraire.

In order that 10 industries including the transportation industry may assume constant returns to scale, excess profits are not generated at the equilibrium. Moreover, it is assumed that excess profits do not similarly occur when the increasing returns of the industries are at the equilibrium. This is the famous monopolistic competition approach. When this condition is assumed, market equilibrium is as follows for the increasing returns of an industry:

$$PD_{r,j2} / \left(1 + ntax_{r,j2}\right) Q_{r,j2} = PQ_{r,j2} Q_{r,j2} + FIX^{*}_{r,j2} \quad (10)$$

The number of small firms is determined at the equilibrium endogenously.

2-4. Database, SAM, and calibration

In this paper, the multi-region input-output table is adopted as a database. This table consists of two parts. One is a table of five regions in Japan and another is an international table. The interregional input-output table of Japan is estimated by using the following input-output tables: Japan, Fukuoka Prefecture, Yamaguchi Prefecture, Fukuoka City, Kitakyushu City, and the interregional table comparing Fukuoka Prefecture and the rest of Japan. The base year is 2000. These tables are available on the regions' administration websites. The disaggregated interregional input-output tables of five regions are estimated mechanically by using proportional and RAS methods. The international table is based on the "2000 Asian International Input-Output Table (estimated by Institute of Developing Economies, Japan External Trade Organization)." Because the information from five regional tables in Japan was used for the international table, the part on Japan is divided into five regions. Since ASEAN was divided into several countries in the international table, these were brought together into one region, and finally, the 10-regions table is used in this paper. The multi-region input-output table was adjusted for building SAM which the CGE model uses and is treated based on this data.

The model is calibrated using the database. All parameters except elasticity are estimated by the database and the maximizing condition. Elasticity parameters are selected on the basis of the literature. Exogenous variables are also decided from the database. Moreover, the number of firms in the industry to which small firms belong is assumed to be equal to 1 as the solution of the base case, and uses a relative measure. One reason is that dealing with the actual number of firms is not helpful, since the number of firms in each industry is too much. This approach simplifies the calculation.

As regards the solution method in this model, the computation is performed by regarding it as the summed up data. Although each small firm faces the same quantity of production and the same price at the equilibrium, in order to assume the number of firms to be 1 in the base case solution, it becomes equal to the summed up data. In addition, since the number of firms in the industry to which small firms belong is determined by equation (7) endogenously, when an exogenous shock occurs, the number of firms changes. When the number of firms exceeds 1, it means that the number of firms of a certain industry in the region increases, and thus the agglomeration effect of the industry between regions can be seen.

3. Simulations

The importance of international logistics has risen steadily along with economic growth. In order for logistics to become important, economic growth is necessary. The fact that the world economy including China has grown, while the Japanese economy has stagnated means there is a relative decrease in the logistics of Japan (see Figure 1). On the other hand, the efficiency of Japan's logistics management is called into question. Therefore, the method for activating the economy must be examined, starting with improving the efficiency of the logistics. The study simulates how the improved efficiency of logistics influences the agglomeration of industry and the regional economy. The simulation assumes the case where the transportation cost is reduced by improved logistical efficiency. Of course, the policy leading to the reduction in transportation cost is not the object of this study.

This discussion concentrated only on the measurement of the economic effect induced by the reduction in the mechanical transportation cost. The method of reducing transportation cost can be measured by reducing the exogenous transportation cost parameter such as *tpc*, *tgc*, *tiv*, *te*, and *txm* in the model.[44] The region where the transportation cost is reduced is determined, and the effects of the policy are compared in the study. First, the paper considers the Northern Kyushu region, and measures the reduction in the transportation cost of Fukuoka City, Kitakyushu City, and the entire Fukuoka Prefecture (Fukuoka City, Kitakyushu City, and the rest of Fukuoka Prefecture), respectively. Fukuoka City and Kitakyushu City are very small economic areas in this model. However, they have independent harbors and airports, and the logistics policy can be executed by each city individually. On the other hand, a more inclusive logistics policy should be executable at the level of the prefecture, and the effect of the policy in this case measured. Second, the paper considers the influence on the Northern Kyushu region when transportation cost in the region other than the Northern Kyushu region is reduced. The region of interest is the rest of Japan and China. As for the rest of Japan, Tokyo, Osaka, and Nagoya are included in the regions, but not the Northern Kyushu region. The case in which the logistics policy was previously executed on these cities and the transportation cost reduced is measured. The reducing transportation cost in China is based on infrastructure maintenance along with economic growth.

Therefore, 6 simulations are given above.

Simulation 1: 10% reduction of the total transportation cost parameter in Fukuoka City.
Simulation 2: 10% reduction of total transportation cost parameter in Kitakyushu City.
Simulation 3: 10% reduction of total transportation cost parameter in Fukuoka Prefecture.
Simulation 4: 10% reduction of total transportation cost parameter in the rest of Japan.
Simulation 5: 10% reduction of total transportation cost parameter in China.
Simulation 6: 50% reduction of total transportation cost parameter in China.

The evaluation of the simulation takes three forms: (1) change of the number of firms in industries with increasing returns, (2) change of industrial structure, and (3) change of macro value of regions. Labor is able to move among regions and industries as the number of firms changes (E-4). However, the capital cannot be moved (E-5). Therefore, the change of labor becomes an important item for observation after the simulations. The output of each industry and

[44] Because we use aggregated input-output data for calibrating the transportation cost parameter, the transportation sector includes all modes of transportation in this study. Moreover, because inner regional transaction is included in the database, reducing the transportation cost means reducing domestic trading costs as well as international trading costs.

regional income are also items for observation in the paper. All have the solution of a base case with 1, and the change between items can be understood by the increase and decrease from 1.

4. Results

All tables show the degree of change under the simulation when setting the results relative to a base case with 1. Table 1 shows the change of the number of firms in industries with increasing returns, in Simulations 1-3. Each region's agglomeration effect is clearly seen. In Fukuoka City's case, a 10% reduction in transportation cost leads 0.9% increase in firms in the food industry (i002) and 10.2% of firms in the chemical industry (i004). In Kitakyushu City's case, the reduction results in a 1.2% increase in firms in the electronic industry (i007) and a 5.3% increase in the textile industry (i003). In Fukuoka Prefecture's case, the reduction results in a 1.0% increase in firms in the transport equipment industry (i008) in the rest of Fukuoka prefecture and a 9.7% increase in the chemical industry (i004) in Fukuoka City. The reason for the difference in results may be that the industrial structure and transportation cost structure differ between regions. Moreover, the number of firms increases in some regions or industries; consequently, there is a decreasing tendency of firms in surrounding regions. On the other hand, the number of foreign firms does not change greatly due to the transportation cost reduction in the Northern Kyushu region. It can be said that the influence of the Northern Kyushu region on the world economy is very small.

This is understood from Table 2. Table 2 shows the total of labor (ilabo), total of gross production (iout), and total of production per labor unit (ioula) in each industry. Most changes are not seen, and the negligible influence of the Northern Kyushu region on the world economy can be understood.

Table 3 shows each region's macro value, that is, total of labor (tlabo), total of gross production (tout), value added income (inco), price fixed income (rinc), and per labor unit of them (toula, incla, and rinla) in each region. The transportation cost reduction increases the labor force, and increases the nominal value of added income in the region. However, the increase of labor is larger than the increase of production, and leads to a decrease in productivity as a macro.[45] Moreover, increase in real income is also smaller than increase in labor, and the economic effect might not be induced by added labor. However, attracting firms and increasing the labor force lead to the activation of the region. Therefore, it can be said that the transportation cost reduction has an economic effect on the region.

Tables 4-6 show the same result as in Simulations 4-6. The transportation cost reduction of the rest of Japan has a dramatic effect on the decrease in the number of firms in Northern Kyushu. On the other hand, though it is not the rest of Japan, the transportation cost reduction of China also decreases the number of firms of the Northern Kyushu region. Even with a 50% reduction and the transportation cost of China being greatly reduced, this tendency is similar. In a word, it is due to the heavy influence of the logistics competition on Japan.

The transportation cost reduction of the rest of Japan causes the reduction of labor, largely in the transportation industry (s015). This is because the transportation cost reduction brings a decrease of production demand for the transportation industry, and a reduction of labor follows. On the other hand, the transportation cost reduction of China increases the amount of labor in agriculture (a001), and the decrease of labor in the transportation industry is small. This difference shows Japan's transportation industry is more active. The influence on the macro is the same as seen in Table 3. The region where the transportation cost was reduced is activated, and another region influences it. Therefore, it is important that the authorities introduce a transportation cost reduction policy as early as possible, judging from these simulations.

5. Concluding remarks

This study develops a multi-region CGE model that analyzes the influence on the regional economy of a reduction in the transportation cost. Reducing the transportation cost in the

[45] One of the possibilities is shown in the model specification. Because labor is a part of production and intermediate goods are included in production, labor might not increase production very much even if the simulation shows an increase in labor.

Northern Kyushu region is expected to attract firms and increase the amount of labor, as well as revitalize the regional economy. On the other hand, the opposite results were seen, with negative activation of the Northern Kyushu region leading to reduction in the rest of Japan. Therefore, a logistics policy should be speedily implemented, the result of which would be reflected in the economic effect.

The reduction in the transportation cost is directly connected with the decline in demand of the transportation industry, though this CGE model is constructed from the theoretical model of Fujita et al. (1999). It is necessary to examine this assumption thoroughly.

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Figure 1 Nominal GDP of selected countries (Billion UD$)

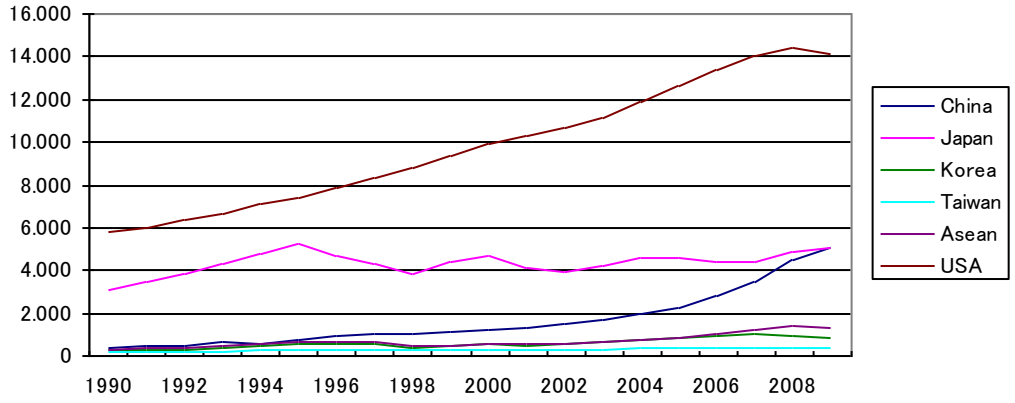


Figure 2 Export of selected countries (Billion UD$)

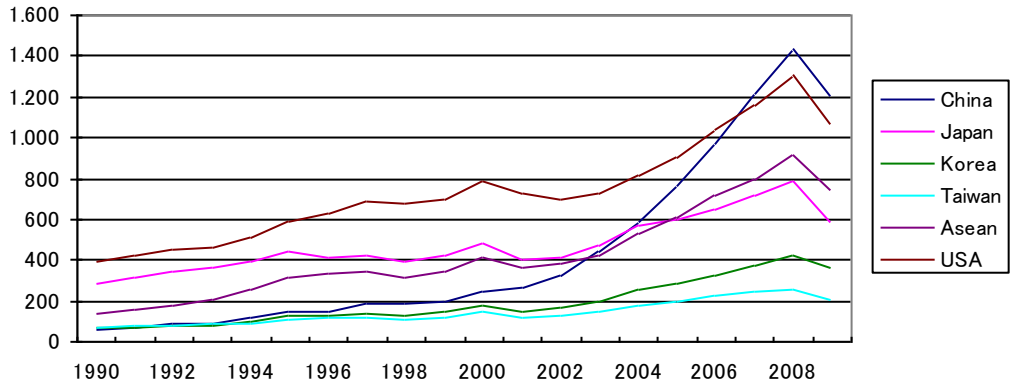


Figure 3 Import of selected countries (Billion UD$)

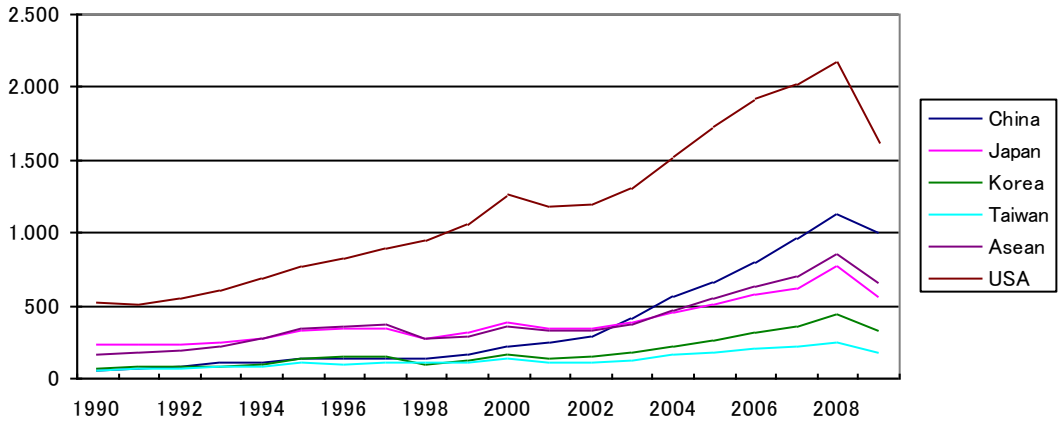
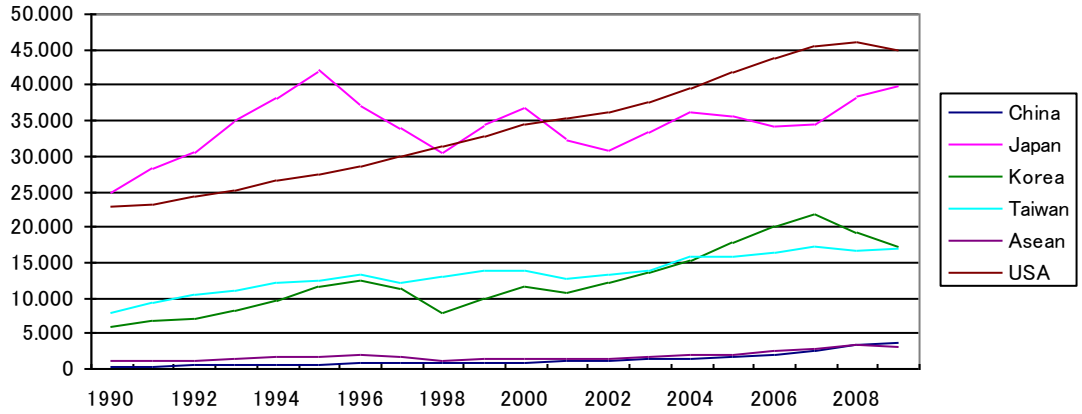


Figure 4 Per capita GDP of selected countries (UD$)



(Source) International Monetary Fund, 2010, *International Financial Statistics*, December 2010 CD-ROM.
Republic of China, Directorate-General of Budget, Accounting, and Statistics, *National Statistics* website (http://eng.stat.gov.tw/mp.asp?mp=5) for Taiwan.

