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Directing Growth in Europe

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Extended abstract

Europe needs to strengthen its economic integration. The EU has emphasized the creation and progressive integration of European states through capital and labour accumulation, infrastructure development, endogenous growth, free trade, monetary unification, institutional creation and change, competitiveness, entrepreneurship, business and SME support and sustainable development. Substantial efforts were taken and funds were devoted to related policies, especially from EU member-states, which have enhanced capital and labour mobility in Europe and contributed in setting-up long-term growth conditions.

The present study uses a broad range of variables for 34 states from geographical Europe in the 2000-2008 period. It assesses their correlation with distance from Brussels, growth rates and growth levels (constant prices). Differences in the Pearson correlation coefficients from an initial to a final year are also calculated, indicating change and convergence among states. The results show that the EU has strengthened its overall position over the study period. Imbalances between peripheral and central states and a very clear pattern in growth gaps between advanced and non-advanced states have appeared. Policies have assisted centrally located and advanced European states, which sustain their competitive position via trade, export of goods and strengthening of capital formation. Although growth rates were higher in peripheral and less advanced countries, their position is weakened, in numerous correlations tested. The prospect of a dualism in the European economy and that of a two-sector non-integrated economy is likely to be created.

It appears that, despite initial expectations, the actual dimension and extent of centrifugal forces in operation were not realised, and theories from regional studies and economic geography, if seen from a broader, pan-European geographical perspective, were not taken sufficiently into account, such as: Myrdal, 1957; Hoover, 1948; Losch, 1954;

Christaller, 1966, Perroux, 1955 and others. Due to the opening of borders, the peripheral and less advanced states experience strong competitive pressure that causes unemployment, and the operation of detrimental forces against their economic, social, and political wellbeing. Other forces increase immigration. Implications should also be seen in relation to the relaxing of social, ethical or cultural values that maintained the integrity of national characteristics, to continuous social imbalances and change, the diffusion of social pathologies such as corruption, through the operation of networks - since people are connected and learn from each other (Christakis and Fowler, 2009)- as well as the rise of collective violence (de la Roche, 1996). Despite that, peripheral and less advanced states are considered to be responsible for many of the economic and social problems, perpetuated in their territories.

On the other hand side, existing policies have managed to create so far those backward and forward linkages needed in the European economy and a chain of disequilibria necessary to produce and sustain growth, especially in the most advanced states (Hirschman, 1958). While doing so, they have also laid down additional, necessary foundations on the historical ones, bringing European states closer to each other, in what appeared once to be a very dissimilar European geography. A long distance is eliminated between what separated once national populations in Europe and what unites them now.

Peripheral states need now to enter a new, take-off stage of development (Rostow, 1960), by increasing their clustering around the most advanced economies. This stage of economic integration will require a “big push” in their economy (Rosestein-Rodan, 1943), especially through investments in hybrid industrial and manufacturing products of high value added (Dixit & Stiglitz, 1977), such as helicopters. Such investments should be followed by the consequent creation of several millions of jobs, especially in SMEs (Hirschman, 1958), favouring, at the same time, the transformation of production in European centres (Combes et al, 2008). The EU could strategically support such infant European industries. Such an investment push is justified by macroeconomic analysis.

The EU needs to operate towards a seemingly opposite direction from the present, emphasizing the association among its economies and the process of uniting its common European interests. Emphasis should be given on the “cement” rather than the “stones” of the European edifice, by pursuing competitiveness alone. Rather the target should now be to turn Europe into a new stage of integration, emphasizing the elements for creation of a European-wide cluster, as extensively discussed in cluster theory (see in Crux and Texeira, 2010 or Martin and Sunley, 2003) that will enhance growth opportunities, offer economic freedom and will be characterised less by harsh competition and more by economic “amyllae”¹.

1. The theoretical framework for building Europe

The united Europe is not only the European Union but its outcome. The unification process may comprise Russia in the family of EU states one day, which could create complications, if problems in every different situation during the unification process are not acknowledged in time. The key challenge throughout the unification process is how to agree and implement changes both inside the EU and at the European level, without hiding the truth about the present situation at the EU, the problems and challenges it faces, the deceptions it creates or the negative forces denying its operation. It is better not to assume different, fallacious views on where the EU actually stands, in order to reach a better future for the benefit of its citizens and the generations to come, all over Europe. This knowledge is ecumenical and does not belong only to the EU, as similar unification efforts are in train all around the world. Besides, it is likely that many contemporary EU problems relate to the application of economic theory or to theory itself. Europe has

¹ The Greek noun ἀμύλλα is one of the ancient Greek words difficult to translate in the English vocabulary. There is no exact synonym. A possible writing, offering a pronunciation close to the Greek, could be the following: “amyllae”. According to Babiniotes, (1998) its root (ἀμα) might come from an ancient Greek root meaning “together” and “simultaneously”. It is understood as the competition without rivalry that intends to help participants to improve themselves in their efforts to excel (Babiniotes, 1998). The word has a positive connotation, usually explained in Greek by reference to the Olympic Games as “noble competition” that emphasizes an environment of collaboration and co-operation. Such an environment prevailed every time the Olympic Games were held. City-states and well-known personalities and athletes across the Greek territory used to gather to celebrate a common purpose, the organisation of the Olympic Games, in a period of Olympic truce.

already achieved a lot in bringing states together, shifting from a point in history characterised by a very wide heterogeneity among EU states to the present.

The creation of the EU is largely based on economic, social, political, cultural and other foundations that pre-existed in nation-states. The EU sought to enlarge them, by creating a new basis, using, to a large extent, economic theory and its applications.

Based on the neoclassical growth model (Solow, 1956; Swan, 1963), conditions for capital accumulation across the European space were and are still sought, where needed. The use of the model for tracing convergence among states has offered limited such evidence (Barro and Sala-i-Martin, 1992; Casseli et al., 1996; McQuinn and Whelan, 2006). Perfect mobility for both European capital and labour, as assumed in the neoclassical model, was sought by the use of core infrastructure (Aschauer, 1989; Reinikka and Svensson, 2002). In earlier, premature integration stages, the EU was suffering from very low factor mobility among states. Large-scale infrastructure developments would enhance mobility at the European level, but not necessarily support national capital and labour mobility, largely depending on their competitiveness. Infrastructure alone could also bring negative effects, e.g. by increasing costs. Hence public spending had to increasingly engage with private sector needs to reduce these effects (Aschauer, 1988; Otto and Voss, 1998).

Since the 1980's, the advent of endogenous and new growth theory emphasized human capital, knowledge, learning-by-doing, R&D, technology and specialisation, reformulating previous debates in economic theory (as in Lewis, 1965; Schumpeter, 1942 or others). Related policies were thought necessary for achieving convergence and integration (Thirlwall, 2003; Barro, 1991; Batiz and Romer, 1991; Romer, 1986; Aghion and Howitt, 2009), even though such views neglected the importance of market sizes, core-periphery imbalances and the need for institutional and social changes (Thirlwall, 2003; Aghion and Howitt, 2009; Martin and Sunley, 1998).

Progressively, various thoughts on the creation of a common currency gained ground in EU policy circles. The EU monetary unification came as an additional attempt in the history of nations to create larger geographical areas of stable economic environments, based, this time, on more solidly built monetary and optimum currency area theory. Derived from an effort to understand crises in the balance of payment and substantial disequilibria in international systems, the optimum currency area theory (OCA) recommended that nations can share a single currency, under certain conditions (Mundell, 1961). The initial targets set for the development of such a theory were full employment, balanced international payments and an average, stable price level (McKinnon, 1963). Monetary unification was expected to eliminate transaction costs, to provide a better performance for money as a medium for exchange and a unit of account (Ricci, 1997, Mundell, 1961) and to create efficiency gains from eliminating relative price distortions generated by transaction costs. Small countries attaching to larger currency areas were suggested to share potential benefits (Alesina and Barro, 2002). A single currency was believed to speed-up the integration process, and to be useful with regard to business cycles, the increase of trade and the reduction of exchange rate volatility (Rose and Engel, 2002). The absence of exchange rates would deprive economies from a short-run adjustment mechanism needed to avoid asymmetric shocks, price rises due to shocks and vulnerability to international financial crises (Ricci, 1997). Monetary theory had failed to acknowledge price differentiation in very large common geographical spaces, as suggested in spatial discrimination and spatial pricing theory (Hotelling, 1929; Hoover, 1934 and others) or price rises resulting from the unification of demand and supply in the EU, the operation of a Balassa-Samuelson effect, mainly in economies based on trade (Balassa, 1964; Samuelson, 1964), or even to take into account the effects of state-level policies.

Various views on trade, exports and trade openness helped to realise the benefits of trade openness and expansion inside the EU. Trade would enhance capital and labour mobility, promote competition, technology transfer and knowledge diffusion, achieve state democratisation especially in less democratic societies and bring new perceptions, principles and techniques in the production of peripheral and less advanced states.

Exports both at the state and regional-level could bring growth (North, 1955; Tiebout, 1956). In the classic view, held by Ricardo and Mill, trade would offer a comparative - rather than just absolute- advantage to states. In the assumption that trade is a positive sum game and regional economies are led to a mutually beneficial specialisation path, which regulates international and global wealth and production. According to the Heckscher and Ohlin view, such comparative advantage relates to the relative abundance of production factors and their intensive use, hence international trade would be shaped by resource differences among EU and European nations and their allocation. From this perspective, states with more intensive use of global transport networks for their products, with international transport infrastructure and vehicles of low transportation costs for their products, produced even outside their borders and with low labour costs, would benefit mostly. Leontief's research (known as the Leontief paradox) proved that Heckscher and Ohlin's views were controversial and that more analysis was needed on the complexity of factors affecting trade, such as human resources, labour or interest groups (as in Krugman and Obstfeld, 2000; Grossman and Helpman, 2002; 1990). Trade and its composition could alter relative prices, the supply and demand of goods, while the composition of production by sector could determine growth rates, when different goods have different technological progress rates (Spilimbergo, 2000). By taking into account imperfect competition, new trade theory brought various novelties, highlighting the need for strategic trade and selective use of trade instruments, such as infant industry protection (Krugman, 1995; Grossman, 1992; Krugman and Obstfeld, 2000).

Dumping could reveal the benefits of price competition for larger firms (Krugman and Obstfeld, 2000). Disassociated from their national shell, trade interests would retreat from their historical role to protect peripheral production, seeking to gain advantages against peripheral (or any other) production. Local and regional production would be progressively replaced by trade, various concerns on product quality removed and the peripheral and less advanced areas left in a more vulnerable position, with insufficient production levels, less recognisable brand names and reduced product quality. In the absence of a range of policy incentives to promote mergers in peripheries, transportation

cost reductions² and the creation of larger firms to enhance economies of scale, peripheral production had to offer substantial profit chances and significant varieties or else risked disappearing. The picture of a Europe driven by trade appears to emerge (Tsoukalis, 2005).

Due to the opening of borders and the release of agglomeration forces, a “new competition” had to be created, through institutions of industrial restructuring and specific regulatory authorities (Best, 1991). The theory of competitiveness emphasized a combination of microeconomic and macroeconomic growth factors, the role of competition, endogenous growth factors, basic points made in the theory of growth, the role of demand and supply, of manufacturing and businesses (e.g. in Porter, 1998). Development in competitiveness theory coincided historically with the need to enhance competition, especially in less advanced European states coming from a central planning background. Initially developed for single nations, it was transferred at the regional and local level (Budd and Hirmis, 2004; Boschma, 2004, Turok, 2004), also followed by a criticism on its relative significance or even elusiveness (Kitson et al., 2004; Bristow, 2009). Though competitiveness was promoted as a national or regional target, the pan-European maximisation of value-added was not crystallised as an explicit EU target. Along with competitiveness theory, the development of entrepreneurship, entrepreneurial dynamism, and policies to support new, small and medium sized enterprises was thought necessary, given the work of Schumpeter (1942) and other economists.

Regional economic association and the diffusion of associative practices across the European space were discussed to contribute to collective learning and improve production, bringing innovation and growth (Cooke and Morgan, 1999). In various readings knowledge, science, research and their diffusion were considered a precondition for national and regional growth across Europe. The emergence of an information society would promote their growth and diffusion, via information and communication technologies (Antonelli, 2002; Dimelis and Papaioannou, 2003). Long-term arrangements

² As in the case of agricultural products that re-gain in several circumstances advantages lost from distance to centres through the Common Agricultural Policy.

were needed to set-up necessary institutions of knowledge, such as libraries, universities, research centres, technological or other educational institutions. Such institutions would help, in conjunction with the progressive building of the information society, to organise human capital resources, innovation activity, the promotion of know-what, know-why, know-who or other learning processes, sheltering different kinds and degrees of knowledge, tacit or codified, formal or not (Gregersen and Johnson, 1996).

The more general role played by institutions in building the EU and a spirit of European solidarity was highlighted since the very early steps of European integration. Their role in growth was referred to in various discourses in economic theory, such as the Regulation School, the “national business systems”, “national innovation systems” and the “varieties of capitalism” discourses (see in North, 1990; Gertler, 2010; Martin and Sunley, 2003). Institutional creation, renewal or development is indispensable for bringing a union of states together. Institutions help to resolve problems and conflicts among interests, explore and economise resources, guide actor’s behaviour, set up strategic agendas, provide information, reduce opportunism and create stable expectations, by setting the “rules of the game” (Borzel, 2002), since institutions progressively promote knowledge and sustain new practices, ideas and values (Rosamond, 2004). Institutional renewal is needed, since as intermediary variables, they affect economic path dependence, operating in a regulative manner, which can increase the danger of reduced freedom and rational choice (Nugent, 2006).

Various international relation theories, such as the federalist, co-federalist, the functionalism, neo-functionalism or the concessional view and comparative political economy studies shed more light on the process of integration. No single theory managed to describe or explain it in full. Regional “players” would integrate through functional co-operation and interaction, in a progressive, functional spill-over process. Various consensuses would improve cooperation and the level of authority for common institutions, enhancing the concentration process of functions (Haas, 1958). Nation-states would transfer more power to central authorities (Haas, 1972, Earnshaw and Judge, 1996). High give-up costs and the legitimisation of processes under operation would lead

to integration by way of determinism. Concessions would realistically guide inter-governmental policy making. For new-institutionalism, institutions would express state needs. The development of networks would support decision-making, compromise and governance (Nugent, 2006). Inside the EU, governance is promoted by the classic Commission method, ministerial meetings, conferences and agreements at the level of permanent representations, with continuous contacting of partners in a spirit of compromise and co-operation. New emerging forms of governance, such as the Open Coordination Method, social dialogue, independent authorities and self-regulation are multi-functional and characterised by variety, flexibility, decentralisation, collaborative work, a learning process and a commitment (Manouvelos, 2010). Forging unity within the context of state variation and difference was necessary, as highlighted by federalism.

An economic union of states is the outcome of different stages of integration, commonly preceded by a customs union or a common market, which are progressively built, in different and necessary stages. The full economic integration requires the unification of economic, monetary, fiscal and other public sector policies. Despite efforts taken, the direct implementation of economic and fiscal unification remains a difficult experiment, since it is related to monetary unification and the various levels of growth and living conditions in the EU member-states.

2. The prospect of divergence: re-examining the theory

In the open-border EU environment of free labour and capital movements, imbalances would increase due to the operation of stock markets and the influx of speculative capital in national markets.

The extent of centrifugal forces in operation and their geographical scale was not realised in full and is much higher than originally thought. Various theories in regional studies and economic geography were used at an early stage to diagnose the prospect or tendency of enhancing core-periphery imbalances and the division between wealthy and poor states. This was highlighted in central place theory (Christaller, 1933; Losch, 1954),

growth pole theory (Perroux, 1955), studies on the location of economic activity (Hoover, 1948) and the theory of cumulative causation (Myrdal, 1957; Kaldor, 1970) that highlighted the presence of backwash and spread effects and of a detrimental mechanism in operation, against some peripheries. Such a prospect is also emphasized in new economic geography readings, emphasizing the significance of locational factors, transportation costs, economies of scale and manufacturing production (Krugman, 1991; Fujita et al., 1999).

Very often investors tend to expend all their energy in growth poles, seeking to take advantage of the constantly overestimated external economies in them, while ignoring opportunities in other areas that remain unexplored (Hirschman, 1958). The intensity of such external economies and agglomeration forces in operation before the opening of EU borders ought to be expected to multiply after their opening, favouring specific locations in the EU. The agglomeration of economic forces around central European regions is also witnessed in the discussions held on the European “triangle”, “backbone”, the “blue banana”, the “red octopus” or other shapes formed in the wider central European area or in other views held on the Europe of multiple “speeds”, variable “geometry”, homocentric circles, and the distinction between the old and the new Europe.

The analysis of multipliers that take into account interregional trade had diagnosed that within a group of regions without monetary and fiscal policy, the creation of large regional state deficits is possible, intensifying economic imbalances (Richardson, 1969 and others). Transferred at the state-level, and under the hypothesis of a closed economy for trade outside the EU, this analysis predicted potentially intense imbalances in trade deficits for some of the states, and, consequently in their balance of payments, given state-level differences in competitiveness, institutions, education, the exploitation of human resources or other factors distinguishing more from less developed economies.

Dualist theories explained the prospect of creation of an economic dualism between the most and the less developed states (for example between the Northern and Southern EU), where one segment of the EU state and regional economies would be the most modern, of

highly developed capitalism, and the other the more traditional and less technologically advanced (Boeke, 1956). Viewed in the light of the creation of comparative advantage, sector theory highlighted the prospect of the creation of a unified economy with specialised sectors, per region, state or group of states. Such an evolution is likely to perpetuate the gap between wealthier and poorer economies at the expense of the most vulnerable and peripheral (Emmanuel, 1972), supporting a vicious-circle inside the EU economy. Following resource-scarcity theory, places in Europe with resource scarcity are more likely to have limited chances for growth and be incapable of exploiting new resources, to turn them to new comparative advantages.

3. Social Dimensions of the Diverging process in European Economies

Increasing economic imbalances would naturally bring population movements, not only nationally but also at the European scale, especially that of highly educated and trained workforce (Hirschman, 1958). Immigration in Europe has a double hypostasis, derived from domestic population movements and from outside Europe and the EU. Globalisation eases migration to Europe, due to intense international demographic pressures, the development of transport, communication and other infrastructure and the multiplication of causes pushing foreign populations towards better social and economic conditions in the EU. The latter include environmental reasons, the search for freedom, human dignity, the respect of human rights, the offering of political asylum and the advent of refugees from places of erupting violence (Jandl, 2007; King, 2002; Schmidt, 1999). Immigration has a multidimensional nature (Goldstein, 1976), and preeminent among the pull factors are the economic and labour causes, the social and ethnic networking in places of destination, but also the intensity of centre-periphery relations, in the cultural and system theory (Hooghe et al., 2008). Large migration influxes first arrive at the EU periphery, which suffers mostly from its consequences, often including a challenge of domestic residency, the value of citizenship and a request for “rights and papers” (Poros, 2008).

The development of only few regions, sections or sectors in the economy produces economic and social gaps between the more progressive parts of the society and those

remaining backwards or excluded from the production process (Hirschman, 1958). This gap further impedes growth, since “successful groups or regions proclaim their superiority over the rest of the country and their countrymen” (Hirschman, 1958; p.185), by highlighting the qualities differentiating them from other groups or regions and by creating for the rest a stereotype image of laziness. On the other hand the less developed groups, regions or sections of a society reply to these superiority claims by accusing the “nouveaux-riches” “of crass materialism, sharp practices, and disregard for the country’s traditional cultural and spiritual values” (Hirschman, 1958; p.186). These views apply for Southern and Eastern EU states, between the more and the less advanced parts of their societies, as well as between the Northern and Southern parts in Europe.

Together with economic change, the EU populations had to intensively assimilate new values brought from abroad, compromising with continuous social change. By opening their borders, populations were asked to adopt new values and to change their organisation and composition (as discussed in Ginsberg, 1958), always in relation to their pre-existing structure and organisation. Intensive social changes would bring social exclusion, especially for those parts of domestic societies left outside the implementation of changes. Various and intensive economic changes and imbalances, such as those stemming from rises in prices and costs of living, alter the character of what was once a stable social environment, with specific and discernible norms, culture, symbols and values, reducing a sense of social consciousness and pushing towards the expression of social cohesion problems. In such environments, the spread of various social pathologies or practices is likely to take place, such as corruption, supported by the operation of networks, since people are connected and learn from each other in various forms of social networks (Christakis and Fowler; 2009). Such networks have the power to shape human conduct and affect the same morale and freedom of choice (Christakis and Fowler; 2009). Against the intensity of economic and social change and imbalance, phenomena of collective violence are likely to appear (de la Roche, 1996; The Telegraph, 2010), as an effort to regain social control lost by groups and parts of the society. Such phenomena are spread in environments of unemployment, reduced opportunity and underinvestment, where some part of societies have differential access to strategic resources from other

“socially distinct entities” and cannot obtain equal treatment by gaining a more substantial role in the production of strategic resources (that would have offered them a better integration at the society, as explained by Paynter, 1989). As opposed to such angles explaining the emphasis on their social problems, societies in peripheral states are assumed to be fully responsible for their presence and expansion over the last decade.

4. Directing European growth

The aforementioned views make difficult, if not unrealistic, the target of balanced growth. An opposite view from the balanced growth thesis recommends that in practice growth is the outcome of a chain of disequilibria and imbalances in the economy (Hirschman, 1958), according to which “in the geographical sense, growth is necessarily unbalanced” (Hirschman, 1958, p. 184). Unbalanced growth is compatible with modern approaches in economic theory, assuming various forms of imperfect rather than perfect competition to offer higher profit chances for firms and the economy, which however sustain various inefficiencies. There are however a certain degree of economic imbalances that a nation or a union of states could sustain. According to Hirschman (1958), non-balanced growth is combined with the creation of forward and backward linkages.

These points should be seen in relation to the principal problem for the most developed states, i.e. their weakness in sustaining high growth rates. By reversing the study of economic imbalances at the European level by 180 degrees and provisionally accepting their intensity, we can manage also to accept that such imbalances have allowed growth to take place inside EU states at a scale that would never have happened otherwise, and may have never operated as a sustaining force for the common economy. The development of international trade and the increasing economic cooperation across EU states allowed the creation of backward and forward linkages -mostly to the benefit of some EU states-, putting the European economy on a long-term developmental basis. From this perspective, it is more the target of balancing the already heavily imbalanced growth in some cases that is currently needed to be achieved as a prospect, rather than

reducing the operation of pan-European linkages, which nurture and sustain the growth prospects of the most advanced states. It is for the common European benefit that due to the creation and operation of such linkages, EU economic and political interests from more advanced states have embraced the current direction for the European economy and are now in the position to realise the necessity of a common economic destiny with the less advanced and peripheral states and wish their better economic integration. Without substantial benefits for their economies, it is questionable whether advanced states would have ever reached a position today to consider supporting the progressive creation of a new stage of economic integration in Europe. The full economic integration in Europe will take time and face many problems and challenges, due to creation of heavy imbalances and the role of human and societal choices. However, from the moment that it is being realised that economic integration in Europe is in its half-way through or at least at some non-final stage, it can also be realised that more and renewed efforts should be undertaken to support further deepening and avoid heavy imbalances denying the operation of a common space and its integration, in full.

It is a common knowledge in economic theory that peripheral and less advanced economies cannot reach directly a takeoff stage, without passing from middle stages (Rostow, 1960). A series of economic, political, institutional and other factors are tested in such stages and their actual operation in practice, which however require the presence of human forces inside domestic territories (or even their return) and not their migration in other European spaces. Labour mobility and a brain drain may alter the direction of the path pursued, if, for some reason, the prospect of a better future is not realistically pictured. Such a transition from one stage to another brings further changes that unleash economic and political forces operating in a way that has been called elsewhere “creative destruction” (Schumpeter, 1942). Rather a “big push” is needed, as recommended in economic theory for some of these economies, in order to draw high private sector leverage not only of domestic origin and the operation in place of high added-value investments, infrastructural development and planning, as well as the parallel industrialisation across different industries (Rosenstein-Rodan, 1943; Murphy et al, 1989). According to economic theory, the spread of growth via small and medium sized

enterprises will be helpful to sustain and localise wealth. This prospect could reduce heavy current account imbalances among member-states and redress them, without breaking the linkages created. Theoretically this view is further supported by the study of a Keynesian model in states with large deficits, following which net exports are equal to the net difference between saving and investments (Richardson, 1969).

Similar conclusions can be drawn using macroeconomic analysis. The basic macroeconomic equation $Y=C+I+G$ shows that in peripheral states facing problems, when policies are implemented to reduce G and C , income can increase through investments.

All open economies incorporated in a common currency area receive their international interest rate. The more a less developed open economy will be requested to invest its savings, public or private, the more these will tend to fall. The prospect of a large absorption of savings at the periphery of a common currency area is pictured in **Appendix B**.

Large amounts of savings, public and private, have been used for investment purposes, as requested by the EU Cohesion Policy. The latter sought to enhance growth by supporting peripheral governmental expenditure and increasing investments, both affecting consumption. Significant funds were devoted in purchasing machines and tools from other EU states. Other reasons for the large absorption of savings relate to the progressive integration of economic space, the use of a common currency that uncovered growth differences and removed concerns for exporting savings, the reduction of transaction costs for transferring money and savings abroad and the competition from non-peripheral financial and banking institutions offering higher profits for savings, as well as better investment opportunities. The creation of new profit opportunities in financial activities is likely to have acted addictively for larger parts of domestic populations seeking new profit opportunities abroad rather than a long-term support of a productive path and an increase of the propensity to save. The fall in savings could also relate to a mismanagement of EU funds and to corruption, further affecting the availability of funds

for investment purposes and the propensity to invest. Furthermore, substantial parts of savings are removed to off-shore firms and destinations outside the EU, benefiting at large from the unionisation process and the free movement of capital.

The relation between savings and investments (whenever current accounts are included) is seen in both identities below:

$$S = I + CA \quad (i)$$

that leads to $S - I = CA \quad (ii)$ (Abel et al, 2006)

If S is reduced, current account deficits are expected to appear, as diagrammatically represented by using the respective curves of S and I , at the current interest rate of a common currency zone (**Diagram A**). According to (ii) a reduction of a large current account deficit can take place by increasing savings (or reducing investments).

Assume one peripheral and small open economy at the Eurozone with large deficits, such as the Greek. Its equilibrium point, if isolated from the rest of Eurozone states (without affecting upon the Eurozone's interest rate) would be formed at an upper left part of **Diagram A** (7%), limiting its product. This is because its savings are very much limited, followed by limited investments. Simultaneously, the interest rate is formed at the bottom right part of the **Diagram**, for all investments and savings at the Eurozone (3%). Since Greece receives its interest rate from the Eurozone, the higher interest rate in **Diagram A** helps to explain a process of price rising in goods and services likely to be under operation and excuses why they are more expensive than in other places of the Eurozone. In the common currency area, increasing interest rates at the level of each state may not become visible and early diagnosed through official inflation rates.

Policies reducing investments in this peripheral state will shift further the investment curve to the left and downwards (from $I1Gr$ to $I2Gr$), bringing, since savings are also limited, an equilibrium closer to that at the Eurozone (assume at 5%). But investments must continue to fall to reach the Eurozone level, bringing an extended recession.

Diagram B reflects similarly the IS curve for Greece and Eurozone, as synthesized by their components in **Diagram A** (See Abel et al, 2006).

