Global trends and the economic crisis: Future alternative European growth strategies☆

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1. Introduction

In front of fiercer competition from outside Europe (especially from emerging countries), of the contraction of the internal European demand, following the crisis and the problems with public finances, and of the process of European integration that fostered increases in both wages and inflation in Eastern countries, European countries can no longer prosper without a clear long-run development strategy as they used to do before 2007.

The pre-crisis, medium-run development patterns of the EU were in fact quite different between Western and Central and Eastern European countries (hereafter, CEECs). While EU15 countries had been focusing for the two decades on a mix of high and low value added service activities (Belloc and Tilli, 2013), CEECs attracted manufacturing plants off-shored mostly from Western EU countries and foreign direct investment (henceforth, FDI) from all over the world, thus enjoying remarkable productivity gains. However, such development patterns could be considered more as a way to adapt to the worldwide globalizing trends in a yielding way, rather than a conscious choice translated into a full-fledged growth policy.

The economic contraction that begun in 2007–2008 exposed the limitations associated with these development processes.[1] Because of the slowdown of the EU economy with respect to (hereafter w.r.t.) the major competitors, the crisis

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[1] The costs of the economic crisis have been assessed with the use of the MASST3 model in Capello et al. (2015a), with a specific focus on the role of cities as sources of regional resilience, and in Capello et al. (forthcoming), where the spatial distribution of such costs has been the main object of analysis.

calls for conscious—and different w.r.t. the past—growth strategies. This paper aims at describing the possible long-run consequences stemming from alternative growth strategies, keeping in mind the two historical growth models that the two blocks of countries have always shown, irrespective of the undisputable variance characterizing Eastern and Western Europe. These historical differences in the growth models adopted make the distinction between these two blocks of countries a particularly relevant case study. Alternative strategies are in turn built upon the idea that EU countries could choose them in reaction to the relevant economic problems and consequent structural changes brought about by the crisis.

In order to reach this goal, this paper describes possible alternative strategic responses of the EU to the relevant economic problems caused by the crisis. This analysis is carried out on the basis of a scenario building exercise, whereby different combinations of strategies adopted in Western and in Eastern European countries are combined to produce different development trajectories for these two groups of economies.

This exercise is helpful for the debate that is taking place at the European and country level, related to the role Europe wants to play in the new world economic order. Facing a new multi-polar global economy, and the emergence of new powerhouses such as China, Europe is no longer the core continent and struggles to identify a new economic role, after the failure of the Lisbon strategy, the incomplete achievements in the first years of the EU 2020 strategy, and the present economic crisis. Ideally, this role should also take Europe's economic and social welfare and way of living specificities into account. But more than that, the paper is useful for understanding the advantages that CEECs reach when the way towards an endogenous growth pattern, through modernization and reconversion to high value added production activities, is undertaken in a decisive way.

The paper focuses on the economic aspects and analyzes two opposite economic development strategies for the two groups of countries forming the European Union.

CEECs, whose membership of the EU is more recent, are assumed to increasingly face the choice between a modernizing industrial strategy and a conservative one. The first strategy, labeled "Modernizing CEECs," involves a shift from traditional to more advanced industries, the strengthening of the system of second-rank cities, and a general improvement of the research and innovation systems. This first approach implies that CEECs will move from their traditional cost-competitive strategy and attraction of foreign capital towards a more endogenous mode of industrial development. The second strategy, labeled "Traditional industrial CEECs," represents a scenario based on the assumption that CEECs will try to maintain their cost-competitive approach and focus their growth potential on their capability to attract the off-shoring of Western firms and export.

The growth effects of these strategies are, however, not independent from which strategy Western countries will choose in turn. Western European countries are assumed to choose between two different strategies to deal with the economic crisis and maintain a role in a globalized world. The first of these strategies is labeled "Industrial EU15" and focuses on a reprise of Western Europe as a global manufacturing center. This is made possible by the shift towards higher quality manufacturing, customized production, and reshoring to control production processes. The opposite strategy is labeled "Post-Industrial EU15"; in this case, Western Europe almost completely gives up manufacturing, delocalizing all production functions and concentrating on the provision of advanced services on a global scale. The latter strategy involves a shift from low-level labor-intensive service activities to knowledge-intensive business services.

All these strategies represent a discontinuity with the pre-crisis development patterns; in fact, also in the case of a procrastination of the current dualism between a manufactur-ing Eastern Europe and a tertiary EU15, our scenarios will assume a conscious decision to improve the quality of the existing production infrastructure; as above anticipated, this would lead EU15 countries towards specializing in advanced services, while CEECs would occupy higher niches in the markets for products.

The combination of the possible alternative strategies by CEE and EU15 countries produces four different scenarios, whose consequences will be analyzed at a disaggregated spatial level by using the last (third) version of the macroeconomic sectoral regional growth model called MASST3 (Capello et al., 2014). The time span of the analysis covers 18 years, from 2012, the latest year with actual data, up to 2030.

The scenarios presented have a clear connection with the recent resurgence of industrial policies in several advanced economies. EU's Industrial Compact, Juncker's Investment plan, and the recent industrial policy communication "for a European Industrial Renaissance" (EC, 2014) in the EU, and Obama's new industrial policy for the US (Cooney, 2014), all suggest that industrial policies could represent possible ways to resume growth where economic performance has been sluggish, as in the case of several EU countries, or instead to fully regain momentum, as in the case of the US. The results discussed in this paper enter the debate on the rationale for such industrial policies and provide a first assessment of the possible outcomes for future growth in EU regions.

This paper is structured as follows. Section 2 summarizes the stylized facts that characterized the evolution of growth trajectories in the EU before the inception of the ongoing crisis, and the ensuing discontinuities that justify the analyses here presented. In Section 3, we describe the way development strategy scenarios for Europe are built, on the basis of the four possible combinations of the strategies for EU15 and CEE countries as above summarized. The main assumptions needed for the simulation of the four scenarios are summarized in Section 5, while Section 6 offers a detailed account of the main empirical results for the scenario simulations. Finally, Section 6 concludes with the main messages from our analyses and the most relevant policy implications that can be derived from our results.

2. The crisis and its structural breaks: Stylized facts

The EU faces a crucial crossroad (Podkaminer, 2013). The combination of the incomplete transition of CEEC economies (Dobrinsky and Havlik, 2014) and the relevant impact of the presently ongoing economic crisis (Capello and Perucca, 2013, 2014; Capello and Caragliu, 2014) sum up to make the weaknesses of the EU economy even more evident.

The average small size of firms in Southern and Eastern European countries has also worsened the impact of the

economic downturn on those areas, and labor market policies aiming at stimulating full employment have only partially succeeded in minimizing the crisis' unemployment effects (Csillag et al., 2013).

A worldwide rush for the latest scientific discovery and the primacy in knowledge and innovation, with continuous overlappings of "giant leaps" and "extinct innovation reawakenings" (Goldenberg et al., 2004) adds further pressure on the EU (Mack, 2014; Maré et al., 2014). In terms of knowledge production, competition from BRICs[2] has proven to be daunting for the EU. Ambitious Lisbon Strategy and EU2020 goals have only partially been met, and while R&D expenditure has been growing both in absolute terms as well as w. r. t. GDP,[3] emerging countries, above all China, have been growing even faster and will, in the absence of corrective measures, soon catch up with European standards. Actually, recent evidence, such as the one presented in Brautzsch et al.(2015) for Germany, would suggest that R&D could be a better target for anti-cyclical policies, thus stressing the need to implement measures capable to actually translate generic R&D targets such as those listed in the Lisbon and EU2020 Agendas, into real public interventions.

In turn, the impact of the crisis has been diversified in different countries and regions (Dustmann et al., 2014; Fingleton et al., 2012). As a result, a recent literature has been specifically devoted to understanding the determinants of the different reactions to the crisis that different national and regional innovation systems managed to display over the last few years. For instance, Archibugi and Filippetti (2013) demonstrate that skills and human capital, different intensities in the high-tech specialization profiles, and the availability of a well-developed financial system seem to be the structural factors allowing regions and countries hit hard by the crisis to be more resilient to the crisis in terms of innovative capacity. These results have been further strengthened by Makkonen (2013), which deals more directly with the impact of the Great Contraction on public science and technology budgets, finding that CEECs have been affected most remarkably by the crisis.

While, in this respect, the Lisbon and EU2020 goals have been so far only partially reached, the main competitors, most noticeably China and India, have grown in their turn and are now chasing the EU in terms of R&D expenditure. The EU transition, and in particular the evolution of CEECs, has been focusing on fundamental and applied sciences; yet, the increase in absorptive capacity of these areas has not been matched by an equally large improvement in research relevance and impact (Radosevic and Yoruk, 2014).