Figure 5 Gross regional products (GRP) of objective regions (2000 price, Billion yen)

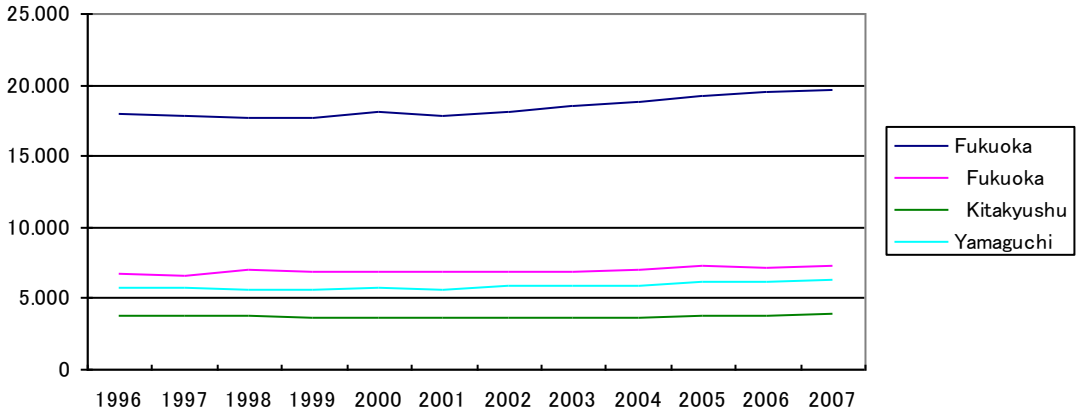


Figure 6 Per capita GRP of selected regions (Thousand yen)

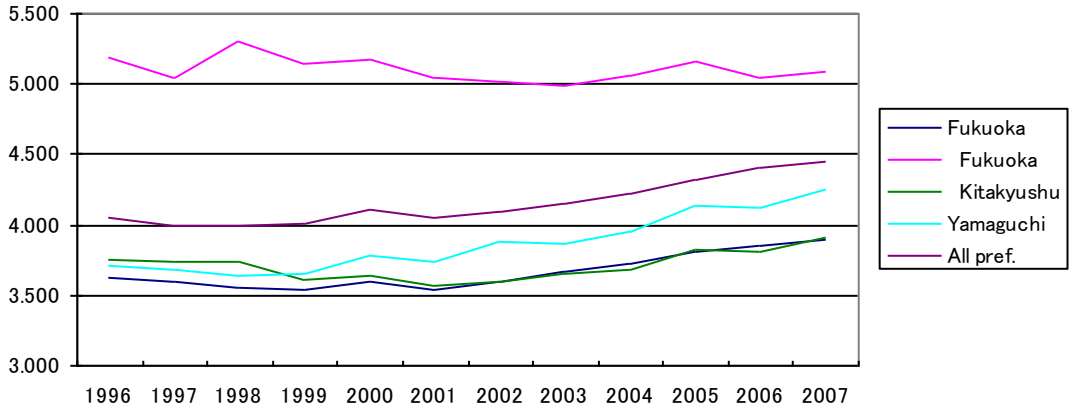


Figure 7 Population of selected regions (10,000 persons)

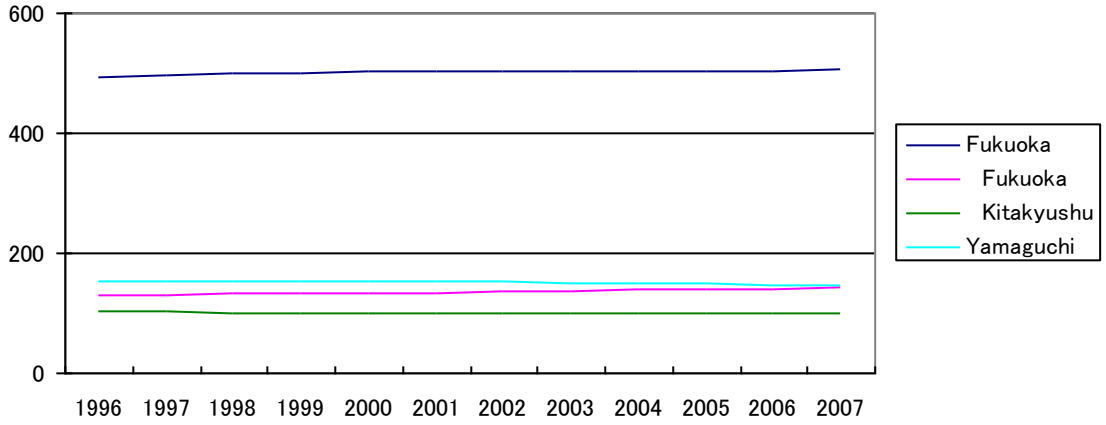
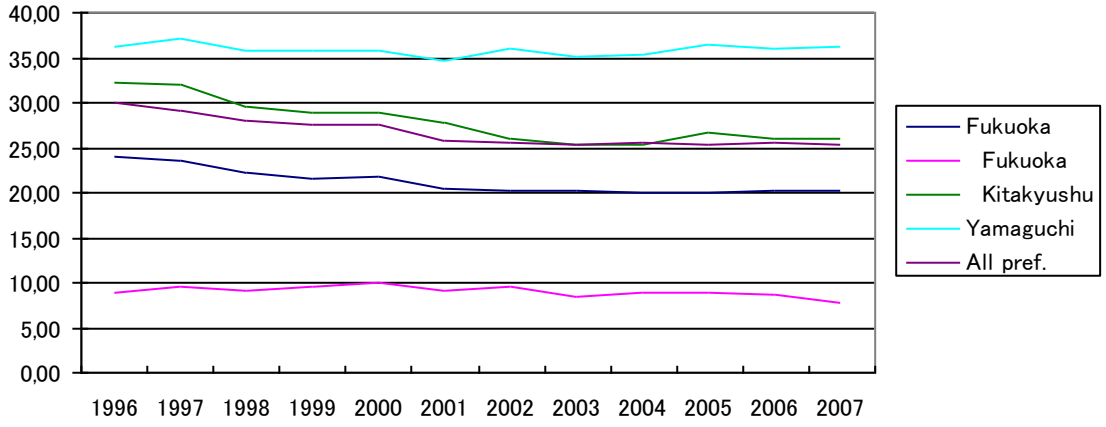


Figure 8 Share of secondary industry (percent)



(Source) *Kenmin Keizai Keisan*, Cabinet Office, Government of Japan

Table 1 Number of firms for each simulation

		fc*0.9	kc*0.9	fp*0.9			fc*0.9	kc*0.9	fp*0.9
cn	i002	0.9999	1.0000	0.9999	op	i002	0.9997	1.0000	0.9997
cn	i003	0.9999	1.0000	0.9999	op	i003	0.9998	0.9999	0.9992
cn	i004	0.9999	1.0000	0.9999	op	i004	0.9998	0.9998	0.9989
cn	i005	0.9999	1.0000	0.9999	op	i005	0.9999	0.9996	0.9991
cn	i006	0.9999	1.0000	0.9999	op	i006	0.9998	1.0000	0.9998
cn	i007	0.9999	1.0000	0.9999	op	i007	0.9999	1.0000	0.9998
cn	i008	0.9999	1.0000	0.9999	op	i008	0.9999	1.0000	0.9997
cn	i009	0.9999	1.0000	0.9999	op	i009	0.9998	0.9999	0.9996
fc	i002	1.0089	1.0002	1.0107	kr	i002	0.9999	1.0000	0.9999
fc	i003	1.0462	0.9999	1.0427	kr	i003	1.0000	1.0000	0.9999
fc	i004	1.1018	0.9991	1.0972	kr	i004	1.0000	1.0000	0.9999
fc	i005	1.0454	0.9991	1.0442	kr	i005	1.0000	0.9999	0.9999
fc	i006	1.0160	1.0003	1.0180	kr	i006	0.9999	1.0000	0.9999
fc	i007	1.0150	1.0001	1.0158	kr	i007	0.9999	1.0000	0.9999
fc	i008	1.0245	1.0001	1.0254	kr	i008	1.0000	1.0000	0.9999
fc	i009	1.0199	0.9995	1.0206	kr	i009	0.9999	1.0000	0.9999
kc	i002	0.9996	1.0281	1.0289	tn	i002	0.9999	1.0000	0.9999
kc	i003	0.9997	1.0533	1.0505	tn	i003	1.0000	1.0000	1.0000
kc	i004	0.9998	1.0416	1.0398	tn	i004	1.0000	1.0000	0.9999
kc	i005	0.9999	1.0260	1.0259	tn	i005	1.0000	0.9999	0.9999
kc	i006	0.9998	1.0129	1.0132	tn	i006	0.9999	1.0000	0.9999
kc	i007	0.9998	1.0121	1.0123	tn	i007	0.9999	1.0000	0.9999
kc	i008	0.9999	1.0131	1.0132	tn	i008	0.9999	1.0000	0.9999
kc	i009	0.9998	1.0345	1.0369	tn	i009	0.9999	1.0000	0.9999
of	i002	0.9996	1.0006	1.0146	aa	i002	0.9999	1.0000	0.9999
of	i003	0.9999	1.0000	1.0366	aa	i003	0.9999	1.0000	0.9999
of	i004	1.0002	0.9999	1.0360	aa	i004	1.0000	1.0000	0.9999
of	i005	1.0008	0.9984	1.0390	aa	i005	0.9999	0.9999	0.9998
of	i006	1.0000	1.0009	1.0142	aa	i006	0.9999	1.0000	0.9999
of	i007	1.0002	1.0007	1.0231	aa	i007	0.9999	1.0000	0.9999
of	i008	1.0001	1.0003	1.0103	aa	i008	0.9999	1.0000	0.9999
of	i009	0.9998	0.9990	1.0256	aa	i009	0.9999	0.9999	0.9998
yp	i002	0.9996	1.0000	0.9998	us	i002	1.0000	1.0000	1.0000
yp	i003	0.9997	0.9992	0.9970	us	i003	1.0000	1.0000	1.0000
yp	i004	0.9997	0.9986	0.9964	us	i004	1.0000	1.0000	1.0000
yp	i005	0.9999	0.9963	0.9955	us	i005	1.0000	1.0000	1.0000
yp	i006	0.9998	1.0002	1.0000	us	i006	1.0000	1.0000	1.0000
yp	i007	0.9998	1.0003	1.0003	us	i007	1.0000	1.0000	0.9999
yp	i008	1.0000	1.0001	0.9997	us	i008	1.0000	1.0000	1.0000
yp	i009	0.9997	0.9982	0.9975	us	i009	1.0000	1.0000	1.0000

Table 2 Change of industrial structure for each simulation

	fc*0.9			kc*0.9			fp*0.9		
	ilabo	iout	ioula	ilabo	iout	ioula	ilabo	iout	ioula
a001	0.9999	0.9999	1.0001	1.0000	1.0000	1.0000	0.9999	1.0000	1.0001
i002	0.9999	0.9999	1.0000	1.0000	1.0000	1.0000	1.0001	1.0000	1.0000
i003	0.9999	0.9999	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
i004	1.0000	0.9999	1.0000	1.0001	1.0000	1.0000	1.0001	1.0000	0.9999
i005	1.0000	0.9999	1.0000	1.0001	1.0001	1.0000	1.0001	1.0001	1.0000
i006	0.9999	0.9999	1.0000	1.0001	1.0000	1.0000	1.0000	1.0000	1.0000
i007	1.0000	0.9999	1.0000	1.0000	1.0000	1.0000	1.0001	1.0000	1.0000
i008	0.9999	0.9999	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
i009	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
i010	0.9999	0.9999	1.0000	1.0001	1.0001	1.0000	1.0001	1.0000	1.0000
s011	0.9999	1.0000	1.0001	1.0001	1.0000	0.9999	1.0001	1.0000	0.9999
s012	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0001	1.0000	1.0000
s013	0.9999	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
s014	0.9999	1.0000	1.0001	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
s015	0.9994	0.9997	1.0002	0.9997	0.9998	1.0001	0.9987	0.9991	1.0005
s016	0.9999	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
s017	0.9999	0.9999	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
s018	0.9999	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Table 3 Change of macro value of region for each simulation

		tlabo	tout	inco	rinc	toula	incla	rinla
fc*0.9	cn	0.9999	0.9999	0.9998	0.9999	1.0000	1.0000	1.0001
	fc	1.0040	1.0032	1.0053	1.0024	0.9993	1.0013	0.9985
	kc	0.9996	0.9998	0.9995	0.9998	1.0001	0.9999	1.0002
	of	0.9998	0.9999	0.9998	0.9999	1.0001	1.0000	1.0001
	yp	0.9996	0.9997	0.9996	0.9998	1.0001	0.9999	1.0002
	op	0.9997	0.9998	0.9997	0.9999	1.0001	0.9999	1.0001
	kr	0.9999	1.0000	0.9999	1.0000	1.0000	1.0000	1.0000
	tn	0.9999	0.9999	0.9999	1.0000	1.0000	1.0000	1.0000
	aa	0.9999	1.0000	0.9999	1.0000	1.0000	1.0000	1.0000
	us	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
kc*0.9	cn	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
	fc	1.0003	1.0002	1.0004	1.0002	0.9999	1.0001	0.9999
	kc	1.0166	1.0140	1.0209	1.0096	0.9975	1.0043	0.9931
	of	1.0009	1.0005	1.0011	1.0006	0.9996	1.0002	0.9997
	yp	0.9993	0.9993	0.9993	0.9996	1.0000	1.0000	1.0003
	op	0.9999	0.9999	0.9999	1.0000	1.0000	1.0000	1.0000
	kr	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
	tn	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
	aa	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
	us	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
fp*0.9	cn	0.9999	0.9999	0.9998	0.9999	1.0000	1.0000	1.0001
	fc	1.0062	1.0047	1.0079	1.0038	0.9985	1.0018	0.9976
	kc	1.0176	1.0145	1.0222	1.0101	0.9970	1.0046	0.9927
	of	1.0142	1.0122	1.0180	1.0089	0.9980	1.0037	0.9948
	yp	0.9983	0.9984	0.9982	0.9990	1.0001	0.9999	1.0007
	op	0.9996	0.9997	0.9995	0.9997	1.0001	0.9999	1.0002
	kr	0.9999	0.9999	0.9999	1.0000	1.0000	1.0000	1.0001
	tn	0.9999	0.9999	0.9999	0.9999	1.0000	1.0000	1.0000
	aa	0.9999	0.9999	0.9999	1.0000	1.0000	1.0000	1.0001
	us	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Table 4 Number of firms for each simulation

		op*0.9	cn*0.9	cn*0.5			op*0.9	cn*0.9	cn*0.5
cn	i002	0.9980	1.0080	1.0406	op	i002	1.0073	0.9992	0.9960
cn	i003	0.9990	1.0043	1.0215	op	i003	1.0049	0.9993	0.9966
cn	i004	0.9987	1.0035	1.0152	op	i004	0.9990	0.9994	0.9970
cn	i005	0.9982	1.0056	1.0273	op	i005	1.0050	0.9992	0.9960
cn	i006	0.9981	1.0056	1.0271	op	i006	1.0030	0.9993	0.9965
cn	i007	0.9986	1.0055	1.0273	op	i007	1.0048	0.9995	0.9973
cn	i008	0.9985	1.0016	1.0039	op	i008	1.0025	0.9996	0.9979
cn	i009	0.9983	1.0057	1.0274	op	i009	1.0063	0.9991	0.9952
fc	i002	0.9943	0.9992	0.9958	kr	i002	0.9982	0.9992	0.9962
fc	i003	0.9757	0.9990	0.9951	kr	i003	0.9990	0.9993	0.9966
fc	i004	0.9777	0.9985	0.9923	kr	i004	0.9984	0.9992	0.9959
fc	i005	0.9825	0.9986	0.9932	kr	i005	0.9979	0.9990	0.9950
fc	i006	0.9896	0.9990	0.9949	kr	i006	0.9981	0.9993	0.9964
fc	i007	0.9948	0.9993	0.9967	kr	i007	0.9984	0.9995	0.9977
fc	i008	0.9904	0.9995	0.9973	kr	i008	0.9988	0.9995	0.9977
fc	i009	0.9886	0.9993	0.9966	kr	i009	0.9979	0.9993	0.9963
kc	i002	0.9899	0.9990	0.9950	tn	i002	0.9985	0.9993	0.9966
kc	i003	0.9775	0.9992	0.9959	tn	i003	0.9992	0.9995	0.9975
kc	i004	0.9854	0.9991	0.9956	tn	i004	0.9988	0.9992	0.9960
kc	i005	0.9785	0.9987	0.9936	tn	i005	0.9982	0.9986	0.9931
kc	i006	0.9921	0.9991	0.9957	tn	i006	0.9983	0.9995	0.9977
kc	i007	0.9943	0.9994	0.9969	tn	i007	0.9983	0.9996	0.9979
kc	i008	0.9931	0.9997	0.9983	tn	i008	0.9986	0.9996	0.9979
kc	i009	0.9852	0.9988	0.9936	tn	i009	0.9987	0.9995	0.9975
of	i002	0.9917	0.9991	0.9955	aa	i002	0.9982	0.9996	0.9979
of	i003	0.9604	0.9991	0.9957	aa	i003	0.9983	0.9996	0.9980
of	i004	0.9549	0.9993	0.9967	aa	i004	0.9985	0.9995	0.9975
of	i005	0.9592	0.9991	0.9956	aa	i005	0.9967	0.9993	0.9966
of	i006	0.9891	0.9991	0.9956	aa	i006	0.9976	0.9994	0.9969
of	i007	0.9881	0.9989	0.9945	aa	i007	0.9988	0.9996	0.9982
of	i008	0.9894	0.9996	0.9979	aa	i008	0.9978	0.9996	0.9980
of	i009	0.9760	0.9989	0.9944	aa	i009	0.9964	0.9993	0.9966
yp	i002	0.9899	0.9991	0.9954	us	i002	0.9995	0.9998	0.9992
yp	i003	0.9793	0.9992	0.9961	us	i003	0.9996	0.9999	0.9993
yp	i004	0.9868	0.9994	0.9968	us	i004	0.9996	0.9999	0.9993
yp	i005	0.9770	0.9989	0.9946	us	i005	0.9995	0.9998	0.9989
yp	i006	0.9892	0.9991	0.9954	us	i006	0.9994	0.9998	0.9991
yp	i007	0.9924	0.9993	0.9965	us	i007	0.9992	0.9998	0.9988
yp	i008	0.9931	0.9997	0.9987	us	i008	0.9994	0.9999	0.9994
yp	i009	0.9850	0.9986	0.9926	us	i009	0.9994	0.9998	0.9992