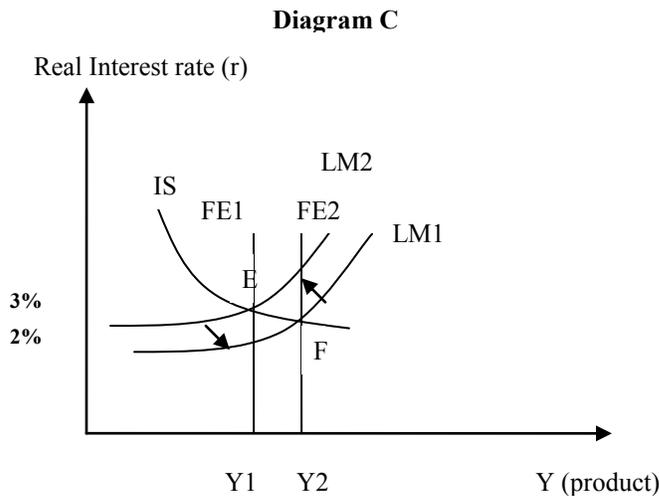
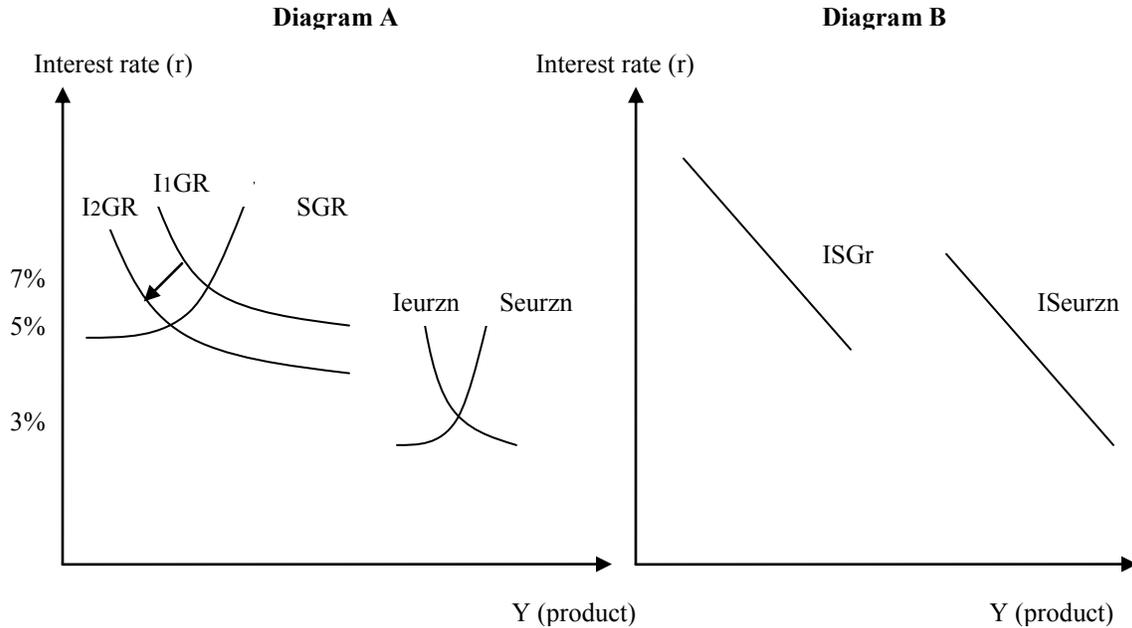


Diagram C helps to explain that the logic of the present argument favouring the importance of investments -from the supply side- should be preferred from a money market (LM) intervention. Assume the economy of a common currency area is at a general equilibrium in point E, producing a product of full employment Y1, at a fixed interest rate (3%) and price level. An increase in money supply because of a problem at

the periphery (for example through issuing national or other common EU bonds), will shift the LM curve to the right and downwards. The new LM2 curve will intersect the IS curve at a point F, now giving a lower interest rate, 2%. By lowering the interest rate, demand for goods in most advanced and central states will increase. If businesses will decide to produce more products to cover the increased demand, the production (and supply) will increase. The main problem is that such supply increases, taking place to the benefit of businesses in central and advanced states, are not in new products but rather in existing products, not incorporating new R&D and patents. This is because demand increases send the signal that supply could be offered through the same products and goods and that there is no actual need for changes.

Because aggregate demand is higher and the product is now at the point F, businesses will increase their prices, bringing a shift from LM2 to LM1 and the supply of money back to its original position. The economy will return at point E (and the respective interest rate and product equilibriums), but through incorporating an increase in prices. In practice, such price increases risk also breaking rather than sustaining the linkages already formed across the EU economy, to the benefit of non-EU, international competitors. An internal competitiveness problem will appear since production at the periphery in some particular products and goods has already shifted away and is now produced in central and advanced states. A part of this production will be finally transferred outside the EU because of the incorporation of price increases. This could take place by locating factories from central and advanced states in non-EU spaces.

Since peripheral and less advanced economies do not actually operate in full employment, any appeal to supply-side policies would require labour market interventions, following a Keynesian prescription for overcoming recession. The application of such policies has a limited value in an environment that actually causes its perpetuation and has no reason to continue if impoverishment is finally brought at some part of this common space. Rather it will act as a migration-push force towards the common space. Their application should rather be seen within the context of putting a peripheral and less advanced economy back in motion in the short run, further acting, by

way of price reductions, as an attractive force for investments. However, particular domestic conditions should also be considered, resulting from the crisis such as the problem of transportation inside the domestic environment that is likely to affect negatively any growth efforts and the circulation of labour and capital.

Assume that a combination of policies that reduce a current account deficit and structural policies targeting at labour market reforms and the enhancing capital and labour circulation are applied at a peripheral state, by the state itself or in association with the common currency members. If such policies would be seeking to affect directly G and indirectly I (for example by reducing bureaucratic or any labour obstacles and leaving more room for the private sector), they should also be expected to negatively affect C. For instance policies increasing tax rates could reduce consumption. Consumption will fall for numerous reasons, including the lack of confidence, the worsening of expectations, high household debts (at the aftermath of a crisis), as well as the lack of willingness from the private sector to invest and replace the withdrawal of state from its activities in the absence of any growth prospect. In the absence of a stable tax environment, the efficiency of policies that raise taxes will be affected, especially if tax rates are increased. Efforts to raise more taxes are likely to lead to tax evasion, if income falls and the limited sources of income are mobile at the common space. Tax evasion may derive from a domestic intergenerational conflict between a new generation being asked to pay a large deficit created by the older generations, which however largely benefited from the application of policies in the past (Rosen and Gayer, 2008). But it may also derive from social and political groups benefiting from past policies, seeking further to affect the application of policies for their own benefit. Overall, it appears that cutting budget deficits alone, in the absence of investments, is unlikely to offer the appropriate results, as it largely depends on many different parameters that may aggravate the effects of such policies in the common space, carrying the prospect of a long-term recession in practice.

Assume further that a peripheral economy witnesses a twin deficit (as Kosteletou (2012) discusses in the case of Greece).

When splitting savings further into private (S_p) and public (S_g), (ii) leads to a basic macroeconomic equation on the use of savings (Abel et al, 2006):

$$S_p = I - S_g + CA \text{ (iii)}$$

This equation on the use of savings emphasizes that a large current account deficit can be resolved by selling public property abroad and using savings from abroad. This is better realised when public savings (S_g) are very low. However, the third component of the equation is investments. Indeed, a current account balance can also be reduced if private savings from abroad are used to drive investments.

After distinguishing investments into private (I_p) and public (I_g), it follows from (iii) that

$$CA = (S_p - I_p) + (S_g - I_g) \text{ and that}$$

$$CA - (S_g - I_g) + S_p = I_p \text{ (iv)}$$

It appears from equation (iv) that, under conditions of a twin deficit (referring to both CA and $S_g - I_g$), a substantial absorption of both private and public savings (S_p and S_g) and the lack of possibility to draw any further public investments (I_g), a long-term perspective to reduce both deficits relates to the side of private investments that should substantially enhance in the peripheral state in need.

Assume further from (iii) two states, one peripheral (1) and one central (2), such that

$$S_{p1} = I_1 - S_{g1} + CA_1$$

$$S_{p2} = I_2 - S_{g2} + CA_2$$

The latter equation can be re-written as

$$I_2 = S_{p2} + S_{g2} - CA_2$$

Tackling a current account deficit for a peripheral state from the investment side (I_1) would require drawing funds from a central state and invest them (I_2). Assume a current account surplus for the central state (CA_2), because it draws income from its activities targeted at the periphery. Any new investments in the peripheral state (I_1) will continue to offer a surplus, provided that they are in new products. Such investments do not necessarily need to derive from governmental (public) savings (Sg_2), especially given the importance of using such funds for re-distributing wealth and income in domestic societies (and the necessity of such policies for further consolidating the building of a common space). It is mostly from private savings Sp_2 (or other) that investments should be driven.

Taken from a broader European perspective, such private investments should arrive back to the periphery from those sources (firms, banks or others), located in EU central and advanced states, which have benefited at large from savings out of the periphery, taking advantage of capital freedom and the use of a common currency. Resolving what appears to be a difficult puzzle relates to investing private EU savings at the EU periphery, where the symptom appears, in high profit opportunity investments.

In a unified EU economic space, where established pan-European linkages allow strong income leakages and diffusion outside the EU periphery, peripheral economies could either reduce such leakages to some extent (which is rather a negative path to take, opposing to their openness), via import substitution policies, direct or indirect or enhance domestic income multiplication through inter-industrial diffusion (in other words to increase the industrial and international Keynesian multipliers). The latter could increase the EU and European value added, if carefully planned. Viewed from this perspective, the EU is forming an internal space for investments with higher profit opportunities that could both deliver and distribute growth and wealth across EU space. Such an investment prospect should further be supported by infant industry protection and strategic trade for the new industries.

In order to establish a more viable solution, it appears that private savings for a peripheral state Sp_1 that will be used for investments in new products should be larger than those private savings from other central and advanced states, Sp_2 , and those from other international savings, Sp_3 , such that profits shared out of this process are also ranked in the same order ($Sp_1 > Sp_2 > Sp_3$ such that $Pr_1 > Pr_2 > Pr_3$)³.

The present solution emphasizes the necessity of private investments in peripheries to organise growth and the undertaking of a certain risk from their side, before a twin deficit is being transferred across the common currency area periphery. Other policy responses to such twin deficits, such as those seeking to reduce public savings, cut investments and balance the unbalanced current accounts by selling state's property (looking at the second side of equation (iii)), currently implemented, risk breaking the linkages formed in the common EU and European space, bringing losses in the long-run for businesses from the rest of the EU and the EU centres investing at the periphery. Similar historical efforts to turn a current accounts balance to positive have appeared to offer mostly short-term solutions (see in Abel et al, 2006). Investment in these peripheries, via new industries, could drive their growth leading to convergence, before any adverse side effects of other policies appear, reducing the profitability chances in these markets.

The success of the existing direction for the growth of the European economy could be based on the model by Dixit & Stiglitz (1977) that considers growth to be the outcome of investments in new, hybrid products, offering higher profits for businesses. This view has been adopted by new economic geography, further recommending that growth in peripheries should not contradict but rather strengthen that in centres, to be sustained on both sides (Combes et al., 2008). Such investments and the resulting industrial support and change in peripheries should target at a progressive transformation of economic centres and reduce risks from various industrial paths taken that need change. Large-scale investments in peripheral states and regions in projects creating new products of high added value could bring a sufficient number of jobs and could drive, in a propulsive way,

³ Profits Pr_2 and Pr_3 do not include income leakages, which will expand the actual profits for central and advanced states.

inter-industrial and inter-regional growth and its diffusion, if sustained by a large number of small and medium sized enterprises. Attracting production and employment force in peripheries that remain excluded or not expressed in central and wealthier areas is to the benefit of Europe. Such manufacturing and large-scale business relocation policies that could now take place at the pan-European level were, up to 1970s, the principal policy paradigm in regional studies, inside national borders. This policy paradigm laid down the growth foundations in most of the developed European regions today (see in Armstrong and Taylor, 1999). By adopting a variety of incentives towards this recommended direction, the EU could support young and dynamic industries at these economies, while offering strategic trade support for infant industries, if needed. This could have helped to better economise European wealth and prepare the EU for a new stage of economic integration.

Stable levels of employment and output are needed for the appropriate operation and deepening of the unification process. Stability is one of the three cornerstones before a common fiscal policy across a unified currency area is implemented. This can be achieved only after an extended period of application of common policies through the other two important conditions, allocation and both income and wealth redistribution (Musgrave, 1959). At early stages of integration, governmental taxes and expenditure would tend to differ across the common currency space. Furthermore the appearance of large deficits in balance of payments and current accounts, especially in those peripheral and advanced states that have applied common policies and achieved to better integrate, would tend to impede the achievement of macroeconomic stability. Reducing these imbalances is necessary, making practically any conditionality on the creation of balance surpluses (as recommended by the Stability and Growth Pact) a short-term measure. Deepening integration towards the direction of fiscal integration highlights the need to reduce such imbalances⁴. A long-term pursued EU Cohesion policy could be viewed as a pioneer of a common fiscal policy, even though it represents a small proportion of total output levels in peripheral and less advanced states and is subject to many policy obstacles, especially those of growth orientation.

⁴ it is rather a positive surplus in the common balance of the currency zone that ought to be pursued

The withdrawal of savings at the geographical scale of the EU or Europe more broadly, could be explained by a pan-European neoclassical-type shift of capital that increases capital accumulation at the EU and European rather than at the state level. Capital accumulation however is a very important precondition before implementing re-allocation and allocative efficiency, as capital needs to expand before it is actually being used for investment purposes at peripheral and less advanced states (so that such investments reduce the risk of its minimisation or loss). As explained, it is mainly via the private sector that such investments should take place. Directing EU growth will help to move integration a step forward, while reaching new frontiers in the enlargement process.

5. Creating the prospect of a unified European cluster

The removal of professional barriers, which relate to political, economic, cultural or other reasons and traditions could contribute to labour mobility and its attraction at the periphery. Business association at the European level is needed in large-scale projects offering a distinctively large number of jobs that would absorb large unemployment levels in peripheries and reduce the effects of unbalanced growth from continuous growth in some central and more advanced areas. Producing new products could create new markets, without threatening the primacy of domestic industries in most advanced states. The production of hybrid vehicles, such as hybrid helicopters, could resolve long-term domestic transportation and labour movement problems in these countries, for example those in Greece, as well as the fundamental problem of distant location of their population and labour force from centres of consumption and production in Europe or those of the wider geographical region. The production of such products covering European needs could promote changes, progressively and over time and help the transformation of production in production centres. Following this way, the demand of one nation could be satisfied by the supply of another, while part of income created in most advanced states via international trade could return in Europe via R&D investments. The price falling tendency at the EU periphery after the world crisis could act attractively, if combined with a middle or long term perspective for higher, directly exploitable, profitability of the European businesses.

From this perspective, creating relations of trust and cooperation with economic interests in central EU areas and associating with them is for the benefit of more peripheral EU states. A better choice for peripheries is to engage in a role supportive or complementary to centres not that as direct competitors, seeking to build coalitions of interests. Reaching a point in European history at which such an association is feasible, had required the creation of a demanding level of economic programming and state capacity building, before policies implemented in peripheries are interwoven with those in growth centres. An intensive learning period, progressively formed and prepared through EU policies, was needed before reaching this point, binding different state, regional and local economic programming and planning.

The theoretical underpinnings for such a direction could be found in the extended discussion on clusters at the local and regional level and the formation of economic relations of collaboration and cooperation in them (Crux and Texeira, 2010). The question of how economies and economic actors associate is provided in various readings concerning the industrial districts and the clusters (Marshall, 1920; Martin and Sunley, 2003). These are considered to act as drivers of national and regional competitiveness, in many respects (Porter, 1998). Firms benefit from domestic agglomeration economies and economies of scale, but the role of endogenous economic growth factors and that of society is also emphasized in forms of “cooperative competition”. Synergistic relations of trust and reciprocity, knowledge transfer, technology and R&D support, “untraded” interdependencies among local actors and firms and the emphasis on human capital support and interaction, endogenous growth factors, institutional building and administration, fosters an industrial environment (“milieu”) conducive to growth (Asheim et al., 2006; Martin and Sunley, 2003; Moulaert and Sekia, 2003; Kuah, 2002; Morgan, 1997; Granovetter, 1985). Clusters were suggested more recently to be a dynamic and metaphorical construct that could be used more broadly (Vorley, 2008).

Various economic, political, social and other conditions are discussed as necessary for the creation and operation of clusters. These appear to be based on a domestic family of

principles and perceptions for production and the economy, in the promotion of innovation and knowledge, research and development, labour movements, the support of small and medium sized enterprises and economic and social forces and institutions. Institutions in particular act as a major catalyst for change and development in clusters, at the local level. Under the prism of cluster theory, existing EU policies appear to have prepared the ground towards this direction, by creating already many of the preconditions of a common pan-European environment with similar characteristics. These could evolve even further towards the direction of a cluster of pan-European radiation. This is better realised, if, in retrospect, what separated and divided EU states in the past is compared against the common points of contact formed among EU economies and the current established perception of common EU economic interests.

6. Conclusions

The present proposal for the future of Europe emphasizes both the importance of the foundations already created by the EU and the direction and conditions of transition towards economic integration. It is highlighted that the EU rather than pursuing a model of rivalry and competition among state economies, which enhances the “stones” at the European edifice because of the emphasis put upon European competitiveness, should rather turn more carefully towards a direction that emphasises and lays down the connecting “material” of this edifice. This “material” is, to some extent, subjective, as it relates to the geography and history of nations that have created conditions for this progress and well-being. It also derives from their different customs, traditions and ethos or other social, economic, political and other characteristics that are a part of the European and human civilisation and wealth and a foundation stone upon which their solidarity is created. What is suggested with the present announcement is the continuation of an existing path towards a direction that cultivates even further an environment of economic amylae, which will provide more chances for a noble competition and cooperation among European partners, offer chances of participation and expression in all growth forces both in centres and peripheries in Europe and many chances to people for succeeding. The foundations for the creation of such an environment have already been

created. They relate to the pre-discussed national and European foundations, the creation of some form of unbalanced growth that needs to be reduced and that of propulsive linkages among economies, the necessary institutions to sustain growth and more generally numerous preconditions for the creation of a cluster at the pan-European level.

The existing direction relates to an increase of opportunities for competition at the European periphery, the strengthening of relations of cooperation among European economies, a better relation of peripheral with the European economy, the significance of putting the right people at the right place and both in state and EU policy making roles, and the creation of an environment that promotes less a harsh competition and more economic amylae. Even from the present viewpoint however, it is important to make clear not only the limits of economic freedom, but also those of social cohesion and stamina, especially for those opposing continuous social change. The latter is important given the danger of loss of confidence regarding the economic, social and political forces needed to operate change. For this purpose, it is appropriate to enable and promote at the political level those forces and personnel inside societies that will undertake the task of implementing such changes. These persons should relate to and express common European interests, have to be capable of understanding better their common points, in the long-run, the need for solidarity and a mutual support of European interests. Institutional state organisation and state regimes, especially for newer and more vulnerable democracies, are likely to affect policy effectiveness, acting as catalysts of change.

7. EU policies and the European convergence; using a new methodology

The remaining of this paper discusses the results from the use of an innovative methodology to test convergence in Europe. The previous conclusions and analysis were based on these results.

Various studies use empirical evidence to assess convergence trends at the EU level. Several methods have been suggested to measure convergence, such as modelling

(including input-output models), cost-benefit analyses, indices and various qualitative assessments. Some of the studies using modelling offered evidence on EU-level convergence (Sala-i-Martin, 1994 and 1996; Badinger et al, 2002; Gallo and Dall’erba, 2008; Cappellen et al, 2003). In some cases EU membership was associated with convergence, especially for the poorer states (Cuaresma et al, 2008). Convergence outcomes were espoused by official EU policy documentation, which made use of indices to quantify the effect of EU policy making (COM 2002; 2004). Club, beta or sigma convergence was discussed among states or regions and the prospect of divergence was highlighted in few studies (Baumont et al., 2003; Cuadro-Roura, 2002). The neoclassical framework was used to diagnose core-periphery imbalances in the EU or inside states (Fingleton, 2003; Siriopoulos and Dimitriou, 1998) and their strengthening in peripheries (Tsionas, 2002; Asteriou et al, 2002).

The present work contributes in the assessment literature by using an innovative quantitative, non-modelling method to assess state-level convergence based on the calculation of correlation coefficients for a panel of states, over the 2000-2008 period. The Pearson correlation coefficients and their levels of significance are calculated, together with the change in their significance over the study period. Pearson is preferred from Spearman correlation coefficient, since the variables used are interval and, in the vast majority of cases, normal, as indicated in the respective normal probability plots (**Appendix C**)⁵. Pearson coefficients are also more sensitive to outliers and increases or reduction in variables, such as in growth levels, which are necessary to capture and measure divergence, for example when GDP or growth level outliers appear. The coefficient of determination is calculated as the square of the correlation coefficient (Rodger and Nicewander, 1988). Convergence is indicated after the calculation of correlation levels and their change over the study period.

⁵ In those few cases where normality is not observed, results, as discussed below, should rather be interpreted with scepticism. These are the cases of production variables (prodcom) and market integration and FDI variables (inoutFDI, inFDI and outFDI). This is also observed for some of the years in the variables used for the net balance of services, imports of services and exports of services (and more specifically for variables from ntblsr0c02 to ntblsr0c08, from expsr0c02 to expsr0c08 and from impsr0c02 to impsr0c08).

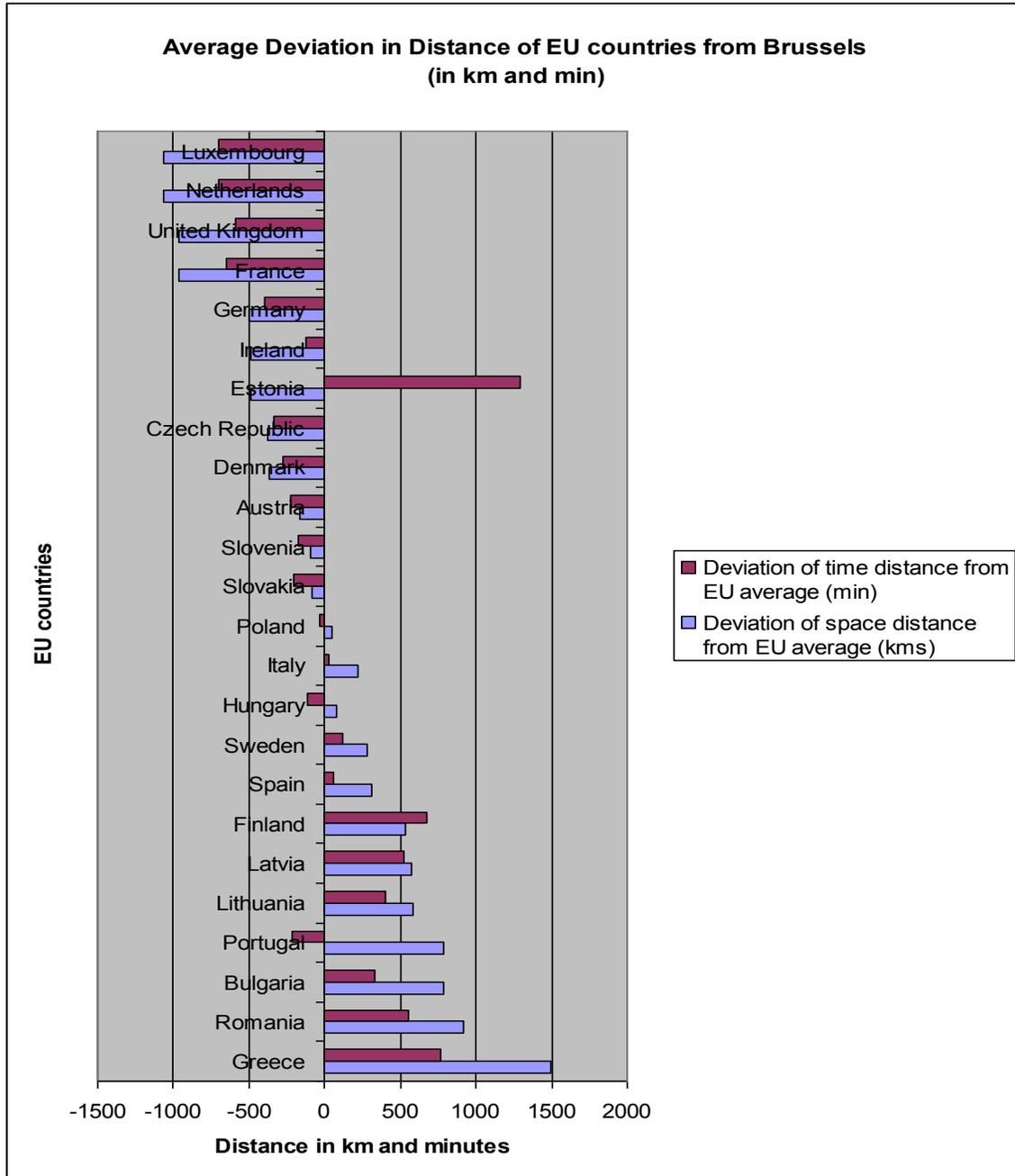
The 2000-2008 period of initial implementation of the Euro-zone is selected, before the beginning of the international crisis and the spread of its effects upon the EU economy and periphery. State-level data are collected from Eurostat's webpage for 34 countries in geographical Europe. These comprise all EU member-states, EU candidates and states for which data were available at Eurostat's website⁶. The variables are either used as provided or constructed (e.g. for prodcom variable). They are deflated if needed, using official consumer price indices from Eurostat's webpage or other official governmental sources. All variables are turned constant for the initial year of study. Distance is drawn from the Michelin guide and measured in kilometers from the city of Brussels, for each state capital. Brussels is centrally situated in the London-Milan-Berlin triangle or the EU's "banana", is the locus of EU political and administrative authorities and also centrally situated among all six countries initially participating at the unification process.

8. Empirical Results and Evidence

Diagrams 1 and 2 indicate the distance in kilometres, time and costs of EU states included in the study. Some suffer from an intensive geographical peripherality, while a distinction can be made between a core of six EU states on the one hand side (Benelux, France, Germany and the UK) and other states on the other, such as Greece, deviating from average EU distance.

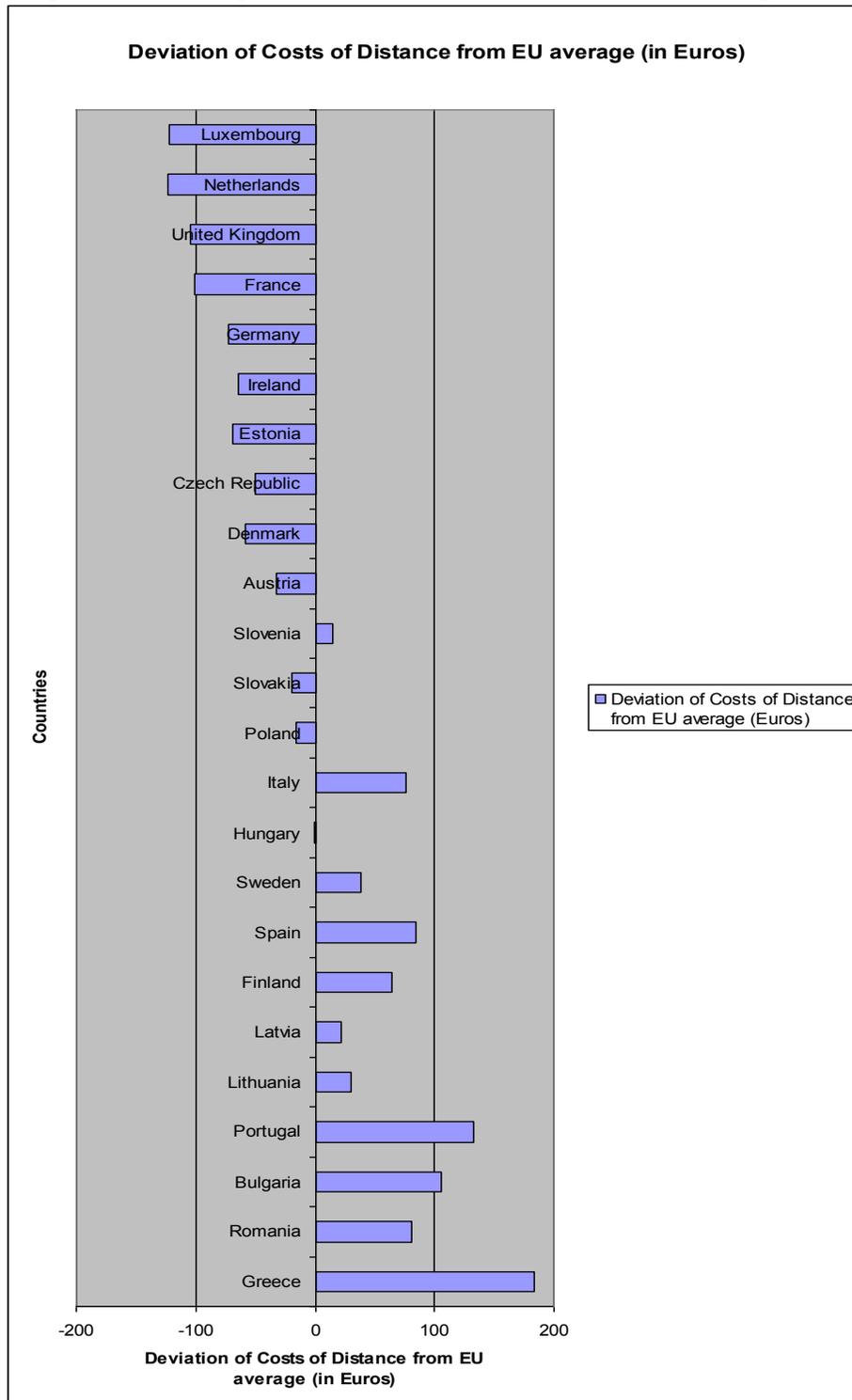
⁶ The non-EU countries included in the study are Iceland, Liechtenstein, Switzerland, Croatia, FYROM and Turkey.