All these endogenous elements intertwine with the new emerging trends of the vast process of globalization (Honglin Zhang, 2014). While the impressive process of transnational outsourcing is not new, globalization has entered a second, more complex stage, whereby outsourcing from high labor cost countries involves no more only low-tech manufacturing, but also, and increasingly so, high-tech manufacturing, and service industries (Damijan et al., 2013).

During the last decades, EU economies have been steadily intensifying tertiary activities and delocalizing manufacturing in labor-intensive industries (Labrianidis, 2008). According to World Bank data, in the EU28, manufacturing jobs decreased in relevance from covering about 32% of the total workforce in the mid 1990s to less than 25% in 2012, with a corresponding increase in service jobs taking place. At the same time, BRICs have attracted many of the manufacturing jobs outsourced by EU28 countries: China's manufacturing employment share alone has increased over the same period 1996–2012 from less than a quarter of the total workforce to more than 30% of employment. This implied the need for European regions to reconvert their economic base towards high value added sectors and activities (Affuso et al., 2011).

CEECs have instead benefited from the long-run process of economic integration into the market economies of their Western European counterparts, which led to a wide, but not uniform process of upgrading (Pavlínek and Ženka, 2011). After the fall of the Iron Curtain, CEECs "rapidly re-oriented their external relations towards Western Europe" (Hildebrandt and Wörz, 2005, p. 120), which also brought business cycle synchronization (Fidrmuc and Korhonen, 2006). Because of the large East–West wage differentials, coupled with the availability of a skilled labor force, several multinational companies located in the EU15 began near-shoring one or more stages of their value chains to CEECs (Tesar, 2006). Recent evidence, however, suggests that even some CEE countries have been facing early deindustrialization. As argued in Rodrik (2015), this early development may engender a significant slowdown of the process of economic and institutional convergence, with different intensities depending on whether CEECs are more or less open to trade (Matsuyama, 2009).

The process of near-shoring of manufacturing jobs from Western countries to Eastern ones has translated into a remarkable growth of FDI inflows into CEECs, as evidenced by Fig. 1, which shows the shares of total FDIs directed to EU28 countries in terms of relative Eastern (with black lines) and Western (light gray full color) shares. Given the relatively stable total amount of FDIs inflowing into the EU as a whole, Fig. 1 suggests that over the 15 years period before the inception of the 2007–2008 crisis, a remarkable growth of FDI inflows into CEECs took place.

However, Fig. 1 also shows that after 2007, FDIs inflowing into CEECs stabilized in terms of share over total FDI inflows into the EU. In fact, in search for cheaper factor prices, FDI inflows deviated towards countries at the Eastern border of the EU, as also evidenced in Capello and Caragliu (2014). This figure, therefore, suggests that the previous pattern of development can no longer be pursued in the absence of an EU strategy for either fostering endogenous demand or (not necessarily in contrast with the previous approach) stimulating the attraction of FDIs from other countries, or towards higher value added industries.

The pre-crisis long-run trends in the patterns of economic development in the EU came to an abrupt halt with the inception of the presently ongoing crisis. New economic phenomena came to the fore—for EU countries, most noticeably this refers to macroeconomic constraints that financial markets made more evident. Traditional patterns of development have been to different extents changed. In general, the crisis elicits a conscious and full-fledged response of the EU to a set of

[2] The label BRICS comprises five of the most rapidly growing emerging economies (Brazil, Russia, India, China, and South Africa) (O'Neill, 2001).

[3] According to EUROSTAT data, the gross expenditure in R&D/GDP ratio in the EU28 has increased from 1.83% in 1999 to 2.07% in 2012; however, over the same period, China doubled its expenditure, from 0.95% to 1.84%.

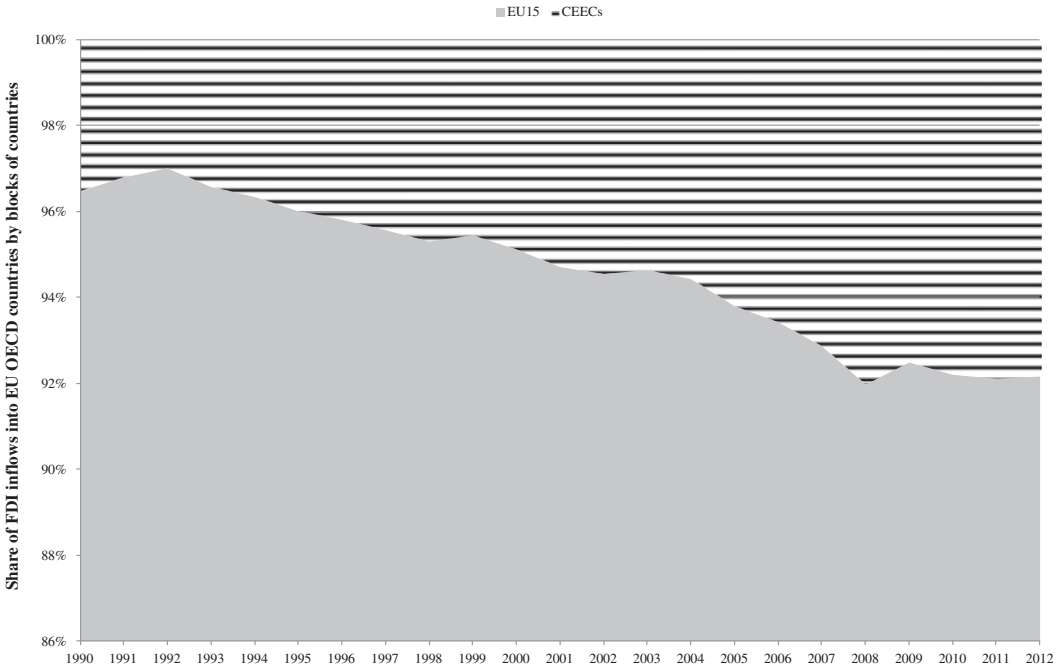


Fig. 1. Share of FDI inflows into the EU by blocks of countries, 1990–2012. Source: UNCTAD, Authors' elaboration.

challenges that need to be tackled, lest EU countries lose ground to the main competitors.

Such challenges are described below. Three main aspects are taken into consideration: competitiveness, macroeconomic constraints, and trade and FDIs.

As for competitiveness, despite the debated first wave of globalization that took place over the early years of the 20th century (Bordo et al., 1999), the relevance of the presently ongoing global integration of trade flows is unprecedented. The nature of FDIs incoming in the EU28, and in particular in countries of post-2004 accession in the Western Europe, has, however, been rapidly changing. Fig. 2 shows the evolution of the industrial composition of incoming FDIs in the EU. While the share of total FDIs inflowing into the EU as a whole and the relatively limited relevance of FDIs in agriculture remained rather stable in the last two decades, over the same period, the main destination of EU-bounded FDIs shifted from manufactur-ing (fully light gray) to service (represented with black lines) activities. This poses a serious challenge for EU countries, especially those holding a relative comparative advantage in manufacturing activities (Germany and Italy among EU15 countries, and many CEECs).

Also, the way growth is taking place in emerging countries is in many respects rather new. In fact, rather than competing only on lower prices, BRICs have, to a certain degree, managed to erode the competitive edge of the EU in many advanced industries. Productivity in emerging countries has grown in absolute terms much faster than in developed ones[4]; while in the EU, real salaries increased by about 10% in real terms over the past decade, despite poor productivity performance, in emerging countries wages have remained relatively stable. As a result, real productivity has been relatively stagnating in developed countries, and enjoyed remarkable growth in emerging ones.

This poor productivity performance in real terms is partially due to a shift towards low value added service employment in many countries, and in particular Greece, Italy, Portugal, and to a lesser extent, France (OECD, 2005; Bennett et al., 2008). An additional explanation may be due to the fact that over the last decades, many Western EU countries failed in fostering the emergence of vertically integrated knowledge-intensive business services, that have been found to be more easily associated with higher productivity levels even in associated manufacturing industries (Ciriaci et al., 2015), so that produc-tivity increases in US multinationals operating in Europe were higher (Bloom et al., 2012).

However, the most apparent effect of the presently ongoing financial and real economy crisis has been felt at a macroeco-nomic level. Yet, despite the dire straits, or at least the doldrums, through which several EU countries have been sailing in the last 7 years, the evidence about the effects of the creation of the European Union in terms of financial stability for the member countries is at least mixed.

