1

Introduction

Donald Storrie, John Hurley and Enrique Fernández-Macías

Despite recent shifts in global economic influence, much of the academic and policy debate on labour markets throughout the world still focuses on the relative merits of the institutions and the performance of labour markets in Europe and the United States of America. The European Union’s grand Lisbon Agenda with its commitment to ‘more and better jobs’ was often explicitly motivated by failure of Europe to generate jobs in the same numbers as the United States. Certainly the US performance in the 1990s had been highly impressive. In that decade, it experienced its longest period of sustained economic growth in the 20th century. Unemployment fell to among the lowest levels in the OECD, and the employment rate peaked at an all-time historical high. There was no doubt that the ‘American Jobs Machine’ had been remarkably successful in creating more jobs, 20 million between 1991 and 2000. But were they better jobs? Some argued that most were low-paid, dead-end jobs in services, while the well-paid jobs in manufacturing were being destroyed by the combined forces of globalization and technical change. Others argued that, on the contrary, this unprecedented employment expansion was associated with the creation of jobs with higher-than-average skill and pay levels, especially in professional and managerial occupations.

One reason for these different views was that their exponents used different types of evidence to support their views. The gloomy perspective on the American Jobs Machine was often based on the evolution of wage inequalities, which clearly increased during this period. The rosy perspective was often sustained by broad analyses of the sectors and occupations that had expanded most over this period, which suggested that the majority of new jobs were of a relatively good quality (managerial and professional occupations, in sectors such as financial services
and information technology). But, surprisingly, most of this evidence was only indirectly related to the key issue in this debate: the actual quality of the jobs created. The evolution of wage inequality measured at the individual level is obviously related to the type of jobs created over the expansion, but it simply could not provide a clear answer to the underlying question of how different patterns of employment expansion by job quality levels could lead to similar outcomes in terms of wage inequalities. Moreover, the analysis of changes in the levels of employment by broadly defined sectors and occupations was too aggregated to provide a clear answer.

A report of the US Council of Economic Advisers (then chaired by Joseph E. Stiglitz), in 1996, provided a simple yet powerful method for evaluating more directly the quality of the jobs created during the expansion of 1994–1996. This method consisted in the sorting of all full-time workers into 45 detailed occupations within 22 industries, and then calculating the median weekly earnings of each of the resulting economic sector and occupation cells. These cells defined a job. Jobs were then ranked by their median wage levels, and split into two groups, each holding half of total employment in 1994. The group that contained the sector and occupation cells with wages below the median were considered as holding ‘bad jobs’; the others were deemed as holding ‘good jobs’. The report found that 68 per cent of the total net expansion of employment had taken place in the ‘good jobs’.

Erik Olin Wright and Rachel Dwyer revisited the same question with a similar jobs methodology as used in the Stiglitz report, but with a more sophisticated analysis (Wright and Dwyer 2000, 2003). They exploited more detailed sectors and occupations and extended the time span. Moreover, and perhaps most importantly, they used five job quality quintiles. This revealed a much more nuanced picture of the evolution of job quality than the dichotomy of just good and bad jobs. They found that between 1992 and 2000 job expansion was strongest at the top of the wage structure, followed by the bottom groups and with the middle either declining or stagnant. Thus while on average good jobs were in a majority, the distribution of jobs was sharply skewed to the high and low tails of the wage distribution. Another interesting result was the contrast to the previous periods of employment expansion in the 1960s and 1970s which was more unambiguously towards good jobs (‘upgrading’) with hardly any sign of simultaneous growth at the lower tail (‘polarization’).

Meanwhile in Europe towards the end of the 1990s, and especially after the turn of the millennium, employment growth had picked up appreciably. Between 2000 and 2007 employment growth in the European Union was marginally higher than in the United States, and for the more advanced economies (EU15) it was appreciably higher. In fact over the longer period between the aftermath of the recession of the early 1990s and the Great Recession (1995–2007), employment growth in the EU15 was 1.24 per cent per annum compared to 1.23 per cent in the United States. This simple statistic is important as it debunks the widely held misconception of sluggish European employment growth relative to the United States. Developments between 2007 and 2010 have further improved European performance vis-à-vis the United States. However, as had previously happened in the US and in light of the central slogan of the Lisbon Agenda of ‘more and better jobs’, the question then arose about the quality of the resurgent employment growth in Europe. To this end the European Foundation for the Improvement of Living and Working Conditions (Eurofound) applied the jobs methodology developed by Wright and Dwyer to the 23 EU member states for which comparable data could be obtained (Fernández-Macías and Hurley 2008).

