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STRUCTURAL CHANGE, AGGREGATE DEMAND AND THE DECLINE OF LABOUR PRODUCTIVITY: A COMPARATIVE PERSPECTIVE

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Structural change, aggregate demand and the decline of labour productivity: a comparative perspective[1]

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Abstract

Over the last three decades, many advanced economies have experienced significant changes in their productive structures, with a decline in the share of workers in manufacture and a transition towards the service sector. This structural change can be considered as one of the main causes behind the poor performance of aggregate labour productivity. Moreover, these changes have been associated with a process of reforms in the labour market - i.e. an increase in labour flexibility and a reduction in employees' protections - and a compression of the wage share. Our hypothesis is that these institutional and economic processes can also be harmful to labour productivity.

We submit our hypotheses to empirical scrutiny. The results are as follows: the share of employment in manufacture is positively related to labour productivity. On the other hand, the share of employment in several service industries and labour flexibility negatively affect it.

Keywords: Structural change, labour productivity, aggregate demand, welfare models

JEL codes: L160; E240; J230; H530

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1. A general overview of the main trend and some theoretical background

Over the last three to four decades, many advanced economies have experienced significant changes in their productive structures and in their industrial strategies. While the post-WWII period of expansion – qualified by some scholars as "The Golden Age of Capitalism" (Marglin and Schor, 1990) – was characterised by the manufacturing industry exerting the leading role, in more recent years, a massive shift in employment has been taking place in most Western countries. Indeed, a steady decline in the share of workers in manufacturing and a transition towards the service sector are very well-known features of contemporary capitalism.[2]

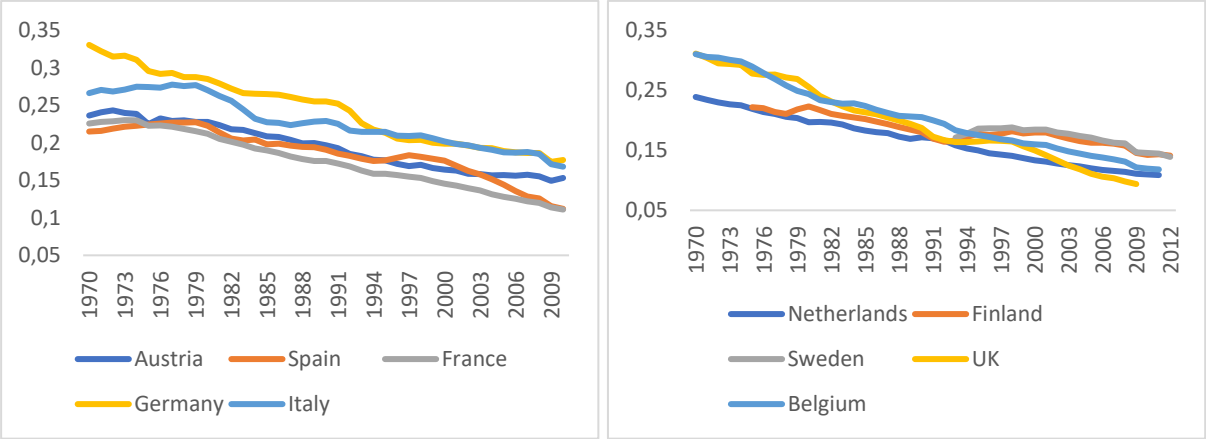


Figure 1: manufacturing share in total employment, 1970-2012
Source: EU KLEMS 2012, OECD. Authors' own elaboration

In this article, we will focus our attention on a subset of ten European countries: Austria, Spain, France, Germany, Italy, the Netherlands, Finland, Sweden, the United Kingdom and Belgium. These countries represent four different socio-economic models as classified in the literature (see below). However, as pointed out e.g. in Szirmai (2012) and in Rodrik (2016), similar deindustrialisation trends are observable in developing countries as well, with a relative exception represented by Asian industrial exporters. With respect to the countries in our sample, a similar pattern emerges in figure 1. At the beginning of the 70s, employment in manufacturing accounted for a third of total

[2] We will not discuss the causes behind this process here. See Autor et al. (2013) for an analysis of the impact of Chinese import competition on the US labour market. Rodrik (2016) identified globalisation and labour-saving technical progress as the main explanatory factors for employment loss in manufacturing in advanced economies. See also Schettkat and Yocarini (2006) for a thorough review of the literature on the 'tertiarization' of the advanced economies, in which the author identified three main explanations: differentials in productivity growth among industries (more on this later, in the discussion of Baumol's contribution); shifts in the inter-industry division of labour and the increasing importance of outsourcing from the manufacturing industries to the service industries; finally, and this is the one preferred by the authors, "the shift to services in the advanced economies is a real shift in final demand" (Schettkat and Yocarini, 2006, p. 145).

employment in Germany, the United Kingdom and Belgium, while in the remaining countries, it remained well above 20%. After forty years, the picture had changed drastically: in two of the formerly most industrialised countries (the UK and Belgium), the share of manufacturing employment is now a third of the previous figure; in France, Spain, the Netherlands and Germany (although in this case, the initial level was much higher), the same share has been reduced by half, and in general, the other countries have also experienced an analogous downward trend. Not surprisingly, Sweden and Finland are experiencing a similar trend.

In the remainder of the paper, we will work on the hypothesis that the structural change briefly sketched above has posed and continues to pose a threat to the dynamics of aggregate labour productivity in the countries under analysis.[3] This idea is obviously not new and dates back at least to Baumol and Bowen (1965), Kaldor (1966) and Baumol (1967). It is easy summarised as follows: "a *transfer of resources from manufacturing to services may provide a structural change burden*" (Szirmai and Verspagen, 2015, p. 47). In our view, this is due in part to the fact that several service industries have a limited potential for productivity gains and are defined by labour-intensive production processes. We will argue, however, that less obvious mechanisms might also be at work, particularly in finance and real estate activities, which, in principle, have comparably high labour productivity and vital capital accumulation. More specifically, the financialisation of the economy, which has taken place vigorously in most of the advanced economies over the last two decades, seems to have had a negative impact on labour productivity, because managers and financial corporations are more interested in maximising their bonuses, shareholders' dividends and financial compensation than in embarking on strategies oriented towards productive investments. In this context, assets are wasted in financial speculation and short-term strategies rather than being used for real investment expansions, innovation improvements and labour productivity gains (see, for instance, Crespi and Pianta, 2008).

Baumol also spoke about the so-called "cost disease" of the service sector: while these industries experience stagnant productivity, their wages tend to grow in line with those of the progressive secondary sectors. Hence, the unit costs in the stagnant sectors grow faster, as do the prices, which are set as a mark-up over costs. Given that "*Baumol assumes that the relation of real output of the two sectors remains constant*" (Hartwig, 2011, p. 472), manufacturing's value added share in nominal GDP drops. Aggregate productivity is an average of sectorial productivity, with weights represented by the ratio between each sector's value added and the nominal GDP of the total economy. Given that the weight attached to service industries steadily increases, aggregate

[3] See also the influential empirical work of Hartwig, in which the author found that "structural change has a growth-dampening effect" (Hartwig, 2011, p. 485) for both the US and a group of fifteen European countries.

productivity is caught in a stagnant spiral, giving rise to the phenomenon known as the "growth disease".

Moreover, the service sector is quite heterogeneous and complex. It may happen that some sub-service sectors do experience productivity growth, such as the ICT sub-sector, architecture and engineering-related activities, etc. (see Maroto-Sánchez and Cuadrado-Roura (2009) for an analysis of productivity differentials within different service industries), while others stagnate in terms of productivity, such as hotels and accommodations, food industries, restaurants, etc. At the same time, these sub-sectors absorb relatively more employment, which, however, is scarcely remunerated. Lower wages imply lower consumption and lower aggregate demand, which, in turn, negatively affects GDP dynamics. Hence, investments and industrial strategies play a very important role in defining the specialisation of an economy and the consequent productivity gains and re-distribution.

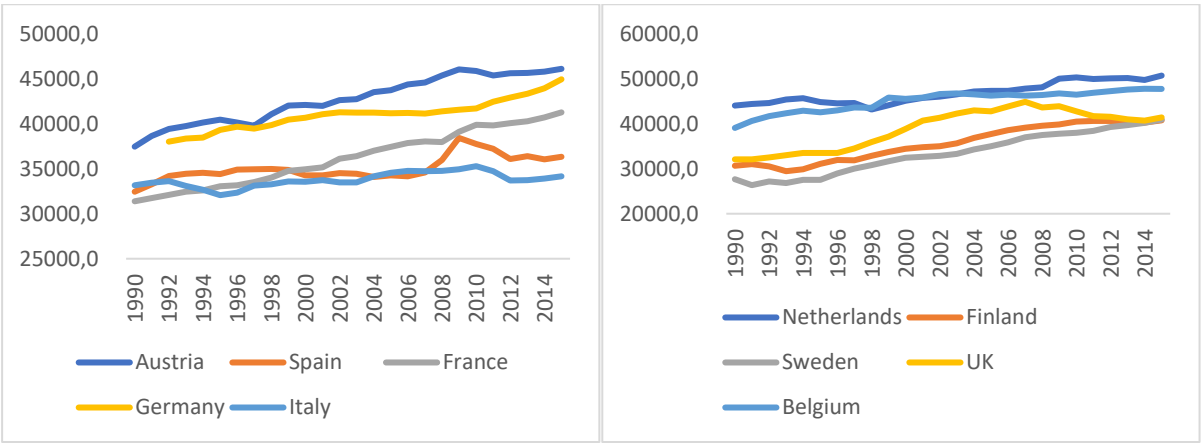
Other supply side arguments explaining stagnation in labour productivity are put forward by (neo)Schumpeterian scholars. For instance, Silva and Texeira (2012) showed that the Mediterranean countries (Spain, Portugal, Greece and Italy) are oriented towards low-skilled employment in low-tech service production. This negatively affects their productivity dynamics (see Saviotti and Pyka (2004), who found that the creation of new sectors is crucial in determining productivity growth and economic development). Similar results were found by Ciriaci and Palma (2012) for a different sample of countries, i.e. Italy, France, Germany and the United Kingdom, and by Quatraro (2009), who focused specifically on Italian regions.

Our argument is closer to the argument of Delli Gatti et al. (2012), who adopted a demand side approach to explain the trend of labour productivity: labour productivity does not stagnate solely because of low-tech specialisation. What matters more is the role of the demand shaped and enhanced by 1) investments of higher capital intensity with respect to investments of lower capital intensity, and 2) increasing wages in capital intensive sectors (which, in turn, drives higher demand and higher labour productivity according to the Kaldor productivity equation (Hein and Tarassow, 2010). However, the contribution of Delli Gatti et al. (2012) focused on the immobilisation of workers in sectors in which productivity increases and prices decline, which is also a factor explaining the low recovery of some countries after the 2007 crisis. Our contribution aims to show the importance of the shift to the service sector, which occurred well before the crisis, with and without productivity stagnation in the manufacturing sector as a result of low capital intensive investments in the manufacturing sector, or more accurately, as a result of the deindustrialisation process that has occurred particularly since the 1990s in some European countries, such as Italy (Gallino, 2003; Sylos Labini, 2004). This process of deindustrialisation has been accompanied in several European countries by a series of reforms in the labour market aimed at increasing labour flexibility, decreasing employment protection and increasing temporary work. These reforms in the labour market were

coupled with strong retrenchments of welfare state spending. Both labour flexibility (labour cost compression) and the retrenchment of the welfare state contributed to the stagnation of aggregate demand, and in turn, to the lower dynamics of labour productivity.

The varieties of capitalism and welfare state policy have affected the shaping of these processes amongst countries. For instance, some European continental countries, such as Germany, have avoided, to a large extent, deindustrialisation and have continued to invest in manufacturing and in capital intensive sectors with positive results in terms of productivity and wage dynamics. Other Scandinavian countries, such as Sweden, have managed to drive the transition towards a service sector dominated by public administration employment and social services of higher quality and standards, resulting in benefits in terms of productivity and wages. Finally, countries such as Italy have experienced both deindustrialisation and transition to low skilled manufacturing sectors, dominated by sub-sectors such as accommodations, food, and private social, community and family services, with low productivity gains and low wages. The deindustrialisation has been accelerated by labour intensive investments incentivised by relatively lower wages and high labour flexibility.

