ISIGrowth, a European project challenging the mainstream paradigm

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Abstract

The 2008 economic crisis has clearly shown the inadequacy of mainstream economic approaches promoting the implementation of austerity measures in Europe. Indeed, a polarization process across European regions has emerged leading to a European periphery strongly hit by the 2008 economic crisis and a EU 'core' increasing its productive capacity (Stollinger et al., 2013; Simonazzi et al., 2013; Cirillo and Guarascio, 2015; Ginzburg and Simonazzi, 2016). In this context, monetary and fiscal policies have become less restrictive and even institutions such as the OECD and the IMF have called Europe and national governments to expand investment, moving beyond the constraints of austerity measures (Prodi, 2014; Quadrio Curzio, 2015; Economia and Lavoro, 2014). However, most of the Euro area is still firmly in the grip of austerity policies. Framed in this context, the *ISIGrowth* research project aims to challenge the mainstream economic paradigm providing policy advices rooted on theoretical and empirical analysis on occupational, industrial and financial dynamics. More than one year since the beginning of the research project, preliminary results show that existent monetary and fiscal policies have failed to reach the declared purposes of unemployment reduction. The aim of the paper is to present an overview of the main results emerging from one year of *ISIGrowth* project focusing on occupational dynamics deriving from the implementation of wrong monetary, fiscal and labour market policies mainly relying on cost competitiveness approaches and wage reduction.

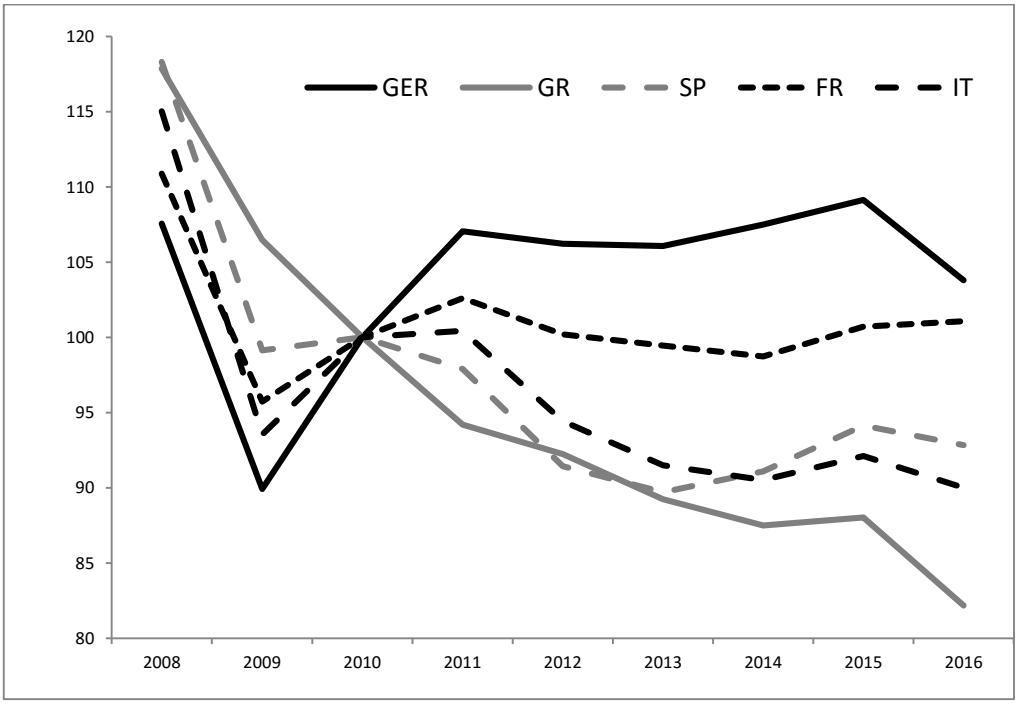
*This paper draws from ISIGrowth working papers published on http://www.isigrowth.eu/

1. Austerity and polarization in Europe

Austerity measures implemented in the Eurozone after the 2008 economic crisis have accelerated the on-going process of polarization across European regions. As underlined in Cirillo and Guarascio (2015), the model of growth and integration followed in Europe during the last decades has been founded on a high degree of capital and goods market liberalization. The economic convergence of EU member states has been one of the fundamental objectives of 'supply side' policy approach implemented mainly in labour markets in order to reduce unemployment and promote inclusion. However, the expected convergence has been limited and the impact of current crisis has led to a growing polarization in terms of employment, competitiveness and industrial specialization. A growing evidence – including Simonazzi et al. (2013), Stoellinger et al. (2013), Landesmann (2013) and Cirillo and Guarascio (2015) - has identified the emergence of a 'German-centred core' – which has maintained employment and production – and a 'Southern periphery' where major losses have occurred. Such geographical dichotomy is also reflected in a polarization of jobs and skills.

The periphery of the European Union – Spain, Portugal, Italy and Greece – has been strongly affected by the 2008 economic crisis, while the centre of Europe – Germany, Czech Republic, Poland, Slovakia and Hungary - managed to contain the effects of the crisis while preserving and, in some cases, increasing its production capacity. The economies of the periphery had a dynamic of constantly lower production than that seen in Germany and France in the period 2008-2016 (Figure 1).

Figure 1. Industrial production index 2008-2016
(GER, FR, IT, SP & GR. 2010=100)



Source: Data from ISTAT

In 2015, after five years of continuous decline, a timid recovery of production has been observed in some countries on the periphery with the exception of Italy characterized by a relatively weaker growth than other EU peripheral countries (the change in the Italian industrial production in 2015 was 1% against a growth of 4.1% in Spain and 1.3% in Greece and Portugal).

