# Structural change and the Crisis in the Italian regions: the causes of the different resilience capacity

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## Abstract

This paper investigates the structural determinants of the recession period occurred after the 2007 crisis in Italy at the regional level. The descriptive and spatial econometric analysis suggest the existence of different regional patterns and performances affected by the ongoing structural change. This process is favouring regions characterised by a higher presence of knowledge and technology-based economic activities. On the contrary, regions where labour mobility towards these sectors is hampered being trapped in low-skilled and routine-based economic activities, are still suffering from the consequences of the 2007 crisis.

## Keywords

Structural change, Regional development trajectories, Knowledge Economy, Spatial regression models

## JEL

**O30, R10, C31**

## Introduction

This paper investigates the structural determinants of the recession period occurred after the 2007 crisis in Italy at the regional level, aiming at identifying the real factors affecting the different post-crisis trajectories of the Italian regions. Italy and its administrative regions represent a particularly interesting case study for several reasons. While the country, among OECD, was one of the less exposed to the financial bubble, it has most severely suffered from the consequences of the 2007 crisis in terms of duration and magnitude. Its GDP decreased as early as 2008 (Fabbris and Michielin, 2010), even though the economy was yet stagnant since the 2000, with a GDP growth rate close to zero (Antonioli et alii, 2013). In addition, Italy is the UE country showing the largest imbalances among regions (Del Monte, 1982; Terrasi, 1999; Quatraro, 2009): whereas northern regions compete with the most advanced European macro-region (the so-called “blue

banana"), southern regions lag behind, with economic performance comparable with those of the less developed European regions. Finally, Italy, along with Germany, is the most manufacturing-oriented economy among UE members, but, differently from Germany, its structural change towards hi-tech manufacturing and knowledge-based services is progressing at a slower pace (Guerrieri and Meliciani, 2005; Quatraro, 2009; Valentini et alii, 2017).

As noted by Fingleton et alii (2012), in the last three decades economic research has basically focused on long-run regional growth patterns and, particularly, on the pace of the convergence process of regional per capita income over time. Only few studies have investigated the variations of regional growth rates over time and the differences of these variations across regions. This work, focused on the recovery of the regional economies after the 2007 crisis and their capability to respond to recessionary shocks, fills this gap for Italy. While some regional economies succeed in undertaking a development path by renewing their economic structure, some others remain stuck in a declining pattern (Martin and Sunley, 2006). Several studies (Pendall et al., 2010; Simmie and Martin, 2010, Xiao et alii, 2017). suggest that these different trajectories can be explained through the concept of resilience. After having been used in the fields of ecology and psychology, the notion of resilience has become familiar to regional and local economic scholars in the past few years (Martin and Sunley, 2015). Countries' and regions' resilience refers to their capacity to respond to shocks and disturbances, such as the economic crisis of 2008, thus on their ability to adapt to new conditions.

As suggested by de Groot *et alii* (2011) the possible causes of the different resilience of European countries and regions can be explained by a) the level of financial and trade integration of each region or country in the global economy; b) the institutional frameworks and peculiarities, c) the differences in the sectoral composition of their economies. Without neglecting the importance of the first two explanations, our work focuses on the last one, by analysing the variations occurred in the sectoral composition of the economy of the Italian regions during the last fifteen years. Our interest is rooted in Delli Gatti *et alii* (2012) theory of "extended crisis" investigating the real determinants - as opposed to financial determinants - that triggered the 2007 crisis and exacerbated its effects in the following recession period. More specifically, Delli Gatti *et alii* (2012) suggested that persistent structural problems arise when a large, but distinctive, sector (agriculture in 1929, manufacturing in 2007) suffers from a major fall (in terms of output prices, wages and employment) due to an excess of output, subsequently affecting the whole economy (because of barriers to labour mobility).

In the following pages, the extended crisis theory will be enriched according with the principles of the Knowledge Economy paradigm (OECD, 1996), suggesting that modern societies and economies are increasingly driven by knowledge production, distribution and consumption, which boost innovation. Since knowledge and innovation are mainly embedded in certain kinds of economic activities (Muller and Zenker; 2001; Muller and Doloreux., 2009). such as hi-tech manufacturing and knowledge-based services, the classic distinction between manufacturing and services must be revised and articulated. Grounding on these theoretical bases, the analysis, while confirming the existence of significantly different regional patterns, corroborates the idea that regions characterised by a faster transition (thus showing a higher level of resilience) towards the knowledge economy are performing better in the aftermath crisis period. Specifically, regions with the best

performances in knowledge-based and hi/medium-tech economic activities and where LKIS played a less important role, are the regions where GDP trends have dropped less dramatically.

The work is organised as follows: after having described the theoretical background that underpins the paper, section 2 will provide a descriptive analysis regarding the structural change occurred in the Italian regions between 1995 and 2015, whereas section 3 performs a spatial econometric analysis aimed at drawing some conclusion about the existence of different regional patterns after 2008.

## 1. An overview of the 2007 crisis and structural change in Italy

Mainstream economics argues that the 2007 US crisis was triggered by the collapse of the subprime mortgage market, that occurred after a five years period of credit boom and a major housing bubble, during which house prices grew by almost 11% per year (Acharya and Richardson, 2009). In October 2008, the crisis spilled over in the advanced countries because of the subprime mortgage derivatives held by their bank systems, finally leading to the crash of the interbank market (Bordo, 2009). Even though EU countries, followed by US Treasury, reacted guaranteeing all interbank deposits and injecting massive liquidity in the financial system, the supply of capital to creditworthy institutions and private citizens dropped significantly.

The private financial crisis ended up having an important knock-on effect on the real economy and on the following recession, even though, as noted by Acharya and Richardson (2009), it is difficult to quantify its impact. Part of the recession could be attributed to the downward trend in housing prices started in 2006, thus before the financial crisis, which heavily affected households' wealth. This gave rise to a vicious circle triggered by the financial crisis: the losses faced by highly leveraged financial institutions led to a credit crunch which decreased the asset price leading to a slump in the capital goods spending, finally enhancing the overall economic contraction. In 2009 the EU GDP fell by 4.1% and industrial production by 20% (EC, 2014). The situation was further deteriorated by the subsequent sovereign debt crisis in 2010. The following austerity policies at both national and local levels characterised by cuts in public service and expenditures, as well as by an increasing taxation, enhanced the recessive effects of the crisis - at least in the short run (EC, 2013). Even assuming that the 2007 crisis was only due to financial factors,[1] what is left relatively unexplained is the reason why the crisis lasted so long and why some countries, like Italy, which was less financially exposed to the subprime meltdown (Quaglia, 2009), were so strongly affected.

Delli Gatti *et alii* (2012) suggest that persistent structural problems arise when a large key sector of the economy suffers from a major decline, subsequently affecting the whole economy. This decline can be caused by a rapid but uneven productivity growth in the concerned sector, associated with inelastic or relatively slowly growing demand, finally leading to an unexpected fall in the sectoral income, both in terms of workforce and income. In case the migration to a new distinctive sector (towards manufacturing in 1929 and towards services in the last decades) is too expensive and/or hard to be achieved, labour will be trapped in the declining even though highly-productive sector. The result in terms

[1] Authors argue in other papers (Valentini et alii – 2017 – Compagnucci et alii – 2018) that there are several real causes behind the recession, however to investigate them is behind the scope of the paper.

of the overall aggregate demand will depend on the comparison between: a) the positive effect due to the increased real income in other sectors caused by lower prices in the declining sector; and b) the negative effect related to the reducing income in the declining sector. When this latter effect has a larger impact, overall aggregate demand falls, spreading recession and stagnation to the whole economy.

When stressing the role played by the structural change in the recent crisis, one should consider that since mid-1980's modern societies have entered the so-called knowledge economy (OECD, 1996; Foray, 2000). Knowledge has been increasingly considered as a key-productive factor (Drucker, 1969). Investments in knowledge and education are supposed to positively affect economic growth (Romer, 1986; 1990), which is mainly driven by the production, distribution and consumption of knowledge (Kenway, 2006). In the last three decades, the rising interest for knowledge-based activities has been fuelled by the internationalisation and globalization processes. Due to the dramatic shortening of product cycles and the increasing opportunities for cost-cutting policies allowed by geographic arbitrage (Shearmur, 2012), enterprises must continuously introduce product and process innovations to downward the exposure to competition from emerging countries. Innovation has become the driving force of economic development in the post-fordist context, and knowledge its necessary premise (Westeren, 2012). Recalling Pasinetti (1981) seminal contribution, the growth of modern economies is not uniform, as different sectors are affected by different productivity level.

Considering all these issues implies that the simple distinction between manufacturing (sector A) and services (sector B) could hide some important ongoing processes, since technological and knowledge-based activities are crucial in several economic activities belonging both to the service (knowledge-based services) and the manufacturing sectors (hi-tech manufacturing). The overall effects on the economic system arising from a workers' migration towards routine services will be substantially different from those following the reallocation of employees in the knowledge-based services. We therefore expect different outcomes when workforce migrates towards low-tech or high-tech manufacturing, although both sectors are characterised by decreasing employment and increasing productivity. Especially high- and medium-tech manufacturing activities (as well as, but to a lesser extent, medium- and low-tech activities) and knowledge-based services, are connected by inter-sectoral linkages (Guerrieri and Meliciani, 2005). These linkages play a crucial role in the knowledge-producing, knowledge-using and knowledge-transforming industry (Strambach, 2008) as drivers of multilevel knowledge dynamics. In this view, knowledge-based services support the efforts of European countries to maintain their competitive positions within the new international division of labour (European Union, 2012), since their mutual presence can trigger a circular cumulative causation process.

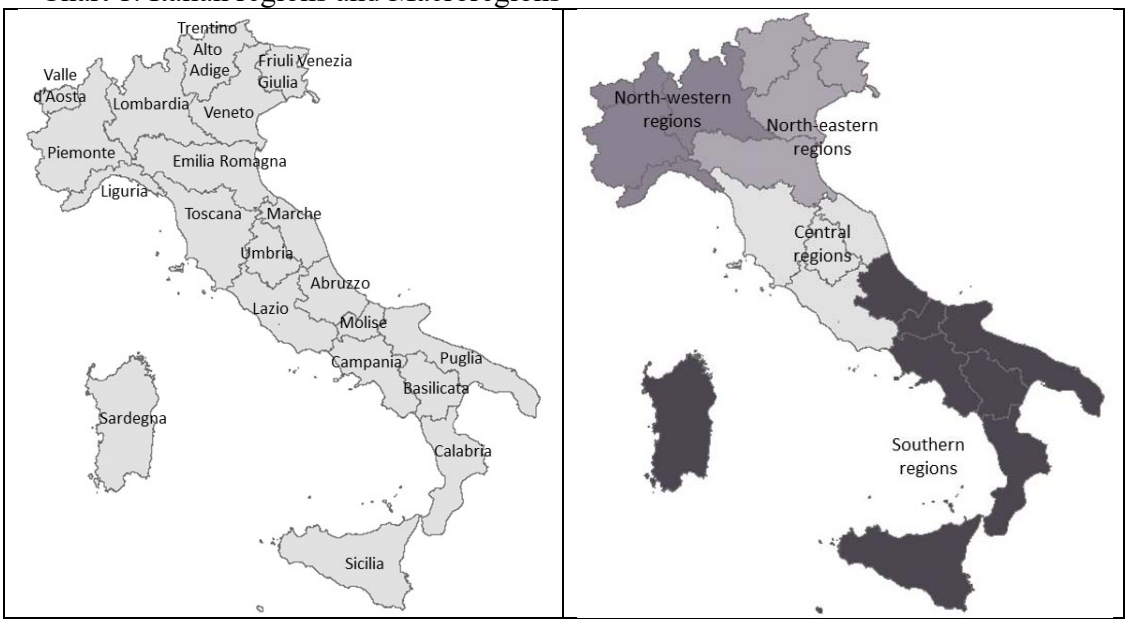
On these basis, the present work overcomes the strict distinction between manufacturing and services, emphasizing the presence of cross-cutting activities between Sector A and Sector B and taking greater account of the complexity of the ongoing economic processes.

Moving from these remarks, the extended crisis theory can be used to analyse the real and regional dimensions of the crisis. Before the crisis, income disparities among the majority of EU countries and regions were shrinking, however, after 2008, they increased dramatically (Crescenzi et alii, 2016a; 2016b). Besides, in the post crisis period, disparities among regions have proved to be greater than disparities among nations (de Groot, 2011;

Blazek and Netrdova, 2012), following a clear centre-periphery spatial pattern (Continental vs Mediterranean Europe, Crescenzi et alii, 2016a). This was mainly due to "structural phenomena concerning labour market characteristics, sectoral composition, and localization factors" (Amendola *et alii*, 2006, p. 26), and to the polarisation effect caused by agglomeration economies (Geppert and Stephan, 2008). Metropolitan regions are the places were the most selective and distinctive processes related to the knowledge economy are taking place thanks to the urbanisation economies, specialised competencies, and dynamic externalities they provide (Jacobs, 1961). They have, indeed, shown a stronger resilience to the crisis, appearing more stable and better performing in terms of employment rate (European Union, 2013**).** These evidences suggest that the knowledge economy could represent a further source of divergence since its most selective and distinctive processes are affecting regions asymmetrically.[2]

Following a Schumpeterian approach, Quatraro (2009) found that migration propensity towards more knowledge-based sectors in the Italian regions between 1980 and 2003 depends on the stage of development of their leading industry, the manufacturing sector. On this basis and according to Fuà and Zacchia (1983), Italian regions (Chart 1), have been split into early (North-western regions) and late industrialised regions (NEC, North-eastern and Central regions).

Chart 1: Italian regions and Macroregions




Quatraro (2009) suggested that the still ongoing manufacturing development in the NEC regions could have been an obstacle on the road towards a more knowledge-oriented economy. This shift might have been prevented by the presence of the Industrial Districts (Becattini, 1979), especially those medium and low-tech-oriented, where innovation and knowledge-based activities have been usually sacrificed on prices. Along this line of thought, Ciriaci and Palma (2016), comparing the four largest European economies, found that in Italy both high- and low-tech manufacturing activities have the lowest degree of

[2] Italian regions seem to fit this hypothesis (Signorini, 2013, Banca d'Italia, 2014)

vertical integration with the so-called Knowledge Intensive Business Services (KIBS - Miles *et alii*, 1995). This missed vertical integration represents an important factor slowing down the shift to a knowledge-based economy. On the one side the economic system is less capable to support the innovation process of manufacturing (in terms of capacity of providing advanced services) and, on the other side, manufacturing fails in generating a large enough demand for advanced services. Within early industrialised macro regions, notwithstanding the decreasing importance of the manufacturing sector, knowledge-based services did not reach a plenty scale as well. In this case, however, the shift to a knowledge-based economy appears to be less challenging, given the fact that, unlikely NEC regions, services demand has reached a given critical threshold (Quatraro, 2009). North-Western regions, those hosting some of the largest Italian metropolitan areas (Milan, Turin and Genova), coped with more favourable conditions in the transition towards a more knowledge-oriented economy.

## 2. Productivity: the value added-labour inputs relationship

To corroborate the theoretical soundness of the extended crisis theory we focus on the Italian regions. Table 1 reports regional data referred to the 20 NUTS Italian regions drawn from the ISTAT regional account database[3]: labour inputs, GDP per capita (chain linked - reference year 2010), gross value added (chain linked - reference year 2010) and real compensations[4] per economic sector of in current prices, as well as the households' disposable income[5] and the yearly average population, covering the 1995-2015 period. The households' disposable income regards primary income formation and income redistribution. As regards labour inputs, we used full-time equivalent[6] (FTE) instead of total hours worked because these latter were available only from 2000.

Following Eurostat (2013) and based on the *Nomenclature statistique des activités économiques* (Nace Rev. 2, Table A in Appendix), we split manufacturing and services into two and three breakdowns respectively. Regarding manufacturing we focus on High and Medium-High-technology (HM-Tech) and, on Medium-Low and Low-technology (LM-Tech) activities, according to the different technological content characterising their respective production processes. Similarly, we divide service sector into 3 categories, depending on whether knowledge is or is not the main production factor and the good they offer: Less Knowledge Intensive Services (LKIS), Public and Private Knowledge Intensive Services (Public KIS and Private KIS[7]). Distinguishing between Public and Private in a country such as Italy is crucial for two main reasons. First, the share of public employment on total workforce is still large. Second, public and private-based activities follow different spatial rationales, which are affected respectively, by profit-seeking and equity-seeking.

[3] Data were downloaded from the Istat website.
[4] According to Istat glossary, real compensation is defined as the total remuneration payable by an employer to an employee in return for work done during the accounting period.
[5] Both real compensation and households' disposable income are provided at current prices and have been deflated using the Istat index of consumer prices (2017=100).
[6] Full-time equivalent corresponds to the number of full-time equivalent jobs, or, in other words, to total hours worked divided by the average annual number of hours worked in full-time jobs. Productivity per sector has been calculated by dividing the gross value added by FTE.
[7] This latter distinction is based on whether they mostly work in the market (Private KIS) or not (Public KIS).

Considering these two sectors together could hide very different economic performances: a specialisation in Public KIS could reveal the lack of "market opportunities".

To simplify the description, we focus on three periods (from 1995 to 2001, from 2001 to 2008 and from 2008 to 2015). Looking at them (Table 1), data suggests the existence of different stylised facts characterising the national level.

First, data show that GDP per capita, after having slightly increased between 2001 and 2008, matched the pre-2000 levels in the recession period, signalling a poor country performance if compared, for instance, with that of Germany. In the same period, in fact, German GDP per capita (which has been always higher than the Italian one) constantly grew, passing from an average of 27.700 Euro between 1995 and 2001, to 30,400 between 2001 and 2008, and to 33,000 Euro after the crisis[8] (Eurostat, 2018).

Second, in terms of sectors shares, we can argue that the tertiarization process did not achieve a level comparable to Germany: although manufacturing has been slightly decreasing along all the three periods (from 18,7% in the first period to 15% in the last period – in line with Germany), affecting LM-Tech more than HM-Tech (similarly to Germany), it maintains a central role in Italian economy (as in Germany). However, the share of KIS is much lower than that of Germany (18% and 25% respectively[9]). Moreover, following the disaggregation proposed in this paper, we can observe an increase in Private KIS (from 15,7% to 17,8%) and LKIS (from 31,5% to 34,9%) relative weight, whereas Public KIS slightly decreased (from 19,4% to 18,8%) mainly due to the turnover stop imposed by austerity policies.