Hence, our purpose here is to provide an empirical analysis of the effects of deindustrialisation[4] on aggregate labour productivity in connection with other economic and institutional processes which have coexisted with the relative loss in the relevance of manufacturing. Sluggish and stagnating wages have been a common feature in many advanced economies; the workers of southern European countries such as Italy and Spain (but also Portugal and Greece) in particular have experienced barely growing or almost flat dynamics of remuneration, as shown in figure 2.



[4] Throughout this article, we use the term deindustrialisation to encapsulate the relative loss of importance and weight of manufacturing. However, as noted in Szirmai (2012), according to the International Standard Industrial Classification of All Economic Activities (ISIC), the industrial sector also comprises mining, utilities and construction. Here, we will follow Szirmai (as well as the standard use) and refer to a narrower concept, focusing only on the manufacturing industry.

Figure 2: average annual wages, 2015 USD PPPS

Source: OECD

This has been translated into a generalised decrease in the wage share, as has been widely discussed and documented in the relevant literature (see, for example, Onaran and Galanis, 2014; ILO, OECD, 2015; ILO, IMF, OECD, World Bank, 2015; Stockhammer, 2015).

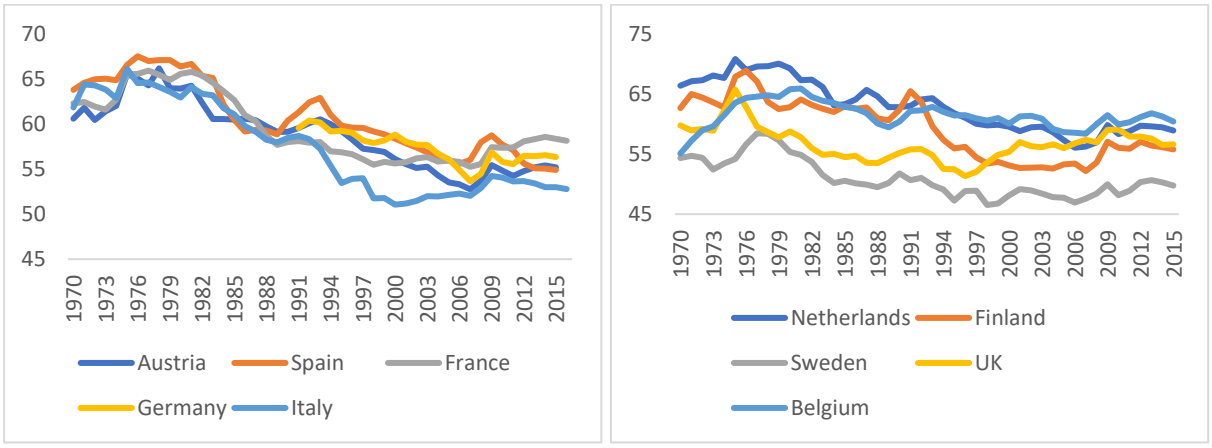


Figure 3: adjusted wage share, 1970-2015

Source: AMECO

As we have argued elsewhere (see Pariboni and Tridico, 2016), there are solid theoretical reasons to expect these trends in labour remuneration to be harmful to labour productivity. Wage compression might act as a substitute for the adoption of technologically advanced production processes (Sylos Labini, 1999); as a consequence, low wage countries tend to remain stuck in low-tech production segments (Storm and Naastepad, 2015). On the other hand, an increase in real wages might push firms to introduce innovative processes and products so to obtain increases in labour productivity, otherwise if they are unable to keep pace with technological innovations, they go out of the market (Webb, 1912; Pasinetti, 1981). Moreover, in the face of exogenous changes in the income share accruing to workers, entrepreneurs might want to defend their income share by attempting to enhance labour productivity and reduce labour unit costs (Hein and Tarassow, 2010). Marquetti (2004) performed an econometric analysis regarding the relation between real wages and labour productivity in the US over a 130 year time span and concluded that "*real wages Granger-cause labor productivity and that labor productivity does not Granger-cause real wages. The unidirectional Granger causality shows that real wages lead the movements of labor productivity*" (Marquetti, 2004, p. 440).

All the processes we have mentioned so far have also been associated with a stream of labour market reforms, i.e. an increase in labour flexibility and a reduction in employees' protections. It is possible to grasp this quickly by looking at the increasing diffusion of temporary employment.[5]

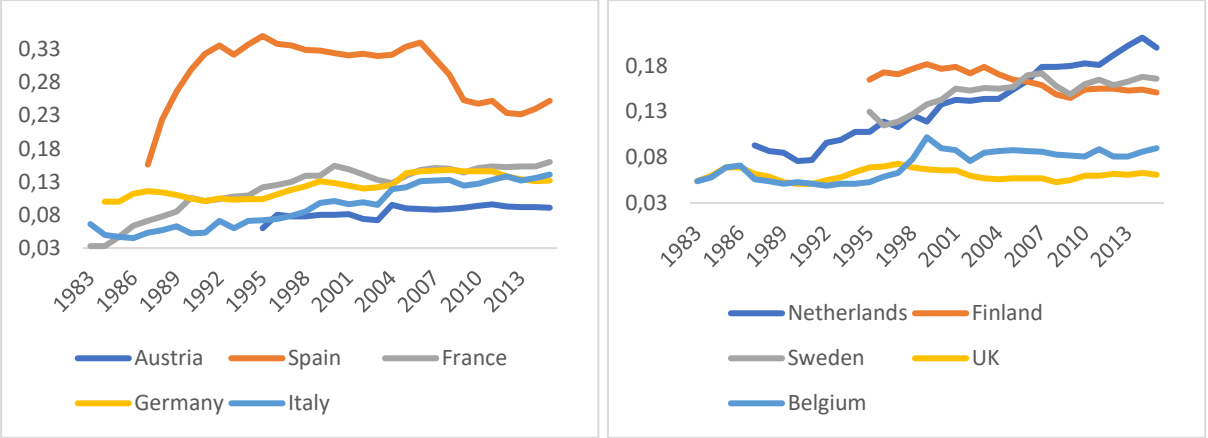


Figure 4: temporary employees as a percentage of total employees
Source: Eurostat

Some years ago, Sylos Labini (1999, p. 265) pointed out that "*a high degree of labour flexibility tends to depress the increase in labour productivity*": given the precarious nature of their position, workers will not identify themselves with the firm and its objectives. In turn, firms will restrain their investments in workers' firm-specific human capital for the same reason (Storm and Naastepad, 2015, p. 972). Moreover, because workers can be fired with few complications and replaced rapidly, and because labour is cheap, entrepreneurs do not have an adequate incentive to adopt modernising, labour-saving technology (Sylos Labini, 1999, p. 265). Kleinknecht et al. (2016) provided a further argument to support the view that flexibility may damage labour productivity: firms with a higher share of 'flexible' workers tend to have higher shares of non-productive, managerial personnel. Higher labour turnover and easy firings result in a lack of trust that must be compensated for by more control.

An alternative way of conveying the same information is displayed in figure 5, which shows the evolution, over time, of the EPL (Employment Protection Legislation) index developed by the OECD, which represents the level of protection offered by national legislation with respect to regular employment, temporary employment and collective dismissal; in other words, the index offers a synthetic picture of the state of the regulations that allow employers to fire and hire workers at will (the index varies between 0 for very low protection and 6 for very high protection). With the

[5] Based on the Eurostat definition, "[t]emporary employment includes work under a fixed-term contract, as against permanent work where there is no end-date" (Eurostat Glossary).

exception of France and Finland, the countries in our sample display a generalised increase in labour flexibility.[6]

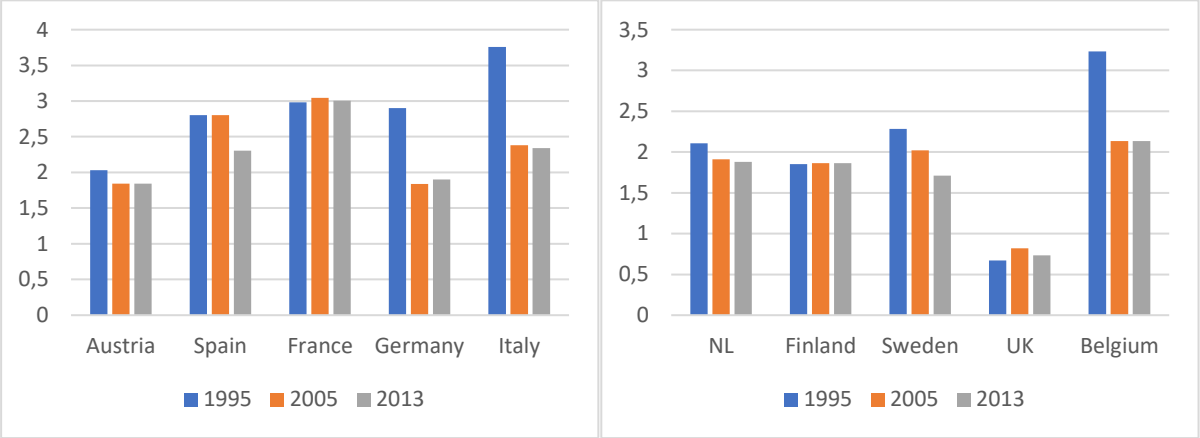


Figure 5: EPL (Employment Protection Legislation) index, 1995-2013
Source: OECD, authors' own elaboration

Structural change and institutional change go hand in hand. Institutions characterise the socio-economic model of countries, and over the last two to three decades, the institutional framework in industrialised countries has changed enormously. Globalisation, as well as changes in policies and ideological paradigms, have had an impact on the policies and strategies of advanced economies. Patterns of production and development models reflect public policies, institutions, and more generally, socio-economic models. In other words, the evolution of the socio-economic models and the shaping of the welfare systems have had an impact on industrial policy and on the transition to the service sector.

The standard classification of socio-economic models, which is widely used, was proposed by Esping-Andersen (1990), who posited that welfare models can be divided into three groups: the Liberal, Continental and Scandinavian models.[7] This classification, although methodologically still very relevant, was based on data from before 1990. Therefore, Hay and Wincott (2012) proposed a new classification which considers the evolution of these models over the last two decades. They extended this classification to five models: the three models used by Esping-Andersen, plus the Mediterranean group and the Central and East European Countries (CEEC)[8], claiming that a strong difference can be observed among these groups in their general patterns. The peculiarities of the

[6] The United Kingdom represents another exception, given that its EPL has not diminished over the last two decades; however, this index was already at a very low level at the beginning of the time period we are investigating.
[7] Esping-Andersen (1990) ranked welfare models mainly according to the level of social spending, the level of (de)commodification of welfare and the degree of the extension of welfare among the citizens.
[8] We will not discuss the features of the CEEC group in this article.

'Southern Model' had already emerged in the debate in the mid-1990s with distinct features (Ferrera, 1996), while the CEEC model (or perhaps it is better to say the CEEC group) is more of a reflection of the transformation from planned economies to market economies that occurred in the Central and Eastern European countries after the fall of the Berlin Wall in 1989. Moreover, since 1990, welfare patterns have diverged even more. The Scandinavian model clearly seems to have increased welfare in order to cope with the challenges of globalisation (following the so-called "compensation thesis"); the continental model maintained a stable or slightly increased level of welfare spending during the same period; the other three groups, the Anglo-Saxons, the Mediterranean group and the CEEC converged among themselves in the sense that they reduced the level of welfare spending, clearly following the so-called 'efficiency thesis' during the last two decades of globalisation.

2. The model

In order to test our assumption, we built an econometric model which reflects our assumptions. We used panel data for 9 countries: Austria, Finland, France, Germany, Italy, the Netherlands, Spain, Sweden, and the United Kingdom. These countries are good representations of the four variations in the European socio-economic models, i.e. the Continental-corporative (Austria, Germany, and to some extent, the Netherlands and France[9]), the Scandinavian-Social Democratic (Finland and Sweden), the Liberal-competitive (the United Kingdom) and the Mediterranean (Italy and Spain) groups, according to most of the welfare systems literature (Esping-Anderson, 1990; 2002; Hay and Wincott, 2012). The data were collected from the EU KLEMS database and are available from 1970 onwards.[10]

Labour productivity is a positive function of the hours worked in the manufacturing sector and the advanced service sectors, such as the professional sector and business services (architecture, engineering services, etc.), while it is a negative function of the hours worked in other service sub-sectors, such as food, restaurants, and accommodations. Moreover, it is a positive function of wages and a positive function of investments, in particular in the ICT assets. Finally, it is a negative function of labour flexibility captured by the variables temporary work and index of EPL. Some of these data, such as temporary work and EPL, were only available for the recent period (1995-2015), while data on other variables were available from 1970 onwards. Therefore, we built two panel data sets: one from 1970 to 2015 (but not all the relevant variables are included) and the other from 1994 to 2014,

[9] France and the Netherlands could also be considered as a hybrid model per se. However, the inclusion of a fourth model would not alter our results.

