What sort of employment for the middle classes in Europe?

Georg Fischer
Robert Strauss
European Commission - DG Employment, Social Affairs and Inclusion *

"Middle class" is a slippery term.[1] At least it is in England, the country of "Monty Python" and "Upstairs Downstairs" and that is perhaps the most obsessed with class and where people have been very aware of who was upper or lower middle class (most people thought they were themselves middle middle class, but everyone else was upper or lower middle class). In the USA the Middle Class has been split into four: the upper middle class; the lower middle class (in the middle of the middle class) which is itself split into the satisfied middle and the struggling middle; and the working class, also known as the blue collar class or conscious middle.[2]

Germany has its well-known Mittelstand but it is not a social class; it is the collection of small- and medium-sized enterprises which are said to power the German economy. The owners of the Mittelstand are often very well off; their employees have incomes across a wide range of levels.

This paper will consider the middle classes as comprising those people in households with middle incomes. If we consider the middle 60% of incomes as so covered, it would exclude the bottom and top income quintiles. Unless specified, the middle classes will be those people in the three middle income quintiles.

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* The views expressed herein are personal and do not necessarily represent those of the European Commission. The authors would like to express their particular thanks to Eric Meyermans whose work is the basis for much of this paper.

[1] See BBC 2014.

[2] Which income class are you? Investopedia, 27 September 2012.

The key determinant of what happens to the middle income group in general and its jobs in particular, is which happens to the overall economy and total employment, in Europe and individual Member States. Though increasingly integrated, the economies of individual Member States still show capacities for very different developments. Job prospects depend to a great extent on how much Member States do or do not succeed in successfully responding to the shorter and longer term challenges confronting them.

After beginning only in late 2013, economic recovery in the European Union was to occur some four years into the Europe 2020 Strategy for smart, sustainable and inclusive growth, years marked by the aftermath of the most severe financial and economic crisis to have hit Europe since the 1930s. In late 2014 economic growth has again retreated, though not turned negative, and is at best fragile and certainly not forecast to return to pre-crisis levels for several years to come. Even if sustained, labour market and social conditions will remain extremely challenging and the EU targets for increased employment and poverty reduction for 2020 are further away than they were in 2010.

After initial resilience to the crisis when it hit in 2008, labour market performance in the EU substantially worsened after 2011 on account of low/negative economic growth and delayed adjustment. Unemployment rose rather than fell, as it did in the US and most other non-European G20 countries, and employment rates declined. The crisis years have also seen poverty increasing in the EU when it has been reduced somewhat in several non EU OECD countries, although inequality (the Gini coefficient) fell a little in while it increased slightly in the US.

Until 2007 the EU had appeared to work as a "convergence machine"; in fact imbalances were building up, but were largely ignored. However, divergences between countries grew throughout the Great Recession, especially within the Euro Area. The south and periphery of the EU have been particularly hard hit but the EU as a whole has been and still is struggling with the consequences of high unemployment, low employment, rising inequalities, rising poverty and social exclusion, and until recently declining household incomes.

As noted earlier in 2014 by the Commission[3]:

"The social situation in the euro area deteriorated throughout the crisis, and almost all social indicators worsened in 2012 (in other words reflecting 2011 income), except for the share of people living in very low work intensity households. The situation has especially worsened further for the working age population, most directly hit by the deterioration of labour market conditions. The current levels are all above pre-crisis levels. The at-risk of poverty level stands at 17%, severe material deprivation at 7.6%, the level of people living in a very low work intensity households at 10.5%, the in-work poverty rate at 10.6%, and lastly, the poverty gap at 23.4%. The potential effects of social development on long-term growth and public debt sustainability are multiple. In fact, poverty matters for productivity via the access to education and health services, while inequality has dynamic effects on growth through private debt accumulation and consumption growth. Additionally, higher poverty and unemployment rates can affect the 'reform fatigue', which can substantially disturb the recovery needed in the EA and, in turn impact on the sustainability of public finances in vulnerable countries."

The Europe 2020 Strategy's objective of job-rich and inclusive growth is even more pressing today than in 2010. The past years have revealed that a number of issues are key for the resilience of countries' labour markets and social systems; a resilience that allows them and especially the middle class to confront both shorter term shocks and longer term challenges, and see sustainable growth. Turning any economic recovery into an employment recovery requires new directions. Inequality has emerged as a key variable with a perception that the middle class is being squeezed by an expanding lower and upper class. The prolonged crisis has had a major impact in many Member States. Public finance constraints are likely to be with them for many years to come. Policy makers face tough choices as to how to cut social security contributions (where they inhibit employment) but finance more and better ALMPs, while also improving the coverage of unemployment benefit in countries where it is

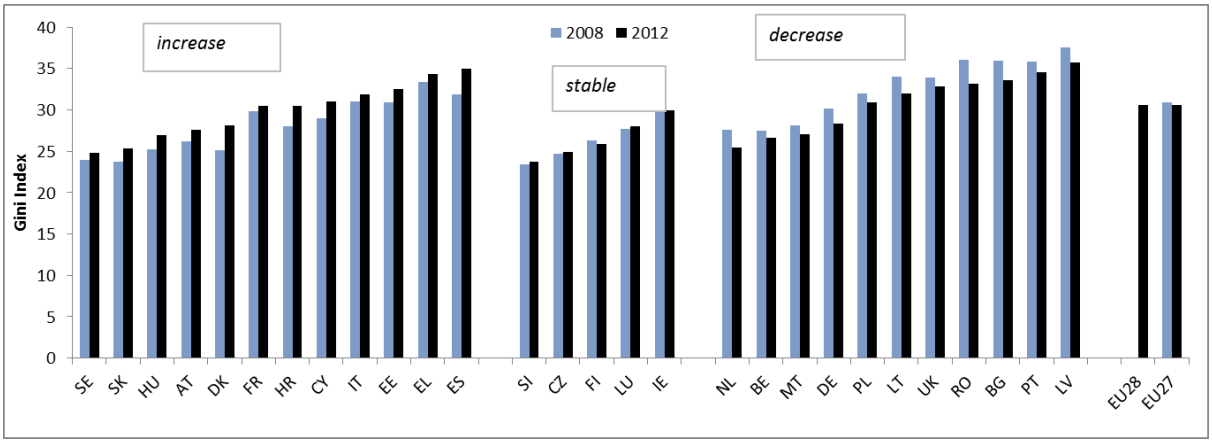
[3] See "Assessment of the 2014 national reform programmes and stability programmes for the EURO AREA", Staff Working Document, European Commission, June 2014.

weak. Segmented labour markets saw some of the sharpest job falls, especially of temporary jobs with little EPL[4], but many of new jobs are those with just such a lack of protection.

Falling incomes and rising inequalities during the Great Recession

The deterioration of economic and employment conditions have inevitably resulted in an overall decline in household incomes in most countries. However, the impact on the income distribution varied across countries. Since 2008 disposable income inequalities[5] have increased in 12 Member States, notably in Spain, Hungary and Denmark, while they have fallen in 12 others, notably in Latvia, Portugal and Bulgaria but also in Germany, Belgium and the Netherlands.