Diagram 1: Average deviation in distance of EU state capitals from Brussels



Source: Michelin guide, accessed on-line, 25th of November 2010, Malta and Cyprus not included (for Cyprus data were not available)

Diagram 2: Average deviation in distance costs of EU state capitals from Brussels



Source: Michelin guide, accessed on-line, 25th of November 2010, Malta and Cyprus not included (for Cyprus data were not available)

Table 1a presents the correlations of distance from Brussels with all variables used in the study. Their difference from the initial to the final year is seen in **Table 1b**.

Table 1a: Correlation coefficients of distance with all variables (bivariate correlations), two-tailed tests of significance, t-values, standard deviations and levels of R-square

df=32	Correlation Coefficient 2-tailed significance	t	Standard deviation	R – square
GDPph01c	-0.4863***	-3.1	16857.66	-0.236488
GDPph02c	-0.4873***	-3.2	17095.95	-0.237461
GDPph03c	-0.4962***	-3.2	16191.95	-0.246214
GDPph04c	-0.4987***	-3.3	16369.99	-0.248702
GDPph05c	-0.4904***	-3.2	16965.08	-0.240492
GDPph06c	-0.4844***	-3.1	17834.47	-0.234643
GDPph07c	-0.4794***	-3.1	18274.99	-0.229824
GDPph08c	-0.4691***	-3	18167.94	-0.220055
GRr00	0.0618	0.35	1.850849	0.003819
GRr01	-0.0592	-0.34	2.922825	0.003505
GRr02	0.3672***	2.23	2.360372	0.134836
GRr03	0.4306***	2.7	2.698093	0.185416
GRr04	0.5151***	3.4	2.199983	0.265328
GRr05	0.2812*	1.66	2.615942	0.079073
GRr06	0.2754*	1.62	2.584498	0.075845
GRr07	0.2713*	1.6	2.52783	0.073604
GRr08	0.2803*	1.6	3.264536	0.078568
Prodcom01	-0.3062**	-1.8	1.74e+08	-0.093758
Prodcom02	-0.3155**	-1.9	1.83e+08	-0.09954
Prodcom03	-0.3107**	-1.8	1.89e+08	-0.096534
Prodcom04	-0.2965**	-1.8	1.91e+08	-0.087912
Prodcom05	-0.3052**	-1.8	2.01e+08	-0.093147
Prodcom06	-0.2924**	-1.7	2.28e+08	-0.085498
Prodcom07	-0.2942**	-1.7	2.48e+08	-0.086554
Prodcom08	-0.2941**	-1.7	2.61e+08	-0.086495
VIFrTrIGDP01	0.2849*	1.7	5.117218	0.081168
VIFrTrIGDP02	0.4679***	2.9	7.539015	0.21893
VIFrTrIGDP03	0.4728***	3.0	9.965909	0.22354
VIFrTrIGDP04	0.5790***	4.0	15.5709	0.335241
VIFrTrIGDP05	0.6617***	5	21.66235	0.437847
VIFrTrIGDP06	0.5890***	4.1	23.43956	0.346921
VIFrTrIGDP07	0.5773***	4	25.45559	0.333275
VIFrTrIGDP08	0.5813***	4.1	24.20329	0.33791
VIPsTrIGDP01	-0.0499	0.3	1.774007	-0.00249
VIPsTrIGDP02	-0.0703	0.4	3.604511	-0.004942
VIPsTrIGDP03	-0.0019	-0.001	5.044046	-3.61E-06
VIPsTrIGDP04	-0.0167	-0.09	6.465356	-0.000279
VIPsTrIGDP05	0.1032	0.59	7.397134	0.01065
VIPsTrIGDP06	0.1283	0.73	8.251228	0.016461
VIPsTrIGDP07	0.1395	0.8	9.785954	0.01946
VIPsTrIGDP08	0.1931	1.11	11.13023	0.037288
InOutFDI02	-0.4558***	-2.9	3.759168	-0.207754
InOutFDI03	-0.0090	-0.05	3.721416	-0.000081

InOutFDI04	-0.1622	-0.93	2.207273	-0.026309
InOutFDI05	-0.3376**	-2.21	3.893774	-0.113974
InOutFDI06	0.1584	0.91	3.645993	0.025091
InOutFDI07	-0.3608***	-2.19	4.361192	-0.130177
InOutFDI08	0.2169*	1.26	2.341273	0.047046
outFDI02	-0.5413***	-3.7	2.451103	-0.293006
outFDI03	-0.2439*	-1.4	3.604382	-0.059487
outFDI04	-0.5263***	-3.5	2.947057	-0.276992
outFDI05	-0.6380***	-4.7	4.54451	-0.407044
outFDI06	-0.6408***	-4.7	3.279424	-0.410625
outFDI07	-0.6789***	-5.2	4.511815	-0.460905
outFDI08	-0.6357***	-4.7	2.377934	-0.404114
inFDI02	-0.3583***	-2.2	6.249696	-0.128379
inFDI03	0.1313	-0.8	4.829816	0.01724
inFDI04	0.2315*	-1.4	4.259883	0.053592
inFDI05	0.0367	-0.2	6.560904	0.001347
inFDI06	0.4263*	2.7	7.331212	0.181732
inFDI07	-0.0496	-0.28	6.726843	-0.00246
inFDI08	0.5087***	-3.34	4.801815	0.258776
fGFC01	-0.5415***	-3.6	2398.08	-0.293222
fGFC02	-0.5395***	-3.6	2362.807	-0.29106
fGFC03	-0.5281***	-3.5	2274.697	-0.27889
fGFC04	-0.5292***	-3.5	2371.518	-0.280053
fGFC05	-0.5228***	-3.5	2538.432	-0.27332
fGFC06	-0.5202***	-3.5	2694.465	-0.270608
fGFC07	-0.5095***	-3.4	2830.47	-0.25959
fGFC08	-0.5097***	-3.4	2739.586	-0.259794
CnFC01	-0.3932***	-2.4	0.0018382	-0.154606
CnFC02	-0.3891***	-2.4	0.0018923	-0.151399
CnFC03	-0.3936***	-2.4	0.0018287	-0.154921
CnFC04	-0.3968***	-2.4	0.0018276	-0.15745
CnFC05	-0.3979***	-2.4	0.0018601	-0.158324
CnFC06	-0.3989***	-2.4	0.0018807	-0.159121
CnFC07	-0.3886***	-2.4	0.0019276	-0.15101
CnFC08	-0.3804***	-2.4	0.0019944	-0.144704
LC ind0c01	-0.0209	-1.1	2.999187	-0.000437
LC ind0c02	-0.2334*	-1.4	3.383343	-0.054476
LC ind0c03	-0.1055	-0.6	4.01226	-0.01113
LC ind0c04	-0.1235	-07	4.29291	-0.015252
LC ind0c05	0.1568	0.9	5.083728	0.024586
LC ind0c06	0.1044	0.6	7.16109	0.010899
LC ind0c07	0.1621	0.9	11.37227	0.026276
LC ind0c08	0.2143*	1.2	15.5807	0.045924
HTExp_TExp00	-0.1980	-1.1	13.91522	-0.039204
HTExp_TExp01	-0.2423	-1.4	12.83414	-0.058709
HTExp_TExp02	-0.2110*	-1.2	12.12301	-0.044521
HTExp_TExp03	-0.1755	-1	11.37353	-0.0308
HTExp_TExp04	-0.1818	-1	11.11732	-0.033051
HTExp_TExp05	-0.2297	-1.3	10.27991	-0.052762
HTExp_TExp06	-0.1772	-1	10.94497	-0.0314
GDERDshGDP00	-0.5185***	-3.43	0.8005907	-0.268842
GDERDshGDP01	-0.5218***	-3.46	0.8085502	-0.272275
GDERDshGDP02	-0.5007***	-3.3	0.8227117	-0.2507

GDERDshGDP03	-0.5046***	-3.3	0.845122	-0.254621
GDERDshGDP04	-0.4958***	-3.2	0.8274536	-0.245818
GDERDshGDP05	-0.4847***	-3.1	0.8221751	-0.234934
GDERDshGDP06	-0.4821***	-3.1	0.8086237	-0.23242
GDERDshGDP07	-0.4527***	-2.9	0.8057081	-0.204937
GDERDshGDP08	-0.4127***	-2.6	0.8622617	-0.170321
ntblgd00	-0.3220**	-1.9	2.289669	-0.103684
ntblgd0c01	-0.3140**	-1.9	2.349667	-0.098596
ntblgd0c02	-0.3088**	-1.8	2.331184	-0.095357
ntblgd0c03	-0.3518***	-2.2	2.141962	-0.123763
ntblgd0c04	-0.3531***	-2.2	2.133598	-0.12468
ntblgd0c05	-0.3403***	-2.1	2.360799	-0.115804
ntblgd0c06	-0.3147**	-1.9	2.558156	-0.099036
ntblgd0c07	-0.3369***	-2	2.34418	-0.113502
ntblgd0c08	-0.3085**	-1.8	2.834932	-0.095172
expgd00	-0.4656***	-3	5.325225	-0.216783
expgd0c01	-0.4937***	-3.2	5.378309	-0.24374
expgd0c02	-0.4913***	-3.2	5.166339	-0.241376
expgd0c03	-0.5215***	-3.5	4.61757	-0.271962
expgd0c04	-0.5430***	-3.7	4.674543	-0.294849
expgd0c05	-0.5473***	-3.7	5.038229	-0.299537
expgd0c06	-0.5546***	-3.8	5.38177	-0.307581
expgd0c07	-0.5634***	-3.9	5.385204	-0.31742
expgd0c08	-0.5493***	-3.7	5.690388	-0.30173
impgd00	-0.4827***	-3.1	3.647495	-0.232999
impgd0c01	-0.5437***	-3.7	3.553746	-0.29561
impgd0c02	-0.5579***	-3.8	3.317568	-0.311252
impgd0c03	-0.5633***	-3.9	2.966837	-0.317307
impgd0c04	-0.5901***	-4.1	3.051671	-0.348218
impgd0c05	-0.5985***	-4.3	3.300513	-0.358202
impgd0c06	-0.6126***	-4.4	3.58507	-0.375279
impgd0c07	-0.6052***	-4.3	3.734047	-0.366267
impgd0c08	-0.6002***	-4.4	3.783107	-0.36024
ntblsr00	0.2458*	1.4	0.8733137	0.060418
ntblsr0c01	0.2567*	1.5	0.8823724	0.065895
ntblsr0c02	0.2860*	1.7	0.8627244	0.081796
ntblsr0c03	0.3025**	1.8	0.7066864	0.091506
ntblsr0c04	0.3052**	1.8	0.6677465	0.093147
ntblsr0c05	0.2829*	1.7	0.6536196	0.080032
ntblsr0c06	0.2442*	1.4	0.5821429	0.059634
ntblsr0c07	0.1996	1.5	0.5202124	0.03984
ntblsr0c08	0.2412*	1.4	0.6458442	0.058177
expsr00	-0.3593***	-2.2	1.452847	-0.129096
expsr0c01	-0.3670***	-2.3	1.727101	-0.134689
expsr0c02	-0.3583***	-2.2	1.756763	-0.128379
expsr0c03	-0.3645***	-2.2	1.898136	-0.13286
expsr0c04	-0.3457**	-2.1	2.040265	-0.119508
expsr0c05	-0.3447**	-2.1	2.254376	-0.118818
expsr0c06	-0.3259**	-2	2.54941	-0.106211
expsr0c07	-0.3069**	-1.8	2.821112	-0.094188
expsr0c08	-0.3016**	-1.8	2.805251	-0.090963
impsr00	-0.3937***	-2.4	1.816169	-0.155
impsr0c01	-0.3814***	-2.3	2.187099	-0.145466

impsr0c02	-0.3852***	-2.4	2.238827	-0.148379
impsr0c03	-0.3814***	-2.4	2.266972	-0.145466
impsr0c04	-0.3814***	-2.4	2.339897	-0.145466
impsr0c05	-0.3742***	-2.3	2.495972	-0.140026
impsr0c06	-0.3551***	-2.2	2.661527	-0.126096
impsr0c07	-0.3478***	-2.1	2.733242	-0.120965
impsr0c08	-0.3434**	-2.1	2.814569	-0.117924

* $0.2 \geq p \geq 0.1$, ** $p \geq 0.05$, *** $p \geq 0.01$

Table 1b: Significance and z-scores of the difference of the correlation coefficient between two variables

Variable A	Variable B	Z
GDPph01c	GDPph08c	-0.09
GDPph01c	GDPph07c	-0.04
GRr00	GRr08	-0.89
GRr00	GRr07	-0.85
Prodcom01	Prodcom02	-0.05
VIFrTrIGDP01	VIFrTrIGDP08	-1.46*
VIPsTrIGDP01	VIPsTrIGDP08	-0.97
InOutFDI02	InOutFDI08	-2.8***
outFDI02	outFDI08	0.57
inFDI02	inFDI08	-3.68***
fGFC01	fGFC08	-0.17
CnFC01	CnFC08	-0.06
LC_ind0c01	LC_ind0c08	-0.94
HTExp_TExp06	HTExp_TExp06	-0.08
GDERDshGDP00	GDERDshGDP08	-0.53
ntblgd00	ntblgd0c08	-0.06
expgd00	expgd0c08	0.44
impgd00	impgd0c08	0.66
ntblsr00	ntblsr08	0.02
expsr00	expsr08	-0.26
impsr00	impsr08	-0.23

* $0.2 \geq p \geq 0.1$, ** $p \geq 0.05$, *** $p \geq 0.01$

Peripheral European states appear to achieve enhanced growth rates and sustain a positive balance of services. The positive correlation of distance with the net balance of services is likely to reflect the service-oriented character of peripheral states, for example in tourism or real-estate and the opening, through unification, of European demand for the provision of services in peripheral states. Such services may not be necessary high-tech or high value added, but of low quality. But the differences of correlation coefficients for these variables are not significant, reflecting non significant changes at the balance of services.

Similarly the differences of correlation coefficients of distance with net balances, exports and imports both for trade and services are not significant. The correlation of exports of goods (expgd) with distance is highly significant, negative and high, changing to even more negative. This is likely to reflect the exporting strength of central European areas enhancing at the expense of more peripheral, even though the difference of the correlation coefficient is not significant. The negative correlation of distance with the net balance of goods (ntblgd) shows that more peripheral states benefit less in balance terms. Net balances of goods reduce to the benefit of peripheral states, but do not significantly change.

The positive and highly significant correlation of distance with freight volume transport relative to GDP reflects freight transport increases in peripheral states across Europe and the delivery of an improved European transportation infrastructure. The difference of correlation coefficient is also not significant, even though at a lower level of significance. Such results, taken together, could be an indication that the further away is a state from Brussels the more is the freight transportation (relative to GDP), which further indicates the strengthening of important role of trade in Europe, especially in peripheral states.

The correlation of distance from Brussels with market integration index (inoutFDI) and inward FDI ranges from negative to positive and is rather inconclusive, even though the difference in the correlation coefficients are highly significant. It appears that ever since 2000 and the enhancing of the European market integration, significant changes occur in FDI in Europe, benefiting the penetration of European capital in peripheral states. But it is not certain from existing data whether such capital has a long-term investment behaviour at the periphery or whether it prefers a speculative, short-term presence. The intense, insignificant for several years, fluctuation of the correlation coefficient of inward FDI (as opposed to a more steady increase and the permanent, high significance of outward FDI) is likely to reflect speculative movements of capital at the European periphery, for example occurring from fund movements in stock markets. This could be a rather dangerous picture. Absorbing EU funds in all peripheral states in the two programming periods (2000-2006 and 2007-2013) could also affect these fluctuations,

since the transfer of EU funds through regional and cohesion policies are calculated in FDI movements.

Manufacturing production (prodcom) does not significantly change from the initial to the final year.

The levels of correlation coefficients of distance from Brussels with Gross Domestic Expenditure on R&D measured as a proportion of GDP, GDP levels, Gross Fixed Capital formation and Fixed Capital consumption appear to change to the benefit of peripheral states. But the respective correlation coefficients reflect the presence of intense core-periphery imbalances and none of their differences over the study period is significant (in **Table 1b**).

The levels of GDP per head show that the EU centres appear to sustain a strong position against the European periphery in growth level terms, despite an EU emphasis upon policies at the periphery and the funds devoted for this purpose. Peripheral states fail to overcome a growth threshold necessary to reduce the intensity of core-periphery imbalances in Europe.

The correlation coefficient of distance with growth rates though positive for 2002, 2003, 2004, fall in the following period. This reflects a problem with sustaining relative higher growth rates at the periphery, which could have brought a relative convergence. The falling of the correlation coefficients of distance with growth rates, are coupled with non significant differences in correlation coefficients, which highlighted the limited prospects of convergence among European economies.

There is a strong negative correlation of distance with GDERDshGDP to the benefit of central states. The correlation reduces over time, revealing the success of respective endogenous growth policies for more central states. As the difference of the correlation coefficient is not significant, it appears that more remains to be done on that direction.

Furthermore, central states appear to sustain a higher level fixed capital formation that emphasizes their role as centres. Such an outcome could relate to an enhanced productive capacity and the level of productivity, but also reflects that more value added is invested in centres⁷. Similarly the correlation of distance with the consumption of fixed capital over the study period is highly significant and negative. This indicates that the further away from Brussels is a state, the less is domestic fixed capital consumption. Therefore capital depreciates faster in centres and costs of production renewal are higher in them.

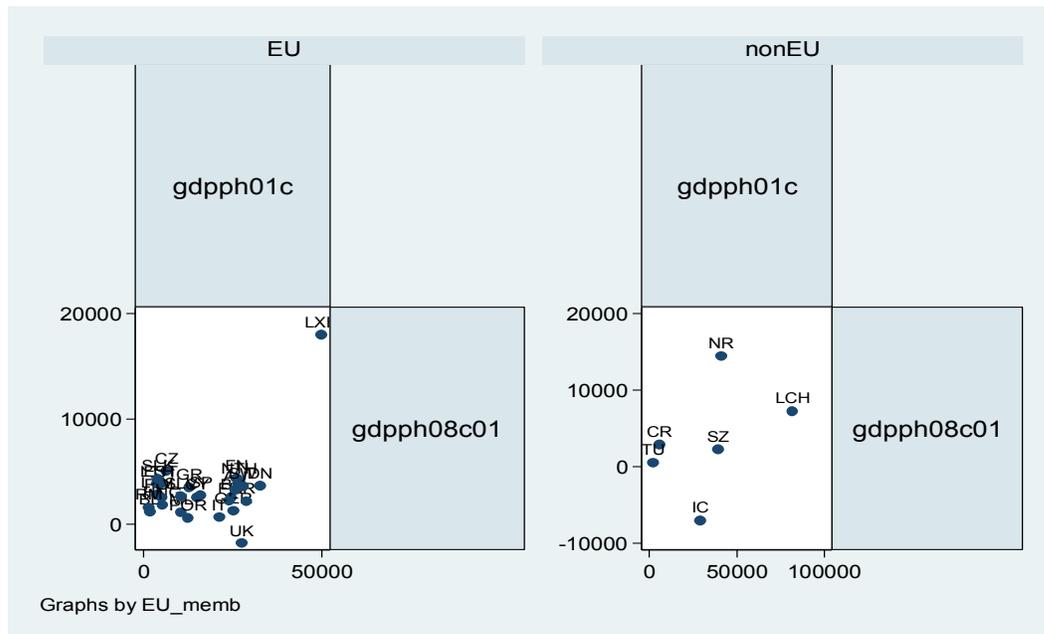
A glance at the evidence provided in **Table 1a**, shows that even though the EU appears to have a certain capacity to redress European core-periphery imbalances, changes in the correlation coefficients over the study period are not significant (**Table 1b**) and therefore the forces of strong core-periphery imbalances remain under operation, causing spatially unbalanced growth in Europe and probably inside states as well. Throughout the study period -that coincides with the creation of the monetary zone- policies do not seem to operate as much as needed to significantly bridge the gaps and achieve convergence.

Despite the intensity and range of changes implemented inside the EU, there is a clear issue with EU policies followed that do not seem to bring substantially higher growth rates at the EU or European periphery, necessary for strengthening their economies and achieving converge. If the target is to create one Europe by reducing geographical imbalances across its space, especially with regard to central-peripheral imbalances, the combined evidence in **Table 1a** and **1b** should lead to skepticism on the actual effects of policies and their implications in reality. The overall picture is that the EU fails to deliver substantial growth rates and the value added at European peripheral states needed to expand exports and improve their balances in trade and services. Data show that central states benefit more from the unification process, to the detriment of peripheral states. But centrally located and advanced states may benefit at the period without participating at the EU. Indeed, in **Diagram 3** it appears that centrally located and advanced non-EU

⁷ GFC shows how much of the new value added is invested. CGFC shows how fast the capital is depreciated.

states, such as Norway and Liechtenstein (with an initially high GDP per head in 2001) benefit mostly in the study period, as reflected in the change of GDP per head.

Diagram 3: Change in GDP per head for EU and non-EU states



In **Tables 2a** and **2b** we focus on the correlation of growth rates with the rest of the variables. More light can be shed on the picture of correlation after remarking that growth rates correlate negatively with GDP per head, at a high level of significance. That is to say that more advanced states have reduced growth rates. The reduction of these correlation levels over time could reflect upon the strength of some advanced states managing to achieve higher growth rates (as it also appears from **Diagram 3**), even though such increases may not be wide enough to make significant the difference of the respective correlation coefficient.

The negative correlation of growth rates with the volume of freight transport relative to GDP, though it fluctuates over the study period remains negative. The difference of respective correlation coefficients is highly significant (from 2001 to 2008). Such correlations are more likely to point at the fact that states with reduced growth rates

(generally the more advanced, as recommended above) have higher volume of freight transport (as a percentage of GDP). This could relate, on the one hand side, to the reduced impact of infrastructure built in peripheral states upon their growth rates and the enhancing of domestic interregional and international mobility or, on the other, to the competitive advantage formed to the benefit of trade from states of reduced growth rates.

The respective coefficients for the exports and imports of goods are negative and highly significant, especially for the 2002-2006 period, while the balance of goods offers negative correlation coefficients, whose difference is not highly significant for the 2000-2006 period. Such correlation coefficients should emphasize that states of higher growth rates are more likely to redress their balance of goods, avoid any insufficiencies in the provision of goods and the upset of the current accounts.

The negative correlation of growth rates with $GDERDshGDP$ is further intensified. This could reveal that R&D taking place in states of reduced growth rates and those supporting endogenous growth via policies, acts to their benefit and probably at the expense of less technologically advanced states. But the difference of correlation coefficient is not significant for the sample of all European countries as a whole. This could reflect problems from emphasizing endogenous growth and related policies only in advanced states, which may finally not deliver an outcome beneficial for Europe as a whole. More expenses on R&D may be needed. The correlation of higher technology exports as a percentage of total exports ($HTExp_TExp$) with growth rates fluctuates and changes from positive to negative. This could reflect that states with reduced growth rates, probably among those promoting more endogenous growth policies, achieve to export a larger percentage of technology added products.

Taken together, evidence on the correlation of distance and that of growth rates reveals the benefits brought by trade in some states, against peripheral production and those achieving higher growth rates. It is likely that a duality is formed or revealed in the European economy, favoring some more advanced and centrally located states that produce goods of higher technology, benefiting more from R&D policies.