The main empirical challenge of this Eurofound JOBS project was to obtain robust rankings of wages for each European country. Several European level data sources were used to construct these rankings: the European Structure of Earnings Survey (ESES), the European Survey on Income and Living Conditions (EU-SILC), the European Community Household Panel (ECHP) and the Structural Business Statistics (SBS) of the EU. This data, as well as the employment data of the European Labour Force Survey from 1995 to 2007, constitute the common empirical backbone for the European chapters in this book. However, the very significant changes of the Nomenclature statistique des activités économiques dans la Communauté européenne (Statistical classification of economic activities in the European Community) (NACE) sector codes introduced by Eurostat in 2008 meant that the original wage rankings could not be used to study job growth after 2007. However, Eurostat were able to provide European Labour Force Survey (EU-LFS) wage data for 2008. This was used to generate a new 2008-based wage ranking and thus permitted a preliminary analysis of the evolution of employment between 2008 and 2010 (Hurley et al. 2011). This data is also used in the postscript final chapter (Chapter 10) which gives some indication of how the Great Recession has impacted the job structure in Europe. However, before introducing the various chapters it is appropriate to briefly outline the essence of the jobs methodology. It is developed in much more detail in Chapter 2.
1.1 The jobs approach

The jobs approach focuses not on the grand aggregates of the ILO statistical definitions of the labour force but, obviously, on jobs. A job is defined as an occupation in a sector. This is an intuitively attractive definition and corresponds to what people think of when describing their job – a secretary at a hospital, a salesperson in a car showroom or a chemist in the food processing industry. This definition is also conceptually very useful as occupation and sector relate to the two fundamental dimensions of structural change. The sector describes what type of economic value is being created and the structure of occupations gives some indication of how this value is being created. They have some correspondence to the division of labour within and outside the firm. A job so defined has also very practical empirical advantages as both occupation and sector codes have some degree of standardization which is obviously convenient for comparative analysis. Also policy-makers throughout the world have recognized the value of framing employment policy and analysis in terms of jobs. The influential OECD Jobs Study was perhaps the pioneer in this respect, but increasingly EU employment policy is phrased in the more concrete concept of a job. ‘More and better jobs’ was the headline phrase of the Lisbon Agenda and ‘New skills and jobs’ is central to its successor, the Europe 2020 strategy.

The jobs approach entails the definition of a job in an intuitive, conceptually coherent and empirically practical way and also requires some means of evaluating or classifying these jobs which is analytically useful. The original US research used the median wage. Wage is of course a useful classification of jobs in itself, not least in terms of the vital contribution of wages for the purchasing power of workers. Moreover, as productivity differentials are a fundamental driver of structural change, the association of wage and labour productivity is particularly relevant in the study of the long-run structural transformations of labour markets that constitute a primary focus in this book.

The US research, however, interpreted wage as a proxy for quality of work (Levy and Murnane 1992; Ilg and Haugen 2000; Wright and Dwyer 2003). Apart from the important intrinsic monetary value of the wage as a dimension of quality of work, one very practical advantage is that wage income is more measurable, generally more widely available and more comparable between different countries and data sets than most other dimensions of job quality. Furthermore, the wage is likely to correlate with other dimensions of work. Wages are certainly strongly related to other payments such as pensions and social-security benefits. Moreover, the status of a job in society is related to wage, as are other job characteristics such as autonomy, cognitive richness and job security. Wright and Dwyer (2003) conclude that wages are a ‘sufficient salient aspect of job quality’ to be used as a proxy even if the concept itself is multidimensional.

One might argue that in the more regulated European labour markets wages may be less strongly correlated with a properly defined multidimensional measure of quality of work than in the United States. However, recent European research on job or work quality has acknowledged the importance of the wage dimension. According to Leschke and Watt (2008), ‘wages are arguably the most important field in regard to job quality’. Work by Davoine et al. (2008b) also bears out the significance of wage in measures of overall job quality. However, it must be made clear that wage is only a proxy of quality. It may be the best one but any single indicator will be always imperfect. Chapter 7 addresses this issue, in a preliminary way, by analysing to what extent the results obtained using wage as an indicator of job quality are mirrored by those obtained using other elements of job quality. Ongoing work at Eurofound is exploring other multidimensional indicators of job quality.