Chart 1: Income inequality in 2008 and 2012, *Gini index*



Source: Eurostat, EU-SILC, ilc_di12.

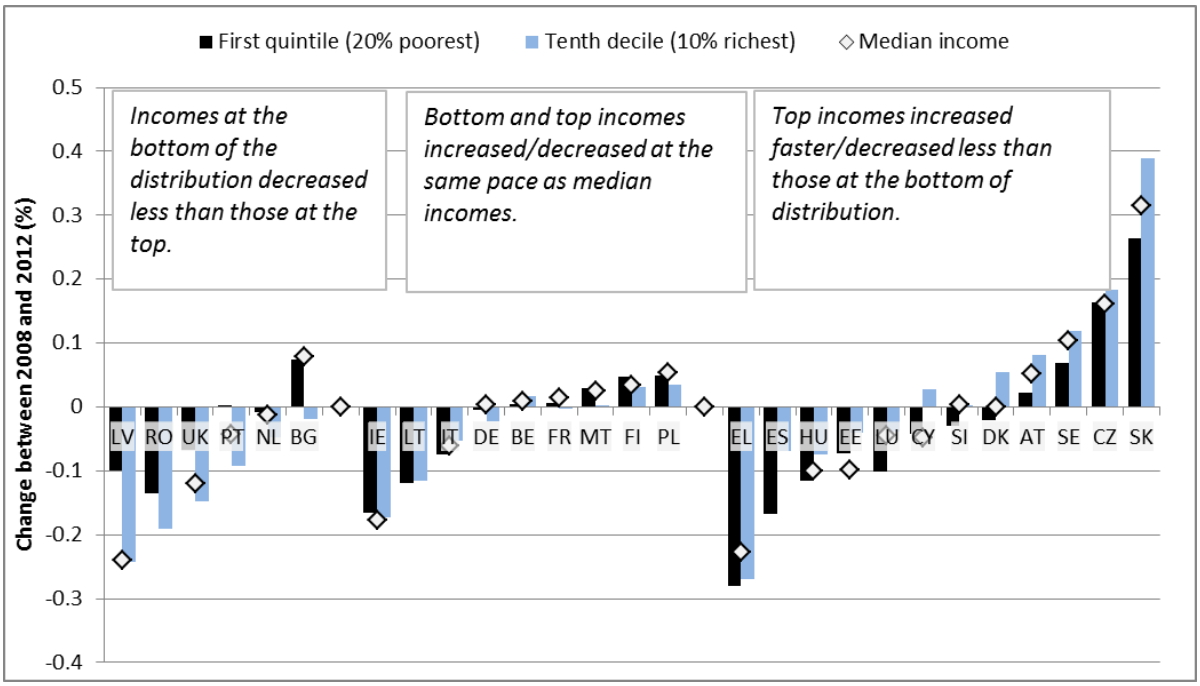
These evolutions reflect the ways in which rich, poor and middle classes have been affected. In some countries (for example Spain, Hungary, Denmark and Austria), incomes at the bottom of the distribution (first quintile) were hit harder than those at the top (tenth decile) while in some countries (Latvia, Romania, the United Kingdom, Portugal, the Netherlands,

[4] This is because temporary jobs by definition contain no redundancy pay at their end. It is not a reference to whether the OECD measures the EPL for the temporary job in these countries as high or low.

[5] Inequalities are measured here through the Gini index. It measures the degree of inequality of the income distribution by taking all income distribution into account. It varies from 0 to 100, with 0 corresponding to perfect equality (everyone has the same income) and 100 to extreme inequality (one person has all the income, everyone else has nothing). Other measures of inequalities (for example S80/S20 ratio) are also available for disposable income inequality, but not for market income inequalities. For this reason, only the Gini coefficient is used.

Bulgaria), incomes at the bottom of the distribution were relatively protected, in the sense that they dropped less than those at the top.

Chart 2: Incomes changes at several points of the distribution (1st quintile, median, 10th decile) – 2008-2012



Source: Eurostat, EU SILC, prices adjusted by consumer prices (HICP), Eurostat
Note: The graph refers to 20% lowest incomes and 10% highest incomes. Asymmetrical percentiles have been chosen for the following reasons. The lowest 10% incomes are generally considered as difficult to capture (see Atkinson-Marlier 2010). Studies on top incomes generally focus on the upper part of the distribution, often top 1pc incomes or 5pc top incomes (see Picketty, OECD).

Incomes of the middle classes as represented by the median are quite scattered across all three distribution patterns. They fell substantially in Latvia, Greece, Ireland, UK but rose significantly in Bulgaria, Austria, Poland, Sweden, the Czech Republic and Slovakia.

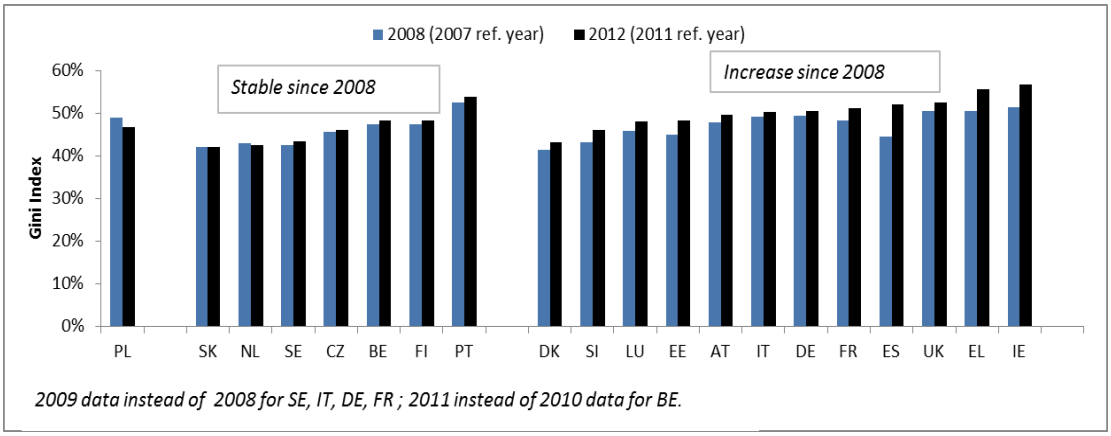
Market incomes: polarization and upgrading in the top of the distribution

Market incomes inequalities (before taxes and transfers)[6] have increased in most Member States (see Chart 3) since 2008, resulting from both increased joblessness and increased earnings polarisation for those in work. Following the worsening of unemployment from 2008 onwards, the share of households with no income from work increased, especially in Ireland, Spain, Lithuania and Greece. In addition, the polarisation of earnings from work

[6] Market incomes refer to gross earnings and capital income. Inequalities are measured based on the Gini coefficient.

increased, resulting from the widening of the hourly wage distribution, a greater dispersion in the quantity of work among those employed and of the quantity of work within households.