Table 2a: Correlation coefficients of Growth Rates with the rest of the variables

df=32	Correl. Coeff. 2-tailed sign.	t	Standard deviation	R – square
GDPph01c	-0.2281	-1.325	13085.2	-0.05203
GDPph02c	-0.5279***	-3.516	13401.96	-0.278678
GDPph03c	-0.6096***	-4.35	13334.99	-0.371612
GDPph04c	-0.4582***	-2.916	13655.26	-0.209947
GDPph05c	-0.3742**	-2.283	14435.7	-0.140026
GDPph06c	-0.5109***	-3.362	15005.43	-0.261019
GDPph07c	-0.3395***	-2.042	15450.84	-0.11526
GDPph08c	-0.2388*	-1.391	15169.35	-0.057025
VIFrTrIGDP01	-0.2794*	-1.646	5.357111	-0.078064
VIFrTrIGDP02	-0.6104***	-4.359	7.462534	-0.372588
VIFrTrIGDP03	-0.5516***	-3.741	9.864631	-0.304263
VIFrTrIGDP04	-0.4401***	-2.773	15.71791	-0.193688
VIFrTrIGDP05	-0.4436***	-2.8	21.08554	-0.196781
VIFrTrIGDP06	-0.5619***	-3.843	23.3759	-0.315732
VIFrTrIGDP07	-0.3659***	-2.224	25.3045	-0.133883
VIFrTrIGDP08	-0.1335	-0.762	23.68023	-0.017822
VIPsTrIGDP01	-0.2215	-1.285	1.938543	-0.049062
VIPsTrIGDP02	0.1251	0.713	3.775464	0.01565
VIPsTrIGDP03	0.2285*	1.328	5.169238	0.052212
VIPsTrIGDP04	0.1567	0.898	6.34788	0.024555
VIPsTrIGDP05	-0.0263	-0.149	7.269607	-0.000692
VIPsTrIGDP06	-0.0206	-0.117	8.183015	-0.000424
VIPsTrIGDP07	0.0044	0.025	9.420129	1.94E-05
VIPsTrIGDP08	0.4703***	3.015	10.70138	0.221182
InOutFDI02	0.1113	0.634	108.2556	0.012388
InOutFDI03	-0.1203	-0.685	65.62105	-0.014472
InOutFDI04	0.0457	0.259	48.20872	0.002088
InOutFDI05	0.0974	0.554	64.46886	0.009487
InOutFDI06	-0.0025	-0.014	57.24978	-6.25E-06
InOutFDI07	0.1233	0.703	89.65543	0.015203
InOutFDI08	0.0406	0.23	40.85154	0.001648
outFDI02	0.0989	0.562	115.761	0.009781
outFDI03	-0.1315	-0.75	70.76493	-0.017292
outFDI04	0.0260	0.147	50.94433	0.000676
outFDI05	0.0752	0.427	68.39839	0.005655
outFDI06	-0.0208	-0.118	55.35354	-0.000433
outFDI07	0.1077	0.613	107.098	0.011599
outFDI08	0.0065	0.037	47.04136	4.23E-05
inFDI02	0.1097	0.624	103.2987	0.012034
inFDI03	-0.1189	-0.677	62.06766	-0.014137
inFDI04	0.0525	0.297	46.71131	0.002756
inFDI05	0.1153	0.657	62.22153	0.013294
inFDI06	0.0023	0.013	60.57909	5.29E-06
inFDI07	0.1285	0.733	74.65783	0.016512
inFDI08	0.0592	0.335	35.91137	0.003505
fGFC01	-0.1945	-1.122	2715.151	-0.03783
fGFC02	-0.4605***	-2.935	2690.084	-0.21206
fGFC03	-0.5558***	-3.782	2670.678	-0.308914
fGFC04	-0.4157***	-2.586	2766.413	-0.172806
fGFC05	-0.2492*	-1.456	3042.092	-0.062101

fGFC06	-0.4331***	-2.718	3208.038	-0.187576
fGFC07	-0.2598*	-1.522	3332.782	-0.067496
fGFC08	-0.2332*	-1.357	3107.483	-0.054382
CnFC01	-0.4841***	-3.13	.0019673	-0.234353
CnFC02	-0.5385***	-3.615	.0019629	-0.289982
CnFC03	-0.6759***	-5.188	.0018974	-0.456841
CnFC04	-0.5126***	-3.377	.0019228	-0.262759
CnFC05	-0.5106***	-3.359	.0019481	-0.260712
CnFC06	-0.5649***	-3.873	.0019908	-0.319112
CnFC07	-0.4641***	-2.964	.0020496	-0.215389
CnFC08	-0.0841	-0.477	.0021478	-0.007073
HTExp_TExp00	0.4293*	2.689	10.15883	0.184298
HTExp_TExp01	-0.0123	-0.07	10.00485	-0.000151
HTExp_TExp02	-0.1529	-0.875	9.103206	-0.023378
HTExp_TExp03	-0.3494***	-2.109	8.554381	-0.122208
HTExp_TExp04	-0.4800***	-3.095	8.221019	-0.2304
HTExp_TExp05	-0.2231	-1.295	9.541721	-0.049774
HTExp_TExp06	-0.2964***	-1.756	9.175377	-0.087853
GDERDshGDP01	-0.2794*	-1.646	.8050052	-0.078064
GDERDshGDP02	-0.6104***	-4.359	.8169041	-0.372588
GDERDshGDP03	-0.5516***	-3.741	.836396	-0.304263
GDERDshGDP04	-0.4401***	-2.773	.8171285	-0.193688
GDERDshGDP05	-0.4436***	-2.8	.8111644	-0.196781
GDERDshGDP06	-0.5619***	-3.843	.7990605	-0.315732
GDERDshGDP07	-0.3659***	-2.224	.797811	-0.133883
GDERDshGDP08	-0.1335	-0.762	.854031	-0.017822
ntblgd00	0.2140	1.239	2.415714	0.045796
ntblgd0c01	-0.0625	-0.354	2.506209	-0.003906
ntblgd0c02	0.0156	0.088	2.507495	0.000243
ntblgd0c03	-0.2054	-1.187	2.279719	-0.042189
ntblgd0c04	-0.1574	-0.902	2.29284	-0.024775
ntblgd0c05	-0.1216	-0.693	2.483764	-0.014787
ntblgd0c06	-0.2454*	-1.432	2.690834	-0.060221
ntblgd0c07	-0.2209	-1.281	2.543761	-0.048797
ntblgd0c08	-0.1529	-0.875	3.105224	-0.023378
expgd00	0.1847	1.063	5.374649	0.034114
expgd0c01	-0.0706	-0.4	5.437823	-0.004984
expgd0c02	-0.2281*	-1.325	5.23163	-0.05203
expgd0c03	-0.4331***	-2.718	4.691638	-0.187576
expgd0c04	-0.4641***	-2.964	4.755957	-0.215389
expgd0c05	-0.2933**	-1.735	5.114618	-0.086025
expgd0c06	-0.3745***	-2.285	5.479576	-0.14025
expgd0c07	-0.2902**	-1.715	5.492918	-0.084216
expgd0c08	-0.2340*	-1.362	5.772215	-0.054756
impgd00	0.1385	0.791	3.548073	0.019182
impgd0c01	-0.0646	-0.366	3.524032	-0.004173
impgd0c02	-0.3718***	-2.266	3.294316	-0.138235
impgd0c03	-0.5374***	-3.605	2.931921	-0.288799
impgd0c04	-0.6126***	-4.384	3.032344	-0.375279
impgd0c05	-0.3705***	-2.256	3.291165	-0.13727
impgd0c06	-0.3972***	-2.448	3.581771	-0.157768
impgd0c07	-0.2860*	-1.688	3.733317	-0.081796
impgd0c08	-0.2350*	-1.368	3.790192	-0.055225

ntblsr00	0.1847	1.063	1.071913	0.034114
ntblsr0c01	-0.0706	-0.4	1.111745	-0.004984
ntblsr0c02	-0.2281*	-1.325	1.177801	-0.05203
ntblsr0c03	-0.4331***	-2.718	1.009521	-0.187576
ntblsr0c04	-0.4641***	-2.964	.9583589	-0.215389
ntblsr0c05	-0.2933**	-1.735	.9483124	-0.086025
ntblsr0c06	-0.3745***	-2.285	.9141298	-0.14025
ntblsr0c07	-0.2902**	-1.715	.8879172	-0.084216
ntblsr0c08	-0.2340*	-1.362	1.125423	-0.054756
expsr00	0.1257	0.717	1.573749	0.0158
expsr0c01	-0.0118	-0.067	1.842778	-0.000139
expsr0c02	-0.2104	-1.217	1.980213	-0.044268
expsr0c03	-0.3100**	-1.844	2.078871	-0.0961
expsr0c04	-0.3350**	-2.011	2.373346	-0.112225
expsr0c05	-0.1865	-1.074	2.19291	-0.034782
expsr0c06	-0.3121**	-1.858	2.640078	-0.097406
expsr0c07	-0.2389*	-1.392	2.90534	-0.057073
expsr0c08	-0.3253**	-1.946	3.005969	-0.10582
impsr00	0.2872*	1.696	1.814288	0.082484
impsr0c01	0.0243	0.138	2.186417	0.00059
impsr0c02	-0.0724	-0.411	2.243374	-0.005242
impsr0c03	-0.2476*	-1.446	2.27427	-0.061306
impsr0c04	-0.2874*	-1.697	2.345638	-0.082599
impsr0c05	-0.1333	-0.761	2.498683	-0.017769
impsr0c06	-0.2618*	-1.534	2.656593	-0.068539
impsr0c07	-0.2217	-1.286	2.72734	-0.049151
impsr0c08	-0.3853***	-2.362	2.821305	-0.148456

* $0.2 \geq p \geq 0.1$, ** $p \geq 0.05$, *** $p \geq 0.01$

Table 2b: Change in the correlation coefficients of growth rate

Variable A	Variable B	z-score 2-tailed significance
GDPph01c	GDPph08c	0.04
prodcom01	prodcom06	0.16
prodcom01	prodcom08	-1.05
VIPsTrIGDP01	VIPsTrIGDP08	-0.6
VIPsTrIGDP01	VIPsTrIGDP06	1.37*
VIFrTrIGDp01	VIFrTrIGDp08	-2.9***
VIFrTrIGDp01	VIFrTrIGDp06	-0.81
InOutFDI02	InOutFDI08	0.26
outFDI02	outFDI08	0.34
inFDI02	inFDI08	0.19
fGFC01	fGFC08	-0.07
fGFC01	fGFC06	0.98
CnFC01	CnFC08	-2.47***
CnFC01	CnFC06	0.02
LC_ind0c01	LC_ind0c08	-0.71
LC_ind0c01	LC_ind0c06	-2.65***
HTEExp_TExp00	HTEExp_TExp06	3.01***
GDERDshGDP01	GDERDshGDP08	-0.6
ntblgd00	ntblgd0c08	1.46*
ntblgd00	ntblgd0c06	1.84**
ntblsr00	ntblsr0c08	-2.14***

ntblsr00	ntblsr0c06	-0.81
expgd00	expgd0c08	1.67*
expgd00	expgd0c06	2.29***
expsr00	expsr0c08	1.83**
expsr00	expsr0c06	1.77**
impgd00	impgd0c08	1.49*
impgd00	impgd0c06	2.2***
impsr00	impsr0c08	2.22***
impsr00	impsr0c06	2.76***

* $0.2 \geq p \geq 0.1$, ** $p \geq 0.05$, *** $p \geq 0.01$

As opposed to the picture of the correlations with distance, most of the correlations of GDP per head (**Table 3a**) are positive and highly significant. This highlights the clear role undertaken by the more advanced states in driving the European economy and its growth.

Negative are the correlations of GDP per head with the volume of freight transportation relative to GDP (VIFrTriGDP) and the balance of services (ntblsr). The former correlation turns to negative and highly significant, while the difference of the correlation coefficient is also significant. This should reflect upon the fact that increased trade takes place in states of lower growth levels, which are exposed and more vulnerable to trade openness.

The correlation coefficients for inward, outward FDI and market integration index are all high, positive and highly significant. Although they all change to the benefit of advanced states, the differences of their correlation coefficients are not significant. Given that EU Cohesion and Common Agricultural policies transfer funds to less advanced states, the results practically reflect an advantageous position of advanced states as both FDI recipients and senders and as places of enhanced market integration. The less advanced states do not benefit from the unification processes and it appears that the less advanced is a country the less important is its position as FDI sender, recipient and as a market integration place. Such results should be treated with more scepticism, given the problem of normality identified before.

The correlation coefficients for GDP per head with gross fixed capital formation and the fixed capital consumption are all positive, extremely high and highly significant. Similarly are the respective coefficients of determination. The picture appears to reveal that, despite efforts for capital accumulation at the EU periphery, the European capital is formed and consumed in most advanced states, sustaining a leading role in forming and consuming it. This is substantial evidence on the existing very large gaps in the formation of capital between the less and more wealthy states. It appears that the unification and integration process at the study period and earlier does not affect this picture and is rather acting to the benefit of the formation of capital in advanced and wealthier states. Since the difference in the correlation coefficients for both variables are not significant, it appears that the EU fails to change towards a direction that would reduce the strength of this correlation, at least marginally. Economic conditions and large economies of scale in European centres, continuously attracting capital and labour from the European periphery after the opening of EU and European borders, sustain their role as attractive places to work and live in. Despite policies pursued at the study period in EU periphery, the overall value added created at the less advanced states appears to have no significant change to their benefit. On the contrary the opposite argument could be hold on the sustaining and enhancing of the competitive strength of advanced European states and their capacity to form the new value added. Taken from this perspective, the unification process appears to have benefited mostly the advanced states, irrespective of EU membership and to cause further problems and the relative impoverishment of the less advanced states.

There is no evidence from the present analysis concerning the benefits extracted from the largest capital from capital formation and accumulation process in advanced states. This might be for example at the expense of smaller businesses. Neither any conclusion can be drawn on whether additional wealth created from value added increases is equally spread socially and spatially. These are important points to be studied further and are of special importance and interest in the light of the policy recommendations made in the present text.

The correlation coefficients GDP per head with exports, imports and net balances of goods are all positive, highly significant and high. The correlation of exports of goods is very high and enhances, reflecting the strength of the position of more advanced states. The correlation of imports of goods fluctuates and reduces only marginally, remaining however in equally high levels. This point remarks that advanced states are also large importers of goods. The correlation of the net balance of goods is strengthened to the benefit of advanced states, reflecting upon deficit problems in balances of goods in several states. All these changes however are not significant, as seen in the difference of correlation coefficients.

The correlation coefficients for the exports and imports of services appear to reduce. The non-significant correlation of GDP levels with the net balance of services also falls, benefiting more advanced states. This could reflect the quality of services in more advanced states, where are more sufficiently internationalised.

The correlation of GDP per head levels with high technology exports as a percentage of exports is significant and enhances. The difference of the correlation coefficient is highly significant, reflecting the capacity of advanced states to export their products of high technology and the penetration to the markets of the less advanced states.

Normally we would expect this to be reflected to in the correlation of GDP per head levels with expenditure of R&D, as a share of GDP. But, the opposite appears as a picture. A possible explanation for this pattern is that while advanced states achieve to export their products of high technology in the less advanced, the take less care of the need to achieve product advancements and that, in other words, the European economy and its production is dangerously “trapped” by its expansion in the less advanced states that appears at first to be a beneficial tendency for European production.

Table 3a: Correlation coefficients of GDP per head (constant prices) with the rest of the variables

df=32	Correl. Coeff. 2-tailed sign.	T	Standard deviation	R – square
GRR01	-0.2281*	-1.325	2.602664	-0.05203

GRR02	-0.5279***	-3.516	2.286699	-0.278678
GRR03	-0.6096***	-4.35	2.658515	-0.371612
GRR04	-0.4582***	-2.916	2.26192	-0.209947
GRR05	-0.3742***	-2.283	2.570302	-0.140026
GRR06	-0.5109***	-3.362	2.474236	-0.261019
GRR07	-0.3395***	-2.042	2.431661	-0.11526
GRR08	-0.2388	-1.391	2.72994	-0.057025
Prodcom01	0.2963**	1.755	1.71e+08	0.087794
Prodcom02	0.2846*	1.679	1.81e+08	0.080997
Prodcom03	0.2631*	1.543	1.86e+08	0.069222
Prodcom04	0.2477*	1.446	1.88e+08	0.061355
Prodcom05	0.2051	1.185	1.98e+08	0.042066
Prodcom06	0.1971	1.137	2.24e+08	0.038848
Prodcom07	0.1791	1.03	2.44e+08	0.032077
Prodcom08	0.1933	1.114	2.57e+08	0.037365
VIFrTrlGDP01	0.1219	0.695	5.357111	0.01486
VIFrTrlGDP02	-0.0718	-0.407	7.462534	-0.005155
VIFrTrlGDP03	-0.0700	-0.397	9.864631	-0.0049
VIFrTrlGDP04	-0.2307*	-1.341	15.71791	-0.053222
VIFrTrlGDP05	-0.4101***	-2.544	21.08554	-0.168182
VIFrTrlGDP06	-0.3741***	-2.282	23.3759	-0.139951
VIFrTrlGDP07	-0.3897***	-2.394	25.3045	-0.151866
VIFrTrlGDP08	-0.3374**	-2.028	23.68023	-0.113839
VIPsTrlGDP01	0.3153**	1.879	1.974421	0.099414
VIPsTrlGDP02	0.3325**	2.013	3.731677	0.110556
VIPsTrlGDP03	0.4307***	2.7	4.873925	0.185502
VIPsTrlGDP04	0.4083***	2.53	6.015109	0.166709
VIPsTrlGDP05	0.3176**	1.895	7.089047	0.10087
VIPsTrlGDP06	0.2527*	1.477	8.139106	0.063857
VIPsTrlGDP07	0.1912	1.102	9.490892	0.036557
VIPsTrlGDP08	0.1777	1.021	10.66328	0.031577
InOutFDI02	0.6043***	4.29	108.2556	0.365178
InOutFDI03	0.6231***	4.507	65.62105	0.388254
InOutFDI04	0.6168***	4.433	48.20872	0.380442
InOutFDI05	0.6450***	4.775	64.46886	0.416025
InOutFDI06	0.6644***	5.029	57.24978	0.441427
InOutFDI07	0.7072***	5.658	89.65543	0.500132
InOutFDI08	0.7191***	5.854	40.85154	0.517105
outFDI02	0.6288***	4.575	115.761	0.395389
outFDI03	0.6526***	4.872	70.76493	0.425887
outFDI04	0.6680***	5.078	50.94433	0.446224
outFDI05	0.6959***	5.482	68.39839	0.484277
outFDI06	0.7183***	5.84	55.35354	0.515955
outFDI07	0.7394***	6.213	107.098	0.546712
outFDI08	0.7720***	6.871	47.04136	0.595984
inFDI02	0.6119***	4.376	103.2987	0.374422
inFDI03	0.6278***	4.563	62.06766	0.394133
inFDI04	0.5909***	4.143	46.71131	0.349163
inFDI05	0.6214***	4.487	62.22153	0.386138
inFDI06	0.6421***	4.738	60.57909	0.412292
inFDI07	0.7038***	5.604	74.65783	0.495334
inFDI08	0.6695***	5.099	35.91137	0.44823
fGFC01	0.9842***	31.444	2715.151	0.96865

fGFC02	0.9809***	28.527	2690.084	0.962165
fGFC03	0.9788***	27.033	2670.678	0.958049
fGFC04	0.9775***	26.215	2766.413	0.955506
fGFC05	0.9643***	20.599	3042.092	0.929874
fGFC06	0.9460***	16.508	3208.038	0.894916
fGFC07	0.9745***	24.567	3332.782	0.94965
fGFC08	0.9884***	36.815	3107.483	0.976935
CnFC01	0.9673***	21.574	.0019673	0.935669
CnFC02	0.9596***	19.293	.0019629	0.920832
CnFC03	0.9497***	17.155	.0018974	0.90193
CnFC04	0.9554***	18.301	.0019228	0.912789
CnFC05	0.9514***	17.476	.0019481	0.905162
CnFC06	0.9488***	16.991	.0019908	0.900221
CnFC07	0.9458***	16.475	.0020496	0.894538
CnFC08	0.9541***	18.021	.0021478	0.910307
HTExp_TExp01	-0.1293	-0.738	12.77679	-0.016718
HTExp_TExp02	0.3610***	2.19	12.0064	0.130321
HTExp_TExp03	0.3696***	2.25	11.49399	0.136604
HTExp_TExp04	0.3477***	2.098	11.15782	0.120895
HTExp_TExp05	0.4070***	2.521	11.34108	0.165649
HTExp_TExp06	0.4026***	2.488	11.68472	0.162087
GDERShGDP01	0.7418***	6.257	0.8050052	0.550267
GDERShGDP02	0.7404***	6.231	0.8169041	0.548192
GDERShGDP03	0.7662***	6.745	0.836396	0.587062
GDERShGDP04	0.7491***	6.397	0.8171285	0.561151
GDERShGDP05	0.7013***	5.565	0.8111644	0.491822
GDERShGDP06	0.6754***	5.181	0.7990605	0.456165
GDERShGDP07	0.6995***	5.537	0.797811	0.4893
GDERShGDP08	0.6724***	5.139	0.854031	0.452122
ntblgd0c01	0.6108***	4.364	2.484681	0.373077
ntblgd0c02	0.5982***	4.223	2.471229	0.357843
ntblgd0c03	0.6247***	4.526	2.262051	0.39025
ntblgd0c04	0.6189***	4.457	2.27777	0.383037
ntblgd0c05	0.6655***	5.044	2.475586	0.44289
ntblgd0c06	0.6769***	5.202	2.675999	0.458194
ntblgd0c07	0.6461***	4.789	2.524526	0.417445
ntblgd0c08	0.6569***	4.929	3.082252	0.431518
expgd0c01	0.7940***	7.388	5.328652	0.630436
expgd0c02	0.7925***	7.351	5.12906	0.628056
expgd0c03	0.8204***	8.116	4.597694	0.673056
expgd0c04	0.8207***	8.125	4.660032	0.673548
expgd0c05	0.8461***	8.979	5.015632	0.715885
expgd0c06	0.8521***	9.21	5.375475	0.726074
expgd0c07	0.8262***	8.296	5.390584	0.682606
expgd0c08	0.8450***	8.939	5.67624	0.714025
impgd0c01	0.7891***	7.267	3.484181	0.622679
impgd0c02	0.8065***	7.716	3.252974	0.650442
impgd0c03	0.8247***	8.249	2.906905	0.68013
impgd0c04	0.8191***	8.077	2.990137	0.670925
impgd0c05	0.8173***	8.024	3.23383	0.667979
impgd0c06	0.8041***	7.651	3.514757	0.646577
impgd0c07	0.7886***	7.255	3.659318	0.62189
impgd0c08	0.7672***	6.766	3.713653	0.588596

ntblsr0c01	-0.1749	-1.005	1.100063	-0.03059
ntblsr0c02	-0.1699	-0.975	1.161698	-0.028866
ntblsr0c03	-0.1550	-0.888	1.00521	-0.024025
ntblsr0c04	-0.1111	-0.632	.9520762	-0.012343
ntblsr0c05	-0.1332	-0.76	.9491056	-0.017742
ntblsr0c06	-0.0598	-0.339	.9214788	-0.003576
ntblsr0c07	0.0280	0.158	.8995766	0.000784
ntblsr0c08	-0.0041	-0.023	1.143306	-1.68E-05
expsr0c01	0.6994***	5.536	1.820349	0.48916
expsr0c02	0.6710***	5.119	1.95598	0.450241
expsr0c03	0.6680***	5.078	2.045479	0.446224
expsr0c04	0.6727***	5.143	2.161508	0.452525
expsr0c05	0.6869***	5.347	2.340881	0.471832
expsr0c06	0.6729***	5.146	2.620337	0.452794
expsr0c07	0.6534***	4.883	2.891944	0.426932
expsr0c08	0.6246***	4.524	2.982941	0.390125
imprsr0c01	0.6688***	5.089	2.144739	0.447293
imprsr0c02	0.6694***	5.097	2.200198	0.448096
imprsr0c03	0.6651***	5.038	2.230315	0.442358
imprsr0c04	0.6626***	5.004	2.300104	0.439039
imprsr0c05	0.6898***	5.39	2.45074	0.475824
imprsr0c06	0.6808***	5.258	2.611548	0.463489
imprsr0c07	0.6826***	5.284	2.683543	0.465943
imprsr0c08	0.6582***	4.567	2.77072	0.433227

* $0.2 \geq p \geq 0.1$, ** $p \geq 0.05$, *** $p \geq 0.01$

Table 3b: Difference of correlation coefficients for GDP per head (constant prices)

Variable A	Variable B	z-score 2-tailed sign.
GRr01	GRr08	0.04
Prodcom01	Prodcom08	0.43
VIFrTrIGDP01	VIFrTrIGDP08	1.86**
VIFrTrIGDP01	VIFrTrIGDP06	2.03***
VIPsTrIGDP01	VIPsTrIGDP08	0.58
InOutFDI02	InOutFDI08	-0.81
outFDI02	outFDI08	-1.13
inFDI02	inFDI08	-0.39
fGFC01	fGFC08	-0.61
CnFC01	CnFC08	0.68
HTExp_TExp01	HTExp_TExp06	-2.19***
GDERDshGDP01	GDERDshGDP08	0.55
ntblgd0c01	ntblgd0c08	-0.3
ntblsr0c01	ntblsr0c08	-0.68
expgd0c01	expgd0c08	-0.62
expsr0c01	expsr0c08	0.53
impgd0c01	impgd0c08	0.22
imprsr0c01	imprsr0c08	0.07

* $0.2 \geq p \geq 0.1$, ** $p \geq 0.05$, *** $p \geq 0.01$

Overall, it appears from **Tables 1b** and **3b** (for the change in correlation coefficients with distance and GDP per head) that only for a very limited number of variables there is a significant change in correlation coefficients over the study period. This indicates the limited effects of policies in operation across the whole space studied (34 states included) and the need for their re-direction. Though significance appears across in many correlations, indicating the correlation of variables with distance and growth levels, the new value added produced (gross fixed capital formation, GFC) is very strongly correlated with growth levels (GDP per head) and similarly is consumption (CFC). Evidence is provided on the significant change of correlations with growth rates.

9. Epilogue

The creation of the EU was an effort to expand the economic horizon of European states, by bringing them together and increasing their interaction and the level of competition. On the historical bases provided by nation-states, which have taken centuries to be formed and provide a substantial environment as a shell that economises, supports and sustains wealth, the EU is now under the process of laying down substantial new foundations through its policies for economic, monetary and political unification, with an explicitly expressed target to act to the common European benefit.

The present paper has assessed such efforts for a recent period that was associated with the early steps of monetary unification (2001-2008) by launching a new methodology that was based on testing the correlation of numerous state-level variables with distance from Brussels, growth levels and growth rates, for 34 European states. Significant evidence was provided that the EU strengthens its position. But, as opposed to other studies and the ambiguity of other evidence, the present work fully rejected the convergence hypothesis. Strengthening EU capital formation coincides with large gaps between more and less advanced states and between central and peripheral. A tendency to sustain and expand a pre-existing dualism and a two-sector European economy between the more advanced and central states is traced. It appears that EU regional and cohesion policies have not delivered substantial growth rates in EU peripheral and less advanced states,

enough to reduce the intensity of growth gaps. Under the present conditions, it must be made crystal clear that an extended time period will be needed before reaching some apparent levels of convergence in Europe, at least in GDP per head levels, creating doubts on how exactly EU politics consider the prospect of future enlargements.