On the one hand, the stock of public debt in several EU countries has been growing rapidly in reaction to the fiscal and demand contraction of the last years. If measured as a ratio to GDP, the EU's stock of public debt is rapidly reaching the infamous 90% threshold suggested in Reinhart and Rogoff (2010) as being detrimental to long-run economic growth. In the absence of political unification (Sapir, 2011; O'Rourke and Taylor, 2013), some individual member states have been subject to the speculations of international markets and the

[4] Recent Penn World Tables (Feenstra et al., 2013) figures suggest that while TFP levels have been growing faster than the US in some emerging countries (China and Russia above all) over the last few years, all the largest EU28 economies (including France, Germany, Italy, Spain, and the UK) have been losing ground.

Fig. 2. Share of FDI inflows into the EU by industry, 1993–2012. Source: OECD, Authors' elaboration.

price paid by public administration for servicing their debt has been for a long while higher than before 2007 and, for some countries, unbearable.[5] Higher costs and insufficient private demand prompted the formulation of Keynesian policies leading to higher growth rates (Coenen et al., 2012), but also increasing in the stock of debt over GDP.

In terms of monetary stability, instead, the EU can be considered an exemplary success story. The adoption of the euro has in fact dramatically limited inflationary pressures in EU economies. Presently, the inflation rate in the EU28 is close to nil, and this is even engendering worries about possible risks of deflation (Miller, 2014).

All these elements provide a complex picture of rapid change to which EU countries must adapt, in order to cope with the existing and forthcoming challenges. Can the history of the last two decades in the EU and emerging countries be compared to the tale of the tortoise and the hare? In order to answer this question, this paper adopts a scenario approach with the aim to depict the possible bifurcations EU15 and CEECs are facing. The effects of these scenarios will then be tested with the latest (third) version of the MAcroeconomic, Sectoral, Social, Territorial (*MASST*) model (Capello et al., 2014). Section 3 presents the philosophy on which the scenarios are build.

3. Scenarios of European development strategies

Our empirical exercise is based on a three-step methodology (Capello et al., 2008). First, scenarios are built on the basis of an expectation about the future built assuming that a strong discontinuity will take place within the driving forces of the economic system. Second, these expected changes are quanti-fied into the MASST3 model; this entails the translation of qualitative assumptions into quantitative hypotheses linking the driving forces to specific values of the model's independent variables. Finally, the simulation procedure proper is run, and this third step leads to a *conditional* forecast of the dependent variables, which represent the outcomes of the model. This methodology does not produce precise forecasts about condi-tional expected GDP growth rates, while at the same time providing figures that can be interpreted in particular in terms of their spatial distribution. For this reason, we label this methodology *quantitative foresight*.[6]

On the basis of the driving forces that can be assumed on the basis of the crisis-induced structural changes described in Section 2, our scenarios are built based on the basis of alternative, and rather opposite, development strategies for each block of countries. This gives rise to four alternative scenarios, represented in Fig. 3.

In particular, we foresee that:

1. CEECs can choose either a major modernization strategy or a traditional, although renewed, industrial growth strategy.

[5] This crisis led Spain, Ireland, and Greece to renegotiate in various terms their debt.

[6] Following the classification of foresight into three main types of exercise discussed in Piirainen and Gonzalez (2015), this approach would allow "theorizing about the future of a given socio-technical system" (Piirainen and Gonzalez, 2015, p. 1).

The transition process that has so far proved successful, based on attracting medium- to low-tech manufacturing FDIs in search for cheaper factors, could represent a burden for their future development. Now that wages in these countries are no more as competitive as immediately after the end of the socialist period, these countries can try and regain productivity increases, attract FDI—inverting the trend presented in the previous section—and foster the creation of an endogenous manufacturing activity through FDI spillovers (defined as *Traditional Industrial CEECs strategy*); however, they can also embark into a long-run, virtuous process of industrial reshuffling. Such process would encompass the growth of medium- and high-tech firms and, consequently, the emergence of high value added tertiary activities typically attracted by such secondary industries. In this second case, economic activity would also increase in second-rank cities, thus strengthening and balancing the urban system, which is instead presently rather hierarchical, and global demand would be partially replaced by endogenous demand as a destination of local products. This is labeled as *Modernizing CEECs strategy*.

2. EU15 countries have instead reached a high degree of welfare, which can either turn into an economy fully based on advanced services (labeled *Post-Industrial EU15 strategy*), or imply a restructuring of the manufacturing industries towards higher order functions, even in sectors of traditional specialization for this group of countries (labeled *Industrial EU15 strategy*). The process of increasing service activities, and in particular the loss of manufacturing jobs in these countries, is already evident in the data (see Section 2). However, so far, the EU15 adopted a relatively yielding attitude towards these events, creating several jobs in relatively low value added service industries. Moreover, this allowed EU15 countries to hold control of unemploy-ment, at least before the inception of the crisis. On the other hand, new jobs in low productivity service industries contribute to the explanation of the poor productivity performance of several EU countries before and during the crisis (Section 2 above).

The continuation of increasing the service process here assumed does not imply a passive extrapolation of the pre-crisis trends, but rather the conscious policy to invest in high value added services. Analogously, because the existing productive infrastructure in the EU is mostly concentrated in medium-tech manufacturing activities, the choice to stimulate manufacturing industries assumed as a possible alternative to the previous strategy implies the future growth of high value added manufacturing, which is, to date, relatively less relevant in EU15 countries.

The combinations of these two bifurcations suggest the need to assess the consequences of the choice made by the two blocks of EU countries in terms of four scenarios, summarized in Fig. 3. The result of combining the two alternative strategies for CEECs and EU15 countries produces four possible scenarios, here described from the first (North–East) quadrant.

The first scenario, labeled "an advanced dual Europe" scenario (scenario A), implies a modernization of the CEECs and an evolution of the presently ongoing increasing service activities trend in EU15 countries towards higher productivity, higher value added service industries, giving rise to a clear and distinct division of labor between Eastern and Western countries. For this reason, the label includes a flavor of duality: CEECs would play the role of the EU's advanced manufacturing

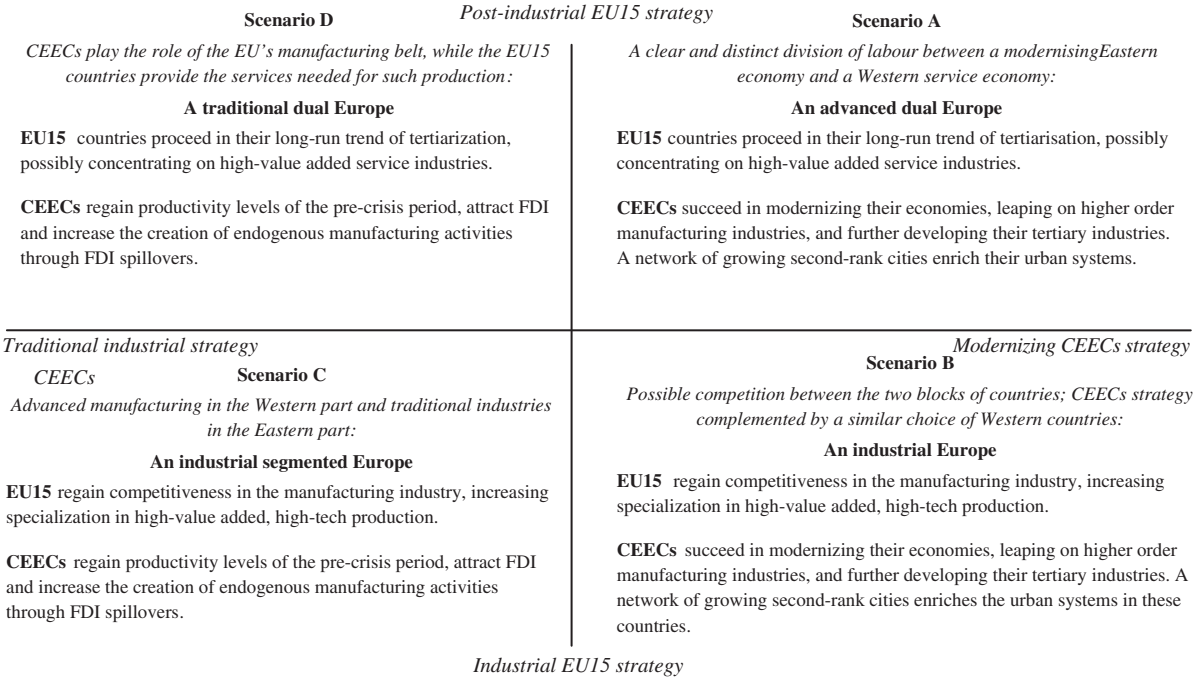


Fig. 3. Possible alternative development strategies by blocks of European countries. Source: Authors' elaboration.

belt, while the EU15 countries would provide the services needed for such production.