Chart 3 - Trends in market income inequalities between 2008 and 2012, Gini coefficient

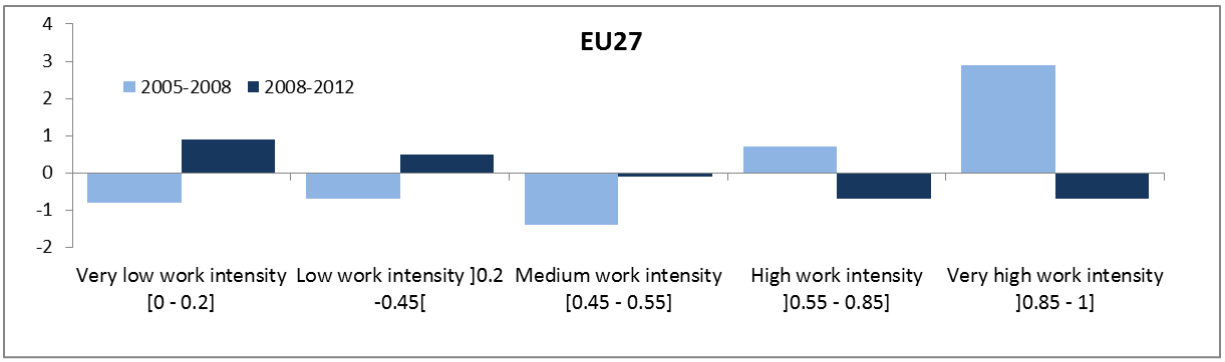


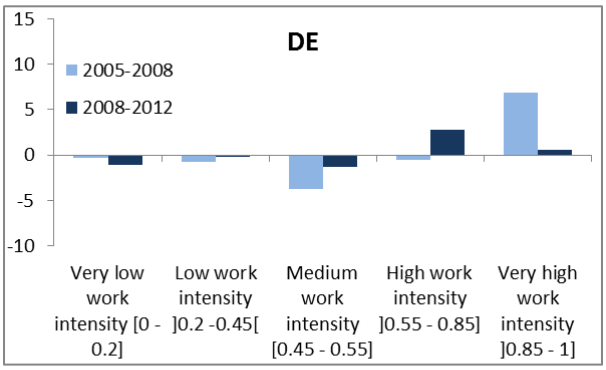
Source: OECD, income distribution database
Note: year refer to SILC production year and not reference year. 2008 data not available for SE, DE, IT, FR, IT. 2012 data not available for BE. No data for Hungary.

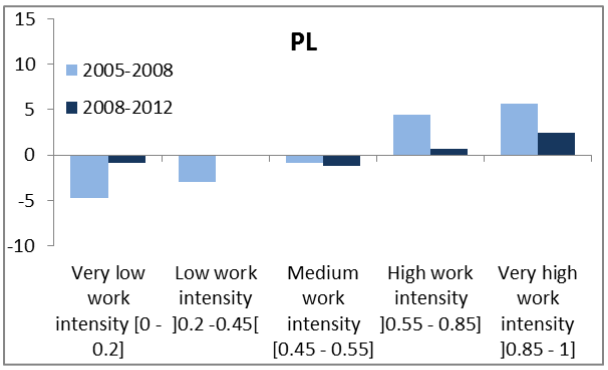
The increased polarisation of household market incomes can also be explained in part by the respective shares of job-rich and job-poor households. Before the recession the share of adults living in very high work intensity households was increasing, driven by the increased labour market participation of women as second earners. During the crisis, this trend reversed with an increase in lower job intensity households and reductions in the number of high work intensity households due to more unemployment and part-time work (see Chart). It was often the men who lost their jobs in dual earner households[7].Trends vary across Member States.

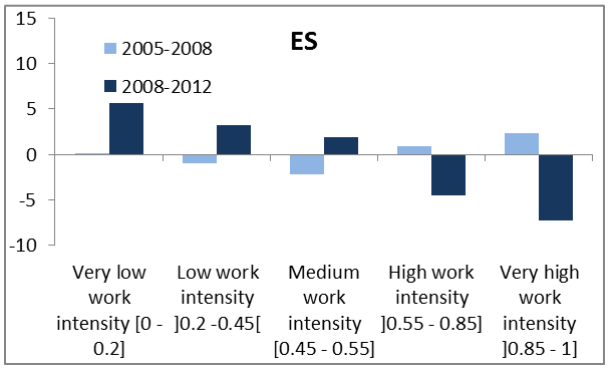
[7] "The gender impact of the crisis and the gap in total hours worked" in Employment and Social Developments in Europe Review 2013, European Commission.

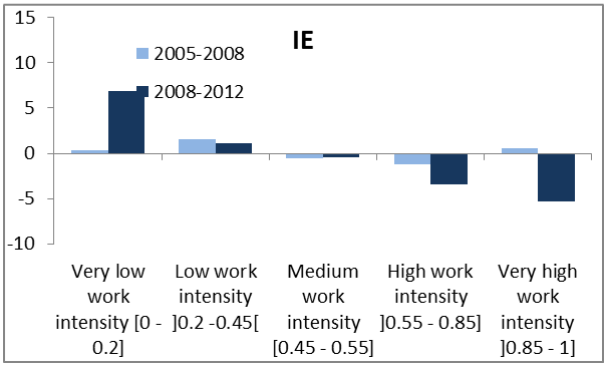
Chart 4: Changes in the distribution of population by household work intensity (2005-2008 and 2008-2012) EU27











Source: EU-SILC, Eurostat (ilc_lvps03)

The role of tax and transfers in mitigating inequalities increased in most countries

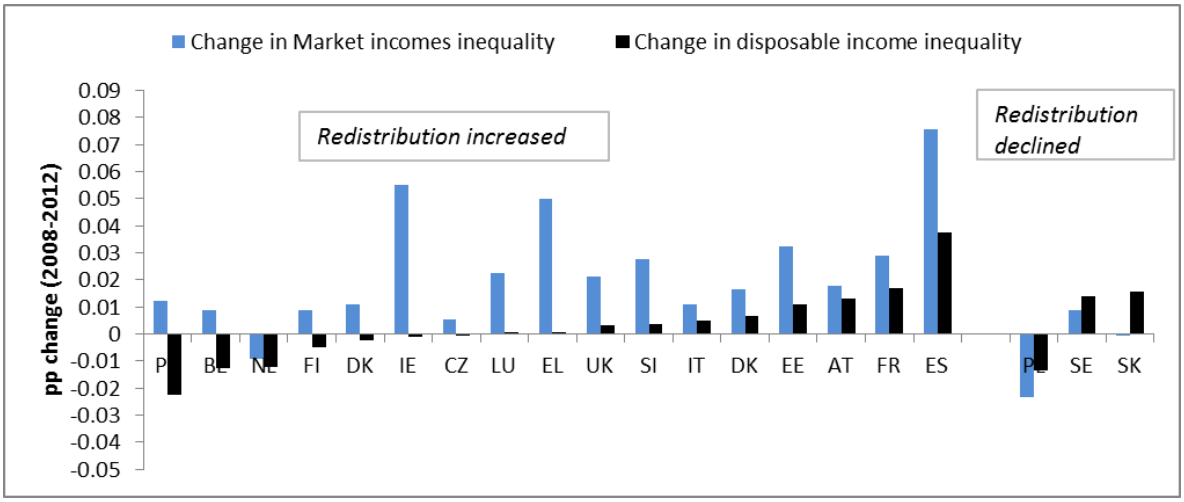
Overall in the EU, social spending had played a significant role in sustaining household incomes in most countries in 2008/2009, but this contribution lessened from 2010 onwards[8]. Furthermore, the redistributive role of tax and transfer systems contributed to mitigate the increase in market income inequality (see Chart 5), which occurred, as expected, when a large number of workers lost their jobs. In a few countries market income inequality declined, but after-tax and transfers inequality increased, indicating that the impact of redistribution through the tax-benefit system was less redistributive

A Euromod micro-simulation study of 13 countries found that overall the policy changes to taxes and benefits undertaken between 2008 and 2013 resulted in a reduction of household income in aggregate terms[9]. This contributed to increase hardship especially among low income households whose budgets are already very constrained. The distributional effects of these changes have nevertheless been broadly progressive, despite increases in VAT rates which are normally seen to be regressive. Again, in a few countries, the impact was regressive, or neutral (meaning that no measures were taken to alleviate the burden of fiscal consolidation on the poorest households). Thus, policies clearly can have a significant role to affect inequality.