Table 5 Change of industrial structure for each simulation

	op*0.9			cn*0.9			cn*0.5		
	ilabo	iout	ioula	ilabo	iout	ioula	ilabo	iout	ioula
a001	0.9992	0.9997	1.0005	1.0074	1.0033	0.9959	1.0382	1.0170	0.9796
i002	1.0025	1.0014	0.9988	1.0017	1.0011	0.9994	1.0091	1.0056	0.9966
i003	1.0015	1.0007	0.9993	1.0009	1.0009	1.0001	1.0044	1.0047	1.0004
i004	0.9999	0.9989	0.9990	1.0013	1.0008	0.9995	1.0061	1.0034	0.9973
i005	1.0021	1.0009	0.9988	1.0008	1.0010	1.0002	1.0042	1.0049	1.0008
i006	1.0016	1.0009	0.9993	1.0006	1.0007	1.0001	1.0030	1.0036	1.0006
i007	1.0022	1.0009	0.9986	1.0006	1.0006	1.0000	1.0030	1.0029	0.9999
i008	1.0012	1.0007	0.9995	1.0001	1.0000	1.0000	1.0001	0.9998	0.9997
i009	1.0014	1.0006	0.9992	1.0014	1.0008	0.9994	1.0069	1.0038	0.9969
i010	1.0021	1.0014	0.9993	1.0006	1.0011	1.0004	1.0034	1.0054	1.0020
s011	1.0018	1.0004	0.9986	1.0019	1.0007	0.9987	1.0095	1.0031	0.9937
s012	1.0023	1.0015	0.9992	1.0000	1.0001	1.0002	0.9999	1.0007	1.0007
s013	1.0003	1.0001	0.9998	1.0000	1.0000	1.0000	1.0001	0.9999	0.9998
s014	1.0010	1.0000	0.9990	1.0003	1.0000	0.9997	1.0015	1.0001	0.9986
s015	0.9707	0.9812	1.0109	0.9948	0.9963	1.0015	0.9730	0.9772	1.0044
s016	1.0015	1.0007	0.9993	1.0003	1.0002	0.9999	1.0015	1.0010	0.9995
s017	1.0004	1.0002	0.9998	1.0000	1.0001	1.0001	1.0001	1.0005	1.0005
s018	1.0010	1.0006	0.9996	1.0000	1.0001	1.0001	0.9999	1.0003	1.0004

Table 6 Change of macro value of region for each simulation

		tlabo	tout	inco	rinc	toula	incla	rinla
op*0.9	cn	0.9980	0.9985	0.9977	0.9988	1.0005	0.9996	1.0007
	fc	0.9945	0.9962	0.9935	0.9966	1.0017	0.9989	1.0021
	kc	0.9882	0.9906	0.9870	0.9932	1.0024	0.9988	1.0050
	of	0.9870	0.9875	0.9864	0.9918	1.0005	0.9994	1.0049
	yp	0.9879	0.9900	0.9870	0.9929	1.0022	0.9992	1.0051
	op	1.0019	1.0013	1.0038	1.0011	0.9994	1.0019	0.9992
	kr	0.9983	0.9988	0.9979	0.9992	1.0005	0.9996	1.0009
	tn	0.9987	0.9989	0.9984	0.9993	1.0002	0.9997	1.0006
	aa	0.9982	0.9988	0.9978	0.9994	1.0006	0.9995	1.0012
	us	0.9995	0.9996	0.9994	0.9997	1.0001	0.9999	1.0002
cn*0.9	cn	1.0078	1.0058	1.0082	1.0050	0.9980	1.0003	0.9971
	fc	0.9992	0.9995	0.9991	0.9995	1.0002	0.9998	1.0003
	kc	0.9990	0.9993	0.9988	0.9994	1.0003	0.9998	1.0004
	of	0.9992	0.9994	0.9990	0.9995	1.0002	0.9998	1.0003
	yp	0.9991	0.9994	0.9990	0.9995	1.0002	0.9998	1.0004
	op	0.9993	0.9995	0.9991	0.9996	1.0002	0.9998	1.0003
	kr	0.9993	0.9995	0.9991	0.9996	1.0002	0.9998	1.0004
	tn	0.9994	0.9995	0.9992	0.9997	1.0001	0.9998	1.0003
	aa	0.9996	0.9997	0.9995	0.9999	1.0001	0.9999	1.0003
	us	0.9999	0.9999	0.9998	0.9999	1.0000	1.0000	1.0001
cn*0.5	cn	1.0389	1.0268	1.0428	1.0246	0.9884	1.0037	0.9862
	fc	0.9962	0.9974	0.9953	0.9976	1.0012	0.9991	1.0015
	kc	0.9951	0.9964	0.9942	0.9971	1.0013	0.9992	1.0021
	of	0.9959	0.9969	0.9951	0.9974	1.0010	0.9992	1.0015
	yp	0.9956	0.9967	0.9948	0.9974	1.0012	0.9992	1.0018
	op	0.9965	0.9975	0.9957	0.9979	1.0010	0.9992	1.0015
	kr	0.9963	0.9974	0.9954	0.9982	1.0011	0.9991	1.0019
	tn	0.9969	0.9975	0.9961	0.9983	1.0007	0.9993	1.0014
	aa	0.9979	0.9985	0.9973	0.9993	1.0007	0.9994	1.0014
	us	0.9993	0.9994	0.9991	0.9995	1.0002	0.9998	1.0003

(Source) Author's calculation

Appendix: Model description

A-1. Set

(r, s, u) Region

cn: China
fc: Fukuoka City
kc: Kitakyushu City
of: the rest of Fukuoka Prefecture
yp: Yamaguchi Prefecture
op: the rest of Japan
kr: South Korea
tn: Taiwan
aa: ASEAN countries (Indonesia, Malaysia, Philippines, Singapore, Thailand)
us: United States

(i, j), (ii, jj), (i1, j1), (i2, j2) Industry

a001: agriculture (CRS) (i, ii, i1)
i002: food products (IRS) (i, ii, i2)
i003: textile, wearing apparel, and wooden products (IRS) (i, ii, i2)
i004: chemical products (IRS) (i, ii, i2)
i005: metal products (IRS) (i, ii, i2)
i006: machinery (IRS) (i, ii, i2)
i007: electronic products (IRS) (i, ii, i2)
i008: transport equipment (IRS) (i, ii, i2)
i009: other manufacturing (including mining) (IRS) (i, ii, i2)
i010: construction (CRS) (i, ii, i1)
s011: electricity, gas, and water supply (CRS) (i, ii, i1)
s012: trade (CRS) (i, ii, i1)
s013: banking (CRS) (i, ii, i1)
s014: real estate (CRS) (i, ii, i1)
s015: transport (CRS costs) (i)
s016: telecommunication (CRS) (i, ii, i1)
s017: public services (CRS) (i, ii, i1)
s018: other services (CRS) (i, ii, i1)

A-2. Parameters

$mtax_{r,i}$	The import tax rate on imported goods
$frei_{r,i}$	The freight and insurance rate on imported goods
$ntax_{r,i}$	The value added tax rate on the goods
$itax_r$	The income tax rate of the private institution
psr_r	The saving rate of the private institution
gsr_r	The saving rate of the government
$tpc_{r,s}$	The transportation cost rate for the consumption demand by the private institution
$tgc_{r,s}$	The transportation cost rate for the government demand
$tiv_{r,s}$	The transportation cost rate for the investment demand
te_r	The transportation cost rate for the exported goods
$txm_{r,s,j}$	The transportation cost rate for the intermediate goods
$\alpha^{PC}_{r,s,ii}$	The share parameter of the goods for private consumption
$\alpha^{GC}_{r,s,ii}$	The share parameter of the goods for government consumption
$\alpha^{IV}_{r,s,ii}$	The share parameter of the goods for investment
$\alpha^{FCL}_{r,j}$	The share parameter of labor in the production function
$\alpha^{FCK}_{r,j}$	The share parameter of capital in the production function
$\gamma^{FC}_{r,j}$	The productivity parameter of the value added in the production function
$\alpha^{ZXM}_{r,ii,s,j}$	The share parameter of the intermediate goods in the production function
$\gamma^{ZM}_{r,ii,j}$	The productivity parameter of the intermediate goods in the production function
$\delta^{FC}_{r,j}$	The share parameter of the composite goods for the Leontief function
$\delta^{ZM}_{r,ii,j}$	The share parameter of the composite goods for the Leontief function

$\alpha^{QY}_{r,j}$ The share parameter of the domestic intermediate goods
$\alpha^{QM}_{r,j}$ The share parameter of the imported intermediate goods
$\gamma^{Q}_{r,j}$ The productivity parameter of the intermediate goods
$\sigma^{FC}_{r,j}$ Elasticity of substitution between labor and capital
$\sigma^{XM}_{r,j}$ Elasticity of substitution among intermediate goods
$\sigma^{M}_{r,j}$ Elasticity of substitution between composite goods and imported goods
$\sigma^{Q}_{r,j2}$ Elasticity of substitution between goods (Dixit and Stiglitz)

A-3. Endogenous variables

$PC_{r,s,i}$ The consumption demand by the private institution
$GC_{r,s,i}$ The consumption demand by the government
$IV_{r,s,i}$ The investment demand
$IN_{r,s,i}$ The inventory
$L_{r,j}$ The labor demand by firm
$K_{r,j}$ The capital demand by firm
$FC_{r,j}$ The composite factor
$XM_{r,i,s,j}$ The intermediate goods
$ZM_{r,ii,j}$ The intermediate goods except transport sector
$Y_{r,j}$ The composite goods
$M_{r,j}$ The imported goods
$Q_{r,j}$ The aggregated goods
$E_{r,i}$ The exported goods
$D_{r,i}$ The domestic goods
$N_{r,i2}$ The number of firms
PL_r The price of labor
PK_r The price of capital
$PFC_{r,j}$ The price of the composite factor
$PZM_{r,ii,j}$ The price of the intermediate goods except transport sector
$PY_{r,j}$ The price of the composite goods
$PM_{r,j}$ The import price of the intermediate goods
$PQ_{r,i}$ The goods price
$PA_{r,i2}$ The price of the marked up goods
$PE_{r,i}$ The export price of the goods
$PD_{r,i}$ The domestic price of the goods
$PPC_{r,s,ii}$ The price of the consumption demand by the private institution
$PGC_{r,s,ii}$ The price of the consumption demand by the government
$PIV_{r,s,ii}$ The price of the investment demand by the private institution
$INCOME_r$ The income of the private institution
$GOINCO_r$ The income of the government
$INVEST_r$ The investment

A-4. Exogenous variables

$PL^{*}_{r,j}$ The labor price
$K^{*}_{r,j}$ The capital supply
$E^{*}_{r,i}$ The exported goods
$PM^{*}_{r,j}$ The import price of the intermediate goods
$PE^{*}_{r,i}$ The export price of the goods
$FIX^{*}_{r,j2}$ The fixed cost for IRS sector
$IN^{*}_{r,s,i}$ The inventory
$INVN^{*}_{r}$ The inventory transfer
FTR^{*}_{r} The foreign transfer
$TFRE^{*}$ The total value of the freight and insurance

A-5. Equations

A-5-1. Value added (CES)

$$L_{r,j} = \left(\alpha_{r,j}^{FCL} \, PFC_{r,j} \Big/ PL_r \right)^{-\sigma_j^{FC}} \left(\gamma_{r,j}^{FC} \right)^{-\sigma_j^{FC}-1} FC_{r,j} \qquad \text{(E-1)}$$

$$K_{r,j} = \left(\alpha_{r,j}^{FCK} \, PFC_{r,j} \Big/ PK_r \right)^{-\sigma_{r,j}^{FC}} \left(\gamma_{r,j}^{FC} \right)^{-\sigma_j^{FC}-1} FC_{r,j} \qquad \text{(E-2)}$$

$$PFC_{r,j} = \left(\left(\alpha_{r,j}^{FCL} \right)^{-\sigma_j^{FC}} \left(\frac{PL_r}{\gamma_{r,j}^{FC}} \right)^{1+\sigma_j^{FC}} + \left(\alpha_{r,j}^{FCK} \right)^{-\sigma_j^{FC}} \left(\frac{PK_r}{\gamma_{r,j}^{FC}} \right)^{1+\sigma_j^{FC}} \right)^{1/1+\sigma_j^{FC}} \qquad \text{(E-3)}$$

$$PL_{r,j} = PL_{r,j}^* \qquad \text{(E-4)}$$

$$K_{r,j} = K_{r,j}^* \qquad \text{(E-5)}$$

A-5-2. Intermediate (CES)

$$XM_{s,ii,r,j} = \left(\alpha_{s,ii,r,j}^{ZXM} \, PZM_{r,ii,j} \Big/ \left(PD_{s,ii} \left(1 + txm_{s,r,j} \right) \right) \right)^{-\sigma_{r,j}^{XM}} \left(\gamma_{r,ii,j}^{ZM} \right)^{-\sigma_{r,j}^{XM}-1} ZM_{r,ii,j} \qquad \text{(E-6)}$$

$$PD_{r,trans} XM_{r,trans,s,j} = TXM_{r,s,j} \sum_{ii} PD_{r,ii} XM_{r,ii,s,j} \qquad \text{(E-7)}$$

$$PZM_{r,ii,j} ZM_{r,ii,j} = \sum_s PD_{s,ii} \left(1 + txm_{s,r,j} \right) XM_{s,ii,r,j} \qquad \text{(E-8)}$$

A-5-3. Composite (Leontief)

$$FC_{r,j} = \delta_{r,j}^{FC} Y_{r,j} \qquad \text{(E-9)}$$

$$ZM_{r,ii,j} = \delta_{r,ii,j}^{ZM} Y_{r,j} \qquad \text{(E-10)}$$

$$PY_{r,j} Y_{r,j} = PFC_{r,j} FC_{r,j} + \sum_{ii} PZM_{r,ii,j} ZM_{r,ii,j} \qquad \text{(E-11)}$$

A-5-4. Import (CES)

$$PM_{r,j} = PM_{r,j}^* \qquad \text{(E-12)}$$

$$Y_{r,j1} = \left(\alpha_{r,j1}^{QY} \frac{PQ_{r,j1}}{PY_{r,j1}} \right)^{-\sigma_{j1}^{M}} \left(\gamma_{r,j1}^{Q} \right)^{-\sigma_{j1}^{M}-1} Q_{r,j1} \qquad \text{(E-13)}$$

$$Y_{r,j2} = \left(\alpha_{r,j2}^{QY} \frac{PQ_{r,j2}}{PY_{r,j2}} \right)^{-\sigma_{j2}^{M}} \left(\gamma_{r,j2}^{Q} \right)^{-\sigma_{j2}^{M}-1} \left(Q_{r,j2} + FIX_{r,j2}^* \right) \qquad \text{(E-14)}$$

$$M_{r,j1} = \left(\alpha_{r,j1}^{QM} \frac{PQ_{r,j1}}{PM_{r,j1} \left(1 + mtax_{r,j1} + frei_{r,j1} \right)} \right)^{-\sigma_{j1}^{M}} \left(\gamma_{r,j1}^{Q} \right)^{-\sigma_{j1}^{M}-1} Q_{r,j1} \qquad \text{(E-15)}$$

$$M_{r,j2} = \left(\alpha_{r,j2}^{QM} \frac{PQ_{r,j2}}{PM_{r,j2} \left(1 + mtax_{r,j2} + frei_{r,j2} \right)} \right)^{-\sigma_{j2}^{M}} \left(\gamma_{r,j2}^{Q} \right)^{-\sigma_{j2}^{M}-1} \left(Q_{r,j2} + FIX_{r,j2}^* \right) \qquad \text{(E-16)}$$

$$PQ_{r,j1} Q_{r,j1} = PY_{r,j1} Y_{r,j1} + PM_{r,j1} \left(1 + mtax_{r,j1} + frei_{r,j1} \right) M_{r,j1} \qquad \text{(E-17)}$$

$$PQ_{r,j2} Q_{r,j2} + FIX_{r,j2} = PY_{r,j2} Y_{r,j2} + PM_{r,j2} \left(1 + mtax_{r,j2} + frei_{r,j2} \right) M_{r,j2} \qquad \text{(E-18)}$$

A-5-5. Market clearing

$$PD_{r,j2}/\left(1+ntax_{r,j2}\right)Q_{r,j2} = PQ_{r,j2}Q_{r,j2} + FIX^{*}_{r,j2} \quad \text{(E-19)}$$

$$PA_{r,j2} = \sigma_{r,j2}/\left(1+\sigma_{r,j2}\right)PQ_{r,j2} \quad \text{(E-20)}$$

$$PD_{r,j1} = PQ_{r,j1}\left(1+ntax_{r,j1}\right) \quad \text{(E-21)}$$

$$PD_{r,j2} = PA_{r,j2}N^{\frac{1}{1+\sigma_{r,j2}}}\left(1+ntax_{r,j2}\right) \quad \text{(E-22)}$$

$$D_{r,i} = Q_{r,i} - E_{r,i} \quad \text{(E-23)}$$

$$D_{r,j} = \sum_{s} PC_{r,s,i} + GC_{r,s,i} + IV_{r,s,i} + IN_{r,s,i} + \sum_{s}\sum_{j} XM_{r,i,s,j} \quad \text{(E-24)}$$

A-5-6. Export (exogenous)

$$PE_{r,ii} = PD_{r,ii}\left(1+te_{r}\right) \quad \text{(E-25)}$$

$$E_{r,i} = E^{*}_{r,i} \quad \text{(E-26)}$$

$$PD_{r,trans}E_{r,trans} = te_{r}\sum_{ii} PD_{r,ii}E_{r,ii} \quad \text{(E-27)}$$

A-5-7. Private consumption

$$PPC_{r,s,ii} = PD_{r,ii}\left(1+tpc_{r,s}\right) \quad \text{(E-28)}$$

$$PPC_{s,r.ii}PC_{s,r,ii} = \alpha^{PC}_{s,r,ii}\left(1-itax_{r}-psr_{r}\right)INCOME_{r} \quad \text{(E-29)}$$

$$PD_{r,trans}PC_{r,s,trans} = tpc_{r,s}\sum_{ii} PD_{r,ii}PC_{r,s,ii} \quad \text{(E-30)}$$

$$INCOME_{r} = \sum_{j}\left(PL_{r,j}L_{r,j} + PK_{r,j}K_{r,j}\right) \quad \text{(E-31)}$$

A-5-8. Government consumption

$$PGC_{r,s,ii} = PD_{r,ii}\left(1+tgc_{r,s}\right) \quad \text{(E-32)}$$

$$PGC_{s,r,ii}GC_{s,r,ii} = \alpha^{GC}_{s,r,ii}\left(1-gsr_{r}\right)GOINCO_{r} \quad \text{(E-33)}$$

$$PD_{r,trans}GC_{r,s,trans} = tgc_{r,s}\sum_{ii} PD_{r,ii}GC_{r,s,ii} \quad \text{(E-34)}$$

$$GOINCO_{r} = itax_{r}INCOME_{r} + \sum_{j} mtax_{r,j}PM_{r,j}M_{r,j} + \sum_{j} ntax_{r,j}/1+ntax_{r,j}\ PD_{r,j}Q_{r,j} \quad \text{(E-35)}$$

A-5-9. Private investment

$$PIV_{r,s,ii} = PD_{r,ii}\left(1+tiv_{r,s}\right) \quad \text{(E-36)}$$

$$PIV_{s,r,ii}IV_{s,r,ii} = \alpha^{IV}_{s,r,ii}\left(INVEST_{r} - \sum_{u}\sum_{j} PD_{u,j}IN_{u,r,j} - FTR^{*}_{r}\right) \quad \text{(E-37)}$$

$$PD_{r,trans}IV_{r,s,trans} = tiv\sum_{ii} PD_{r,ii}IV_{r,s,ii} \quad \text{(E-38)}$$

$$INVEST_{r} = psr_{r}INCOME_{r} + gsr_{r}GOINCO_{r} \quad \text{(E-39)}$$

A-5-10. Inventory

$$IN_{r,s,i} = IN^{*}_{r,s,i} \quad \text{(E-40)}$$

URBAN HERITAGE AND METHODOLOGIES OF RENEWAL♦

Rosa GRAZIA DE PAOLI
Architect, Phd, Contract Lecturer, DASTEC Department, Mediterranean University of Reggio Calabria *rosadepaoli@unirc.it*

Abstract
The renewal of the city started from the examination of urban conditions of comfort/discomfort (safety, mobility, environment, social cohesion); this required the direct involvement of the city's inhabitants as experts of the urban environment, and therefore able to suggest solutions.
Nowadays in Italy the renewal tools of the city cannot be found in planning laws, but in new tools with participated procedures. These participated procedures have put the public administration and the private entrepreneurial class in agreement. In the '90's, the so-called Complex Programs both in the national and regional domain have been realized. The Complex Programs aim to propose urban improvement through innovative procedures to improve urban life quality. Among the Complex Programs, the District Contracts have been realized in January '98 and proposed in 2002 by the Infrastructure Administration. They set the aim of district renewal in places characterized by buildings degradation, urban environment lacking services, scarce social cohesion and marked housing problems as well as the presence of an elevated seismic vulnerability.
This paper underlines a methodology of urban retraining with participated procedures applied in a historical centre of a town in southern Italy.