Focusing on manufacturing production, table 1 – drawn from Guarascio and Simonazzi (2016) - shows a general picture of the European manufacturing dynamics during the crisis begun in 2008. It emerges, again, a sharp divergence between core and periphery. Looking at the averages of manufacturing production in the German Manufacturing core with respect to the Southern periphery, it clearly emerges a sound difference across regions. In Southern Europe, the percentage change of the production index compared to the previous year is always negative with the exception of 2014 and 2015, while for the German Manufacturing core the percentage change of manufacturing production of one year to the previous one is always positive suggesting an increasing trend stopped only in 2008-2009 in correspondence of the edge of the crisis.

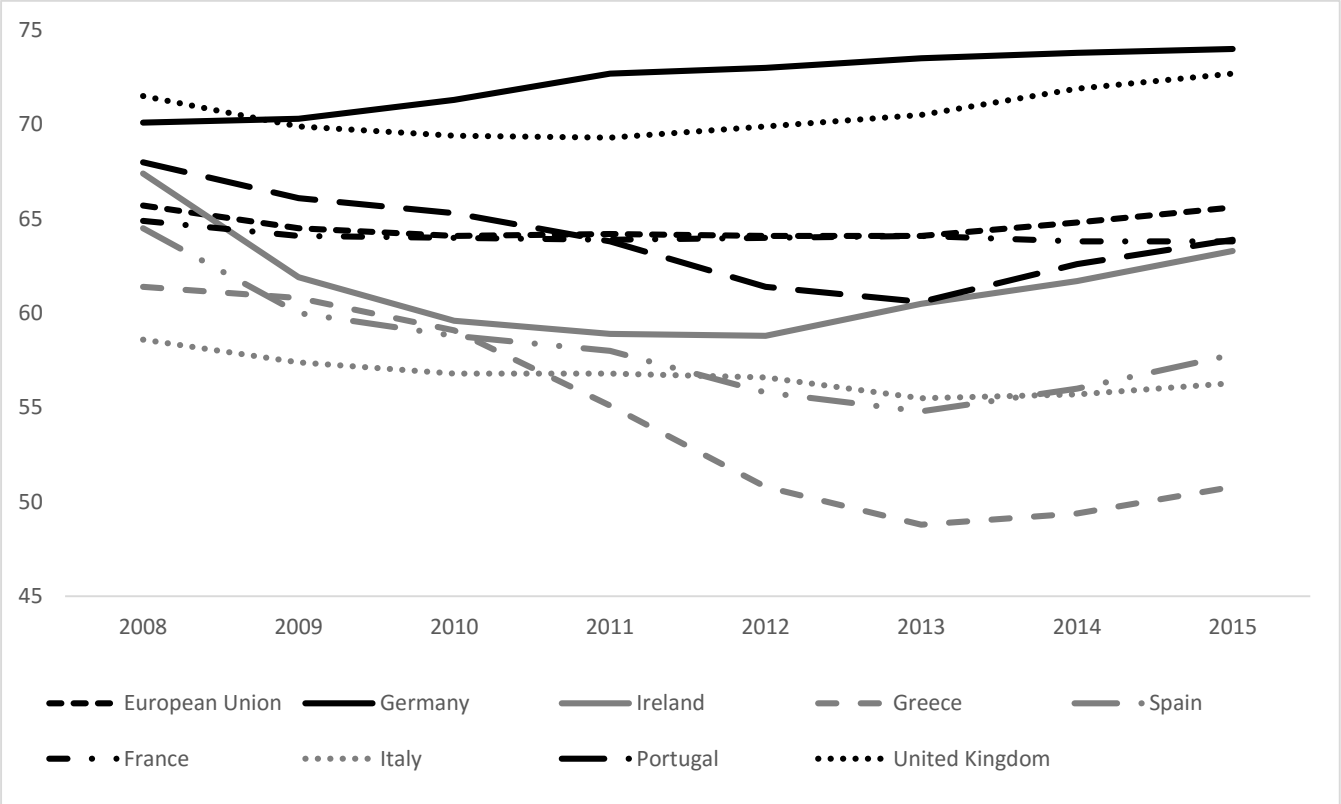
Table 1. Manufacturing production in Europe – core vs. periphery
(Index of production, percentage change compared to the previous year. 2008-2015)

COUNTRY	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	*2014*	*2015*
EUROPEAN UNION	-1,9	-15,1	7,4	4,6	-2,2	-0,5	2,1	1,9
GERMANY	0,3	-17,2	11,7	8,6	-0,5	0,2	1,9	0,4
AUSTRIA	0,9	-12,7	7,0	6,9	-0,4	1,1	1,1	2,0
POLAND	2,5	-3,5	13,0	7,7	1,4	3,0	4,3	5,4
CZECH REPUBLIC	-2,0	-14,7	9,4	7,6	-0,6	1,0	6,7	5,9
HUNGARY	-1,5	-18,2	11,6	6,0	-1,2	1,8	8,2	7,8
SLOVENIA	1,7	-19,1	7,4	1,9	-1,7	-2,0	3,7	5,9
SLOVAKIA	16,5	-18,7	9,8	7,0	11,5	4,9	10,6	7,5
GERMAN MANUFACTURING CORE	1,6	-15,0	9,4	6,1	0,4	1,0	4,5	4,3
FRANCE	-4,0	-15,0	3,8	4,0	-2,7	-0,7	-0,1	1,7
ITALY	-3,5	-19,4	7,1	1,6	-6,8	-2,9	-0,1	1,1
GREECE	-4,7	-11,2	-5,1	-9,1	-3,5	-1,1	1,8	1,3
SPAIN	-8,3	-16,6	0,5	-1,1	-7,8	-1,3	2,0	4,1
PORTUGAL	-3,9	-10,3	2,2	-0,8	-2,4	0,8	1,7	1,3
SOUTHERN EUROPE	-4,9	-14,5	1,7	-1,1	-4,6	-1,0	1,1	1,9
PERIPHERY	-5,5	-15,7	0,8	-2,9	-6,0	-1,8	1,2	2,2