The essentials of the approach can be explained with the aid of Figure 1.1. Jobs defined as an occupation in sector are first ranked according to median wage. This ranking is carried out once and remains fixed throughout. The jobs are then assigned to quintiles of employment, that is each accounting for 20 per cent of total employment. The difference between the initial and final employment levels is then presented in the quintile charts showing how employment growth or change over the period has been distributed among the job-wage quintiles.

1.2 Outline of the book

The data compiled in the Eurofound JOBS project allows for a much more detailed analysis than performed in the hitherto, largely descriptive, Eurofound reports. Even if the scope of topics addressed in this book is very wide, the analysis is all based on a common or closely compatible data sets. The methods used in the chapters are also essentially the same and the results can be presented in a relatively simple fashion. We expect that this provides both coherence and clarity throughout the book.
European countries, although most of them could be categorized in relation to two dominant patterns. The first (and most frequent) was a pattern of upgrading where net employment gains were more or less monotonically skewed to the top job quality quintiles; the second was a polarization pattern where growth was greater in both the top and the bottom quintiles compared to the middle quintiles. In fact, the top of the employment structure (the good jobs) expanded similarly everywhere, whereas most of the differences lay in the bottom (with some countries creating many bad jobs and others not creating bad jobs at all, or even destroying them in net terms) and to a lesser extent in the middle (with just a few countries creating middling jobs, and the majority remaining relatively stagnant in that segment of employment). This contrasts with some of the previous findings for the US and some European countries, which tended to emphasize polarization. The chapter discusses the occupation and sector dynamics which are behind these patterns in the context of the Social Sciences debates on the implications for job quality of compositional changes in the division of labour.

As already indicated, the analytical approach adopted in this book owes much to the pioneering work of American sociologists Erik Olin Wright and Rachel Dwyer in their analysis of the Great American Jobs Machine of the 1990s (Wright and Dwyer 2003). Indeed one of the key motivations to repeating the analysis for the EU was to see the extent to which qualitative shifts in the EU employment structure in the period up to 2007 mimicked or diverged from the pattern of asymmetrical polarization previously identified for the earlier but comparable period of employment expansion in the US. In Chapter 4, Rachel E. Dwyer and Erik Olin Wright update their previous analysis and make an explicit comparison between the patterns in the US and in the EU as a whole. They find that the employment expansions in both the EU and US shared some common features which were, in order of importance, higher growth in high-paid jobs, relatively lowest growth in middle-paid jobs and intermediate levels of growth in lower-paid jobs. However, some differentiation in the degree of asymmetrical polarization was observed. The ‘declining middle’ or the ‘hollowing out’ of the labour market appears to have been somewhat sharper in the US than in the EU, probably related to more rapid deindustrialization and tertiarization in the US.

Dwyer and Wright draw attention to one of the obvious advantages of extending the jobs approach to the EU: it opens up possibilities for a more institutionalist framework of analysis. The availability of data from the US as well as 23 EU member states with in many cases quite
different sectoral employment compositions, distinctive forms of labour market and social welfare regulation as well as worker representation systems may provide evidence of additional explanatory factors for differing patterns of employment change complementing those which focus more or less exclusively on technological change. The authors point to the diversity of employment change patterns within the US where faster-growing regions such as the south and west have had less polarized growth compared to the older industrial regions in the Northeast and Midwest. This regional pattern in the US offers some similarities to that in the EU between core, original member states – Germany, France, the Netherlands – where polarization was stronger than in peripheral member states – Spain, Ireland – which enjoyed higher levels of growth during the 1990s and 2000s.

Over the period 1995–2007, employment growth in the EU was greater for women than for men, narrowing the gender employment gap. This is the latest episode of the generational labour-market revolution that has seen the share of female workers in national workforces approach and, in some cases, surpass that of men. As authors Damian Grimshaw and Hugo Figueredo point out in Chapter 5, the gender gap in terms of job quality also narrowed in all but one of the twenty-three EU member states covered (Spain) as women took a higher share of well-paid new jobs than men. However, the patterns of employment growth for women display the same heterogeneity across countries as that for all workers. The authors also point out that women in many countries experienced job upgrading in terms of skills (based on highest level of education attained), but polarization in terms of wage (i.e. a net expansion of both the highest and lowest paid jobs, with stagnation in the middle). This supports the notion that many skilled jobs where women’s employment has grown are in fact undervalued in terms of wage compared to jobs which are still dominantly male.