[10] We do not include Belgium in the econometric analysis, given that neither the 2012 nor the 2016 EU KLEMS (which is our primary source) provide the necessary data for some relevant variables, in particular, investment. However, for descriptive purposes, we do include this country in the paper.

which includes most of the relevant variables. In this way, we were able to consider the period from 1995 onwards, or more generally, the last 20 years, with a specific panel data set for European countries. For both political and economic reasons, this is an important period for the European Union countries. On the one hand, over the last 20 years, the Maastricht constraints and the Euro have been the main drivers of economic policy in the EU. On the other hand, technical progress, ICT, and the intensification of the knowledge-based economy should have been the main drivers of labour productivity according to most of the literature in the field (Malerba et al., 2007; Dosi et al., 2008; Delli Gatti et al., 2012; Mazzucato, 2013). Moreover, this is the period in which the transition from manufacturing to services occurred more intensively in most advanced economies.

However, we will show that labour productivity increased only in countries that maintained higher levels of hours worked in the manufacturing sector and in some of the advanced service sub-sectors. Hence, the transition towards the service sectors *tout court* was detrimental for labour productivity, particularly if these countries have employed most of their workers in the unskilled service sectors. We will also show that the transition towards the unskilled service sectors may have been accompanied by labour flexibility, with the presence of a higher incidence of temporary workers, and by lower levels of ICT investments, with further negative consequences for labour productivity for the reasons explained in the previous section.

Some preliminary statistical evidence reported in the Appendix, both for the more recent period (1994-2015) and for the longer period (1970-2015), clearly show that our assumption may be strongly verified. Hourly labour productivity for the total economy (hlp) is positively correlated with investments in ICT assets (ict_inv), as well as with the share of total hours worked in professional and business (sthwpbs) services and with the share of total hours worked in information and communication (sthwic), (scatter plots, respectively, 1a, 1b, 1c), while it is negatively correlated with the share of total hours worked in the sub-service sectors, such as accommodations and food (sthwaf) and wholesale and retail (sthwwsr) (scatter plots 2a, 2b). The same variables follow similar trends for the period 1970-2014. Moreover, when we consider the rate of growth of labour productivity (rglpte) against both average wages (RLCH_avg) and the share of hours worked in manufacturing (sthwm), we can identify positive relations (scatter plots 3a, 3b, 3c). Finally, the relationship between labour productivity and share of temporary work (TW) is negative as expected (scatter plot 2c). All this evidence strengthens our analysis and the validity of the econometric model that we are going to test. In particular, the general models are specified as follows (the first for the whole period 1970-2015 and the second for the sub-period 1994-2015):

$$Y_{\substack{1970\\-2015}} = \alpha + \beta_1 M - \beta_2 WSR - \beta_3 AF - \beta_4 FRE + \beta_5 PBS + \beta_6 IC + \beta_7 RS + \beta_8 I + \beta_9 W + \varepsilon$$

$$Y_{\substack{1994\\-2015}} = \alpha + \beta_1 M - \beta_2 WSR - \beta_3 AF - \beta_4 FRE + \beta_5 PBS + \beta_6 IC + \beta_7 RS + \beta_8 W - \beta_9 TW + \beta_9 EPL + \beta_{10} ICT + \varepsilon$$

Table 1. Regression Table

	GLS model, random effect. Dep var: hourly labour productivity	
	Panel 1970-2015	Panel 1995-2015
sthwm	13.55841 (5.123227)**	22.77713 (8.897275)***
sthwwsr	-9.984194 (9.341191)	-79.01002 (15.90175)*
sthwaf	2.562935 (11.78464)	-32.44724 (23.24004)
sthwfre	-26.33085 (18.96174)	-48.97454 (33.30619)*
sthwpbs	73.42521 (8.162228)*	117.9447 (12.28364)*
sthwic	-67.73225 (28.2348)**	203.8687 (57.81981)*
sthwrs	13.26419 (5.195353)**	19.71993 (9.654674)**
Tot_NR_Inv_2	.216437 (.1294167)***	
RLCH_avg	1.211317 (.0405092)*	.3294595 (.0510691)*
ttw		-.1312379 (.0274403)*
epl		2.542203 (.4842897)*
Ict inv		10.13182 (1.039787)*
Constant	-8.810104 (2.768932)*	8.630823 (6.289888)
	R-sq: overall = 0.9446 Wald chi2(9) = 4401.17 Prob > chi2 = 0.0000 Number of obs = 268 Number of groups = 9	**R-sq: overall = 0.9463** Wald chi2(9) = 2133.38 Prob > chi2 = 0.0000 Number of obs = 133 Number of groups = 9

Significance level*=1%; **=5%; ***=10% (heteroskedasticity-robust standard errors in brackets)

The regression result confirms our analysis. When we consider the whole period (1970-2015), hourly labour productivity is enhanced by the share of hours worked in the manufacturing sector, in the professional and business sub-sector, in the information and communication sub-sector and in the remaining service sectors (excluding the accommodations and food and wholesale and retail sub-sectors). Investments and wages also play a role in enhancing hourly labour productivity. In the sub-period 1995-2015, while the positive influence concerning the manufacturing sector, the professional

and business sub-sector, and the information and communication sub-sectors was confirmed, more interesting information emerged for other sub-sectors. Shares of hours worked in the wholesale and retail and financial and real estate sub-sectors had a negative and significant sign on hourly labour productivity in the sub-period, while their impact was not significant over the whole period. As far as food and accommodations services are concerned, in this sub-period, the sign of the coefficient on hours worked in this sub-sector was negative, although not significant. Over the last 20 years, the structural transformation had impacted more in advanced economies, and clearly, the shares of these sub-sectors have increased; their impact on labour productivity was negative. However, the manufacturing and other advanced sub-sectors maintained a positive impact, along with investments in ICT. In this context, labour market reforms also played a very important role: higher labour flexibility, captured by the reduction in the employment protection legislation index, and the increase of temporary work, have had a negative impact on labour productivity, while wages have maintained a positive and significant impact, confirming their enhancing effect on labour productivity.

Diagnostics tests were performed on the regression output. First, the results are very similar when both the fixed effect and random effect are used. Hence, we preferred to use the random effect, supported by the performance of the Hausman test, because the time span analysed is very wide; given that the random effects assumption holds, this model is more efficient than the fixed effects model. Second, the residual normality test confirms a symmetric and unimodal distribution for the dependent variables used, both for the 1970-2015 panel and for the 1995-2015 panel (see the Kernel tests in figures A4 and A5 in the appendix). Third, the VIF test (*variance inflation factor)* excludes systematic multicollinearity among the explanatory variables: all the VIF values are well below 10, and the tolerance level (1/VIF=0.1) under which multicollinearity may take place is overcome by all the independent variables used in the regressions. Last but not least, several tests to verify whether the panel data contain unit roots or are stationary were performed, confirming that the series are stationary.

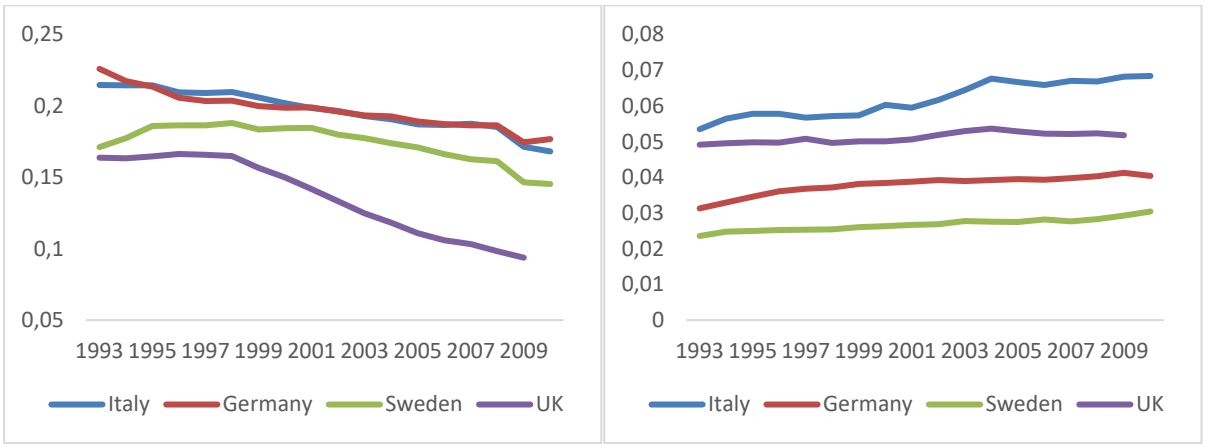
3. A comparison between Italy, Germany, Sweden and the United Kingdom

In this section, we discuss some descriptive evidence that can be derived from our dataset. We focus our attention on four countries in the sample, i.e. Italy, Germany, Sweden and the United Kingdom,[11]

[11] See also Baccaro and Pontusson (2016), in which the authors compared the underlying growth models in these countries.

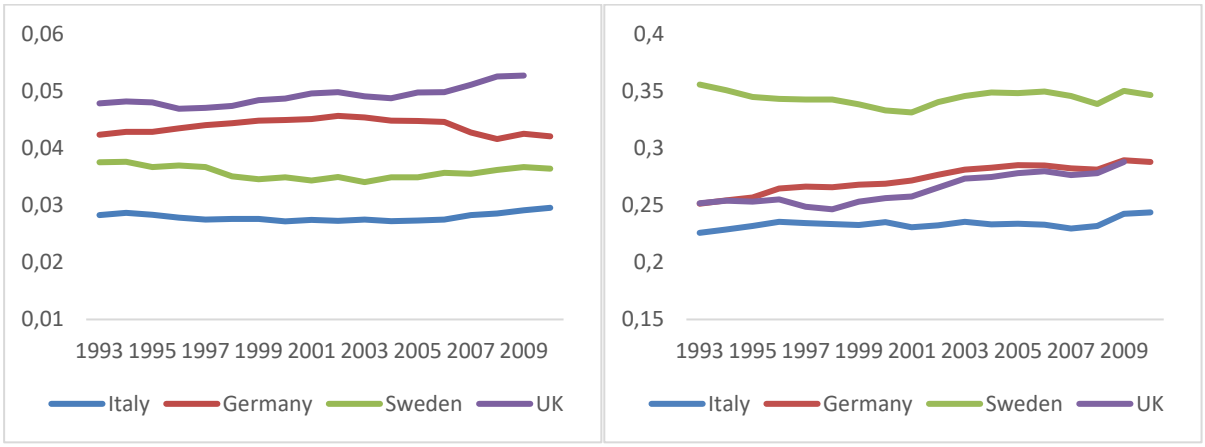
which have been chosen as representatives of, respectively, the Southern Europe model, the Coordinated Market model, the Scandinavian model and the Anglo-Saxon Liberal Model.[12]

A straightforward way to begin the investigation of the possible structural differences among these four countries is to look at the distribution of employment among industries.



(a) manufacturing

(b) accommodation and food service activities



(c) financial and insurance activities, real estate activities

(d) community, social and personal services

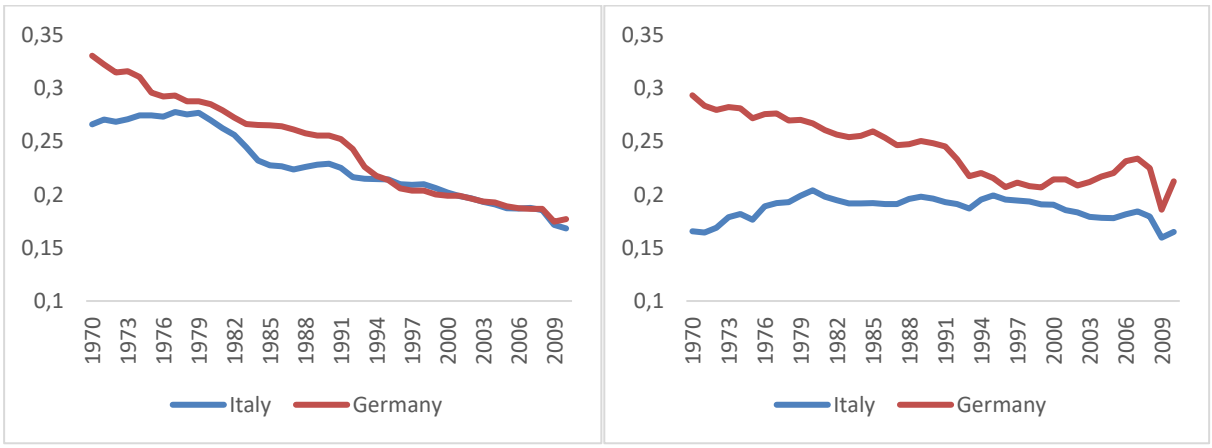
Figure 1: share of total employment, 1993-2010
Source: EU KLEMS 2012, OECD. Authors' own elaboration

As we would expect, finance and real estate activities play a comparatively significant role in the United Kingdom (panel c), without correspondent positive gains in productivity, while Sweden stands out for an employment share devoted to community, social and personal services that is

[12] For another interesting study in this field, see also Guarascio et al. (2016), who classified countries in two groups (North and South of Europe), obtaining, in general, results similar to ours.

consistently around 35% (panel d). In this sector, however, the labour productivity of Sweden is higher. It is important to note that this category includes mainly services such as public administration, social security, health and education, which, in general, tend to be associated with public employment. Hence, to large extent, Sweden's public strategy has been to enhance quality and productivity in this sector, with higher wages compared to other countries. The case of Italy seems to be the opposite of that of Sweden: most of these services for personal care are left to the private and *jeopardised* sector, with cost competition, low quality services, lower productivity gains and declining wages.