Source: elaboration on Eurostat data. Note: data are seasonally and calendar adjusted. The 'German manufacturing core' (Simonazzi et al., 2013; Stollinger et al., 2013; Cirillo and Guarascio, 2015) includes Germany, Austria, Poland, Czech Republic, Hungary, Slovenia and Slovakia; the Southern periphery includes all the Mediterranean countries and France; the Periphery comprehends all the Mediterranean countries (Italy, Greece, Spain and Portugal)

A pattern of polarization also emerges focusing on employment dynamics as depicted in figure 2. The average employment rate of major European countries located in the periphery of EU stays below the average European Union employment rate – around 65% over the period – with the only exemption of Germany and United Kingdom whose average employment rates are constantly above over the entire period (2008-2015).

Figure 2. Employment rates in European countries (2008-2015)



Source: Eurostat – LFS

In the next table, we explicitly consider the nexus between changes in fiscal consolidation as a proxy for austerity measures – the change in government deficit/surplus as a GDP share over the period 2008-2015 – and the change in employment rates over the same period. The poor occupational performances of European countries in the periphery – Ireland, Greece, Italy, and Portugal – are generally associated with measures of fiscal consolidation as in Greece reducing its net borrowing position from 10.2% on GDP to 7.2%.

Table 2. Fiscal consolidation and employment rates in European countries (2008-2015)

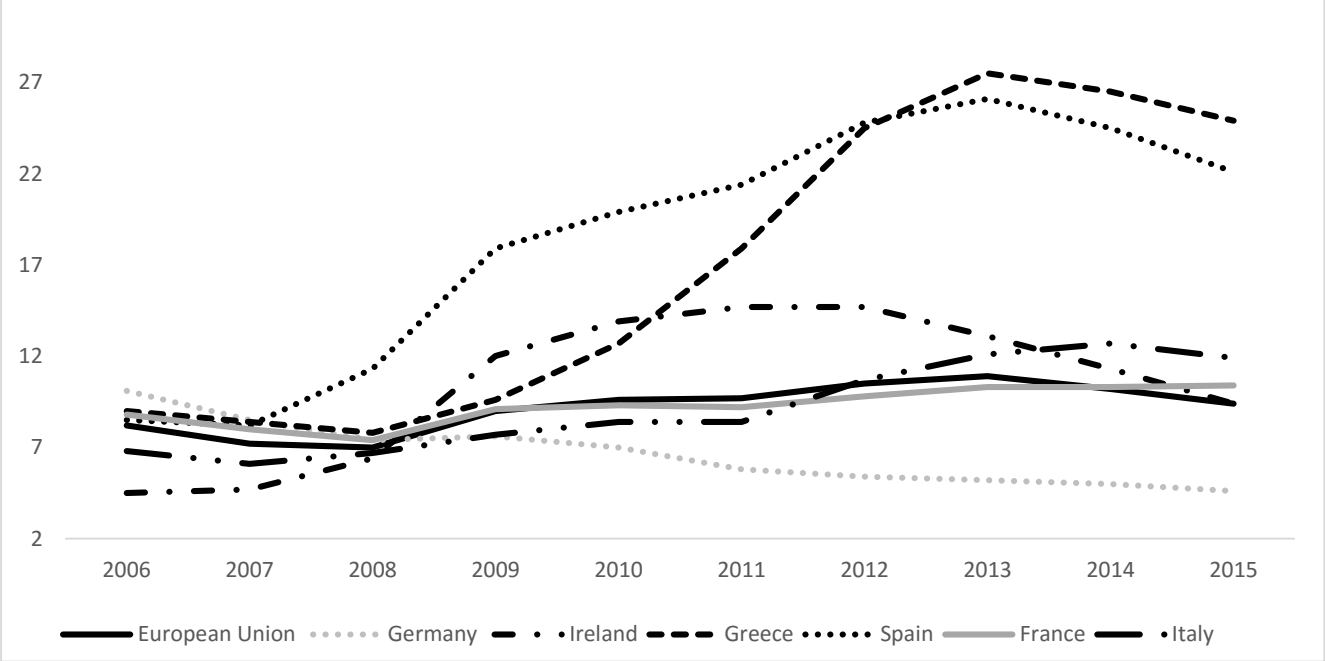
	NET LENDING (+) / NET BORROWING (-) AS SHARE OF GDP		CHANGE IN EMPLOYMENT RATE
	2008	2015	2008-2015
EUROPEAN UNION	-2.4	-2.4	-0.1
BELGIUM	-1.1	-2.6	-0.6
BULGARIA	1.6	-2.1	-1.1
CZECH REPUBLIC	-2.1	-0.4	3.6
DENMARK	3.2	-2.1	-4.4
GERMANY	-0.2	0.7	3.9
ESTONIA	-2.7	0.4	1.8
IRELAND	-7	-2.3	-4.1
GREECE	-10.2	-7.2	-10.6
SPAIN	-4.4	-5.1	-6.7
CROATIA	-2.8	-3.2	-4.2
ITALY	-2.7	-2.6	-2.3
CYPRUS	0.9	-1	-8.2
LATVIA	-4.1	-1.3	-0.1

