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## THE EFFECTIVENESS OF VOCATIONAL EDUCATION IN PROMOTING EQUITY AND OCCUPATIONAL MOBILITY AMONGST YOUNG PEOPLE

**ABSTRACT:** *This paper reviews current knowledge about the impact of vocational education and training on the labour market outcomes for young people in advanced market economies, and asks whether the results can be extrapolated to countries in the Western Balkans and the EU neighbourhood. It draws four main policy conclusions. First, in transition countries, specialised vocational education should not be replaced by streaming or tracking within comprehensive school systems or integrated into general education programmes. Abandoning effective vocational schooling may worsen the labour market outcomes for the less able and disadvantaged young people. Inadequate vocational school systems should be strengthened, while ensuring effective pathways to higher levels of education. Second, while apprenticeship systems enable lower ability students and minorities to access the labour market, they may lock women into traditional female occupations. Well-organised and resourced school-based vocational education may be preferred by women who feel they could*

*benefit from them, and may furthermore reduce school drop-out rates. Third, occupational mobility can be improved by effective school-based vocational education. If returns to such education are sufficiently high, they can incentivise mobility. While for developed economies there is little difference in rates of return between general and vocational education, in transition economies, returns to vocational education are higher than returns to general education. Fourth, while occupational mobility is needed for countries undergoing structural change, it should be noted that too much mobility can also be harmful to the skill retention, especially for women. Special attention should therefore be given to providing complementary opportunities for retraining and for lifelong learning to all workers, but especially to women, to encourage and support the desired degree of mobility in the labour market.*

**KEY WORDS:** *vocational education, labour market, occupational mobility, transition economies*

**JEL CLASSIFICATION:** J24, J62, J68, P51

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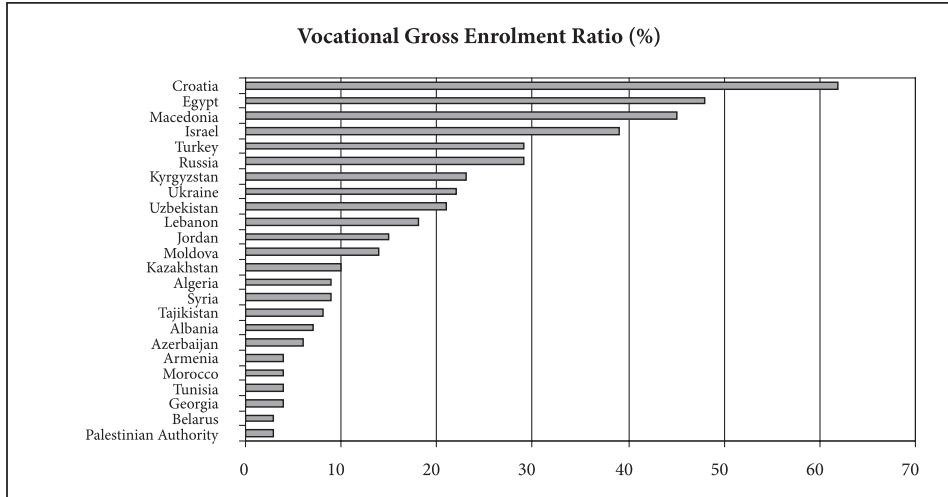
## 1. Introduction

Countries place different emphases on school-based vocational education and apprenticeship training. Some countries have comprehensive education up to age 16; others stream children into academic and vocational streams at an earlier age. Vocational school shares vary considerably around the world (van de Muelen Rodgers and Boyer 2006). In Belgium and the UK more than half of all students enrolled in secondary school are on the vocational track. In most countries a higher share of male secondary school students are enrolled in vocational school tracks compared to the share of female students. In the USA, trades and industrial courses are dominated by male students, while business preparation courses are predominantly female, and apprenticeships are also segregated by gender. Countries with well-established apprenticeship systems have lower shares of students without any post-compulsory education, and also have lower youth unemployment (Ryan 1998). However, they also have higher unemployment among older people, suggesting that their education did not provide them with adaptable skills.