Third, looking at productivity, the different path followed by sector A and sector B of the Italian economy corroborates the extended crisis theory. Both LM-Tech and HM-Tech (sector A) along with Agriculture, show an increasing trend of the average productivity. On the contrary, KIS services (sector B), shows a flat productivity trend, turning negative in the case of Private KIS. LKIS, instead, is characterised by a more swinging productivity trend.

Fourth, with respect to the FTE, the situation is more articulated. While we expected a fall in Sector A following its increasing productivity, it is worth noting that FTE of HM-Tech activities, unlike LM-Tech, kept rising until 2008 (although they substantially slumped in both sub-sectors after the 2007 crisis). Thus, the above-mentioned productivity increase in LM- and HM-Tech seems to be caused by, respectively, an employment reduction and an improvement in innovation. Services (and Construction) TFE show a common increasing trend until 2008, whereupon they slightly decreased. Finally, Agriculture TFE continuously decreased behaving as LM-Tech.

Table 2 shows the workforce migration trend from declining to expanding sectors. Until 2008, employees migrated from LM-Tech and Agriculture to all the other sectors, especially LKIS. Before 2001, the expansion of services has been affected almost equally by LKIS and Private-KIS increase, but, in the new millennium until 2008, it was driven by LKIS and Construction, which are routine-oriented and low-skilled activities. Moreover, after the 2007 crisis, LKIS was the only sector able to absorb workforce (although at a slow pace).

[8] http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=nama_10_gdp&lang=en

[9] KLEM database, see Valentini et alii (2017)

Table 1: average GDP per capita, FTE average share per sector, average percentage variation of productivity and FTE in the Italian regions

| | Piemonte | | | Valle d'Aosta | | | Liguria | | | Lombardia | | | Veneto | | | Friuli-V-G | | | Emilia-Romagna | | | Trentino Alto Adig | | | Toscana | | | Umbria | | | Marche | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Years | 95-01 | 01-08 | 08-15 | 95-01 | 01-08 | 08-15 | 95-01 | 01-08 | 08-15 | 95-01 | 01-08 | 08-15 | 95-01 | 01-08 | 08-15 | 95-01 | 01-08 | 08-15 | 95-01 | 01-08 | 08-15 | 95-01 | 01-08 | 08-15 | 95-01 | 01-08 | 08-15 | 95-01 | 01-08 | 08-15 | 95-01 | 01-08 | 08-15 |
| **TOT** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GDP p.c.* | 28,5 | 30,4 | 27,9 | 36,5 | 36,7 | 34,1 | 28,7 | 31,2 | 29,1 | 34,1 | 36,3 | 34,7 | 30,0 | 31,6 | 29,5 | 28,2 | 30,1 | 28,1 | 31,9 | 34,0 | 31,9 | 35,0 | 36,1 | 35,5 | 27,8 | 29,8 | 28,2 | 26,2 | 27,2 | 23,8 | 25,0 | 27,4 | 25,3 |
| Prod. growth | 0,9 | -0,1 | -0,3 | -0,3 | 1,1 | -0,6 | 1,3 | 0,2 | -0,7 | 0,6 | 0,4 | 0,6 | 0,7 | -0,1 | -0,1 | 0,6 | 0,0 | 0,1 | 1,2 | 0,2 | 0,2 | 1,1 | 0,2 | 0,4 | 1,3 | 0,0 | 0,1 | -0,1 | -0,6 | -0,9 | 1,3 | 0,1 | -0,3 |
| Var % FTE | 0,5 | 0,8 | -0,9 | 0,3 | -0,2 | -0,6 | 0,6 | 0,4 | -0,7 | 1,2 | 0,9 | -0,7 | 1,2 | 1,0 | -0,6 | 1,4 | 0,5 | -1,1 | 1,3 | 1,0 | -0,7 | 0,8 | 0,6 | 0,0 | 0,6 | 0,9 | -0,7 | 1,8 | 1,2 | -1,0 | 1,0 | 1,0 | -1,1 |
| **LM-Tech** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| % sector | 16,1 | 14,2 | 11,6 | 8,4 | 8,0 | 6,5 | 8,0 | 7,3 | 6,1 | 17,6 | 15,5 | 13,1 | 21,3 | 18,9 | 17,0 | 16,1 | 14,8 | 13,7 | 16,0 | 14,7 | 12,8 | 10,1 | 10,0 | 9,1 | 19,5 | 17,0 | 13,9 | 16,3 | 15,3 | 13,1 | 22,4 | 21,0 | 18,9 |
| Prod. growth | 0,4 | -0,4 | 3,0 | -0,5 | 0,7 | -0,8 | 0,9 | 0,5 | 0,7 | 1,2 | 0,6 | 1,6 | 1,2 | 0,9 | 1,2 | 0,5 | 0,9 | 0,7 | 1,0 | 1,2 | 1,5 | 0,3 | -0,7 | 1,5 | 1,9 | 0,4 | 1,8 | -0,6 | 0,3 | 0,1 | 2,0 | 1,2 | 1,3 |
| Var % FTE | -0,6 | -1,7 | -3,2 | -2,2 | 0,0 | -5,6 | -0,9 | -0,9 | -4,5 | -1,6 | -0,7 | -3,3 | -0,2 | 0,0 | -1,9 | 0,9 | -0,7 | -2,2 | 0,0 | -0,8 | -2,4 | 0,7 | 0,3 | -1,0 | -1,2 | -0,7 | -2,7 | 0,9 | -0,2 | -3,1 | 0,1 | 0,7 | -3,0 |
| **HM-Tech** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| % sector | 10,5 | 9,0 | 7,5 | 2,3 | 1,8 | 1,4 | 3,9 | 3,8 | 3,4 | 7,2 | 7,0 | 6,5 | 6,0 | 6,1 | 6,1 | 6,7 | 6,2 | 5,6 | 7,4 | 7,5 | 7,4 | 2,8 | 2,9 | 2,6 | 4,0 | 4,0 | 3,6 | 2,8 | 3,1 | 2,9 | 5,1 | 5,4 | 5,3 |
| Prod. growth | 0,2 | 3,6 | 1,0 | -5,0 | 4,1 | 9,2 | 2,4 | 2,2 | 1,1 | 0,9 | 0,8 | 1,8 | 0,0 | 0,3 | 1,1 | 0,5 | 2,1 | 0,0 | 0,7 | 1,7 | 1,8 | -0,7 | 0,7 | 1,2 | 2,1 | -0,2 | -0,2 | -1,0 | 0,0 | 1,7 | 1,6 | 2,4 | 1,7 |
| Var % FTE | -0,7 | -1,9 | -2,6 | -8,3 | 6,3 | -12,5 | 0,7 | 1,2 | -4,1 | -0,6 | 0,7 | -1,8 | 2,1 | 1,8 | -1,1 | 0,6 | -1,1 | -2,7 | 1,7 | 0,9 | -0,7 | 2,7 | 0,1 | -0,8 | 0,6 | 1,4 | -2,9 | 2,0 | 2,3 | -4,3 | 2,8 | 2,2 | -2,5 |
| **Private-KIS** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| % sector | 15,8 | 17,5 | 18,4 | 16,3 | 16,3 | 17,3 | 18,7 | 19,9 | 20,7 | 19,8 | 20,8 | 21,1 | 14,5 | 15,9 | 16,4 | 14,7 | 16,1 | 16,6 | 17,1 | 17,6 | 18,3 | 13,2 | 14,4 | 15,5 | 15,4 | 16,7 | 17,5 | 13,9 | 15,5 | 16,5 | 13,4 | 14,6 | 15,3 |
| Prod. growth | 0,9 | -0,5 | -0,9 | 3,6 | 3,2 | 0,2 | 0,8 | 0,5 | -1,7 | 0,8 | 1,2 | 0,4 | 0,1 | -0,2 | -0,7 | 0,9 | -0,6 | 0,1 | 1,0 | 0,1 | -0,7 | 1,5 | 0,0 | 0,3 | 0,4 | -0,7 | 0,1 | -0,1 | -1,8 | -0,9 | 1,0 | -0,1 | -1,3 |
| Var % FTE | 2,6 | 1,6 | -0,1 | 1,7 | -1,1 | 0,1 | 2,0 | 1,3 | -0,7 | 3,5 | 0,9 | -0,3 | 3,6 | 1,3 | 0,0 | 2,7 | 1,4 | -0,8 | 3,4 | 0,6 | 0,4 | 3,4 | 1,6 | 1,2 | 3,2 | 1,2 | -0,6 | 4,4 | 2,3 | -0,8 | 3,4 | 1,2 | -0,2 |
| **Public-KIS** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| % sector | 17,7 | 17,5 | 17,5 | 20,9 | 23,7 | 24,8 | 21,7 | 20,4 | 19,5 | 14,4 | 14,5 | 15,0 | 15,7 | 15,1 | 15,2 | 21,4 | 20,8 | 21,2 | 15,9 | 15,6 | 16,1 | 19,8 | 20,4 | 21,1 | 18,7 | 17,7 | 17,6 | 19,5 | 18,3 | 17,9 | 17,5 | 16,9 | 17,1 |
| Prod. growth | 1,5 | -0,1 | -0,6 | -1,0 | 0,9 | 1,3 | 1,0 | 0,1 | 0,5 | 0,1 | -0,5 | 0,5 | 0,5 | -0,1 | 0,4 | 1,0 | 0,6 | 0,0 | 0,6 | 0,6 | -0,4 | 2,3 | 1,0 | 0,7 | 0,8 | 0,0 | 0,7 | 0,4 | 0,0 | -0,1 | 0,8 | -0,3 | 0,0 |
| Var % FTE | 0,9 | 0,4 | -0,5 | 2,7 | 1,0 | 0,1 | 0,2 | -1,5 | 0,1 | 2,0 | 0,6 | 0,1 | 1,0 | 0,2 | 0,0 | 1,5 | -0,4 | -0,3 | 1,0 | 0,9 | 0,2 | 1,7 | 0,5 | 0,6 | 0,1 | -0,1 | -0,3 | 0,5 | 0,0 | -0,4 | 1,1 | 0,3 | -0,2 |
| **LKIS** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| % sector | 28,1 | 30,1 | 33,1 | 34,7 | 32,1 | 32,7 | 36,6 | 37,4 | 38,7 | 31,8 | 32,7 | 34,7 | 29,2 | 31,0 | 33,0 | 28,9 | 30,7 | 32,4 | 30,2 | 31,7 | 33,5 | 36,9 | 35,7 | 35,6 | 30,9 | 32,3 | 35,0 | 29,4 | 31,9 | 35,1 | 27,4 | 28,5 | 30,6 |
| Prod. growth | 0,5 | -1,4 | -0,9 | 1,0 | 0,1 | -1,1 | 1,0 | -0,3 | -0,5 | 0,1 | 0,0 | 0,8 | 0,0 | -1,4 | -0,3 | 0,5 | -0,9 | 0,1 | 0,6 | -1,1 | 0,2 | 0,2 | -0,6 | -0,2 | 1,2 | -0,6 | 0,3 | -0,5 | -1,4 | -0,3 | 0,9 | -0,8 | -0,6 |
| Var % FTE | 0,4 | 2,5 | 0,2 | -1,4 | -1,8 | 0,7 | 1,0 | 1,0 | -0,3 | 1,5 | 1,7 | 0,1 | 1,6 | 2,0 | 0,1 | 1,5 | 1,8 | -0,6 | 1,2 | 2,1 | -0,2 | -0,2 | 0,4 | -0,1 | 0,5 | 1,9 | 0,4 | 2,5 | 2,7 | -0,2 | 0,8 | 1,6 | 0,0 |
| **COS** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| % sector | 6,8 | 7,1 | 7,3 | 9,3 | 10,6 | 10,8 | 6,4 | 7,1 | 7,6 | 6,3 | 6,8 | 7,0 | 6,6 | 7,6 | 7,4 | 6,5 | 6,4 | 6,3 | 7,1 | 8,0 | 7,3 | 6,8 | 7,3 | 7,5 | 5,9 | 6,9 | 7,2 | 7,9 | 7,9 | 7,9 | 6,4 | 6,9 | 7,0 |
| Prod. growth | 0,3 | 0,8 | -1,9 | ### | 0,4 | -0,1 | 5,8 | 0,4 | -1,8 | -0,1 | -0,3 | -2,5 | -0,8 | 0,2 | -3,2 | -0,8 | 0,4 | -1,5 | 2,5 | 0,3 | -1,8 | 3,7 | 0,2 | -2,6 | 2,0 | 0,1 | -1,9 | 1,9 | -0,7 | -1,8 | -0,6 | -1,2 | -4,1 |
| Var % FTE | 1,3 | 1,5 | -2,3 | 3,3 | 2,1 | -1,8 | 0,5 | 2,9 | -0,5 | 1,9 | 2,7 | -1,7 | 2,0 | 2,7 | -2,5 | 1,5 | 0,2 | -1,8 | 2,6 | 3,1 | -4,3 | 0,6 | 2,3 | -0,2 | 2,4 | 3,3 | -2,5 | 1,3 | 1,8 | -2,7 | 2,6 | 1,8 | -3,1 |
| **AGR** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| % sector | 3,7 | 3,4 | 3,5 | 6,6 | 6,0 | 4,9 | 3,0 | 2,6 | 2,6 | 2,1 | 1,8 | 1,7 | 5,7 | 4,5 | 3,9 | 4,8 | 4,3 | 3,6 | 5,2 | 4,1 | 3,6 | 9,0 | 8,0 | 7,2 | 4,4 | 4,2 | 4,0 | 8,7 | 6,8 | 5,4 | 6,9 | 5,7 | 4,7 |
| Prod. growth | 2,1 | -0,4 | 1,3 | 4,8 | 2,0 | -0,4 | 0,1 | -1,9 | -2,0 | 3,8 | 1,2 | 3,0 | 4,3 | 2,4 | 2,1 | 2,5 | -1,3 | 4,7 | 5,9 | 1,0 | 3,3 | 4,0 | 3,6 | 4,0 | -1,4 | 4,1 | -0,1 | 1,3 | 3,0 | 1,1 | 1,7 | 0,7 | 2,3 |
| Var % FTE | -1,0 | 0,2 | -0,1 | 0,8 | -2,1 | -3,1 | -2,5 | -0,6 | 0,8 | -1,3 | -0,9 | -1,3 | -1,9 | -3,2 | -1,4 | 0,1 | -0,4 | -2,9 | -2,9 | -2,2 | -0,8 | -1,0 | -0,3 | -1,4 | 0,6 | -1,4 | -0,1 | 0,1 | -2,8 | -1,1 | -3,2 | -2,0 | -2,2 |