LITHUANIA	-3.1	-0.2	2.8
LUXEMBOURG	3.4	1.2	2.7
HUNGARY	-3.6	-2	7.5
MALTA	-4.2	-1.5	8.4
NETHERLANDS	0.2	-1.8	-3.1
AUSTRIA	-1.4	-1.2	0.3
POLAND	-3.6	-2.6	3.7
PORTUGAL	-3.8	-4.4	-4.1
ROMANIA	-5.5	-0.7	2.4
SLOVENIA	-1.4	-2.9	-3.4
SLOVAKIA	-2.3	-3	0.4
FINLAND	4.2	-2.7	-2.6
SWEDEN	2	0	1.2
UNITED KINGDOM	-5	-4.4	1.2

Source: Eurostat

In this context of disruption of industrial production and massive unemployment mainly in the periphery of the European Union – see Figure 3 -, monetary and fiscal policies have become less restrictive and even institutions such as the OECD and the IMF have called Europe and national governments to expand investment, moving beyond the constraints of austerity measures (Prodi, 2014; Quadrio Curzio, 2015; Economia and Lavoro, 2014).

Figure 3. Unemployment rates on total active population (2006-2015)



Source: LFS, Eurostat

However, most of the Euro area is still firmly in the grip of austerity policies. Framed in this context, the *ISIGrowth* research project aims to challenge the mainstream economic paradigm providing policy advices rooted on theoretical and empirical analysis on occupational, industrial and financial dynamics.

In the next section, after revising the main aims of ISIGrowth research project, we present major results emerging after one year of ISIGrowth.

2. *ISIGrowth* challenging the mainstream economic paradigm

2.1 Aims of the project

The main goal of ISIGrowth project is twofold. First, it aims to provide novel and comprehensive diagnostics of the relationships between innovation, employment dynamics and growth in an increasingly globalized and financialized world economy. Second, on the grounds of such diagnostics, it aims to elaborate policy scenarios delivering a coherent policy toolkit to achieve the Europe 2020 objectives of smart, sustainable and inclusive growth.

Therefore, in order to deliver comprehensive diagnostics and coherent set of policy tools beyond the mainstream approach, the analysis is undertaken from several, highly complementary, angles:

- ✓ The analysis of long-term dynamics of European economies, in comparison with the United States, Japan and some major emerging economies, with respect to their degrees of innovativeness; their patterns of structural transformation; the sectoral and regional shifts in innovation, productivity and employment; and their growth performances.

- ✓ The study of dynamics of global production and financial networks allows placing the European macroeconomic, sectoral and micro dynamics in the context of a world economy characterised by increasing globalisation of production and, to an even faster pace, by finance. To varying degrees, European economies are displaying a significant tendency toward deindustrialisation, with profound consequences in terms of income distribution and employment.

- ✓ The nature and drivers of the observed increasing inequality in an attempt to disentangle purported 'skill biases' of technical change, 'globalisation effects', 'financialisation effects' and possible broader institutional causes.

- ✓ The analysis of multiple links between the financial sector and the real economy, which are important for the rates of innovation, growth and income distribution.

- ✓ The dual role of innovation as a driver of income and employment growth and a labour-saving factor, relating the ensuing patterns to the flows of job creation and destruction is explored.

- ✓ The links between 'Schumpeterian' patterns of innovation and 'Keynesian' mechanisms of demand generation, and study the conditions under which their combination can drive socially inclusive and environmentally sustainable growth.

- ✓ An ensemble of policies (innovation, industrial, fiscal and monetary policies) and an agenda of structural and institutional reforms can help unlock European economies from the current crisis and put them on solid, socially-inclusive growth paths.

ISIGrowth addresses these points from both a theoretical and an empirical, intensively data-driven perspective on the basis of the idea that the economy and its main domains (e.g., technologies, agents, social relations and institutions) should be studied accounting for both their powerful inter-domain interactions and their specific nature (for example, the peculiar rules that shape and constrain every inducement and adjustment mechanism between them). A complex evolving

nature of the economy (Kirman, 2010; Arthur, 2013; Dosi, 2013) is acknowledged arguing that only a limited number of its configurations allow a relatively 'well-regulated' and smooth consistency between them (that is, the 'possible worlds'). This complex and evolutionary view of the economy characterises a fundamental domain for policy intervention and institutional engineering.

After slightly more than one year, the project has significantly advanced along all the foregoing directions.

Major contributions on the "diagnostic" side include:

(i) The characterization of the different European "Systems of innovation" in a comparative perspective;

(ii) Further evidence on the changing international division of labour, characterized by an overall European de-industrialization but with notable exceptions, in primis Germany, and some Eastern European countries;

(iii) A dramatic 'finacialization' of all economies, albeit at different rates and its effects on the real sector of the economy;

(iv) Novel comparative insights on macro to micro links – from macro policies to microeconomic and sectoral patterns of innovation and structural change, also building on the comparison between the experiences of Latin America and the Far East;

(v) Significant inroads on the debunking of the purported link between supposedly 'skill-biased' technical change and increasing inequality;

(vi) The evidence on the micro and sectoral relations between innovation and the dynamics of labour demand.

