

The resilience of VET: Managing economic shocks, ageing, and technological change in an age of uncertainty

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ABSTRACT

Since the mid 1990s vocational and education and training systems across Europe have had to respond to a number of external factors which have transformed the demand for skills. This paper examines the way in which VET systems have responded to the external factors and increase their resilience in the face of external shocks of one kind or another. The paper also reveals the way in which VET increasing established itself as a mainstream option for young people over the same period because of its capacity to deliver skills which the labour market demands.

KEYWORDS

vocational education and training, labour market, apprenticeships

INTRODUCTION

Recent years has seen increasing weight attached to vocational education and training (VET) in national and pan-EU debates about competitiveness. The logic for doing so is simple enough. Skill shortages, however defined, are seen as a drag on output and productivity. If the supply of skills can be better matched to demand then competitiveness will be improved. VET, because it

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tends to be a joint enterprise between industry and education – especially when delivered via apprenticeships – is seen to be particularly well-placed to supply skills matched to demand. Industry involvement should result in skills being delivered which have economic value in the workplace and labour market, otherwise one might ask why companies would engage in this form of training. But this presupposes that VET is able to respond in a timely and effective manner to the changes taking place in the economy and labour market.

Technological change, for instance, in the guise of Industry 4.0, robotics, artificial intelligence, has the potential to transform the demand for skills via accelerating both the pace of skills obsolescence and the emergence of new jobs. While one needs to be circumspect here given that the speed of change - and its impact - can be all too easily overstated, the new technologies increasingly coming on stream in many sectors would appear to have the potential to bring about swingeing changes in the demand for skills. Best estimates, for example, indicate that around 9 to 14 percent of employment in the EU could be at risk of being substituted by automation – i.e. around 17 to 27 million jobs could disappear in the EU-27 (Nedelkoska & Quintini, 2018; Pouliakas, 2018).

At the same time, because new jobs will be created and there will be a need to replace people who will leave existing jobs due to retirement (replacement demand), the net impact may be less than these headline estimates suggest (Cedefop/Eurofound, 2018). But there's the rub. VET systems need to meet the demand for people to work in existing jobs whilst at the same time making sure they are able to satisfy demand in new, emerging jobs, some of which may lie outside those sectors traditionally associated with VET. If this were not challenge enough, national VET systems also need to adapt to demographic trends and sharp shifts in the economic cycle. The fall in the number of 15–24 year olds – the target population for much initial VET provision (IVET) – potentially increases the intensity of competition between the vocational and general pathways through upper secondary education and beyond. In many countries young people reveal a preference for taking the general pathway. And sharp shifts in the economic cycle – especially the deep recession which followed the financial crisis in 2008 and the COVID-19 induced slump at the time of writing (2020/21) – is likely to have dampened employer demand for new recruits from the education system. Whether this increases the relative attractiveness of general education remains to be seen, but is already clear that maintaining participation levels in apprenticeship programmes has proved challenging during the COVID-19 pandemic.

Turbulence in the external environment has the potential to throw VET policy and practice off-course and, with it, the associated policy ambitions. Based on Cedefop's 'Changing Nature of VET' study evidence is presented on the way in which VET systems have been able to navigate technological, demographic, and economic change over the last two decades or so (Cedefop, 2018a, 2020). Given the increased emphasis which has been placed upon VET in meeting future skill needs at member state and EU levels, understanding how VET, especially its initial form, has adapted to the external environment provides lessons for how it might address future challenges.

THE EXTERNAL ENVIRONMENT AND SKILLS

Before looking more closely at how VET has responded to a variety of external factors, by way of context information is provided on the nature of the changes which have taken place in the external environment with respect to:



- trends in output (to given an indication of economic stability and change) and employment;
- technological change (especially that associated with Industry 4.0); and
- demographic trends

Output and employment demand will have an impact on VET simply because it is preparing people to enter the labour market. Employers often continue to recruit young people into entry level jobs during downturns in the economy because they are required to fill skilled jobs in the future. And where employers make job cuts these sometimes have more limited impacts on the employment of trainees than other groups of workers, at least in the first instance (Hart, 2005). But as Fig. 1 reveals there have been sharp shifts in the economic and employment cycles over recent decades; from the sharp downturn resulting from the financial crisis in 2008 after which employment growth was relatively sluggish, to the calamitous fall in output brought about by COVID-19.¹ This has placed a pressure on VET systems to find a means of maintaining levels of provision – especially IVET delivered to young people – at a time when employer demand for the types of skills produced from the VET system, at least over the short-term, is relatively low, especially so for those programmes which have a significant work-based element.