Panel (b) seems to confirm the general wisdom[13] that Italy suffers from an employment misallocation and is characterised by the highest share of hours devoted to food and accommodation services, which comprises the national sector with the lowest real hourly labour compensation, the highest share of temporary workers and the lowest hourly labour productivity, dragging down the average hourly labour productivity of the service industries. However, the poor productivity performance of the Italian economy cannot be explained only by looking at the sectoral shift towards (low value added) services. At first sight, panel (a) of figure 2 might convey the idea that, with regard to the importance of manufacturing, Italy and Germany show a very similar productive structure.[14] Especially over the last pair of decades, the manufacturing shares in their total employment display quite parallel patterns.



(b) share of total employment (a) share of total gross value added

Figure 2: manufacturing, 1970-2010
Source: EU KLEMS 2012. Authors' own elaboration

[13] See The Economist (2011).
[14] However, since 2010, Germany has displayed a flat or increasing share in manufacturing employment, while in Italy, it has continued to decrease steadily.

However, the picture changes if we look at the contribution of manufacturing to the total gross value added in both countries (panel b). The discrepancy between the German and the Italian cases raises doubts about sluggish labour productivity in the latter, as is confirmed by figure 3.

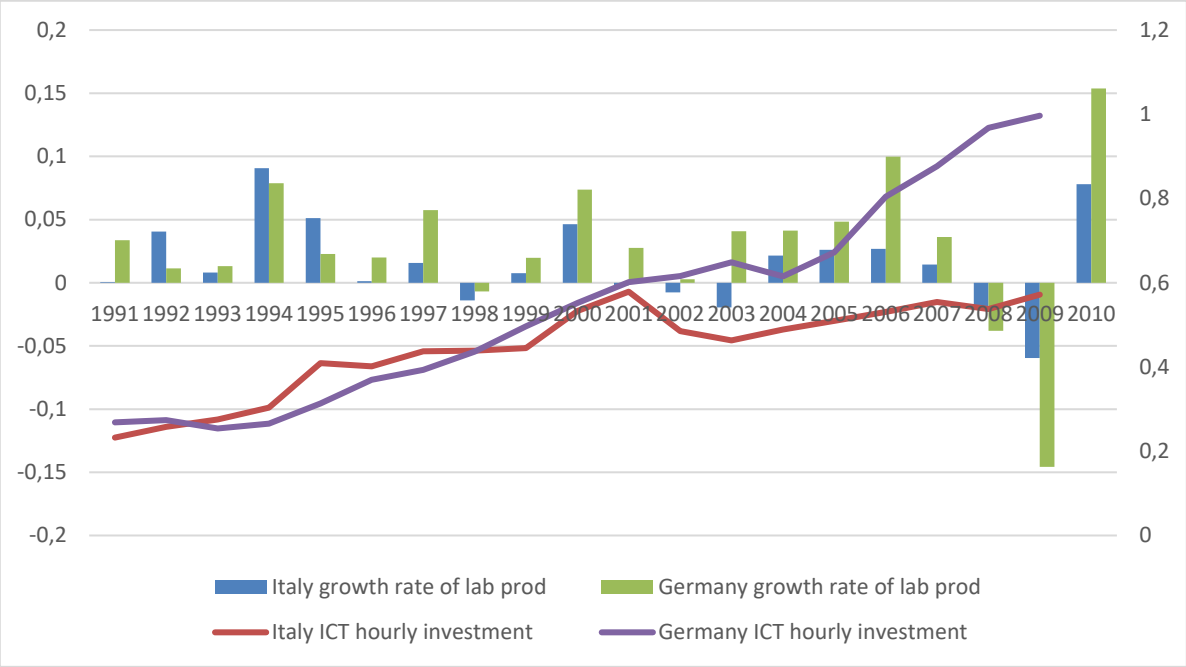


Figure 3: manufacturing, growth rate of hourly labour productivity (left axis); manufacturing, investment in ICT and software per hour worked, 2005 Euros (right axis); 1991-2010
Source: EU KLEMS 2012. Authors' own elaboration

It is apparent that over the last twenty years, labour productivity in the Italian manufacturing sector has lagged behind the analogous variable for German. The statistical evidence suggests that the dynamics of technologically advanced investment[15] may have played a significant explanatory role. Indeed, during the same time span in which Italian manufacturing accumulated a growing delay in efficiency and competitiveness, the German firms operating in the sector have continued steadily to accumulate assets which can conceivably be considered as productivity-enhancing. The same cannot be said about the dynamics of the Italian firms' investment, where ICT and software accumulation has been almost stagnant throughout the last decades.[16]

It is also possible to widen the perspective in order to grasp the relative performance of the four countries under analysis in this section. As figure 4 shows, the Swedish manufacturing sector has tended to outperform that of the others in terms of productivity for most of the years in the sample;

[15] In using this term, we refer to that part of gross fixed capital formation made up of the following assets: computing equipment; communications equipment; and software. Up to the 2012 issue of the EU KLEMS database, these three assets defined ICT investment (and this is the case, for example, for the OECD). However, in its most recent issue (EU KLEMS, 2016), the database adopted a more stringent definition of ICT assets, comprising only computing and communications equipment (see Jäger, 2016), and we adopted it throughout the paper.

[16] Similar patterns can be observed in the evolution of the total non-residential investment in Germany and Italy.

we have already commented on the sluggish Italian case, while Germany and the UK presented balanced paths, although their manufacturing sectors have very different sizes (see figure 1, panel a).

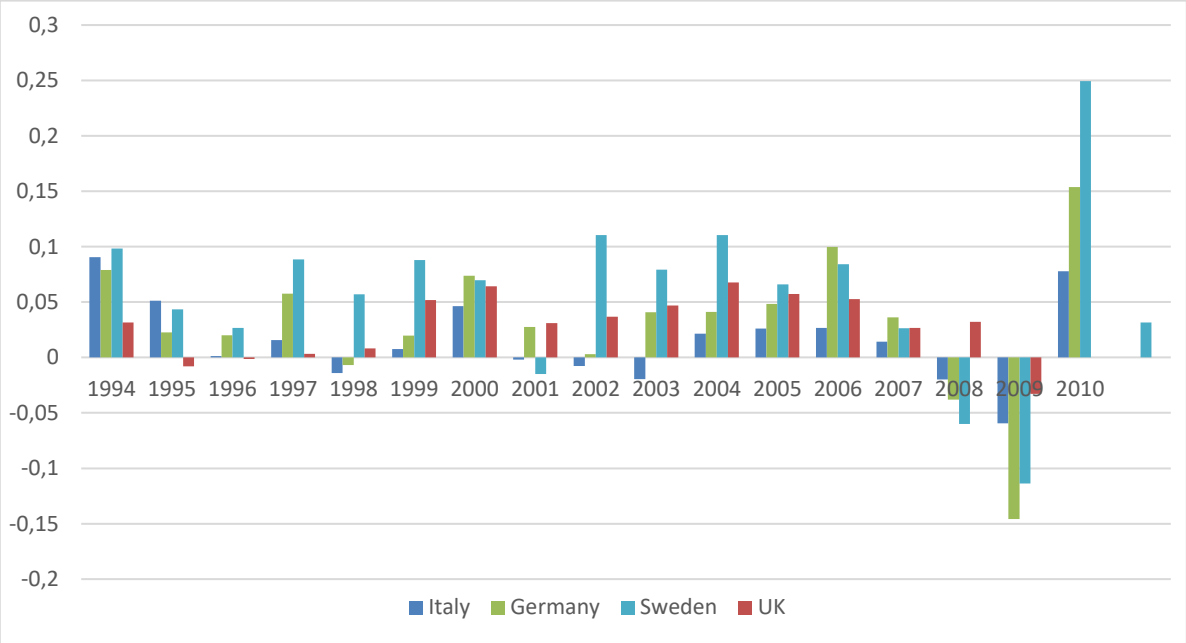


Figure 4: manufacturing, growth rate of hourly labour productivity; 1994-2010
Source: EU KLEMS 2012, OECD. Authors' own elaboration

Qualitatively similar conclusions can be drawn from figure 5, in which we show the rates of growth of labour productivity for the whole aggregation of the service industries. Once again, the two extreme poles seem to be represented by Italy – with several years characterised by a decline in overall service productivity – and Sweden. The relatively large sized welfare model in Sweden, which is relevant to the large public employment share in the service sector, plays an active role in setting higher level of wages, efficiency and productivity, with appropriate investments and quality standards controlling in the service sector. The case of Italy instead seems to be, on the one hand, affected negatively by the higher share of total hours (unskilled) worked in a lower productivity sector such as food and accommodation, which has absorbed most of the workers expelled by (or no longer entering into) the manufacturing sector; on the other hand, the employment share devoted to community, social and personal services, which had increased tremendously in all the advanced economies, in particular, in consideration of the ageing population, is burdened by a large amount of occasional and informal employment with poor wages. In these sub-sectors, wages are not set by national bargaining agreements or by a minimum wage, which does not exist in Italy. Hence, they are left to a *jeopardised* private sector in which individual competition between the principal agents (firms, social service agencies, or often, the principal beneficiary of the service directly) and workers often takes place. This is contrary to what has happened in Sweden, where a larger public intervention in these subsectors and/or the active role of trade unions has sustained the wage level

and productivity improvements. Hence, in these sub-service sectors, the features of the welfare state play a crucial role in the driving strategy of the investments, productivity gains and wage trends.