Keywords: Building Experimentation, seismic vulnerability, district renewal, strategic planning.
JEL classification: R52, Q01, Q54

Introduction

In the last years, the retraining of degraded urban areas has represented the main field of planning action, after a long period during which the attention had been directed on the growth and development of cities.

The actions of retraining are meant to give new identity to meaningless places, which means to give new quality to the urban design through urban plans. In the planning debate, urban quality falls within the sustainable city theme, and it concerns not only the ecological - quantitative aspects, but also the meaning, identity and aesthetic values of urban areas: in other words, "landscape".

In 1990, the European Commission published the Green Book on the Urban Environment (COM (90) 218 final, 27 June 1990), where it supported an integrated approach to the cities planning theme. As a consequence of this principle, the new "European Economic Community action programs on cities" was born, which suggests the necessity to integrate the different but compatible functions in order to create more complex and complete urban spaces.

1. The theoretical framework

The case study presented here can be ascribed to the themes of strategic planning and mitigation seismic risk at urban scale. This experience requested knowledge of urban planning and provided sustainable interventions, as required by the European Community.

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Since the beginning of the 1990s, an ever-increasing interest has arisen in Italy around the concept of urban renewal. In response to this new research area, the Italian Government, regional governments and local administrations developed policies and programmes to improve urban degraded centres.

The general principles of interest in citizens' welfare and in degraded urban renewal were given applicability through the delineation of further international instruments (Italian National Committee for Unicef , 2000):

- the *Green Book on the Urban Environment*, 1990, by the European Union, sought to give a complete description of territorial and urban action that could support sustainable development.
- the *Barcelona Charter on the Educative City*, 1991, delineated a complex system of parameters that express the priority of cultural growth and in progress training possibilities for citizens.
- The *Meeting of American and European cities for the Exchange of Experiences in Strategic Planning* held in Barcelona in 1993. The meeting showed that organizational synergies will develop, that will eventually improve resource management and citizens' quality of life if cooperative processes are used in large cities in order to carry out strategic planning processes, and if a reasonable degree of comprehension is reached between the administration, businesses and a wide representation of social agents.
- th*e Agenda 21 Rio de Janeiro*, 1992, United Nations Conference on Environment and Development (Earth Summit) discussed the environmental problems of the planet and their links to social and economic development.
- The *Charter of Aalborg*, 1994, elaborated the idea of sustainability within the European context by devolving responsibility to local administrations for elaborating plans of action to achieve permanent, sustainable city development. The objectives were social justice, economic sustainability, and environmental sustainability.
- The *World Conference on Human Settlements Habitat II*, Istanbul, 1996, United Nations Human Settlements Programme, was the second United Nations conference on the environment and development. It dealt with the urgent problem of human habitation, as at the time, around half of the 600 million citizens lived in difficult and dangerous urban situations. The Habitat Agenda was formulated, and a Declaration in which guidelines were expounded.
- The *World Health Organization.* The programme aims to assist cities in dealing with health-related issues such as poverty and social exclusion, social support, urban planning and transport, and the special needs of vulnerable groups.

2. The Programs of Urban Renewal

In Italy, "modern" planning utilizes new intervention tools to operate on urban level more than past planning tools. Indeed, from the demographic growth of the 60's and 70's, to the consequent urban growth, at the end of the 70's the need was born for urban renewal, initially referred to old towns and later applied to the cities of the 90's, thus becoming a "leitmotiv" of urban degradation.

City renewal initiated from the examination of urban conditions of comfort/discomfort (safety, mobility, environment, social cohesion); this required the direct involvement of city inhabitants as experts of their own urban environment, and therefore able to suggest more adequate solutions.

Nowadays, in Italy, new tools may be found with the partecipation of the citizens with these new procedures. The participation of these procedures have put the public administration and the private entrepreneurial class in agreement. In the 90's, the so-called Complex Programs both in the national and regional domain have been formed.

In order to apply the Complex Programs, it was found necessary to provide:

- integration of public and private economic founds;
- easy administrative procedures;
- access to the public economic found by exam procedures (S. Ombuen, M. Ricci, O. Segnalini, 2000).

The Complex Programs aim to propose urban improvement through innovative procedures to improve urban life quality. Among the Complex Programs, the *District Contracts* were created in January '98 and proposed in 2002 by Infrastructures Administration. They set the aim for district

renewal in places characterized by buildings degradation, urban environment lacking services, scarce social cohesion and marked housing problems as well as the presence of an elevated seismic vulnerability. The *Building Experimentation* is a part of the District Contracts, that allows for proposals of new methodologies for renewal, also through the mitigation of urban seismic risk. For this reason many Calabrian municipalities have decided to apply for Building Experimentation in seismic risk mitigation.

Through this innovative *Building Experimentation* of District Contract II it has been possible to intervene on seismic risk mitigation also through experimentation methodologies of citizens' participation (e.g. listening services for local communities, study and definition of tools of address and control of urban quality etc.).

Many Calabrian municipalities attended the District Contract II based on the Building *Experimentation* for the mitigation seismic risk. Through the *Building Experimentation* it has also been possible to suggest new constructive techniques in bio-architecture and urban ecology areas, but also the financing of research for the improvement of the urban project.

3. The *Building Experimentation* (B. E.)

The Italian law n. 112/1998 has conferred to the Regions all the functions of public residential house building area. The B. E. is a consequence of an innovative action in public residential house building area founded upon a system of quality requisite in the processes of building and territorial transformation.

The B.E. is applied through the "Guide to the programs of experimentation" concerning safety and available requirements, comfort and morphological quality. For many Italian municipalities, the Guide has become a successful tool for urban renewal and also for the seismic prevention pursued through experimental interventions of seismic risk mitigation.

Urban recovery interventions have been done in different ways according to the Regions. The Guide proposed by the Emilia-Romagna region, based on "Mitigation of seismic risk urban areas" regarded two experimentation themes:

- analysis and assessment of seismic vulnerability;
- mitigation of seismic vulnerability urban systems.

On the other hand, the Calabrian Region, has based the experimental programs on four general aims regarding houses in the urban complexity of districts (See the next Table).

Table 1 – The Building Experimentation in Calabria Region

Themes	Aims	Interventions
Morphological quality	To reach satisfactory qualitative levels concerning architectural and perceptive aspect.	Retraining of degraded consolidated districts. Interventions of preservation and enhancement of historical centres.
Ecosystemic quality	Retraining through interventions of bio-architecture and urban ecology	Separate experimental interventions in 5 categories: "Water", "Energy", "Acoustics", "Air" and "Waste"
Available quality	To support the accessibility of disabled and worse-off people.	To build: - small lodgings; - lodgings for collective use; - house-hotels; - services to support the management of emergency areas
Quality system	Global quality control	Containment of costs and attainment of elevated qualitative levels

The eligibility requirements from the contract corresponded to the characteristics present in most Calabrian historical centres, and particularly in the province of Reggio. For this reason, some town administrations got together through the scientific support of the Mediterranean University of Reggio Calabria.

4. The District Contract in Southern Italy

Palmi, in the Province of Reggio Calabria, represents one of the greatest urban centres in Southern Italy (Mediterranean area).

Palmi is situated 250 meters above the sea level in a coastal plateau next to Sant'Elia mountain (Aspromonte mountains) in the province of Reggio Calabria and it stretches to the sea level next in the area of Piana di Gioia Tauro (Mediterranean port).

The urban area of Palmi has been designed for homogeneous areas with similar district characteristics. One of these urban areas is "Pille", selected site for the Contract of District II.

The demographic dynamics introduces a negative course up to the 70's with an inversion of tendency in the last twenty years, even though the increase of population has not been evident.

Such increase has depended above all on a lower mortality rate owed to citizens' better life condition.

The district of Pille is situated at the North/East side of Palmi urban centre The district citizens amount to 1.031, 97 of whom live in foreign countries.

Pille has been planned in 1934 by a Regional Council Housing technical office. It is based on neighbourhood blocks situated on a much higher level of the ground, so the urban system is collocated on terracing.

The district descends from country farms and is composed of about 300 small lodging areas. The district is almost exclusively residential with the exception of a school situated in the central area.

The predominant building typology was formed by semi-detached double decker houses; the ground floors were about 2.40 meters high, and were adapted as sheds, whereas the purpose of the first floor was for domicile.

The shell typology was the so-called "collaborating masonry", very much used in Reggio Calabria where it was experimented after the earthquake of the 1908 as stiffening typology.

When the residents bought the houses where they used to live, a period of continuous "rehashes" of the buildings had started and modified all the district planning.

The consequences of these unauthorized interventions concerned:

- a total change of both planning order and buildings through the construction of unauthorized building parts and superfetations (construction parts added to some parts of buildings) and also occupying some areas;
- a general urban degradation, of urban landscape in particular.

All the rehashes, besides, were made with cheap inadequate material and constructing techniques, bringing alterations to the main building structures and thus increasing their seismic vulnerability.

The conditions of housing degradation in the district "Pille" represented, therefore, an ideal framework to participate in the Contract of District II that has been formulated with the aim to suggest an integrated renewal taking into account the following aspects:

- planning;
- building;
- environmental;
- socio-economic.

The renewal strategy has been directed particularly to the mitigation of the seismic vulnerability of the buildings.

The problems in the district "Pille" are summed up as follows:

- degradation of buildings caused by unauthorized interventions that turned them into less functional and more vulnerable buildings;
- unsuitable road system;
- degradation of lifelines, undersized about new housing requirements;
- socio-economic degradation.

4.1 Landscape quality and social interactions

The inquiry of urban and social environment has headed to recognize the *strengths* related to material aspects (the morphology of the urban area), and social relationships (*genius loci*). The inquiry

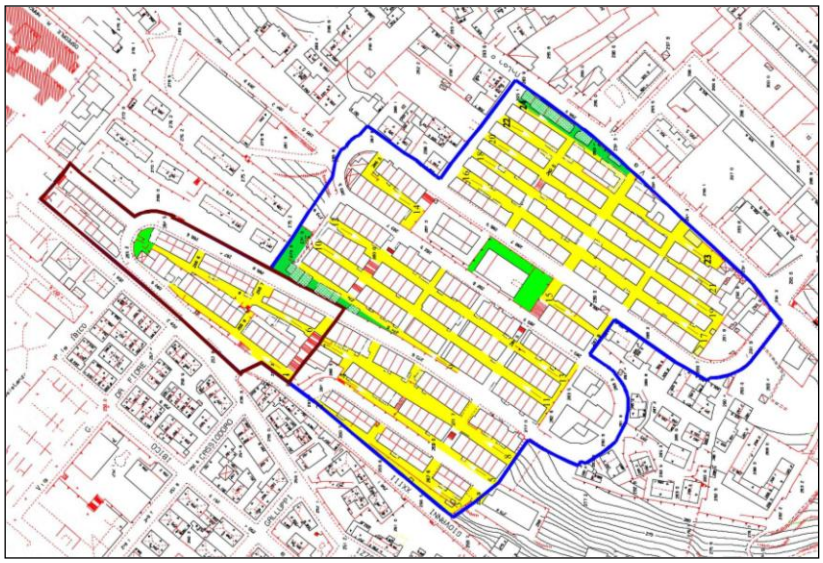
starts from SWOT analysis to evaluate the Strengths, Weaknesses, Opportunities, and Threats involved in the plan, technique, as suggests Albert Humphrey method's. (Hill T. & R. Westbrook, 1997).

The District Pille (Fig. 1) is located in a strategic position in the Palmi urban centre, which is directly connected to Bruno Buozzi street (main driveway).

The district, in this way, has become a "hinge" between the centre and the new urban growth area.

Another characteristic of the Pille District concerns the land orography as a drop between two area extremities that generated an original urban system. From the District there is a particularly nice view on the Sicilian Straits and the Eolian isles. This landscape represents an added value in the renewal of the District.

Figure 1 – Pille District



4.2 Urban vulnerability

The actual urban system of Pille District is formed by buildings constructed without rules and total absence of squares, green areas, parks and gardens. The unauthorized interventions on buildings and on public spaces caused a tightening of service roads and the increase of seismic vulnerability.

This phenomenon caused the alteration of the original typology of terraced houses into a heterogeneous typology represented by three, four or five-storey buildings with numerous superfetations (Fig. 2). The consequence of this is a new urban system that is extremely vulnerable, because of both the "heterogeneous buildings" and the total absence of public spaces as emergency areas.

4.3 Strategies and aims

The proposal of District Contract II has been included inside a wide strategy referred to by the Plan of Local Action 21.

The general aims are coherent with the sustainable criterions of Aalborg Charter (1994) and with the seismic security principles, and are the following:

- to improve the housing quality and citizens' life conditions;
- renewal of the urban system with interventions meant to restore the original features of buildings and public spaces;
- to promote in an integrated way the building and socio-economic renewal also through the introduction of cultural activity and social welfare;
- to improve knowledge on the sustainable theme, seismic security and urban renewal through the sharing of decisional processes.

The main aims that take into account the citizens' participation, are the following:

- to improve the residential housing quality;
- to increase and promote the relationship and the social inclusion;

- to improve the seismic security;

Figure 2 – Unauthorized interventions

- to promote new employment and the development of new enterprises.

The aim related *to improvement of residential housing quality*, was directed to offering innovative solutions of buildings renewal through energy saving and thermal insulation, etc.
The aim related to *the increase and promotion of relationship and the social inclusion*, was directed to the renewal of public spaces and to plan new urban and cultural spaces.
The aim related to the *improvement of anti-seismic security* was directed to the mitigation of urban and buildings vulnerability.
The aim related to *the increase of new employments and development of new enterprises* was directed to the promotion of new local activities.

4.3.1 The strategy of citizens' partecipation

The strategy of integrated renewal was based on the process partecipation suggested from Local Action 21 and adopted as guide and program framework[46].

The process participation was expedited by the local Administration that has represented the leadership and the point of reference for all the citizens.

The citizens partecipation was started through the Urban Forum as a citizens information point where requirements and problems of different social classes were shown. Initially, the social involvement started thorough direct interviews that were necessary to direct the plan and to deepen the general information.

The Visioning approach (vision and planning)[47] (Longo et alii, 1999) has oriented the urban Forum and was structured by several phases referring to the first part of the partecipation program. The suggestions arisen from the process partecipation delineated a development strategy with effects on three topics (See next table).

[46] The Municipal Administration of Palmi had undersigned in the 2004 the Charter Aalborg, for the application of the Rio de Janeiro Local Action 21 principles.

[47] The Strategic planning concerns of an organization's future course. All strategic planning deals with at least one of three key questions,

1. The profile of the social community: Where are we now?
2. The future perspective: Where are we going?
3. The vision, or the future we would like to have: Where do we want to go?
4. The action plan, or the vision roadmap: How do we get there?