In addition to the sharp movements observed in the economic cycle, technological change has placed substantial demands on VET systems to ensure that provision is matched to emerging skill needs. Production processes in both manufacturing and service sectors have been transformed by the integration of technologies that fall under the rubric of the Fourth Industrial Revolution or, depending upon one's preferred nomenclature, Industry 4.0. Increased use of artificial intelligence routines linked to rapid improvements in communication systems have facilitated both the automation and globalisation of the way in which goods and services are

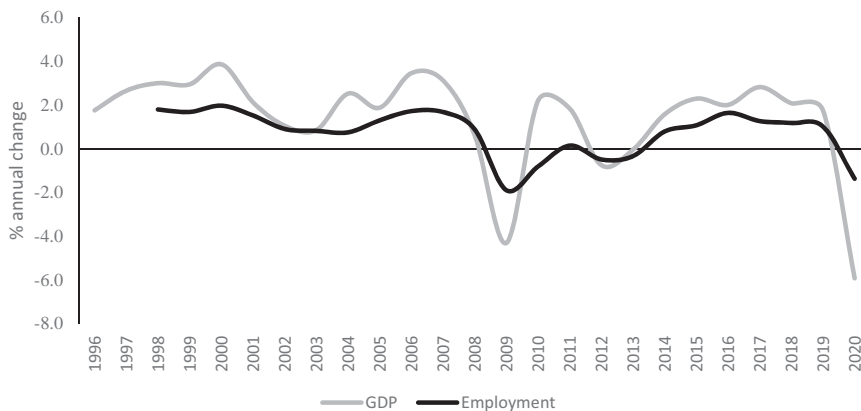


Fig. 1. Output and employment growth in the EU-15, 1995–2020

Source: Eurostat GDP and main components [NAMA_10_GDP] and Employment and activity - annual data [LFSI_EMP_A]. Own calculations for 2020.

¹Data are shown for the EU-15 (i.e. those countries which members of the EU in 1995) so that a consistent series of data can be presented for the 1995–2000 period.



designed, manufactured and distributed. Over the past forty or fifty years, technological change, typically in the guise of information and communication technologies (ICTs) has brought about real wage growth for those in employment, especially those educated and skilled to a relatively high level (i.e. at tertiary level). More recently the relationship between real wage growth and technological change would appear to be increasingly dependent upon the specificities of the technologies being introduced and the particular types of skills required to use them (Acemoglu & Autor, 2011; Autor, Levy, & Murnane, 2003). Policy makers have, accordingly, become interested in identifying those specific skills for which technological change creates a demand which, in turn, has necessitated skills anticipation systems to quickly identify emerging skill needs to inform the responses of national education and training systems.

Industry 4.0 would appear to have the capacity, through processes such as machine learning, to allow a range of routine tasks previously undertaken by workers to be substituted by automation. ‘Routine tasks’ here does not refer to skill level but the replicability of tasks by a machine. Some of the impact would appear to have been in the middle of the skills hierarchy with the jobs of clerks and those engaged in skilled trades and assembly and operator jobs particularly at risk (Handel, 2016). Other results, however, suggest the impact of technological change in the EU has predominantly affected those working in relatively low skilled jobs without access to training opportunities (Pouliakas, 2018). Figure 2 reveals that over time the percentage of overall employment accounted for by people working in clerical, skilled and related trades, and plant and machine operators has declined. The occupational shift in employment stems mainly from the increase in the share of people employed in high skilled jobs (especially professionals and associate professionals); something which is projected to continue into the future (Cedefop/Eurofound, 2018). In summary, the occupational structure of employment in the EU