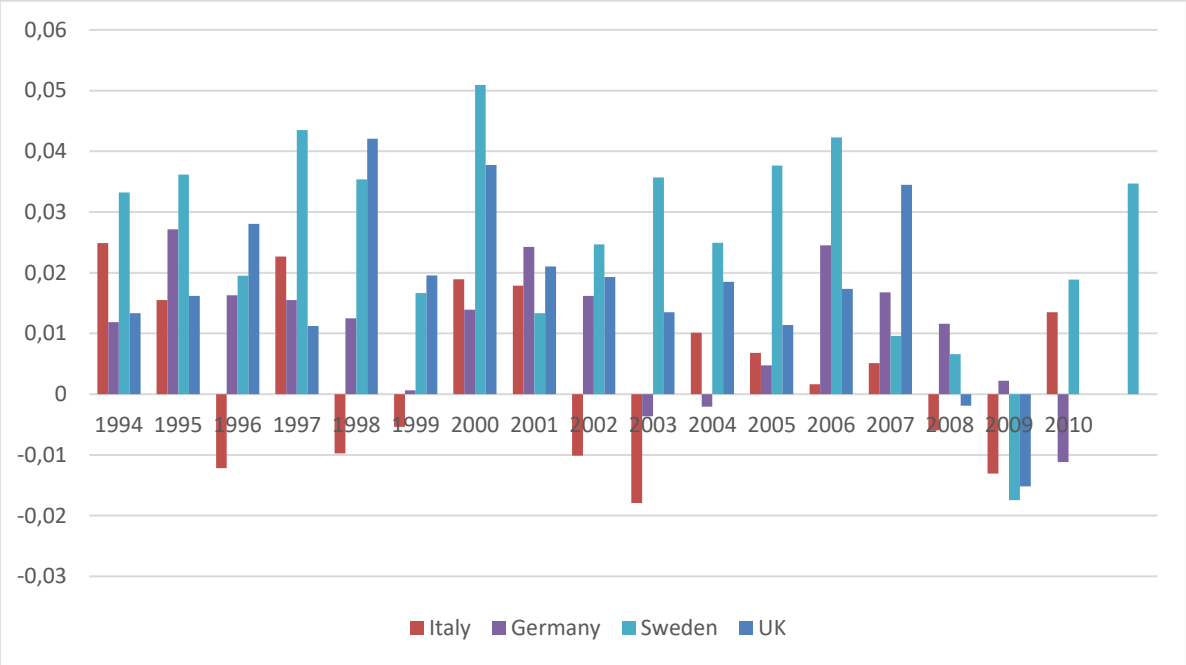
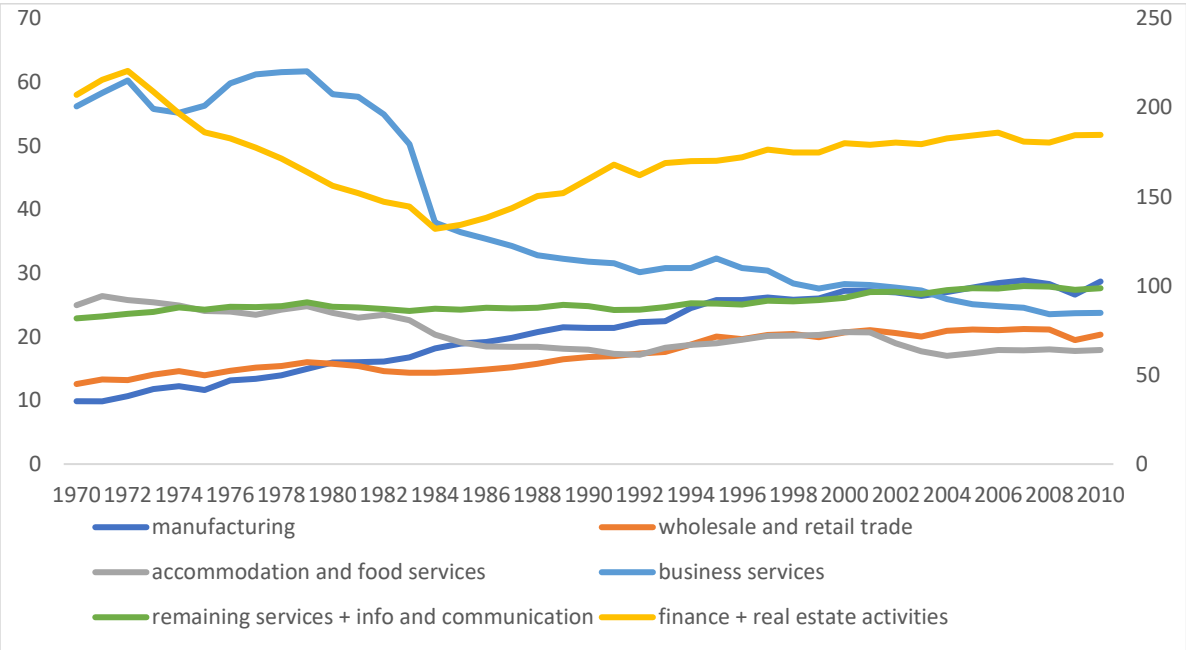


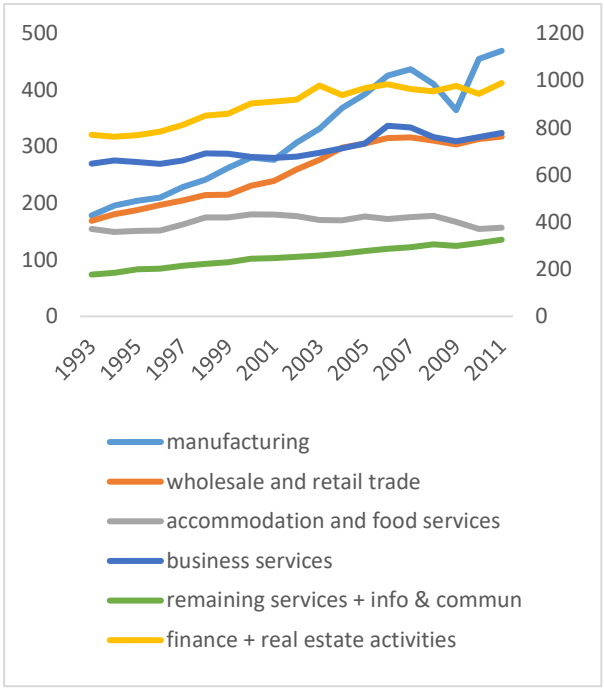
Figure 5: services, growth rate of hourly labour productivity; 1994-2010
Source: EU KLEMS 2012, OECD. Authors' own elaboration

Figure 6 sheds further light on the Italian situation: the downward trend in business services productivity and the relevant concentration in low productivity segments of the industry, such as accommodations and food services and wholesale and retail trade, are clearly contributing to the poor average performance in the service sector.[17]

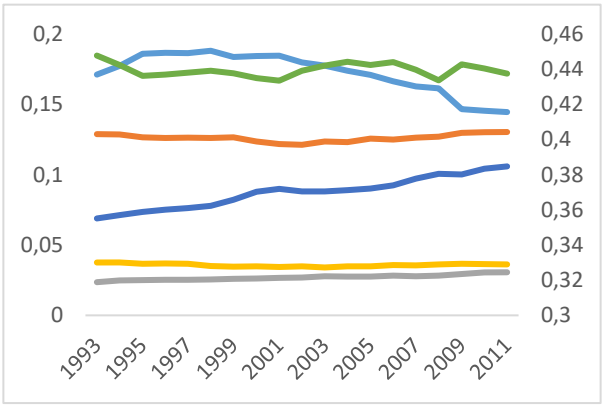


[17] Also, the 'remaining services' industries' productivity presents a rather flat pattern.

Figure 6: Italy, hourly labour productivity by industry, 2005 Euros (finance + real estate activities on the right axis; other industries on the left axis). 1970-2010
Source: EU KLEMS 2012. Authors' own elaboration



(a) hourly labour productivity by industry, 2005 Kronas (finance + real estate activities on the right axis; other industries on the left axis)



(b) share of total employment (remaining services on the right axis)

Figure 7: Sweden; (a) hourly labour productivity by industry; (b) share of employment by industry; 1993-2011; Source: EU KLEMS 2012, OECD. Authors' own elaboration

Regarding the Swedish case, the large employment concentration in the relatively less productive aggregate of industries ('remaining services') does not compromise the overall dynamics of the whole services sector. Indeed, although the level of labour productivity is comparatively low, its evolution over time has shown a fast and vital pattern. Given this evidence, it seems possible to argue that the public employment[18] strategy has managed to attain low levels of unemployment without damaging the average productivity of the services industry. This is possible to the extent that public policy in Sweden has set high standards concerning both quality and innovation (and therefore, wages) in the public sector, and in particular, in the social care sector. As Esping-Andersen (1990, p. 27) argued, in the social democratic regime, policy does not tolerate a dualism between the state and the market. Rather, the welfare state promotes "*an equality of the highest standards not of minimum needs*" as was pursued elsewhere (Hay and Wincott, 2012, p. 36). Moreover, similarly to the manufacturing case shown in figure 3, figure 8 suggests that the Italian service industries might also suffer from structurally poor investment dynamics: both ICT and total non-residential hourly investment have been mostly stagnating throughout the last two decades, while in Sweden, comparable magnitudes grew steadily, with some cyclical fluctuations in the acquisition of ICT assets.

[18] On average, around 80% of the employment hours in the 'remaining services' are made up of community, social and personal services (public administration and defence; education; health and social work, etc.).

Given that "*improved knowledge is, largely if not entirely, infused into the economy through the introduction of new equipment*" (Kaldor, 1961, p. 207), it is not surprising that the productivity performance of services in Italy is weak, both in absolute terms and in comparison to the benchmark represented here by Sweden.

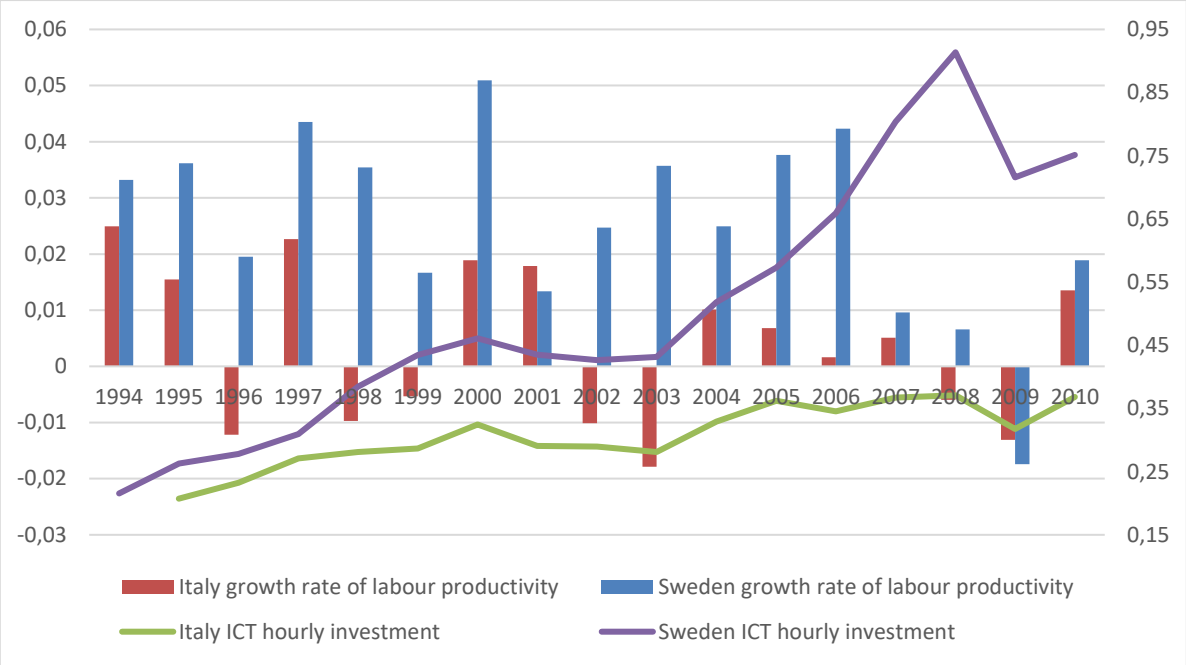
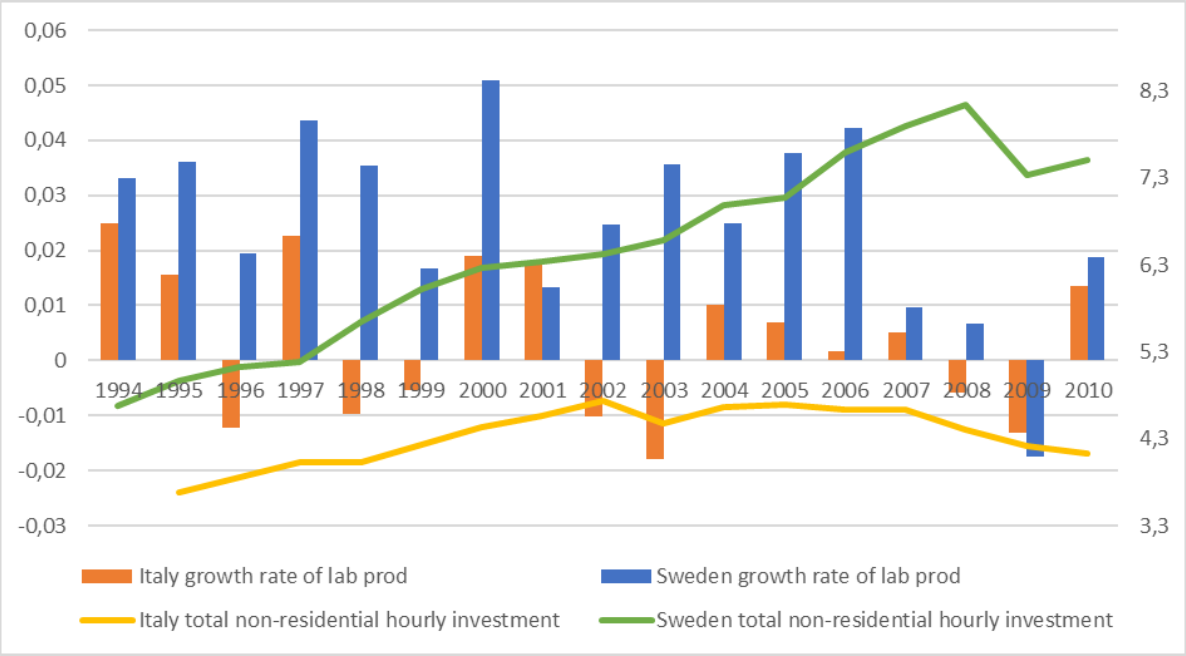


Figure 8: total services, growth rate of hourly labour productivity (left axis); ICT investment per hour worked, 2005 Euros (right axis); 1994-2010



(b)

Figure 9: total services, growth rate of hourly labour productivity (left axis); total non-residential investment per hour worked, 2005 Euros (right axis); 1994-2010

Source: EU KLEMS 2012, Eurostat, OECD. Authors' own elaboration

4. Conclusions

We have argued so far that the structural transition which has taken place in most European economies over the last decades – namely the gradual decline of the manufacturing industry in favour of services – appears to be one of the underlying causes of the labour productivity slowdown. However, there are also other aspects of this transition that need to be considered, not only because of their indirect and negative influence on labour productivity, but also because they matter in their own right. Figure A6 and figure A7 in the appendix can shed some light on some of the labour market issues related to the transition towards a service economy. Temporary work, which is prevalent in the food and accommodation sub-sectors, but also in the wholesale and retail sub-sectors, allows small contributions to labour productivity. Instead, they seem to be driven by labour intensive investment strategies that aimed at labour cost compression that is able to compensate for declining competitiveness. The countries which employ more workers in these sub-sectors and in these contractual forms show the worst productivity performance.