What is the picture in the Western Balkans and the EU neighbourhood countries? Figure 1 shows the Vocational Gross Enrolment Ratio for this group of countries. This indicator is defined as the number of students enrolled in technical/vocational programmes at a given level of education, regardless of age, expressed as a percentage of the population in the theoretical age group for the same level of education (UIS 2006: 101). The data show low enrolment in vocational education, with ratios below 10% in several countries in Central Asian and Northern Africa. Exceptions include Kyrgyzstan and Uzbekistan where ratios are above 20%, and Lebanon and Jordan where ratios are between 10% and 20%. The highest ratios are in the most developed countries within the group including Croatia, Egypt, Macedonia, and Israel which each have almost 40% or above enrolled in vocational education. Perhaps surprisingly, two other developed countries, Turkey and Russia, each have less than 30% enrolment.

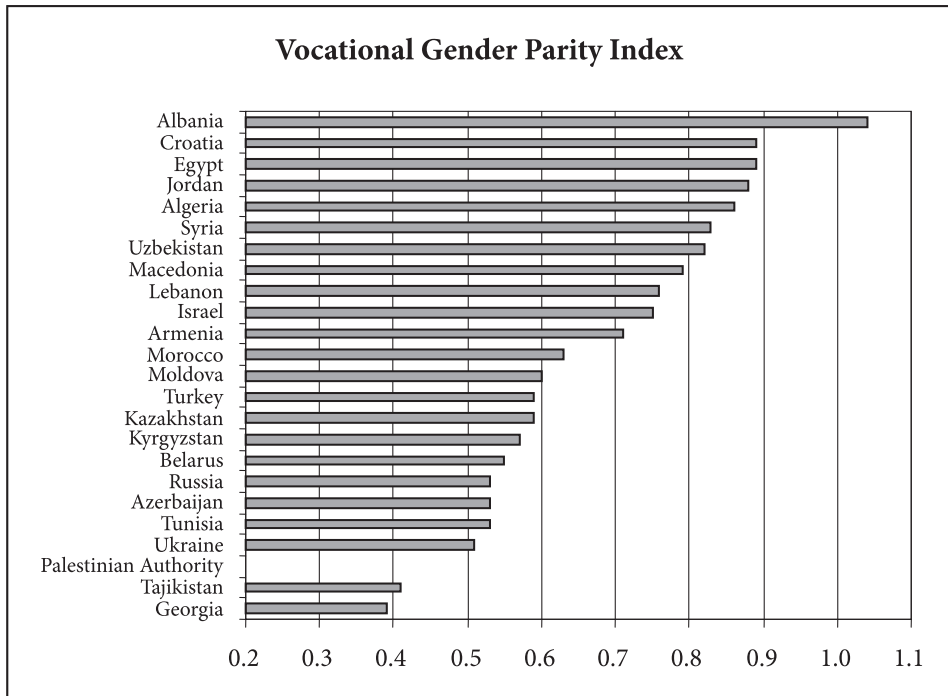
Figure 2 shows the Vocational Gender Parity Index (GPI) for the same group of countries. This indicator is defined as the ratio of female-to-male values of the Vocational GER. This indicator is also widely spread, but in general it shows the under-representation of women in vocational education in the region. Three countries have a GPI below 0.5. These are Georgia, Tajikistan and the Palestinian Authority. Seven countries have a GPI above 0.8 with only Albania exceeding 1.0 indicating that, unusually, more women than men are enrolled.

**Figure 1**



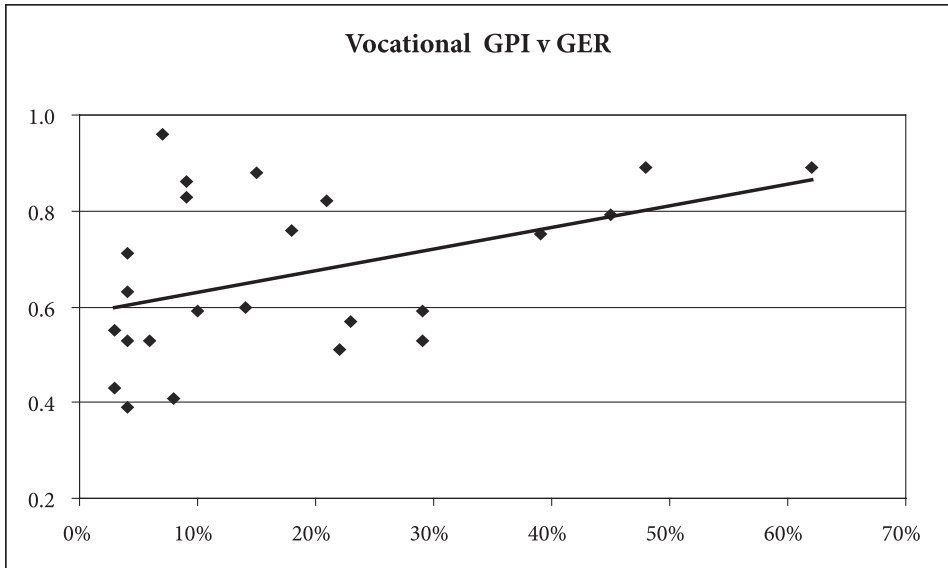
Source: UIS (2006)