[8] See Joint Employment Report 2014 and Employment and Social Developments in Europe Review 2013, European Commission. The lessening observed as from 2010 is explained by the increase in the number of long-term unemployed losing their entitlements to unemployment benefits along with the partial phasing-out of the measures put in place to counter the crisis and the tapering off of the impact of social spending in Member States where the economic situation improved.

[9] De Agostini P., A. Paulus, H. Sutherland, I. Tasseva, 2014, The effect of tax-benefit changes on the income distribution in EU countries since the beginning of the economic crisis, EUROMOD Working Paper No. EM 9/14.

Chart 5 - Changes in market income and disposable income inequalities (2008-2012), Gini index



Source: OCDE, income sources database.
Note: year refer to SILC production year and not reference year. 2008 data not available for SE, DE, IT, FR, IT. 2012 data not available for BE. No data for Hungary.

Job polarisation

Changes in job structure during the recession

In the decade to 2007, employment levels in EU-27 increased by over 20 million. Earlier analysis of this period of employment expansion using the jobs approach (Fernandez-Macias, 2010; Fernandez-Macias and Hurley 2008) emphasised the following broad developments:

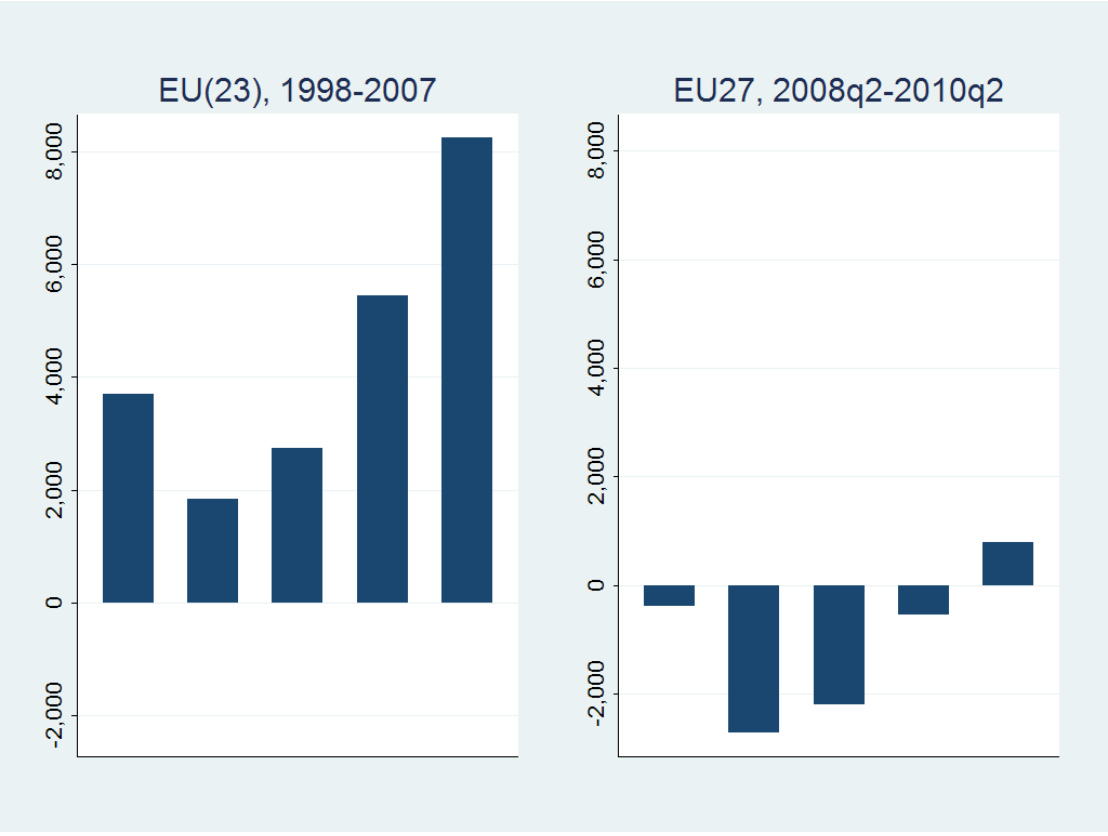
- Net employment growth was strongest in the top two quintiles with higher paid jobs, especially in knowledge-intensive services, and accounted for the majority of net new jobs
- Employment growth was comparatively subdued in low-medium and medium-paying jobs, linked in part at least to the secular decline in employment in the manufacturing sector
- Employment growth was relatively more robust in lower-paid jobs than in medium-paying jobs. This was associated with the expansion of less knowledge intensive

service sectors (restaurants, hotels, retail, etc.) and the 'de-standardisation' of lower-paid jobs.

- A variety of quintile patterns were observed at the national level, although many conformed broadly to one of three types: polarising; upgrading; or growth in the middle.

Chart 6 below sets, side-by-side, the employment shifts by job-wage quintile in the EU during the period of employment expansion up to 2007 against the same shifts during the recession. How do the two patterns compare? Apart from the obvious difference – the change from strongly positive to strongly negative employment growth – the patterns of relative employment shift by quintile are broadly similar with the decline in aggregate EU employment between 2008 quarter two and 2010 quarter two strongly concentrated in middle- and lower-middle paying jobs (Chart 6, right pane).