The move towards a service economy implies, in general, lower labour remuneration. Except for finance and real estate activities – industries which, however, employ a rather small fraction of the population (see figure 1, panel c) – labour compensation tends to be higher and to grow at a faster path in manufacturing. At the same time, the incidence of temporary and precarious jobs is higher in the service industries, with peaks in accommodation and food services in all four countries. In this context, the relatively higher share of employment in the food and accommodation sub-sectors is detrimental for Italy (see figure A7 in the appendix).

More generous regulations on labour flexibility, precarious jobs and temporary work have, over the short term, compensated for the lower trends in labour productivity in the service sectors. Firms are still able, with this kind of compression on labour costs, to maintain a certain level of competitiveness in the economy and to generate profits. However, over the long run, at least three detrimental effects can be observed:

1) Declining productivity performance caused mainly by non-productivity enhancing strategies, typically labour-intensive investment strategies;
2) Reduction in the wage share;
3) Declining or stagnation of aggregate demand, which is affected by the consumption of workers mainly employed in the unskilled tertiary sectors with lower wages.

The econometric analysis confirms our hypotheses, in particular, for the sub-period 1994-2015, in which not only have the shares of total hours worked in manufacturing and in the professional and business sectors and the information and communication sectors proven to be positively and statistically significant against labour productivity, but also the shares of total hours worked in the

wholesale and retail and financial and real estate sectors have moved in the expected direction (negatively related). Moreover, investment in the ICT sector is positively and statistically significant, while labour flexibility, captured by EPL and by the share of temporary work has impacted in the expected direction, i.e. the higher the labour flexibility, the lower the labour productivity performance. In this context, it is worthwhile to refer to other studies which have found similar results regarding labour flexibility, innovation and labour productivity: for instance, Kleinknecht (1998) and Tridico (2013). These authors have found that changes in employment turnover and a lack of stable industrial relations produce fewer incentives for firms to invest in innovation and in human capital, and therefore, to gain higher efficiency from workers. At the same time, weaker incentives also operate from the workers' perspective for investing in human capital accumulation and in committing more effort into the workplace. In both cases, the result will be a lower productivity performance.

The enhancing role of wages on productivity is also confirmed, meaning that wages have a positive effect on productivity: aggregate demand dynamics and increasing consumption are also positive challenges for firms, which are pushed to embark on capital intensive strategies when they are burdened by higher labour costs to satisfy the larger demand, which in turn, has a positive impact on labour productivity. Conversely, negative pressures on labour, such as higher flexibility and higher shares of temporary work, have a detrimental effect on productivity for at least two reasons: 1) aggregate demand and consumption will decline, and following Kaldor's (1961) approach (as well shown in other studies, such as Kleinknecht and Verspagen (1990); Saviotti (2001); Saviotti and Pyka (2017)), the incentives for productivity enhancing strategies will be lost; and 2) firms are inclined to exploit labour intensive investment strategies, which would place them on a lower technological frontier, with lower productivity gains and the higher use of unskilled labour (Pasinetti, 1981; Sylos Labini, 1999). This trend is particularly likely to occur in the service sector, where a national strategy state-supported and aimed at technology improvement (following Mazzucato (2013) approach) would be very useful. In this context, further research could focus on the possible strategies and policies to be concretely adopted to allow for better productivity performances.

Conflict of Interest: The authors declare that they have no conflict of interest.

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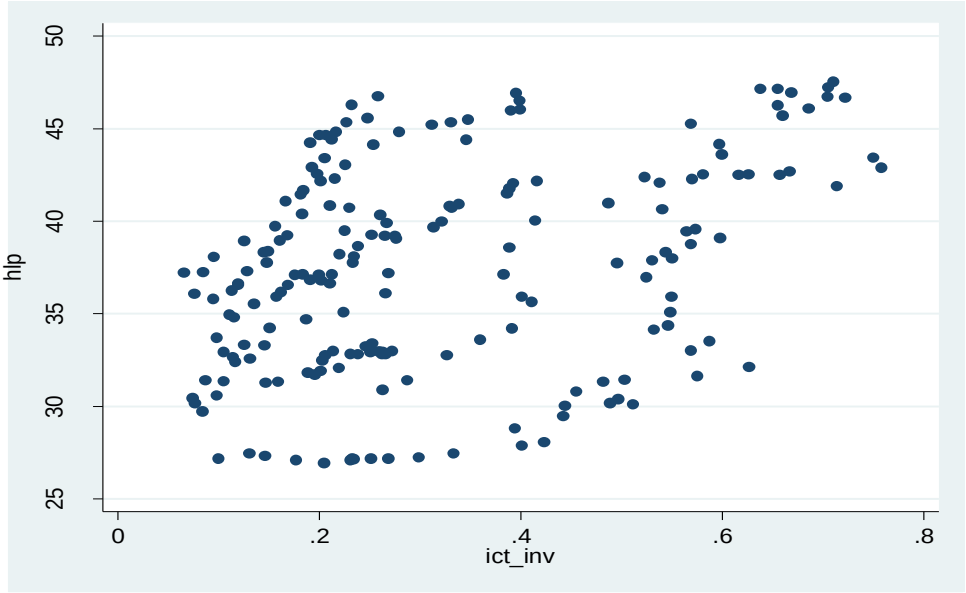
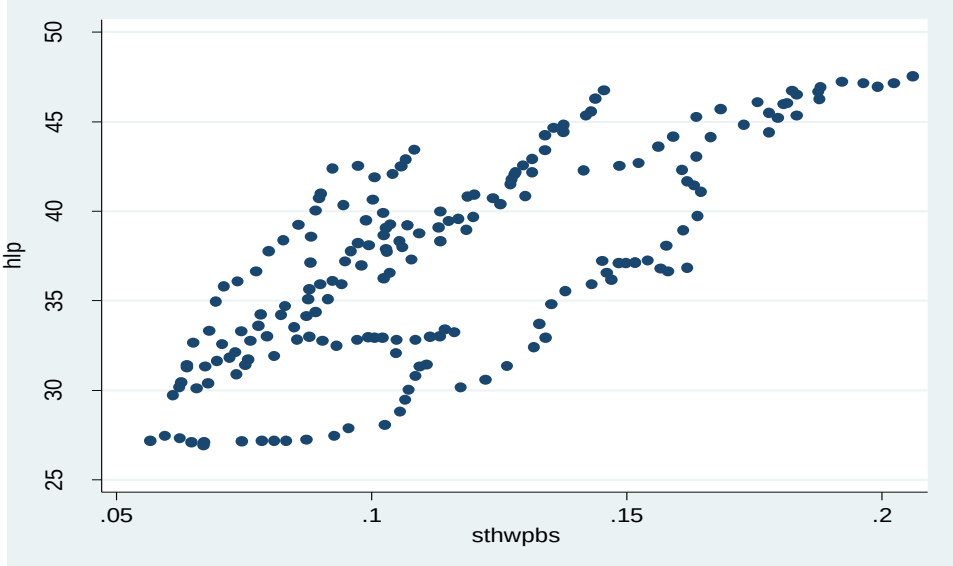
APPENDIX

Scatter plot 1a: hourly labour productivity (hlp) and ict investment (1994-2015)



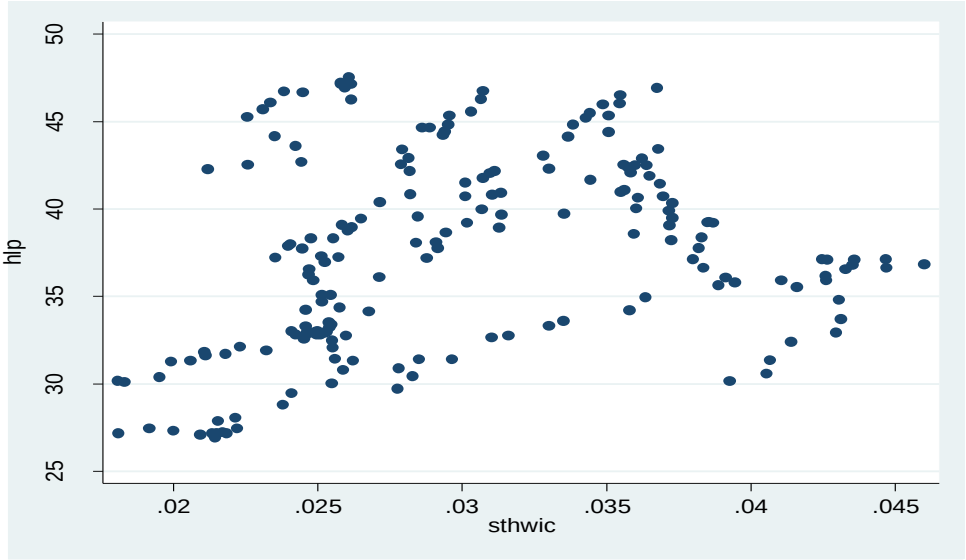
Source: own elaboration on EUKLEMS data

Scatter plot 1b: hourly labour productivity (hlp) and positively-related share of total hours worked in professional and business sector (sthwpbs) 1994-2015



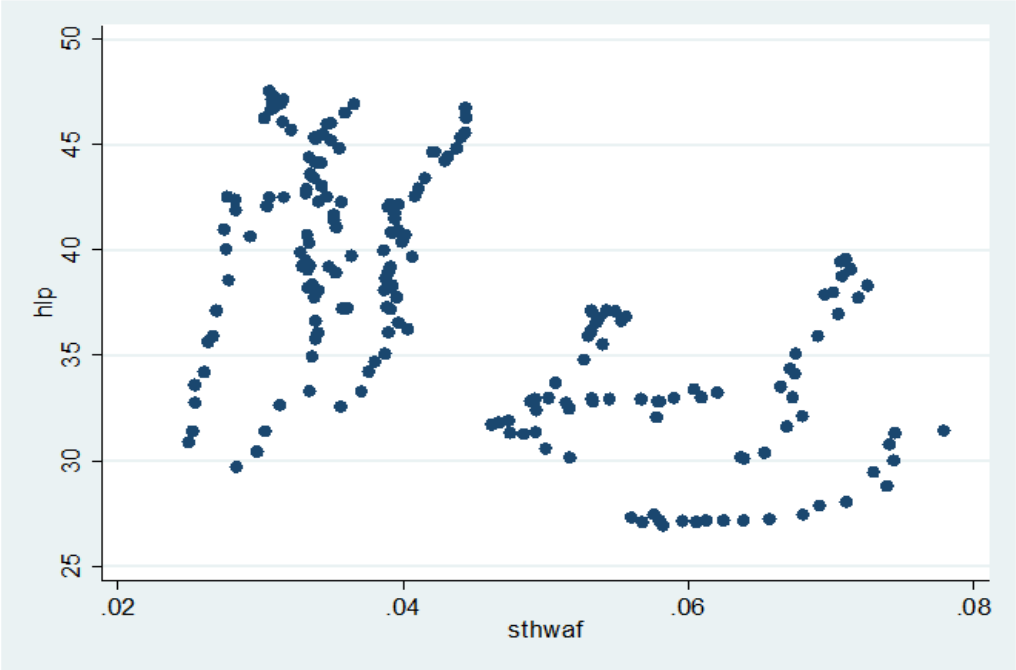
Source: own elaboration on EUKLEMS data

Scatter plot 1c: hourly labour productivity (hlp) and positively-related share of total hours worked in information and communication sector (sthwic), 1994-2015