| | Lazio | | | Abruzzo | | | Molise | | | Campania | | | Puglia | | | Basilicata | | | Calabria | | | Sicilia | | | Sardegna | | | Italy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Years | 95-01 | 01-08 | 08-15 | 95-01 | 01-08 | 08-15 | 95-01 | 01-08 | 08-15 | 95-01 | 01-08 | 08-15 | 95-01 | 01-08 | 08-15 | 95-01 | 01-08 | 08-15 | 95-01 | 01-08 | 08-15 | 95-01 | 01-08 | 08-15 | 95-01 | 01-08 | 08-15 | 95-01 | 01-08 | 08-15 |
| **TOT** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GDP p.c.* | 31,7 | 35,0 | 32,0 | 23,2 | 24,1 | 23,0 | 20,6 | 22,1 | 19,8 | 17,7 | 19,0 | 17,1 | 17,0 | 18,0 | 16,8 | 18,7 | 19,9 | 19,1 | 15,9 | 17,4 | 16,3 | 17,4 | 18,6 | 17,0 | 19,0 | 20,7 | 19,6 | 26,1 | 28,1 | 26,3 |
| Prod. growth | 1,0 | 0,1 | -0,7 | 1,0 | -0,1 | 0,0 | 0,5 | -0,7 | -1,3 | 1,1 | 0,5 | -0,2 | 1,4 | -0,5 | -0,2 | 1,1 | -0,3 | 1,2 | 2,0 | -0,3 | -0,4 | 1,1 | 0,0 | -0,3 | 0,7 | -0,2 | 0,1 | 1,0 | 0,1 | 0,0 |
| Var % FTE | 0,9 | 1,4 | -0,4 | 0,7 | 0,7 | -0,7 | 1,2 | 0,8 | -1,4 | 0,9 | -0,1 | -1,4 | 0,7 | 0,4 | -1,0 | 1,6 | -0,1 | -1,4 | 0,2 | 0,7 | -1,2 | 0,4 | 0,5 | -1,5 | 1,1 | 1,1 | -1,1 | 0,9 | 0,8 | -0,9 |
| **LM-Tech** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| % sector | 5,8 | 5,2 | 4,3 | 13,6 | 13,5 | 11,8 | 9,4 | 9,4 | 8,4 | 10,3 | 9,7 | 8,2 | 11,8 | 11,6 | 9,5 | 10,6 | 10,9 | 8,0 | 5,4 | 5,7 | 4,8 | 6,0 | 6,3 | 5,4 | 7,5 | 7,8 | 6,4 | 13,7 | 12,6 | 10,7 |
| Prod. growth | 1,6 | -0,7 | 0,6 | 1,9 | 0,1 | 0,6 | 1,4 | 0,8 | -0,1 | 1,7 | 0,4 | 1,2 | 1,5 | 0,7 | -0,3 | -0,5 | 2,4 | 2,7 | 4,0 | 0,6 | 0,7 | 1,6 | -0,1 | 0,2 | 1,6 | -0,5 | 1,7 | 1,1 | 0,5 | 1,5 |
| Var % FTE | -1,9 | 0,0 | -3,9 | 1,7 | -0,3 | -3,4 | 1,7 | 0,1 | -3,8 | -0,1 | -0,7 | -4,4 | 0,6 | -0,6 | -4,5 | 5,4 | -2,7 | -4,8 | -0,8 | 1,4 | -5,0 | -0,1 | 0,6 | -4,4 | -0,3 | 1,2 | -6,1 | -0,5 | -0,5 | -3,2 |
| **HM-Tech** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| % sector | 3,4 | 2,8 | 2,1 | 4,6 | 4,8 | 4,6 | 5,5 | 5,0 | 4,0 | 2,8 | 2,6 | 2,2 | 1,9 | 1,8 | 1,6 | 6,5 | 5,7 | 3,9 | 0,7 | 0,7 | 0,6 | 1,6 | 1,6 | 1,3 | 1,2 | 1,1 | 0,7 | 5,0 | 4,8 | 4,3 |
| Prod. growth | 2,6 | 1,1 | 0,8 | 0,0 | 0,9 | 0,8 | 2,0 | 0,3 | -3,0 | 0,1 | 2,1 | -0,6 | -0,8 | -0,1 | 2,2 | 1,3 | -2,7 | 10,9 | 5,3 | 2,1 | 0,1 | -2,4 | -0,2 | 10,0 | -2,7 | 2,1 | 18,1 | 0,6 | 1,2 | 1,0 |
| Var % FTE | -1,3 | -2,1 | -4,7 | 2,2 | 1,1 | -1,2 | 0,4 | 0,4 | -3,5 | -0,5 | -0,4 | -4,0 | 0,7 | 0,1 | -2,9 | 2,8 | -2,8 | -5,6 | 0,8 | 0,0 | -5,6 | 0,0 | -0,4 | -4,8 | 0,0 | -1,8 | -9,5 | 0,3 | 0,2 | -2,3 |
| **Private-KIS** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| % sector | 20,3 | 21,9 | 23,0 | 12,4 | 13,5 | 14,6 | 10,7 | 11,8 | 13,3 | 12,9 | 14,5 | 15,8 | 11,8 | 12,7 | 13,7 | 10,4 | 12,0 | 13,3 | 10,3 | 11,1 | 12,1 | 11,9 | 12,5 | 13,5 | 11,9 | 13,2 | 14,3 | 15,7 | 16,9 | 17,8 |
| Prod. growth | 1,7 | 0,9 | -1,5 | 1,0 | -1,4 | -1,1 | -0,5 | -0,6 | -2,9 | 0,7 | -0,7 | -1,7 | 1,0 | -1,1 | -0,9 | -0,2 | -2,0 | -0,5 | 1,1 | -1,3 | -0,6 | 1,7 | -0,9 | -1,7 | -0,1 | -1,4 | 0,5 | 0,9 | 0,1 | -0,7 |
| Var % FTE | 2,3 | 2,5 | -0,1 | 2,7 | 1,8 | -0,2 | 2,9 | 1,9 | 0,0 | 3,3 | 1,2 | -0,3 | 2,2 | 1,2 | -0,1 | 3,3 | 2,4 | -0,8 | 2,5 | 1,6 | -0,4 | 2,1 | 0,9 | -0,4 | 4,2 | 2,5 | -0,7 | 3,0 | 1,3 | -0,2 |
| **Public-KIS** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| % sector | 24,9 | 22,7 | 21,9 | 19,2 | 18,6 | 18,4 | 25,0 | 24,1 | 23,3 | 21,7 | 21,0 | 21,2 | 21,5 | 20,7 | 20,6 | 22,5 | 21,1 | 21,6 | 24,5 | 23,3 | 23,1 | 25,1 | 25,4 | 25,3 | 23,4 | 21,9 | 22,2 | 19,4 | 18,7 | 18,8 |
| Prod. growth | -0,1 | 0,5 | 0,2 | 0,5 | 0,7 | 0,9 | 1,1 | -0,1 | -0,2 | 0,3 | 0,7 | -0,3 | 0,9 | 0,0 | 0,1 | 1,2 | 0,0 | -0,3 | 0,7 | -0,1 | -0,3 | 0,0 | 0,6 | 0,2 | 0,9 | 1,3 | 0,1 | 0,5 | 0,2 | 0,1 |
| Var % FTE | -0,2 | -0,1 | 0,0 | -0,3 | 0,0 | 0,1 | -0,6 | 0,0 | -0,9 | 0,1 | -0,3 | -1,2 | 0,1 | -0,1 | -0,5 | 0,0 | -0,5 | -0,9 | -0,3 | -0,1 | -0,9 | 0,8 | 0,5 | -1,3 | -0,2 | -0,1 | 0,0 | 0,6 | 0,1 | -0,3 |
| **LKIS** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| % sector | 34,4 | 36,8 | 38,1 | 32,1 | 32,6 | 33,8 | 25,7 | 28,1 | 28,9 | 35,0 | 36,4 | 37,9 | 30,4 | 32,2 | 34,2 | 21,7 | 25,0 | 28,6 | 30,3 | 31,0 | 32,5 | 33,9 | 34,0 | 36,2 | 30,4 | 32,8 | 36,0 | 31,5 | 32,9 | 34,9 |
| Prod. growth | -0,1 | -1,5 | -0,9 | 0,2 | -0,2 | 0,3 | -1,1 | -2,4 | -1,1 | 0,1 | 0,8 | 0,7 | 0,8 | -1,1 | 0,1 | -0,7 | -0,7 | 0,2 | 1,2 | -0,1 | -0,1 | 0,9 | 0,4 | 0,4 | -0,6 | -1,6 | 0,0 | 0,3 | -0,6 | 0,1 |
| Var % FTE | 1,8 | 2,4 | 0,1 | 0,5 | 1,3 | -0,2 | 2,3 | 2,0 | -1,8 | 2,1 | 0,0 | -0,7 | 1,5 | 1,3 | -0,2 | 3,5 | 2,1 | 0,0 | 0,9 | 1,0 | -0,2 | 0,8 | 0,5 | -0,5 | 3,1 | 2,2 | 0,5 | 1,3 | 1,6 | -0,1 |
| **COS** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| % sector | 5,0 | 5,8 | 6,4 | 8,4 | 8,3 | 8,6 | 8,5 | 9,0 | 8,8 | 6,8 | 7,9 | 7,2 | 6,2 | 7,8 | 7,6 | 7,1 | 8,2 | 8,2 | 8,0 | 8,7 | 7,7 | 7,3 | 8,4 | 7,2 | 9,2 | 9,8 | 7,8 | 6,6 | 7,4 | 7,2 |
| Prod. growth | -1,7 | -3,2 | -2,6 | 0,5 | -1,0 | -1,2 | -2,6 | 0,0 | -1,8 | -0,2 | 0,2 | 0,0 | 0,5 | -3,2 | -1,2 | -3,7 | 0,2 | 1,3 | 1,1 | -2,6 | 0,9 | -0,8 | -2,4 | 0,1 | -2,1 | 0,2 | 0,4 | -0,1 | -0,7 | -1,7 |
| Var % FTE | 1,1 | 4,7 | -1,4 | 0,8 | 1,2 | -1,6 | 3,5 | 1,6 | -2,5 | 2,5 | 1,5 | -4,1 | 3,0 | 4,4 | -3,6 | 2,4 | 1,6 | -2,8 | 0,5 | 2,8 | -5,7 | 1,6 | 3,3 | -6,2 | 1,3 | 1,4 | -6,5 | 1,8 | 2,6 | -3,0 |
| **AGR** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| % sector | 4,7 | 3,6 | 3,0 | 8,5 | 7,5 | 7,0 | 14,5 | 11,6 | 12,8 | 9,1 | 6,6 | 6,1 | 15,3 | 11,9 | 11,5 | 19,4 | 15,4 | 14,6 | 19,4 | 18,3 | 18,1 | 12,3 | 10,0 | 9,6 | 14,5 | 11,8 | 10,7 | 6,9 | 5,6 | 5,2 |
| Prod. growth | 0,6 | 2,6 | 0,9 | 2,4 | -1,1 | 1,9 | 4,3 | 2,0 | 1,5 | 5,8 | 2,5 | 0,7 | 3,4 | 2,2 | 0,4 | 6,3 | 3,5 | -0,2 | 7,6 | 2,3 | -0,4 | 1,4 | 0,9 | -0,2 | 4,1 | 1,7 | 0,8 | 3,4 | 1,5 | 1,2 |
| Var % FTE | 0,0 | -3,0 | -1,1 | -1,1 | -0,6 | -0,2 | -2,0 | 0,2 | 1,0 | -3,8 | -3,1 | -1,2 | -2,2 | -2,8 | 0,1 | -1,6 | -3,2 | -0,3 | -1,5 | -0,3 | -0,2 | -3,5 | -1,7 | -0,8 | -1,8 | -1,1 | -1,0 | -2,0 | -1,9 | -0,8 |

Looking at FTE employment the path appears even more negative. Before 2007, the increase in HM-Tech, Public KIS and LKIS has been significantly affected by part-time and temporary jobs, and these forms of contracts extended to Private KIS after 2008. The

negative effects in terms of households' purchasing power related to temporary and partial jobs are well founded in literature (Peck and Theodore, 2007; Lagravinese, 2015; OECD 2015).

Table 2. Variations in absolute terms* of employees and FTE per economic sector and period

| | Employees | | | | FTE employment | | | |
|---|---|---|---|---|---|---|---|---|
| Sector | 1995-2001 | 2001-2008 | 2008-2015 | 1995-2015 | 1995-2001 | 2001-2008 | 2008-2015 | 1995-2015 |
| LM-Tech | -87,4 | -63,6 | -568,1 | -719,1 | -100 | -121 | -659 | -880 |
| HM-Tech | 19,9 | 45,3 | -151 | -85,8 | 19 | 28 | -192 | -145 |
| Private-KIS | 677,1 | 398,8 | 0,3 | 1076,2 | 644 | 387 | -107 | 924 |
| Public-KIS | 210,4 | 80,2 | -56,2 | 234,4 | 171 | 3 | -122 | 52 |
| LKIS | 760,7 | 1172,3 | 384 | 2317 | 571 | 737 | -18 | 1290 |
| COS | 168,8 | 349,8 | -407 | 111,6 | 166 | 270 | -427 | 9 |
| AGR | -194,6 | -107,7 | -64,1 | -366,4 | -198 | -228 | -46 | -472 |
| TOT | 1562,3 | 1875,9 | -851,3 | 2586,9 | 1276 | 1073 | -1573 | 776 |

*in thousands

These four stylized facts corroborate the Delli Gatti et alii (2012) theory. Moreover, we can argue that LM-tech, Agriculture, and HM-Tech behave as sector A in the theory, showing a 20 years continuous increase in productivity. Besides, as reported in Valentini et alii (2017), these sectors suffered from a reduction in relative prices, which led to a fall in employment. Leaving aside Agriculture (which however correspond to 2.2% of nominal GDP), this fall, which initially had affected only LM-Tech, spreads to MH-Tech. Nonetheless, the workforce reallocation towards most knowledge intensive and high-tech sectors has proceeded at a too slow pace, especially in comparison with the most advanced OECD countries (Guerrieri and Meliciani, 2005). This can have worsened the magnitude of the crisis and its long-lasting effects on the Italian economy.

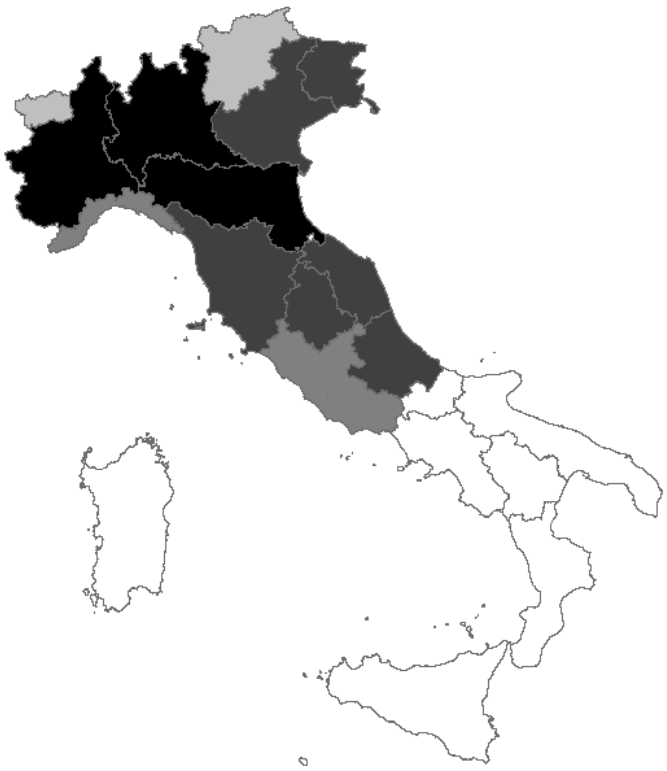
When considering the regional level, we must take into account the different economic specialization affecting the different areas of the country. Table 1 and Chart 2 show these different patterns.

The first includes Lombardia and Piemonte, two of the three regions of the former North-western industrial triangle, along with Emilia Romagna. Only in these neighbouring regions the share of both HM-Tech and Private KIS, along with LM-Tech is higher than the national average. Unlike the national average, productivity and employment in MH-Tech both increased in Emilia Romagna before 2008, and in Lombardia, between 2001 and 2008, signalling a process of technological innovation. In contrast with the national average, workforce migration from sector A to sector B was mainly led by Private KIS before 2001, whereas, in line with national average, it was mainly lead by LKIS between 2001 and 2008.

A second group includes most of the so-called NEC regions (Veneto, Friuli-Venezia Giulia, Toscana, Umbria, Marche, and Abruzzo) whose common feature is the relative specialization in LM-Tech. While productivity declines in both LM- and MH-Tech, FTE trends are more articulated. In most regions (especially in Veneto, Umbria and Marche) manufacturing employment has increased, at least in one (MH-Tech) or both sectors and at least in one period, even though slightly. Toscana, on the contrary, was the region that recorded the highest fall in LM-tech employees, and, at the same time, was the region with

the largest migration towards Private KIS, in particular before 2001, followed by Veneto, Marche and Abruzzo.

Chart 2: Different regional economic specializations



Lazio and Liguria constitute the third group, characterized by a marked service-oriented economy. Unlike the previous regions, workforce increase has been equally driven by both LKIS and Private KIS before 2008, implying a lower involvement of knowledge-oriented services with respect most of the previous regions. In addition, in these two regions, Public KIS played a countercyclical role in the period following the crisis.

Trentino Alto Adige and Valle d'Aosta[10] (group 3), are characterized by a Public KIS-oriented economy, that, in the case of Trentino, is further supported by LKIS. Although this common feature, the two regions have shown very different economic performance. GDP trend, in fact, shows that Trentino has a higher level of resilience. It is worth noting that in Trentino workforce reallocation has been led by Private KIS, whereas in Valle d'Aosta by Public KIS.

The group of the remaining regions belongs to the South of the country. The common feature is the high importance of public services signalling a lack of market opportunities.

[10] Both these areas have a special legislation. In Italy there are 4 regions (Valle d'Aosta, Friuli, Sicilia and Sardegna) and 2 provinces (Trentino and Alto Adige) which have special legislation due to historical motivation. While this is not the place to discuss the different institutional set, it is necessary to remark that, on average, these areas benefit from a much higher flexibility in self organization and larger transfers from central government than the rest of the country.

In the cases of Campania and Sicilia, the Southern regions with the most developed urban structure, Public KIS are complemented by LKIS. The still relatively underdevelopment of Private KIS, according with the theoretical section, can result from the scarce development of the manufacturing sector (except for Basilicata), especially the HM-Tech, which is an important outlet and driver for the knowledge intensive services. In terms of trends, data show that employment growth has been mostly driven by LKIS whereas Public KIS have been shrinking since 2001, representing a criticality for these regions.

To conclude, looking at those regions with a GDP pro-capite variation between 2008 and 2015 over the national average (in decreasing order: Trentino Alto Adige, Friuli-Venezia Giulia, Toscana, Veneto, Emilia-Romagna, Lombardia, Piemonte, Liguria , Valle d'Aosta and Lazio) and considering the above descriptive analysis, it appears that a higher level of resilience is linked with the role played mainly by Private KIS, whose presence is mostly correlated with economies which were and/or still are manufacturing-based. These services drove employment growth and reallocation in all these regions before 2000 and, at a lesser extent, between 2000 and 2008, laying the foundations for the raising of the knowledge economy.

## 3. Real compensations: the link between structural change and aggregate demand

The process of structural change has important medium- and long-term effect on the economy since it shapes the development trajectory of a nation/region (Berger and Frey, 2016). Nonetheless, it has a substantial short-term impact since it transmits its positive or negative effects to the real economy by means of compensations, affecting citizens' purchasing power (Acemoglu, 1999; Autor *et al*., 2003). An economy prevalently LKIS and low-tech oriented, in fact, could imply low-paid jobs, with negative effect on the aggregate demand. The same situation may arise when migration toward KIS is observed, but labour compensations show a stagnant trend. The magnitude of Italian crisis and the following long-lasting recovery period could be referred to a yet ongoing process of declining purchasing power of its inhabitants, consequently preventing the expansion of the aggregate demand (Valentini et alii, 2017).

Graph 1: Gross real compensations per employee (Comp_pe) and consumer households' disposable income per inhabitant (Income_pe): 1995-2015

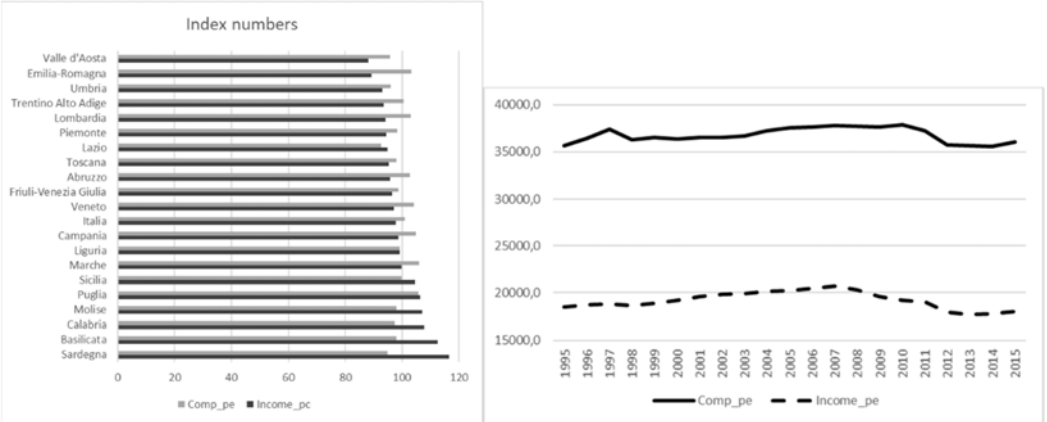


Table 3: Total gross compensations per sector at the national level in 1995, 2001, 2008 and 2015: absolute and percentage values

| | | LM_Tech | MH_Tech | Private_KIS | Public_KIS | LKIS | COS | AGR | TOT |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | num | 89451,6 | 53149,3 | 114008,4 | 157023,9 | 98867,0 | 28685,7 | 10230,3 | 566248,8 |
| | % | *15,8* | *9,4* | *20,1* | *27,7* | *17,5* | *5,1* | *1,8* | *100,0* |
| 2001 | num | 92760,0 | 56936,1 | 122603,0 | 177360,8 | 119161,9 | 31824,3 | 8793,3 | 622929,6 |
| | % | *14,9* | *9,1* | *19,7* | *28,5* | *19,1* | *5,1* | *1,4* | *100,0* |
| 2008 | num | 95559,5 | 60892,7 | 138958,9 | 198988,8 | 148558,7 | 42019,5 | 8480,7 | 707558,1 |
| | % | *13,5* | *8,6* | *19,6* | *28,1* | *21,0* | *5,9* | *1,2* | *100,0* |
| 2015 | num | 80912,6 | 55632,0 | 132885,3 | 179807,5 | 155295,8 | 30924,6 | 8858,9 | 659327,2 |
| | % | *12,3* | *8,4* | *20,2* | *27,3* | *23,6* | *4,7* | *1,3* | *100,0* |

Data at the national level show that consumer households' disposable income per inhabitant has slightly decreased between 1995 and 2015 (Graph 1) Despite a partial recovery of Southern regions, occurred before 2008, the gap with Northern regions remain large. Compensations per employee show an equally poor performance: the national value is almost unvaried from1995.