**Figure 2**



Source: UIS (2006)

**Figure 3**



Source: own calculation based on data from UIS (2006)

Figure 3 shows the positive relationship between the two indicators: the higher the rate of enrolment, the higher is the GPI. The relationship explains 18% of the variance in GPI, with other factors also involved in determining its level, including cultural and historical factors, as well as economic ones. Enrolment has a stronger positive effect on gender parity among countries with a higher enrolment rate, while among countries with a low enrolment rate there is less impact. Increasing the enrolment in vocational education, on the whole appears to reduce gender discrimination in enrolment. This is only partly causal, however, as a necessary condition of increasing enrolment above low levels is drawing more women into the education system.

## **2. Selection, tracking and equity in educational outcomes**

One of the basic distinctions in secondary education systems is between academic or general education and vocational or technical education. Some education systems have been structured with separate schools for these types of education provision; others have different tracks or streams within comprehensive schools. In the latter case, some systems try to postpone the allocation to different tracks until upper secondary level. The term 'tracking' originated in the USA where

most secondary schools are comprehensive and use internal streaming into either academic or vocational pathways. In contrast, many European countries have separate schools for academic and vocational studies, and use different methods of selection to place students in either type of school. Reforms of school systems have introduced comprehensive secondary education into several European countries. In recent years the term ‘tracking’ has come to be used to denote the allocation of students into different educational pathways, whether between or within schools (OECD 2007). It should be noted that this usage glosses over, and obscures, the important differences in choice and flexibility in systems which involve separation into different schools and more comprehensive systems where allocation and pathway choice takes place within schools.

There are also significant differences between countries in the degree of selection in secondary education. Many countries select more able students into academic pathways, and less able students into vocational pathways. Among OECD countries, academic selection<sup>1</sup> is most important in Japan and least in Portugal, while Turkey and Russia have intermediate levels of selection (OECD 2007). Vocational education may be entirely school-based, or it may combine vocational schooling with work experience, as in apprenticeship contracts. In the latter case, firms as well as schools, parents, and students have a say in the content of the education provided (Wößmann and Schütz 2006). School-based vocational education programmes were introduced in Australia in 1996 and have developed rapidly (Anlezark et al. 2006). Students on vocational education programmes tend to have lower academic ability, to have parents with lower academic levels, and attend government schools.

There is a strong relationship between early selection into academic or vocational education pathways and the degree to which schools exhibit social differentiation secondary education. The OECD measures social differentiation using an index of separation between schools. This measures the extent to which a country has sorted 15-year olds from different socio-economic backgrounds into different schools (OECD 2007). Using these measures, the OECD reports that eight out of ten countries with the highest index of separation start selection before the age of 15. Among OECD countries, Hungary has a highly selective secondary education system and one of the highest degrees of social differentiation. Turkey has the second highest; Russia has a far lower, intermediate level, while Finland, Norway and Sweden have the least. According to OECD (2007) early academic selection

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<sup>1</sup> Defined as the percentage of 15-year olds in schools where the principal considers student academic records to be a prerequisite or high priority for admittance.

poses risks to equity, especially in the context of school choice. More popular schools may benefit from attracting better teachers and have higher quality teaching than less popular schools. Selection into such schools will reinforce peer group effects on learning. Vocational schools may be less well resourced than academic schools leading to poor quality education for lower ability groups. The best teachers may avoid teaching in deprived schools. Initial gaps in performance may widen, increasing inequality in educational outcomes. Since initial differences in performance are associated with socio-economic background, this may widen social inequality. All this could create widening gaps in educational outcomes in selective systems.

A closely related debate is the discussion of 'tracking' which, as noted above, refers to selection within or between schools though streaming higher ability and lower ability students into different schools, or different classes within schools. Tracking takes place at different stages in different school systems. In Hungary it takes place at age twelve, while in Finland, Norway and Sweden it takes place at upper secondary level. Many OECD countries have introduced comprehensive education up to about the age fifteen, and do not allow tracking before then. Countries in Central and Eastern Europe tend to have retained the distinction between vocational and academic schools. Differences in structure have implications for equity of outcomes. For example, the proportion of women in tertiary education in Europe is higher in late tracking than in early tracking countries (Pekkarinen 2005).