In addition to the narrowing gender gaps, the authors point to the level of concentration of female employment in a small number of jobs; developments in just ten jobs go a long way to explaining the shifts in women’s employment structure in most member states. Many of these jobs are ‘welfare state jobs’ – in education, health and social care – where female workers account for between 64 and 84 per cent of employment depending on country. One intriguing finding is that the significant growth in welfare state jobs has been a strong contributor to upgrading of women’s employment in most countries but has had a more polarizing influence in the liberal welfare regime countries such as the UK and Ireland.

In Chapter 6, Rafael Muñoz de Bustillo and José-Ignacio Antón use the jobs approach to analyse another dimension of labour-market segmentation: that separating native from immigrant or non-national workers. They highlight the fact that the current migrant flows in the developed world are low compared to those that occurred during the first great wave of globalization in the 40 years that preceded World War I. Nonetheless, in the period 1995–2007 Europe received a growing share of immigrants who now account for nearly one in ten of the population. Patterns of recent migration intra-EU have been very different from those that occurred in earlier decades. Flows into traditional host European countries such as Belgium and France have stabilized while former net emigration countries such as Spain and Ireland have faced sudden and intense periods of immigration since the late 1990s.

Taking advantage of the new perspective brought by the jobs approach, the authors confirm that immigrant workers tend to concentrate in lower-paid jobs though with varying levels of intensity across countries; this pattern of segregation is much less marked in the UK and Belgium, for example, than in Germany, Spain or Italy. There is also evidence that this concentration is not solely explained by lower levels of human capital in the migrant population. The higher incidence of overqualification amongst migrant compared to native workers shows that there is a significant untapped potential which may be underutilized for reasons of insufficient integration, poorer job-matching dynamics or discrimination.

The main proxy of job quality used in our approach has been the job wage, and a secondary proxy has been the average highest educational level attained by the job holders. But clearly job quality is not reducible to just wages or the educational background of individual workers. It has many other dimensions – job security, non-exposure to health risks, cognitive richness, autonomy, development opportunities and so on – which should also be taken into account. In Chapter 7, John Hurley, Enrique Fernández-Macías and Rafael Muñoz de Bustillo develop a synthetic measure of job quality anchored in the Social Sciences literature and made operational using the European Working Conditions survey (2005) data set. The main result of this exercise is that the overall patterns of employment expansion by job quality in Europe do not change significantly using such multidimensional job quality index or using the wage-or skill-based measures. How we measure job quality does not appear to impact substantially on the observed patterns of employment expansion, as jobs in the same sectors – financial intermediation at the
top end and hotels/restaurants at the bottom – and in the same occupations within those sectors – professionals, associate professionals and managers at the top end and elementary occupations at the bottom – tend to be similarly placed irrespective of whether we use a composite job quality measure, a wage-based measure or a skill-based measure.

One of the findings of previous analysis of European labour markets using the jobs approach (Fernández-Macías and Hurley 2008) was that the patterns of employment expansion were quite different in ‘older’ EU member states (those that joined before 1992) compared to those that were part of the major accession of the mid-2000s. Employment growth was in particular much less skewed towards higher-paid jobs in the new member states than the older member states. That the two groups of countries should exhibit different patterns is unsurprising. The experience of transition post-1989 from a planned, command economy to a market economy was particularly brutal in many of the countries in the sphere of influence of the former Soviet Union and the period covered by the analysis (1995–2006) was close enough to still bear the marks of these traumas which included huge decreases in employment levels (of up to 30% in Hungary, Estonia and Latvia). The process of convergence with west-European economic and political models continued throughout the period, beyond accession in 2004, and is ongoing at the time of writing.

In Chapter 8, Ágota Scharle sets labour-market developments in seven of the new member states against the backdrop of the transition. Though somewhat poorer, these economies were roughly at the same stage of industrial development as the southern-European economies had been in the mid-1990s. They also experienced similar bouts of sectoral relocation of labour in the period prior to and after EU accession in 2004. Nonetheless, patterns of employment shift by job quality quintile varied from country to country possibly related to different policy responses to the transitional shock. Evidence is suggestive of a trade-off between employment growth and job quality. Faster employment growth was associated with increases in lower-quality jobs (e.g. in Estonia) while qualitatively upgrading countries (e.g. the Czech Republic) recorded negative employment growth in the same period (the decade up to 2007).