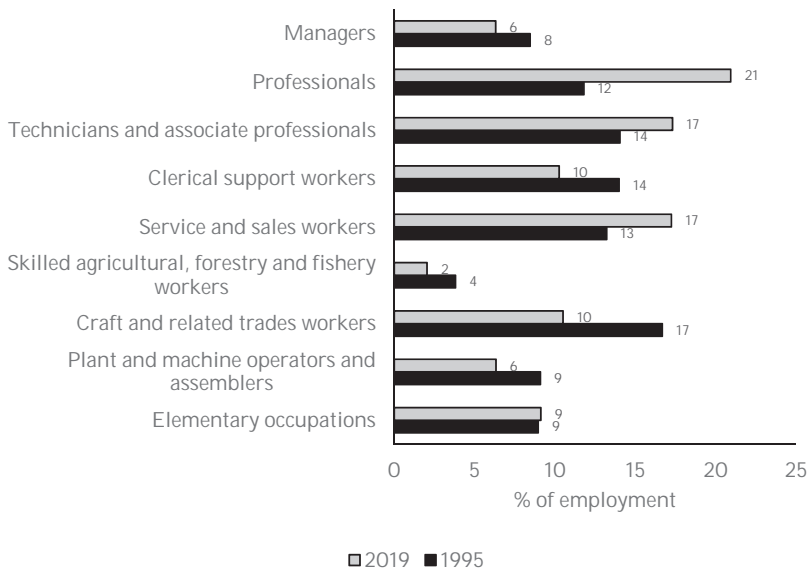


Fig. 2. Change in the occupational structure of employment in the EU-15

Source: Eurostat Employment by Occupation [LFSA_EGAIS]



has changed largely as a result of the growth in high skilled employment which again poses a challenge – and opportunity – for VET because hitherto its provision has largely focused on those in the middle of the occupational hierarchy. There is, however, a danger in over-emphasising this point given that there will continue to be substantial demand for people to be trained in jobs which are located in the middle of the occupational hierarchy because of sizeable replacement demands.

Demographic change is the third driver of change in VET. Fig. 3 shows the number of people aged 15–24 years (which might be interpreted as a key target group for VET) has fallen in the period since 1995 in both absolute terms and as a share of the overall number of people in employment. Between 1995 and 2019 the number of 15–24 years has fallen by around 12m people. That said, demographic forecasts suggest that the number of people in this age group is projected to stabilise over the period to 2030 in the EU.

In summary, the last few decades have seen the main occupations which VET has traditionally served contract in absolute and percentage terms. At the same time the number of people in one of its key target groups, 15–24 olds, has also contracted. And all the time, technological change has been incrementally - but with increasingly large steps - transforming the demand for skills in existing jobs, and brought about the creation of new ones not yet classified in occupational classifications. Each one of these challenges alone might be considered profound, but in combination they have the potential to shake the very foundations on which VET has established itself over many decades if not centuries.

How has VET responded? The statistical evidence suggests that participation rates in IVET have been stable. The data are incomplete here and affected by changes in the classification of skills. But if one looks at the split between vocational and general education at upper-secondary level in 2010 and 2019 for the ten EU countries for which data are available, the percentage in vocational education has been more or less stable (there has been a fall of 3 percentage points from 51 percent in 2010 to 48 percent in 2019). Over a relatively shorter-period where data are available for the EU-28 using a consistent classification the evidence reveals a similar picture of stability: participation in IVET has fallen by 1 percentage point (from 48 to 47 percent) between 2013 and 2018. Other statistics reveal that while the number of IVET enrolments over the the

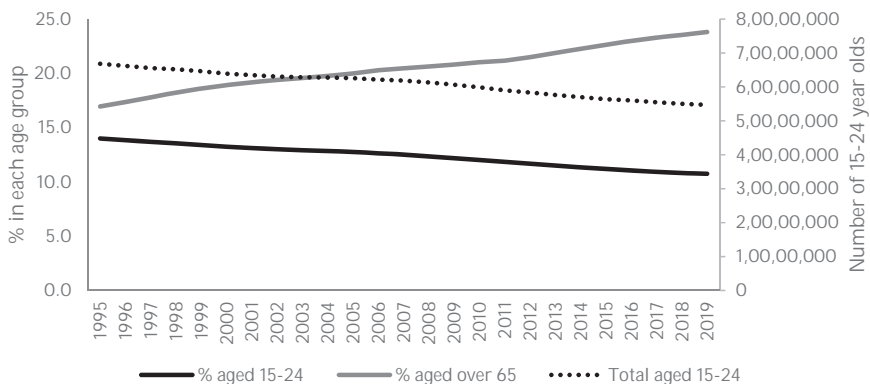


Fig. 3. Number and share of people aged 15–24 years old in the EU, 1995–2019
 Source: Eurostat Population on 1 January [DEMO_PJANGROUP]



period 1995 to 2015 at ISCED levels 3 and 4 has declined over time, this is largely attributable to changes in the size of the youth population and, in some of the countries which joined the EU in 2004, this is because of the smaller shares of the youth population studying at these levels (Cedefop, 2018b).