Chart 6 - Changes in EU employment levels by wage quintile, 1998-2007 and Q2 2008 – Q2 2010q (thousands)



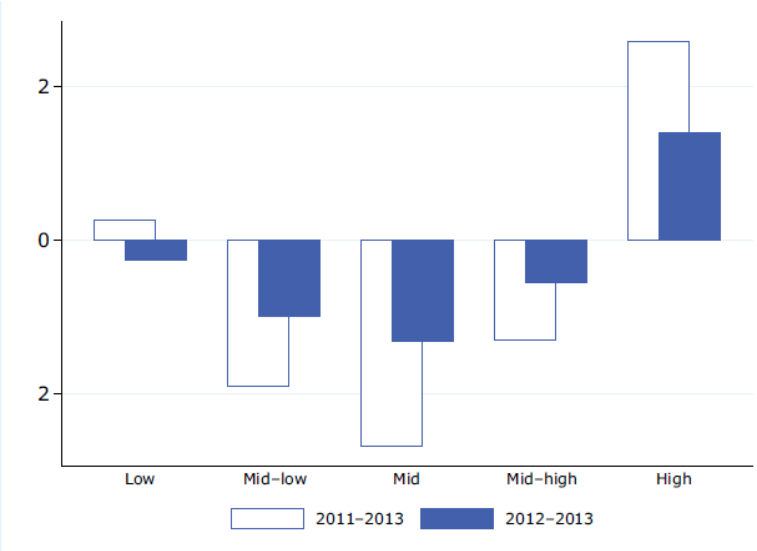
Source: EU LFS (Commission's calculations), Fernández-Macías (2010)

These were also the two quintiles recording relatively weak growth in the pre-recession employment expansion. Despite the recession, jobs in the top quintile actually increased employment by around 1 % per annum using the wage-based measure, and around 2 % per annum using the education-based measure (see Figure 5). Higher-paid and skilled jobs were much more resilient to the effects of the recession than lower-paid and (especially) lower-skilled jobs. They were also the main beneficiaries of employment growth during the long preceding period of European employment expansion. Moreover, the relative employment shift in jobs at the lower-end of the wage spectrum was also similar to that in the preceding expansion: employment grew relative to (or declined less markedly than) medium-paying jobs, but declined relative to higher-paying jobs.

Employment change during the crisis in the EU-27 as a whole can be characterised as polarised, with some element of upgrading. Figure 3 also makes clear that the recession has 'hollowed out' the labour market by disproportionately affecting those jobs in the middle of the wage distribution. This is a common finding of previous analyses in both the US and UK using a similar methodology and applied job-wage or occupation-wage rankings (Wright and Dwyer 2003, Goos and Manning 2007) to analyse employment shifts over longer periods. In other words, employment trends are relatively positive in jobs at the top and at the bottom, and relatively negative in the middle, giving rise to an overall polarisation of the labour market as the 'middle disappears'. It is noteworthy, however, that these earlier trends should not only persist, but become amplified, during a severe downturn.

In the past years, the trend towards a hollowing out of jobs at the middle of the wage distribution continued. Since 2011, top-paid jobs were resilient even in the countries where employment losses were substantial (Italy, Greece, Ireland, see Appendix). They contributed positively to job growth in the countries where the recession was milder (Austria, Belgium and Germany). Jobs at the bottom of the wage distribution either decreased less markedly than the middle, or even expanded significantly, in France, Greece or the UK. The jobs of the middle classes those with wages in the 2^{nd}-4^{th} quintiles fell substantially: they bore the brunt of the recession.

Chart 7 - Net employment change (%) by job-wage quintile, 2011 Q2 to 2013 Q2, EU28



Source: Eurostat, EU-LFS, based on Eurofound's calculations.

The effects of knowledge and technology-intensive growth on middle class job prospects

Technological progress poses challenges for jobs both in terms of quantity and quality. Knowledge and creativity are of increasing importance in the future labour market and there are clear risks associated with the automation of tasks, such as jobs losses and labour market polarisation. Some see that an industrial renaissance associated with the potential for further innovations in information and communications technology (ICT) and key enabling technologies (KETs) has the ability to generate more and better jobs. It might be particularly significant for SMEs, but they face particular challenges in improving job quality in the context of technology innovation. Labour market policies have a role to play in tempering labour market polarisation driven by technological progress.

Technology change and innovation will change the job landscape of the future and can render jobs obsolete

Technological progress is a key defining factor in how goods and services are produced and delivered to consumers. The fact that production processes are changing is by no means new, but the speed of that change may be. It can take decades for a new invention to be applied, but when it is applied, changes accelerate. The typewriter was invented in the 1860s but was not introduced into the office until the early twentieth century, when it joined a wave of mechanisation, with Dictaphones, calculators, mimeo machines, address machines,

and the predecessor of the computer – the keypunch (Frey and Osborne, 2013 after Beniger, 1986; Cortada, 2000). There are many signs that the cumulative effect of advancements in information sharing, computing power, machine learning, machine vision and data mining will soon accelerate the changes in terms of the types of jobs that are needed, how rewarding these jobs are and the requisite organisational arrangements.

In the not-so-distant past the switchboard operator became obsolete due to direct number dialling, the copy-typist gave way to personal word processing, the bank teller was replaced by cash machines, the travel agent fell prey to online booking systems and many car assembly line workers were replaced by industrial robots. Deindustrialisation and relocation to low-cost countries have been shaping the economic landscape and labour markets of the high income countries over the past forty or so years. A long-term decline of heavy industries such as mining or steel production has been observed, while specialised high tech industries have been holding ground even if employing fewer workers per output (automotive manufacturing being one of many examples).

The current changes are expected to have a strong and polarising impact on labour markets (for example Acemoglu and Autor, 2010; Eurofound, 2013). Currently, technology is changing the face of education, through online lectures classes and learning resources that are available globally and often at a fraction of the cost. Digital applications have shown the ability to compete with and potentially undermine various traditional service providers such as taxis or hotels (for example, the ride-sharing app “Uber” or the “AirBnb" flat rental and sharing). Computerisation, typically confined to manual and cognitive routine tasks, is now spreading to activities that were commonly defined as non-routine (for example Autor and Dorn, 2013; Goos et al., 2009). Tasks regarded as non-routine only a decade ago have since been computerised at a rapid pace (Autor, et al., 2003; Markoff, 2011; Frey and Osbourne, 2013). Recent examples of how the boundary between routine and non-routine tasks and between automatable and non-automatable routines will be pushed further by technology include handwriting recognition, machine translation and the use of language analysis to identify general concepts in documents.[10] Much of the research has been done for the USA; the EU is likely to have very similar technological developments. Labour market institutions including a prominent role for the social partners are different in many Member States. So far

[10] For instance, Symantec's Clearwell system proved to be capable of analysing (conceptual contents, not just words) and sorting more than 570,000 documents in two days.

these differences have not appeared to affect the way new technologies have been associated with increased polarisation but perhaps they might in the years to come.

Authors speculate about the scale of the challenge ahead if new technologies mature and spread beyond prototypical and experimental applications: self-driving vehicles, health diagnostics, automated call centres and robot assisted remote surgery are some examples. Impacts may spread to related sectors. For example, self-driving vehicles can reduce drivers' jobs and, if safer, reduce business opportunities in the insurance sector.

In some sectors, there are already palpable signs of rising automation in work spaces such as container ports, logistics warehouses or even hospitals (for example robots pulling trolleys with meals, medicines and blood samples in hospitals (Bloss, 2011)). Robots could easily have a role in the expanding sector of green jobs (for example fitting and maintenance of environmental appliances) as demonstrated by the General Electric robot that climbs (much faster than a human) wind turbines and inspects the blades 100 metres above ground (Robotics-VO, 2013).