Both these variables have grown at a very slow pace until 2007, after which they have almost returned to the 1995 levels. Table 3 shows that the stagnation can be related with the role played by the different economic sectors. The most substantial variation between 1995 and 2015 is the one of LKIS, whose share passes from 17,5% to 23,6% on total, and to manufacturing activities (from 25,2% to 20,7%), whereas Private KIS and Public KIS remain stable. When looking at the trends of the economic sectors, we found that both Private KIS and LKIS have lower compensations per employee in 2015 than in 1995, unlike both manufacturing sectors and Public KIS, where compensations increased.

To investigate the regional level (Table B in Appendix), we consider the national GDP per capita as a benchmark. Among the regions with a GDP higher than the national average, Lombardia, Emilia Romagna, Veneto and Marche Region show the (relatively) best performances, being the only group of regions with gross real compensations per employee in 2015 slightly higher than in 1995. These regions, in fact, performed better in most sectors, even though, their trend in Private KIS is slightly negative.

Summarizing, the relatively better positions in the national GDP per capita ranking are taken by those regions where KIS have driven the tertiarization process before 2001 and where HM-Tech manufacturing have been able to create employment at least until 2007. The South of Italy, on the contrary, which is still lagging notwithstanding the partial recovery of some regions (namely Basilicata and Sardegna), seems to be excessively Public KIS-oriented, being all the other economic sectors (apart from LKIS in a few cases) under-developed. On this background it is necessary to highlight the stagnant trend in employees' compensations common to almost all sectors, trend which has prevented a substantial increase in the aggregate demand further exacerbating the crisis negative effect.

## 4. Spatial Econometric analysis

In addition to a description of the behavior of Italian regions and their structural change, showing that they are in line with the extended crisis theory, we aim at disentangling the impact of the financial crisis and of the structural change on regional economies. To support the hypothesis that the pace of the transition towards KIS services and High-Tech

manufacturing plays a crucial role in determining regional economic performances, we propose a panel analysis at the regional level between 2008 and 2015. This analysis, by assessing the relationship between real GDP per capita (the dependent variable, 2008=100) and employment sectoral composition (shares of employment according with the different economic breakdowns - independent variables), is aimed at understanding the eventual effect triggered by the structural change.

Data on employment shares per sector were drawn and processed from Eurostat, which further provides the classification of economic activities according with their technological and knowledge content. Specifically, we considered KIS Services, Less KIS Services, Medium-High Tech and High-Tech Manufacturing. In addition, following Valentini et alii (2017) we include house prices as proxy for the financial shock, given that the real estate bubble was one of the most evident factors in the 2007 financial crisis. The house prices index is obtained by dividing nominal house price index (Agenzia delle Entrate - Osservatorio del Mercato Immobiliare, 2017) by the overall Consumer Price Inflation Index. All the mentioned variables have been initially considered as indexes (2008=100) and successively transformed in logarithms.

When dealing with spatial phenomena, the results of a panel regression might be biased, since it neglects any sort of spatial correlation. To take into account the possible local spillover effects triggered by the regressors and possible spatial dependence phenomena affecting the patterns of specialization, we follow the methodology proposed by Belotti et al. (2013a; 2013b), based on Lee and Yu (2010), Elhorst (2010) and Cameron et al. (2011). It consists in testing the presence of spatial autocorrelation and in running different tests to identify the most appropriate model.

The following specification is a general specification for Spatial Panel models:

[1] $y_{i,t} = \alpha + \tau y_{i,t-1} + \rho \sum_{j=1}^{n} w_{i,j}\, y_{i,t} + \sum_{k=1}^{K} x_{i,t,k}\, \beta_k + \sum_{k=1}^{K} \sum_{j=1}^{n} w_{i,j} x_{j,t,k} \theta_k + \mu_i + \gamma_t + v_{i,t}$

[2] $v_{i.t} = \lambda \sum_{j=1}^{n} m_{i,j}\, v_{i,t} + \varepsilon_{i,t} i = 1, \dots, nt = 1, \dots, T$

Where:
- $i$ and $j$ identify the regions;
- $v_{i,t}$ is the normally distributed error term;
- $w_{i,j}$ are the elements the spatial matrix W, used for the autoregressive component and for the spatially lagged independent variables;
- $m_{i,j}$ are the elements of the spatial matrix for the idiosyncratic error component;
- $\mu_i$ is the individual fixed or random effect and $\gamma_t$ is the potential time fixed effect.

Different model specifications derive from different values of some key parameters;
- if $\lambda = 0$: Spatial Durbin Model (SDM), Static ($\tau = 0$) or Dynamic ($\tau \neq 0$);
- if $\lambda = 0$ and $\theta = 0$: Spatial Autoregressive Model (SAR), Static ($\tau = 0$) or Dynamic ($\tau \neq 0$);
- if $\theta = 0$ and $\tau = 0$: Spatial Autoregressive Model with Auto Regressive disturbances (SAC);
- if $\rho = 0$, $\theta = 0$ and $\tau = 0$: Spatial Error Model (SEM);

The spatial matrix was built using the inverse distance matrix calculated on the basis of the Euclidean distance between each region centroid[11], in which $w_{i\,j} = 1/d_{i,j.}$ (the weight decreases at the distance increases). For both the spatially lagged variables and the spatially lagged error term we use a row-normalized and distance-weighted matrix, obtained considering latitude and longitude of the centroids of the Italian regions.[12]

Given the relatively small set of statistical units (18 regions over 8 periods, 144 total observations), we estimate a static model ($\tau = 0$) since rolling estimates require a sample reduction to be performed. Furthermore, considering spatial (individual, $\mu_i$) fixed effects instead of time fixed effects, we run four different types of spatial regression (*sdm, sar, sac* and *sem*) to assess the robustness of the analyzed correlation, without assuming *a priori* restrictions.

Tables 4, 5, 6 and 7 report the results for, the *sdm, sar, sac* and *sem* spatial regressions respectively. The "strategy" followed is common to all the four tables, which report models from (1) to (7), each of them considering just one variable as regressor of interest – KIS Services, Less KIS Services, Medium-High Tech and High-Tech Manufacturing - , and the parameters of the spatial regression and spatial lag variables when required by the model. Model (8), finally, considers as regressors: a) the share of employment in "Less Knowledge Intensive Services" (which is negatively correlated with the index of GDP in all the models and specifications); b) the share of employment in "High and Medium High Tech Manufacturing" and c) the share of "Knowledge Intensive High Tech Services" (which, on is positively correlated with the index of GDP in all the models and specifications).

Finally, it is useful to underline that the proxy for the financial crisis (House Prices Index) is positively correlated with the index of GDP, supporting the idea that international financial crisis was a significant factor of instability all over the period in analysis.

Focusing on column 8 in each table, thus considering the test of the extended crisis theory, we find that results not only corroborate the theory, but also, support the idea that sectoral composition is the key driver of growth. Knowledge intensive sectors are positively affecting regional performances, whereas a transition towards less knowledge intensive sector is an obstacle to growth. In conclusion , it is worth noting that $\rho$ is strongly significative in all the models where it is included, suggesting that regions are affected by the GDP level of the neighboring regions, and, hence, supporting the choice to use spatial econometrics to avoid spatially-biased results. The results about $\lambda$ in the *sem* specification goes in the same direction.

[11] Data on regional administrative boundaries are drawn from Istat - http://www.istat.it/it/archivio/124086

[12] This is made using the STATA SPMAT [Pisati, 2012]

Table 4: Spatial Fixed Effects Panels, Spatial Durbin Model (SDM),

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| Main | | | | | | | | |
| House Prices Index | 0.0662<br>[0.0371] | 0.0615<br>[0.0397] | 0.0680<br>[0.0435] | 0.0725*<br>[0.0364] | 0.0692<br>[0.0395] | 0.0765<br>[0.0400] | 0.0671<br>[0.0343] | 0.0766*<br>[0.0373] |
| High & Medium High Tech Manufacturing | 0.0706***<br>[0.0209] | | | | | | | |
| Medium Low Tech Manufacturing | | 0.0558<br>[0.0307] | | | | | | |
| Low Tech Manufacturing | | | 0.0580<br>[0.0398] | | | | | |
| Knowledge Int. High Tech Services | | | | 0.0378**<br>[0.0131] | | | | |
| Other Knowledge Int. Services | | | | | 0.0512<br>[0.0797] | | | |
| Less Knowledge Int. Services | | | | | | -0.363***<br>[0.0920] | | -0.303**<br>[0.0959] |
| Knowledge Int. High Tech Services + High & Medium High Tech Manufacturing | | | | | | | 0.0944***<br>[0.0154] | 0.0701***<br>[0.0162] |
| Wx | | | | | | | | |
| House Prices Index | 0.0289<br>[0.0557] | -0.0593<br>[0.0559] | 0.0375<br>[0.0587] | 0.0265<br>[0.0514] | 0.0322<br>[0.0640] | -0.0476<br>[0.0552] | 0.0495<br>[0.0573] | -0.0292<br>[0.0537] |
| High & Medium High Tech Manufacturing | 0.0492<br>[0.0808] | | | | | | | |
| Medium Low Tech Manufacturing | | 0.134*<br>[0.0592] | | | | | | |
| Low Tech Manufacturing | | | 0.00207<br>[0.0709] | | | | | |
| Knowledge Int. High Tech Services | | | | -0.0305<br>[0.0258] | | | | |
| Other Knowledge Int. Services | | | | | -0.0407<br>[0.323] | | | |
| Less Knowledge Int. Services | | | | | | -0.0582<br>[0.191] | | -0.0174<br>[0.189] |
| Knowledge Int. High Tech Services + High & Medium High Tech Manufacturing | | | | | | | 0.0325<br>[0.0634] | -0.0121<br>[0.0602] |
| Spatial | | | | | | | | |
| rho | 0.783***<br>[0.0447] | 0.716***<br>[0.0531] | 0.759***<br>[0.0402] | 0.796***<br>[0.0439] | 0.790***<br>[0.0494] | 0.732***<br>[0.0436] | 0.780***<br>[0.0460] | 0.752***<br>[0.0378] |
| Variance | | | | | | | | |
| sigma2_e | 0.000277***<br>[0.0000568] | 0.000302***<br>[0.0000603] | 0.000307***<br>[0.0000562] | 0.000296***<br>[0.0000632] | 0.000316***<br>[0.0000689] | 0.000255***<br>[0.0000411] | 0.000268***<br>[0.0000594] | 0.000226***<br>[0.0000365] |
| r2_w | 0.728 | 0.772 | 0.744 | 0.670 | 0.664 | 0.811 | 0.722 | 0.813 |
| r2_b | 0.230 | 0.215 | 0.245 | 0.220 | 0.209 | 0.265 | 0.266 | 0.318 |
| r2 | 0.636 | 0.668 | 0.640 | 0.580 | 0.570 | 0.711 | 0.637 | 0.722 |
| ll | 378.2 | 373.8 | 371.5 | 373.0 | 368.3 | 385.7 | 380.6 | 393.7 |
| aic | -744.3 | -735.6 | -731.1 | -734.0 | -724.7 | -759.4 | -749.3 | -771.3 |
| bic | -726.5 | -717.8 | -713.2 | -716.2 | -706.9 | -741.6 | -731.5 | -747.5 |
| N | 144 | 144 | 144 | 144 | 144 | 144 | 144 | 144 |

Standard errors are clustered on Regions. All variables: log of index (100=2008). Spatial (regional) fixed effects in all the models.

Dep. Var: Crisis Index (GDP per capita, deflated by ICP), Source OECD. House Prices Index: House Prices/NIC, Sources: Agenzia delle Entrate - Osservatorio del Mercato Immobiliare and OECD

Sectors Shares: Sector Employment/Total Employment. Source: Eurostat, Employment in technology and knowledge-intensive sectors by NUTS 2 regions, htec_emp_reg2

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5: Spatial Fixed Effects Panels, Spatial Autoregressive Model (SAR)

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| Main | | | | | | | | |
| House Prices Index | 0.0815** [0.0258] | 0.0702* [0.0287] | 0.0875** [0.0314] | 0.0940** [0.0289] | 0.0878** [0.0299] | 0.0584* [0.0240] | 0.0897*** [0.0264] | 0.0659** [0.0231] |
| High & Medium High Tech Manufacturing | 0.0693*** [0.0199] | | | | | | | |
| Medium Low Tech Manufacturing | | 0.0560 [0.0301] | | | | | | |
| Low Tech Manufacturing | | | 0.0575 [0.0342] | | | | | |
| Knowledge Int. High Tech Services | | | | 0.0358** [0.0124] | | | | |
| Other Knowledge Int. Services | | | | | 0.0535 [0.0761] | | | |
| Less Knowledge Int. Services | | | | | | -0.343*** [0.0997] | | -0.289** [0.103] |
| Knowledge Int. High Tech Services + High & Medium High Tech Manufacturing | | | | | | | 0.0928*** [0.0141] | 0.0722*** [0.0153] |
| Spatial | | | | | | | | |
| rho | 0.811*** [0.0542] | 0.769*** [0.0628] | 0.787*** [0.0531] | 0.825*** [0.0453] | 0.815*** [0.0519] | 0.719*** [0.0674] | 0.816*** [0.0514] | 0.737*** [0.0661] |
| Variance | | | | | | | | |
| sigma2_e | 0.000276*** [0.0000558] | 0.000303*** [0.0000574] | 0.000305*** [0.0000588] | 0.000296*** [0.0000651] | 0.000315*** [0.0000687] | 0.000258*** [0.0000403] | 0.000267*** [0.0000602] | 0.000228*** [0.0000369] |
| r2_w | 0.721 | 0.724 | 0.752 | 0.618 | 0.654 | 0.796 | 0.723 | 0.805 |
| r2_b | 0.230 | 0.210 | 0.233 | 0.230 | 0.195 | 0.247 | 0.268 | 0.310 |
| r2 | 0.632 | 0.626 | 0.651 | 0.541 | 0.565 | 0.694 | 0.639 | 0.715 |
| ll | 377.6 | 372.1 | 371.0 | 371.9 | 367.9 | 384.9 | 379.8 | 393.4 |
| aic | -747.1 | -736.2 | -734.0 | -735.8 | -727.8 | -761.9 | -751.5 | -776.8 |
| bic | -735.3 | -724.3 | -722.2 | -723.9 | -715.9 | -750.0 | -739.6 | -761.9 |
| N | 144 | 144 | 144 | 144 | 144 | 144 | 144 | 144 |

Standard errors in brackets

Standard errors are clustered on Regions. All variables: log of index (100=2008). Spatial (regional) fixed effects in all the models.

Dep. Var: Crisis Index (GDP per capita, deflated by ICP), Source OECD. House Prices Index: House Prices/NIC, Sources: Agenzia delle Entrate - Osservatorio del Mercato Immobiliare and OECD

Sectors Shares: Sector Employment/Total Employment. Source: Eurostat, Employment in technology and knowledge-intensive sectors by NUTS 2 regions, htec_emp_reg2

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 6: Spatial Fixed Effects Panels, Spatial Auto-Correlation model (SAC)

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| Main | | | | | | | | |
| House Prices Index | 0.0689* [0.0268] | 0.0578 [0.0407] | 0.0827** [0.0320] | 0.0874** [0.0298] | 0.0773* [0.0325] | 0.0691 [0.0423] | 0.0785*** [0.0235] | 0.0701* [0.0328] |
| High & Medium High Tech Manufacturing | 0.0696*** [0.0205] | | | | | | | |
| Medium Low Tech Manufacturing | | 0.0547 [0.0291] | | | | | | |
| Low Tech Manufacturing | | | 0.0548 [0.0294] | | | | | |
| Knowledge Int. High Tech Services | | | | 0.0347** [0.0125] | | | | |
| Other Knowledge Int. Services | | | | | 0.0569 [0.0730] | | | |
| Less Knowledge Int. Services | | | | | | -0.354*** [0.0993] | | -0.295** [0.106] |
| Knowledge Int. High Tech Services + High & Medium High Tech Manufacturing | | | | | | | 0.0925*** [0.0142] | 0.0718*** [0.0154] |
| Spatial | | | | | | | | |
| rho | 0.846*** [0.0641] | 0.803*** [0.0904] | 0.803*** [0.0686] | 0.846*** [0.0587] | 0.846*** [0.0660] | 0.687*** [0.136] | 0.852*** [0.0516] | 0.723*** [0.107] |
| lambda | -0.326 [0.462] | -0.235 [0.495] | -0.138 [0.331] | -0.174 [0.355] | -0.264 [0.443] | 0.166 [0.324] | -0.377 [0.397] | 0.0868 [0.254] |
| Variance | | | | | | | | |
| sigma2_e | 0.000304*** [0.0000463] | 0.000338*** [0.0000489] | 0.000345*** [0.0000562] | 0.000332*** [0.0000580] | 0.000349*** [0.0000569] | 0.000297*** [0.0000403] | 0.000291*** [0.0000493] | 0.000262*** [0.0000370] |
| r2_w | 0.724 | 0.727 | 0.753 | 0.612 | 0.650 | 0.793 | 0.719 | 0.805 |
| r2_b | 0.232 | 0.202 | 0.233 | 0.230 | 0.199 | 0.258 | 0.268 | 0.312 |
| r2 | 0.633 | 0.626 | 0.650 | 0.534 | 0.559 | 0.695 | 0.635 | 0.716 |
| ll | 378.1 | 372.4 | 371.2 | 372.1 | 368.3 | 385.1 | 380.6 | 393.4 |
| aic | -746.3 | -734.8 | -732.3 | -734.1 | -726.5 | -760.3 | -751.2 | -774.9 |
| bic | -731.4 | -719.9 | -717.5 | -719.3 | -711.7 | -745.4 | -736.4 | -757.1 |
| N | 144 | 144 | 144 | 144 | 144 | 144 | 144 | 144 |