Given the variety of factors with which VET has had to address over recent decades, how has the nature of VET changed apart from the minor overall decrease in participation? This is turned to in the next section.

COMMON PATTERNS ACROSS MEMBER STATES

A key finding to emerge from Cedefop's Changing Nature of VET study was the resilience of VET systems across Europe (Cedefop, 2018a; Cedefop, 2020).² By looking in depth at how IVET had developed in selected member states over the period since 1995, it was able to identify common responses to a range of common external challenges. It also pointed to how VET came of age in many member states in the post-1995 period. For several member states the period from the late 1970s onwards was characterised by substantial changes being made in VET systems and, in some countries, the changes which took place represented putting in place the foundations of the VET systems which now exist today. Prior to this point VET was, to a large extent, concerned with the provision of education and training to a relatively narrow range of industries (e.g. manufacturing and construction) and, consequently to a relatively small share of the youth cohort. From the late 1970s onwards one can observe policy in countries such as England, the Netherlands, Norway and Finland extending the provision of education and training to young people beyond lower secondary education in response, in many instances, to the skill needs of a post-industrial economy. By extending the provision at upper secondary levels to young people the pressure on youth unemployment was relieved and, importantly, it ensured that the supply of skills was better matched to the needs of the economy. As will be returned to later, the need to better match skills supply to demand is a recurring theme in the debate about VET's role in the education and training system.

If the late 1970s to mid 1990s were a period of upheaval and reinvention of VET systems, the post-1995 period was one characterised by more incremental adjustment interspersed with periods of more radical change as the systems sought to mitigate the impact of severe external shocks (e.g. the financial crisis and the COVID-19 pandemic) to ensure continuity of VET provision in those cases where programmes such as apprenticeships were considered particularly vulnerable to weakened employer demand for labour and skills. They were also designed to avoid the emergence of a lost generation whose transition from education to work would be so adversely affected it would impose a lifetime of costs upon them.

The types of incremental changes introduced where concerned for the most part with increasing the quality of provision and its relevance to the labour market (demonstrating the returns to employers and would-be learners alike), and offering progression routes increasingly in to higher education. In more detail, the types of incremental change observed over a quarter of a century included the following (Cedefop, 2018a).

²The study undertook case studies in the following countries: Germany, Estonia, France, Greece, Italy, Netherlands, Norway, Poland, Finland and UK (England).



- Making VET more attractive to young people, often by stressing the opportunity to continue with further study beyond the upper secondary level but also revealing the relative returns to be obtained from gaining a vocational qualification.
- Ensuring that VET curricula are responsive to meeting labour market needs not just in those sectors where programmes such, as for instance, apprenticeships have been prevalent but to a much wider range of sectors which have traditionally satisfied their skills needs other than through VET provision.
- Shifting to an output-based approach to curriculum construction with an increasing emphasis placed on competence-based approaches to the acquisition of a vocational qualification. The competences to be obtained, when specified in conjunction with labour market actors, increase the relevance of VET provision to the labour market.
- Making VET provision more individualised by allowing students, for instance, a degree of mix and match between various VET courses or modules so that their particular needs and interests are met.
- An increased emphasis on workplace-based training, especially apprenticeships, as an effective means by which competence can be conferred upon a VET learner.
- Emphasis in some countries on providing a broader range of skills/knowledge within a VET course or programme to equip people with the breadth of learning they might need to cope with a more fluid labour market where an individual might need to change jobs more than their counterparts in the past. But this is not universal. In England, for example, the trend seems to be in the opposite direction.
- Blurring the distinction between what has traditionally been considered initial versus continuing VET so that adults are able to access IVET courses/programmes to re-skill or upskill such that they might enter a new occupation or take work in different sector. This is regarded as being increasingly important as a means of avoiding the emergence of skills obsolescence as a consequence of technological change.
- Increasing provision at higher levels in order to provide progression routes for VET learners but also in recognition that vocational programmes at higher levels can satisfy a range of skill needs at that level.