On the theory side, major advances have been made on the modelling and exploration of:

(i) The links between 'Schumpeterian' innovation processes and the "Keynesian" demand-generation mechanisms;

(ii) The relations between finance and real dynamics ("Minsky meeting Keynes meeting Schumpeter…");

(iii) The impact of labour market organization upon aggregate dynamic patterns, and the related debunking of the magic of 'structural reforms'.

Finally, on the policy side, the project has already offered important insights on:

(i) The crucial role of publicly sponsored "mission oriented" programs both as engines of innovation and drivers of macro growth;

(ii) The importance of (expansionary) fiscal policies, and, conversely, the self-defeating impact of austerity ones;

(iii) The design and impact of 'green' policies.

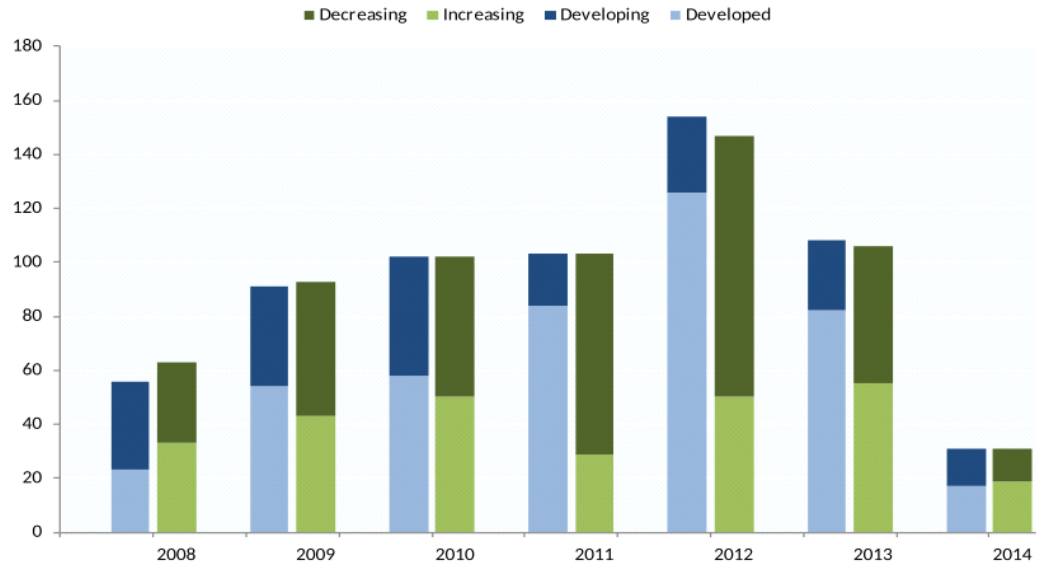
2.2 Main results in one year of ISIGrowth project on occupational, industrial and financial dynamics

Occupational dynamics and labour market reforms

Adascalitei et al. 2015 realize a compendium on the labour market reforms implemented during the period 2008-2014 over 111 countries. They find how the majority of the labour maket reforms were undertaken in advanced economies. Figure 4 classifies decreasing vis-a-vis increasing policy interventions. Decreasing policy reforms are those direct at reducing workers bargaining power and labour protection. Figure 4 clearly shows a trend in implementing reforms aimed at make labour market more flexible especially in developed countries. The authors break downs the overall packages of reforms in six categories, namely, collective dismissal, permanent contracts, temporary contracts, working hours, other forms of employment and collective bargaining.

Figure 4. Sources Adascalitei et al. 2015

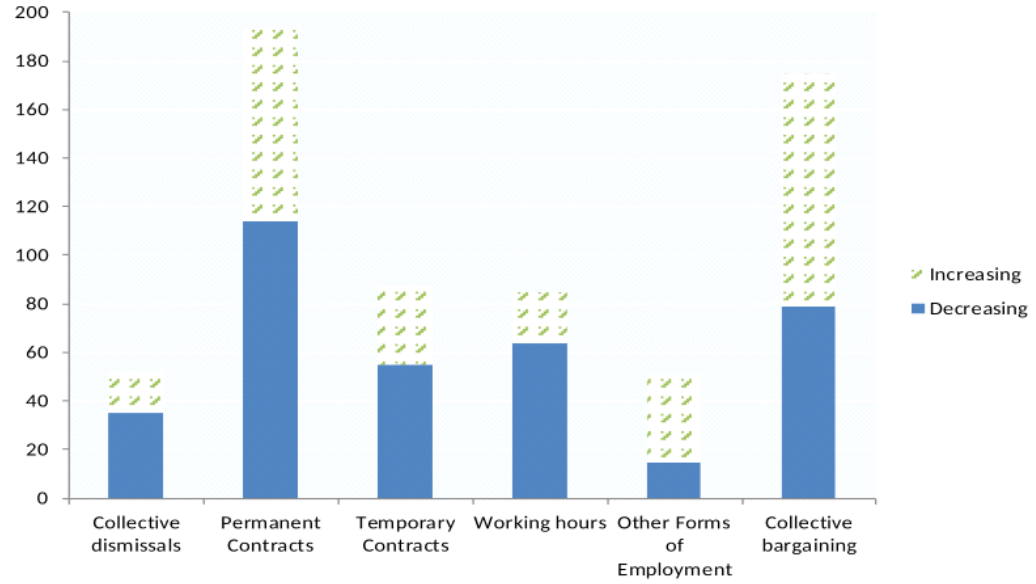
Figure 4: Number of changes in labour market regulation by year of implementation



Note: Data for 2014 is preliminary.
Source: Authors' calculations based on Natlex, EPLex, Eurofound, LABREF and ILO (2012a).