While intellectual and knowledge work (for example, computer programming) is flourishing and craftsmanship-based manual trades remain in high demand, many middle class occupations, typical of the industrialised societies of the latter half of the 20th century, are being eroded. Programmable machines are expected to take over many routine and less routine tasks many of which are performed by unskilled and semiskilled industrial and clerical service workers who typically occupy the middle layers of employment. Some studies strike an alarmist tone and argue that the process has only just begun. Frey and Osborne (2013) predict that 47% of current jobs in advanced economies like the US are at risk of being automated over the next 20 years.. There is evidence that even the best paid jobs or occupations are vulnerable to automation, lawyers and architects are cited as examples, but it is not clear whether it is the poorly paid paralegals and architectural assistant rather than the well paid legal and architect superstars (who have always been quite few) who will suffer the associated job and/or income losses.

Further technological change is therefore expected to have a strong and polarising effect, affecting jobs and skill levels in a different manner (see further). In this context, managing the transition into a new labour market where many jobs succumb to automation must become a key priority for policymakers.

Occupations resilient to automation: the importance of knowledge and creativity (human capital) in view of technology change

The non-routine jobs that are likely to resist automation in the foreseeable future are located at either the lower or top end of the wage and skill spectrum. At the lower end, there are services such as hospitality, care, beauty, cleaning, customer service, construction, decorating and installation. These may be subjected to some vocational training and licensing in particular legal settings but require soft skills such as empathy, improvisation and complex decision making. Further, they feature complex manual tasks, which in turn rely on specific skills and experience. These jobs are not suited to outsourcing since they have to be performed on site.

Despite their undisputed social utility, such non-routine, manual, low to medium-skilled jobs often offer modest remuneration with precarious job arrangements and physically demanding working conditions. Likely reasons for this are the abundant labour supply, the possibility of using underpaid migrant workers and in some cases the threat to relocate some part of these tasks to low wage countries (Standing, 2011). In this context, there is clearly a need to step up efforts to improve the working conditions in these jobs and to ensure the application of existing worker protection laws.

At the high end of non-routine and non-automatable jobs are those consisting of complex cognitive tasks and a high level of professional competence, usually combined with a long and versatile formal education (for example computer programmers, creative industries, engineers, managers, investment bankers, lawyers, doctors, teachers and scientists). Europe has great stakes in developing the knowledge-based economy, investing in high end skills and assuring optimum job conditions for knowledge workers. Compared with low-skilled workers, knowledge workers already enjoy a more privileged position on the labour market with more favourable working conditions and a higher pay. Yet, the knowledge sector is where the highest potential for productivity growth is likely to lie. Hence, a focus on more efficient working arrangements will be key to securing Europe's position as a hotspot of high productivity.

An industrial renaissance may generate jobs of high quality and value added…

In the recent past, increasing job losses and the rise in job uncertainty have affected job quality, particularly in industry. For example, the employment share of the industry sector in the EU as a whole dropped from 22.1% in 2000 to 17.7% in 2013. At the same time, jobs in industry typically offer a high wage level (compared with the national average wage): average gross wages in industry were 10.6% above the national average gross wage in the EU. The drop in industry shares and high wages are a combined effect of: a) a strong productivity growth in industry; b) the opening of world markets and changing business models, whereby manufacturers outsource certain tasks (such as logistics, marketing or legal advice); and c) a shortage of skilled human capital in engineering and science which may have been aggravated by the recent crisis that stifled access to funds for innovation.

A variety of policy measures have been implemented to temper the adverse socio-economic impact of delocalisation and offshoring (for example Eurofound s.a.)[11]. These initiatives have primarily been used to accommodate the ongoing job shift from industrial activities to other activities notably in the services sector (though not necessarily associated with higher job quality).

An important policy challenge will be to exploit the future job growth potential of emerging innovations in ICT and KETs, such as bio-based products, smart vehicles, sustainable construction and smart grids. Where future developments are characterised by a shift from mass-produced goods and services to more customised high quality goods, there is a strong potential for the resource-poor, skills-rich EU to create high quality and value added jobs.

…through stronger support for job training in SMEs

SMEs will have an important role to play in this industrial renaissance since they are a major source of job creation and innovation. Workers' performance is largely determined by the scope with which educational systems are complemented by in-work training (see chapter 2). Therefore, job training in SMEs will be important to ensure their workers' productivity and their international competitiveness. In this context, SMEs face very specific challenges that may reduce their efforts to reinforce their workers' educational attainment. Indeed, compared

[11] At http://www.eurofound.europa.eu/areas/industrialrelations/dictionary/definitions/restructuring.htm

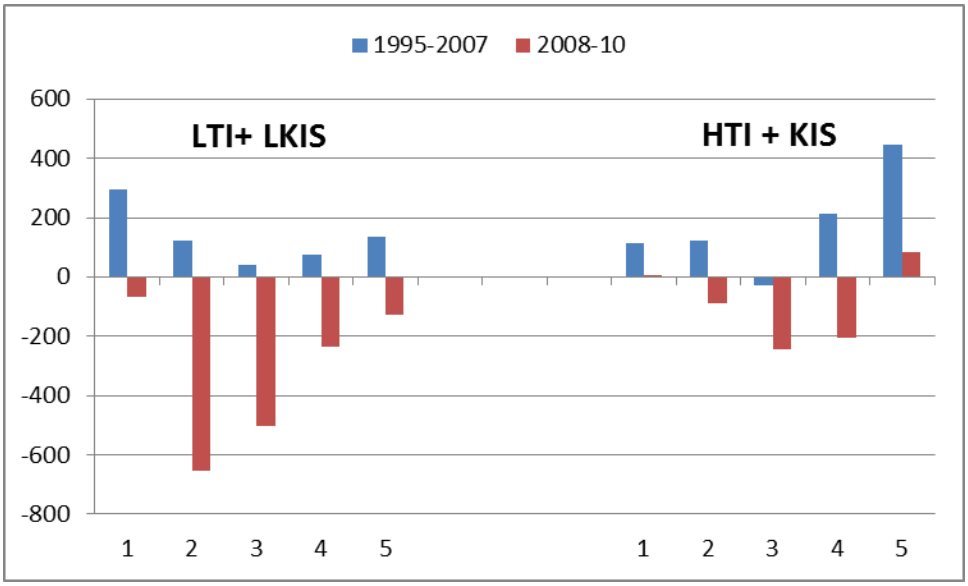
to larger firms, SME have less internal human and financial resources for skill development both at managerial and lower personnel level. Therefore, improved regulation of credit markets and lending conditions for SMEs is crucial to ensuring sufficient access to credit for skill formation. Where financial markets may fail to provide such finance, public funding should be considered.

Technology change can result in stronger labour market polarisation …

As discussed, there is a risk that the skill and talent-biased industrial renaissance brought about by the strong technological changes will sharpen the ongoing labour market polarisation. It is expected that further digitalisation of the economic activity, in combination with globalisation (see further), will increase the demand for high skilled workers, increasing their job security and earnings, while the opposite may be observed for low to medium skill groups and the long-term unemployed. The coming technology change is expected to disproportionately benefit the strongest talents, in other words the "super-stars" that create services such as Facebook, for which there is a very strong demand (for example Brynjolfsson and McAfee, 2014).