In scenario B, labeled "an industrial Europe," CEECs are assumed to modernize their economies, while EU15 countries are hypothesized to revert to manufacturing, and in particular to upgrading towards high value added products, in line with the recent industrial policy communication of the EU "for a European Industrial Renaissance" (EC, 2014). This scenario can also reflect some competition between the two blocks of countries, and the question here is whether CEECs' strategy to move towards an advanced industrial strategy is not obfuscated by a similar choice of Western countries.

In scenario C, defined "an industrial segmented Europe," EU15 countries are again assumed to shift to high value added manufacturing, thus inverting the long-run increase in service activities. However, this strategy is coupled with a lack of full-fledged modernization of Eastern economies, which would choose to reinforce their present role of medium- to low-tech manufacturing belt. With respect to scenario B, the difference lies in the geographical segmentation of production in Europe: advanced manufacturing in the Western part and traditional industries in the Eastern part.

Finally, scenario D, labeled "a traditional dual Europe," represents the endogenous counterpart of the picture described in Section 2 above. While, however, pre-crisis long-run trends could be conceived of as stemming from a relatively yielding attitude of EU countries towards context conditions, this scenario is built around the idea that both CEECs and EU15 countries will voluntarily make square around their traditional growth potential, increasing the quality of their strategies within their traditional specialization patterns. In particular, CEECs would focus on medium-tech manufacturing, with the benefits of technological spillovers from and increased inflow of FDIs, while EU15 countries would specialize in higher value added stages of the service activities.

Before turning to the description of the quantitative assumptions needed for the simulation process, it is worth emphasizing that none of these scenarios can be considered *ex ante* as better than the others. Because each of the possible combinations of strategies is the result of a conscious decision of local actors—policymakers and entrepreneurs above all—each strategy comes after a bottom-up process of rediscovery of competitive advantage is completed. This process of discovery shows clear links with the recent literature on smart specialization strategies (Coffano and Foray, 2013).

4. Scenario description: Qualitative assumptions

The scenarios are first theoretically designed by making assumptions on the evolution of the major existing trends and on the paths assumed by the possible future bifurcations (Capello et al., 2014). Assumptions are formulated at both national and regional level, and summarized in Fig. 4.

For the four scenarios of this paper, the qualitative hypotheses will be described in this section; the qualitative assumptions are translated and inserted in MASST3 as levers of the model, their values are presented in the figures of the Technical Appendix.

In the first scenario (scenario A, *an advanced dual Europe*), EU15 countries adopt a post-industrial strategy, while the CEECs follow a modernizing one. It is therefore a scenario of courageous strategies for both blocks of countries, calling for deep structural changes. In this scenario, a process of modernization of CEECs matches a high-profile knowledge economy for Western countries. This prompts the growth of internal demand and a general reshuffling of production towards higher market niches. A revaluation of the euro area's terms of trade follows, and this pays off on world financial markets in terms of lower interest rates on EU public bonds. In this scenario, regions reinforce their productive specialization, moving towards an increase in quality and intensity of their historical production.

Besides, in this scenario, CEECs benefit from the ongoing modernization of their economies and increase the quality of public services offered, which is financed with an increased tax rate. The development path of CEECs moves towards an endogenous model of growth, less dependent on FDIs and more on self-sustained industrial activities. This strategy requires an increase in innovation efforts in all regions, with a less concentrated pattern in EU15 countries and a penetration of these kinds of activities also in second-rank areas in CEECs. A generalized increase in control and high-level functions will also take place, especially in core urban areas typically hosting advanced services in Western countries, and a diffused trajectory in CEECs.

Finally, a partial dissolution of social capital in core areas in both CEECs and EU15 countries is expected to take place in this scenario. In Eastern countries, the complete transition process and the diffusion of production capacity towards second-rank areas means that some of the old mental schemes and procedures change, and consequently, people feel less protected by social ties (Lenzi and Perucca, 2014; Latusek and Cook, 2012). In Western countries, the transition towards high-level services increases the distance between those able to take advantage of it (i.e. the skilled and educated) and those whose competences are scarce or obsolete, who are left behind.

Because scenario A acts as a benchmark, the qualitative hypotheses of the other scenarios follow accordingly. These hypotheses depend on whether the CEECs are unable to fully pursue a modernizing strategy and focus on regaining the competitive advantage (mostly FDIs and externally driven, although with technological spillovers driving the emergence of local firms) they enjoyed before the inception of the crisis, and on whether the EU15 countries are pursuing, rather than a post-industrial strategy, an industrial one, in which they focus on the sectors abandoned in scenario A.

Scenario B (*an industrial Europe*) differentiates for the choice of EU15 countries to focus again on manufacturing activities, and in particular on advanced industrial production. In this scenario, CEECs are instead still assumed to proceed towards full modernization. In order to formalize this framework, an increase in the specialization of EU15 countries in high value added manufacturing activities takes place, with an ensuing growing share of blue collars and a consequent growth of cost competitiveness (i.e. a decrease in unit labor costs). A devaluation of the exchange rates of the euro against other major currencies would further strengthen the EU competitiveness. As a consequence of all above-mentioned assumptions, an increase in the industrial competitiveness of EU15 countries on world markets triggers a remarkable growth of exports.

Post-industrial EU15 strategy

Scenario D) A traditional dual Europe

Post-industrial EU15
Increase in the quality of internal demand (revaluation of €/USD exchange rate)
Increase of skilled labour force (Increase in unit labour costs)
Stability on international financial markets (decrease ofinterest rates on public bonds)
Partial dissolution of social capital in core areas (decreased trust)
Increase in service activities (growth of tertiary industries)
Increased high-value functions, especially in core areas (increased share of high-level professions)
Geographical diffusion of R&D activities

Traditional Industrial CEECs
Increase share of blue collars (decrease in unit labour costs)
Devaluation of €/USD exchange rate
Increased traditional manufacturing activities (growing specialization in low and medium-tech manufacturing industries)
Pre-crisis FDI attractiveness

Scenario A) An advanced dual Europe

Post-Industrial EU15
Increase in the quality of internal demand (revaluation of €/USD exchange rate)
Increase of skilled labour force (increase in unit labour costs)
Stability on international financial markets (decrease of interest rates on public bonds)
Partial dissolution of social capital in core areas (decreased trust)
Increase in service activities (growth of tertiary industries)
Increased high-value functions, especially in core areas (increased share of high-level professions)
Geographical diffusion of R&D activities

Modernizing CEECs
Increase in the quality of internal demand (revaluation of €/USD exchange rate)
Increase of skilled labour force (increase in unit labour costs)
Stability on international financial markets (decrease of interest rates on public bonds)
Increased quality of public services financed through public resources (increased public expenditure and higher tax rates)
Increased CEECs' competitiveness on world markets (growth of exports)
Increased R&D activities and high-value functions (especially in strong areas)

Traditional industrial CEECs strategy

Scenario C) An industrial segmented Europe

Industrial EU15
Increased share of blue collars (decrease in unit labour costs)
Devaluation of €/USD exchange rate
Increased industrial competitiveness of EU15 countries on world markets (growth of exports)
Increased R&D activities (especially in strong areas)
Increased advanced manufacturing activities (growing specialization in high-tech manufacturing industries)

Traditional Industrial CEECs
Increase share of blue collars (decrease in unit labour costs)
Devaluation of €/USD exchange rate
Increased traditional manufacturing activities (growing specialization in low and medium-tech manufacturing industries)
Pre-crisis FDI attractiveness

Scenario B) An industrial Europe *Modernizing CEECs strategy*

Industrial EU15
Increased share of blue collars (decrease in unit labour costs)
Devaluation of €/USDexchange rate
Increased industrial competitiveness of EU15 countries on world markets (growth of exports)
Increased R&D activities (especially in strong areas)
Increased advanced manufacturing activities (growing specialization in high-tech manufacturing industries)

Modernizing CEECs
Increase in the quality of internal demand (revaluation of €/USD exchange rate)
Increase of skilled labour force (increase in unit labour costs)
Stability on international financial markets (decrease of interest rates on public bonds)
Increased quality of public services financed through public resources (increased public expenditure and higher tax rates)
Increased CEECs' competitiveness on world markets (growth of exports)
Increased R&D activities and high-value functions (especially in strong areas)

Industrial EU15 strategy

Fig. 4. Qualitative assumptions for the alternative development strategies by blocks of European countries.

Scenario B also implies an increased intensity of R&D; increased production of high value added manufacturing goods in Western countries implies the growth of innovative activities needed to stay on the technological frontier. CEECs are still assumed to fully modernize, hence shifting their production towards quality competition on international markets, along with the increased cost of labor associated to this process and the increased stability of interest rates on public bonds.