Table 2 – The renewal strategy

Topic	Intervention area	Aim
Replacement part	The housing characteristic of Pille District are so vulnerable and degraded that demolition of some urban areas is advisable.	1. To improve the housing quality and citizens' life conditions, also increasing the seismic security and to carry out post-seismic meeting points and events. 2. to improve relationships and social integration, with a new plan of urban spaces as relationship places. 3. Breaking-down of architectural features that do not respect handicapped people; 4. to integrate the residential function with commercial and service activities, to promote employment.
Renewal	The renewal is also directed to restore buildings and public spaces to their original conditions.	The reduction of vulnerability of existing Building Stock with Building reconstruction in accordance with anti-seismic law.
Citizens partecipation	The complexity of interventions of renewal of Pille District has requested a decision-making process necessary to formulate the interventions strategy.	To promote socio-cultural activity through participated planning laboratories to improve the knowledge of local requirements.

Figure 3 – Urban project "Piazzale B. Buozzi"

4.3.2 The renewal plan

The strategy of integrated renewal was realized through four projects:

1. Implementation of an *Urban laboratory of planning partecipation* to promote the Palmi citizens' participation and to plan integrated renewal programs of degraded areas. The Laboratory should express needs and requirements of different social classes and in particular women, children, seniors, poor people, etc;
2. to create a social state-owned company to promote craftsman's laboratories;
3. to promote a service system to improve life quality;
4. the renewal of the buildings of Pille with safety requirements. The interventions for structural and architectural renewal were directed:
   - to the replacement of structural parts and demolition of superfetations;

- the removal from buildings façades of degraded parts (paintings, plasters, external windows and door frames, etc.), the restoration of decorative parts as pilaster strip, skirt roof, cornices etc.;
- restoration of rooflop through caulking interventions, original tiles and replacement of eaves and downpipes etc. All the renewal interventions were outlined in a Vademecum of buildings renewal, that is a part of the Renewal Plan of Palmi Administration.

5. the *removal of construction parts* in public spaces to restore them to their initial statement. The District of Pille is full of square steps which allows pedestrian crossing inside the district, so they are necessary for an easy road and local traffic. Often these pedestrian crossings are obstructed from unattended car parks or unauthorized garages.
   In order to redesign public spaces, the interventions were directed:
   1. to the demolitions of unauthorized parts built on public spaces;
   2. to the retraining of square steps, with particular attention to the cultural heritage named "Fontana Muta"(Fig. 4);
   3. to the reconstruction of the paved road.

Figure 4- Urban project "Fontana muta"

4.3.3 Expected results

The Districts Contract represented an innovative tool to activate contract talks between Administration and citizens for the purpose of integrated retraining.

Indeed, the Districts Contract II has allowed the planning of good effects on different aspects: urban landscape, social and economic.

The *District Contract II Plan* was included inside the *European Economic Community Plan* based on Sustainable Development (Agenda 21 local, 2002).

The expected results regarded the following aspects:

- *planning and building*. The urban plans were directed to the improvement of urban quality concerning the public spaces and the cultural and building heritage;
- *social*. The citizens' participation process trough the urban forum allowed the expression of new cultural and moral forces that had never been involved in the community social life. The urban forum had the aim of improving the citizens knowledge about environmental development. The retraining of public spaces allowed to activate effortless social interactions. The participation in the laboratory of urban planning allowed the Administration to get to know the needs of citizens, above all children, older people, immigrates, etc. Besides, the Laboratory has improved the cultural participation and awareness campaign about sustainable environmental. It allowed, besides, a greater potency on decisional process;
- *employment*. The projects forming the District Contract of Pille have increased the activities in buildings, social services, artisanal areas;
- *the improvement of earthquake resistance security*. Pille District is one of the most seismic urban areas of southern Italy. The building heritage is extremely vulnerable because of several unauthorized interventions on buildings and public spaces. The projects scheduled were directed to:
  - the improvement of the knowledge about seismic risk and civil protection culture;
  - the planning of Pille Anti-seismic Urban Plan;
  - the Anti-seismic buildings adjustment;
  - the planning of safety areas as post-earthquake meeting points;
  - the creation of voluntary associations in the field of civil protection.

Conclusion

The innovative peculiarity of District Contract II concerns the Building Experimentation, recognized to raise innovations in the fields of bio-architecture, urban ecology and seismic risk. The Building Experimentation is directed to the urban retraining of degraded districts with social, economic and buildings problems.

The District Contract II was completely suitable to intervene in a District with particular difficulties as Pille urban centre. The Retraining Programme on Pille District regarded sustainable interventions as requested from the European Community and represents an example of *good practice* in urban planning with a process of citizens partecipation becoming a challenge against an irreversible process of total degradation towards an opposite process of integrate renewal.

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EUROPEAN ENVIRONMENTAL POLICY AND THE STRATEGY 'EUROPE 2020'

Olga GIOTI PAPADAKI
Associate Professor
Department of Economic and Regional Development
Panteion University
opapadak@panteion.gr

Abstract
The evolution of European environmental policy is examined in this paper in conjunction with the objectives of developmental strategy 'Europe 2020'. The possibility of being mutually supportive with the objectives of environmental policy is a key issue in this paper. It might be argued that the current economic crisis has negative impacts upon the overall achievements of the European Union. In this light, the success of the implemented strategy can be said to be a necessity. The approach in this paper is based on the contention that adopting environmental protection objectives, apart from moral and sustainable reasons, is amongst the most important apparatus for overcoming economic downturn, given that the European Union is able to reduce its dependence on imported energy resources and take advantage of its leadership on environmental technology.

Environmental Policy

As early as 1986, protection of the environment has become a common policy objective, mentioned in the European convention texts and the Single European Act.[48] In the Maastricht Treaty in 1992, the concept of environmental protection was upgraded and "to promote harmonious and balanced development that should be stable, lasting, non-inflationary, and respectful of the environment", became a fundamental objective of the EU.[49] Subsequent revisions expanded further the content of the respective title[50] which now constitutes the legal basis for environmental protection. The Treaty of Lisbon elevated environment protection to the status of an EU objective,[51] stipulating that the EU member states must finance and implement environmental policy.[52]

Environmental policy in the EU has a long history, beginning with the adoption of waste management policy. During the 1970s and 1980s a series of problems and scandals involving waste treatment gave the necessary impetus for the creation of environmental policy. Adopting stricter environmental regulation requirements in the industrialized countries caused a very rapid increase of the disposal cost of hazardous waste. In seeking cheaper ways to get rid of waste, certain "toxic materials businesses" began to transport hazardous waste mainly to developing countries and Eastern Europe. Exposing such activities, an international outcry prompted a new agreement in 1989, the Basel Convention; namely an international environmental agreement regulating the transboundary movement of hazardous waste. As a result, the European Community established a system for monitoring and checking every shipment of transported waste.

Its first directives, however, did not specify the acceptable environmental emission parameters for waste management, namely sanitary burial of waste, incineration and recycling. This omission inadvertently allowed waste disposal methods that were, in effect, harmful to the environment.

Most of the omissions were tackled later in a directive on spaces for sanitary burial of waste, endorsed in 2001, and by a 2000 directive concerning the incineration of waste. These directives established standards for atmospheric and groundwater pollution and the legislative texts formed the foundation of the regulatory structure for waste management.

Environmental policy in the EU is formulated in the EU Environmental Action Programmes, setting the appropriate policy framework in accordance with the priorities adopted during their effective period. This has led to the establishment of legislative acts that cover particular aspects of

[48] Single European Act, Article 25
[49] TEU Article 2
[50] Treaty of Amsterdam, Article 130S
[51] TEU (as amended by the Treaty of Lisbon) Article 3
[52] Treaty on the Functioning of the EU, Article 192

environmental protection. The Sixth Action Program,[53] which will be in effect until year 2012, emphasizes four priorities:

- Climate change, with the short run aim of achieving the Kyoto protocol goals
- Biodiversity, with primary emphasis is on the prevention and management of major disasters involving hazardous substances[54], and on expanding the Natura 2000 Network[55]
- The connection between the environment and health, aiming to environmental quality such as that human health is neither threatened nor negatively influenced;[56] and finally,
- Sustainable management of resources and waste materials. Regarding the latter, the EU endeavors to define the objectives and describe the instruments by which it can move towards a better waste management, clarifying also the current legal frame of reference. Waste management is considered a priority field in the general endeavor of simplifying European law.[57]

The Sixth Action Plan is followed by the integration of environmental protection issues[58] in the fundamental development strategy 'Europe 2020'. The EU environmental policy is permeated by the principle "*The Polluter Should Pay*", which is incorporated in EU treaties following the adoption of the Treaty of Maastricht.[59] Another important principle is the Extended Producer Responsibility Principle, with positive consequences on the recycling processes. According to this principle, the producers and importers of goods share responsibility for the environmental impact of their products for the entire duration of the products' life, from the acquisition of raw materials, through the manufacturing process, the distribution and use of the products (Davis et al, 1997). This, rather broad, interpretation of the principle "The Polluter Should Pay", acknowledges the fact that the producer shares the responsibility towards limiting pollution. The argument runs as follows. The cost of recycling solid waste should be borne primarily by the producers—who will thus be compelled to design their products in such a way as to assure the longest possible useful life and optimum reclaiming in the waste phase, facilitating recycling. This principle is originated in two Directives of year 2002.[60] The two principles described here have been combined in the Framework Directive of the European Parliament and the Council concerning waste management.[61]

Public Health

The Treaty of Maastricht was the first EU treaty which has included a title on Public Health[62], stating that "The Community contributes to assure a high level of protection for human health, by encouraging cooperation among the member states and, where required, supporting their action." Stated in an alternative way, initially, the action of the European Community regarding matters of Public Health was limited, consisting solely in the coordination of respective national policies. A subsequent amendment of the Treaty included a moderate expansion of the content under this title by

[53] Decision No 1600/2002/EU, 6th Action Program for the Environment was decided by the European Parliament and by the Council (decision issued on 22 July 2002) and it sets forth the strategic framework for environmental policy making in the European Union during 2002-2012.

[54] Council Directive 96/82/EU of 9 December 1996 on the control of major accident hazards involving dangerous substances.

[55] Council Directive 92/43/EC of 21 May 1992 on the conservation of natural habitats and wild fauna and flora.

[56] Announcement dated 24 January 2001 by the European Commission to the Council, the European Parliament, the Economic and Social Committee and the Committee for the Regions, concerning the Sixth Community Action Program for the Environment "Environment 2010 – Our Future, our Choice" [COM(2001) 31 final

[57] COM (2005) 535 Communication of the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of Regions Implementing the Community Lisbon program: A strategy for the simplification of the regulatory environment

[58] It should be noted, nevertheless, that several items were already included in the Lisbon Strategy.

[59] TEU Article 130R 2; Treaty on the Functioning of the EU, Article 191 Paragraph 2 "It shall be based on the precautionary principle and on the principles that preventive action should be taken, that environmental damage should as a priority be rectified at source and that the polluter should pay".

[60] Directive 2002/95/EU of the European Parliament and of the Council, dated 27 January 2003 regarding the restriction of use of certain hazardous substances in electrical and electronic equipment; and Directive 2002/96/EU of the European Parliament and the Council, dated 27 January 2003 on waste electrical and electronic equipment (WEEE)

[61] Directive 2008/98/EU of the European Parliament and of the Council, dated 19 November 2008 on waste and repealing certain directives.

[62] TEU Title X (Consolidated version of the Treaty on the Functioning of the EU: Title X Article 152 (former Article 129)

anticipating (among other things) that the Council may institute "measures to encourage the protection and improvement of human health […]"[63]. The respective Article forms the legal base upon which the articulation of European Public Health Policy is based.

The Directorate General for Public Health has also presented five special action programs for Health (cancer, drug addiction, and so forth) and two programs in total, one for period 2003-08 and one for period 2008-13.[64] In addition to the independent action programs, the two General Directorates, one for the Environment and one for Public Health, presented their first joint program, covering period 2004-10.[65] The proposal for joint action emerged due to the realization of the fact an increasing growing number of Europeans citizens are concerned about the environmental effects on health. Its principal objectives are:

- Contributing to scientific knowledge on the effects of certain environmental parameters upon the health of human populations,
- Improving cooperation among all agencies involved, and finally
- Helping review and revise the answers that policies offer to resolve problems as they arise.

The level of the European strategy concerning health can be considered as quite satisfactory, even though member states bear primary responsibility for health issues. Even more satisfactory is the overall level of European environmental law, which is probably the most contemporary and potent legal system in the world for environmental protection. There is a variety of Regulations and Directives adopted by the EU under this policy, serving to regulate the entire breadth of individual issues connected with the protection of Public Health and the Environment. In addition to the general provisions, defining the principles, several action programs and instruments employed under this system. In particular, strategies for sustainable development, climate change, air pollution, the protection and management of water resources, the protection of Nature, biodiversity, protecting the soil, chemical products, protection against environmental accidents and disasters, waste management, and noise pollution, are also included in European Union regulations.

Distribution of Competences between the EU and the Member States

The European Union functions abide by the Principle of Conferral, maintain that EU competences remain within the limits conferred to the EU by its member states,[66] while all the competences that have not been expressly conferred to the EU remain in the domain of the member states.[67] Certain competences have been granted to the EU in full (e.g. monetary policy) while others are shared between national and supranational institutions. The latter category includes the policies for the environment and for Public Health protection. These are policies where the competences conferred by the member states to the EU are not exclusive, and the member states retain the option of adopting more stringent intervention measures if they choose. The funding and implementation of those measures are also in the hands of the member state, and the EU may intervene only if and to the extent that the objectives of the proposed action cannot be achieved to a sufficient degree through the actions alone of the lower level of administration, according to the principle of Subsidiarity. The competences, determined as exclusive, are clearly distinguished in law from concurrent (or parallel) competences, in the sense that EU regulations may be more succinct and clear for its citizens.[68] If competences are concurrent, the European Union operates in accordance with the principles of Subsidiarity and Proportionality.

[63] Ibid., Article 152 Paragraph 4c
[64] COM 2007/630 final
[65] COM(2003) 338 final
[66] TEU (as amended by the Lisbon Treaty) Article 5
[67] TEU (as amended by the Lisbon Treaty) Article 4
[68] Treaty on the Functioning of the EU Articles 3 and 4

EU Laws and their Application

Nowadays EU environmental policy covers practically every environmental issue. Member states are charged with transcribing EU level provisions into national law, as to implement in each country. The obligations of the member states vary in accordance with the type of the legal provisions. European level provisions are distinguished into Regulations, Decisions, and Directives. Regulations impose immediate and undeviating provisions on all member states. Decisions apply only to specific member states or sectors. Directives define one or more objectives that must be fulfilled by the member states within a determined time, without imposing limits on the choice of instruments or procedures for implementation. Their implementation is often inadequate, due to the fact that even though the member states incorporate EU – level law into national legislation, they fail to accompany the new laws with corresponding actions producing immediate environmental effects. To ensure sufficient implementation of European law, the EU - level institutions, further cooperation with national institutions is required. This is, usually, accomplished through bilateral consultations with the member state, aiming to organize efficient resolution of any implementation issues. Moreover, cases with great delay in resolving the relevant problems may be adjudicated in the European Court of Justice.

The European Commission is in charge of reviewing the compatibility of national laws with the provisions of EU - level regulations. In cases of deviations, the European Commission follows the judicial route established in the Treaties. Every EU citizen is entitled to submit to the Commission a complaint concerning an infringement of the EU law.

European Development Strategy and the Environment

The Lisbon Strategy

In the first decade of the 20th century, the Lisbon Strategy established a strategic goal for the European Union. That is to say, to transform the European Union into a more robust and competitive knowledge-based economy, capable of both sustainable development and social cohesion. The environmental dimension, with particular emphasis on environmental protection and sustainability, was added on the Lisbon development strategy in 2001, during the EU summit in Gothenburg - Goeteborg. The strategy for sustainable development initiated after Goeteborg, and the Lisbon Strategy, were regarded as being mutually compatible and complementary.

The policies intended to advance the implementation of the Lisbon strategy objectives are almost exclusively within the competence of the member states. The method applied for the implementation of the policies—an open coordination method—was not particularly helpful (Papadaki 2007). The intermediate review of that strategy did not show any encouraging results. The growth rate of new-jobs creation declined while investments in research and innovation remained inadequate. The revision of that policy[69] focused mainly on four priority areas: investments in knowledge and innovation; utilizing the potential of business (especially of SMEs); investing in human resources and modernizing the labor market, and finally an economy with low CO_2 emissions and fuel efficient. Examining the effectiveness of the Lisbon Strategy — until the beginning of the current crisis — range from absolutely negative (Treidler, 2011)[70] to positive — at least as far as some of its objectives (European Commission, February 2010). Irrespective of the degree to which it has been accomplished, the Lisbon Strategy is widely appreciated for its policy goals, one of which is to create an economy with low CO_2 emissions. The approach chosen to the commitment to sustainable development is based on the principle that sustainable development ought to be incorporated and integrated at every level of policy formulation. In turn, this calls for a greater need for cooperation at all levels of policymaking. A more effective approach would be to incorporate the goal of sustainable development in the majority of EU policies. This view emerged, initially during the Cardiff European Council in June 1998. From a strictly short-run-profit perspective, environmental protection is, rather often, considered to restrict economic development. In a similar vein, the concept of open markets seems to exclude any concerns

[69] COM(2005) 24 final

[70] See Oliver Treidler ' The immediate aim of this paper was to provide a consistent and convincing answer to the question "was the Lisbon Strategy successful?" Answer: **No, it was distinctly negative'.**

for environmental protection. In response to that, seemingly, contradiction, the European Commission endeavored to create synergies between the single market and environmental policy by adopting economic instruments such as environmental taxes in order to promote and implement the principle 'The Polluter Should Pay'[71]. Furthermore, "the incorporation of environmental concerns in other policy sectors" was endorsed during the Cardiff process in 2004.[72] Indeed the environmental dimension was incorporated in several policy sectors such as (i) industrial policy;[73] (ii) energy policy[74] — as a result of energy policy adjustments, and the commitments made under the Kyoto Protocol signed in 1997, the EU adopted the European Program for Climate Change;[75] (iii) environmentally safe sustainable agriculture — as a result of agriculture policy adjustments, subsidies were disconnected entirely from the quantities produced, and supplemented with direct payments of revenue support to farmers. The amounts of support depend on compliance with the environmental terms and conditions. In addition, the environmental dimension was incorporated in (iv) the Common Fisheries Policy;[76] (v) in sustainable urban development,[77] (vi) in economic policy,[78] (vii) in transport,[79] and finally (viii) in aid to developing countries.[80]

Europe 2020 Strategy

On the 3rd of March 2010 the European Commission inaugurated the Europe 2020 Strategy[81], aiming to prepare the EU economy for the forthcoming decade. The Europe 2020 Strategy has succeeded the Lisbon Strategy for Growth and Jobs.