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11. APPENDICES

Appendix A

Table 1: The variables in the study (names, units, explanation or other useful comments)

Variable name	Variable	Units	Comments
gdpph01c	GDP per head, 2001	Constant 00	GDP per head Index
gdpph02c	GDP per head, 2002	Constant 00	
gdpph03c	GDP per head, 2003	Constant 00	
gdpph04c	GDP per head, 2004	Constant 00	
gdpph05c	GDP per head, 2005	Constant 00	
gdpph06c	GDP per head, 2006	Constant 00	
gdpph07c	GDP per head, 2007	Constant 00	
gdpph08c	GDP per head, 2008	Constant 00	
InOutFDI02	Market integration – FDI intensity, 2002		Market integration index, average value of inward and outward FDI flows divided by GDP (in %)
InOutFDI03	Market integration – FDI intensity, 2003		
InOutFDI04	Market integration – FDI intensity, 2004		
InOutFDI05	Market integration – FDI intensity, 2005		
InOutFDI06	Market integration – FDI intensity, 2006		
InOutFDI07	Market integration – FDI intensity, 2007		
InOutFDI08	Market integration – FDI intensity, 2008		
outFDI02	Outward F.D.I., flows in % of 2002 GDP		
outFDI03	Outward F.D.I., flows in % of 2003 GDP		
outFDI04	Outward F.D.I., flows in % of 2004 GDP		
outFDI05	Outward F.D.I., flows in % of 2005 GDP		
outFDI06	Outward F.D.I., flows in % of 2006 GDP		
outFDI07	Outward F.D.I., flows in % of 2007 GDP		
outFDI08	Outward F.D.I., flows in % of 2008 GDP		
inFDI02	Inward F.D.I., from the rest of the world, flows in % of 2002 GDP		Inward FDI index
inFDI03	Inward F.D.I. from the rest of the world, flows in % of 2003 GDP		
inFDI04	Inward F.D.I. from the rest of the world, flows in % of 2004 GDP		
inFDI05	Inward F.D.I. from the rest of the world, flows in % of 2005 GDP		
inFDI06	Inward F.D.I. from the rest of the world, flows in % of 2006 GDP		
inFDI07	Inward F.D.I. from the rest of the world, flows in % of 2007 GDP		
inFDI08	Inward F.D.I. from the rest of the world, flows in % of 2008 GDP		
nblgd00	Net balance of goods, 2000	Constant 00	
nblgd0c01	Net balance of goods, 2001	Constant 00	
nblgd0c02	Net balance of goods, 2002	Constant 00	
nblgd0c03	Net balance of goods, 2003	Constant 00	
nblgd0c04	Net balance of goods, 2004	Constant 00	
nblgd0c05	Net balance of goods, 2005	Constant 00	
nblgd0c06	Net balance of goods, 2006	Constant 00	
nblgd0c07	Net balance of goods, 2007	Constant 00	
nblgd0c08	Net balance of goods, 2008	Constant 00	Net Balance of Services index
ntblsr00	Net balance of services, 2000	Constant 00	
ntblsr0c01	Net balance of services, 2001	Constant 00	

ntblsr0c02	Net balance of services, 2002	Constant 00	
ntblsr0c03	Net balance of services, 2003	Constant 00	
ntblsr0c04	Net balance of services, 2004	Constant 00	
ntblsr0c05	Net balance of services, 2005	Constant 00	
ntblsr0c06	Net balance of services, 2006	Constant 00	
ntblsr0c07	Net balance of services, 2007	Constant 00	
ntblsr0c08	Net balance of services, 2008	Constant 00	
expgd00	Export of goods, 2000	Constant 00	
expgd0c01	Export of goods, 2001	Constant 00	
expgd0c02	Export of goods, 2002	Constant 00	
expgd0c03	Export of goods, 2003	Constant 00	
expgd0c04	Export of goods, 2004	Constant 00	
expgd0c05	Export of goods, 2005	Constant 00	
expgd0c06	Export of goods, 2006	Constant 00	
expgd0c07	Export of goods, 2007	Constant 00	
expgd0c08	Export of goods, 2008	Constant 00	Export of Services index
expsr00	Export of Services, 2000	Constant 00	
expsr0c01	Export of Services, 2001	Constant 00	
expsr0c02	Export of Services, 2002	Constant 00	
expsr0c03	Export of Services, 2003	Constant 00	
expsr0c04	Export of Services, 2004	Constant 00	
expsr0c05	Export of Services, 2005	Constant 00	
expsr0c06	Export of Services, 2006	Constant 00	
expsr0c07	Export of Services, 2007	Constant 00	Import of Goods index
expsr0c08	Export of Services, 2008	Constant 00	
impgd00	Import of Goods, 2000	Constant 00	
impgd0c01	Import of Goods, 2001	Constant 00	
impgd0c02	Import of Goods, 2002	Constant 00	
impgd0c03	Import of Goods, 2003	Constant 00	
impgd0c04	Import of Goods, 2004	Constant 00	
impgd0c05	Import of Goods, 2005	Constant 00	
impgd0c06	Import of Goods, 2006	Constant 00	Import of Services index
impgd0c07	Import of Goods, 2007	Constant 00	
impgd0c08	Import of Goods, 2008	Constant 00	
impsr00	Import of Services, 2000	Constant 00	
impsr0c01	Import of Services, 2001	Constant 00	
impsr0c02	Import of Services, 2002	Constant 00	
impsr0c03	Import of Services, 2003	Constant 00	
impsr0c04	Import of Services, 2004	Constant 00	
impsr0c05	Import of Services, 2005	Constant 00	Manufacturing production indicator, Added sum of manufacturing production for every manufacturing activity, confidential information is not included in official EU source
impsr0c06	Import of Services, 2006	Constant 00	
impsr0c07	Import of Services, 2007	Constant 00	
impsr0c08	Import of Services, 2008	Constant 00	
prodcom01	Value of the production of manufactured goods, PRODCOM (NACE Rev 2), 2001		
prodcom02	Value of the production of manufactured goods, PRODCOM (NACE Rev 2) 2002		
prodcom03	Value of the production of manufactured goods, PRODCOM (NACE Rev 2) 2003		
prodcom04	Value of the production of manufactured goods, PRODCOM (NACE Rev 2) 2004		
prodcom05	Value of the production of manufactured goods, PRODCOM (NACE Rev 2) 2005		
prodcom06	Value of the production of manufactured		

	goods, PRODCOM (NACE Rev 2) 2006		
prodcom07	Value of the production of manufactured goods, PRODCOM (NACE Rev 2) 2007		
prodcom08	Value of the production of manufactured goods, PRODCOM (NACE Rev 2) 2008		
VIPsTrlGDP01	Volume of Passenger Transport relative to GDP, 2001		Index of Passenger Transport
VIPsTrlGDP02	Volume of Passenger Transport relative to GDP, 2002		
VIPsTrlGDP03	Volume of Passenger Transport relative to GDP, 2003		
VIPsTrlGDP04	Volume of Passenger Transport relative to GDP, 2004		
VIPsTrlGDP05	Volume of Passenger Transport relative to GDP, 2005		
VIPsTrlGDP06	Volume of Passenger Transport relative to GDP, 2006		
VIPsTrlGDP07	Volume of Passenger Transport relative to GDP, 2007		
VIPsTrlGDP08	Volume of Passenger Transport relative to GDP, 2008		
VIFrTrlGDp01	Volume of Freight Transport relative to GDP, 2001		Index of Volume in Transport
VIFrTrlGDp02	Volume of Freight Transport relative to GDP, 2002		
VIFrTrlGDp03	Volume of Freight Transport relative to GDP, 2003		
VIFrTrlGDp04	Volume of Freight Transport relative to GDP, 2004		
VIFrTrlGDp05	Volume of Freight Transport relative to GDP, 2005		
VIFrTrlGDp06	Volume of Freight Transport relative to GDP, 2006		
VIFrTrlGDp07	Volume of Freight Transport relative to GDP, 2007		
VIFrTrlGDp08	Volume of Freight Transport relative to GDP, 2008		
fGFC01	Formation of Gross Fixed Capital, 2001		
fGFC02	Formation of Gross Fixed Capital, 2002		
fGFC03	Formation of Gross Fixed Capital, 2003		
fGFC04	Formation of Gross Fixed Capital, 2004		
fGFC05	Formation of Gross Fixed Capital, 2005		
fGFC06	Formation of Gross Fixed Capital, 2006		
fGFC07	Formation of Gross Fixed Capital, 2007		
fGFC08	Formation of Gross Fixed Capital, 2008		
CnFC01	Consumption of Fixed Capital, 2001		
CnFC02	Consumption of Fixed Capital, 2002		
CnFC03	Consumption of Fixed Capital, 2003		
CnFC04	Consumption of Fixed Capital, 2004		
CnFC05	Consumption of Fixed Capital, 2005		
CnFC06	Consumption of Fixed Capital, 2006		
CnFC07	Consumption of Fixed Capital, 2007		
CnFC08	Consumption of Fixed Capital, 2008		
LC_ind0c01	Labour Costs in industry, 2001		Labour Cost Index

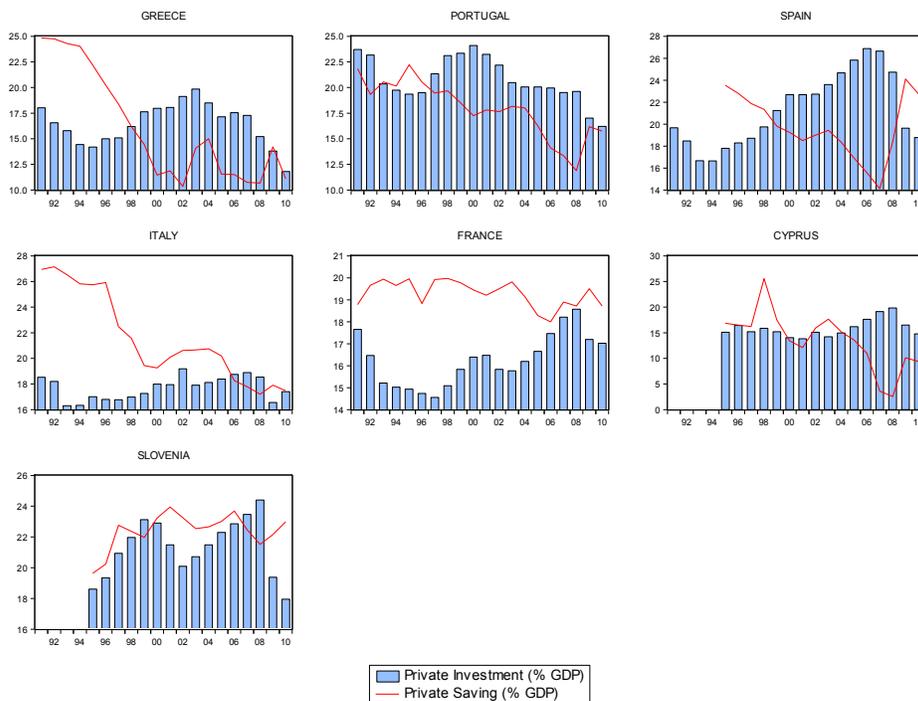
LC_ind0c02	Labour Costs in industry, 2002	constant 00	
LC_ind0c03	Labour Costs in industry, 2003	constant 00	
LC_ind0c04	Labour Costs in industry, 2004	constant 00	
LC_ind0c05	Labour Costs in industry, 2005	constant 00	
LC_ind0c06	Labour Costs in industry, 2006	constant 00	
LC_ind0c07	Labour Costs in industry, 2007	constant 00	
LC_ind0c08	Labour Costs in industry, 2008	constant 00	
HTExp_TExp00	High Tech Exports as a proportion of total exports, 2000		
HTExp_TExp01	High Tech Exports as a proportion of total exports, 2001		
HTExp_TExp02	High Tech Exports as a proportion of total exports, 2002		
HTExp_TExp03	High Tech Exports as a proportion of total exports, 2003		
HTExp_TExp04	High Tech Exports as a proportion of total exports, 2004		
HTExp_TExp05	High Tech Exports as a proportion of total exports, 2005		
HTExp_TExp06	High Tech Exports as a proportion of total exports, 2006		
GDERDshGDP00	Gross Domestic Expenditure in R&D as percentage of GDP 2000		R&D index
GDERDshGDP01	Gross Domestic Expenditure in R&D as percentage of GDP 2001		
GDERDshGDP02	Gross Domestic Expenditure in R&D as percentage of GDP 2002		
GDERDshGDP03	Gross Domestic Expenditure in R&D as percentage of GDP 2003		
GDERDshGDP04	Gross Domestic Expenditure in R&D as percentage of GDP 2004		
GDERDshGDP05	Gross Domestic Expenditure in R&D as percentage of GDP 2005		
GDERDshGDP06	Gross Domestic Expenditure in R&D as percentage of GDP 2006		
GDERDshGDP07	Gross Domestic Expenditure in R&D as percentage of GDP 2007		
GDERDshGDP08	Gross Domestic Expenditure in R&D as percentage of GDP 2008		
GRr00	Growth Rate, 2000		Growth Rate index
GRr01	Growth Rate, 2001		
GRr02	Growth Rate, 2002		
GRr03	Growth Rate, 2003		
GRr04	Growth Rate, 2004		
GRr05	Growth Rate, 2005		
GRr06	Growth Rate, 2006		
GRr07	Growth Rate, 2007		
GRr08	Growth Rate, 2008		

Table 2: The 34 countries included in the study

Country	Status	Country	Status	Country	Status	Country	Status
Belgium	EU	Italy	EU	Portugal	EU	Iceland	EU candidate
Bulgaria	EU	Cyprus	EU	Romania	EU	Liechtenstein	Non – EU
Czech Republic	EU	Latvia	EU	Slovenia	EU	Norway	Non – EU
Denmark	EU	Lithuania	EU	Slovakia	EU	Switzerland	Non – EU
Germany	EU	Luxembourg	EU	Finland	EU	Croatia	EU candidate
Estonia	EU	Hungary	EU	Sweden	EU	FYROM	EU candidate
Ireland	EU	Malta	EU	United Kingdom	EU	Turkey	EU candidate
Greece	EU	Netherlands	EU				
Spain	EU	Austria	EU				
France	EU	Poland	EU				

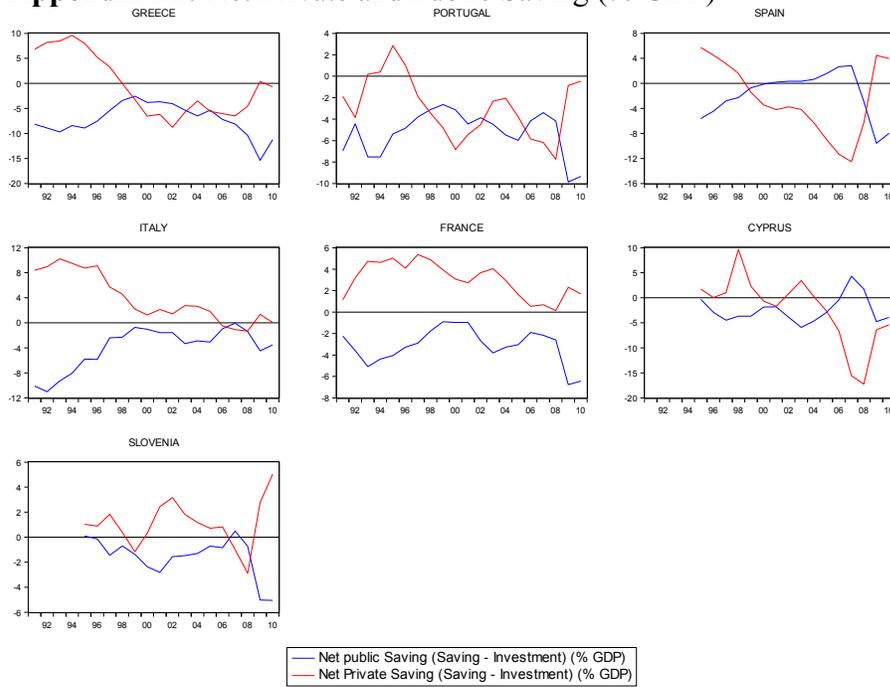
Appendix B

Appendix B2: Private Saving and Investment (% GDP)



Source: Kosteletou, 2012, data from European Commission, Economic and Financial Affairs.

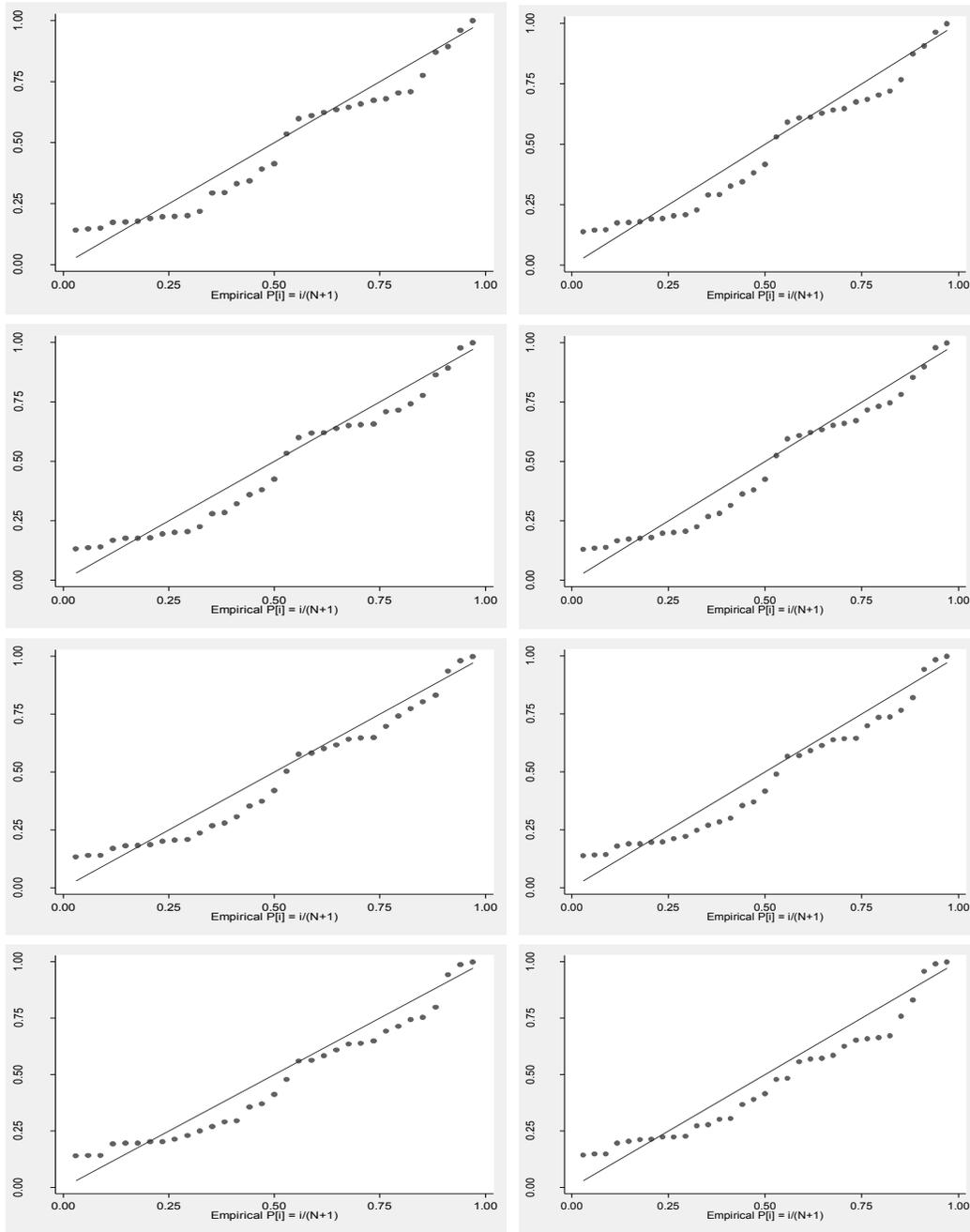
Appendix B2: Net Private and Public Saving (% GDP)



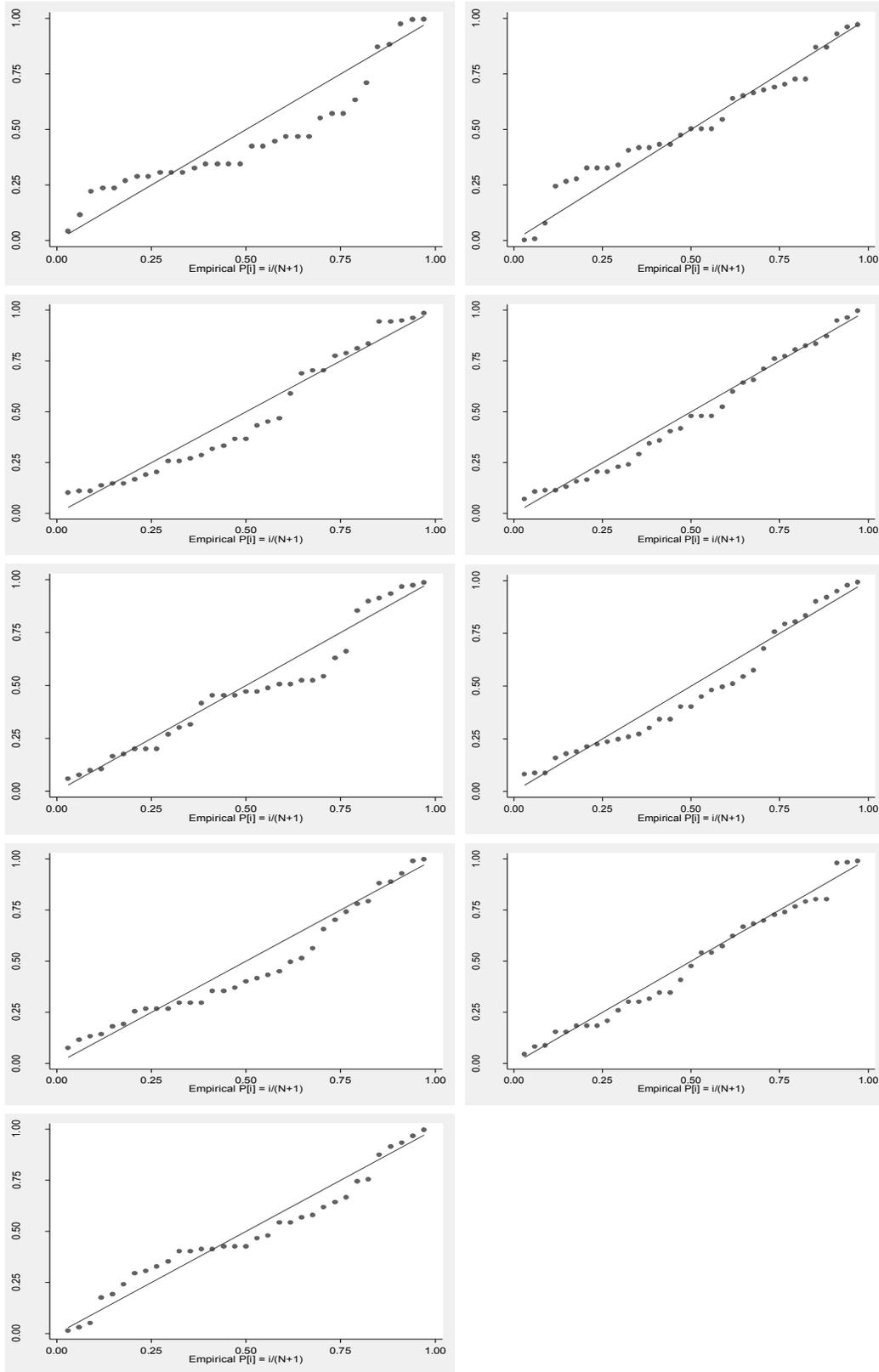
Source: Kosteletou, 2012, data from European Commission, Economic and Financial Affairs.