In the C scenario (*an industrial segmented Europe*), instead, while EU15 countries are still assumed to follow a reindustrialization pattern, with the hypotheses qualitatively described in the previous scenario, CEECs are assumed to regain competitiveness in the way they proceeded before the inception of the crisis, i.e. on the basis of an exogenously FDI-driven path of development. Besides the increased relevance of manufacturing activities, with the consequent decrease of unit labor costs, which they share with EU15 countries, in this scenario, the specialization pattern of CEECs shifts towards traditional manufacturing activities. FDIs regain instead the relevance they had in these countries before the crisis began (Capello and Caragliu, 2014), with a progressive process of spinoff generation of a universe of local firms, benefiting from technological spillovers generated by this renewed inflow of FDIs. Thus, for CEECs, an exogenous pattern of production, based on externally financed investment, can also foster the strengthening of a fabric of local firms.

Finally, scenario D (*a traditional dual Europe*) represents the less courageous scenario among the four presented: CEECs remain in the logic of price competitiveness, and of FDI-driven growth. At the same time, Western countries opt for a post-industrial strategy and reinforce the knowledge economy paradigm, giving up the attempt to regain core manufacturing activities. R&D efforts remain those of the past for both CEECs and EU15, while both groups of countries reinforce their historical specialization, upgrading it: low-tech manufacturing activities in Eastern countries enlarging the spectrum towards higher functions and medium-value sectors, and service activities in Western ones. In the latter, an effort is made to move from low to high value added service activities.

With the combination of these strategies, the four scenarios depicted in Fig. 4 can be translated into quantitative assumptions that are included in the MASST3 model with the values which are presented in detail as Technical Appendix.[7]

5. Regional growth and disparities in Europe in the four scenarios

This section presents the results of the simulations with the MASST3 model in the four scenarios. The purpose of the MASST model is to create territorial scenarios under different assumptions about the main driving forces of change that will act in the future, and for this reason, the quantitative results of the model

[7] For all the quantitative hypotheses that are needed in the MASST3 model and are unaffected by the assumptions of the four scenarios, the values of a baseline scenario simulation are kept. The baseline scenario assumes that the actual economic trend situation is kept constant and that no new policies are applied. For a detailed description of the baseline, see Capello et al. (2014).

are not to be read as precise values of specific economic variables in the future, such as in a forecast, but depict the tendencies and relative behavioral paths of regional variables in countries and regions when certain conditions take place.

5.1. Aggregate growth

Table 1 and Table 2 show the annual average GDP growth rates and the annual average employment growth rates, respectively, in the four scenarios. At European level, scenarios B and C are more expansive, both from a GDP as well as from the total employment point of view; Western countries grow more if they do not give up their manufacturing base, but upgrade it, as in the case of the "industrial EU15" strategy. Losing manufacturing altogether, on the contrary, brings lower growth rates, because high-level services bring development only in core areas where service activities are concentrated, leaving behind regions less endowed with skills and education.

It is also worth stressing that scenario B turns out to be more expansionary also in terms of productivity growth. In fact, for both EU15 as well as CEECs, GDP grows faster than total employment, suggesting that a strategy whereby advanced manufacturing is preferred in both areas is also conducive to an overall better performance. By contrast, this can also be seen when looking at the productivity performance of scenario C, because in CEECs, GDP grows less remarkably than total employment in this scenario, where CEECs do not fully modernize their economies.

For Eastern countries, the result clearly depends on their strategy, but also on what Western countries decide to do. A courageous strategy pays the most, as Eastern countries benefit from a modernizing strategy with respect to a traditional industrial strategy. Their GDP growth rate is higher in scenario A with respect to scenario D and in scenario B with respect to scenario D (Table 1). It is especially beneficial, with a difference of 0.29% annual growth rate, in case the EU15 pursues a post-industrial strategy, meaning that *if the EU15 is no longer a manufacturing zone, the CEECs benefit more from shifting to an endogenously driven growth pattern, in which they do not depend on EU15 FDIs.*

Table 1
Annual average GDP growth rates in the four scenarios: absolute values and relative to scenario A.
Source: MASST3 model results.

Annual average GDP growth 2012–2030				
Scenario	A: An advanced dual Europe	B: An industrial Europe	C: An industrial segmented Europe	D: A traditional dual Europe
EU27	1.70	2.20	2.18	1.68
EU15	1.67	2.18	2.18	1.67
CEECs	2.07	2.43	2.17	1.70

Annual average GDP growth with respect to scenario A. 2012–2030				
Scenario		**B**	**C**	**D**
EU27	–	0.50	0.48	−0.03
EU15		0.51	0.51	0.00
CEECs		0.36	0.10	-0.37

Table 2
Annual average employment growth rates in the four scenarios: absolute values and relative to scenario A.
Source: MASST3 model results.

Annual average employment growth 2012–2030				
Scenario	A: An advanced dual Europe	B: An industrial Europe	C: An industrial segmented Europe	D: A traditional dual Europe
EU27	1.43	1.85	1.80	1.37
EU15	1.31	1.75	1.72	1.28
CEECs	2.14	2.46	2.31	1.92

Annual average employment growth with respect to scenario A. 2012–2030				
Scenario		**B**	**C**	**D**
EU27	–	0.42	0.37	−0.06
EU15		0.44	0.41	−0.03
CEECs		0.32	0.17	−0.22

Besides, *Eastern countries strongly benefit from the presence of a fast-growing Western Europe.* The growth rate of CEECs, in scenarios B and C, when the EU15 grows more thanks to an industrial strategy, are significantly higher than those in scenarios A and D, where the EU15 adopts a post-industrial strategy. This depends on two factors. On one hand, there are strong spillover effects from Western to Eastern countries, in terms of demand for goods and, more recently, services, being these economies strongly intertwined. For this reason, if the EU15 grows more, this brings more demand, and consequently more exports and growth, to Eastern countries. On the other hand, there is also an impact due to the type of strategy pursued in Western countries. The two strategies of Eastern countries, in fact, are both largely based on manufacturing, though in the *Modernizing CEECs* strategy they are able to upgrade and modernize their structure and in the *Traditional Industrial CEECs* strategy they rely on a traditional industrial strategy. Being close to a manufacturing Western Europe generates, therefore, an advantage in terms of the intensity of technological spillovers intra-industry trade generates. This is even more relevant for the *Traditional Industrial CEECs* strategy, which depends on EU15 delocalization, but also when CEECs modernize, as being close to high-level Western manufacturers generates demand and technological advantages.

5.2. Regional growth

The MASST 3 model produces results at regional NUTS2 level, and this represents a crucial asset w.r.t. other scenario models that usually provide results at national level only. Fig. 5 depicts the average annual GDP growth rate in the regions of the EU27 from 2010 to 2030, as obtained by the simulations, in four separate maps.

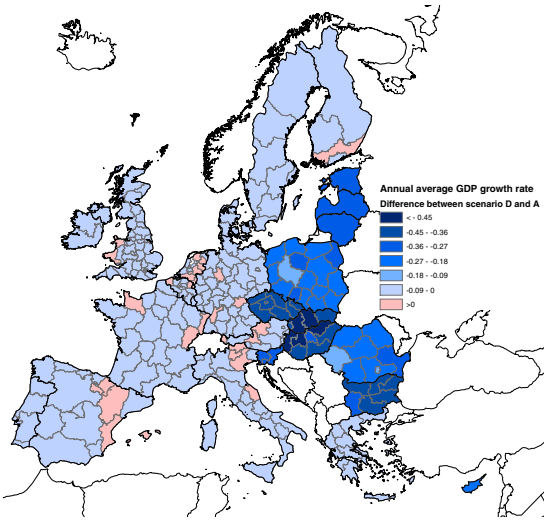
The first map (Fig. 5.a) depicts the absolute growth rate in scenario A, *an advanced dual Europe*, where the EU15 follows a post-industrial strategy and the CEECs a modernizing one.