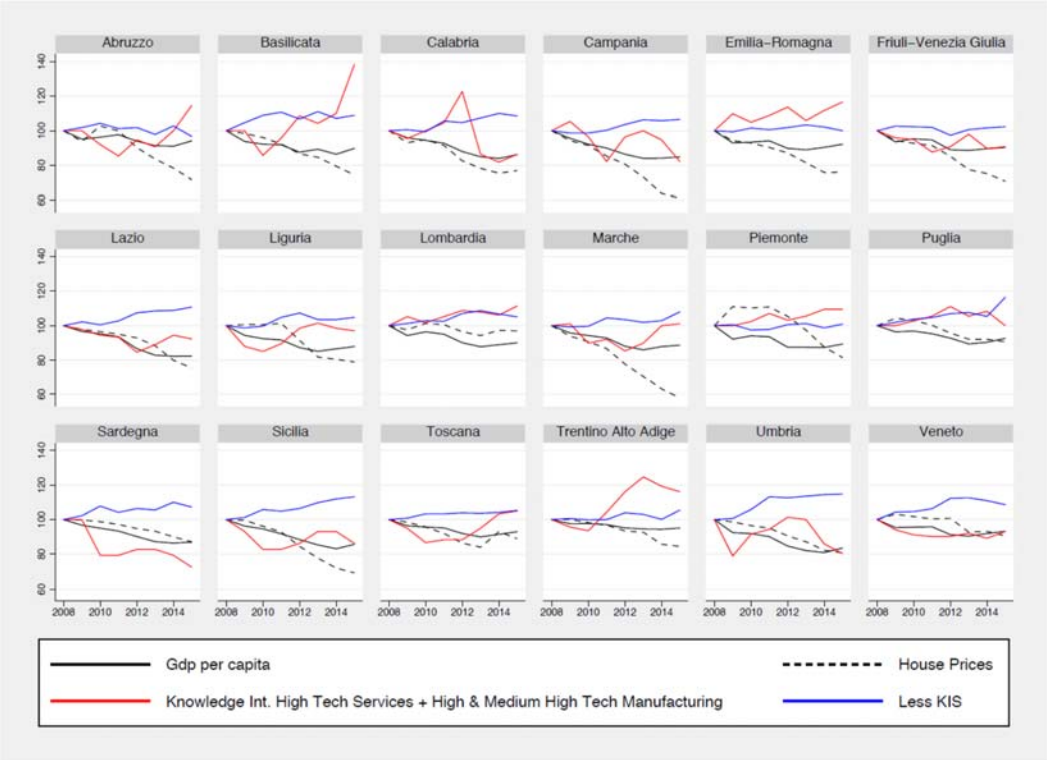
Standard errors in brackets
Standard errors are clustered on Regions. All variables: log of index (100=2008). Spatial (regional) fixed effects in all the models.
Dep. Var: Crisis Index (GDP per capita, deflated by ICP), Source OECD. House Prices Index: House Prices/NIC, Sources: Agenzia delle Entrate - Osservatorio del Mercato Immobiliare and OECD
Sectors Shares: Sector Employment/Total Employment. Source: Eurostat, Employment in technology and knowledge-intensive sectors by NUTS 2 regions, htec_emp_reg2
$^{*}$ $p < 0.05$, $^{**}$ $p < 0.01$, $^{***}$ $p < 0.001$

Table 7: Spatial Fixed Effects Panels, Spatial Error Model (SEM)

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| Main | | | | | | | | |
| House Prices Index | 0.0791* | 0.0838 | 0.0734 | 0.0801* | 0.0781 | 0.0965* | 0.0757* | 0.0930* |
| | [0.0390] | [0.0464] | [0.0480] | [0.0404] | [0.0426] | [0.0418] | [0.0369] | [0.0384] |
| High & Medium High Tech Manufacturing | 0.0647*** | | | | | | | |
| | [0.0164] | | | | | | | |
| Medium Low Tech Manufacturing | | 0.0524 | | | | | | |
| | | [0.0353] | | | | | | |
| Low Tech Manufacturing | | | 0.0591 | | | | | |
| | | | [0.0380] | | | | | |
| Knowledge Int. High Tech Services | | | | 0.0389** | | | | |
| | | | | [0.0136] | | | | |
| Other Knowledge Int. Services | | | | | 0.0553 | | | |
| | | | | | [0.0674] | | | |
| Less Knowledge Int. Services | | | | | | -0.356*** | | -0.302** |
| | | | | | | [0.105] | | [0.109] |
| Knowledge Int. High Tech Services + High & Medium High Tech Manufacturing | | | | | | | 0.0876*** | 0.0666*** |
| | | | | | | | [0.0158] | [0.0164] |
| Spatial | | | | | | | | |
| lambda | 0.897*** | 0.880*** | 0.894*** | 0.897*** | 0.893*** | 0.876*** | 0.900*** | 0.887*** |
| | [0.0371] | [0.0457] | [0.0383] | [0.0375] | [0.0400] | [0.0408] | [0.0356] | [0.0365] |
| Variance | | | | | | | | |
| sigma2_e | 0.000288*** | 0.000318*** | 0.000316*** | 0.000305*** | 0.000328*** | 0.000263*** | 0.000280*** | 0.000234*** |
| | [0.0000681] | [0.0000715] | [0.0000699] | [0.0000740] | [0.0000811] | [0.0000489] | [0.0000712] | [0.0000440] |
| r2_w | 0.506 | 0.650 | 0.597 | 0.411 | 0.544 | 0.713 | 0.445 | 0.692 |
| r2_b | 0.220 | 0.191 | 0.214 | 0.192 | 0.182 | 0.304 | 0.258 | 0.342 |
| r2 | 0.385 | 0.533 | 0.483 | 0.328 | 0.432 | 0.615 | 0.355 | 0.584 |
| ll | 369.8 | 364.0 | 363.5 | 365.7 | 360.9 | 378.0 | 371.8 | 385.6 |
| aic | -731.7 | -720.0 | -719.0 | -723.4 | -713.8 | -747.9 | -735.5 | -761.2 |
| bic | -719.8 | -708.1 | -707.1 | -711.5 | -701.9 | -736.0 | -723.7 | -746.4 |
| N | 144 | 144 | 144 | 144 | 144 | 144 | 144 | 144 |

Standard errors in brackets
Standard errors are clustered on Regions. All variables: log of index (100=2008). Spatial (regional) fixed effects in all the models.
Dep. Var: Crisis Index (GDP per capita, deflated by ICP), Source OECD. House Prices Index: House Prices/NIC, Sources: Agenzia delle Entrate - Osservatorio del Mercato Immobiliare and OECD
Sectors Shares: Sector Employment/Total Employment. Source: Eurostat, Employment in technology and knowledge-intensive sectors by NUTS 2 regions, htec_emp_reg2
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Graph 2: Regional patterns (indexes, 2008=100)




Graph 2 shows the patterns of those variables which, according with the econometric analysis, played a significant role from 2008 and 2015: GDP per capita, House Prices Index, the share of employment in "Knowledge Intensive High Tech Services + High & Medium High Tech Manufacturing" and in "Less Knowledge Int. Services".

On its basis, it is easy to split Italian regions in three group. The first conveys those regions which have hardly suffered from the international crisis as the House Prices dynamic shows: Abruzzo, Campania, Lazio, Liguria, Marche, and Friuli Venezia Giulia. A second group conveys those regions which have been able to react by boosting knowledge-based and hi-tech sectors: Emilia Romagna, Lombardia, and Trentino Alto Adige. Basilicata fit both groups. Last and least in performances those regions where only Less Knowledge Intensive Services have grown: Calabria, Lazio, Marche, Sardegna, Sicilia, and Umbria. Sicilia fits both group 1 and group 3

In conclusion, we can affirm that results from the descriptive and the econometric analysis are in line. The empirical analysis on the Italian regions corroborates the soundness of the extended crisis theory. Besides, it suggests that the refinement to the classification of economic activities we introduced, play a major role in explaining the asymmetrical effects of the ongoing structural change in the Italia regions.

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## Appendix

Table A: High-technology and knowledge-based services aggregations based on Eurostat classification - NACE Rev. 2

**Manufacturing industries NACE Rev. 2 codes – 2-digit level**

***High-technology***
**21** Manufacture of basic pharmaceutical products and pharmaceutical preparations
**26** Manufacture of computer, electronic and optical products
***Medium-high-technology***
**20** Manufacture of chemicals and chemical products
**27 to 30** Manufacture of electrical equipment, Manufacture of machinery and equipment n.e.c., Manufacture of motor vehicles, trailers and semi-trailers, Manufacture of other transport equipment
***Medium-low-technology***
**19** Manufacture of coke and refined petroleum products
**22 to 25** Manufacture of rubber and plastic products, Manufacture of other non-metallic mineral products, Manufacture of basic metals, Manufacture of fabricated metal products, except machinery and equipment
**33** Repair and installation of machinery and equipment
***Low-technology***
**10 to 18** Manufacture of food products, beverages, tobacco products, textiles, wearing apparel, leather and related products, wood and of products of wood, paper and paper products, printing and reproduction of recorded media.
**31 to 32** Manufacture of furniture, Other manufacturing

**Knowledge based services NACE Rev. 2 codes – 2-digit level**

***Knowledge-intensive services (KIS)***
**50 to 51** Water transport, Air transport
**58 to 63** Publishing activities, Motion picture, video and television programme production, sound recording and music publishing activities, Programming and broadcasting activities, Telecommunications, Computer programming, consultancy and related activities, Information service activities (section J)
**64 to 66** Financial and insurance activities (section K)
**69 to 75** Legal and accounting activities, Activities of head offices; management consultancy activities, Architectural and engineering activities; technical testing and analysis, Scientific research and development, Advertising and market research, Other professional, scientific and technical activities, Veterinary activities (section M)
**78** Employment activities
**80** Security and investigation activities

***Public knowledge-intensive services***
**84 to 93** Public administration and defence, compulsory social security (section O), Education (section P), Human health and social work activities (section Q), Arts, entertainment and recreation (section R)

***Less knowledge-intensive services (LKIS)***
**45 to 47** Wholesale and retail trade; repair of motor vehicles and motorcycles (section G)
**49** Land transport and transport via pipelines
**52 to 53** Warehousing and support activities for transportation, Postal and courier activities
**55 to 56** Accommodation and food service activities (section I)
**68** Real estate activities (section L)
**77** Rental and leasing activities
**79** Travel agency, tour operator reservation service and related activities
**81** Services to buildings and landscape activities
**82** Office administrative, office support and other business support activities
**94 to 96** Activities of membership organisations, Repair of computers and personal and household goods, Other personal service activities (section S)
**97 to 99** Activities of households as employers of domestic personnel; Undifferentiated goods- and services-producing activities of private households for own use (section T), Activities of extraterritorial organizations and bodies (section U)