Appendix C

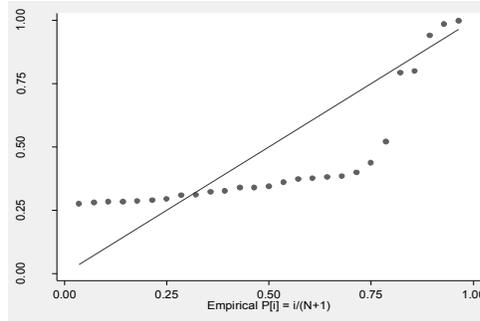
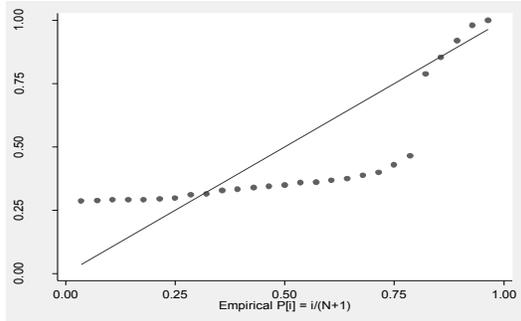
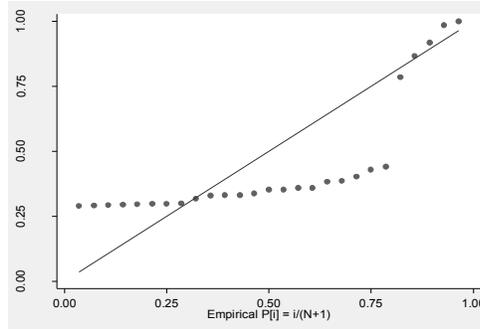
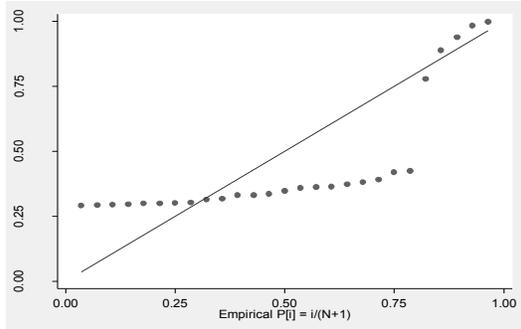
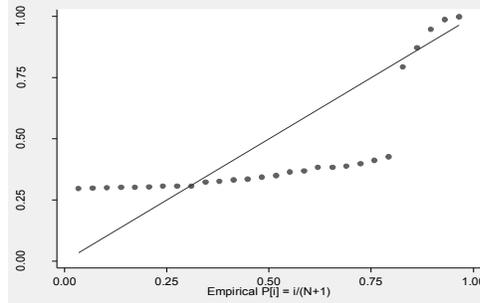
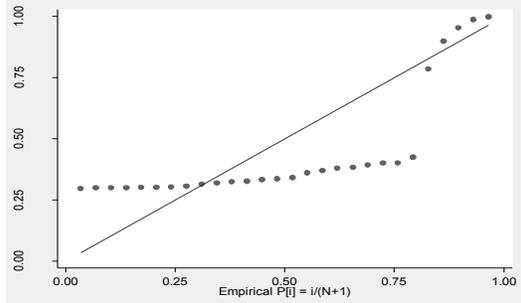
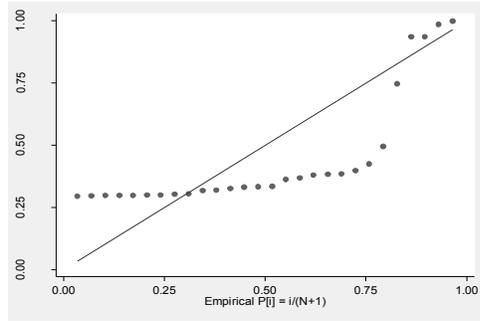
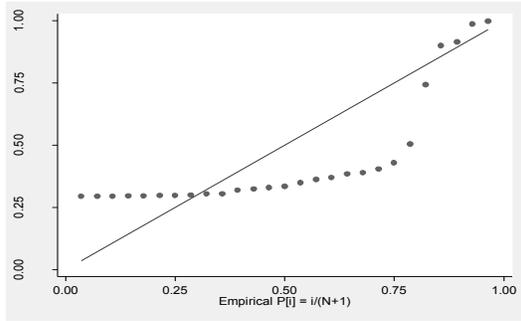
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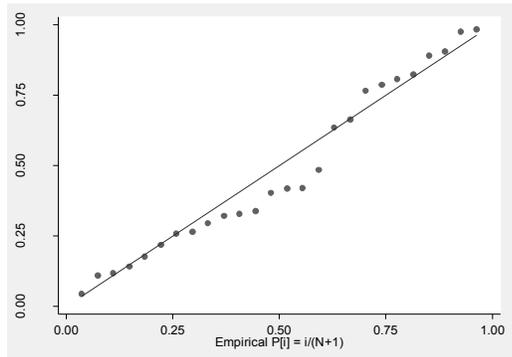
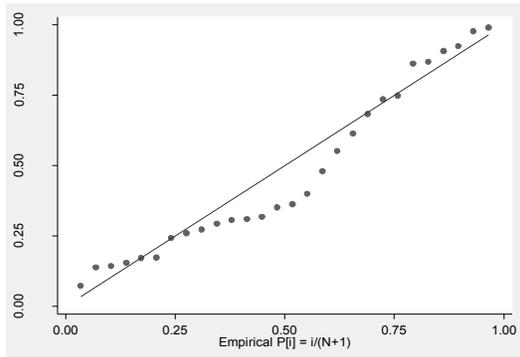
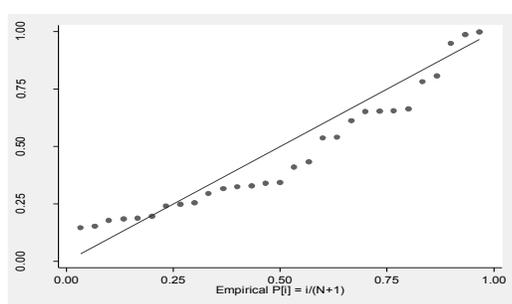
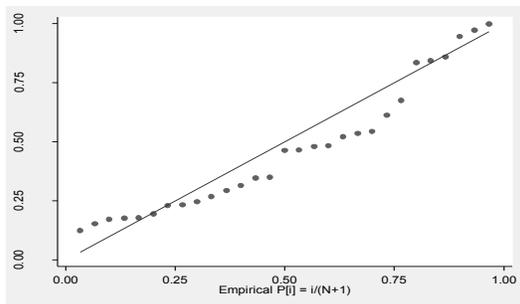
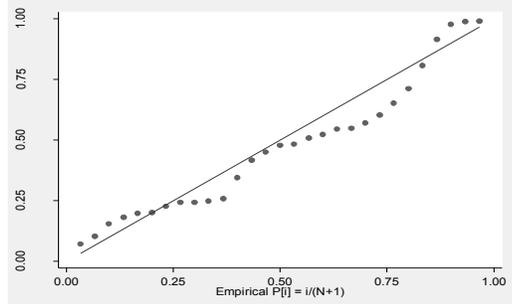
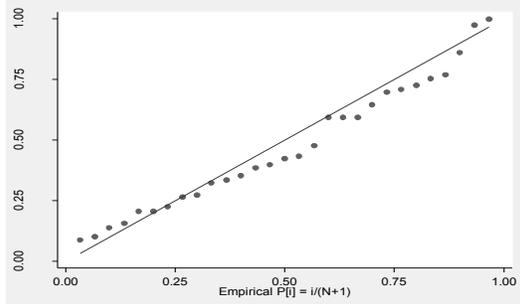
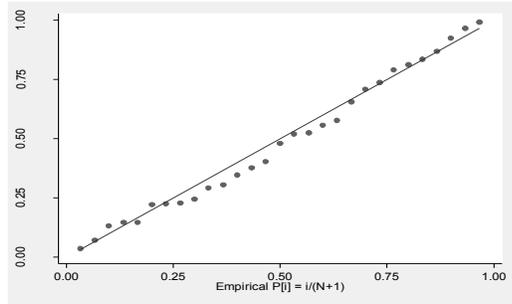
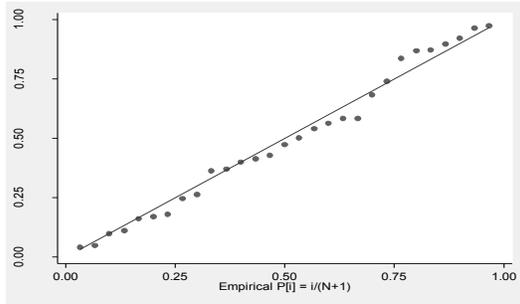
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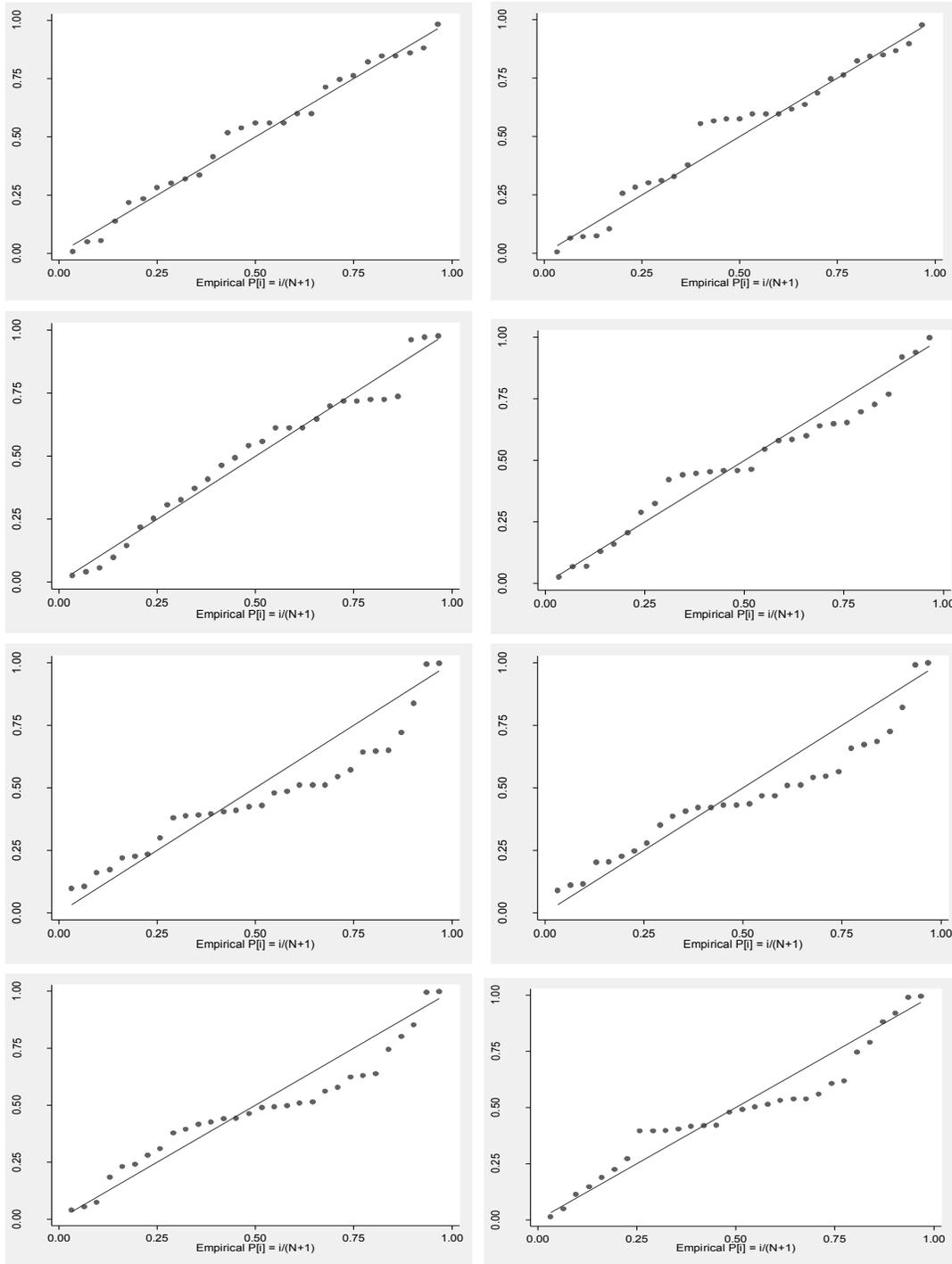
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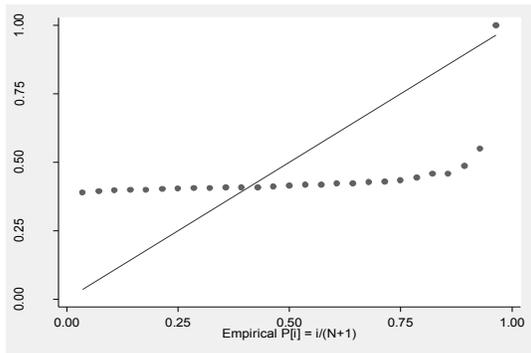
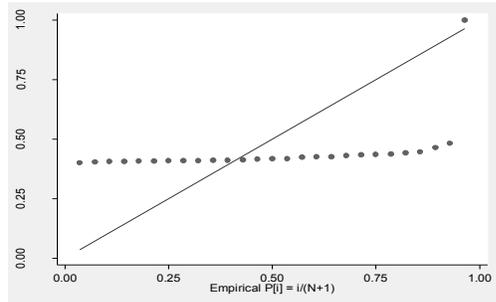
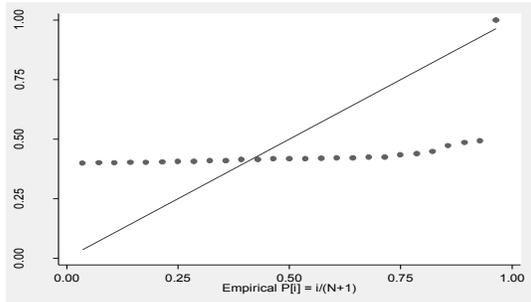
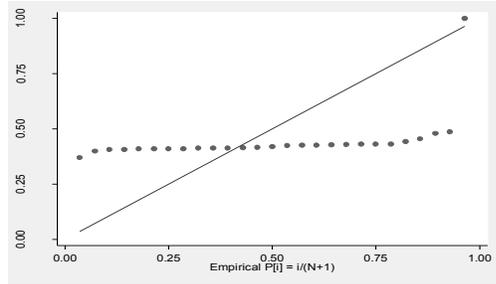
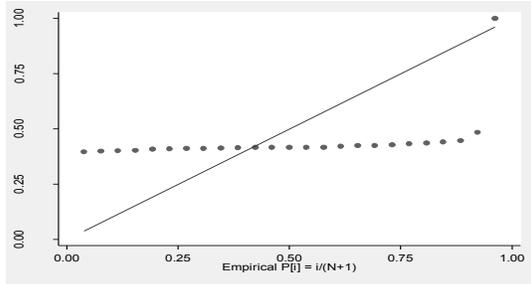
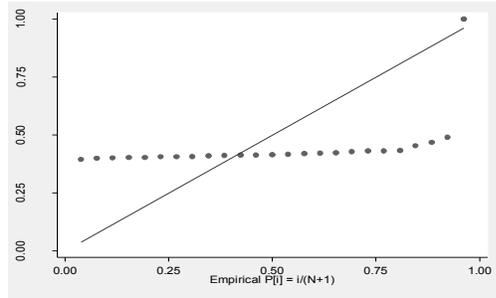
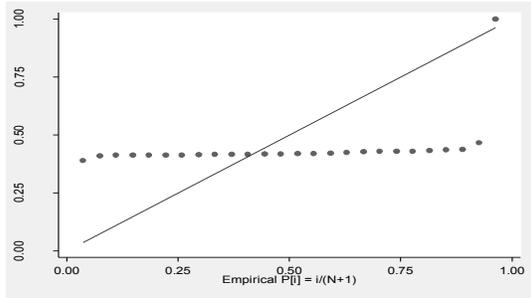
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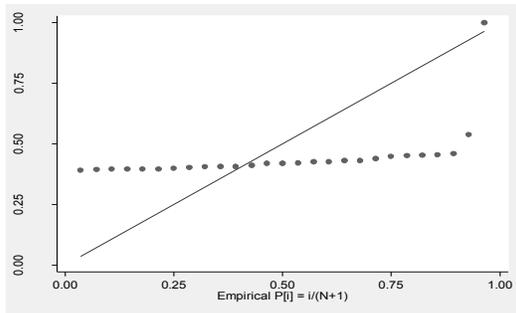
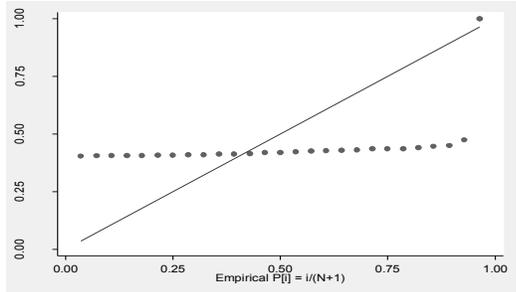
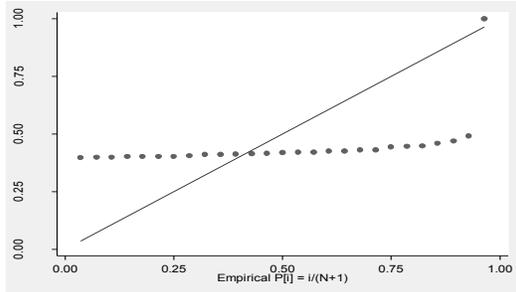
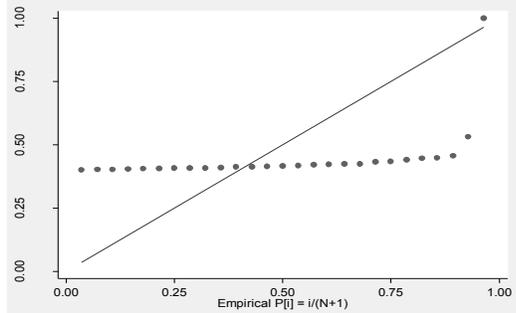
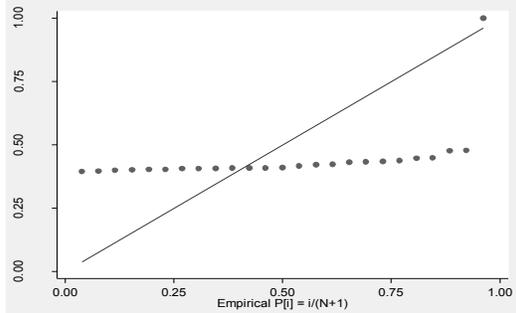
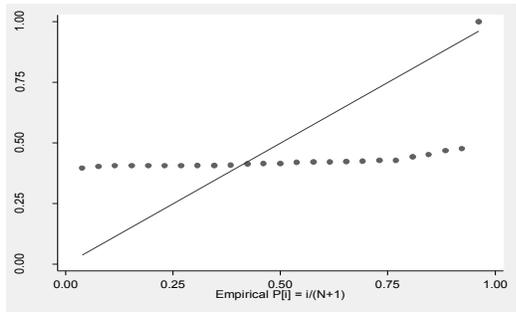
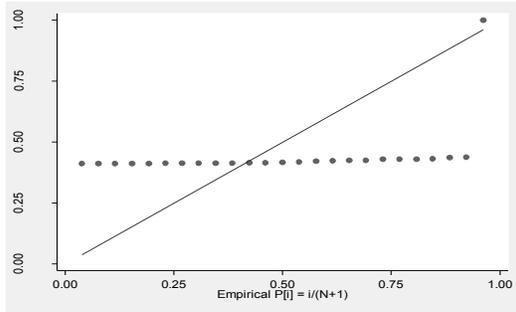
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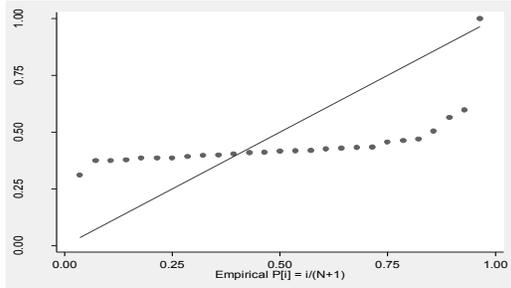
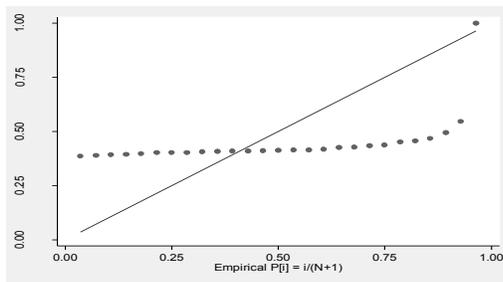
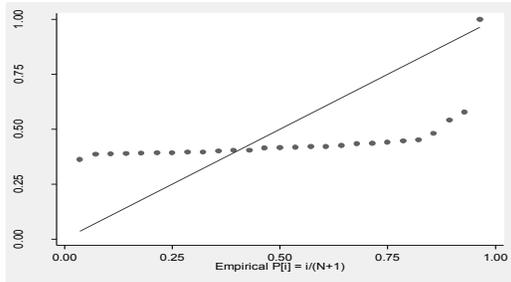
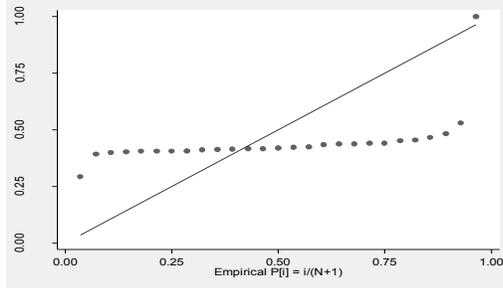
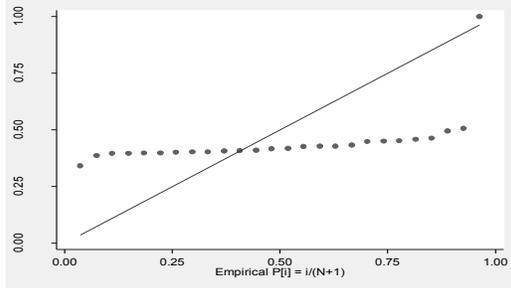
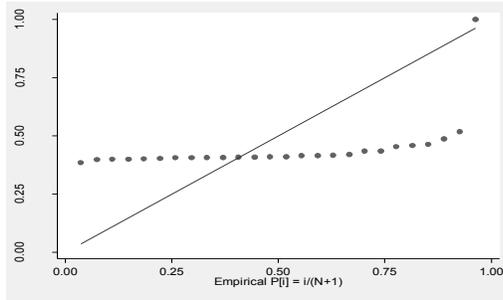
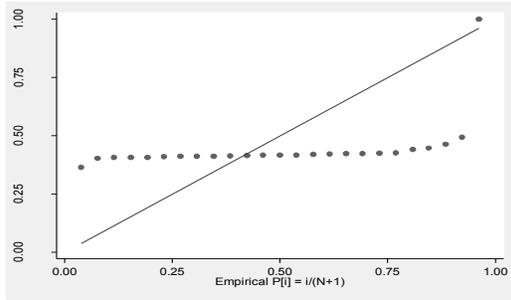
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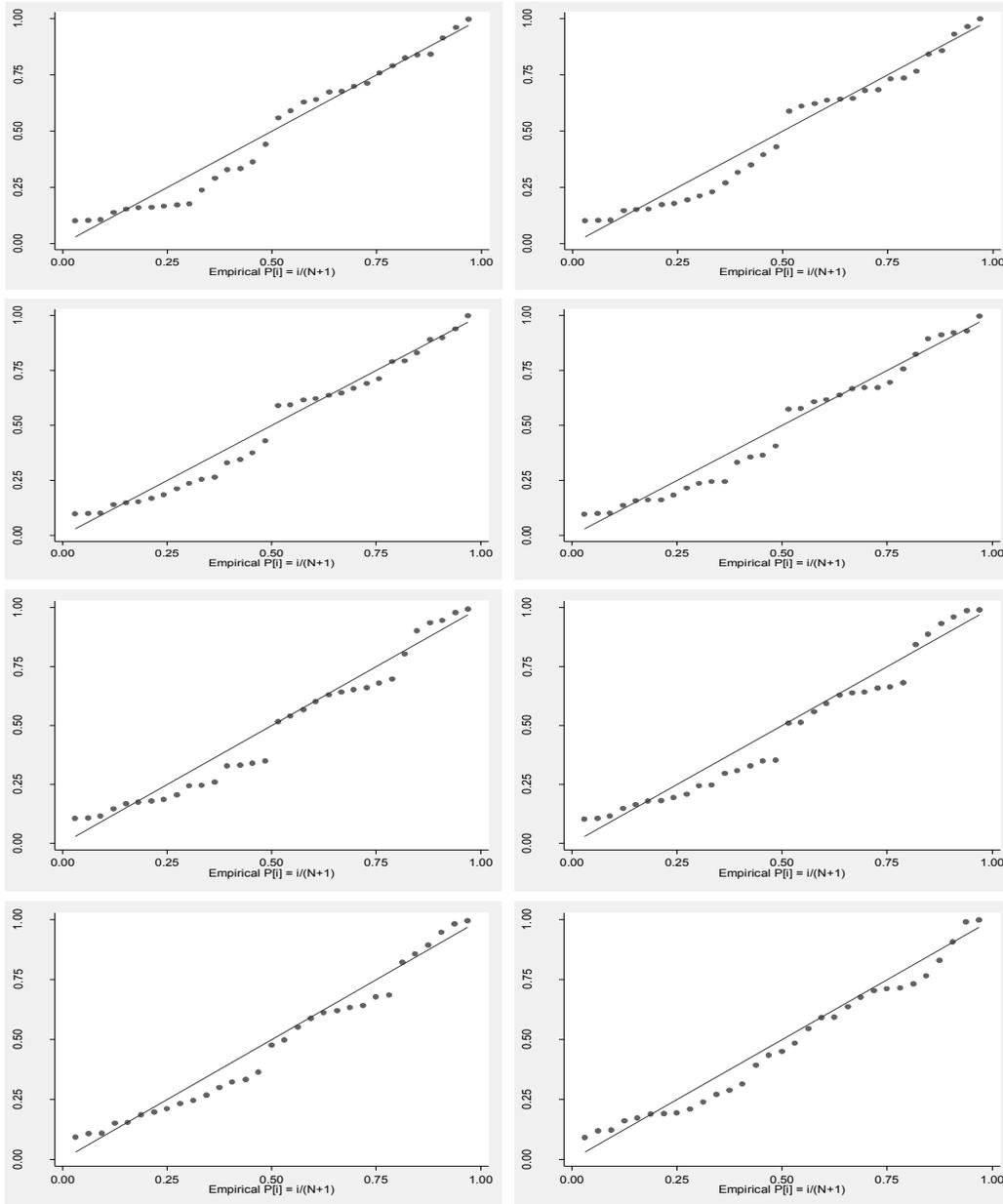
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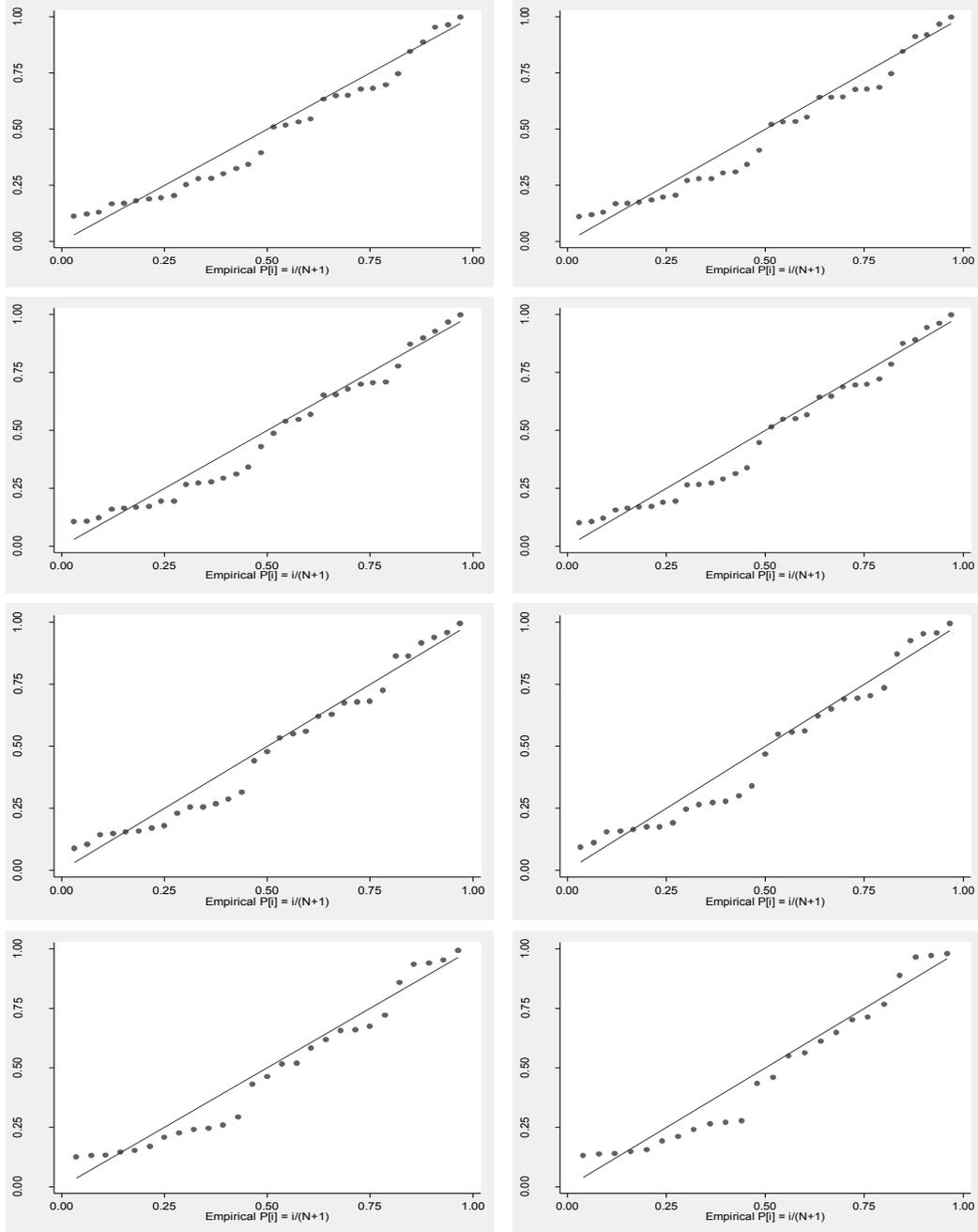
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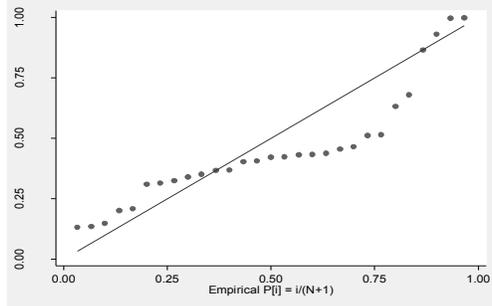
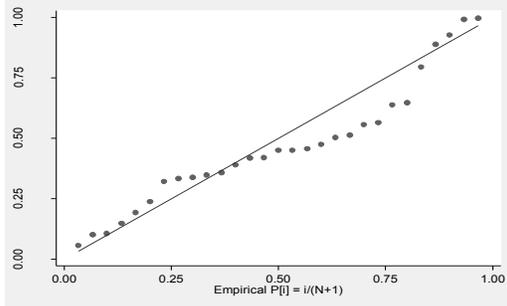
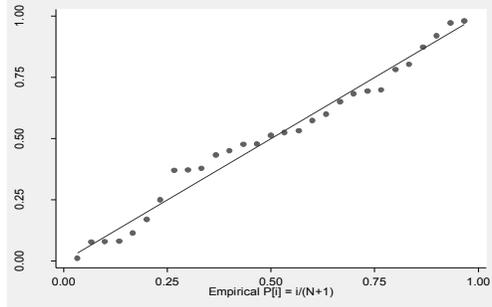
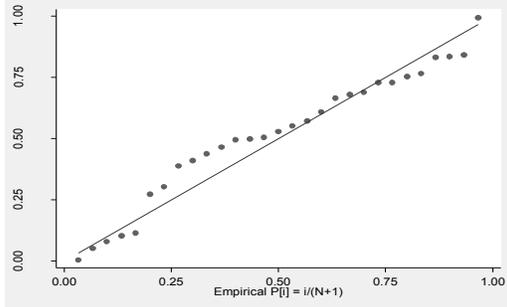
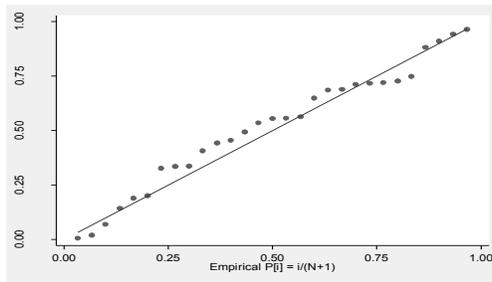
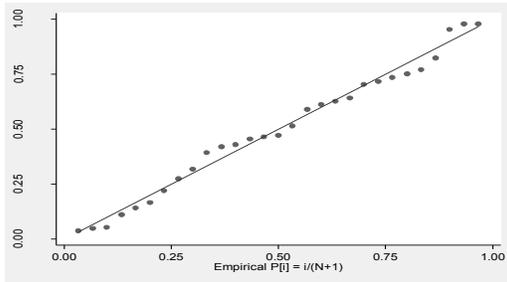
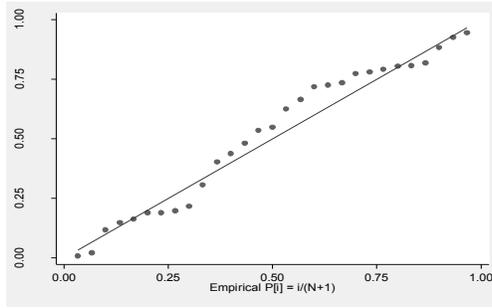
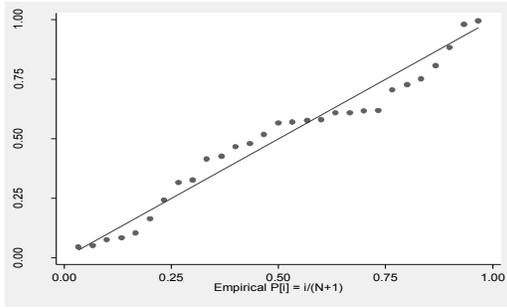
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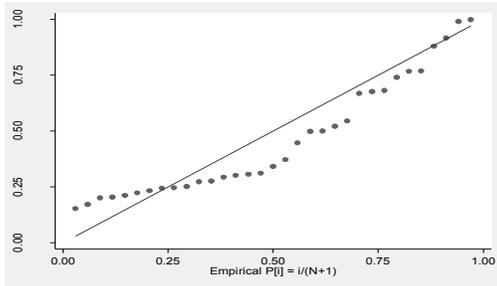
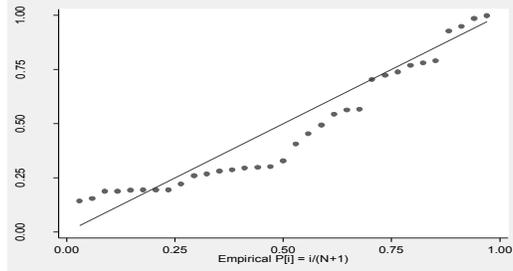
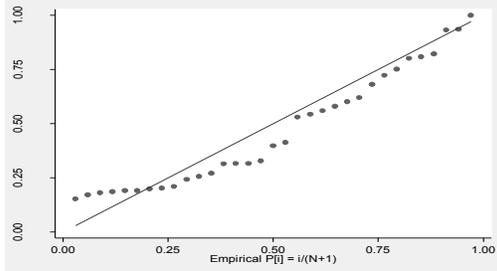