What emerges from the above trends is that of VET proving to be resilient in the face of manifold pressures. It has also resulted in VET looking very different at the end of the 2010s than it did in the mid-1990s as [Table 1](#) indicates.

The above point to the common trends observed across a number of countries. But it needs to be borne in mind that member states had differing starting points. The situation in 1995 in, say Germany, was very different from that in, for instance, Estonia which was still in the process of establishing a VET system following the collapse of the Soviet bloc and gaining its independence in 1991. Similarly, labour market structures and institutions differ between countries. The nature of the labour market regime – i.e. the extent to which it is co-ordinated or market-oriented – can explain much about the provision of VET ([Thelen, 2014](#)). For example, the role of collective bargaining for wage setting in countries which are characterised by co-ordinated labour market regimes (such as Germany) results in a degree of wage compression which incentivises employers to train people and the role of generally binding collective bargaining means that the employer is much more likely to appropriate any return it makes in IVET or CVET compared with more market-oriented countries ([Acemoglu & Pischke, 1999](#); [Hogarth & Gambin, 2017](#)). This has the effect of making employers much less resistant to taking on



Table 1. VET in the early 1990s and mid 2010s compared

	Early 1990s	Mid 2010s
Formal part of the education system	Emerging from the fragmented provision of largely industry led training	A coherent system of VET with qualifications accredited under National Qualification Frameworks
Participation levels/attractiveness of VET	Often relatively low (often because continuation into post-compulsory education low)	Still a struggle to increase participation rates, but increasingly seen as a mainstream choice at upper-secondary level
Standard setting	Often in the hands of specific industries which set their own standards	Centralised control of standard setting with some autonomy granted to vocational schools/regional authorities
Competence based approaches	Only just being established	Now an accepted part of the VET system
The prioritisation of workplace based learning	Recognition that 'apprenticeship' style training is advantageous but nothing more than this	Much the preferred means of delivering VET in many countries
Skills anticipation	Not much in evidence/piecemeal	Increasingly integrated systems being put in place to identify emerging skill needs
Accreditation of skills acquired outside of formal education system	Not much in evidence	An integral part of the VET system
Higher level VET/progression to higher education	Not much in evidence	Still patchy, but an active area of policy development

Source: Cedefop (2018a).

apprentices compared with countries which have a more market-oriented regime where labour mobility is more to the fore and can make employers reluctant to invest in training. This type of argument has explained the struggle in England to increase the number of apprentices (Hogarth & Gambin, 2021). The development of VET, especially IVET, across countries has a large element of path dependency attached to it.

It also needs to be recognised that there are different tensions in the various VET systems which emerge at least in part from the differences in the labour market regimes within which they operate. Arguably the principal one is who pays for VET or how the costs are shared between employers, learners and the state. As noted above, this differs with respect to the type of labour market regime and the extent to which employers can appropriate their investments in IVET. This tends to be easier in labour market regimes which are characterised by collective bargaining such that the free rider problem is not so much in evidence. Because the employees who train with an employer cannot readily obtain a wage increase by moving to a non-training employer upon completion of their IVET, the free rider problem is to some extent overcome. But collective bargaining is on the wane in many member states and there are pressures to adopt more market-based approaches to the regulation of their



labour markets in an effort to boost international competitiveness. Moreover, collective bargaining tends not to include those who are in more precarious employment relationships, or the ones where the nature of the employment relationship is sometimes nebulous as in the case of some platform workers.