This scenario immediately shows a concentric Europe, in which rich and core areas tend to outperform the others. This is partly due to the continuation of the present trends due to the crisis, but also, largely, due to the strategies adopted. In fact, if

Post-industrial EU15 strategy

d) A traditional dual Europe

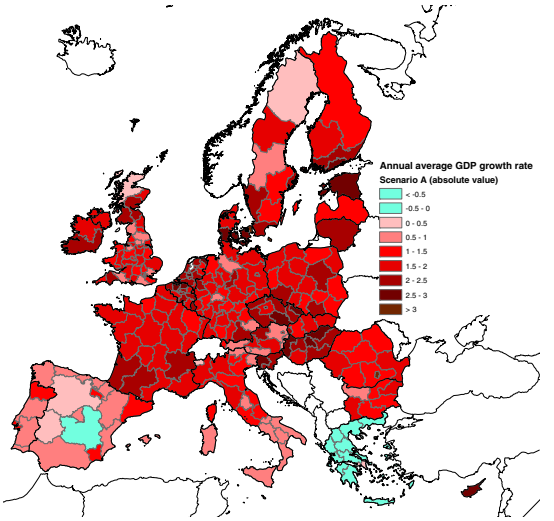
(value relative to scenario A)



Traditional Industrial CEECs strategy

a) An advanced dual Europe

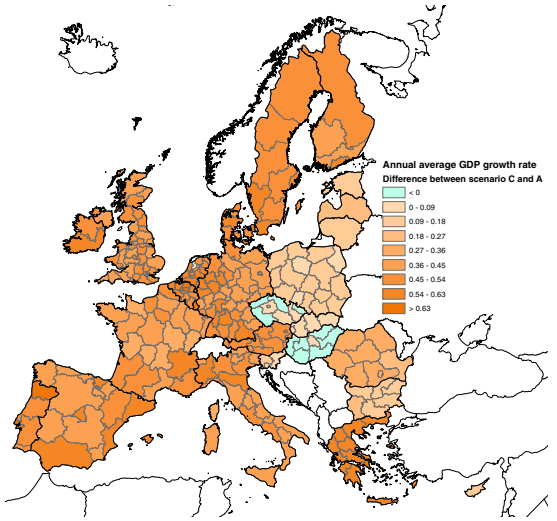
(absolute value)



Modernizing CEECs strategy

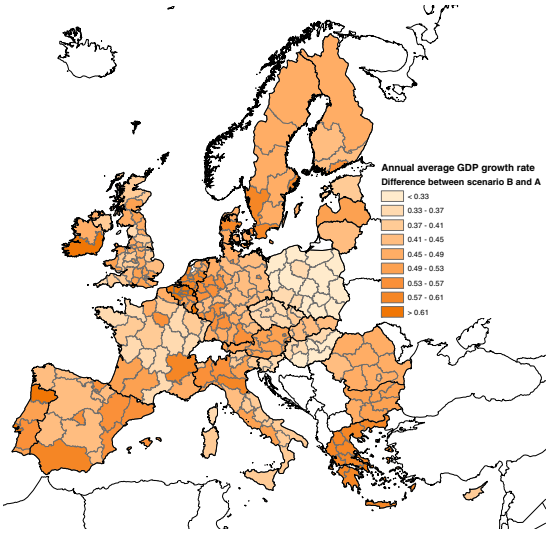
c) An industrial segmented Europe

(value relative to scenario A)



b) An industrial Europe

(value relative to scenario A)



Industrial EU15 strategy

Fig. 5. Annual average GDP growth rate. Legend: a) Absolute annual GDP growth rate; b) c), and d) annual average GDP growth with respect to scenario A.

Europe pursues a dual strategy in which the Eastern countries modernize and the Western ones pursue a transition to advanced services, this strategy does favor those regions which are more endowed with technological abilities, skills, education, creativity, and knowledge, i.e. those same regions which are nowadays more advanced. In particular:

1. GDP growth is positive in almost all European regions, with some exception in a very limited number of regions, all belonging to Southern European countries. In these regions, the recovery after the end of the crisis is not able to compensate for the loss of wealth during the crisis years. These include Castilla-La-Mancha in Spain and almost all of Greece, with the exception of Attiki, where major urban functions are performed.
2. In general, a pattern emerges from Fig. 5.a: Central and Northern regions and countries are expected to outperform the Southern periphery, since, in addition to Greece, also most regions of Spain, Portugal, and Southern Italy are growing less than the rest of Europe.
3. CEECs tend to outperform their Western counterparts, but not so significantly, as they are basically growing similarly to the Central European EU15 countries.
4. Within Western European countries, in most cases, urban areas outperform the rural ones, although not necessarily large cities outperform medium-sized ones. The highest growth rates, in fact, are experienced in places such as Cataluña and Murcia in Spain; Norte in Portugal; Rhone-Alpes, Midi-Pirenees, and Aquitaine in France; Utrecht in the Netherlands; London and South Western and Eastern Scotland in the United Kingdom; and Hamburg and Oberbayern in Germany.
5. In Eastern European countries, there is a clear tendency of favoring the capital regions, but in some countries, this spreads also to second-rank poles. Sofia, Bucharest, Budapest, Prague, and Warsaw are also joined as the best performers by Észak-Magyarország, Jihovýchod, Dolnoslaskie, etc.

The second map (Fig. 5.b) depicts the growth rate of scenario B (*an industrial Europe*) as a difference with respect to scenario A, so that a direct comparison is allowed. This scenario is more favorable for all regions of Europe, especially for Western but also for Eastern ones. Country effects are clearly present; for example, Greece and the Nordic countries clearly benefit more from the strategy of reshoring, whereas this is less true for Poland, which was recently more able to diversify its economy.

At regional level, in Eastern countries, there are small differences, normally more in favor of non-capital regions, those for which spillovers from Western countries and FDI are more important.

For Western countries, on the contrary, urban and core areas tend to gain more, due to the fact that they are able to appropriate a larger share of the diffused growth and of the fact that in these regions' innovative activities linked to the new manufacturing are easier. This is the case of Dublin, Frankfurt, Wien, etc. Also, some second-level urban regions gain from this scenario, for example, Emilia-Romagna in Italy, Stuttgart in Germany, and Västsverige and Sydsverige in Sweden.

The third map (Fig. 5.c) depicts the growth rate of scenario C (*an industrial segmented Europe*), also as difference with the reference scenario A, to which it is just the opposite in terms of strategies. This scenario tends to be associated to higher growth rates for all Western regions, which benefit from the strategy of keeping and upgrading manufacturing, while for Eastern regions the results are mixed. In fact, because of the spillovers and FDIs from Western manufacturing, this scenario is positive for many Eastern regions despite their traditional industrial strategy. However, this result is limited in terms of magnitude and does not apply to all regions: in particular, losing regions including some belonging to Hungary and the Czech Republic.

At regional level, in Western countries, scenario C (*an industrial segmented Europe*) displays the same regions favored in scenario B (*an industrial Europe*), suggesting that Western regions are not very sensible to what is done in CEEC countries. Favored regions include capital ones, and the second tier urban ones.

In Eastern countries, capital regions are generally able to gain more from scenario C than the rest of their countries, including Budapest, Bucharest, and Warsaw; also, second-rank urban areas such as Timisoara in West Romania are able to gain more than rural areas, suggesting that spillovers and FDI are not space blind but tend to go towards the same attractive regions which attracted them in the past.

The fourth map (Fig. 5.d) depicts the differences of the fourth scenario D, *a traditional dual Europe* as w.r.t. the first one (*an advanced dual Europe*). A crucial result emerging from this figure is that for almost all regions of Europe, this scenario, in which Eastern countries adopt a conservative strategy, is less expansionary than the one in which they adopt a modernizing one.

This traditional industrial strategy by the CEEC, when coupled with a post-industrial EU15, brings disappointing results especially for CEEC regions, whose difference with respect to scenario A is negative and significant. It is nevertheless interesting to observe that the most negative differences are not found in the urban and capital areas, which in any case succeed in somehow defending themselves, but in non-core areas of countries such as Slovakia, Hungary, and Bulgaria.

In Western countries, the difference between scenario D, *a traditional dual Europe*, and scenario A, *an advanced dual Europe*, is limited. Most regions lose because of the lack of complementarity between the strategies of the two groups of countries. However, for some traditional manufacturing Western areas, the dual scenario is slightly better, since they face lower competition from firms in Eastern countries on the markets for advanced products. This is the case of Veneto and Marche in Italy; Franche-Comté in France; Noord-Brabant in Belgium, part of Wales, in the UK; and Karlsruhe in Germany.

5.3. Regional disparities

The four scenarios are also different in terms of the level of disparities which are achieved at European level. To analyze them, we use the Theil index (Fig. 6) which can be usefully decomposed between international and intranational dispar-ities, i.e. the so-called *between countries* and *within countries* Theil indexes.