Figure 5. Sources Adascalitei et al. 2015

Figure 5: Number of changes in labour market regulation by policy area, 2008-2014



Note: Data for 2014 is preliminary.
Source: Authors' calculations based on Natlex, EPLex, Eurofound, LABREF and ILO (2012a).

The Eu member states were among the more active countries in liberalizing the labour markets in the aftermath of the crises.

> Quoting from the report:
> "In advanced economies and the EU a total of 444 changes to labour market regulation have been registered between 2008 and 2014 – equal to 69 per cent of the registered changes. These changes have mostly concerned the regulation of permanent employment contracts (135 changes), collective bargaining legislation (83 changes) and working hours (77 changes). Overall, 68 per cent of these changes have decreased existing levels of protection in an effort to facilitate the capacity of firms to adjust over the business cycle. Examples include the reduction of severance payments for unjustified dismissals in Spain from 45 to 33 days per year worked, the cut from one year to 60 days of the length of time employees have to launch an unfair dismissal claim in Portugal and the shortening of the notice period from 24 to six months in Greece for workers with at least 28 years of job tenure. In other cases, the possibility for the employers to adjust working hours over the business cycle has been increased in an effort to avoid layoffs. These include increasing the maximum period allowed for the recourse to limited working hour schemes in Austria and Germany." (Adascalitei et al 2015, pag 15).

The purported aim of the policy intervention was the one of promoting employment rate. Unfortunately there is very little evidence on the beneficial effects of structural reforms on labour market outcomes.
The well-known OECD (1994) Jobs Study was among the first studies to advocate the benefits from labour market liberalization. The report and a series of subsequent papers (including Scarpetta, 1996; Siebert, 1997; Belot and Van Ours, 2004; Bassanini and Duval, 2006) basically argued that the roots of unemployment rest in social institutions and policies such as unions, unemployment benefits, employment protection legislation. Unfortunately, at least an equivalent numbers of papers pointed out the fragility and unreliability of the empirical evidence used to support the claim. Particularly, Howell et al. (2007), reviewing the findings on the effects of protective labour market policies (PMLI)

on unemployment, argue that the evaluation of the effects of PMLI has been biased by a number of factors: (i) the findings were largely theory driven discarding the empirical evidence, (ii) the explanatory powers of labour market institutions as sources of unemployment decline with the quality of the PMLI indicators and the sophistication of the econometric methodology, (iii) inclination to violate the mantra against endogeneity, phrasing simple cross-correlations as evidence of causation, (iv) remarkable differences in the magnitude of coefficients, statistical significance, and estimation methodology across the works. Even more distinctively, Oswald (1997), Baccaro and Rei (2007), Avdagic and Salardi (2013), Avdagic (2015) and Storm and Naastepad (2012) on more recent datasets find no compelling evidence on the revealed benefits of labour market liberalization. In fact, Adascalitei and Pignatti (2015) and Adascalitei et al. (2015) find that higher labour market flexibility increases short run unemployment rate and, together, reduces employment rates.

More specifically on Italy, Fana et al. (2016) – as a part of the ISIGrowth project - have analysed the law 183 of 2014, named the "Jobs Act" which has determined a deep change in the Italian industrial relations. The Jobs Act has introduced a new contract type - 'contratto a tutele crescenti' - implying a substantial downsize of obligation for workers' reinstatement in case of firms invalidly firing them. The new permanent contract is therefore deprived of the substantial requirements of an open-ended contract. The Law has also weakened the legal constraints for firms intending to monitor workers through electronic devices and introduced new incentives for firms using temporary contracts. This work frames the Jobs Act within the overall labour market reform process occurred in Italy since mid-nineties and provides a first evaluation of its impacts on the Italian labour market. Taking advantage of different data sources (administrative and labour force data) and concentrating the analysis over the period after the Jobs Act implementation, the investigation provides the following results: the expected boost in employment growth is not detected; an increase in the share of temporary contracts over the open-ended ones is observed; a raise of part-time contracts within the new permanent positions emerge. The analysis shows that the Jobs Act failed in achieving its main goals. The authors discuss the observed evidence evaluating the appropriateness of the Law 183/2014 in the present Italian economic context accounting, in particular, for the structural effects of the 2008 economic crisis.

Industrial dynamics

- ✓ *Structural change, sectorial and regional shifts in innovation, productivity and employment in the EU*

We are studying shifts in employment between manufacturing and service sectors and the role of R&D investments as well as productivity dynamics in this process. In particular, relying on World Bank as well as on OECD STAN sectorial-level data for European countries the following questions have been addressed: (i) How has the overall employment share of the manufacturing respectively the service sectors evolved over time in different European countries? Are there qualitative differences in the evolution between 'old' and 'new' EU member countries? (ii) How is the shift in employment shares related to (country-specific) changes in labour productivity? Does it contribute to a faster increase in total labour productivity? (iii) What is the impact of (country- and sector-specific) R&D expenditure on employment in a sector? Is there a systematic difference with respect to this impact between manufacturing and service sectors? The motivation that took us to explore these questions is twofold. First, it helps to identify the driving forces of the observed sectorial employment shifts. Second, and more importantly, gaining a better understanding of the role of R&D for employment and for sectorial shifts clearly has important implications for innovation policy. If certain sectors can be identified in which increases in R&D investments tend to have particularly strong positive effects on employment, then fostering investments in those sectors would not only have direct effects on productivity and international

competitiveness in such sectors but would also contribute to positive second order effects through demand stimulation and human capital improvements, e.g. through learning by doing effects. Also, the analysis performed sheds light on the question of how far the observed shifts in employment might be desirable or at least necessary from the perspective of overall labour productivity increases. The scientific output produced on this regard is contained in Mitkova M. and Dawid, H. "An Empirical Analysis of Sectoral Employment Shifts and the Role of R&D", ISIGrowth WP 27/2016.