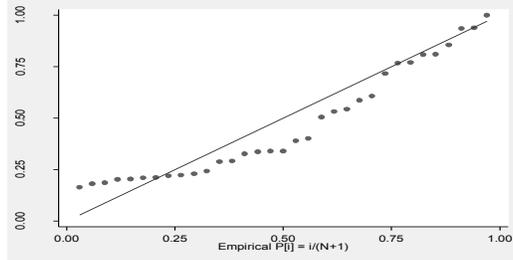
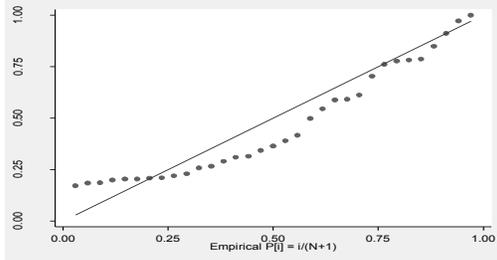
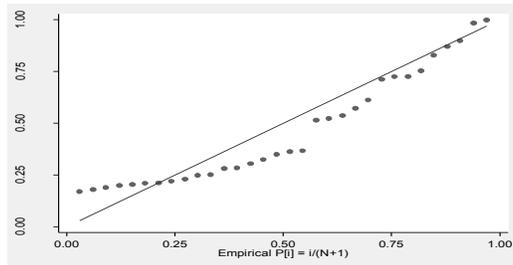
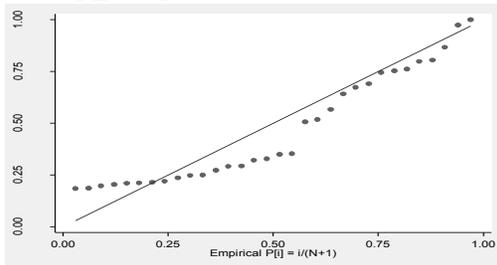
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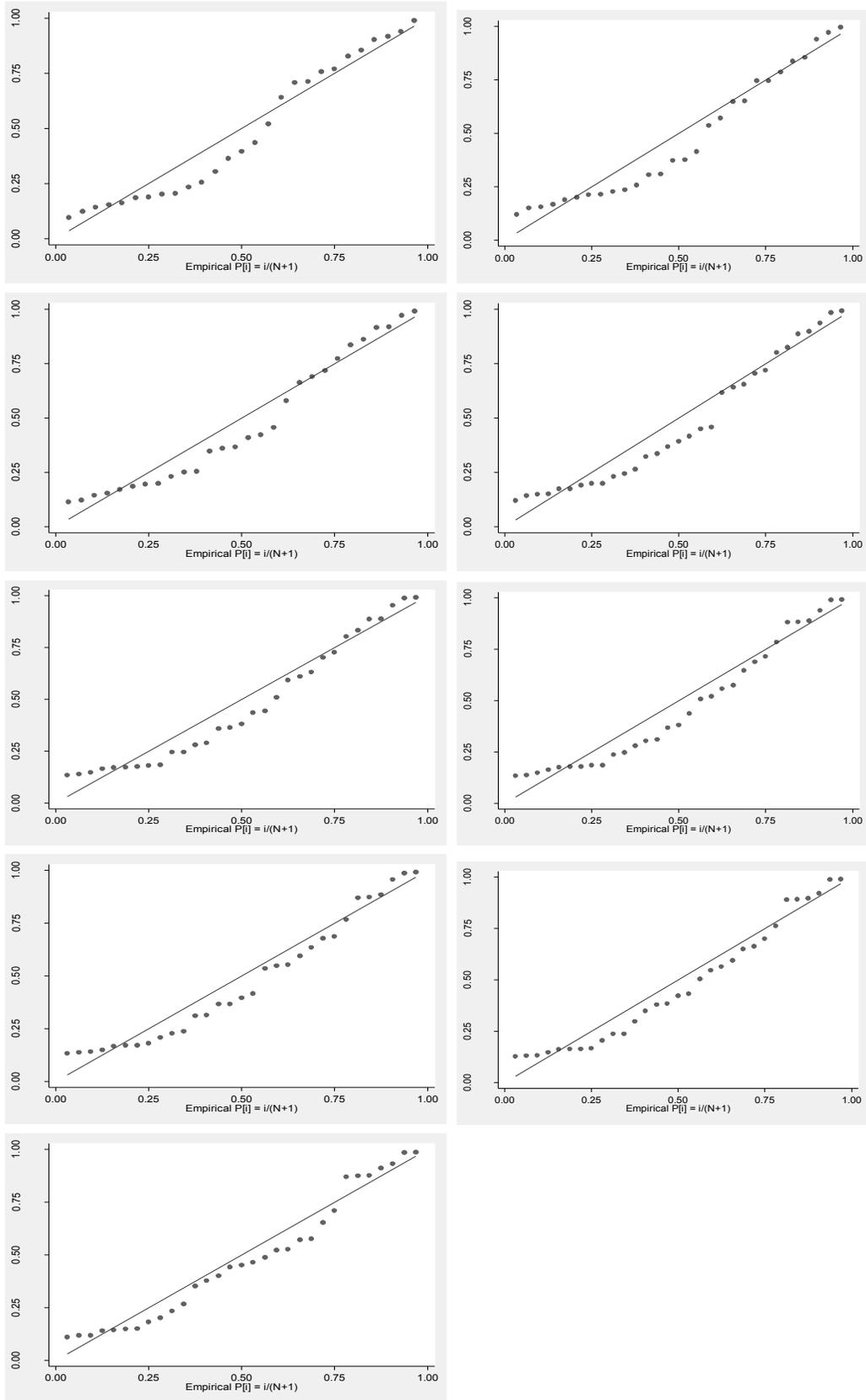
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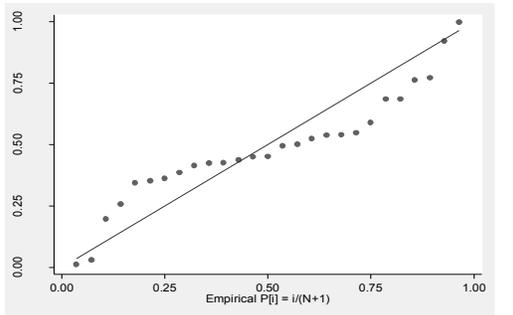
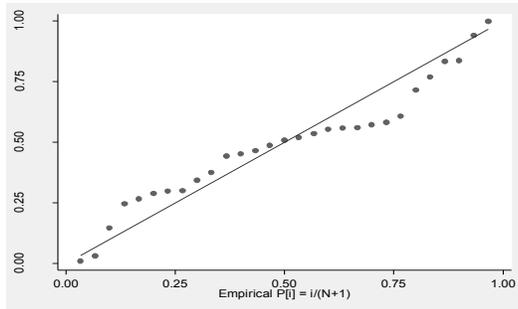
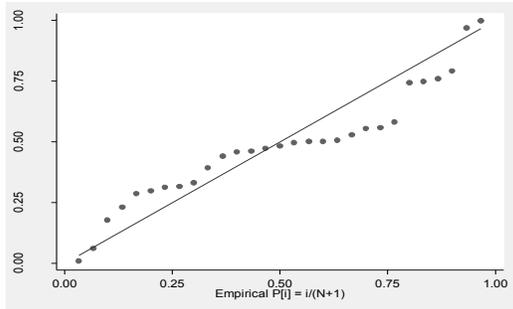
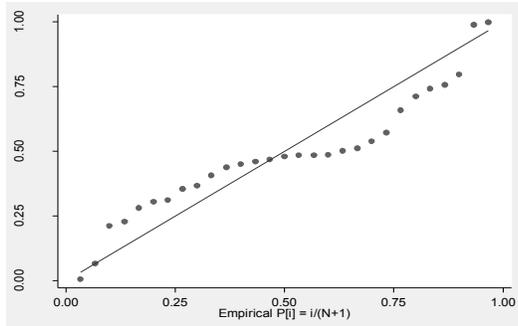
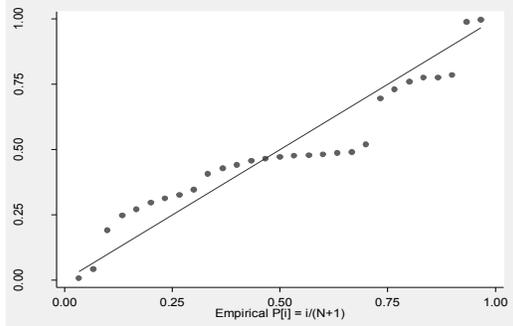
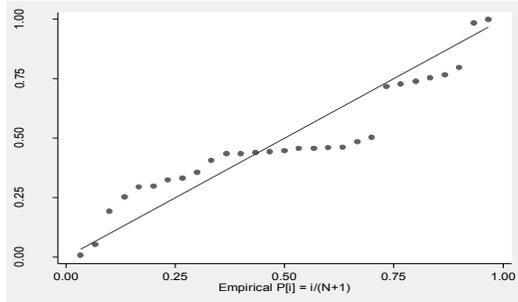
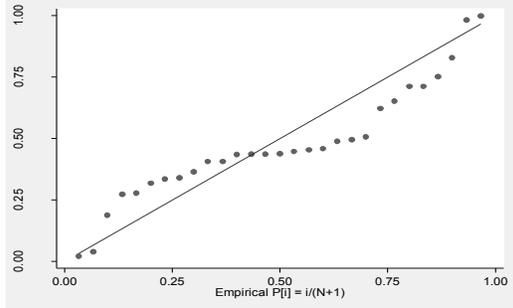
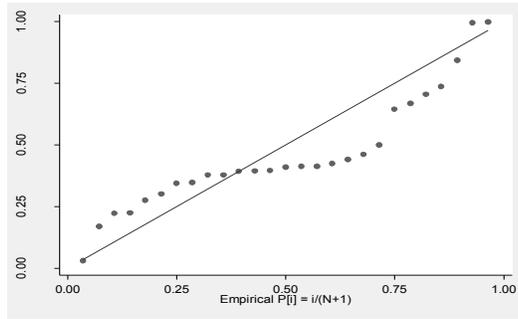
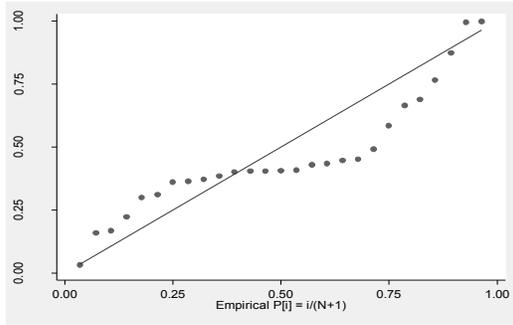
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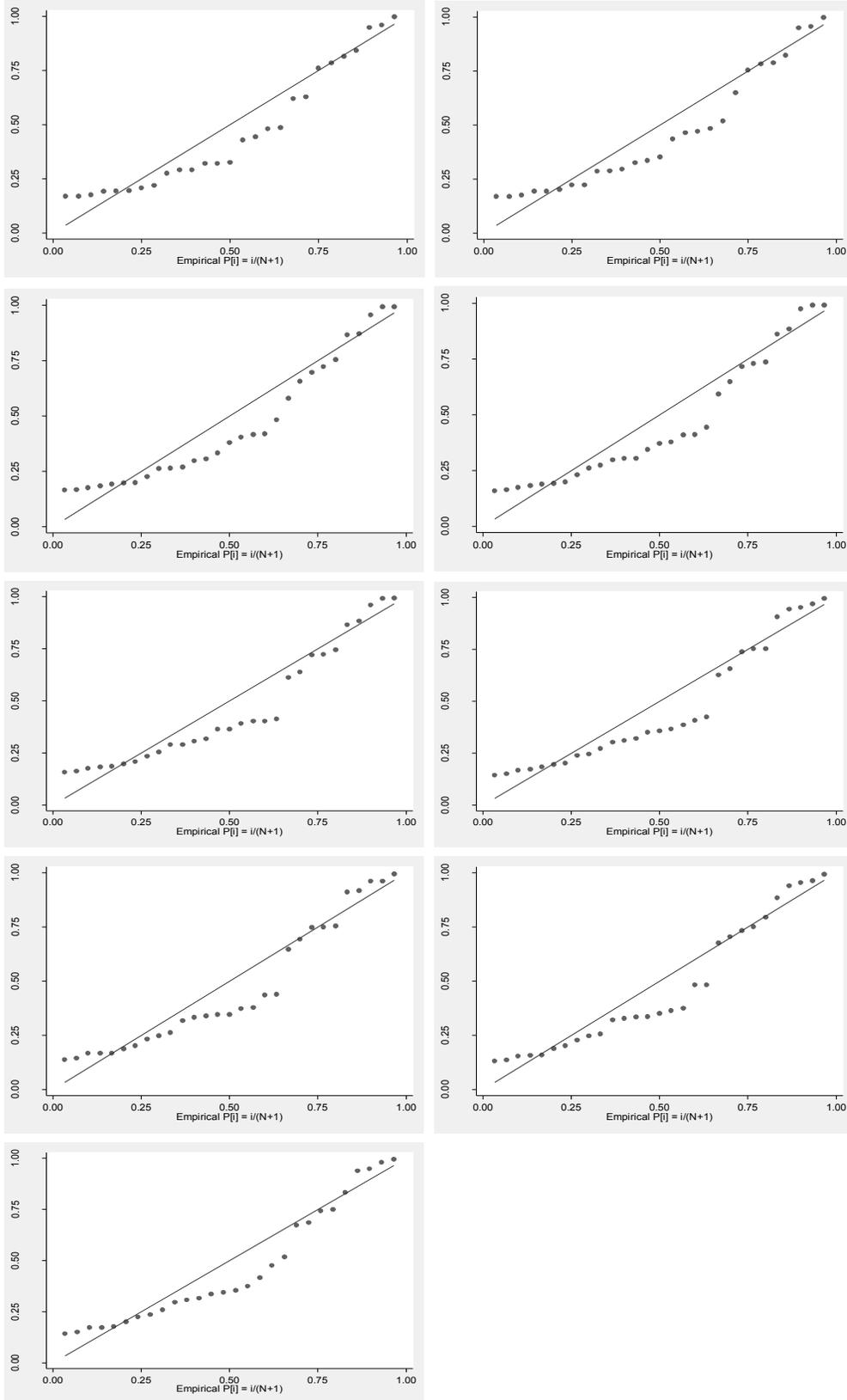
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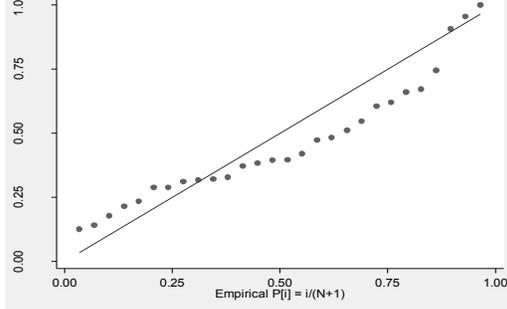
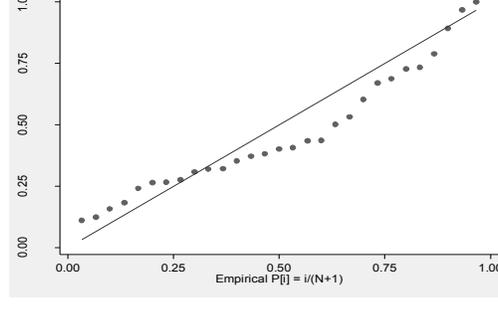
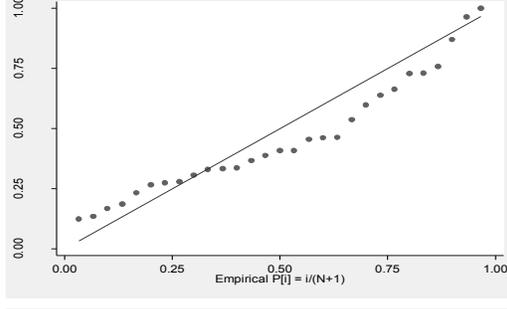
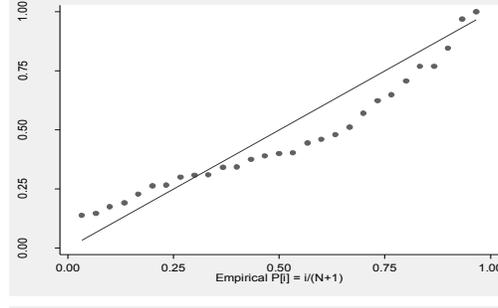
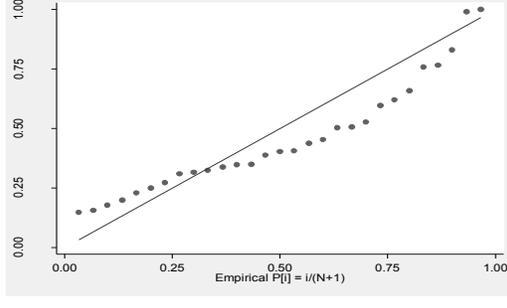
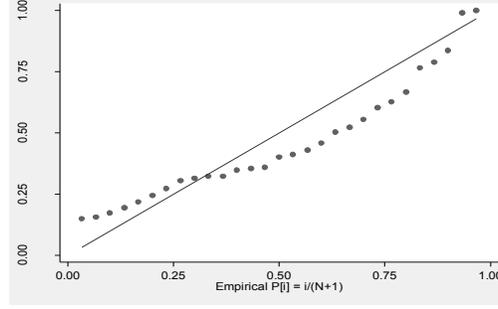
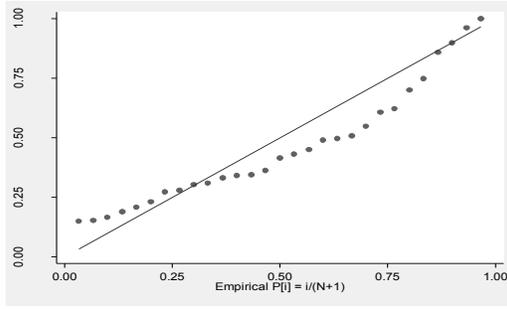
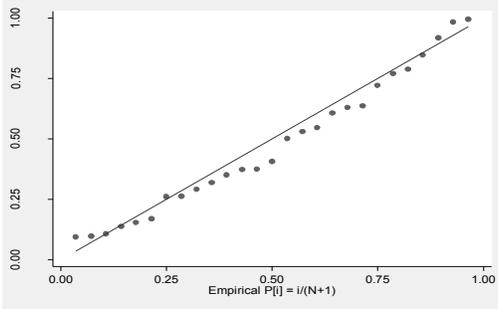
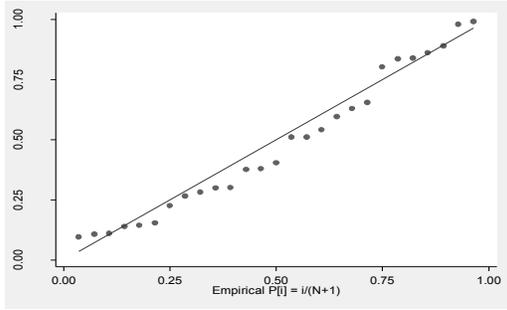
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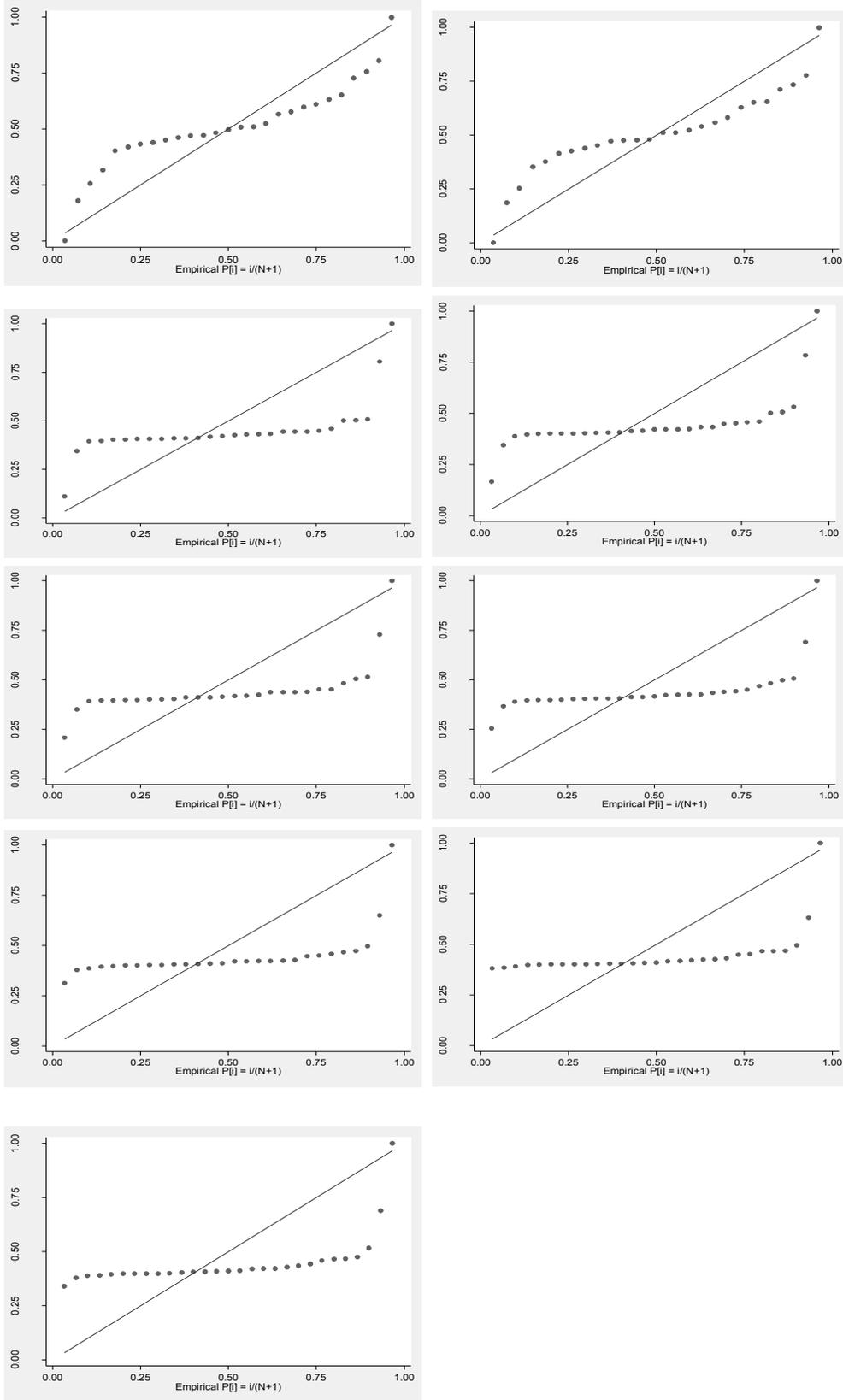
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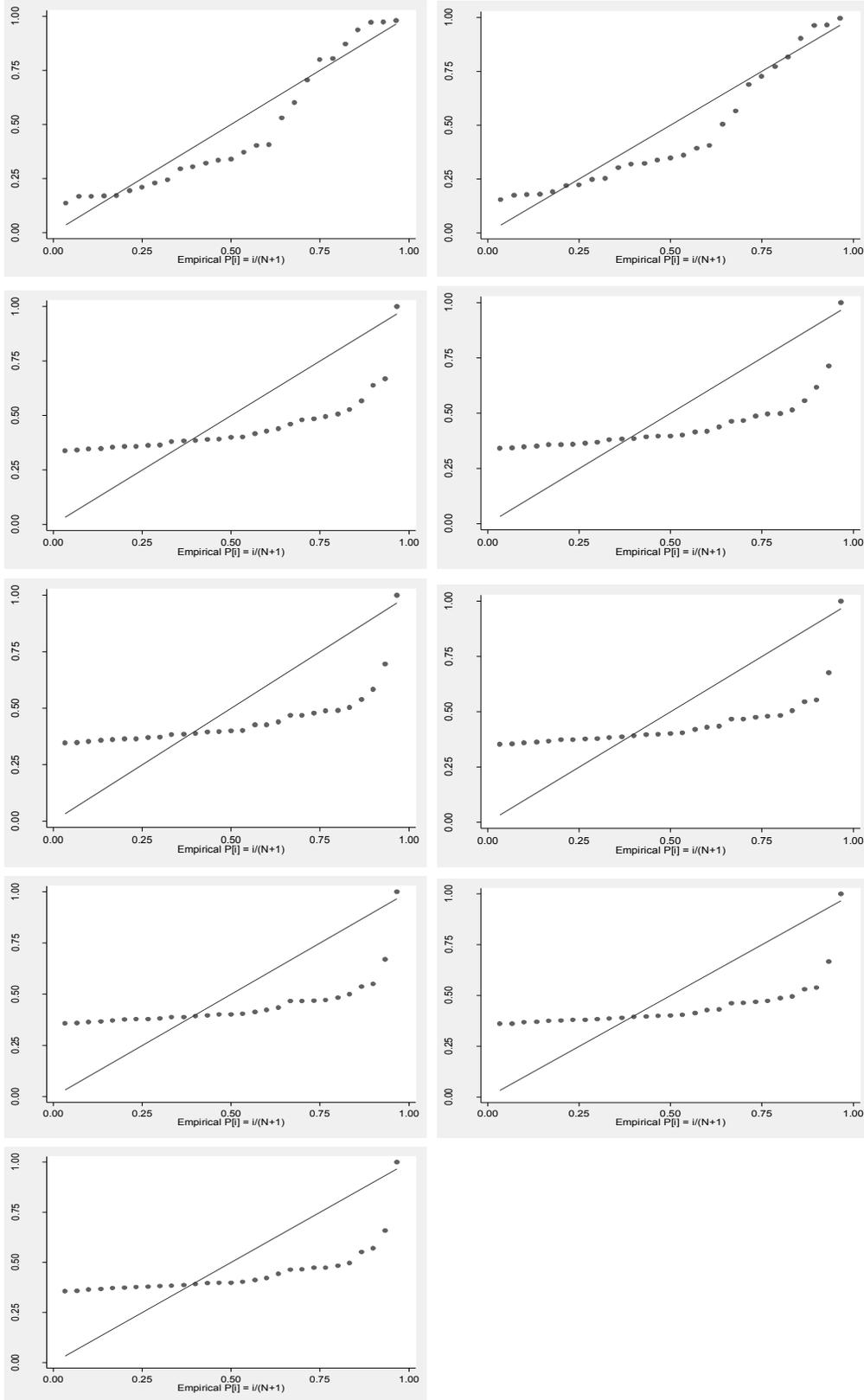
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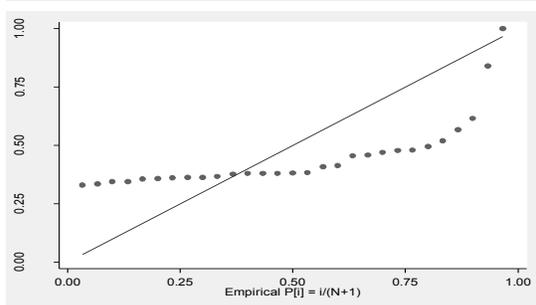
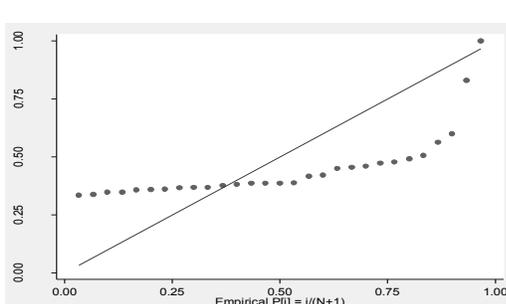
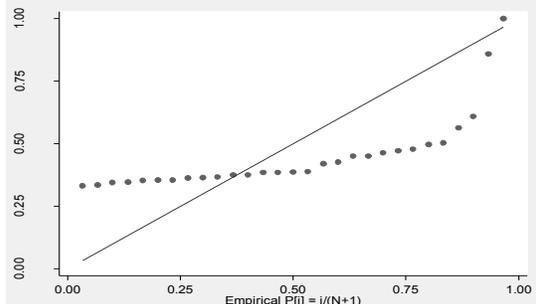
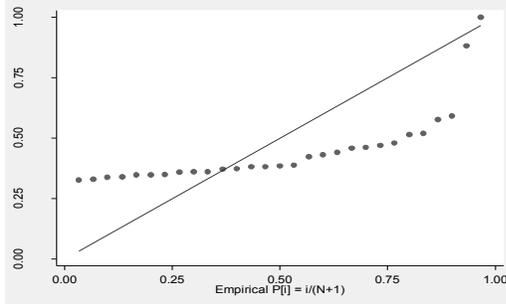
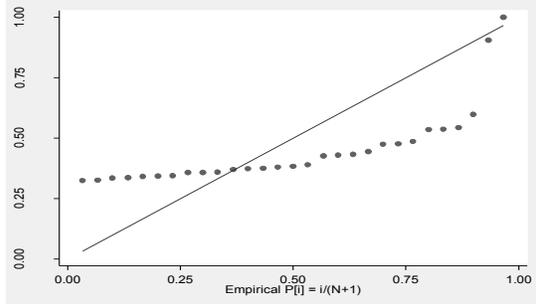
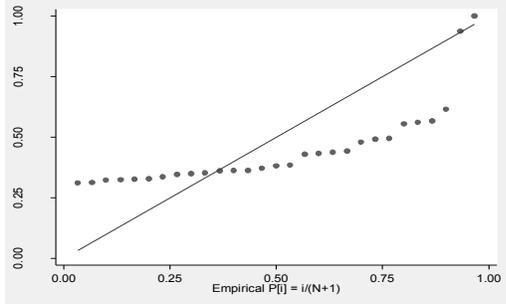
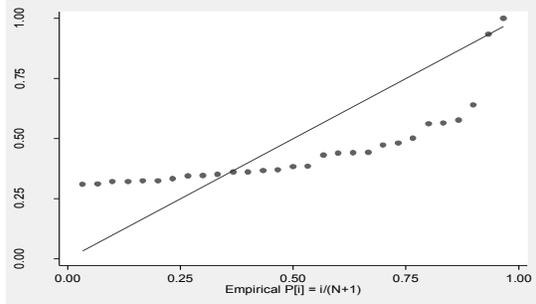
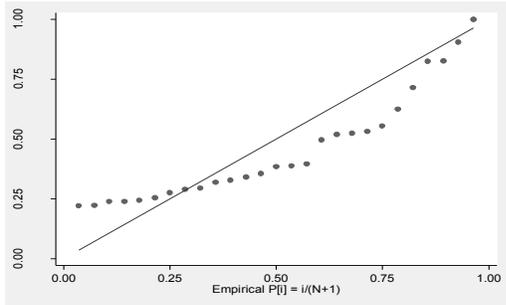
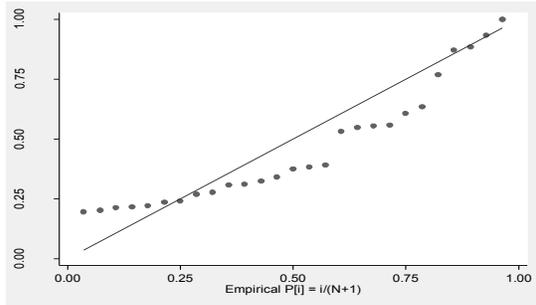
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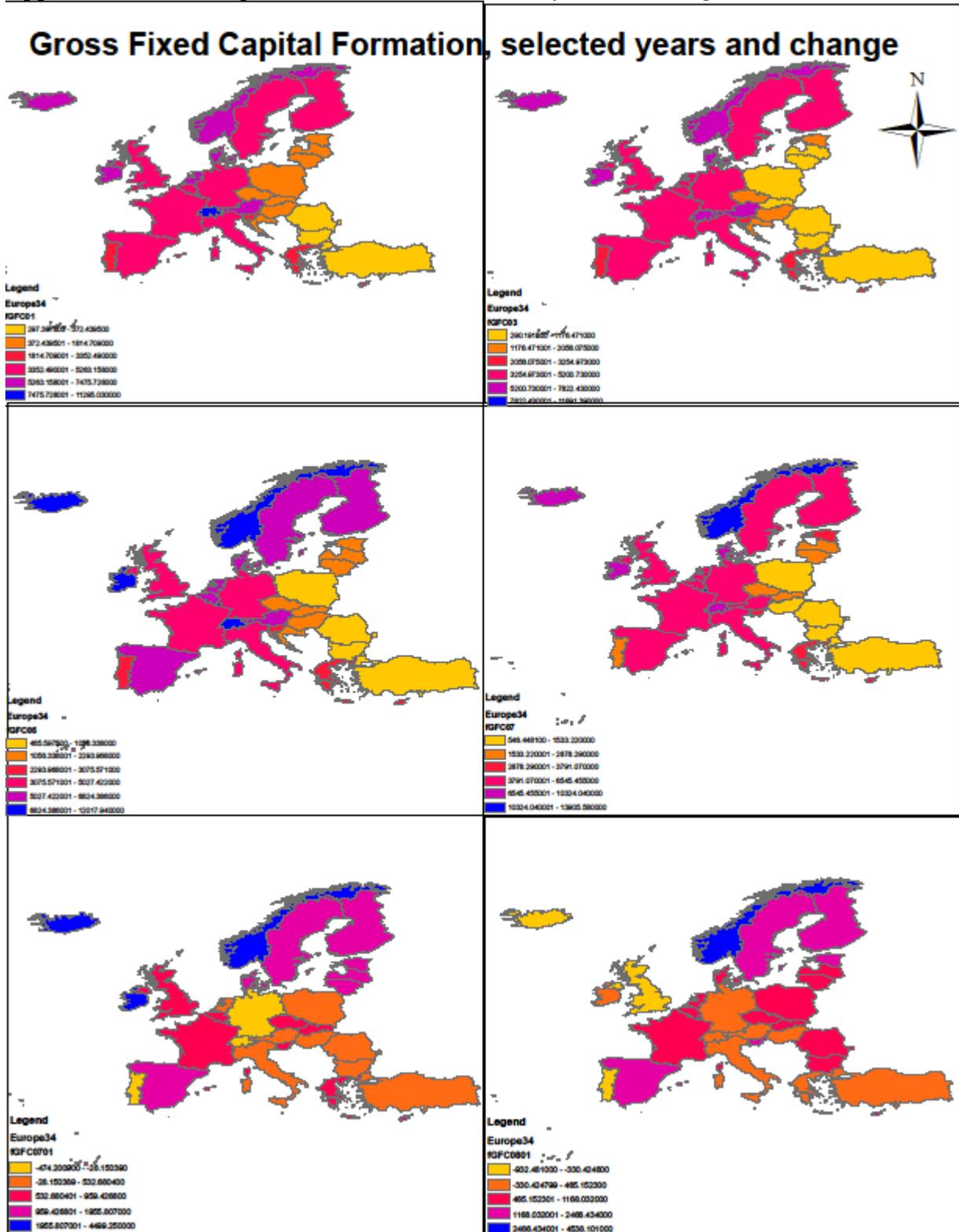
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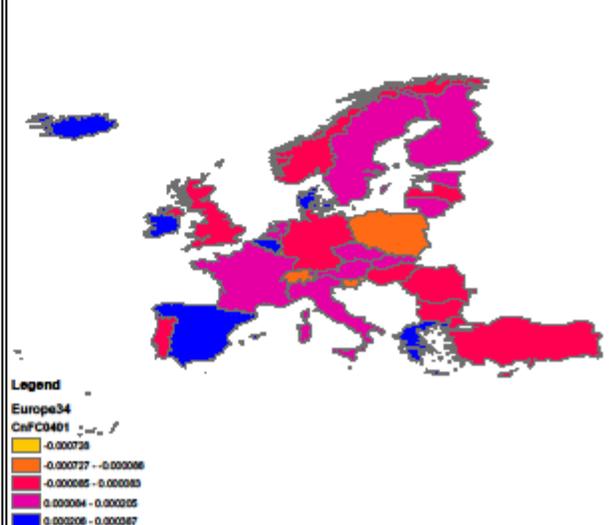
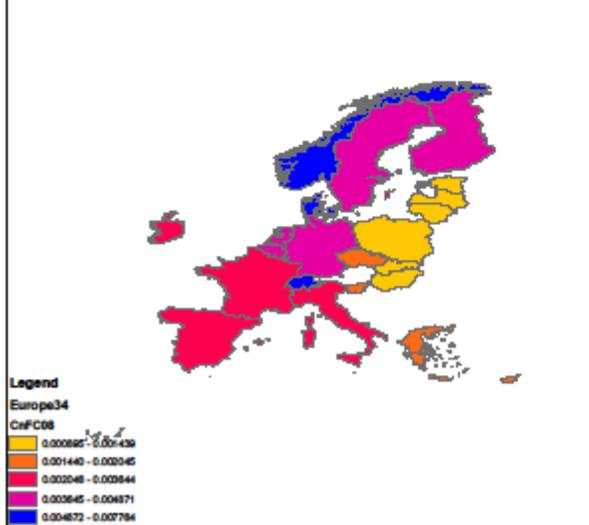
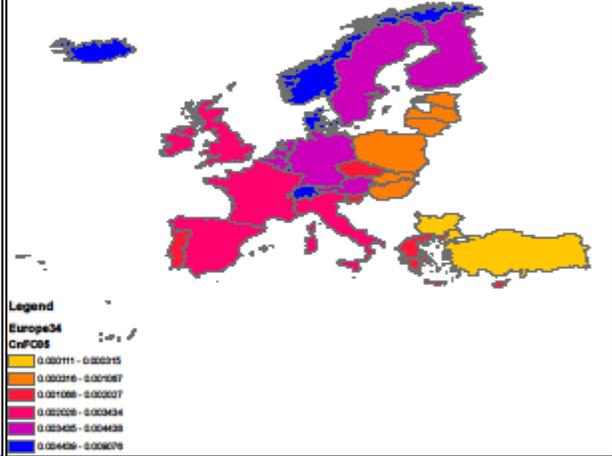
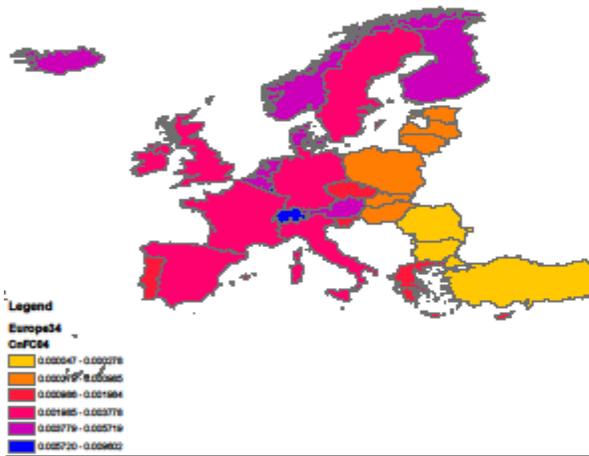
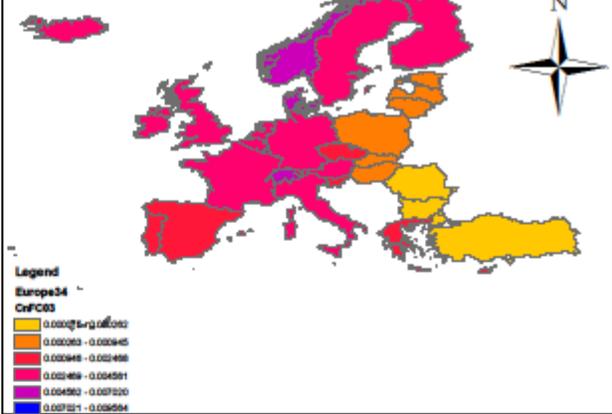
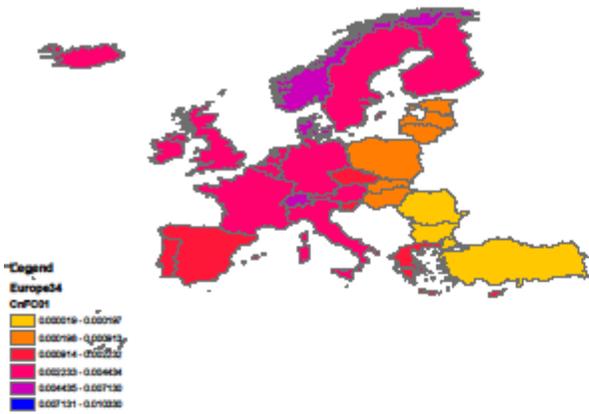
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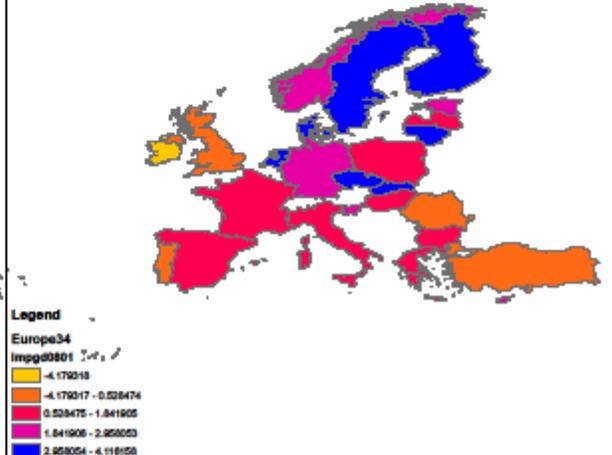
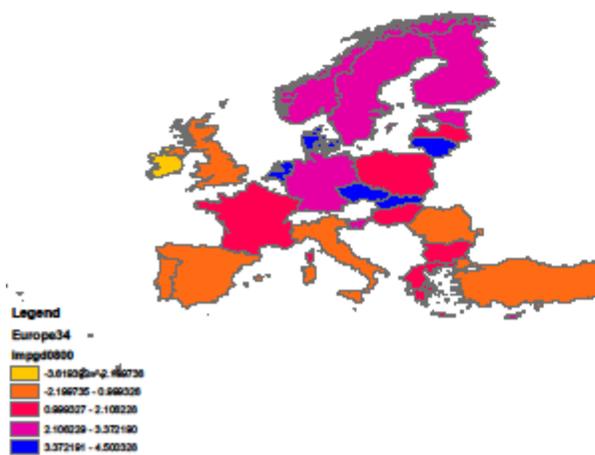
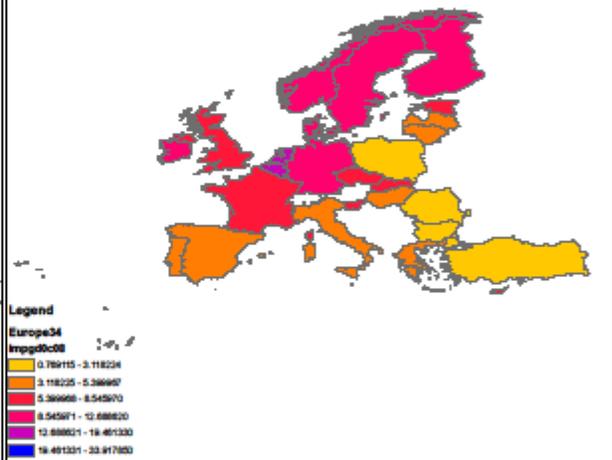
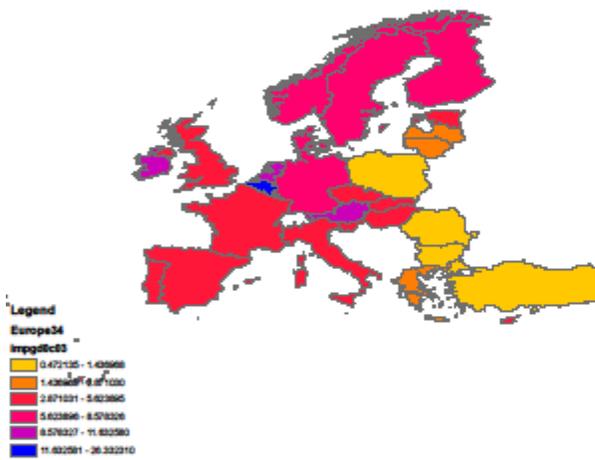
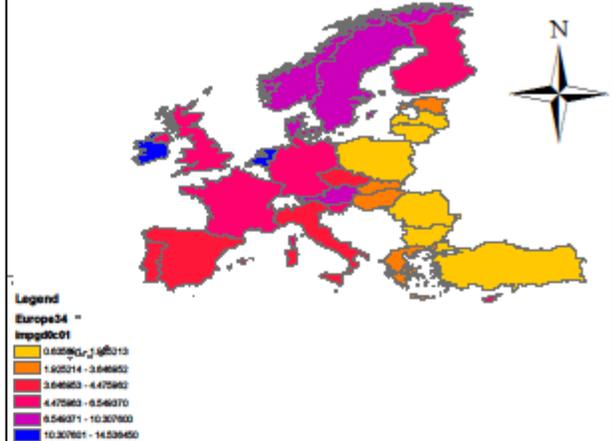
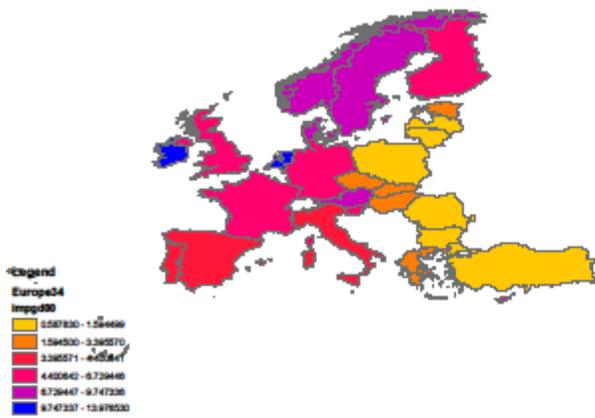
Appendix D: Basic maps, selected variables, selected years and change