There are several arguments in favour of selection into vocational and academic schools or tracks. Tracking, whether between or within schools, may help students by better adapting the learning environment to their needs. It may lead to a more focused curriculum that improves learning. It may improve achievement if students perform better in groups of similar ability. There are also arguments against tracking. In comprehensive systems, students in grouped classrooms may benefit from being taught alongside students with higher ability.

In a recent study, Dustmann (2004) shows that intergenerational mobility in Germany is restricted by choice of education track, since poor parents are more likely to direct their children to academic or vocational education schools<sup>2</sup>.

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2 Dustmann (2004) refers to different types of schools in Germany as educational 'tracks'. The standard use of this phrase has been for streams within schools rather than to describe selection into different types of schools. In Germany the three different types of secondary schools are *Hauptschule* (general school) *Realschule* (intermediate school) and *Gymnasium* (grammar school). The use of the term tracking to describe pathways through different types of schools as well as streams within schools is becoming more common (see OECD 2007: 65-7).

The probability of high school attendance is below 20% for male working class children, but above 70% for those with an academic family background. Therefore, despite formal choice of secondary educational track, in practice educational mobility is largely determined by parental background. This leads to intergenerational immobility in educational achievement, which in turn leads to immobility in subsequent wages, which are in this way significantly related to parental background.

Pekkarinen (2005) investigates the impact of a reform to the age of tracking pupils into vocational and academic streams from age ten to age sixteen in Finland in 1972-1977 on educational achievement and earnings in employment. The reform was associated with a decrease in male earnings. This is explained by the argument that girls have a developmental advantage over boys from the age of ten and a half onwards, due to the earlier onset of puberty. Being more mature they benefit more than boys from later tracking, by more often choosing academic tracks. This may explain the improved educational outcomes of girls following the Finnish reforms. Boys whose father had no academic education were negatively affected: their probability of choosing the academic track decreased by three percentage points and led to a negative effect on income of the same magnitude.

Hanushek and Wößmann (2006) examine the relationship between school tracking and student performance. They use a difference-in-difference approach to compare the level and distribution of younger students' reading results before tracking, with those of older students across countries both with and without tracking. This effectively uses the early outcomes in each country as a control variable. They show that relative inequality increases along with tracking in every country with tracking except Slovakia, while relative inequality decreases in every country without tracking except for Sweden and Latvia. The top four countries in which there is an increase in inequality between primary and secondary school are all early trackers. The bottom six countries with the largest decrease in inequality are all late trackers. The results across the other seven pairs of international achievement tests are generally consistent with the results for reading, but are not as strong or as statistically significant. Hanushek and Wößmann conclude that comprehensive schooling reduces inequality in achievement, while early tracking increases it. They find little evidence that there is any efficiency gain in tracked systems which would compensate for the increased inequality of educational outcomes which those systems seem to generate.

A contrary view is presented by Vandenberg (2006) who studies whether ability grouping, in particular segregation into vocational and academic tracks, leads to

lower average scores in international tests, or to a wider dispersion of scores, across countries. He argues that comparisons of inequality in scores across countries can be misleading if not corrected for differences in the level and distribution of resources. Instead he focuses on the residual from an equation predicting scores as a function of the gap between the actual and the international average socio-economic profile. This residual should provide a better representation of the actual performance of a country in terms of inequality of achievement. Using data from the PISA 2000 survey of maths, science and reading scores of students aged 15, across 32 countries, he shows that ability grouping has no impact on effectiveness in terms of country mean scores. Inequality (dispersion of scores) is not affected in a consistent way. In the case of maths, higher inter-school segregation leads to greater inequality, whereas tracking (academic versus vocational) and grade repetition do not. The conclusion is that ability grouping is not an important cause of poor educational performance.

According to the OECD (2007), evidence from the PISA studies shows that there is no statistically significant correlation between academic selection and either country average results, or spread of results. While earlier studies had shown that countries with tracking performed less well on average than countries with more comprehensive systems, the analysis showed that there was no relationship between tracking and level or spread of performance (in maths). Countries with more selection showed higher achievement in mathematics and science scores. The evidence however shows a strong effect of social background on individual performance in selective systems, which are associated with more social separation between schools. Systems with a high level of school separation have worse results in maths. The OECD (2007) concludes that the social composition of a school is strongly associated with school outcomes.