Generally, higher-paid jobs are also jobs that require higher-level skills. As a result, the assignment of jobs to job quality quintiles across countries shows a high level of correlation for these two types of job ranking. Such ‘returns to education’ are usually interpreted in terms of increased levels of productivity of highly educated workers compared to workers with only compulsory or basic schooling. Discrepancies in the match between job-skill levels and job wages do exist, however. These are of interest in particular in identifying situations in which the labour market behaves in ways that depart from the predictions of classical economics; that is, where workers are paid more or less than their marginal productivity. In Chapter 9, Jean-Maile Jungblut and Philip O'Connell outline various mechanisms that could lead to different wage levels for workers of similar skill levels.

Internal labour markets – characterized by long-term employment relationships with a strong focus on human capital development – may tend to underpay younger or entry-level workers on the basis that they will recoup and realize these ‘investments’ in the shape of seniority premia later in their career in the same company or group. Employees in such jobs accept a trade-off over time in the wage returns to education. The theory of segmented or dual labour markets on the other hand assumes a reserve pool of flexible labour where the returns to education may be low or non-existent. The fact of belonging to the less favoured, outsider or secondary labour market can consign even highly qualified workers to a succession of low-status and prospect-less jobs. The jobs approach can be used for comparing relative skill and wage levels for jobs using the quintile assignments. The authors take advantage of this and use multivariate techniques to investigate the extent to which job-skill mismatches are attributable to different types of labour market – internal, occupational or dual/segmented – and how such mismatches vary by gender and across countries as well as according to other institutional variables.

The tenth and final chapter examines the impacts of recessions on the labour market going back to the early 1980s. It does so in the wake of the Great Recession of 2008–2009 in which financial crisis contributed to destabilize the economies of the developed world more thoroughly than at any time since the Great Depression of the 1930s. Instead of increasing by six million as trend growth would have predicted, European labour markets shed five million jobs between the second quarter of 2008 and the second quarter of 2010. Terry Ward, Robert Stehrer and John Hurley compare this recent period of employment decline with those that occurred in earlier recessions in particular as regards the relative employment impact by sector and occupation. They find, for example, that secular trends towards increasing shares of services employment have accelerated during periods of recession. This in turn is associated with a sharp divergence in employment growth between higher-skilled, white-collar occupations and blue-collar
occupations (both high and low skilled) where workers in the former category are relatively cushioned from the impacts of recession while those in the latter blue-collar category are disproportionately affected. Because of the location of these jobs in the (lower) middle of the wage distribution, the impact of the Great Recession has been to sharpen the previously observed asymmetrical polarization of employment growth. Employment grew, for example, by nearly one million in top-quintile jobs in the EU during the recession.

This last chapter is something of a coda to the earlier chapters which concentrate on the preceding period of employment expansion from 1995 to 2007. One principal conclusion is that a wrenching recession such as the one that occurred in 2008–2009 while impacting very negatively on the quantity of jobs has broadly similar impacts in terms of the relative distribution of well-paid and medium-paid jobs. The distinctive effect of the recession was simultaneously to sharpen the relative growth of well-paid, well-skilled jobs and the relative decline of medium-paid jobs. Specific sectoral effects – the large-scale destruction of construction jobs, resilience and growth of higher-grade public sector employment in health and education – have contributed to this accentuation of asymmetrical polarization during the recession. Ongoing austerity measures have nevertheless considerably diminished the durability of these higher-grade public sector jobs.

Perhaps the primary empirical value of the contributions to this book is the convincing evidence of the considerable variation in the patterns of employment growth by type of job throughout Europe and the United States. This is in contrast to a more homogeneous picture painted by others for many European countries, for example in Goos et al. (2009). In Chapter 3, the reasons behind this empirical discrepancy are discussed in some detail. It should be noted that other recent research has found similar heterogeneity in Europe (Oesch and Rodriguez-Menes 2011) as is presented in this book. Nevertheless, many countries do show some degree of polarization and it occurs in the aggregate figures for both the United States and Europe. Moreover, it could be argued that polarization would have been even stronger had it not been for the extraordinary construction boom which held up the middle in many countries (see Chapter 3).