The priorities of the Europe 2020 Strategy are mutually supportive and can be summarized as follows:

- Intelligent development aiming to improve access to education; more spending on research and innovation and on utilizing information and communication technologies by advancing the digital society.
- Viable development by building a more competitive economy with low carbon emissions; limiting the loss of biodiversity; making pioneering advances in creating new green technologies; employing efficient electric power grids; providing aid to enterprises, especially SMEs; assisting consumers to make appropriate choices.
- Development without exclusion; increasing total employment; reducing the number of people who live under the poverty level or are threatened with poverty or social exclusion.

The quantified objectives for viable development, the so-called 20–20–20, include the following specific goals:

- Reducing greenhouse gas emissions by 20% against the 1990 baseline before the year 2020. The EU intends to increase greenhouse gas reduction by an additional 30%, provided that other developed countries also contribute proportionally to their capabilities, and commit themselves in international agreements.
- Raising the share of renewable energy sources to 20%, measured in terms of actual final consumption.
- Increasing energy efficiency by 20%.

At the heart of the development plans of this new strategy are the new technologies of low carbon emission. Similarly, it proposes stricter reviews and controls of the national reform programs ensuring that they have been aligning themselves with the strategy. Such controls were entirely absent in the Lisbon strategy, which can be considered as a principal weakness. The overall objectives of the strategy are distributed quantitatively among the EU member states;[82] while the EU president Herman

[71] COM (1999) 263
[72] COM(2004) 394
[73] COM(2002) 714 final and COM(2006) 136
[74] Directive 2006/32/EC and European Program for Climate Change.
[75] COM(2000) 88 and COM(2001) 580
[76] COM(2002) 186, Regulation (EC) No. 2371/2002, COM(2004) 438
[77] COM(2005) 718
[78] COM(2000) 576
[79] Council Report of 6 October 1999 to the Helsinki Council, COM(2005) 446, COM(2005) 459
[80] Regulation (EC) No. 2493/2000, COM(2004) 629
[81] COM(2010) 2020
[82] See http://ec.europa.eu/commission_2010-2014/president/news/speeches-statements/pdf/20110623_2_en.pdf

Van Rompuy suggested that member states which have reached their targets should be rewarded with additional allocations.[83] The overall effect of those European Union initiatives and actions is that the EU has adopted a decisive role in steering international response to core issues such as climate change, sustainable transport, preserving natural resources (European Commission, 2009).

The Economic Crisis and the Europe 2020 Strategy

The new Strategy coincided with unfavourable economic conditions wiping out achievements that took decades to build up. GNP in the EU declined by 4% in 2009; industrial production reduced to the level of the 1990s and unemployment increased to 10% (European Commission report, March 2010). The Europe 2020 Strategy aims to reverse these negative effects and to advance a new paradigm for growth. It goes without saying that the current crisis, and the need to overcome it, involves policies and objectives of a broader scope than environmental policy per se. Yet the adoption of a cohesive and effective environmental policy can be used, along with other policies, as a mean to overcome the crisis and an instrument for viable development. It follows, therefore, that environmental policy has been elevated to a major strategic option of the European Union. The EU must be able to deal with negative developments within its own member states so that they do not become consolidated, remaining adaptable to the continuously changing international context, with the intensity of globalization, the pressure for raw materials and the demographic ageing of its own population. If European citizens continue to enjoy the same living standard and affluence, there is no choice other than to underpin the European economy; a necessity if the EU wishes to continue interacting and influencing the international community as presently, employing indirect and peaceful means.

All the EU major policies need to be adapted to the mutually supportive objectives of the Europe 2010 Strategy. Those policies must enable the EU to confront with the challenge of facilitating economic growth, and simultaneously ensuring the condition that the environment will not be aggravated. As in the basic priorities of the Europe 2020 Strategy described above as mutually supportive and complementary, there is not necessarily any contradiction between the goal of inducing growth and, at the same time, protecting the environment, even at a first sight they seem contradictory. Nevertheless, a change of paradigm will be necessary, and Europeans need to modify their attitude on issues such as, waste management, for example. Waste must not be seen as a necessary evil to be managed in a rudimentary, albeit short-sighted manner, involving minimum cost, but rather as a potentially valuable resource. The transition of the EU to an age of sustainable economics with low noxious emissions shall depend on a combination of actions which cannot remain in the domain of policymaking alone, but rather emerge from every segment of society; that is to say, individual citizens, businesses, research centres and administration at every level.

Europe is a world leader in cost-effective environmental technologies that can provide solutions to a series of environmentally sensitive issues, including limiting the inflow of raw materials, curbing energy consumption and the resulting pollution, processing waste to reclaim useful by-products, and downscaling the overall volume of waste. European companies are in a strong position as far as renewable energy production, waste management and recycling, fields where they hold 40% and 50% of the global market share respectively.[84] By taking advantage of its leadership in environmental technology, the EU is in position to create significant opportunities for economic growth, provided, of course, that the issues connected with the requirements of environmentally friendly economic development are acknowledged and more widely accepted.

Acceptance of environmental issues by the citizens is a major factor toward accomplishing the goals of environmental policy. But it is the citizens that will transform environmental goals into inducing-growth actions. Of critical importance is the particular combination of policy instruments. The EU's long involvement, including policymaking in environmental issues, has endowed the Union with a "toolbox" of suitable instruments, including legal requirements, technology transfer, market-based instruments, relevant research, and environmental responsibility regulations. Among these instruments, the EU has developed great expertise in the field of market-based instruments such as the

[83] 'Seven steps to deliver on the European Strategy for growth and jobs' Brussels 8 February 2010 http://www.euractiv.com/sites/all/euractiv/files/HRV%20EU%202020%20strategy.pdf

[84] European Environment agency 'Environmental technology' http://www.eea.europa.eu/themes/technology/intro

European Emissions Trading System (EU ETS), targeted subsidies, and environmental taxes.[85] The purpose of those instruments is to transfer to the market the cost that those economic activities impose upon the environment and health, and to define accordingly prices for the utilization of natural resources such as the air, fresh water, and the sea. A good example is the Emissions Trading System (EU ETS). The reasoning for the adoption of this instrument is to endeavour to correct market distortions, and cases where an economic activity generates social costs upon assets that are public by nature, as for example environmental assets. Although some of these instruments, e.g. the environmental taxes, have been labeled as obstacles to economic development, it is quite possible to incur positive effects. In other words, they could provide a valuable contribution to innovation, since they tend to discourage "traditional" detrimental activities and to foster the creation and dissemination of new technologies (EEA 2011). The view held by the European Commission is that, along with regulations and other institutional measures, certain other instruments and methods should also be employed; especially in the form of market-oriented instruments such as commerce, taxation and subsidies. These instruments can yield positive economic results in the pursuit of environmental and other objectives, both at the national and the European level.[86] The EU is advancing its basic choices in relation to the environment and to the Europe 2020 Strategy by incorporating environmental impact into the design of other European policies and by employing appropriate policy measures. In this context, it is important to note that the principal policy employed toward the achievement of EU goals is the Cohesion Policy — a major European policy currently entrusted with over one-third of the total European budget (33% allocation in 2014-2020). Cohesion Policy alignment with the Europe 2020 Strategy may contribute to its success. The primary choice governing the design of the Cohesion Policy over the next program period (2014-2020) is to concentrate resources in a small number of priorities. These may include investments related to climate change and the transition to a low-carbon-emission economy, and viable urban development. Among the regions receiving aid, the more developed ones will be required to allocate 80% of the ERDF funding in energy efficiency, renewable energy sources, innovation, and to support SMEs and the remaining 20% to be allocated in energy efficiency and renewable energy sources.[87]

A principle priority, under the Europe 2020 Strategy, is to reduce dependence on imported energy resources, making ultimately the EU self-sufficient in terms of energy. This is a very ambitious goal and can be pursued by means of technological improvements, major changes in manufacturing-processing and agricultural production, in energy generation, and in the transport systems. Although the overall goals set forth in the environmental policy are very ambitious, some progress is visible: recycling has become an everyday practice in the EU for many businesses and for millions of citizens, gas emissions have been reined in by 10% since 1990, and dependence on raw mineral resources tends to decline along with the development of alternative energy sources.[88] Whether or not the goals of economic growth and simultaneous protection of the environment can be fulfilled will depend on the insistency that these goals are supported; on the creation of an effective framework for long-term review, formulation and implementation of related policies; and on the incorporation of environmental impact research and considerations into all EU policies.

[85] European Commission, Green Paper on market-based instruments for environment and related policy purposes COM(2007) 140 final

[86] Commission Of The European Communities, Commission Staff Working Document 'Analyzing the replies to the Green Paper on market-based instruments for environment and related policy purposes' SEC(2009)53 final

[87] Regulation2014_ leaflet_el.pdf

[88] EUROPEAN COMMISSION Brussels, 26.1.2011 COM(2011) 21 Communication from the Commission to the European Parliament, the Council, the European Economic And Social Committee and the Committee of the Regions
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THE ICT IMPACT ON THE ARAB REVOLUTION UNDER THE PRISM OF THE GLOBAL POLITICAL ECONOMY AND THE US-CHINA RELATIONS

Pantelis **SKLIAS**
Associate Professor, Dept. of Political Science & International Relations, University of Peloponnese, Corinth, Greece
E-mail: psklias@hotmail.com
Tel.: +30271040040, fax: +30271040050

Abstract
The aim of the paper is to propose an enriched framework of analysis to assess and analyze complex social, political and economic phenomena, such as the developments that took place in the Arab countries. I call this framework of analysis Elaborated Realism and I present its main epistemological elements hereby. In this framework, individual variables such as the role and the impact of the Information and Communication Technology (ICT) are considered as being only a part of an overall set of variables, a Feedback Mechanism in which the state national interest is the main catalyst for the formation of state behavior. Such a Feedback Mechanism constitutes the framework out of which the main elements of the global political economy, meaning the network of global political and economic relations are formed. In my opinion, although ICT as well as other social, political and economic variables should be assessed, developments in the Arab countries should be considered under the prism of the global political economy, and more precisely the USA-China economic contest which is the core axis of this frame. ICT can be considered as an accelerating factor but not as the root neither the cause of the events that took place. I claim that such an enriched framework of analysis and approach can also be applied in other similar cases in which national interest is very much influenced by a hierarchical structure of power as it is captured by global political economy structure.

Keywords: Global Political Economy, ICT, Arab revolution, USA-China Economic Rivalry

1. Introduction

We have lately seen unprecedented events taking place in a series of countries of the Arab World. Long-standing regimes have been questioned, even overthrown by the people of the region. Political personalities and widely acknowledged historical figures with unlimited experience and unquestionable power have lost their places and roles within weeks. The people of the Arab states have demonstrated their power. They have reacted in such a way that the globe may have not seen before. This is even more impressive when the state-people framework of relations in the region was taken for granted, in social and political terms.

The aim of the paper is to enrich the current frameworks of analysis deployed to capture the roots and causes of the Arab Revolution from the point of view of global political economy and more precisely the US-China economic and political relations. I consider the 2011 Arab revolution as a peripheral asymmetrical shock whose roots and causes can well be identified in the framework of the rivalry relations between USA and China. These rival relations are the axis of the contemporary hierarchical GPE structure.

Kurlantzik states that [1] "with a better understanding of China's soft power, Washington can more systematically set clear limits — for itself, for China, and for other nations — and establish where it believes China's soft power possibly threatens American interests. As we have seen, these U.S. interests include other nations' territorial integrity; support for the United States in case of a conflict in regions like Southeast Asia; control of sea lanes and waterways; access to resources; formal alliances with foreign nations; and, perhaps most important, the promotion of democratization and good governance".

In order to achieve this goal I assess the following issues. Firstly, I provide the main principles of the approach I propose to assess and comprehend GPE, that is the Elaborated Realism. I then mention the main elements of the rivalry framework of the US-China relations and how this affects

global political and economic relations. I then capture the Chinese struggle for access to national resources which is their main concern in order to keep steady growth rates and consequently sustainable development in the interior. I then apply the framework of analysis in the case of the Arab Revolution and the ICT impact on the events. Finally, I proceed with conclusions and recommendations for further research ahead. I hope that the proposed framework of analysis can also be helpful for comprehending similar cases around the world.

2. The Framework of Analysis: Elaborated Realism

The current complex reality has provided us with new data and scientific questions to be answered. Above all, it has also repositioned the traditional boundaries among the sciences as well as the components of the Global Political Economy (GPE). Although the classic approaches of the GPE have been outreached by the facts, their undisputable temporal contribution is still acknowledged. Nevertheless, the enrichment of the methodological and scientific tools is necessary. To this direction, I hereby move on to the development of an analysis framework which I call Elaborated Realism and in parallel to a new Feedback Mechanism of the Global Political Economy. This Feedback Mechanism constitutes the logical starting point via which the Global Political Economy is being formed as a result of a consistent process and interaction. The target of this attempt is to enrich the current discussion on the role and the meaning of the International Political Economy (IPE) as well as the way that the GPE is being perceived and analyzed.

My goal is to highlight those key-elements that in my opinion are the cornerstone of an analytical frame that can contribute to the better understanding of the contemporary social, political and economic reality under the scope of the Realist School of the IPE. This is the analytical framework that I call Elaborated Realism and I will further explain its key elements and its basic parameters.

For the argument's development and the data analysis (so that conclusions can be derived), I have adopted a wide and notably receptive to further enrichment, sense of the IPE, as this is framed by its realistic perspective[2].

The three basic axes of the formation of these key- elements and by extension of the feedback mechanism that adopts the proposed Elaborated Realism analysis frame as the logical starting point are as follow:

- The consistent and dynamic feedback process of the system that formulates the state behavior towards the international environment and eventually the environment of the global political economy as such. Ensuring the national security and the national interest remains the dominant factor that ultimately determines the final decision and the state behavior. This fact finally results in an anarchic international system without the appropriate institutional regulatory mechanisms which mostly remain informal and in the logic of the states-groups such as G7 or G20. Eventually, the formation filter of the final decision is the reinforcement of the state in a global power pyramid structure and the global political economy.

- The integration into the analytical framework of variables and factors that traditionally had been ignored by the classic realists. It is not a coincidence that the economic nationalism is considered by some scholars to be the restrictive approach regarding the study of the IPE, since the relation between wealth- power is an exclusive tool for the analysis and understanding of the states' behavior in the international system [3]. However, restrictive approaches may lead to restricted analytical conclusions and to assumptions with limited scientific value. The integration of variables such as the universal issues, the historical conditions dependency path, the role of new technologies, the meaning and the contribution of non- governmental, non-state actors, the contribution of ideas, values and traditions as well as the unity of politics with economics, of domestic with international, enriches the tools of analysis, the scope of information, the scope and the content of the available variables. It also forms even more inclusive hypotheses. Moreover, it creates an analysis framework which without disrupting the initial scientific basis of realism and economic nationalism, creates the background and the conditions for a more integral study and analysis of the reality and the global political economy.

- The variables interact and create a network, reflecting the complex nature of the global political economy. The explanation and analysis of the variables cannot be done in isolation but in combination and complementary with each other. The relations' network "produced", after being filtered by the target of improving the state's status in the global power pyramid, is an integral mechanism that eventually forms state's behavior in the global economic and political environment and consequently in the Global Political Economy. As a result of this dynamic process, the new environment and the content of the variables is being repositioned and redefined. Variables' networking and interaction continues constantly and the system's feedback mechanism keeps working intensifying the complexity of the situation even further.