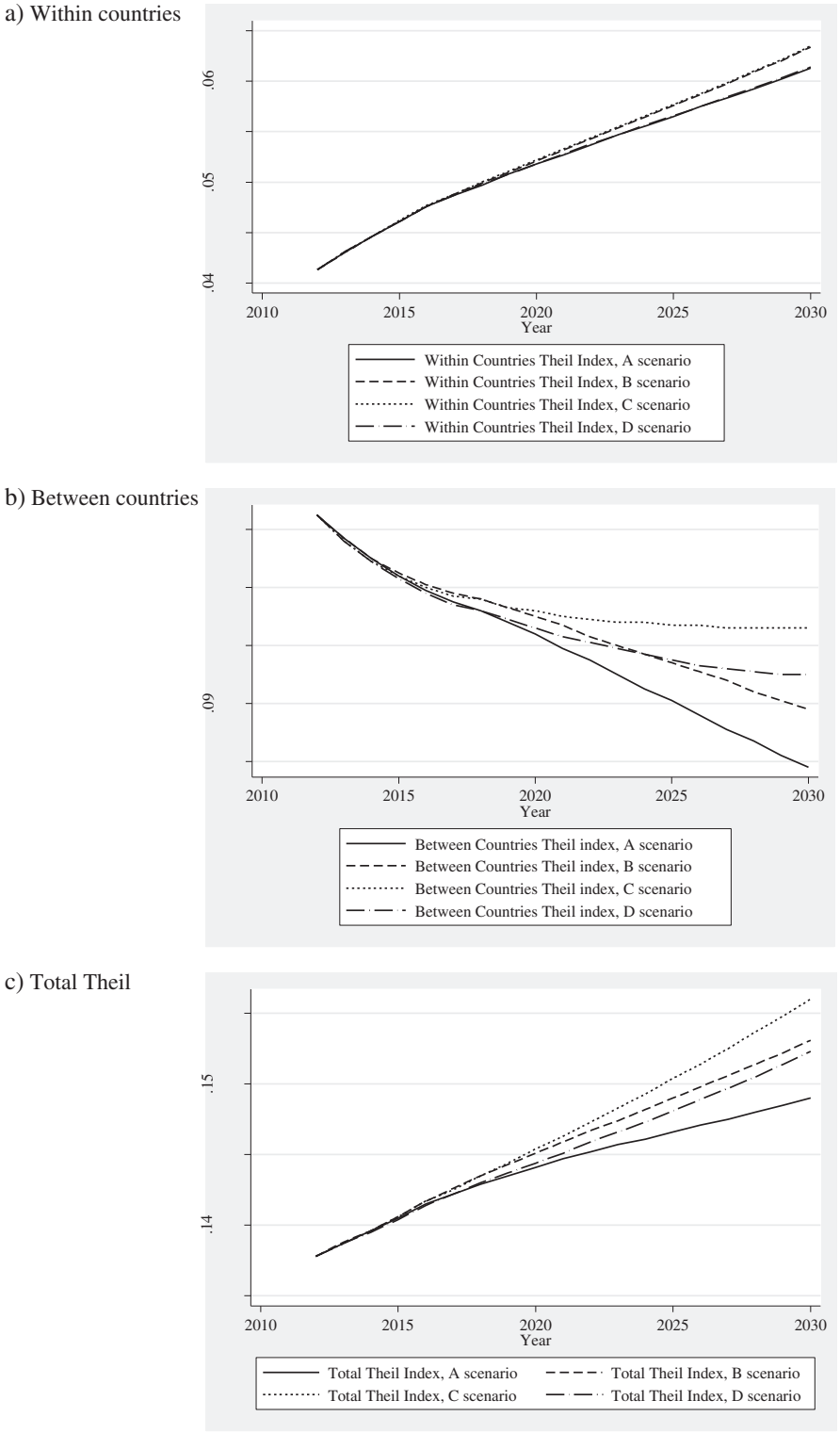


Fig. 6. Trends in regional disparities (Theil index 2012-2030). Source: MASST3 model results.

The *within country* Theil index is presented in Fig. 6.a. All four scenarios are characterized by an increasing level of internal disparities, due to the fact that the concentric trends present after the crisis are not curbed by any particular scenario assumption, nor by any specific policy. The four scenarios are quite similar in terms of internal disparities, but of the four

scenarios, the minimum level of *within country* disparities is achieved in scenarios A and D, those where the EU15 adopts a post-industrial strategy.

Fig. 6.b presents the *between country* Theil indicator. In this case, the four scenarios are highly differentiated although all of them are characterized by a decreasing level of international disparities, mostly due to the fact that the CEECs are never significantly outperformed by the Old 15 in any scenario. The decrease of *between country* disparities is quite uniform until the first years after the end of the crisis (assumed in 2015 in all scenarios). However, since then, patterns become highly differentiated, with the A scenario being the most convergent and the C scenario the least convergent. Scenario B also has a pattern of relatively fast convergence, while scenario D is less convergent.

Scenario A, the one in which CEECs adopt a modernizing strategy and the EU15 adopts a post-industrial strategy, is the most convergent, also because in this scenario, the growth rate of CEECs is 0.4% higher. If CEECs maintain the modernizing strategy, while the EU15 adopts an industrial strategy (scenario B), this brings slightly higher international disparities (since Eastern countries now outperform the Western ones by 0.24%). However, both groups of countries benefit from the B scenario, even if to a different extent, which makes it the most favorable (also in terms of disparities).

In scenarios C and D, the growth rate of CEECs is very similar to the one of EU15, which makes the reduction of international disparities much smaller. This suggests one more crucial finding of these analyses: *Eastern countries lose also in terms of catching up, if they do not move to a courageous modernizing strategy*. The reduction of *between country* disparities is lower in scenario C with respect to scenario D, where CEECs are left with an incomplete process of modernization and the EU15 adopts an industrial strategy. In this case, in fact, the growth rate of CEECs is even smaller than the one of EU15.

Because of its additive nature, the total Theil index is the sum of the other two and shows divergence in all four scenarios (Fig. 6.c), driven by inter-regional divergence. The least divergent is experienced in scenario A, the one in which there is more international convergence. The maximum of diver-gence is achieved in scenario C, which has the least interna-tional convergence, while scenarios B and D are very similar, even if because of different trends, B having more *within country* disparities and D facing more *between country* disparities.

6. Conclusions and policy implications

The paper has presented possible alternative growth strategies that the two blocks of European countries (Western and Eastern countries) can put in place to react to the structural changes produced by the crisis that call active industrial strategies. Scenarios are built in such a way that the results obtained depend on an interaction of different strategies of the two groups of countries.

Results are rather interesting and have clear policy relevance. A general remark is that the effects of Eastern countries' development strategies are highly influenced by the strategies chosen by the Western countries, while the opposite does not hold.

The most expansionary result is obtained by a regain of industrial activities of the Western economies: when the EU15 moves towards a renewed and advanced industrial model, also Eastern countries gain more. If the choice of an industrial growth model of Western countries is matched by an effort of Eastern countries to move towards a modernization of their economies, the result achieved is even greater (scenario B with respect to C). Interestingly enough, scenario D, the most similar to the present situation, in which both groups of countries increase the quality of the strategies but remain in their actual productive specialization trajectories, is the least expansionary.

Results of the scenarios presented in this paper become particularly relevant when seen from the perspective of the recent attention paid in several advanced economies to the possible reshoring of manufacturing activities. EU's Industrial Compact (Tajani, 2013), Juncker's Investment plan, and the recent industrial policy communication "for a European Industrial Renaissance" (EC, 2014) for the EU, and Obama's new industrial policy for the US (Cooney, 2014), point at a renewed interest for industrial policies as means to revitalize either gasping economies, as in the case of several EU countries, or to fully reap the benefits of a full-fledged economic recovery, as in the case of the US. The results discussed in this paper enter the debate on the rationale for such industrial policies and provide a first assessment of the possible outcomes for future growth in EU regions.

Specific policy implications can also be highlighted for CEECs. Even if their future trajectories strongly depend on what happens in the Western countries, a modernizing strategy is the most expansionary one for Eastern countries. If Western countries also move towards an industrial strategy, a modernizing strategy pays off the most. More than competition effects that could arise when both blocks of countries pursue an advanced industrial strategy, input–output linkages and synergy effects between complementary industry activities seem to take place and generate their positive spillovers. Moreover, if Western countries pursue a strategy of reinforcing their service activities and opt for a post-industrial strategy, Eastern countries' best strategy is a modernizing one (scenario A).

In terms of regional disparities, a further interesting result emerges. A modernizing strategy for Eastern countries does not mean, as expected, higher increases in regional disparities; on the contrary, this choice is associated to lower increases in regional disparities, whatever the choice of Western countries is, thanks to the spillovers and positive effects that modernization generates in all sectors and regions that drive to higher GDP growth rates in Eastern countries, and a relatively lower international disparity level. This is an important encouragement for moving towards an endogenous growth pattern in CEECs.