- ✓ *The dynamics of EU countries and sectors in global production networks*

Drawing on a large database of publicly announced R&D alliances, we have carried out a detailed empirical investigation of the evolution of R&D networks and the process of alliance formation in several manufacturing sectors over a 24-year period (1986-2009). This work is contained in Tomasello M., Napoletano M., Garas A., and Schweitzer F. "The Rise and Fall of R&D Networks", ISIGrowth WP 8/2016. More precisely, we find that most network properties are not only invariant across sectors, but also independent of the scale of aggregation at which they are observed, and we highlight the presence of core-periphery architectures in explaining some properties emphasized in previous empirical studies (e.g. asymmetric degree distributions and small worlds). In addition, we show that many properties of R&D networks are characterized by a rise-and-fall dynamics with a peak in the mid-nineties. Via regression analyses we show that such dynamics is driven by mechanisms of accumulative advantage, structural homophily and multiconnectivity. In particular, the change from the "rise" to the "fall" phase is associated to a structural break in the importance of multiconnectivity.

- ✓ *The determinants of international competitiveness at the level of countries, sectors and firm*

We are carrying out research in several directions. First, by using data on the universe of Italian firms, we are studying how firm's export status influences the patterns of growth at different firm age classes and conditional on firm size. Results obtained so far show that the positive effect (on productivity) associated to the export status declines with firm age. Second, by combining detailed firm-level (balance-sheet), trade (export flows) and labour (employer-employee) datasets on the universe of French firms, we are studying whether a change in firms' labour organization is associated with an increase in their export diversification and performance. Preliminary results show that exporters have indeed a more complex organization in terms of hierarchical layers. A change in the labour organization may thus be a pre-requisite to raise productivity and face higher trade costs on more difficult markets.

- ✓ *Empirical evidence on human capital formation and inequality*

The report 'Human Capital & Inequality' explores the relationship between innovative activities of firms and the level and dispersion of wages paid by these firms. The study is based on firm level data from the European Union Structure of Earnings Survey (SES) and the Community Innovation Survey (CIS) employing OLS and Quantile Regressions. The main findings are that there is a positive association between firms' innovative activities and the average wages they pay, where this relationship is strongest for small firms. With respect to within firm wage dispersion, it is shown that innovation on average increases wage dispersion in small firms, whereas the opposite is true for medium-size and large firms. These qualitative findings hold across firms with different wage levels and different levels of wage-inequality.

- ✓ *Understanding the interplay between skill dynamics and innovation*

A systematic review of the existing work on the relationship between technological change, skill dynamics, employment and wages has been carried out. In particular, empirical studies on these issues carried out for different countries and sectors have been collected and compared. Furthermore, within this task a computational model has been designed and implemented, which aims to investigate the effect of different remuneration schemes for firm managers, which can be seen as a proxy for different ownership structures, on the allocation of firm investments between short and long term activities. In particular, a simple industry model is considered, where managers decide about investments in innovative activities, which have positive long run effects on productivity, and share buybacks (respectively share emissions), which potentially have short term impact on the stock price. The model includes a rudimentary representation of the market for the firm stocks, which captures the impact of firms' investment decisions on stock prices. Managers are remunerated by a weighted mix of fixed salary, profit dependent component and stock options. The model will allow insights into the effects of changes in this remuneration scheme and expected duration of the managers' tenure in the job on individual firms' investments, relative performance and industry dynamics.

Financial dynamics

- ✓ *Finance, innovation and inequality*

The task has consisted mainly of two activities. First, in order to study how the presence of a public actor producing a new technology of uncertain success affects the imbalance of risks and rewards between the public sector and private firms, an agent-based model has been designed, in which a public sector agent explores a rugged NK-type technology landscape with adaptive walks. Private firms are able to build on these explorations, and, by performing applied R&D, might generate profits. In this way value extraction might arise since the private actors get full benefits from innovation spillovers without re-investing profits to perform further technology improvements. Key questions to be explored in this context are how a potential redistribution of rewards towards the public sector would influence the system-wide innovation performance and which institutional configurations would be supportive in this respect. The second activity in this task focuses on the role of public investment in risky early stage innovation projects taking. The approach takes into account the trade-off between the fact that public investment in certain technologies might act as a focal point for private investments, thereby reducing the danger that investments are so spread out in the technology landscape that they never reach a critical mass needed to make the projects successful, and the danger of under-exploitation of the landscape due to early lock-in of investments to technologies early selected by the public sector actors. A simple model has been designed to capture this trade-off and for baseline cases analytical insights have been obtained. More general scenarios will be explored computationally.