Such developments will reinforce ongoing labour market polarisation in the private sector in the EU economy (Chart 8: Annual average change in absolute employment by wage quintile in private sector, EU, 1998-2010 (1000)). The left pane of Chart 8: Annual average change in absolute employment by wage quintile in private sector, EU, 1998-2010 (1000) shows changes in the earnings quintiles in low-tech industries and basic knowledge services, while the right pane of Chart 8: Annual average change in absolute employment by wage quintile in private sector, EU, 1998-2010 (1000) shows changes in the earnings quintiles in the high-tech and knowledge intensive services. Blue bars show the pre-crisis period (in other words 1995-2007) while the red bars show the period since the onset of the crisis (in other words 2008-2010).

Chart 8: Annual average change in absolute employment by wage quintile in private sector, EU, 1998-2010 (1000)



Source: DG EMPL calculations based on Eurofound (2013) available at http://www.eurofound.europa.eu/emcc/ejm/summary.htm
Note: LTI: low-tech industry, LKIS: low knowledge intensive services, HTI: high-tech industry, KIS: knowledge intensive services
Note: No data for BG, MT, PL or RO.

In the run-up to the crisis, the lowest quintile within the low-tech and basic knowledge services showed the strongest increase, while the highest quintile within the high-tech and knowledge intensive services showed the strongest increase. In both sectors, the other quintiles showed more modest increases. During the crisis, the same pattern can be observed but in the context of employment reduction: the lowest quintile within the low-tech and basic knowledge services showed the weakest decrease, while the highest quintile within the high-tech and knowledge intensive services showed an increase.

… which will require adequate labour market policies …

In this context, the potential for technology change to improve job quality will require proactive labour market policies developed in synergy with other policies[12] to support the reallocation of labour towards these new activities in a secure way and in a way that benefits all employees, especially the low-skilled. For these workers, adequate earnings could be

[12] Such as investments in innovation, improvements in the functioning of the Internal Market and opening up international markets, mobilising public resources and unlocking private funds, equipping labour force for industrial transformations. See, for example Industrial revolution brings industry back to Europe at http://ec.europa.eu/enterprise/initiatives/mission-growth/index_en.htm#h2-4

provided in the short to medium run by measures that have a direct impact on wages (such as the minimum wage paid by the employer), hiring subsidies (paid by the tax payer to employer) or by social transfers or fiscal benefits (paid by the tax payer to the employee).

However, since differences in gross earnings are largely driven by differences in productivity[13], closing the earnings gap through nominal unit labour cost increases[14] may be unsustainable for companies. In other words, to keep workers with excessive labour costs (relative to productivity) may be financially unsustainable to companies especially in the face of increased international competition. Therefore, it is crucial to immediately reinforce the incentives and opportunities for skills formation and life-long learning directed at the low skilled and both inside and outside the job (European Commission, 2010a). These productivity-enhancing measures should complement the wage/income and other targeted measures towards workers at the lowest end of the earnings distribution (for example access to support services, such as child and elderly care and removing fiscal benefits that discourage the transition to a higher income category).

Anticipating future changes in jobs and associated skill needs will remain a challenge, requiring a stronger collaboration between stakeholders (including employers, employees, education providers, and skills forecasters) and better support for job mobility including through better information flows on job availability and the portability of social security benefits (health, pensions).

… but uncertainties remain

Finally, uncertainties about projecting future developments in employment and earnings distribution remain – requiring a permanent monitoring and assessing of developments in the field of technological progress.

For example, some analysts, for example Gordon (2014), claim that today we are facing the first phase of a secular stagnation as future innovation will not carry the same productivity growth potential as past innovations related to the use of power generation,

[13] At least if competition and information flows are not distorted too much. Notable exceptions are, for example, in "winner-takes-it-all" games where it is relative (not absolute) productivity which determines earnings, as is the case, for example, Olympic athletes, or employees in the financial sector.

[14] In other words nominal compensation per employee adjusted for productivity, whereby gross wages are an important part of compensation per employee.

chemistry, etc., and that the observed changes in employment distribution generated by information technology will be short-lived . This view is in sharp contrast with, for example, Brynjolfsson and McAfee (2014) who argue that the ongoing "digital revolution" (characterised by exponential growth in computing power, digital information and supply of relatively cheap devices which leads to new business opportunities) carries an even stronger potential for sustainable innovations and growth than the past "industrial revolution" – though its benefits will not automatically be distributed in an equitable way.

At the same time, others, for example, Autor (2014), emphasize that employment polarization does not automatically lead to wage polarization since the latter is also determined by 1) degree of complementarity (for example performances of workers may improve significantly to the extent they can be complemented with the computing power of machines), 2) the price- and income- elasticity of demand for services (for example low price elasticity for intensive manual work allows for stronger wage increases for these service providers) and 3) elasticity of labour supply (for example, it usually takes more time to form high-skilled workers than to train intensive manual workers).

Globalisation creates opportunities but also challenges for job quality and productivity

Further globalisation brought about by the removal of barriers to free and fair trade, foreign direct investment (FDI) and migration will have significant effects. This is expected to create upward and downward movements of job quality which have a direct impact on labour market participation and productivity.

Expansion of free and fair trade and FDI may trigger gains in job quality and productivity…

Further opening to world markets strengthens countries' ability to exploit their comparative advantages thereby reinforcing their overall productivity growth. For example, it is estimated that a 1 % increase in the openness of the economy generates an increase of 0.6 % in labour productivity the following year, based on an analysis of EU trade flows between 1996 and 2005. These increases in productivity create the potential to raise real wages, which is an important determinant of job quality. In turn, these increases in earnings may strengthen workers' commitment with further positive impacts on productivity.

Production patterns will change as globalisation, in combination with technological progress, will allow (large) firms to specialise in core activities and delegate much of their non-core activities to global suppliers so as to reduce production costs. For the resource-poor, skill-rich EU this may imply a shift from traditional manufacturing (for example agro-food, steel, textiles) to more knowledge and technology-intensive activities (for example high-tech business services, haute couture and design).[15] These developments will strengthen workers' opportunities to move to jobs of higher quality and value added (f in terms of earnings or autonomy).

... but may also give rise to adverse developments in job quality and productivity of the EU workforce…

However, increased international competition from firms located in countries with lower job quality standards and low wages may also result in increased job insecurity (for example due to off-shoring, restructuring), poorer worker conditions (for example in terms of maintenance of hygiene, occupational health and safety norms) and cuts in wage and non-wage labour costs (for example severance pay, individual and collective dismissal procedures), especially for workers performing routine tasks in the production of tradable goods and services. Globalisation may then have a persistent adverse impact on jobs and on job quality to the extent that workers get trapped in low-quality jobs and have no opportunity to move up. In that sense, a significant portion of the work force may become hindered or demotivated with a negative impact on overall productivity growth.

... that call for adequate labour market policies …

Several policy instruments can be used to strengthen up-ward job mobility, including job-searching assistance, skill formation and portability of social security benefits[16]. Job-searching assistance is a relatively effective, low-cost tool for smoothing the reallocation of labour. However, as the transition to new knowledge and technology-intensive activities poses new challenges, awareness of job opportunities and skills requirements by workers, employers and employment services can be low.

[15] For example, from 1970-2003, the textile workforce dropped by 60% in the G7 countries (Huwart and Verdier 2013).