More analytically, the components of the Elaborated Realism are the following:

- The proposed framework of analysis of Elaborated Realism adopts the basic features of the State-centered Realism [4], mostly the formation of traditional nation-state behavior on the basis of increasing its power and improving its status in the global power pyramid within which the states satisfy their needs depending on the power acquired. As a result, national interest plays a significant role in the nation-state's foreign policy choices and international economic relations. The limited perception of the contemporary reality doesn't take into consideration the complexity of the international political and economic relations, that has appeared particularly through the emergence of new actors, the emergence of new complementary networking relations, the impact of new technology, the increasingly obscure finance products and services, the new themes of universal interest such as the environment and the human rights on other variables. Without neglecting the fundamental principles (meaning the pursuit of power and the need to ensure security as the main determinates of the states' behavior), I strongly believe that it is not feasible to interpret so many phenomena with a limited scope of meanings and variables. For this reason, I hereby enrich the analytical framework so that the contemporary reality can be explained and analyzed in a more efficient way.
- We cannot expect to have a general view of the social, economic and political development level of a country if we follow separable lines among politics, economics and society. While the Liberal Approach separates politics from economics and the Economic Nationalism/ Realism subjugates economy to politics, I believe that economy supplements the politics and reverse. I adopt an integrated approach where politics and economics are interrelated creating a new scene, this of political economy. Besides, it has not been that long times ago since the GDP or the exclusively economic indicators were considered as adequate to evaluate the growth trend and the overall progress of a country or even of an entire continent. It has been proved that this methodologically restricted and analytically incomplete approach of the IPE has resulted in incorrect conclusions and wrong analysis. We cannot realize the progress and development of a country outside of a frame of reference and analysis in which politics, economy and society is not built in a methodological tool and a common interpretive dimension [5]. For example, the success of privatizations in Bulgaria or in Poland cannot be judged by the revenues and the number of the privatizations of enterprises only. It has also to be evaluated taking into account the number of work places abolished, the increase of (un)employment rate, the environmental impact, etc.
- The same common, integrated approach is valid for the traditional separation between "domestic" and "international" issues as well. Globalization has brought forward the issue of the delineation of national borders. The National Political Economy System of a country must be assessed with regard to the global scene and the international environment instead of the narrow frame of its national borders. This is how specific policies and initiatives that affect the domestic actors of the social, economic and political development can be perceived. A country's international commitments, its participation in economic, military and other organizations and the acceptance of globalization values and principles are playing an important role in its domestic initiatives' planning and implementation. As a result, the "domestic" must be analyzed according to the "international" and in reverse in order to cover the "whole".

- I also embody in the IPE the role of the ideas, the norms, the values and the traditions, in planning and decision making. In the GPE, the actors' perceptions greatly contribute to the formation of relations and networks as well as to the result of their initiatives and reactions. In other words, the formation of the political and economic diplomacy, in the framework of the foreign policy can eventually be proved inefficient and incomplete if the framework of values and principles of the hosting country are not taken into account. Respectively, priorities can be defined according to the traditions and norms, affecting the institutional framework were the decisions are being taken.
- I take for granted the fact that the IPE actors now vary. I do not accept the classic realistic approach, which should be judged in line with the chronological period and the ideological and theoretical framework within which it was developed, in which the states were considered to be the exclusive actors. The actors have now been multiplied and they should be examined [6] and analyzed within the framework of the IPE. More specifically, the interest groups, the Non Governmental Organizations and the multinational enterprises have their own role and participation in the international political economy which recognizes not only the statehoods, legal entities and individual but also the overall relations' and contacts' network which connects the non- governmental organizations with other non-governmental organizations and the state. NGOs have acquired a legitimate basis regarding their action and their role. As a result, an IPE approach must take into consideration the NGO's importance and role. Respectively the same applies to the multinational enterprises. Their action in the country of origin as well as in the hosting country, is a basic object of study regarding the policies' planning and implementation in the domestic and international environment.

- The international political economy adopts a historical approach to the facts. Such an approach includes the historical dimension and the historical background while formatting and analyzing the parameters and conditions of the facts' analysis. The knowledge of dependency path is an important variable for justifying the states' behavior. Many of these (states) define their behavior and are being captured in policies as a result of specific historical facts or historical tradition. This exact path is a significant variable that must be taken into account. If not, we will not be able to embody specific values and principles.

- In a contemporary reality study, variables form fields of "universal" interest e.g. the environment, the human rights; the new technologies etc. which are being evaluated. This is how thematic and consequently variables and analysis tools that have traditionally been outside the scientific interest of the classic realists are becoming part of the analysis framework. Under this prism, we can better define, understand and analyze the state's behavior in the global system of economic and political power.

The above framework offers a wider approach to the realistic school of the IPE, which I call "Elaborated Realism". It is about an approach which gives us the chance of critical evaluation of the parameters that compose the global economic and political relations and reach conclusions.

The IPE now a day is a field of study of the international economic and political relations. From time to time, different theoretical approaches have attempted to create the appropriate scientific tools and analysis frameworks of the global political economy. The contribution of those efforts cannot be ignored since each of them has contributed to the enrichment of thinking, the perception of reality, the explanation of facts and to the formulation of future hypotheses. I believe that the proposed analysis framework of the Elaborated Realism as well as the Feedback Mechanism which can be used as a logical starting point, can create the appropriate scientific and methodological tool in order to analyze the contemporary complex reality and furthermore the complicated networks' framework that have been created in the global political economy.

Under this expanded prism of the realistic school, without the conceptual and methodological preconceptions and analytical limitations, I hope that the Elaborated Realism recommends a scientifically healthy proposition for a further evaluation from the scientific community of the international economic and political relations.

3. The USA – China Rivalry Framework as a dependent variable in contemporary GPE

I assume that the main elements that constitute the USA-China Rivalry Framework in contemporary GPE are the following:

- Conflicting geopolitical interests;
- China's need for export and trade routs;
- China's thirst for raw material resources;
- China's centrally planned extrovert economy;
- Competitiveness Race;
- China's regulatory role in USA's indebtedness;
- China's need to preserve high development rates internally;
- China's role as a Free rider in contemporary GPE;
- Indebted USA economy;
- Low level of USA's economic competitiveness;
- USA's need to keep its economic and political dominance.

In this framework, the national interest of a given state actor is very much affected by the way it is perceived by the main actors of this rival relationship, meaning USA and China. Parallel, to a Cold War situation, where peripheral conflicts have been accentuated and considerably increased, the USA-China rivalry leads to a series of asymmetrical shocks in the periphery. In my opinion, the Arab Revolution can be considered as being one of those peripheral asymmetries and should be considered as such.

The roots and causes of those asymmetries are the conflicting interests and the rival framework of the USA-China relation, being the main axis of contemporary GPE. On the one hand, one should consider the need of the USA to preserve existing GPE hierarchical balances. The preservation of existing balances is the main prerequisite for keeping USA's political dominance and the economic dominance, which is very much based on a weak internal economic structure and an even weaker dollar. On the other hand, China is more than eager to secure raw material resources and wealthy markets for its production. Continuously increased growth rates and their preservation in China is the main prerequisite for keeping peace and security in the interior.

Consequently, The USA-China rivalry relationship should be taken as a dependent variable when assessing contemporary GPE. Such a dependent variable consists of the following elements:

- Internal / external correlation.
- Interconnection between politics and economics.
- Formation of the dependency path.
- Influence on norms, principles and values.
- Emergence of new actors.
- Use of technology.

The competing relations among the two nations have also been revealed in the case of the Copenhagen Summit for Climate Change. One of the root causes of the failure of the Summit has been the undeclared economic war among China and the USA. This economic war is eloquently presented by Wayne Morrison [7] in the framework of the research activity undertaken by the Congress:

"U.S.-China economic ties have expanded substantially over the past three decades. Total U.S.- China trade rose from $2 billion in 1979 to an estimated $459 billion in 2010. China is currently the second-largest U.S. trading partner, its third-largest export market, and its biggest source of imports. Because U.S. imports from China have risen much more rapidly than U.S. exports to China, the U.S. merchandise trade deficit has surged, rising from $10 billion in 1990 to an estimated $273 billion in 2010.

The rapid pace of economic integration between China and the United States, while benefiting both sides overall, has made the trade relationship increasingly complex. On the one hand, China's large population and booming

economy have made it a large and growing market for U.S. exporters. Over the past decade, China has been the fastest-growing market for U.S. exports. U.S. imports of low-cost goods from China greatly benefit U.S. consumers by increasing their purchasing power. U.S. firms that use China as the final point of assembly for their products, or use Chinese-made inputs for production in the United States, are able to lower costs and become more globally competitive. China's purchases of U.S. Treasury securities (which stood at $907 billion in October 2010) help keep U.S. interest rates relatively low. On the other hand, many analysts argue that growing economic ties with China have exposed U.S. manufacturing firms to greater, and what is often perceived to be, "unfair,"competition from low-cost Chinese firms.
They argue that this has induced many U.S. production facilities to relocate to China, resulting in the loss of thousands of U.S. manufacturing jobs. Some policymakers have also raised concerns that China's large holdings of U.S. government debt may give it leverage over the United States.
China's incomplete transition to a free market economy and its use of distortive economic
policies have contributed to growing trade friction with the United States over a number of issues, including China's refusal to allow its currency to appreciate to market levels, its mixed record on implementing its World Trade Organization (WTO) obligations, its relatively poor record on protecting intellectual property rights (IPR), and its extensive use of industrial policies and discriminatory government procurement policies to subsidize and protect domestic Chinese firms at the expense of foreign companies. The United States initiated three WTO trade dispute resolutions against China in 2010, dealing with such issues as China's use of subsidies to promote its wind power industries, its use of trade remedy laws to protect domestic industries, and restrictions on electronic payment services. Some members of Congress have argued that, given the slow rate of U.S. economic growth and the high rate of unemployment, China's distortive trade policies can no longer be tolerated and have called for tougher action to be taken against China to induce it to eliminate policies that hurt U.S. economic interests. These trade frictions may intensify in the future as China attempts to implement policies to increase the output of more advanced products.
Numerous bills were introduced in the 111th Congress to address various Chinese economic and trade policies. For example, one bill, which passed the House (but was not taken up by the Senate), would have made certain fundamentally undervalued currencies (such as China's) actionable under U.S. countervailing duty laws (which address government export subsidies).
U.S.-China commercial issues may continue to be a major focus in the 112th Congress. This report provides an overview of U.S.-China trade relations. It describes the trends in commercial ties, identifies major trade disputes, and surveys legislation that may affect economic relations."

One of the main characteristics of this undeclared economic war is the increasingly growing trade deficit among the two countries, which is also accentuated by the USA's lack of competitiveness in global economic environment (Table 1). USA's problem is further accentuated by the fact that China denies to proceed with the free fluctuation of its currency. Fixed exchange rates of Yuan is the main weapon in Chinese external economic policy and fulfillment of its national interest objectives.

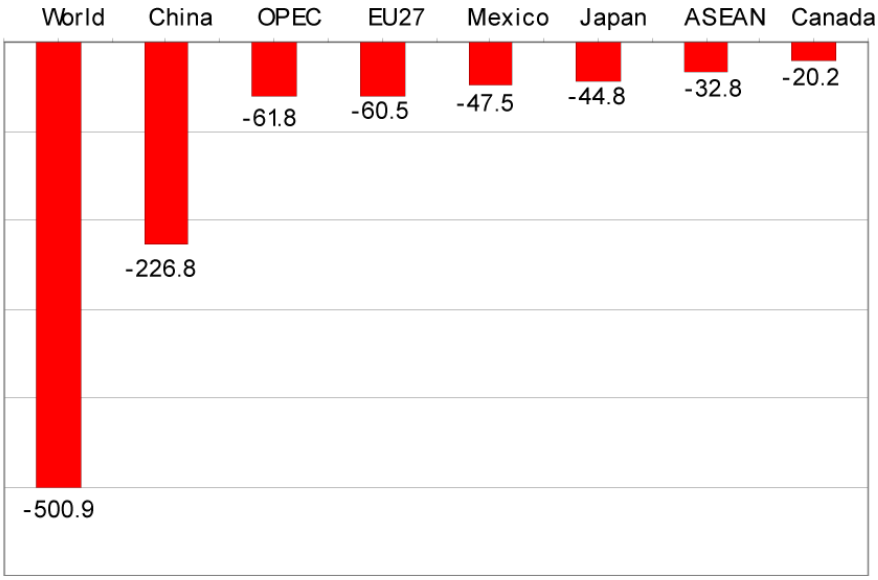
Table 1
The Increasingly USA-China Trade Deficit

Year	Exports	Imports	Balance
2010	91,878.3	364,943.8	-273,065.5
2009	69,496.7	296,373.9	-226,877.2
2008	69,732.8	337,772.6	-268,039.8
2007	62,936.9	321,442.9	-258,506.0
2006	53,673.0	287,774.4	-234,101.3
2005	41,192.0	243,470.1	-202,278.1
2004	34,427.8	196,682.0	-162,254.3
2003	28,367.9	152,436.1	-124,068.2
2002	22,127.7	125,192.6	-103,064.9
2001	19,182.3	102,278.4	-83,096.1
2000	16,185.2	100,018.2	-83,833.0

Source: http://www.census.gov/foreign-trade/balance/c5700.html

The case is similar for almost all the main trade partners of the USA, which makes the problem for them even worse (Table 2).

Table 2
USA Trade Deficit (2010)



Source: U.S. International Trade Commission DataWeb, 2011.

The above reality very much influences USA's behavior in the global arena. This has also been the case of the Copenhagen Summit for Climate Change and its failure. USA have explicitly expressed their intention to have China abide by a legally binding document as a result of the Copenhagen Summit. The objective was to integrate China into a series of international obligations which were not restricted only to emissions reduction and its impact on growth rates in the interior of the country. In this framework we should not neglect the fact that China and the USA correspond to 41.8% of the global gas emissions. Eventually, a lot of researchers claimed that achieving a level of mutual rapprochement among USA and China means that we also reach a level of interdependence and understanding between the two countries on issues of global economic governance and, eventually, climate change affairs [8]. I should also add that this bilateral framework of relations has also been very much affected by the emerging new global environment of international relations which is influenced by the increasing role of newly emerging economies such as those of Brazil and India. However, it was very well comprehended that at the end the USA are pretty sure for the failure of theirintention. They use it very much as an alibi for pursuing their own policy objectives rather than a genuine approach towards the accomplishment of the objectives of the Summit. Their main objective was to avoid any legal binding obligation for reducing emissions, in an era that economic crisis is still accentuating and growth rates are not satisfactory at all [9].

I also make clear that I consider the USA-China rivalry framework as a dependent variable in contemporary GPE, meaning that its existence and subsequently its impact, should be taken as a given element when assessing events that affect national political economy systems and formulate to a large extent the nature of national interests and the scope of the influence of a series of actors and stakeholders. This is also the case of the Arab Revolution which is addressed in this paper.

In the following part of the paper I asses the way that the analytical framework of Elaborated Realism and the USA-China rivalry framework in GPE relations as a dependent variable provide an enriched framework of analysis when attempting to comprehend the 2011 Arab revolution and the consequent events.

4. The Chinese Struggle for Resources

A prominent figure in the Arab case is the increasing Chinese presence in the field of exploitation of natural resources. In my opinion, the developments in the region should be seen within the framework of the Chinese endeavors to guarantee adequate natural resources with the objective to keep the high growth rates, necessary for its sustainable development.

The data that follow present the framework of this explosive development, reflecting the overseas business initiatives undertaken by the three major Chinese National Oil Companies (NOCs) – China National Petroleum Corporation (CNPC), China Petroleum & Chemical Corporation (Sinopec) and China National Offshore Oil Corporation (CNOOC) [10]. More precisely:

"The USD 18.2 billion spent on merger and acquisition (M&A) deals by Chinese companies in 2009 accounted for 13% of total global oil and gas acquisitions (USD 144 billion), and for 61% of all acquisitions by national oil companies (USD 30 billion; CNPC Research Institute of Economics & Technology, 2010). In 2010, Chinese companies spent USD 29.39 billion approximately again with more than half invested in Latin American (USD 15.74 billion). Such a level of activity should not be surprising; in 2009, when world oil demand fell 1.24 million barrels per day (mb/d), China's rose by 0.7 mb/d.

Similarly, while world gas demand fell by 2%, China's gas demand increased by 11%. As domestic production is at or near its peak, virtually every incremental barrel or cubic meter of oil or gas consumed must be imported. According to IEA data, successful acquisitions allowed China's NOCs to expand their overseas equity shares from 1.1 mb/d in 2009 to 1.36 mb/d in the first quarter of 2010; for comparison, China's domestic production in 2009 was 4.0 mb/d. Chinese oil companies are now operating in 31 countries and have equity production in 20 of these countries, though their equity shares are mostly located in four countries: Kazakhstan, Sudan, Venezuela and Angola. No evidence suggests that the Chinese government currently imposes a quota on the NOCs regarding the amount of their equity oil that they must ship to China. Decisions about the marketing of equity oil — where the Chinese company has control over the disposition of its share of production — are mainly based on commercial considerations, in some cases, carried out by marketing subsidiaries located outside the headquarters of the NOCs."

The same report also states that "China has entered into a sequence of privileged relationship with its Arab counterparts and regimes which now belong to the past, as a result of the revolutionary process that has followed" [11].

It is characteristic and in my opinion should not be neglected that among the countries that have considerably increased their crude oil exports to China in only one year is Yemen (201,72%) and Libya (249,9%) (Table 3). This means that China has developed privileged relations with the regimes concerned. In an intensive trade war between China and USA this element should be taken into consideration when assessing the events that followed.

Table 3: China's Crude Oil Imports Data for January 2010

BEIJING(Chinaoilweb): Crude Oil imports in Jan.2010 totalled 17,105,839 tons, grow +33.39% on year.

Countries	Jan in Tons	Change on Year
Angola	3,360,687	+53.44%
Saudi Arabia	2,908,350	-7.25%
Russia	1,273,039	+41.96%
Sudan	1,149,869	+130.25%
Iran	1,085,752	-48.76%
Kuwait	749,234	+31%
Oman	685,001	-35.77%
Brazil	681,931	+82.33%
Kazakhstan	681,780	+52.17%
Iraq	655,897	-
Libya	622,209	+249.9%
UAE	541,576	+117.76%
Yemen	389,326	+201.72%
Congo(b)	388,409	-1.46%
Venezuela	363,371	-
Colombia	277,890	-
Indonesia	265,365	+95.6%
Malaysia	198,796	+57.89%

Source: **www.chinaoilweb.com**

Pure social, political or economic perspectives and analysis are useful for offering insights as well as for introducing outsiders in the issues concerned. However, global political economy entails a series of variables to be taken into consideration when attempting to capture complex reality. Eventually, the Arab Revolution should be seen as part of an overall complex totality which is composed of a series of variables and dynamics. US-China relations are in the core of contemporary global political economy. Frameworks of analysis should take it into consideration. Eventually, the Arab Revolution should be considered within this context.