The effect of social background seems to be stronger in countries with an earlier age of selection and a larger number of separate tracks. Bauer and Riphahn (2005) find evidence from Switzerland that early tracking reinforces the relative advantage of children of highly educated parents. Meghir and Palme (2005) show that the Swedish 1950s reform, which replaced tracking at age twelve with a comprehensive system, increased both attainment and equity by generating improvements for students with unskilled fathers.

The OECD's favoured policy responses to these findings on the negative equity effects of tracking are based on pro-market mechanisms such as lotteries for school places in excess demand, or changes to school funding formulae by including weighting by an index of social deprivation, rather than abolishing tracking



altogether. The European Commission adopts a more direct interventionist approach, arguing that tracking should be postponed to upper secondary level (OECD 2007). The OECD concludes that "...in summary, the evidence points to the fact that early academic selection poses risks to equity, especially in the context of school choice. School popularity may reflect quality teaching or strong peer group support for learning or both. The combined effect will be to accelerate the learning of the stronger performers and could create a gap in overall outcomes" (OECD 2007: 60).

Brunello and Checchi (2007) confirm the view that school tracking reinforces the impact of family background on educational attainment and labour market outcomes, but contradict other studies concerning the impact on literacy and on-the-job training. They point out that tracking has two counter-acting effects. First, it has a detrimental impact on educational attainment because it prevents less advantaged individuals from progressing to tertiary education. This is the 'diversion effect'. Second, tracking into vocational education is more effective in promoting further training and adult competences. This is the 'specialisation effect' which counteracts the impact of parental background. Therefore, while policies that favour comprehensive education may succeed in improving educational attainment and reducing intergenerational inequality, they may also inadvertently worsen labour market prospects and increase social exclusion for people from disadvantaged backgrounds that would otherwise have benefited from a more focused vocational education. Despite extensive empirical investigation of these issues they are unable to come to a firm conclusion concerning the net impact of diversion and specialisation effects. This raises the question of what, exactly, *is* the impact of vocational education on the transition from school to work and labour market outcomes.

### **3. The transition from school to work**

Ryan (2001) reviews studies which compare the two traditional dichotomies between (a) vocational and general education and (b) within the vocational category between apprenticeship and full time schooling. In relation to the first comparison, he concludes that while there is some evidence that vocational courses lead to improved labour market outcomes compared to general education courses for school leavers, especially in improving employability, these advantages are far less in comparison with the gain from tertiary education, which is mainly accessed from general secondary education. He concludes that routes of progression from vocational to tertiary education should be strengthened, and vocational education

broadened. In relation to the second comparison, he concludes that apprenticeship does not have great advantages over full-time vocational education, and may even lead to lower pay. However, it is clearly superior to the alternative of direct entry into the labour market, and appears to improve employment chances of young people also in relation to full-time vocational education.

Bishop and Mane (2004) argue that giving students the option of choosing school-based vocational education will increase participation rates in education, and improve staying-on rates into college education. It will improve success in the labour market, increase probability of finding a job in the occupation of choice, and increase earnings.

In Hungary individuals who attend vocational school are less likely to be unemployed, while those who attended a Gymnasium school have less chance of getting a job than those who attended a vocational school, and this difference persists over time (Audas et al. 2005). Initial labour market decisions are of crucial importance. Those who make good initial career choices tend to thrive, while those that experience unemployment do not, controlling for other determinants of career success. Academic achievement has an enduring effect on subsequent labour market success. In Greece, Paleocrassas et al. (2003) show that there is poor matching of vocational skills to subsequent employment. It varies across sectors from 10% to 30%.

### **3.1. Gender bias**

In Australia, girls and boys participate equally in school vocational education programmes (Anlezark et al. 2006). However, girls tend not to continue with vocational subjects after leaving school. School-based vocational education programmes do not align well with vocational programmes delivered outside school, and only seem to provide effective pathways into further vocational education for boys studying engineering and building courses. Students who take a vocational education course in Year 11 have a smoother transition to work than those who leave school early, although the gain diminishes over time (Anlezark et al. 2006). There is no observable gain to those students who carry on with vocational education programmes in Year 12. The study concludes that school-based vocational education should focus more on delivering broader vocational skills in which they have a comparative advantage, leaving more specialised vocational training to be delivered outside school in a work-place setting.