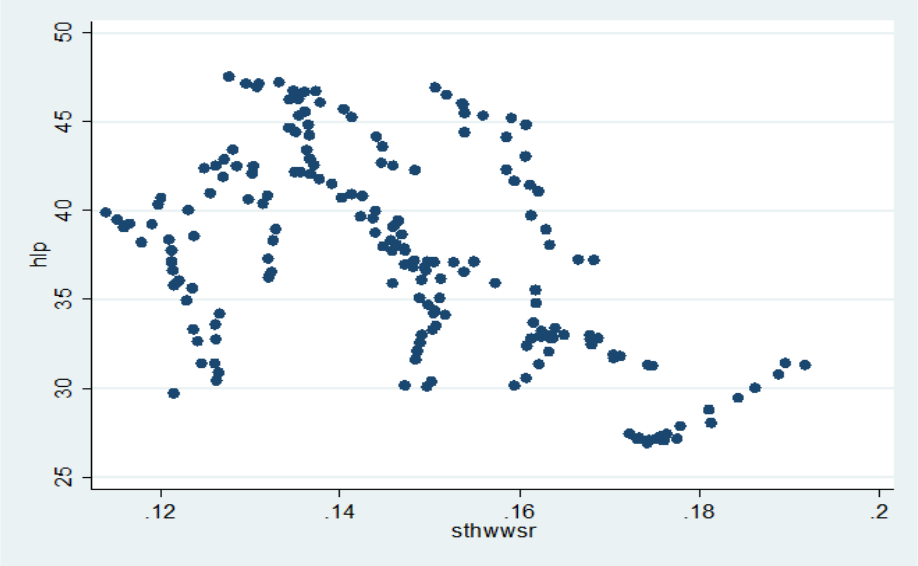
Source: own elaboration on EUKLEMS data

Scatter plot 2a: hourly labour productivity (hlp) and negatively related share of hours worked in accommodation and food sector (sthwaf), 1994-2015



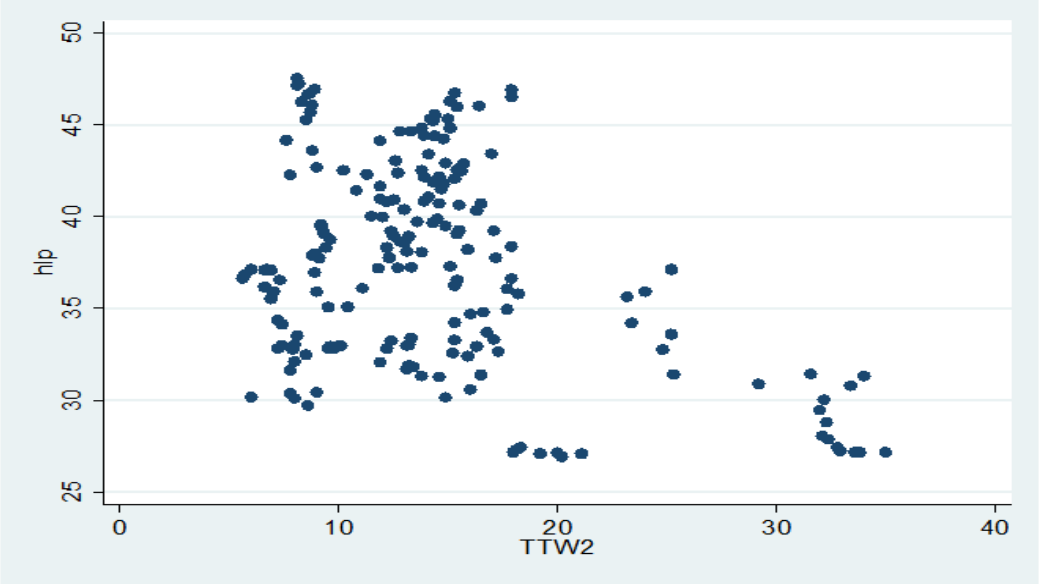
Source: own elaboration on EUKLEMS data

Scatter plot 2b: hourly labour productivity (hlp) and negatively-related share of hours worked in wholesale and retail sector (sthwwsr), 1994-2015



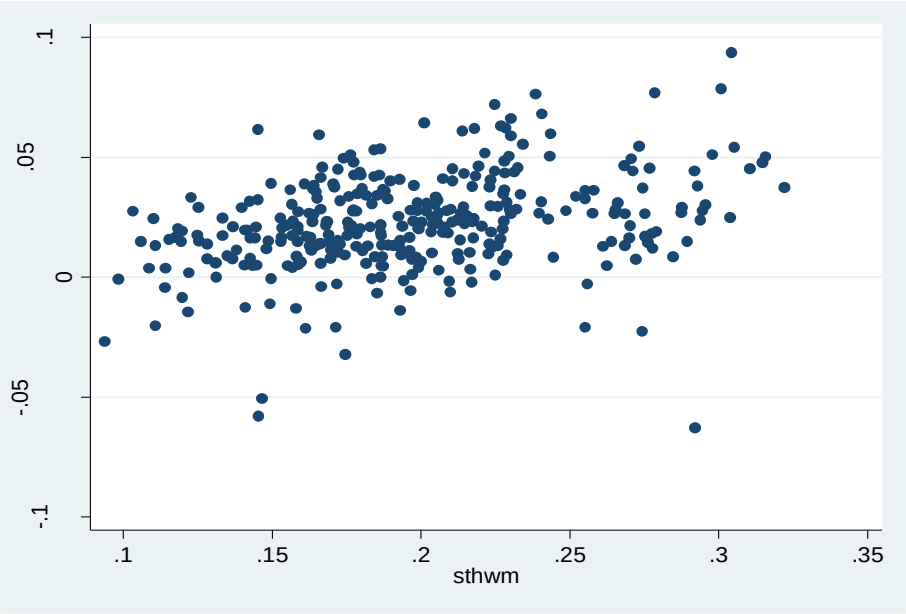
Source: own elaboration on EUKLEMS data

Scatter plot 2c: hourly labour productivity (hlp) and negatively-related share of temporary workers (TTW2), 1994-2015



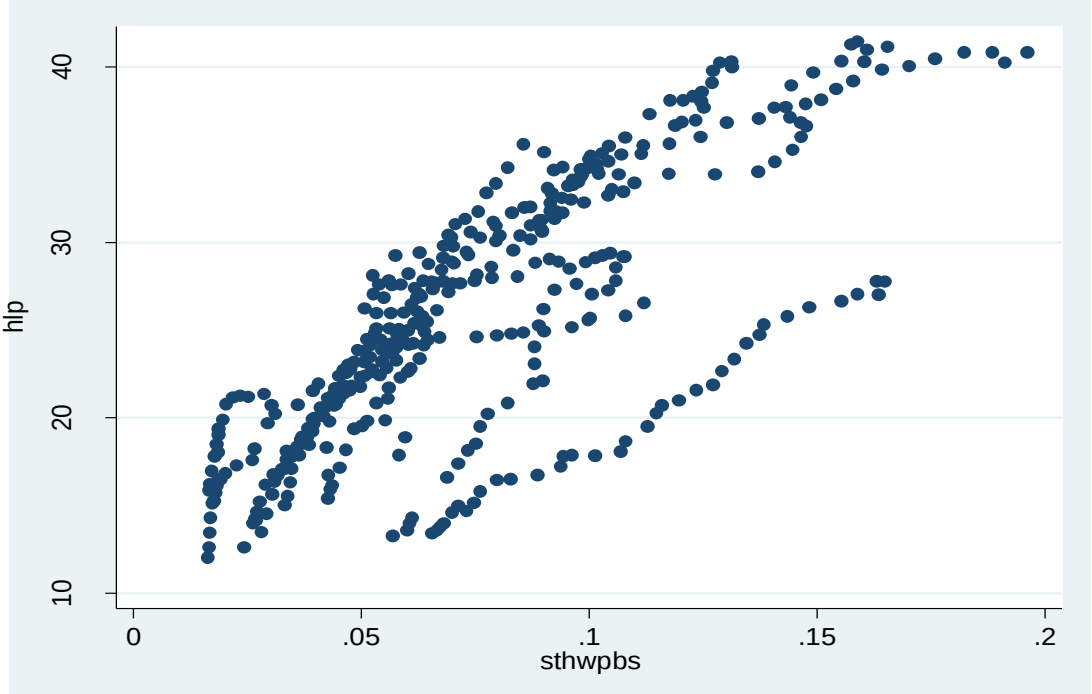
Source: own elaboration on EUKLEMS data

Scatter plot 3a: real growth of hourly labour productivity (rglpte) and positively-related shares of hours worked in manufacturing (sthwm) 1970-2014



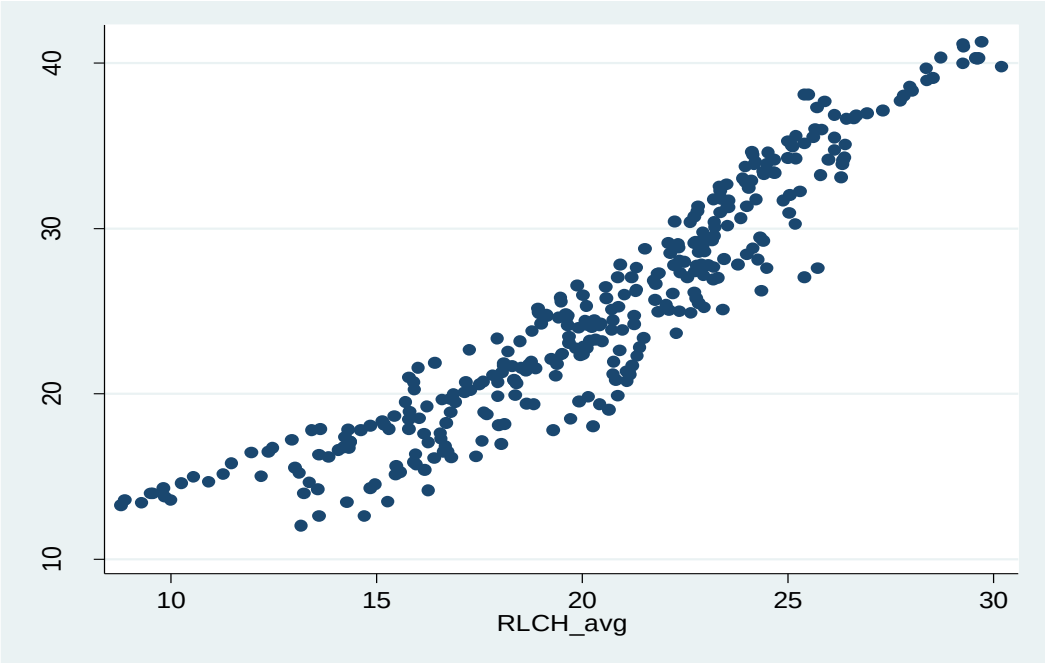
Source: own elaboration on EUKLEMS data

Scatter plot 3b: hourly labour productivity (hlp) and positively-related share of total hours worked in professional and business sector (sthwpbs) 1970-2015