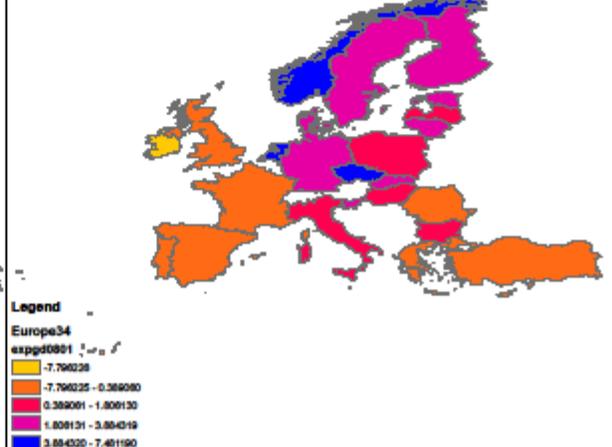
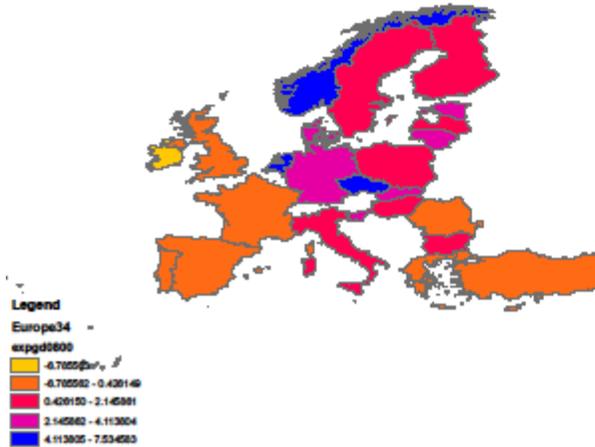
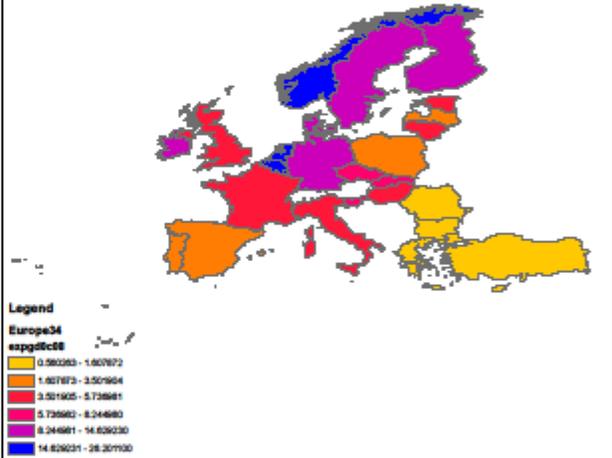
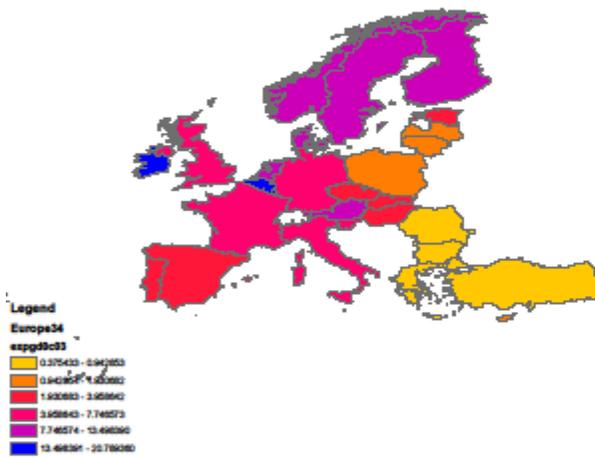
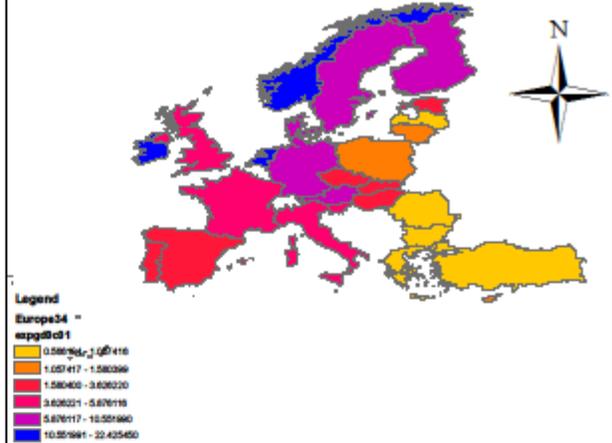
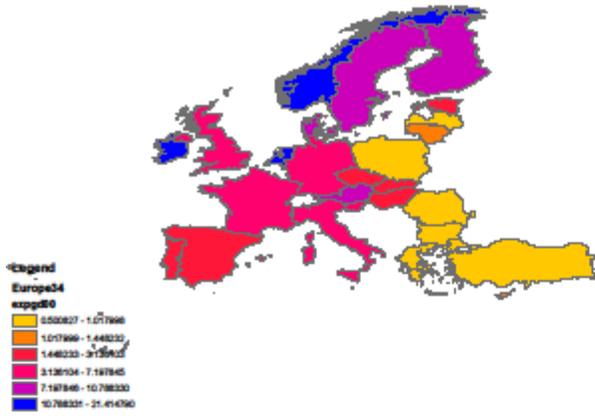
Consumption of Fixed Capital, selected years and change



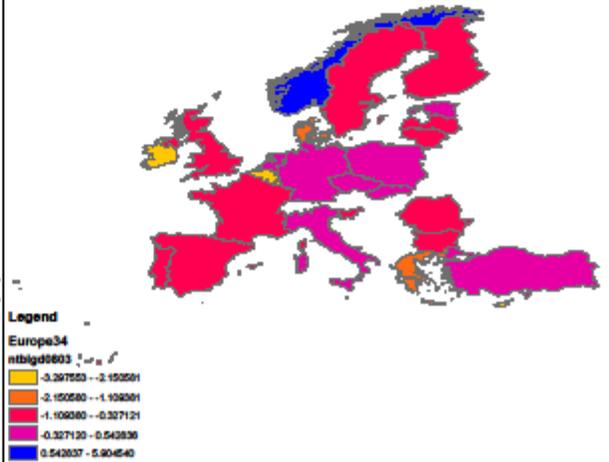
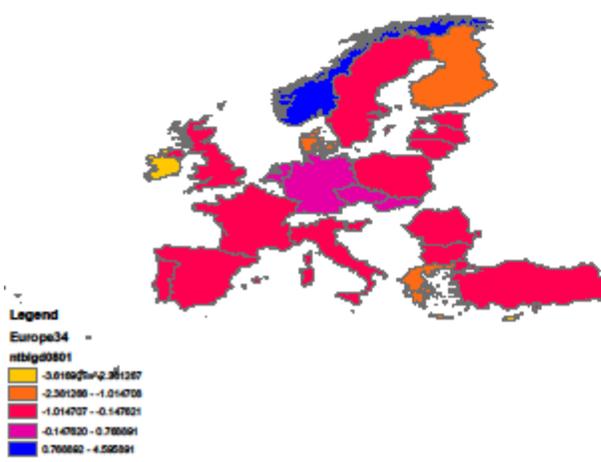
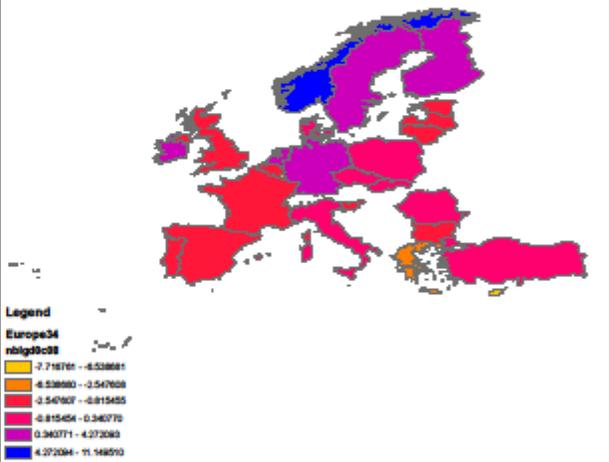
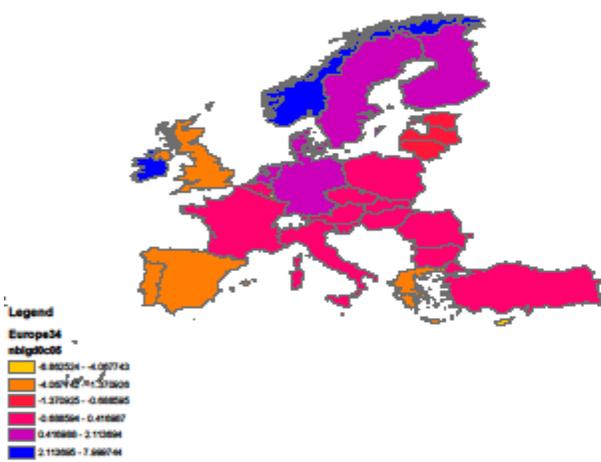
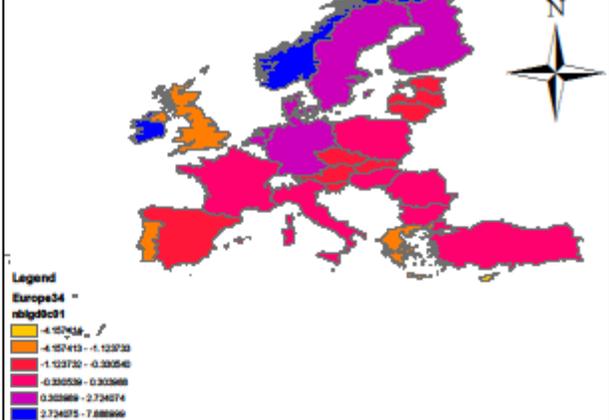
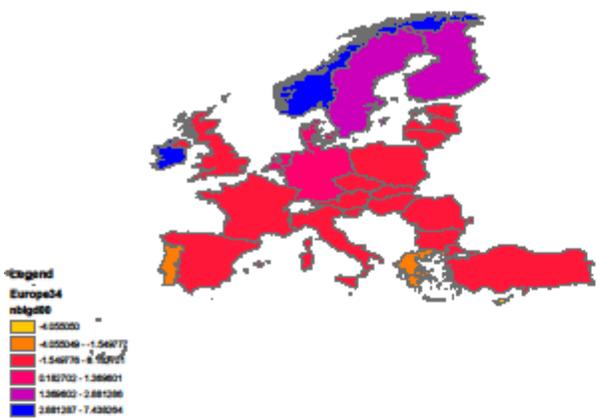
Imports of Goods, selected years and change



Exports of Goods, selected years and change



Net Balances of Goods, selected years and change



GDP per head, selected years and change