[16] Apart from guidelines for Multinational Enterprises that establish responsible business conduct wherever they operate, as is outlined in, for example, Organisation for Economic Cooperation and Development (OECD) (2011.a), ' OECD Guidelines for Multinational Enterprises – 2011 Update', available at http://www.oecd.org/daf/inv/mne/oecdguidelinesformultinationalenterprises.htm

Hence, European and national platforms that facilitate the exchange of information between all stakeholders should be strengthened to improve the effectiveness of job-searching structures. Another policy is to strengthen the expertise and capacity of employment services to be more proactive and to increase their offer of re-training programmes and other relevant services.

In addition to modernising education and training systems to meet the emerging demand for new skills, equal access to skills formation should be ensured to avoid any further polarisation. Despite a strong political commitment to life-long learning, only half of all European workers underwent training in 2010 (Eurofound, 2010). The figures are particularly low among women, older workers, lower-skilled workers, workers in small companies and workers on temporary contracts.

Improving the cross-border portability of social security benefits and pensions together with better information about rights and assistance and their enforcement can further reduce institutional barriers to labour mobility and increase the opportunities to exploit job quality to the fullest extent across the EU.

… with a focus on the vulnerable …

Particular attention will need to be put on the low to medium skilled workers who are in a disadvantageous position in their ability to upgrade their skills to meet the requirements of the new knowledge and technology-intensive activities and are employed in jobs subject to international competition from countries with lower job quality standards. In such cases, just as with technology, a combination of targeted measures in terms of adequate earnings, support services, targeted skill-formation programmes and appropriate health and safety standards is necessary.

At the same time, a level playing field with trading partners could be assured via, for example, the inclusion in Free Trade Agreements of provisions covering minimum working conditions and the enforcement of national labour laws, with monitoring and enforcement of labour standards, in line with existing good practices. The ILO (2013a) reports a substantial growth in the number of trade agreements featuring labour-related measures since the mid-1990s as a result of a growing awareness of social and employment effects of trade

liberalisation[17]. In this context, implementing health and safety at work legislation in the EU is important. The G-20 has decided to launch an occupational health and safety initiative for the G-20 and other countries linked to them via supply chains.

[17] In total, there were 58 agreements with labour provisions in June 2013 – almost a quarter of the total 248 trade agreements currently in force.

Conclusion

The middle classes in the EU were being squeezed before the crisis with job growth higher in both low and high wage occupation. In this crisis, middle income jobs lost most employment. The future looks just as challenging for the European middle classes with knowledge and technology intensive growth likely to be dominant.

Technological change will probably see many of today's jobs succumbing to automation. Some see technology bringing about an industrial renaissance in the EU (and other OECD countries). However, it seems likely that even if this happens, technology will tend to further increase job and wage polarisation with the middle classes risking to be hit hardest. Continued globalisation, linked with technological change, carries both opportunities and threats to middle class jobs both in quantity and quality terms. Labour market policies can help ensure the changes brought about are as beneficial as possible. Social security policies must also be adjusted to reflect better the needs of people who will not only more often change jobs but also their employment status. Both can and should try to ensure that job mobility for the middle classes is upwards and in particular ensure that workers have the right skills for the new jobs and the support between jobs to accept and even welcome the changes.

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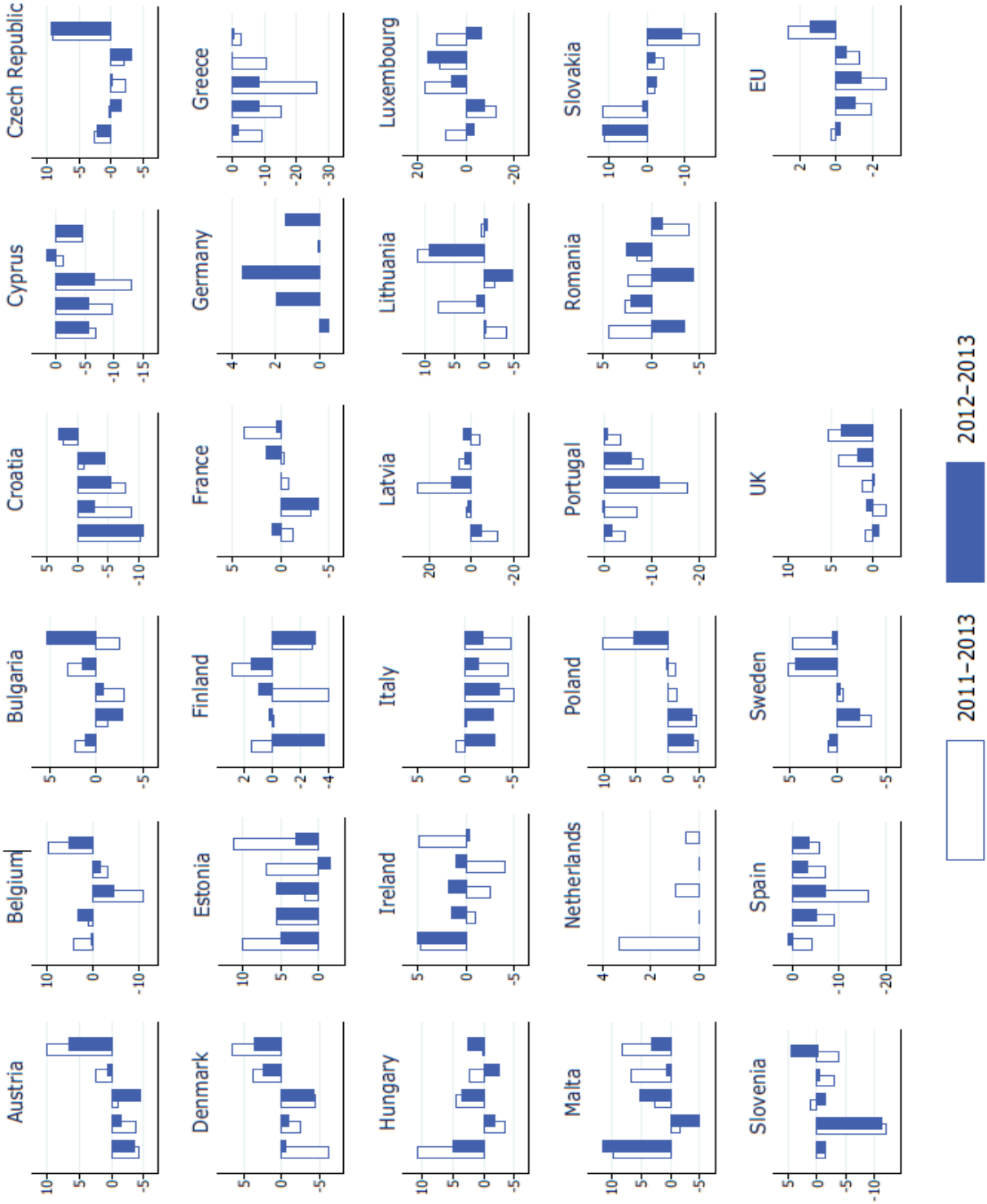
Appendix: EMPLOYMENT % CHANGE BY WAGE QUINTILE
(2011 Q2–2013 Q2 and 2012 Q2–2013 Q2)



Source: Eurofound (2014)