5. The Elaborated Realism framework of analysis for assessing the Arab Revolution and the ICT impact

The 2011 Arab revolution is considered from the following angles:

- Political (the authoritarian political elites/ shadow democracies).
- Social (the role of tribes, religions, social classes, nation groups).
- Economical (unequal distribution of income among social groups).
- Technology (the role of social networks and web technology).

Journalists, scholars, academics, researchers and various experts have extensively written on the developments and the events that take place in the framework of the 2011 Arab Revolution. They also attempt to explain the roots and causes of the events and recent developments. Such explanatory frameworks make use of a series of factors to try to comprehend what is going on in the region, why and what the future will be.

Characteristically, I can mention only some of them:

- In technological terms: the influence and role of technological development, market liberalization and capital and labour mobility, in other words the change in the formation of traditional productive forces has led to the emergence of new forms of social participation and consequently the inability of the traditional state structures to control information and its dissemination.
- In political terms: Decision – making mechanisms and political participation has been restricted to an almost exclusively certain political elite without any willingness from their part to disseminate political power to those who do not have the opportunity to participate, while institutional, participatory and democratic mechanisms have not been put in place or in function.
- In economic terms: huge inequalities in income distribution among the people have obliged the big part of the population to live under the poverty line. Economic elites have

- exploited in full natural and other resources without taking into consideration the majority of the populations.
- In social terms: political and economic elites have coincided with a specific ruling social class in the states concerned, thus marginalizing the rest of the people.

Analysis with emphasis on technology, economics, sociology and politics for sure provide certain explanatory frameworks in order to anticipate current events in the Arab world. What I argue in the paper is that the above mentioned explanatory frameworks are not adequate since they do not take into consideration the global political economy perspectives and dynamics, that is the network of political and economic relations that are currently formed in the global context.

I claim that we have to enrich the above frameworks and place them within the context of developments in global politics and economics. I argue that Arab revolutions should also be seen within the global context of the US-China relations, and the undeclared economic war among them, which might also involve other parts of the world such as Europe, Middle East and Africa.

Considering the analytical framework of Elaborated Realism as an appropriate approach to comprehend and assess developments in contemporary GPE, I will now see how this framework can be applied in the case of the Arab Revolution. Contemplating the Arab Revolution, as an outcome of a series of complexities in GPE I claim that the technological tools deployed cannot satisfactorily justify the spectrum and the dynamics of the series of events that took place.

Technological revolution has affected not only national states' economies but the nature of governance, social relations as well as the way war actions are realized. One of the purposes of the paper is to analyze and assess the way state policies and behavior in global political economy has been affected as a result of the use of information technologies and communications.

Technology may act as a variable and constructive element in a GPE feedback mechanism. However, national interest and security is a catalyst for the formation of National State behaviour.

More specifically, in the framework of the paper I assume the following:

a) States use Information and Communication Technologies (ICT) as a power factor and development variable to achieve and enhance political transparency, empowerment of people's democratic participation, more efficient provision of state services, reduction of the cost of state function and, ultimately, economic development.

b) States use information technologies in the global context in order to merely achieve foreign policy objectives, that is to: enhance their role and presence in the global political economy (global e-marketing); be an active negotiations actor, participate in partnerships and cooperative schemes, achieve political and diplomatic objectives at local, regional and global level (e-diplomacy).

Finally, my main assumptions are as follows regarding the issue are the following:

- ICT should be seriously considered as a variable when assessing the spectrum and the dynamics of a series of developments, such as the ones that took place in the case of the Arab Revolution, but not overestimated.
- ICT should be considered as a tool to enhance existing social, economic and political dynamics via:
  - Transparency;
  - Diffusion of information;
  - Development of new Actors;
  - Mobilization of social, economic and political actors;
  - Sharing the message among the groups and the stakeholders.
- ICT should be considered as a means / tool to accomplice national state interests and further enhance GPE hierarchical power structure. Eventually, it should be considered as a dependent variable rather than an independent one, meaning that its role and impact should be considered for granted.

More precisely, the State National Interest (SNI) is the major catalyst in the interaction connection among a series of variables that form national state behavior, including ICT, Information, Innovation, Knowledge, Ideas, and the elements that constitute the global economics and politics. This interaction finally leads to the creation of a national system of political economy, within which national interest satisfaction is playing a major role. Eventually, although a series of variables hereby exist and should be taken into consideration when assessing actors' behavior, nevertheless, national security and national interest is the dominant figure in such an interaction.

In other words, in the case of the events of the 2011 Arab Revolution, the main elements of the framework of analysis as it is anticipated by the one of Elaborated Realism are the following:

- ICT is an important tool for enhancing the dynamics of the events in the field;
- ICT alone cannot justify the roots and causes of the events, neither can lead us to safe conclusions for similar developments in the future. ICT can be one among other tools deployed in order to achieve specific National State Interests at a given time and location.
- National State Interest is the main catalyst when addressing political, social and economic developments in the framework of a given National Political Economy system. ;
- National Political Economy system cannot be seen independently from the Global Political Economy framework as it is seen in the context of a GPE Feedback Mechanism. Such a Mechanism is anticipated within the context of an hierarchical GPE.

I will now proceed with certain conclusions, mainly reflecting the framework of analysis of Elaborated Realism and the related Feedback mechanism.

6. Conclusion

The aim of the paper was to enrich existing analytical frameworks when assessing complex political social and political events, with similar to the 2011 Arab revolution. I conclude this paper by earmarking the following elements:

- Global Political Economy may provide the as a framework for the formation of national political economy systems and the dependant variable for major developments.
- Elaborated realism may offer us adequate analytical research tools in order to better comprehend today's reality as well as the roots and causes of a series of events taking place in contemporary GPE, including the 2011 Arab revolution.
- National Security and state interests remain the major catalyst of state behaviour formation.
- ICT is conceived as a tool to preserve and/or enhance hierarchical power structures in GPE, rather than the catalyst of events.
- US – China rivalry is the core axis in GPE and the framework to be applied when assessing developments in National Political Economy Systems. National State Interests are very much affected by the way the two main actors in GPE conceive their status in contemporary globalism politics and economics.

In the framework of the above I claim that the proposed framework of analysis of Elaborated Realism can be the appropriate tool for assessing thw global political and economic complexity. Fulfillment of state's national interest and sovereignty remain the main objectives of the nation state. In the meantime we cannot neglect a series of factors and variables which would otherwise be outside of a traditional realist approach. Among those the following are included:

- The growing importance of a series of the so-called "ecumenical" issues including the environment, the human rights, etc. Such issues are now seriously considered as being part of the global agenda and consultation for a as well as the decision making processes of the international community.
- The growing interdependence among economics and politics, the interior and the exterior. The Arab revolution cannot be assessed but only under the prim of this complex interdependence.
- The growing importance and impact of new technology, especially through the means of social networking such as facebook and twitter, on the formation of public opinion, public stances and perceptions. Message dissemination is now taking place faster, without obstacles in a globalised web. It is true that certain regimes try to put obstacles controlling electronic networks. The success of this attempt is questionable, as events have demonstrated.

The Feedback Mechanism of the Global Political economy is a new reality which cannot be neglected. National interest is the main catalyst for the formation of decisions and choices. Nevertheless, there is a plethora of parameters and variables which have been formulated in the new era of the global political economy. This plethora of new factors presupposes that the Feedback

Mechanism is not static and it presupposes its continuous supply with new data and the continuous redefinition of the content of those data. Otherwise, we face the danger of adopting one sided analytical approaches, thus making erroneous hypothesis and reaching erroneous conclusions.

I hope that the effort of attempting to enrich existing methodologies provide adequate room for further exploration and research work. I hope that scholars may find this approach interesting and will deepen its insights and analytical elements.

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Announcements, Conferences, News

The 17th Conference of the Hellenic Association of Regional Scientists «The Future of Development and Spatial Planning of Greece»

Conference Overview[89]

In the new programming period 2014-2020 and developments which occur (taking place) in Greece, has been organized the 17th Conference of the Hellenic Association of Regional Scientists on February 25, 2012. The conference, entitled "The Future of Development and Spatial Planning of Greece" has been organized in collaboration with the University of Central Greece, Department of Regional Economic Development Cooperation of the National Technical University, Department of Geography and Regional Planning, and with the participation of the scientific journal "Regional Science Inquiry". President of the Congress was Charal. Botsaris Professor of the University of Central Greece and the Principal Investigator Chr. Ladias Professor of the same University. The realization and success also contributed to the universal support and participation of local actors, particularly the sponsors of this kind.

The conference took place in the city of Delphi, Hall Papadimitriou City Council and the room "school", where 51 papers were presented by scientists from 80 Universities and other scientific organizations in the country. The conference was attended by 75 students of the Regional Economic Development at the University of Central Greece, Athens University of Economics, School of Rural and Surveying Engineering, National Technical University of Athens and the Aristotle University of Thessaloniki. With their presence on the Court honored the 100 members of academic communities and the Centre for Planning and Economic Research.

The agenda included the following main topics:

- Developing proposals and presenting research results on economic and regional development
- Promoting sustainable spatial development objectives through a balanced polycentric development
- Promoting intraregional cooperation networks
- Prudent management of natural and cultural resources

The Development Planning with the key elements of the economic planning and financial management and the spatial planning with the basic concern of the serenity of productive act- vities in space should be consistent for the result to optimize.

[89] **Conference overview by Antonia Obaidou, Aristotle University of Thessaloniki, Greece**

The international conference GEOCAD 2012

Conference Overview[90]

The international conference GEOCAD 2012 has taken place 11-12/5/2012 in Alba Iulia, Romania. It was mainly organized by "1 Decembrie 1918" University of Alba Iulia – Faculty of Sciences, Staff of Surveying, Cadastre and Environmental Engineering, University of West Hungary – Faculty of Geoinformatics, Székesfehérvár, University of Kavala Institute of Technology (TEI) - Department of Landscape Architecture National Agency for Cadastre and Land Registry, Agency of Alba County. Researchers, academics, public officials, military and enterprise representatives from various countries (Germany, Greece, Hungary, Romania, UK) participated contributing 60 papers.

The following fields and subjects were discussed: registering property, geodesy, digital technology in survey engineering, cadastral information and local public administration, positioning technologies, GIS applications, real estate, modernization of study programs, mapping application in soil science and farming, morpho-topographic, cartographic and 3d modelling analysis in archeology, architecture and spatial planning, monitoring natural calamities, terrain modeling, landscape sociology, socio-spatial functionality, landscape architecture, forestry, rural development, earthworks, quarry disturbance & restoration scenarios, laser scanning, landslides monitoring, urban utilities.

[90] **Conference overview by Dr Nikolaos Hasanagas, Aristotle University of Thessaloniki, Greece**

Academic Profiles

Professor Yuzuru Miyata

Professor Yuzuru Miyata is Professor of Technology Department of Architecture and Civil Engineering Toyohashi University. He is also a Doctor of Philosophy in Environmental Science (Hokkaido University). Research interests cover a broad range of topics. In his long research career he has focused in particular on quantitative methods for urban planning and development. He has broad expertise in the area of public policy, services planning, infrastructure management and environmental protection. In all these fields he has published hundreds of scientific articles in the international literature.

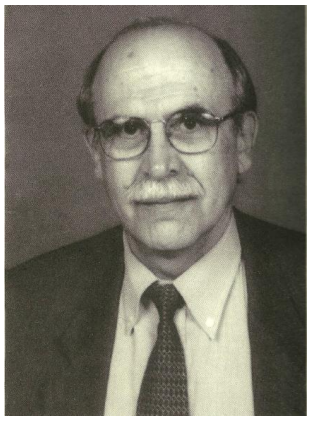
His most recent publications include:

- A Study of Dynamic Urban Model: A Numerical Experiment of the Compact City Study in Regional Science （Academic Journal, 2003） 33 / 1.
- Assessment on Energy Technology to Abate Air Pollution Emissions in China Studies in Regional Science （Academic Journal） 33 / 1.
- A Study on Evolution of Regional Population Distribution Based on the Dynamic Self-Oraganization Theory (1990)
- A Study on Model Reference Adaptive Control In Economic Development (VIII) : Model Reference Adaptive Interregional Migration in Indonesia (1988)
- An Intertemporal Urban Economic Model with Natural Environment
- Interregional Analysis of Environmental Tax on Sultur Dioxide Emissions in China -An Interregional Computable General Equilibrium Modeling Approach-
  Human and Environmental Symbiosis （Academic Journal） 8, 15-29.

His research interests focus on:

- Theoretical consideration and/or empirical study of the economies of cities and/or regions
- System Architecture and Urban Sciences
- Urban and Regional Analysis
- Environmental Economics
- Study on a Compact City Environment, Material Circulation, Compact City

By Antonia P. Obaidou, Aristotle University of Thessaloniki, Greece



Professor Pavlos Loukakis

Professor Pavlos Loukakis is Emeritus Professor of Urban Planning at the Panteion University of Athens. Professor Paul Loukakis developed and developing research activities in the fields of urban planning, regional planning and regional development, etc.

Throughout his career Paul Loukakis addition to academic and research activity has developed and continues to develop an extensive project involving the actions of collective scientific and professional bodies. His writings more than 150 publications. Professor P. Loukakis continues the scientific and design work and still active in teaching and research in the graduate program of TOPA.

In 1979 undertook to carry out the master plan of the city of Heraklion and then made a series of important studies, point to some interventions in the city.

His research interests focus on:

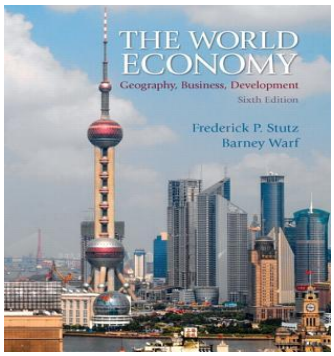
- Spatial phenomena and variations in the Greek countryside
- Attempts to create a new institutional framework in the European Union
- Regional development, spatial or territorial development and urban issues
- Strategic spatial planning, contemporary context and characteristics
- Sustainable reuse of building sets policies and culture and leisure activities
- Urban space and housing strategies of immigrants
- Regional convergence and transport

His most recent publications include:

- 2007, Opinion on the background and design planning sustainable development, National council planning and design for sustainable development
- 2005 Regional design and rural development, New technologies in agricultural production and rural development

ByAntonia P. Obaidou, Aristotle University of Thessaloniki, Greece

Book Reviews



The World Economy: Geography, Business, Development [Kindle Edition]

Barney Warf , Frederick P. Stutz

Prentice Hall

6th Edition, 2011, ISBN:0321722507

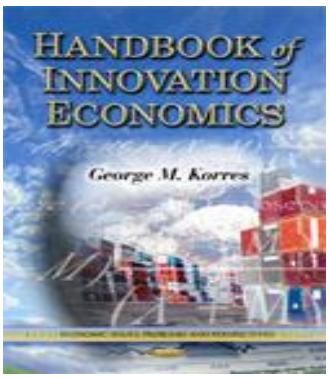
This book is the Sixth Edition which is enriched with informative tables and data, color maps, eleven new case studies, economic statistics of 2009, a detailed analysis of global change global trade and development and a new Premium Website with videos, web links, RSS feeds, and quizzes.

The authors through the text explore the contemporary geographic issues and prospects for global economy and provide a strong theoretical and practical basis for understanding the global economy in an era of change of borders, restructuring economies, and regional realignments. It is provided to the reader a sound theoretical and practical basis for understanding these issues while providing information on natural resources, international trade and population.

It combines theory with geography in addressing growth, distribution, and development, and explains their impact on international business. Presents recent geopolitical changes using real examples and promotes a greater appreciation of international and U.S. economic issues through a global perspective while highlighting world trade. The sixth edition of this book includes an additional chapter on consumption.

The book highlights global interdependence, flexible production, the globalization of business, culture, environmental issues and problems, and telecommunications. Analyzes the roles of traditional factors reduce the production and provide the latest from country to country economic data for all major world economies. An essential reference for any professional or business owner doing business in the world economy.

By Antonia Obaidou, Aristotle University of Thessaloniki, Greece



Handbook of Innovation Economics

by
George M. Korres

University of Newcastle, UK &
University of the Aegean, Greece

Nova Publishers, New York

The book is intended to provide a broad understanding of the current issues and problems of knowledge economy, technical change, and innovation activities; it will also examine many aspects and consequences of regional knowledge integration that are obscure or yet to be explored. After general issues in these fields have been addressed, the discussion turns to empirical and theoretical aspects of technical change, productivity, economic growth, European policy and technology policy. Most of this research has been presented in a variety of conferences, seminars, and workshops; some sections have already been published as Departmental papers, as well as referred papers in academic Journals.

The book consists of the following main chapters:

- Chapter 1: Measuring Innovation Activities and Technical Change
- Chapter 2: Modeling Innovation Activities
- Chapter 3: Innovation Activities and the Productivity Puzzle
- Chapter 4: Technical Change and the Diffusion Models
- Chapter 5: National and Regional Systems of Innovation
- Chapter 6: European Innovation Policy and Regional Convergence
- Summary - Conclusions

In particular, with its wide range of topics, methodologies and perspectives, the book offers stimulating and wide-ranging analyses that will be of interest to students, economic theorists, empirical social scientists, policy makers and the informed general reader.

By Dr. Aikaterini Kokkinou, University of Glasgow

THE REGIONAL SCIENCE INQUIRY JOURNAL (RSIJ)
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