Table B. Compensations per employee – index numbers

| | | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Piemonte | | 100 | 100,3332 | 103,4614 | 102,5308 | 102,6146 | 102,2977 | 102,3332 | 102,2228 | 102,4609 | 103,8714 | 103,537 | 103,7571 | 106,0405 | 104,5005 | 94,82306 | 102,4763 | 103,1419 | 99,62721 | 102,083 | 104,2188 | 108,1643 |
| | LM-Tech | 100 | 100,962 | 104,4101 | 103,5004 | 104,7324 | 104,1044 | 103,7753 | 102,1719 | 94,36071 | 104,1354 | 102,2256 | 103,2493 | 105,0124 | 105,2277 | 92,57795 | 101,9958 | 103,7653 | 100,0578 | 100,4806 | 104,6833 | 108,6297 |
| | HM-Tech | 100 | 100,5223 | 99,16478 | 95,71347 | 94,93033 | 92,63825 | 93,30488 | 93,30528 | 88,9212 | 94,79807 | 95,26794 | 96,00984 | 97,21371 | 94,44967 | 93,80175 | 95,77063 | 93,55422 | 88,38289 | 87,0905 | 88,58748 | 91,10947 |
| | Private-KIS | 100 | 105,3477 | 112,9629 | 106,6127 | 109,3676 | 112,3527 | 114,0706 | 117,6981 | 122,1325 | 125,4715 | 129,3798 | 132,3344 | 128,5179 | 129,5047 | 130,6384 | 131,1057 | 126,7179 | 124,2892 | 123,3082 | 122,8447 | 120,8293 |
| | Public-KIS | 100 | 99,38527 | 101,2377 | 100,9025 | 102,1265 | 99,61176 | 99,50356 | 97,85671 | 96,17606 | 96,62593 | 96,3428 | 94,99575 | 96,24303 | 96,10878 | 96,95886 | 97,90832 | 96,04969 | 90,58209 | 89,72044 | 89,42416 | 91,65248 |
| | OOS | 100 | 100,982 | 101,9305 | 98,83313 | 101,6116 | 99,96226 | 97,94074 | 97,97056 | 100,3974 | 102,1338 | 100,734 | 100,1477 | 100,6622 | 100,2442 | 103,7123 | 102,504 | 102,1877 | 96,17798 | 94,85199 | 95,27287 | 98,45622 |
| | AGR | 100 | 98,85985 | 101,7706 | 96,93487 | 99,63045 | 95,9581 | 85,63897 | 86,39433 | 87,47546 | 85,93793 | 85,80841 | 84,68756 | 85,95304 | 81,87603 | 87,24657 | 87,37413 | 87,45964 | 85,78006 | 86,45586 | 84,62429 | 90,14209 |
| | TOT | 100 | 101,3015 | 104,0478 | 101,4867 | 102,0556 | 101,3317 | 101,3646 | 101,3069 | 100,7028 | 103,1643 | 103,2956 | 103,5946 | 103,6447 | 102,4308 | 99,74245 | 102,486 | 100,7936 | 95,92101 | 95,70623 | 96,36646 | 98,38205 |
| | | | | | | | | | | | | | | | | | | | | | | |
| Valle d'Aosta | | 100 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
| | LM-Tech | 100 | 99,49544 | 103,9005 | 104,3688 | 101,7134 | 103,9487 | 101,7777 | 100,9999 | 105,8959 | 103,3279 | 103,9221 | 104,8184 | 111,1835 | 106,3743 | 101,8286 | 113,2368 | 110,828 | 101,6959 | 107,0945 | 108,0827 | 109,2193 |
| | HM-Tech | 100 | 101,3775 | 102,2541 | 89,91057 | 79,74059 | 76,80599 | 60,8339 | 62,60953 | 60,41022 | 58,03822 | 56,72264 | 51,63448 | 62,86074 | 58,8594 | 47,51515 | 58,60514 | 59,19615 | 54,61889 | 45,22821 | 51,95335 | 61,05328 |
| | Private-KIS | 100 | 102,532 | 101,7545 | 100,5786 | 99,34215 | 98,17468 | 112,8091 | 110,8291 | 113,6071 | 116,3599 | 117,5068 | 119,1096 | 116,9438 | 116,0754 | 115,0425 | 116,3304 | 111,3828 | 107,8995 | 103,6011 | 105,464 | 106,6221 |
| | Public-KIS | 100 | 102,8223 | 101,6349 | 93,32943 | 86,80231 | 88,93985 | 91,83978 | 94,11582 | 94,46638 | 98,26496 | 105,4281 | 105,3912 | 100,1581 | 103,4521 | 102,4452 | 97,00071 | 97,76224 | 93,74654 | 92,76828 | 90,41342 | 98,94525 |
| | UKIS | 100 | 102,3084 | 105,545 | 105,9817 | 106,0844 | 108,3013 | 106,8643 | 108,5322 | 107,147 | 108,5962 | 107,205 | 106,4458 | 105,9565 | 106,2445 | 107,6474 | 105,9719 | 104,0289 | 96,24232 | 94,30079 | 92,51869 | 93,9028 |
| | OOS | 100 | 101,5392 | 100,0976 | 95,5267 | 96,02459 | 98,01884 | 94,65854 | 100,6109 | 103,2604 | 106,6532 | 105,8191 | 106,4869 | 104,9558 | 105,3755 | 111,9754 | 109,3684 | 110,1073 | 109,2916 | 110,0969 | 111,0424 | 109,413 |
| | AGR | 100 | 99,52328 | 94,8685 | 76,85504 | 69,74939 | 76,52501 | 69,57321 | 64,20966 | 61,58607 | 67,6036 | 57,79962 | 62,17636 | 61,52189 | 62,457 | 64,40586 | 66,16653 | 68,86486 | 58,03331 | 53,45263 | 54,72418 | 52,43471 |
| | TOT | 100 | 102,1723 | 103,3657 | 98,25449 | 95,18826 | 96,26203 | 97,75654 | 99,01665 | 99,85756 | 101,7847 | 103,5128 | 103,5952 | 102,1521 | 102,7827 | 102,1632 | 101,2302 | 99,84716 | 94,79593 | 93,27795 | 92,09463 | 95,67805 |
| | | | | | | | | | | | | | | | | | | | | | | |
| Liguria | | 100 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
| | LM-Tech | 100 | 102,1458 | 106,2887 | 104,0838 | 104,5394 | 102,2735 | 101,6329 | 101,1272 | 101,1103 | 102,3648 | 102,0245 | 102,094 | 104,8697 | 106,1084 | 103,5331 | 103,9691 | 102,444 | 98,20375 | 96,88806 | 99,22377 | 102,1624 |
| | HM-Tech | 100 | 104,9952 | 107,1899 | 105,0917 | 107,1374 | 106,0459 | 100,055 | 99,89984 | 100,7259 | 102,8527 | 101,087 | 101,9148 | 103,4697 | 103,1757 | 102,0031 | 102,5585 | 103,6111 | 110,7483 | 111,1796 | 111,1511 | 111,241 |
| | Private-KIS | 100 | 99,19695 | 99,99661 | 96,99244 | 96,71025 | 97,05516 | 92,8085 | 92,51079 | 92,00483 | 93,12092 | 93,35551 | 94,17956 | 96,39581 | 95,52782 | 94,66115 | 93,75438 | 91,71662 | 88,29533 | 90,27049 | 90,10321 | 93,2052 |
| | Public-KIS | 100 | 105,4072 | 111,8643 | 109,6746 | 106,3367 | 107,2772 | 110,4177 | 112,1168 | 119,9124 | 123,9519 | 124,843 | 128,0211 | 128,9068 | 130,2957 | 128,4725 | 124,1154 | 120,6536 | 116,3409 | 114,1715 | 113,2843 | 114,1304 |
| | UKIS | 100 | 96,45077 | 99,1878 | 96,4594 | 98,9141 | 97,74346 | 99,33754 | 100,1451 | 99,88607 | 100,8187 | 99,56102 | 97,80249 | 98,83634 | 98,69518 | 100,426 | 100,586 | 98,57714 | 94,55817 | 98,94505 | 100,2956 | 99,89973 |
| | OOS | 100 | 99,40724 | 101,4898 | 97,07546 | 96,70332 | 97,5234 | 97,55379 | 99,74602 | 102,0724 | 103,9728 | 101,2387 | 101,477 | 103,8176 | 104,261 | 110,1606 | 110,6779 | 110,0028 | 105,7811 | 102,3242 | 100,4897 | 103,9012 |
| | AGR | 100 | 104,2727 | 107,2891 | 100,4478 | 102,0203 | 105,0067 | 110,6208 | 114,8155 | 121,4377 | 114,9239 | 103,4361 | 108,9729 | 106,428 | 100,7976 | 105,0824 | 103,4087 | 112,3828 | 104,5315 | 105,3054 | 106,8667 | 110,3476 |
| | TOT | 100 | 100,8051 | 103,964 | 100,8556 | 100,1163 | 99,85647 | 100,0877 | 100,2238 | 102,273 | 104,162 | 103,3347 | 103,2406 | 104,4463 | 104,4849 | 104,6307 | 103,3731 | 100,8985 | 97,26244 | 97,96902 | 98,08245 | 99,16812 |
| | | | | | | | | | | | | | | | | | | | | | | |
| Lombardia | | 100 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
| | LM-Tech | 100 | 101,9844 | 104,4575 | 103,0618 | 104,6201 | 105,8924 | 106,3159 | 107,4598 | 108,4261 | 109,5343 | 109,7746 | 109,9051 | 111,73 | 111,9452 | 108,2106 | 112,3428 | 113,3446 | 110,6764 | 111,8285 | 114,1186 | 117,0048 |
| | HM-Tech | 100 | 102,7999 | 105,7041 | 104,5373 | 105,3158 | 105,5974 | 106,7866 | 105,967 | 105,0401 | 106,6364 | 106,0769 | 106,6858 | 108,4903 | 109,0379 | 104,8633 | 107,9176 | 109,9876 | 107,8309 | 108,6279 | 109,7821 | 112,4295 |
| | Private-KIS | 100 | 100,9714 | 100,713 | 96,82992 | 97,19515 | 98,811 | 94,18015 | 94,66678 | 95,18497 | 96,19997 | 99,15437 | 99,39081 | 99,19497 | 99,38981 | 99,8345 | 100,9995 | 99,7585 | 98,373 | 93,93751 | 95,20054 | 96,34942 |
| | Public-KIS | 100 | 103,9904 | 109,6021 | 104,1291 | 106,9656 | 104,562 | 105,3243 | 106,47 | 107,7215 | 108,6398 | 110,0615 | 111,3943 | 108,5222 | 109,5245 | 112,062 | 113,0446 | 109,6915 | 105,9429 | 105,1497 | 105,1321 | 104,0972 |
| | UKIS | 100 | 99,42241 | 100,3459 | 99,62418 | 102,8646 | 104,1872 | 105,4633 | 105,6602 | 104,2364 | 104,5826 | 106,1584 | 102,958 | 102,2209 | 102,0145 | 104,7257 | 106,1202 | 104,8624 | 100,6701 | 101,4615 | 101,0226 | 101,4625 |
| | OOS | 100 | 98,90156 | 100,8756 | 96,8505 | 96,33462 | 97,1136 | 97,21775 | 98,41021 | 99,03589 | 100,3412 | 99,75312 | 97,632 | 99,78897 | 103,0905 | 107,4966 | 108,6386 | 109,2574 | 105,4599 | 104,178 | 104,602 | 107,4441 |
| | AGR | 100 | 101,8046 | 102,1123 | 98,64581 | 100,6026 | 99,33114 | 109,0855 | 108,464 | 116,7357 | 109,7581 | 110,9061 | 108,4477 | 108,1284 | 107,2784 | 116,1174 | 117,3438 | 100,9608 | 93,59808 | 92,33141 | 92,36695 | 97,20282 |
| | TOT | 100 | 101,5154 | 103,7359 | 101,1964 | 102,6976 | 101,9847 | 102,6384 | 102,993 | 103,0954 | 103,8792 | 105,0054 | 104,1606 | 103,899 | 104,225 | 104,712 | 106,3405 | 105,4026 | 101,5382 | 101,5266 | 102,0069 | 102,926 |
| | | | | | | | | | | | | | | | | | | | | | | |
| Veneto | | 100 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
| | LM-Tech | 100 | 103,1104 | 105,7606 | 103,4547 | 105,405 | 106,4695 | 108,061 | 109,5666 | 110,8275 | 112,6085 | 113,4054 | 114,2965 | 116,4168 | 116,9073 | 114,0008 | 116,7151 | 116,737 | 114,3588 | 115,5699 | 116,9045 | 120,8049 |
| | HM-Tech | 100 | 101,6913 | 104,2282 | 102,0653 | 102,6928 | 102,2568 | 103,5715 | 103,5079 | 102,9697 | 105,1214 | 104,9512 | 105,4684 | 107,5117 | 109,7056 | 103,2244 | 107,6323 | 109,3429 | 105,3315 | 107,8074 | 109,057 | 112,2497 |
| | Private-KIS | 100 | 100,3829 | 99,68471 | 96,21589 | 94,81619 | 92,18108 | 88,706 | 88,89436 | 89,10034 | 90,2479 | 91,66381 | 92,94169 | 92,71644 | 91,43197 | 90,79575 | 91,80884 | 89,59807 | 85,29086 | 84,75755 | 85,79774 | 88,26863 |
| | Public-KIS | 100 | 104,4434 | 110,3562 | 105,3737 | 104,1625 | 107,063 | 109,8746 | 111,9202 | 117,1545 | 119,0772 | 119,9012 | 120,8672 | 117,3742 | 116,7714 | 118,8586 | 120,6313 | 118,2228 | 115,4658 | 113,8847 | 113,2537 | 112,5465 |
| | UKIS | 100 | 99,75062 | 102,0426 | 100,3823 | 101,7932 | 101,8782 | 100,2754 | 100,5317 | 98,96761 | 99,59502 | 100,9364 | 99,27103 | 99,90101 | 100,2097 | 101,071 | 101,4207 | 99,6971 | 95,40625 | 95,64785 | 95,74875 | 96,7386 |
| | OOS | 100 | 101,7052 | 104,507 | 100,1896 | 101,9742 | 103,5576 | 104,2154 | 106,2156 | 108,6379 | 110,8235 | 110,7462 | 110,4322 | 111,9263 | 115,2297 | 117,9968 | 117,8528 | 116,1753 | 109,8833 | 107,909 | 107,6303 | 109,6736 |
| | AGR | 100 | 100,5599 | 101,3153 | 97,1246 | 98,19875 | 97,5395 | 99,91022 | 101,3352 | 105,162 | 103,8414 | 98,50244 | 97,7783 | 95,98875 | 98,00359 | 103,4746 | 104,8459 | 109,55 | 100,7582 | 100,2144 | 100,3616 | 108,9941 |
| | TOT | 100 | 102,1015 | 104,813 | 101,8026 | 102,2607 | 102,5807 | 102,3445 | 103,1594 | 104,2834 | 105,7509 | 106,5334 | 106,6369 | 106,5635 | 106,3922 | 105,8596 | 107,2505 | 105,9133 | 101,9013 | 101,9875 | 102,4478 | 104,1055 |
| | | | | | | | | | | | | | | | | | | | | | | |
| Friuli-Venezia Giulia | | 100 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
| | LM-Tech | 100 | 101,5006 | 102,6689 | 100,403 | 102,8473 | 103,7911 | 103,8952 | 104,8169 | 106,0243 | 107,4425 | 107,2501 | 107,6122 | 109,4617 | 110,3883 | 106,9089 | 108,9732 | 110,2175 | 105,9427 | 107,9049 | 109,4859 | 113,7097 |
| | HM-Tech | 100 | 101,2656 | 102,3992 | 100,7985 | 101,7543 | 101,2134 | 106,6362 | 105,1847 | 105,2932 | 107,7041 | 106,8413 | 107,1538 | 108,9933 | 108,6485 | 106,1675 | 107,8712 | 108,0452 | 103,7627 | 108,5123 | 110,1914 | 112,744 |
| | Private-KIS | 100 | 100,6211 | 100,7952 | 96,41307 | 95,78208 | 93,33307 | 88,2981 | 86,96447 | 86,48389 | 89,03217 | 89,58533 | 91,26746 | 94,42339 | 92,89693 | 91,34909 | 91,34163 | 90,18698 | 85,34636 | 84,26701 | 85,06335 | 88,12039 |
| | Public-KIS | 100 | 103,808 | 108,9505 | 100,845 | 102,9025 | 102,9134 | 105,4752 | 112,1104 | 122,9469 | 128,2809 | 125,3761 | 124,3859 | 124,5208 | 123,609 | 124,0568 | 125,5351 | 123,807 | 117,5391 | 115,3147 | 113,8677 | 114,1081 |