The most credible explanation of the polarization phenomenon is the theory of ‘task biased technological change’. Autor et al. (2003) argue that the relevant way of understanding how technology replaces various types of labour is not primarily by analysing the skill content of a job but the extent to which tasks can be made routine. Technology, and currently not least digital technology, can quite readily replace labour in routine tasks; that is, in tasks that can be codified into repetitive step-by-step procedures. Goos and Manning (2007) have shown for the UK that non-routine tasks tend to be concentrated at the two extremes of the skill and wage distribution. Thus the jobs containing tasks in the middle decline due to the introduction of labour productivity enhancing technological change for these routine tasks. Thus while the previously dominant skill-biased technological change hypothesis, reviewed in Katz and Autor (1999), predicted lowest growth in low-paid jobs, the recognition that many low-skilled jobs cannot be readily made routine leads to a polarized pattern of employment growth in developed economies. However, it must be noted that the standard skill-biased technological change hypothesis still has some explanatory staying power in that the results of this book, and elsewhere, show strong growth at the top in most countries, and certainly this was a very striking feature of the aggregate EU-level job growth. The middle jobs may not just be replaced by technology and disappear; they may also be offshore (i.e. existing jobs moved from high- to low-cost countries) or simply eliminated by the competitive effects of international trade. Many of the lower-paid jobs remain as they entail non-routine tasks that are less tradable. In the trade context others focus more on the personal nature of these tasks and the fact that they require face-to-face interaction rather than routinization per se (Blinder 2006).

The differences between countries are more difficult to explain and the authors in this volume have been appropriately cautious in interpreting the reasons for the heterogeneity. There is no lack of possible explanations. Obviously the different levels of economic development as reflected by the employment structure and wage levels would lead to different exposures to the technological and international competitive pressures outlined above. It is, however, interesting to observe that countries differ mainly in the bottom wage quintile(s). This suggests that institutional features such as social-security systems, wage-determination mechanisms, minimum-wage regulation and public-sector employment are important in this respect. Indeed there is some suggestion that a deregulation of labour markets occurred in some of the more polarized countries. There is also some evidence that immigration flows impact on the variation in employment growth at the bottom end of the distribution.

Economic and social policy will not only determine growth at the bottom end of the wage distributions in different countries. Not least the experiences of the Great Recession show the negative impact of lax
financial regulation and practices (Ireland) and what happens to jobs with low employment protection (Spain). Moreover, countries that do promote skill formation, research and development, education and other social investments (Germany and Sweden) will succeed in growing the top jobs even in a competitive global economy.

The evidence suggesting that institutions do affect the patterns of employment growth (and hence the observed diversity across countries) has a very positive reading in terms of employment policies. For if institutions matter, there is nothing inevitable in the implications for job quality of the unrelenting march of technological change. Even if on its own, the current wave of technological change has a polarizing impact, institutional arrangements such as vocational training, collective bargaining coverage or employment protection can minimize such an impact or even reorient it in more socially desirable ways.

If polarization were to become a more widespread and deeper phenomenon it raises a number of real policy concerns. The middle classes and the well-paid working class constitute the political basis for the welfare state of both the universal and the corporatist variety common in many European countries. Furthermore, there are many negative welfare implications of inequalities, not least in terms of physical and psychological well-being (Wilkinson 2006). A disappearing middle may also undermine the possibility of stepwise social and occupational mobility. However, it is hard to imagine how the existing middle-paid jobs in manufacturing and routine services can be protected in high-wage countries in a competitive global world. Are there other jobs that can fill the gap created by the shrinking middle? In the short-medium run, construction will recover but hardly back to the level of the years before the recent property and financial crash. In the longer term one can only speculate. For example, is it likely that the jobs that will emerge from the adaptation to global warming fill the middle?

Is it inevitable that personal and other service jobs are destined to remain at the bottom of the wage distribution? Could technological innovation boost productivity in many of the currently non-routine occupations? While it may be highly unlikely that people would agree to a personal care robot or a digital hairdresser, it is exceedingly difficult to predict the innovations emerging from the dazzling pace of technological progress.

Notes

1. The Lisbon Strategy was an action and development plan for the economy of the European Union between 2000 and 2010. Its aim was to make the EU ‘the most competitive and dynamic knowledge-based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion’, by 2010. It was set out by the European Council in Lisbon in March 2000.
2. The employment growth data are from the EU KLEMS data set.