Technical appendix

Scenario assumptions are needed to build consistent entries for the exogenous variables of the model, which are introduced in different ways depending on the type of variable. For all

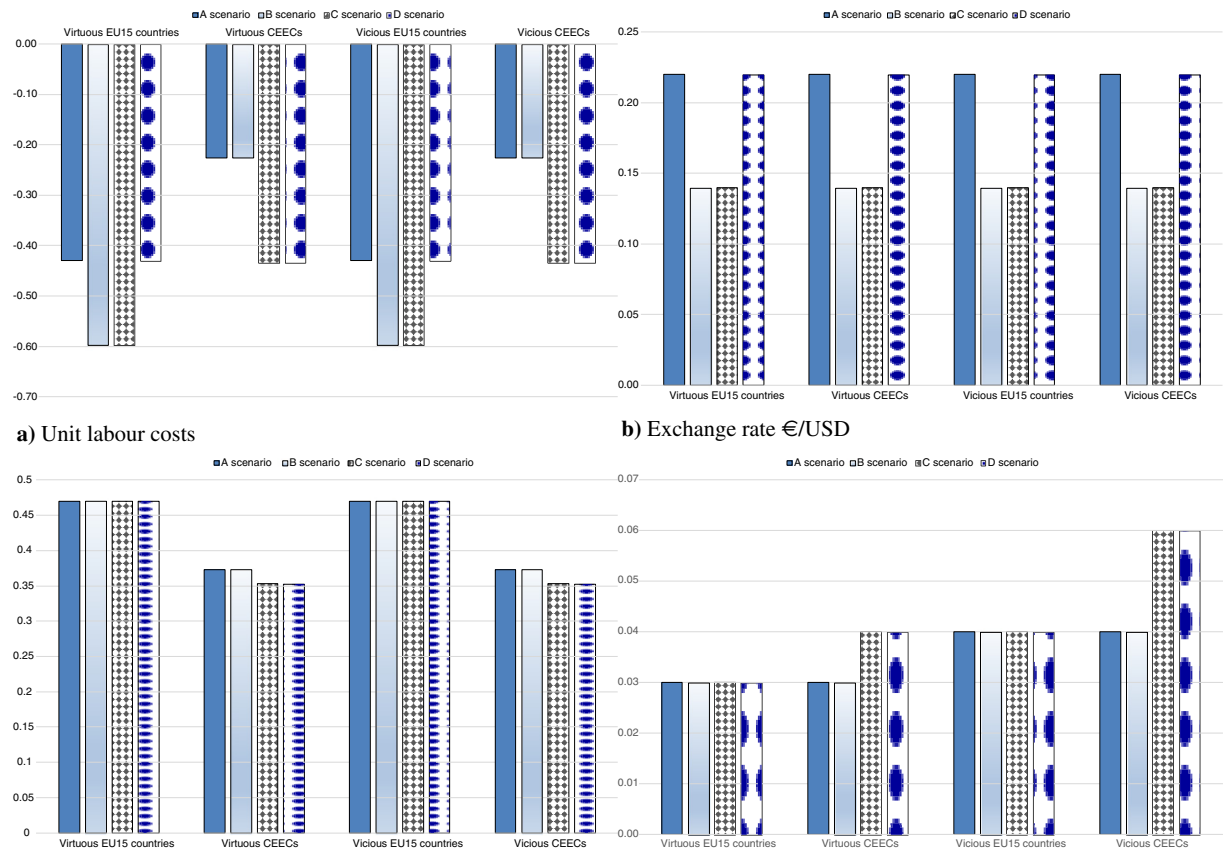
variables, the scenario assumptions are translated into long-run quantitative values, or targets, i.e. values which the exogenous variables tend to attain in the long run. Each exogenous variable starts from its actual value in the last year prior to simulation and adjusts towards its long-term value with an adaptive mechanism as follows:

$$x_t = x_{t-1} + s(T - x_{t-1}) \quad (1)$$

where x is the value of the exogenous variable for a given region/country, T is the long run (target) value to which the variable converges, and s is the speed of adjustment. A value of 1 in the speed of adjustment implies an immediate adjustment (in 1 year) of the variable to its long-term target. However, the speed of adjustment is usually assumed to be lower than 1 and to be faster (i.e. values closer to one) for more reactive variables (such as policy changes) and slower (i.e. closer to zero) for more structural variables such as demo-graphic variables or the economic structure (Capello et al., 2008). The target values can be the same for all geographical units (for example, the euro/dollar exchange rate) or, at the opposite, they can be different for each geographical unit and entered as a vector (for example, at regional level, the policy expenditure) or, as the intermediate and most common option, they can be differentiated by regional/country typologies.

In this Appendix, all major assumptions used to build the four scenarios described in Sections 3 and 5 are presented. As anticipated in Section 5, all targets that are held constant w.r.t. the baseline scenario described in Capello et al. (2015b) are not shown here.

Fig. A1 plots the national targets. Different values for the various groups of countries used in the simulation of the four scenarios are represented as histograms. In particular, we divide the targets by EU15 and CEECs, both in turn classified as virtuous and vicious countries, i.e. those countries experiencing a public debt or not during the crisis years.



a) Unit labour costs

b) Exchange rate €/USD

c) Tax rate

d) Interest rates on public debt

Fig A1. Quantitative national targets.

Fig. A2 shows instead the values for the various typologies of regions used in the simulation of the four scenarios (regions in the EU15 and CEECs, both classified as core area or small- and medium-sized cities and rural regions).

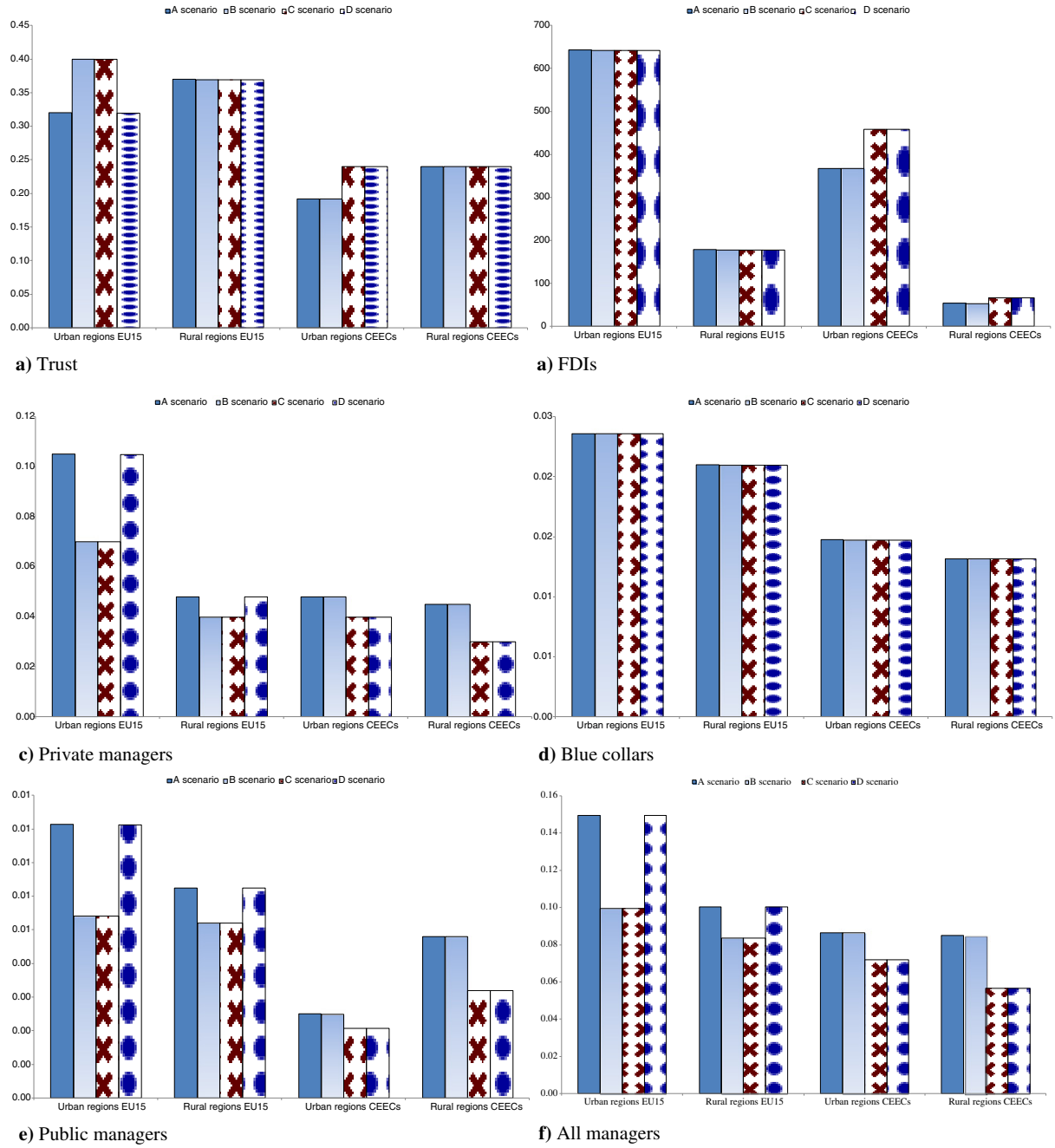


Fig A2. Quantitative regional targets.

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