| | UKIS | 100 | 99,68308 | 101,7187 | 99,62327 | 98,84143 | 99,84212 | 101,0863 | 98,40801 | 96,85014 | 98,19034 | 97,99902 | 97,80836 | 98,26774 | 98,70541 | 99,98217 | 100,1737 | 98,13283 | 92,20844 | 92,9327 | 90,75716 | 91,46843 |
| | OOS | 100 | 99,08754 | 101,3824 | 96,93132 | 96,07245 | 94,25101 | 102,3928 | 102,08 | 102,3648 | 106,8469 | 103,859 | 102,4963 | 104,5955 | 105,7664 | 110,6784 | 110,3413 | 110,3586 | 104,8017 | 102,386 | 101,1845 | 104,4513 |
| | AGR | 100 | 113,758 | 110,384 | 108,4126 | 114,0388 | 119,51 | 98,16342 | 64,53294 | 63,45825 | 59,36889 | 65,84955 | 66,50563 | 65,66233 | 52,52755 | 53,8641 | 54,40353 | 55,75468 | 52,62985 | 51,3959 | 50,67308 | 53,69095 |
| | TOT | 100 | 101,6686 | 104,0471 | 99,81915 | 100,1337 | 100,0157 | 100,0482 | 100,1225 | 102,3428 | 104,9724 | 104,2867 | 103,6871 | 104,7306 | 103,6271 | 103,3192 | 104,3278 | 103,1542 | 98,0017 | 98,03541 | 97,14617 | 98,7496 |
| | | | | | | | | | | | | | | | | | | | | | | |
| Emilia-Romagna | | 100 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
| | LM-Tech | 100 | 103,5465 | 105,9257 | 103,761 | 104,4532 | 104,7468 | 104,2123 | 104,547 | 105,8931 | 108,4682 | 109,5424 | 108,9154 | 111,5215 | 110,8944 | 107,5522 | 109,3528 | 109,1772 | 106,7637 | 108,3505 | 110,5027 | 113,9285 |
| | HM-Tech | 100 | 103,4187 | 105,3704 | 103,3615 | 103,4008 | 103,6315 | 106,0105 | 106,0218 | 106,3747 | 109,0581 | 108,3456 | 107,8406 | 110,3085 | 111,1229 | 102,7197 | 107,3492 | 109,9997 | 106,6679 | 109,2655 | 112,4449 | 116,9965 |
| | Private-KIS | 100 | 99,67718 | 99,93367 | 96,27489 | 95,62025 | 93,98332 | 90,74179 | 91,75992 | 93,41943 | 96,3606 | 97,34563 | 97,73464 | 99,61131 | 98,31663 | 97,86016 | 97,63268 | 95,406 | 93,8023 | 90,64486 | 92,06137 | 94,03896 |
| | Public-KIS | 100 | 103,7193 | 109,1251 | 102,4179 | 104,3041 | 105,7125 | 106,6424 | 108,6392 | 111,2643 | 113,9985 | 116,2803 | 117,6873 | 116,6968 | 116,5969 | 118,2972 | 119,6859 | 116,3094 | 113,4337 | 112,9489 | 111,9481 | 111,0743 |
| | UKIS | 100 | 98,04748 | 100,369 | 98,5233 | 100,8399 | 99,84357 | 102,5708 | 103,008 | 101,5434 | 103,2683 | 104,302 | 101,6962 | 101,9504 | 102,1422 | 104,0421 | 104,4067 | 102,3646 | 98,6781 | 98,21394 | 98,60851 | 100,2167 |
| | OOS | 100 | 102,3584 | 102,7059 | 101,3135 | 101,9612 | 101,1208 | 93,78259 | 96,75066 | 99,92089 | 104,7211 | 104,4906 | 101,8629 | 103,5591 | 104,1311 | 108,9649 | 107,9747 | 105,3849 | 101,9406 | 98,52081 | 98,33549 | 99,90756 |
| | AGR | 100 | 101,0438 | 100,8994 | 95,34802 | 96,05851 | 90,9302 | 96,94076 | 96,63921 | 97,82723 | 97,92778 | 99,83421 | 100,156 | 100,1318 | 99,07554 | 104,5131 | 105,3204 | 107,7303 | 106,4632 | 104,5791 | 102,4998 | 109,0485 |
| | TOT | 100 | 101,758 | 104,3398 | 101,4148 | 101,9863 | 101,4547 | 101,0269 | 101,746 | 102,7212 | 104,8813 | 105,6429 | 104,7345 | 105,5057 | 105,0022 | 104,4484 | 105,6586 | 104,2011 | 101,0542 | 100,5849 | 101,4404 | 103,2527 |
| | | | | | | | | | | | | | | | | | | | | | | |
| Trentino Alto Adige | | 100 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
| | LM-Tech | 100 | 100,806 | 103,3032 | 101,3141 | 101,037 | 99,45918 | 101,1838 | 102,0323 | 102,3601 | 104,2663 | 104,7803 | 104,2596 | 106,7211 | 107,2751 | 106,323 | 107,8034 | 108,377 | 105,4318 | 106,8918 | 106,6496 | 108,8961 |
| | HM-Tech | 100 | 103,299 | 104,3959 | 102,8558 | 105,3519 | 104,9701 | 107,5348 | 106,2551 | 107,0079 | 109,328 | 107,1972 | 107,7519 | 109,8304 | 110,3086 | 105,4432 | 107,8075 | 113,0315 | 104,3747 | 109,0334 | 111,548 | 113,8317 |
| | Private-KIS | 100 | 98,12458 | 97,56092 | 93,67109 | 90,57522 | 87,58453 | 91,34028 | 91,84929 | 92,69855 | 95,56909 | 95,44021 | 98,02239 | 97,80899 | 97,232 | 95,81941 | 95,96895 | 94,57982 | 89,30864 | 89,1139 | 87,2179 | 89,10828 |
| | Public-KIS | 100 | 104,7923 | 109,0301 | 95,5237 | 99,51236 | 98,56205 | 102,3823 | 102,7341 | 104,9843 | 108,1493 | 105,4075 | 105,6823 | 102,0324 | 105,4305 | 107,3743 | 106,6663 | 106,4922 | 102,3328 | 100,4689 | 100,5287 | 101,8622 |
| | UKIS | 100 | 98,92626 | 98,93738 | 101,077 | 99,54772 | 102,2286 | 99,04985 | 99,62695 | 100,6196 | 102,0345 | 102,2597 | 101,0503 | 101,1331 | 102,2186 | 103,4495 | 103,746 | 101,4549 | 98,65823 | 98,76076 | 98,79549 | 99,86874 |
| | OOS | 100 | 100,7192 | 102,8691 | 101,4493 | 100,793 | 103,7257 | 106,2112 | 107,3146 | 109,523 | 111,1947 | 108,8753 | 107,7513 | 109,2379 | 110,3228 | 114,1335 | 113,5356 | 113,1901 | 109,2157 | 108,2285 | 105,9157 | 107,3838 |
| | AGR | 100 | 100,7348 | 99,57629 | 95,79479 | 86,07414 | 81,26696 | 79,37245 | 78,66487 | 78,0643 | 76,9528 | 81,04911 | 79,62477 | 81,24809 | 75,67889 | 79,41886 | 79,81435 | 78,53079 | 79,04582 | 79,44104 | 78,15598 | 77,75767 |
| | TOT | 100 | 101,0981 | 102,9568 | 99,17761 | 99,09503 | 98,86811 | 99,88617 | 100,2922 | 101,855 | 103,8132 | 103,0301 | 102,9192 | 102,2441 | 103,7236 | 104,4381 | 104,373 | 103,5514 | 99,72124 | 99,52283 | 99,00905 | 100,4795 |
| | | | | | | | | | | | | | | | | | | | | | | |
| Toscana | | 100 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
| | LM-Tech | 100 | 102,0583 | 104,0815 | 100,6326 | 102,9028 | 103,59 | 103,3954 | 103,7568 | 104,1281 | 106,3962 | 106,3297 | 107,3711 | 109,7031 | 109,6125 | 107,507 | 108,5928 | 107,2888 | 104,0043 | 103,8672 | 104,0848 | 106,1754 |
| | HM-Tech | 100 | 102,5376 | 104,9173 | 104,7073 | 104,7178 | 107,4252 | 107,7449 | 107,5322 | 107,3478 | 110,3785 | 108,811 | 109,6003 | 111,9374 | 112,7496 | 109,7763 | 111,6095 | 112,7579 | 110,2514 | 111,3032 | 110,9377 | 109,8298 |
| | Private-KIS | 100 | 98,32167 | 96,88919 | 93,41786 | 92,49905 | 92,63156 | 87,56495 | 86,65281 | 85,56937 | 87,32053 | 87,74826 | 89,71615 | 90,76192 | 89,47411 | 87,75376 | 88,33679 | 85,85419 | 81,12483 | 80,17453 | 80,06017 | 84,56732 |
| | Public-KIS | 100 | 105,3399 | 112,9962 | 107,4801 | 108,0006 | 109,9227 | 112,693 | 113,6977 | 117,1853 | 121,3346 | 122,2613 | 125,3178 | 124,1689 | 122,79 | 123,8294 | 124,4364 | 121,4846 | 116,9226 | 115,6362 | 115,3789 | 114,6521 |
| | UKIS | 100 | 99,42346 | 101,1363 | 100,7585 | 102,3078 | 100,9645 | 101,7662 | 100,167 | 97,85235 | 99,75727 | 99,4014 | 98,96508 | 99,14994 | 98,28098 | 99,10381 | 99,32866 | 98,11134 | 94,54437 | 94,16752 | 93,63354 | 94,00871 |
| | OOS | 100 | 98,15728 | 100,418 | 97,96094 | 97,86915 | 97,44785 | 94,6846 | 96,23597 | 97,49724 | 100,4042 | 98,1108 | 98,69024 | 100,1678 | 100,2751 | 104,1414 | 105,11 | 104,6457 | 98,09021 | 96,25877 | 96,95602 | 98,82194 |
| | AGR | 100 | 100,5395 | 99,87977 | 95,57518 | 99,19523 | 91,16855 | 105,5408 | 106,6179 | 109,0898 | 107,8531 | 108,0859 | 105,9901 | 108,5599 | 105,1961 | 109,7672 | 109,3996 | 112,0279 | 104,7509 | 105,8357 | 106,1852 | 110,0221 |
| | TOT | 100 | 101,6941 | 104,4436 | 101,4309 | 101,9815 | 102,0541 | 101,7631 | 101,3181 | 101,3153 | 103,9228 | 103,5383 | 104,4717 | 105,2961 | 104,3113 | 103,8191 | 104,2064 | 102,4762 | 98,08831 | 97,35651 | 96,93975 | 98,05677 |
| | | | | | | | | | | | | | | | | | | | | | | |
| Umbria | | 100 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
| | LM-Tech | 100 | 103,4664 | 107,8606 | 104,0076 | 104,6245 | 104,2506 | 105,5938 | 105,472 | 105,3921 | 106,6374 | 107,6242 | 108,5314 | 110,1177 | 111,0164 | 108,7163 | 111,25 | 111,2967 | 107,2869 | 108,806 | 107,8581 | 112,6007 |
| | HM-Tech | 100 | 103,8192 | 107,7712 | 103,5493 | 103,1553 | 103,206 | 100,6564 | 100,7406 | 100,5893 | 100,5347 | 101,2994 | 98,93021 | 100,6244 | 101,1331 | 96,2844 | 97,33271 | 97,20739 | 89,536 | 101,7791 | 102,8322 | 111,6855 |
| | Private-KIS | 100 | 99,08802 | 95,11867 | 94,03826 | 93,48324 | 89,99456 | 85,54893 | 85,08418 | 84,57723 | 84,64562 | 87,11965 | 88,15202 | 88,99466 | 88,08023 | 86,4374 | 85,46031 | 84,5796 | 77,81733 | 78,57201 | 78,28588 | 79,30117 |
| | Public-KIS | 100 | 104,2626 | 110,4271 | 106,186 | 107,3506 | 109,7515 | 109,7577 | 111,2145 | 114,3537 | 118,2965 | 120,7411 | 122,9555 | 120,9197 | 124,5464 | 123,6514 | 122,4374 | 118,419 | 115,3788 | 114,4984 | 114,1432 | 109,9068 |
| | UKIS | 100 | 98,58399 | 98,00651 | 96,25205 | 98,89575 | 97,06107 | 98,50778 | 97,44312 | 96,52236 | 98,31075 | 100,7006 | 100,2752 | 100,3152 | 101,6248 | 101,7288 | 100,8365 | 99,59595 | 95,58918 | 95,98679 | 95,49472 | 94,79218 |
| | OOS | 100 | 101,7378 | 103,6138 | 101,2605 | 102,669 | 102,2682 | 106,3837 | 108,1944 | 113,2934 | 113,4267 | 116,0841 | 114,9629 | 116,2873 | 117,804 | 122,1924 | 121,4876 | 122,1879 | 116,2593 | 110,5295 | 111,298 | 117,4321 |
| | AGR | 100 | 100,6058 | 99,34226 | 93,46948 | 94,55401 | 87,39293 | 82,95416 | 83,83268 | 83,41951 | 81,83645 | 85,71548 | 85,14462 | 86,71823 | 81,43905 | 85,12521 | 84,65063 | 87,5344 | 87,26361 | 86,10784 | 85,45994 | 81,11464 |
| | TOT | 100 | 101,704 | 103,4664 | 100,2367 | 100,5915 | 99,29897 | 98,95118 | 99,02809 | 99,79269 | 100,9936 | 102,5642 | 102,6718 | 102,2054 | 103,0547 | 102,4778 | 102,2718 | 100,5514 | 95,87938 | 96,31881 | 96,14483 | 96,00558 |
| | | | | | | | | | | | | | | | | | | | | | | |
| Marche | | 100 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
| | LM-Tech | 100 | 102,6765 | 106,6196 | 103,1982 | 103,9398 | 105,2687 | 108,2722 | 109,1807 | 109,4606 | 111,3586 | 112,8001 | 113,1688 | 114,8384 | 115,7267 | 112,8026 | 115,3982 | 115,6996 | 111,5377 | 112,0829 | 114,3138 | 118,8965 |
| | HM-Tech | 100 | 101,7152 | 105,0381 | 103,4338 | 102,7876 | 102,5312 | 105,7123 | 105,5102 | 105,8678 | 109,8184 | 110,3526 | 111,3368 | 112,6585 | 113,7783 | 107,2726 | 109,7505 | 113,1179 | 110,6454 | 107,0841 | 113,3524 | 120,2894 |
| | Private-KIS | 100 | 100,6171 | 99,3166 | 96,87974 | 94,62809 | 94,31334 | 87,92892 | 87,64292 | 87,82707 | 88,43572 | 89,7779 | 91,03951 | 90,69385 | 90,12513 | 88,41017 | 89,0278 | 87,64696 | 89,12446 | 87,73097 | 88,1035 | 91,62967 |
| | Public-KIS | 100 | 105,4488 | 108,9039 | 103,508 | 104,1494 | 109,4925 | 111,7183 | 112,6011 | 115,1585 | 115,3296 | 117,5986 | 124,1835 | 120,4777 | 120,4641 | 121,438 | 120,2012 | 118,4139 | 115,4682 | 114,7027 | 113,9647 | 113,6163 |
| | UKIS | 100 | 99,51149 | 100,3227 | 100,5106 | 103,4017 | 99,72609 | 101,2113 | 101,9591 | 100,4128 | 103,0521 | 104,7384 | 101,7965 | 101,2925 | 101,0831 | 101,082 | 101,2734 | 100,9275 | 96,01167 | 96,02863 | 94,80892 | 96,07635 |
| | OOS | 100 | 102,4486 | 103,491 | 100,9672 | 105,9387 | 103,3545 | 104,8828 | 105,3131 | 106,8447 | 108,6766 | 108,2633 | 108,1469 | 110,7874 | 112,8374 | 114,9104 | 117,2461 | 117,7925 | 115,922 | 114,3484 | 114,3549 | 117,7511 |
| | AGR | 100 | 97,67059 | 95,55774 | 93,79942 | 96,01621 | 92,47526 | 94,24945 | 96,16547 | 98,38986 | 97,47622 | 96,84314 | 92,07067 | 91,50795 | 88,39789 | 89,94143 | 92,29526 | 97,2209 | 95,1749 | 98,09459 | 96,0223 | 100,3486 |
| | TOT | 100 | 102,5748 | 105,0971 | 101,969 | 102,4948 | 103,3351 | 103,7316 | 103,972 | 104,3639 | 106,0478 | 107,375 | 108,3617 | 107,548 | 107,7764 | 106,7309 | 107,4941 | 106,7281 | 103,5638 | 103,0881 | 103,6215 | 105,9345 |