- ✓ *Finance and innovation*

The research in this section of the work package provides data on share buy-backs, dividends and retained earnings in Europe, with a comparison with the United States. These data enable us to measure the extent to which European companies have been afflicted by financialization, and provide indispensable quantitative background for carrying out the industry and companies studies on innovation versus financialization in other parts of work package 4, as described below. We are in the process of gathering the data for European companies. Similarly, research on the components and measure of executive pay in Europe, in comparison with the United States, enables us to determine the extent to which European executives are incentivized and rewarded by stock-based pay, and hence are susceptible to financialized decision-making in corporate

resource allocation. We are in the process of gathering the data for European companies (the analysis on the case of US companies is completed).
In the meantime, OFCE and SSSA have completed an overall assessment of the implications of the general financialization of all western economies in terms of short-termism in investment decisions and propensity to commit resources to uncertain long-term innovative search. The results are presented in Dosi G., Sapio A., Revest, V., "Financial regimes, financialization patterns and industrial performances: preliminary remarks", ISIGrowth Working Paper 22/2016, which is forthcoming in Revue d'Economie Industriel. Ongoing research will contribute with an institutional and empirical analysis of the performance of companies listed on stock market segments and on the main markets involved (France, Germany, Italy, Nordic countries, Japan). The objective is to assess to which extent the stock markets (junior and main markets) influence positively the listed firm's real performances, granting a special attention to European countries. The institutional comparison among junior stock markets in several European countries and in Japan and the collection of data on stock market listed companies has been completed and the empirical analyses has started.

- ✓ *Financialisation, innovative capabilities and global competitiveness*

Two sector specific studies are in progress here: on communication technology industry and on biopharma in Europe. The case of the European communication technology industry: in-depth analysis of case studies is in progress. European cases include Ericsson (in March 2016 an interview was conducted with the Head of Ericsson Vodafone Key Account Office), Alcatel-Lucent (now part of Nokia) and Orange. Two non-European cases will also be included: Cisco (US) and Huawei (China). Biopharma in Europe: A comparative study of pharma/biopharma in the United States and Europe is being carried out, focusing on Pfizer and Merck in the United States and Novartis and Riche in Europe. Data relevant to research on innovation versus financialization are also being collected on a sample of publicly listed biopharma firms in Germany, France, and the United Kingdom, with the size of the sample depending on the possibility for data collection within the constraints of FELU's budget and time.

3. Policy discussion

The interactions between innovation, demand generation and aggregate growth

The task studies the conditions under which higher rates of innovation lead to more sustained economic growth by stimulating aggregate demand instead of yielding labour displacement and income inequality. At the empirical level, the link among innovation, changes in marginal propensities to consume and inequality has been investigated using data-driven methods (i.e. vector auto-regressive models) employing UK households expenditure data and Amadeus data on patent applications. The work shows for specific sectors significant causal effects between demand and innovation, suggesting that an increase of interest in a particular good by consumers brings about a positive response by firms in the form of increase of inventive activity.

The crucial role of fiscal policies for income redistribution, inclusiveness and ultimately sustainable growth

We have started designing an agent-based model to assess the role of fiscal policies as a tool to reduce the inequality in the economy and promote inclusive and sustainable long-run growth. In particular, the model will be employed to study (i) the effects of various fiscal instruments (e.g. different degrees of the progressivity of the tax system, wealth and financial taxes) in tackling inequality; (ii) how different fiscal instruments can allow the government to reap the fruits of

government-sponsored innovations introduced by private firms; (iii) how lower level of inequality, together with the higher amount of resources to support government-funded, mission-oriented research, can put European economies on a more inclusive and sustainable growth path.

Analysing the aggregate outcomes of the interactions between finance, innovative firms and the overall economy

We have been developing a family of agent-based model to theoretically analyse: (i) how access to credit and financial markets affect firms' innovation, investment and production decisions; (ii) the conditions under which financial markets lead to unstable growth regimes, financial crises and which early warning signals can be detected to prevent such crises; (iii) interactions between Keynesian demand-management and Schumpeterian innovation policies under different finance scenarios shaped by macro-prudential regulations (e.g., Basel II vs. Basel III); (iv) which structural reforms are appropriate to improve the growth performance of European economies, under different combinations of innovation, fiscal and monetary policies; (v) the financial systems under which firms have greater incentives to use available financial resources to invest, innovate and increase productivity. Results already obtained on the impact of labour market regimes and "structural reforms" show indeed that more "flexibility " in the labour market yield higher volatility of growth, higher unemployment, and in some circumstances, lower rates of long term growth. In this work, we introduce regime changes capturing a series of alternative policy interventions aimed at making labour markets more flexible. Yet, such policy interventions effectively cause the increase of both functional and personal income inequality, on the one hand, and of the unemployment rate, on the other. Conversely, the model fails to provide any evidence of the existence of an equity-efficiency trade-off. On the contrary, the two dimensions are highly correlated: a larger fraction of unemployed workers (who get reduced or no unemployment benefits) simply increases the level of personal income inequality. Finally, we find robust evidence on how the degrees of job protection and the wage setting policies directly affects functional income distribution. Therefore, are structural labour market reforms a panacea for unemployment, growth and income redistribution? According to the results provided by our model, definitely not, maybe well the opposite. Whenever the institutional structure of labour markets tends to exacerbate the asymmetry in the bargaining power between workers and firms, in favour of the latter, whenever productivity gains are not shared with workers but are retained by capitalists, or unemployment benefits are reduced or eliminated, also the macroeconomic conditions tend to get worse in terms of unemployment rates and the long-run growth of income and productivity. Indeed, it happens that the nearer the system gets to competitive conditions in the labour market, the harder it is for the Schumpeterian engine of innovation and growth to operate. More unequal income distribution and higher unemployment spells induce, via Keynesian dynamics, a stagnationist bias in the aggregate dynamics. On the macroprudential side, we find that the Basel III macro-prudential framework and a "leaning against the wind" monetary policy is the best policy combination to reduce macroeconomic instability.

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