In the period since 1995, VET provision across Europe has matured with increasing commonalities across countries. VET as a means of satisfying the skills countries will need to acquire to support their competitiveness has increasingly taken centre stage in the policy discourse about Europe's future economic development. At the same time, changes in the external environment pose challenges to the provision of VET. Perhaps the most important one relates to the extent to which there may be more fluidity in the labour markets of the future. If people are expected to increasingly shift between occupations and sectors as a consequence of technological change then this suggests, other things being equal, that VET curricula need to be broader so that individuals are equipped with the wide range of competences required to make transitions in the labour market. If VET curricula are designed to facilitate transitions between jobs, employers may be less likely to invest in this form of training because of the increased uncertainties of appropriating the return. The challenges facing VET are clearly recognised by policy makers. In order to understand how policy has responded and anticipated challenges to VET systems, the next section looks specifically at EU-wide VET policy.

THE RESPONSE OF EU VET POLICY

Key developments between 1995 and 2020

Article 128 of the Treaty of Rome (1957) specified that the Council of Ministers would lay down the 'general principles for implementing a common vocational training policy capable of contributing to the harmonious development both of the national economies and of the common market', and Article 118 stated that basic and advanced vocational training was a matter where the Commission was given the task 'of promoting close cooperation between Member States'. In the early years of the European Economic Community, as was, the member states struggled to find agreement on VET, but in the post-Lisbon Treaty (2009) period more common ground has been found. What has this meant in practice? A series of declarations have set out the EU's policies starting with the Copenhagen Declaration (2002) which starts out by stating the need for action at the European level: "Economic and social developments in Europe over the last decade have increasingly underlined the need for a European dimension to education and training."

Arguably, the Copenhagen Declaration (2002) provided for the creation of an EU-wide infrastructure which afforded a basis for developing more specific interventions of a kind indicated in the Riga Conclusions of 2015 which sought to promote work-based learning across the EU and the development of quality assurances mechanisms among others. These have been developed further in subsequent New Skills Agenda (2016) and the 2020 Skills Agenda. Summarily, one might classify the EU's activities as follows:

Improving the EU-VET infrastructure

1. information provision;
2. improving the functioning of the European single (labour) market;
3. technical assistance to member states;



Policy specific interventions

4. encouraging the take of vocational education and training/reskilling;
5. target setting; and
6. supporting equality of opportunity/access to training.

Admittedly this over-simplifies the current range of EU policy making on skills, but it serves the purpose of summarising key policy developments.

The current state of play

July 2020 saw the latest instalment in the European Union's (EU) development of its skills policy. The 2020 Skills Agenda - European Skills Agenda for Sustainable Competitiveness, Social Fairness and Resilience (2020) - outlined how EU skills policy, especially that associated with vocational education and training (VET), will respond to the digital and green transformations of European economies and contribute to the economic recovery following the COVID-19 pandemic. The objectives set out in the 2020 New Skills Agenda reprises a number found in previous skill agendas:

- the emphasis on encouragement to invest in skills (the Pact for Skills) and in particular kinds of VET such as apprenticeships;
- the need to accommodate the green and digital transformation of EU economies;
- the continued focus of skills intelligence and skills anticipation;
- the emphasis on adult learning and upskilling;
- improvements and/or increased usage of existing EU initiatives such as EQAVET - European Quality Assurance in Vocational Education and Training, Europass, etc.;
- being able to identify core competences;
- promotion of specific interventions to increase levels of skills development (i.e. the suggestion that Individual Learning Accounts are used to facilitate individuals' access to training and the proposition to establish Centres of Vocational Excellence).

There are additions as well which have not been apparent to the same degree in previous agendas, including:

- unlocking investments in VET;
- qualification design, given the mention of micro-credentials;
- high level skills associated with university-level researchers.

The goals of EU policy making in the field of skills appear clear enough:

- to boost investments in skills which confer economic value on individuals (green and digital skills are repeatedly mentioned as areas where investments in skill will generate a positive return);
- bring about equality of opportunity in access to the training which will deliver skills of economic value over an individual's life course;
- offer safeguards to young people to ensure they have the skills to make a successful transition into the labour market; and
- further the integration of a single European labour market.



Achievement of the above goals is, in large measure, dependent upon improving the provision and quality of vocational education and training. The mechanisms the EU has at its disposal to bring about these goals are mainly those of: (a) using its own funding to improve the EU-wide VET infrastructure (cf. the Blueprint for Sectoral Co-operation on Skills); (b) encouragement backed up by the use of a limited range of targets; and (c) use of European Structural and Investment Funds plus those recently made available through the Next Generation EU instrument (including the Recovery and Resilience Facility). Ultimately, however, the responsibility for ensuring that VET remains relevant to the needs of individuals, employers and, in aggregate, the economy will be the Member States. EU policy provides a resource but stimulating the demand for VET and ensuring that that demand can be satisfied rests with the Member States.