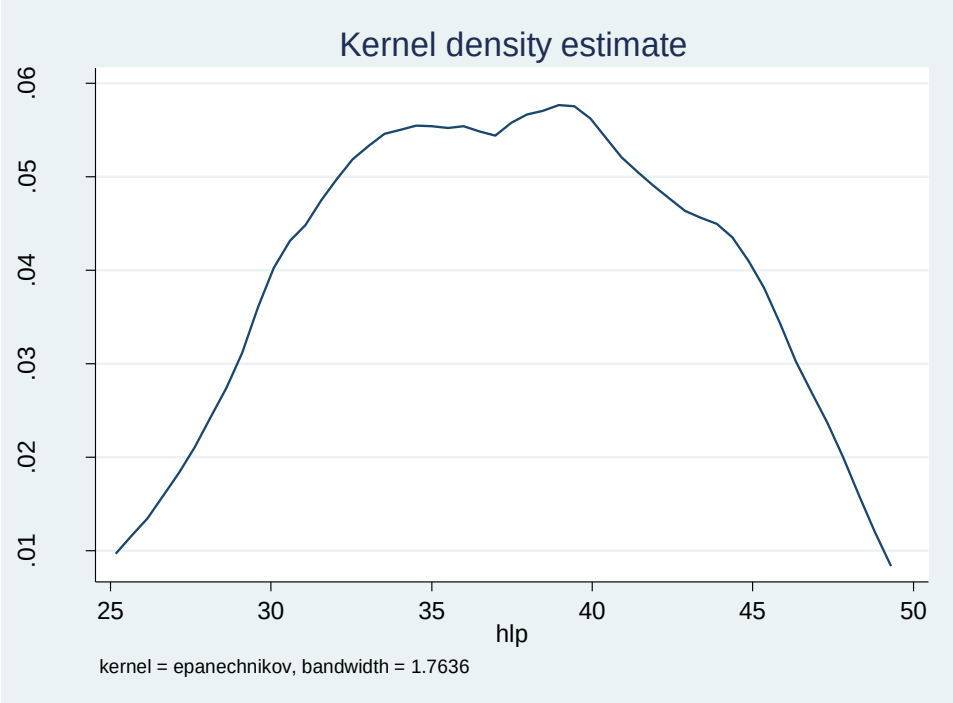
Source: own elaboration on EUKLEMS data

Scatter plot 3c: hourly labour productivity (hlp) and positively-related real labour compensation per hour (RLCH_avg) 1970-2015



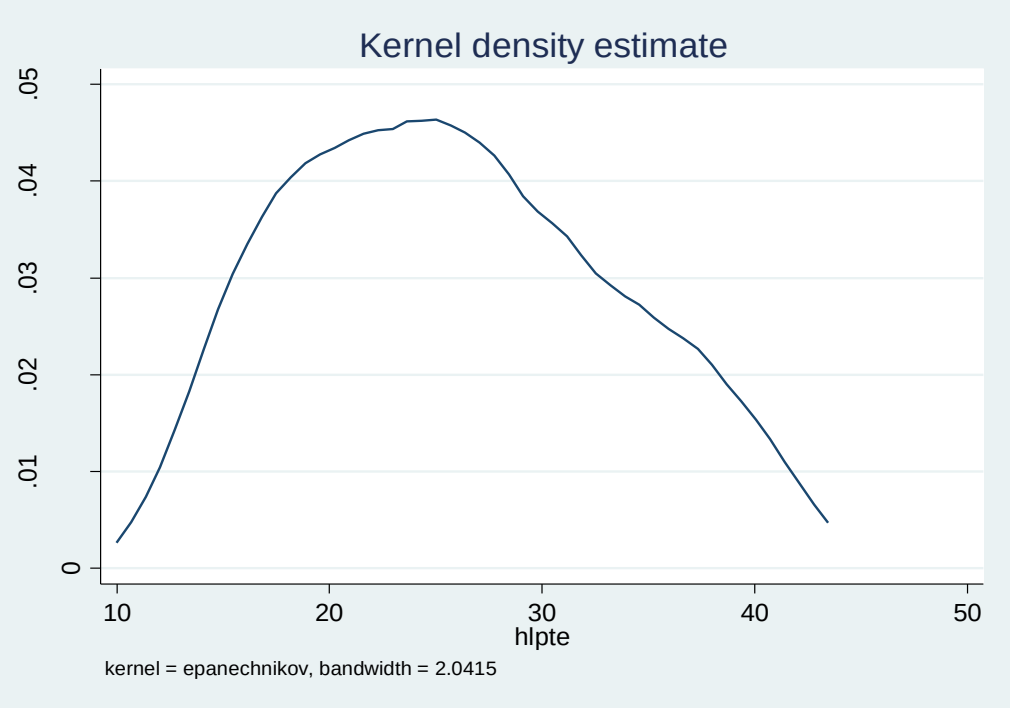
Source: own elaboration on EUKLEMS data

Figure A4. Normality test, hlp panel 1995-2015

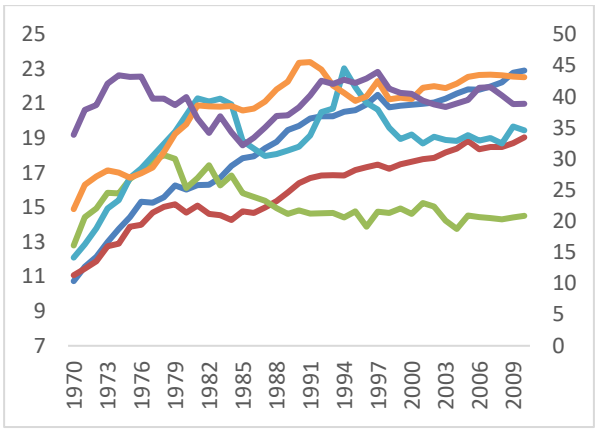


Source: own elaboration on EUKLEMS data

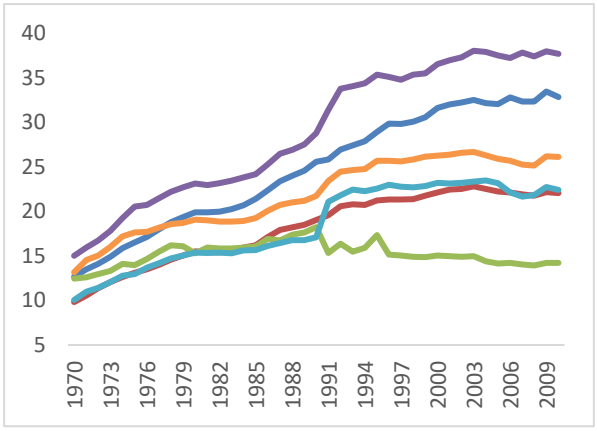
Figure A5. Normality test, hlp panel 1970-2015



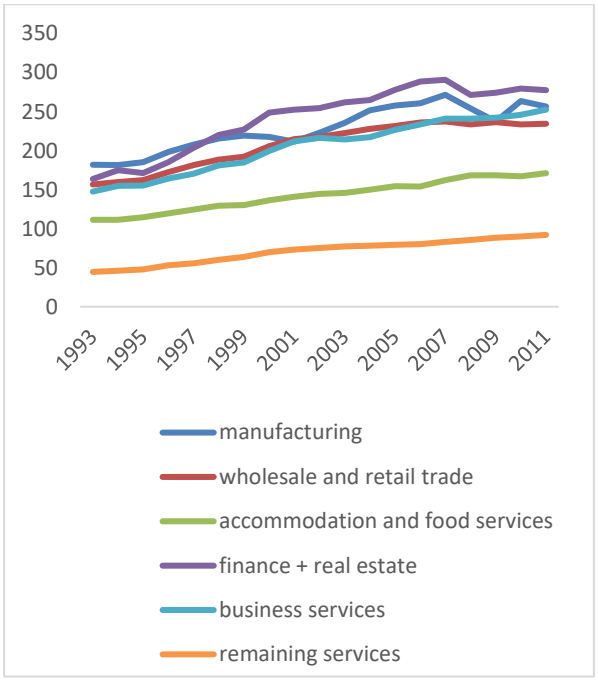
Source: own elaboration on EUKLEMS data



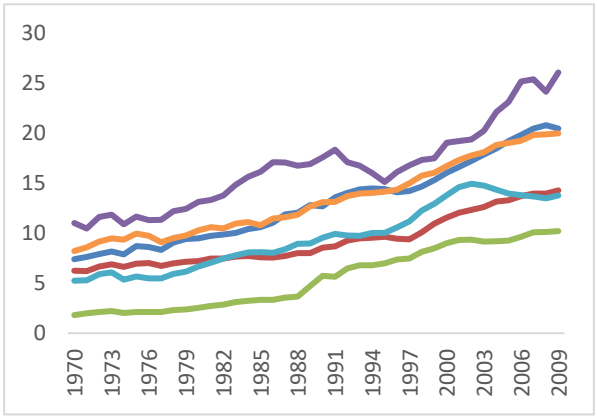
(a) Italy, 2010 Euros (finance + real estate activities on the right axis; all the other industries on the left axis)



(b) Germany, 2010 Euros



(c) Sweden, 2010 Kronas



(d) UK, 2010 Pounds

Figure A6: real hourly labour compensation

Source: EU KLEMS 2012, OECD, AMECO. Authors' own elaboration

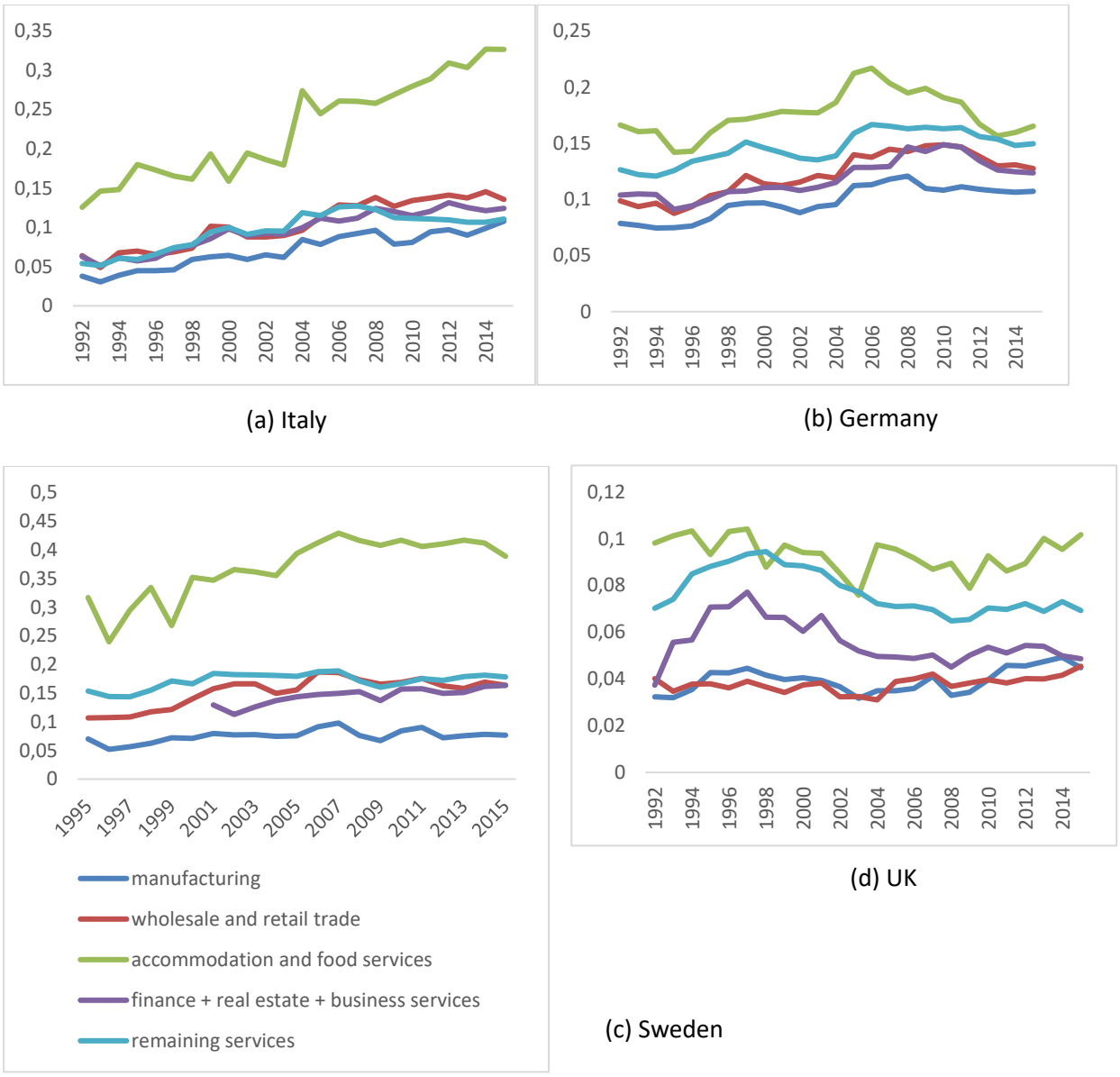


Figure A7: share of temporary employees in total employees[19]

Source: Eurostat

[19] Due to data availability, we utilise a slightly different industry aggregation here. The data provided by Eurostat do not allow us to distinguish between business services, on the one hand, and financial and real estate activities, on the other.