| Lazio | | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LM-Tech | 100 | 103,4008 | 106,2186 | 104,5764 | 104,3418 | 102,196 | 101,6533 | 100,9141 | 100,1364 | 100,285 | 101,0176 | 101,8075 | 103,2196 | 103,7547 | 98,99969 | 100,3965 | 100,3237 | 97,42876 | 97,83697 | 99,87147 | 103,2616 |
| | HM-Tech | 100 | 103,9156 | 107,0333 | 106,9606 | 107,4164 | 108,44 | 107,5713 | 107,6208 | 107,2068 | 105,0848 | 105,611 | 102,1436 | 107,8534 | 106,8963 | 102,3736 | 99,0907 | 103,652 | 101,1972 | 102,6918 | 105,4956 | 109,2145 |
| | Private-KIS | 100 | 99,65046 | 99,51813 | 94,11278 | 93,41883 | 94,05944 | 98,04477 | 98,09293 | 97,12593 | 97,04149 | 98,13845 | 100,931 | 102,199 | 99,98453 | 98,3251 | 98,00524 | 96,38241 | 93,18222 | 92,22664 | 92,69805 | 93,38768 |
| | Public-KIS | 100 | 104,1594 | 108,6687 | 103,9809 | 104,4136 | 104,0796 | 105,7183 | 106,5559 | 111,748 | 111,281 | 112,7892 | 113,6846 | 112,3412 | 113,3343 | 113,9137 | 112,9915 | 107,0846 | 101,7893 | 100,3444 | 100,2936 | 100,6819 |
| | LKIS | 100 | 97,8866 | 99,28032 | 97,84415 | 99,11692 | 98,79798 | 97,54875 | 97,80841 | 96,40821 | 96,82778 | 98,16929 | 98,46844 | 100,9008 | 98,95373 | 99,36654 | 98,9316 | 97,58034 | 93,5281 | 92,75687 | 90,80079 | 91,87126 |
| | COS | 100 | 101,5128 | 103,9593 | 103,2816 | 103,8314 | 103,4423 | 100,2443 | 103,8166 | 107,6365 | 107,8928 | 107,7618 | 111,5973 | 112,8164 | 112,6978 | 115,6876 | 117,4901 | 118,9101 | 110,9222 | 106,8797 | 109,1004 | 109,1686 |
| | AGR | 100 | 100,1787 | 100,1144 | 94,72759 | 98,091 | 98,94612 | 103,6589 | 109,0312 | 108,2843 | 103,9892 | 104,2198 | 100,8999 | 101,211 | 95,38232 | 97,99541 | 97,99334 | 98,66594 | 93,29088 | 91,86044 | 93,22818 | 97,45618 |
| | TOT | 100 | 101,3811 | 103,4896 | 99,99529 | 99,75034 | 99,0911 | 99,72566 | 99,88597 | 100,7948 | 99,70932 | 100,4385 | 101,4691 | 101,8357 | 101,2873 | 100,9311 | 100,366 | 97,83947 | 93,72298 | 92,51088 | 91,99983 | 92,71071 |
| Abruzzo | | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
| | LM-Tech | 100 | 102,9899 | 108,7398 | 105,231 | 105,7884 | 103,9965 | 105,5827 | 105,6864 | 107,6041 | 109,9409 | 109,3467 | 111,8724 | 114,7434 | 113,7281 | 111,5958 | 112,009 | 110,4135 | 104,7434 | 102,8791 | 103,0654 | 108,3969 |
| | HM-Tech | 100 | 103,9378 | 107,9594 | 104,965 | 104,6156 | 106,7994 | 110,8524 | 109,5957 | 110,4038 | 115,1433 | 113,4979 | 115,5466 | 119,2275 | 116,2655 | 104,3726 | 112,5671 | 117,1127 | 108,6918 | 111,0821 | 117,1599 | 126,7386 |
| | Private-KIS | 100 | 102,0822 | 101,7379 | 99,52239 | 98,32727 | 94,86266 | 97,75176 | 95,98707 | 96,19729 | 98,32173 | 98,52326 | 100,0388 | 104,4615 | 100,9968 | 100,8322 | 100,0358 | 96,18688 | 94,04561 | 91,16582 | 92,04991 | 91,91152 |
| | Public-KIS | 100 | 105,2092 | 107,6705 | 102,8926 | 103,5994 | 107,0865 | 108,1684 | 108,7283 | 113,3734 | 116,6206 | 121,6142 | 124,449 | 125,2089 | 126,212 | 131,3864 | 128,5577 | 130,6473 | 123,3251 | 120,1115 | 118,3377 | 116,67 |
| | LKIS | 100 | 101,6392 | 98,62857 | 98,86361 | 99,74649 | 98,06468 | 97,70448 | 95,82467 | 94,21618 | 95,67612 | 97,93118 | 98,01866 | 99,14263 | 100,8649 | 99,53766 | 101,5567 | 99,70529 | 91,67119 | 90,59936 | 92,68157 | 92,64311 |
| | COS | 100 | 103,6393 | 108,5856 | 103,3268 | 107,0072 | 106,6967 | 107,5071 | 105,3571 | 107,377 | 108,8423 | 106,6043 | 108,4266 | 109,9919 | 109,8581 | 111,2605 | 109,4245 | 108,1211 | 101,7892 | 99,07275 | 98,90767 | 98,74374 |
| | AGR | 100 | 101,9869 | 93,62653 | 92,48936 | 92,42674 | 89,22474 | 95,27443 | 97,32904 | 102,2159 | 101,239 | 99,34189 | 96,23479 | 96,05813 | 92,94816 | 96,55564 | 97,97751 | 102,7196 | 107,7827 | 106,6767 | 103,0601 | 108,3323 |
| | TOT | 100 | 103,1911 | 105,172 | 102,1954 | 102,3512 | 101,7251 | 103,0068 | 101,8051 | 103,209 | 106,0958 | 107,073 | 108,5206 | 110,6312 | 109,6846 | 110,351 | 109,8314 | 108,8747 | 102,5833 | 100,9315 | 101,9713 | 102,6887 |
| Molise | | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
| | LM-Tech | 100 | 105,3879 | 111,1419 | 109,0705 | 108,9181 | 108,7322 | 111,7336 | 110,4477 | 110,2285 | 113,073 | 112,0103 | 113,3574 | 115,9421 | 115,1177 | 110,1355 | 112,4914 | 107,9399 | 98,46502 | 107,0808 | 94,26002 | 101,2348 |
| | HM-Tech | 100 | 99,20189 | 102,0263 | 102,3408 | 107,2793 | 106,0701 | 110,4067 | 112,4612 | 113,4153 | 115,5452 | 114,5014 | 117,1228 | 122,5114 | 115,9378 | 115,455 | 119,8654 | 112,9855 | 105,7013 | 98,73254 | 108,2348 | 113,6717 |
| | Private-KIS | 100 | 97,64292 | 99,53377 | 99,37754 | 99,28361 | 93,60312 | 89,72399 | 89,29691 | 89,91741 | 90,29336 | 91,64599 | 93,73025 | 94,71696 | 91,06477 | 88,80445 | 89,27336 | 88,34508 | 83,94882 | 84,20402 | 81,31445 | 82,11592 |
| | Public-KIS | 100 | 106,7661 | 115,3032 | 109,3264 | 110,8388 | 109,9949 | 113,5995 | 112,8655 | 118,747 | 119,9615 | 121,5805 | 130,756 | 130,0787 | 128,8627 | 128,6132 | 128,3935 | 123,4941 | 119,3567 | 116,9307 | 114,26 | 113,922 |
| | LKIS | 100 | 97,0382 | 98,10093 | 97,55321 | 103,0204 | 97,73071 | 103,1378 | 101,8625 | 98,91035 | 103,6467 | 103,2616 | 103,071 | 103,2333 | 102,7548 | 101,9508 | 103,3996 | 100,0772 | 87,34551 | 88,41025 | 85,05859 | 86,22036 |
| | COS | 100 | 103,2535 | 103,1936 | 97,72956 | 101,8348 | 102,3022 | 98,38703 | 96,74314 | 97,92225 | 97,81254 | 94,12994 | 94,80885 | 97,0159 | 96,25003 | 95,36965 | 94,66691 | 93,99204 | 88,51577 | 88,50782 | 88,93926 | 91,38107 |
| | AGR | 100 | 98,31183 | 98,29434 | 95,74533 | 96,42674 | 89,22474 | 95,27443 | 97,32904 | 102,2159 | 101,239 | 99,34189 | 96,23479 | 96,05813 | 92,94816 | 96,55564 | 97,97751 | 102,7196 | 107,7827 | 106,6767 | 103,0601 | 108,3323 |
| | TOT | 100 | 102,4444 | 107,2178 | 103,38 | 105,1358 | 102,0412 | 103,9465 | 102,9284 | 104,6522 | 106,9961 | 107,0717 | 110,3965 | 110,0702 | 108,3755 | 107,7776 | 108,5046 | 104,4549 | 98,36976 | 98,26006 | 96,02698 | 97,97033 |
| Campania | | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
| | LM-Tech | 100 | 104,4549 | 108,1832 | 108,5389 | 109,3343 | 109,7774 | 111,0719 | 108,0999 | 107,2223 | 109,1489 | 111,0426 | 114,879 | 118,5657 | 116,812 | 115,3622 | 115,5948 | 114,403 | 109,742 | 110,3133 | 112,1057 | 115,8768 |
| | HM-Tech | 100 | 104,8775 | 112,3515 | 113,4694 | 114,4043 | 114,63 | 108,021 | 104,0751 | 101,6179 | 104,5627 | 102,4306 | 104,1013 | 107,7973 | 105,9482 | 95,29687 | 94,9736 | 94,44375 | 84,3212 | 91,4535 | 92,36524 | 93,61397 |
| | Private-KIS | 100 | 102,8627 | 103,4921 | 101,05 | 101,4161 | 100,453 | 98,28002 | 96,26327 | 93,39606 | 95,32296 | 98,30586 | 100,7593 | 103,915 | 100,6774 | 99,75691 | 101,1348 | 98,42064 | 93,99451 | 93,47641 | 92,26929 | 92,72968 |
| | Public-KIS | 100 | 105,1022 | 110,1779 | 104,3227 | 105,6776 | 110,0606 | 113,2275 | 113,0304 | 114,2305 | 117,2963 | 125,1532 | 127,4902 | 127,908 | 128,7988 | 131,1591 | 132,2489 | 125,6956 | 120,8044 | 119,6209 | 117,7271 | 117,944 |
| | LKIS | 100 | 101,4325 | 104,0646 | 102,8867 | 105,093 | 105,6268 | 107,9442 | 106,4383 | 103,622 | 106,7879 | 110,0467 | 109,6526 | 111,7142 | 109,5525 | 111,9622 | 112,3367 | 109,5009 | 106,6139 | 106,5816 | 103,3599 | 105,1759 |
| | COS | 100 | 105,8046 | 110,8125 | 108,9353 | 115,5169 | 114,9999 | 112,8367 | 117,5242 | 119,3351 | 123,0851 | 123,9717 | 126,0649 | 132,8416 | 126,7503 | 128,917 | 125,8808 | 124,2939 | 117,9519 | 117,6105 | 116,3908 | 120,485 |
| | AGR | 100 | 99,11318 | 102,3655 | 97,09021 | 99,02467 | 97,28907 | 96,66585 | 96,04775 | 100,8284 | 97,09878 | 100,5292 | 99,64148 | 101,6244 | 100,1561 | 105,2975 | 106,3121 | 109,3982 | 100,7205 | 96,30312 | 100,7749 | 103,9814 |
| | TOT | 100 | 103,8288 | 107,3588 | 104,0059 | 105,3056 | 106,3693 | 107,0483 | 105,458 | 104,7001 | 106,7953 | 110,7181 | 112,4096 | 114,7905 | 113,6594 | 114,4286 | 114,3519 | 110,5964 | 105,6253 | 105,6633 | 103,7839 | 104,8224 |
| Puglia | | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
| | LM-Tech | 100 | 106,4408 | 109,5338 | 106,1873 | 108,865 | 107,1679 | 110,8544 | 109,5766 | 108,8039 | 112,4654 | 113,1876 | 114,7394 | 115,7824 | 115,5672 | 109,4423 | 109,3685 | 112,0599 | 108,6198 | 108,0396 | 110,7567 | 111,5485 |
| | HM-Tech | 100 | 104,6934 | 108,5173 | 108,1172 | 109,8997 | 106,1816 | 103,5505 | 102,9013 | 102,4266 | 104,6705 | 102,6629 | 103,1699 | 105,6142 | 102,8753 | 95,44564 | 98,20815 | 98,56354 | 94,60666 | 97,33633 | 102,1715 | 103,1564 |
| | Private-KIS | 100 | 103,223 | 106,3093 | 104,9505 | 103,1539 | 100,218 | 97,60212 | 96,38656 | 96,23556 | 98,35545 | 98,27477 | 98,56153 | 99,70353 | 96,13291 | 93,79298 | 93,79488 | 91,4988 | 86,82488 | 85,94103 | 85,93004 | 87,0466 |
| | Public-KIS | 100 | 107,9752 | 114,1103 | 109,0742 | 107,0623 | 109,1942 | 112,3695 | 116,1413 | 122,8206 | 124,2 | 127,6451 | 128,1731 | 127,539 | 125,3187 | 127,6371 | 131,1095 | 128,6503 | 122,9562 | 119,2596 | 117,7152 | 117,7894 |
| | LKIS | 100 | 102,0644 | 103,2018 | 104,0243 | 106,692 | 107,2573 | 110,6738 | 109,6915 | 108,9659 | 112,2012 | 112,0399 | 110,6719 | 112,2664 | 111,7463 | 111,7709 | 115,3258 | 112,6878 | 108,148 | 109,5367 | 107,7387 | 107,8525 |
| | COS | 100 | 100,68 | 108,9368 | 108,5107 | 111,038 | 106,4867 | 113,9001 | 115,8887 | 118,9568 | 125,3422 | 122,9742 | 121,2454 | 124,1937 | 123,9216 | 124,3576 | 125,6126 | 125,7534 | 119,1059 | 121,6154 | 123,4242 | 125,3976 |
| | AGR | 100 | 99,61026 | 102,6079 | 101,8453 | 99,91936 | 95,42379 | 91,81092 | 91,93523 | 95,35701 | 96,34461 | 99,82618 | 100,8153 | 100,7679 | 97,53631 | 98,29289 | 100,1113 | 103,809 | 99,05466 | 100,135 | 104,1612 | 109,1038 |
| | TOT | 100 | 105,6668 | 110,166 | 106,8579 | 106,32 | 105,2767 | 106,7008 | 107,3881 | 109,764 | 112,1504 | 113,0114 | 112,5212 | 113,1326 | 111,0526 | 110,7924 | 112,9658 | 111,4471 | 106,3999 | 105,9091 | 105,5611 | 105,7646 |
| Basilicata | | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
| | LM-Tech | 100 | 104,383 | 109,7263 | 106,0001 | 104,2085 | 99,01139 | 96,69743 | 95,6859 | 94,00595 | 96,84661 | 97,64878 | 97,95574 | 99,21316 | 101,9735 | 96,64832 | 98,43963 | 94,48297 | 91,22602 | 95,42024 | 94,70899 | 100,3719 |
| | HM-Tech | 100 | 106,8754 | 110,0253 | 111,9422 | 111,6556 | 109,7717 | 107,6062 | 107,5551 | 105,3362 | 105,972 | 106,4236 | 113,0276 | 112,6523 | 99,81709 | 108,7682 | 101,343 | 94,94668 | 80,93527 | 72,40871 | 93,96917 | 132,8018 |
| | Private-KIS | 100 | 103,2524 | 103,8624 | 100,371 | 101,277 | 98,01253 | 90,92067 | 91,22164 | 91,36035 | 92,53183 | 95,06997 | 96,33621 | 97,49833 | 95,29447 | 93,80669 | 93,50024 | 89,69594 | 87,86982 | 85,46027 | 85,83717 | 83,1719 |
| | Public-KIS | 100 | 106,5735 | 110,1459 | 103,5951 | 102,3073 | 102,0447 | 105,3216 | 109,4013 | 112,2008 | 115,2261 | 121,3984 | 122,2226 | 121,3992 | 119,8767 | 120,0009 | 121,7788 | 115,2737 | 107,2634 | 106,5433 | 106,8447 | 104,3993 |
| | LKIS | 100 | 102,7725 | 102,8975 | 101,6899 | 105,1793 | 103,8939 | 102,2489 | 100,1036 | 97,10625 | 100,9126 | 101,2224 | 98,74235 | 99,37736 | 98,02732 | 95,4594 | 98,42971 | 94,33987 | 90,37657 | 88,75707 | 88,09289 | 89,19948 |
| | COS | 100 | 98,43542 | 99,66595 | 97,36485 | 101,297 | 92,77457 | 95,05584 | 94,41145 | 93,99082 | 96,56189 | 94,28634 | 96,39627 | 97,19375 | 97,57748 | 97,63917 | 100,8164 | 100,5135 | 92,08448 | 93,31244 | 92,04712 | 95,11961 |
| | AGR | 100 | 99,9806 | 98,2276 | 97,59082 | 101,8078 | 98,88642 | 114,241 | 113,2244 | 113,821 | 114,7418 | 118,4251 | 118,4523 | 117,9308 | 114,0134 | 119,6869 | 119,3577 | 121,8133 | 119,4969 | 121,2964 | 123,1327 | 130,4848 |
| | TOT | 100 | 104,7812 | 107,2568 | 103,185 | 103,1942 | 100,501 | 100,4977 | 100,8648 | 100,2661 | 103,2255 | 105,5672 | 106,0357 | 106,4629 | 104,5324 | 104,4234 | 104,931 | 100,5366 | 94,52138 | 93,6302 | 94,95305 | 98,01832 |
| Calabria | | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
| | LM-Tech | 100 | 106,3182 | 109,2993 | 108,9031 | 109,8537 | 108,3978 | 107,0933 | 106,3302 | 103,8567 | 105,4299 | 106,6854 | 107,7179 | 109,7393 | 114,0191 | 112,3769 | 108,5288 | 107,9649 | 104,2679 | 102,1785 | 102,9405 | 107,0528 |
| | HM-Tech | 100 | 107,1817 | 109,8131 | 114,5836 | 112,4744 | 111,8217 | 99,22732 | 98,11309 | 99,41234 | 101,1442 | 101,2621 | 100,9488 | 104,092 | 92,9879 | 91,73393 | 84,52153 | 88,41706 | 89,03156 | 96,78471 | 92,76398 | 97,43505 |
| | Private-KIS | 100 | 104,3038 | 102,4411 | 99,90415 | 102,142 | 97,05325 | 87,3788 | 86,09726 | 85,58483 | 85,80634 | 87,78174 | 88,83066 | 90,6962 | 87,35243 | 86,6073 | 85,10181 | 85,5115 | 80,44995 | 78,67627 | 78,10953 | 78,34166 |
| | Public-KIS | 100 | 107,5206 | 114,0678 | 109,7466 | 110,7812 | 110,5597 | 111,9195 | 112,8952 | 112,1793 | 112,7171 | 120,1457 | 121,8331 | 124,3225 | 126,7999 | 126,6936 | 124,0328 | 122,0739 | 116,9205 | 115,6783 | 116,1095 | 115,7473 |
| | LKIS | 100 | 101,0759 | 101,7611 | 101,502 | 104,3645 | 102,8742 | 104,4567 | 103,5312 | 102,5371 | 104,5306 | 105,8273 | 104,4259 | 105,6676 | 105,0801 | 103,9718 | 101,1757 | 100,6543 | 95,93002 | 93,7098 | 92,03863 | 93,24591 |
| | COS | 100 | 105,4603 | 102,3589 | 103,3052 | 108,421 | 109,8807 | 111,8898 | 112,7231 | 113,3572 | 111,3967 | 108,4228 | 110,0748 | 114,0198 | 112,4188 | 110,5381 | 104,9214 | 104,2956 | 101,8366 | 102,2752 | 102,4746 | 104,3685 |
| | AGR | 100 | 99,05001 | 98,04128 | 95,54137 | 98,01187 | 94,36085 | 91,52575 | 90,82767 | 95,34148 | 94,40117 | 94,93015 | 95,69454 | 94,16007 | 89,26239 | 90,39012 | 92,1533 | 83,79735 | 78,05411 | 78,02774 | 83,31622 | 79,94769 |
| | TOT | 100 | 105,3981 | 108,7958 | 106,3161 | 107,9301 | 106,3923 | 104,1118 | 103,1876 | 102,9225 | 102,8589 | 105,3313 | 106,0935 | 107,8644 | 108,1563 | 107,6826 | 105,5532 | 102,8356 | 98,32875 | 97,75383 | 97,69458 | 97,43232 |
| Sicilia | | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
| | LM-Tech | 100 | 105,7492 | 108,2384 | 106,3834 | 107,8638 | 109,2153 | 109,3025 | 108,8636 | 108,5765 | 110,1331 | 110,1461 | 112,9921 | 115,3255 | 117,879 | 114,1832 | 114,2394 | 111,947 | 108,6885 | 108,1329 | 108,0381 | 110,6411 |
| | HM-Tech | 100 | 104,6885 | 107,4426 | 108,4143 | 108,3326 | 107,7153 | 107,5728 | 105,3949 | 98,05079 | 107,057 | 106,3016 | 108,2745 | 109,5761 | 107,7227 | 105,1936 | 102,6901 | 101,759 | 98,73222 | 109,487 | 108,3591 | 110,0969 |
| | Private-KIS | 100 | 101,9455 | 102,2731 | 98,32131 | 96,89978 | 93,93381 | 96,20525 | 96,28505 | 94,06722 | 97,7902 | 96,13406 | 97,58506 | 98,98459 | 96,07899 | 95,07709 | 93,55933 | 91,64017 | 86,77017 | 86,80014 | 85,18178 | 87,85943 |
| | Public-KIS | 100 | 105,3193 | 107,1616 | 103,1394 | 104,1956 | 106,2594 | 107,4224 | 109,7338 | 111,3987 | 113,6683 | 114,8965 | 119,5684 | 118,5323 | 120,0675 | 119,9813 | 119,4154 | 114,7579 | 111,7211 | 111,0401 | 109,8829 | 110,3033 |
| | LKIS | 100 | 99,44505 | 103,1865 | 102,7541 | 107,0115 | 108,3559 | 114,0845 | 112,1194 | 111,1392 | 114,4883 | 114,5487 | 114,153 | 116,1129 | 115,9919 | 113,8395 | 113,7683 | 110,2153 | 103,3875 | 100,7705 | 99,2807 | 101,1394 |
| | COS | 100 | 102,9529 | 106,4621 | 106,9584 | 110,0307 | 108,9983 | 109,4179 | 108,3017 | 110,4036 | 114,3423 | 109,6856 | 111,6824 | 115,8324 | 115,4979 | 113,5918 | 110,8538 | 109,807 | 104,9374 | 105,7017 | 106,8546 | 109,3057 |
| | AGR | 100 | 98,76438 | 96,57533 | 94,51897 | 93,71375 | 93,06509 | 94,26962 | 94,56969 | 99,69286 | 100,4159 | 102,8656 | 98,80991 | 100,5808 | 97,82704 | 101,3861 | 101,4861 | 104,6332 | 104,4367 | 102,1423 | 101,7684 | 104,1938 |
| | TOT | 100 | 102,936 | 105,3894 | 102,5316 | 103,5559 | 104,1101 | 106,017 | 105,8239 | 105,3987 | 108,4046 | 108,1032 | 110,0709 | 110,6768 | 110,4947 | 109,84 | 108,6443 | 105,4145 | 100,5276 | 100,1538 | 99,86704 | 99,89656 |
| Sardegna | | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
| | LM-Tech | 100 | 103,9901 | 108,5808 | 107,4403 | 110,4527 | 107,9711 | 103,8025 | 104,6929 | 103,0231 | 104,3995 | 106,0657 | 106,4462 | 109,3986 | 109,2626 | 105,4257 | 103,5375 | 98,63814 | 97,39929 | 96,05405 | 97,25173 | 102,9814 |
| | HM-Tech | 100 | 102,9547 | 103,1973 | 103,9123 | 100,4573 | 93,31223 | 93,35585 | 89,64947 | 90,01807 | 90,87948 | 95,01298 | 93,44994 | 95,95473 | 97,84027 | 98,42695 | 100,5174 | 102,3666 | 95,47901 | 82,69218 | 79,35546 | 87,0277 |
| | Private-KIS | 100 | 101,7459 | 102,0887 | 98,30278 | 97,22239 | 94,34396 | 90,25769 | 89,96322 | 89,70957 | 91,88496 | 91,81534 | 92,8328 | 94,85677 | 91,37438 | 91,62039 | 89,80764 | 86,45088 | 84,67926 | 85,00897 | 85,35787 | 85,88545 |
| | Public-KIS | 100 | 106,8118 | 112,3124 | 106,2604 | 107,8978 | 110,8206 | 114,9906 | 115,1566 | 119,7989 | 121,9471 | 125,3859 | 129,3432 | 125,6769 | 126,973 | 126,8528 | 128,7738 | 124,2431 | 120,1559 | 118,7177 | 115,3414 | 114,4863 |
| | LKIS | 100 | 98,41957 | 99,89816 | 98,81404 | 101,4922 | 102,0555 | 99,50439 | 99,48499 | 95,34571 | 97,50426 | 100,8908 | 98,19173 | 100,5247 | 100,285 | 99,46878 | 97,95071 | 94,3819 | 90,13584 | 89,05131 | 88,01767 | 88,31876 |
| | COS | 100 | 98,79017 | 102,3168 | 100,0182 | 103,0758 | 107,1034 | 111,4965 | 110,5717 | 110,2209 | 112,29 | 112,2731 | 111,3571 | 113,3258 | 114,3939 | 116,9625 | 113,9612 | 111,9314 | 105,4874 | 105,997 | 108,7212 | 111,2918 |
| | AGR | 100 | 100,9894 | 98,06263 | 95,71831 | 100,1884 | 97,46279 | 91,26157 | 85,5016 | 85,74849 | 76,01208 | 81,35478 | 81,60704 | 84,69838 | 84,19611 | 76,751 | 77,65996 | 80,0915 | 73,04326 | 71,49183 | 78,79057 | 71,99674 |
| | TOT | 100 | 102,5484 | 105,32 | 101,7291 | 102,5291 | 102,8642 | 102,7685 | 102,1492 | 102,2929 | 103,4966 | 105,0117 | 105,1136 | 105,4334 | 104,8877 | 104,7125 | 103,9199 | 100,0089 | 96,52788 | 95,97123 | 94,69364 | 94,99225 |
| Italia | | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
| | LM-Tech | 100 | 102,7259 | 105,4614 | 103,3977 | 104,5893 | 104,8442 | 105,3608 | 105,5284 | 105,9536 | 107,9527 | 108,4772 | 109,0909 | 111,136 | 111,1648 | 107,5818 | 110,5992 | 110,7734 | 107,7834 | 108,9282 | 110,5668 | 113,9542 |
| | HM-Tech | 100 | 102,6996 | 105,6309 | 104,5143 | 105,0325 | 104,9573 | 105,2346 | 104,4592 | 102,836 | 105,9594 | 105,0975 | 105,4365 | 107,6656 | 107,7155 | 101,4244 | 104,8365 | 106,7026 | 103,4384 | 105,2037 | 107,406 | 110,7615 |
| | Private-KIS | 100 | 100,5855 | 100,3094 | 96,62572 | 96,07231 | 94,23567 | 93,49888 | 93,34978 | 93,14835 | 94,44042 | 95,86881 | 97,09747 | 98,13674 | 96,69134 | 95,98815 | 96,36157 | 94,44855 | 90,58566 | 89,52189 | 90,10236 | 91,88017 |
| | Public-KIS | 100 | 105,0343 | 110,1916 | 104,6887 | 105,5552 | 106,8209 | 108,7736 | 110,5153 | 113,9171 | 115,9296 | 118,4046 | 120,3969 | 118,8687 | 119,5738 | 120,8268 | 121,0869 | 117,2875 | 113,1254 | 111,7529 | 110,9948 | 110,59 |
| | LKIS | 100 | 99,18508 | 100,6882 | 99,66269 | 101,704 | 101,6733 | 102,531 | 102,0545 | 100,4558 | 101,68 | 102,7907 | 101,4152 | 102,355 | 102,0439 | 103,2997 | 103,8478 | 102,0011 | 97,61554 | 97,60509 | 96,86544 | 97,86457 |
| | COS | 100 | 101,323 | 103,6326 | 101,1382 | 102,7934 | 102,442 | 101,834 | 103,0543 | 104,4951 | 106,8729 | 105,866 | 105,8255 | 107,9688 | 108,585 | 111,9401 | 111,9418 | 112,0603 | 106,992 | 105,9427 | 106,3255 | 108,2123 |
| | AGR | 100 | 101,0622 | 101,6147 | 98,75676 | 100,0826 | 97,87772 | 98,82564 | 97,93133 | 100,2502 | 98,65122 | 100,6249 | 99,67827 | 100,5398 | 97,37718 | 100,2609 | 101,1576 | 100,2874 | 96,19346 | 95,36613 | 97,29896 | 99,92766 |
| | TOT | 100 | 102,1914 | 104,8086 | 101,7541 | 102,3801 | 102,0726 | 102,4285 | 102,4818 | 102,897 | 104,4045 | 105,2843 | 105,5264 | 105,9988 | 105,6652 | 105,4557 | 106,2114 | 104,3595 | 100,1514 | 99,86494 | 99,84048 | 100,9952 |