Understanding how to stimulate investments in skills has been of longstanding interest to economists and policy makers. Analyses tend to focus on those factors – usually referred to as market failures – which result in the volume of training being at a sub-optimal level or being mismatched to demand. These usually refer to information failures (e.g. about the returns to investing in skills), access to capital (the difficulties faced by either individuals or employers in finding the resources to invest in training), and co-ordination failures (e.g. with respect to how the supply-side responds to the labour market demand for skills). These can be formidable barriers affecting the take-up of VET, especially in countries which have much less of a tradition in delivering it. The key issue is the extent to which these barriers become increasingly formidable as a result of economic and technological change. Certainly, in EU policy making there is increased recognition of the need for policy – at national and EU levels - to address these issues, especially in relation to addressing information failures of various kinds through, amongst other things, an increasingly sophisticated approach to skills anticipation and communicating with a wide range of stakeholders about the way in which VET can meet a variety of labour market needs.

CONCLUSION: WHERE NEXT FOR VET?

As noted at various points in the commentary, over the last quarter of a century VET has proved itself to be responsive to changes taking place in the economy and labour market. This has been achieved in no small measure due to the major investments in the VET infrastructure at national and pan-EU levels, not least with respect to skills anticipation. So there is every reason to be optimistic that VET can continue to cater to the needs of individuals, employers, and the economy as a whole in face of whatever future challenges lie ahead. But to do so it will need to have measures in place to deal with a range of current uncertainties. The external factors which have done much to shape the provision of VET over the recent past pose many potentially formidable challenges for the future. Technological change in the guise of Industry 4.0, or the green and digital transitions, have the potential to accelerate change in the labour market. One possible future sees technological change bringing about increased levels of skills obsolescence resulting in some jobs disappearing which to some extent is counterbalanced by the emergence of new skills and new jobs. This has always been the case. But if the pace of change accelerates then this may well be reflected in more fluid labour markets where workers are increasingly expected to move between employers, occupations, and sectors. Training in the form of upskilling or reskilling will be necessary to support labour market transitions. In many countries upskilling and reskilling has been undertaken to some extent within internal labour markets



where employers have been able to manage the process of change in-house. If technological change becomes more rapid or swingeing then the capacity of internal labour markets to manage the process of change is likely to be much reduced. This then places the onus on the individual and the state to provide any necessary upskilling or reskilling. And if technological continues to increase demand for higher level skills, this may well persuade would-be IVET students to take the general route which more readily grants access to higher education. The attractiveness of general education might be accentuated if general skills are seen to better prepare people for careers which might necessitate multiple job switches.

The scenario sketched out above exaggerates potential future changes likely to affect VET. And, to be fair, VET systems across Europe have been able to successfully respond to the types of change outlined above through: changes to the funding of VET, reforms to CVET, providing VET at higher/tertiary levels, and anticipating future demand for skills (Cedefop, 2018a, 2020). The key issue is the extent to which these issues are being intensified and the continuing capacity of VET to respond. Other things being equal, a more flexible labour market will increasingly push the cost of education and training on to the individual and the state if employers are less able to appropriate the returns of the training they currently fund. The capacity of the state to increase its investment in VET, especially so bearing in mind the impact of COVID-19 on public finances, may become increasingly constrained. Of course, this affects post-compulsory general education as well, though for the most part that is already predominantly funded by the individual and the state.

Pan-European and national discourses on meeting future skill needs have placed an increasing emphasis on the role of VET. But as the foregoing indicates, there are likely to be significant challenges ahead about how to make VET relevant and attractive to employers and individuals alike. Given the pace of change in the provision of VET over the past quarter century or so, there is every reason to believe that VET will find the means to adapt to changes in the external environment. VET has proved itself to be versatile and adaptive in the face of change. And this time around there is a general policy environment that sees a critically important role for VET in efficiently and effectively meeting future skill needs. But equally one should not under-estimate the challenges which lie ahead.

Conflict of interest: I confirm there is no conflict of interest.

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