In Greece, Paleocrassas et al. (2003) study the impact of vocational courses on outcomes in terms of gender equity. Women had lower employment rates than men irrespective of whether they find employment in occupations that are matched to their vocational courses. However, among the relatively few who find employment in matched occupations, the gender gap diminishes dramatically. Among graduates of vocational schools, male employment rates nine years after graduation reached over 90%, compared to just fewer than 60% for females. Considering those who found matched occupations however, the respective rates were just under 20% for males compared to over 10% for females. In some 'female' and 'neutral' sectors, employment rates for women were the same or higher than for men in the matched sectors. For pre-vocational (i.e. comprehensive school) secondary education graduates, the employment rates of men and women were similar in matched occupations. Women had similar employment rates in all the matched occupation sectors, with higher rates in 'neutral' sectors. Comparisons are also made in terms of earnings, but only in terms of average wages by sector. However, there is no statistical control for selection bias and so the results, although suggestive of gender gaps among vocational school graduates, are not reliable.

### **3.2. Minorities**

In the USA there are many racial differences in enrolment in vocational courses with white students clustered in trades, black and Hispanic students in business courses and Asians in technical courses (van de Muelen Rodgers and Boyer 2006). International evidence on racial, ethnic and class differences in vocational education is limited but shows an uneven distribution across these groups. Drawing on US experience and data, Ainsworth and Roscigno (2005) argue that poor and racial minority students are more likely to participate in vocational education, and that female students may be steered towards less skilled courses. Following that, participation in vocational courses increases the likelihood of dropping out of high school, and decreases the likelihood of proceeding to tertiary education. While vocational education may increase the chances of entering employment, poor, minority, and female students may not benefit from this protection.

Ainsworth and Roscigno demonstrate a high level of correspondence between vocational courses and the types of jobs attained. They confirm earlier findings that participation in vocational education reduces the risk of persistent unemployment. However, racial minorities and females are more likely to be persistently unemployed than whites and males respectively with more than 40 per cent of the gender effect due to having taken a vocational course.

Surprisingly, students from higher socioeconomic status families receive a greater benefit from participation in agricultural and low-wage service-sector vocational education, and are more likely to be protected from bouts of persistent unemployment than lower socioeconomic status students who participate in the same vocational courses. Black males and Hispanic males benefit less in terms of reduced unemployment from vocational courses than do white males. Black females are much more likely than others to be persistently unemployed after taking a vocational course. Hispanic and Asian females are more likely to be disadvantaged after taking a service-sector vocational course. White females are twice as likely to as white males to be persistently unemployed following a course in agricultural vocational education. Overall, while the results demonstrate some benefits associated with students' involvement in vocational education due to the diminished likelihood of persistent unemployment, the findings also suggest that such involvement reproduces class, sex and racial inequalities.

### **3.3. Apprenticeship**

In a comprehensive review of country-specific survey evidence, Ryan (1998) shows that apprenticeship compares favourably with full-time vocational education in respect to pay, especially for men, but only weakly with respect to employment. Comparisons to youth training and labour market programmes are far more favourable and significant. Ryan notes however, that many studies are unreliable as they often fail to take into account selection bias. International comparative studies show improved employment prospects for apprentices against the alternative vocational pathways, subject to various caveats. However, recently the German dual system has experienced difficulties due to reduced demand for apprentices. This has been explained by a shift in teaching towards more general skills which cannot be captured by the firm. In response to this trend, Wößmann (2004) recommends that a greater share of the training costs should be borne by the student.

In France, apprentices have a better chance of finding a job on first entry to the labour market than do full time vocational school leavers, even after controlling for selection bias (Bonnal et al. 2002). Many apprentices find employment in the firm where they carried out their apprenticeship, which is presumably a main source of their advantage. However, those apprentices who do not succeed in finding a job immediately fare worse than vocational school leavers. Job mobility gives some young people a further advantage. Male apprentices who leave their first employers ("movers") do better than school leavers, indicating that the advantage of apprenticeship is not simply a consequence of a higher level of firm-

specific human capital. Movers appear to have better general human capital as well. However, the effect is reversed for women, suggesting that female apprentices are selected into occupations with a higher component of firm-specific human capital. Overall, young women do worse than young men in finding a job, whatever the type of education.

Büchel (2002) investigates the employment prospects of newly qualified apprentices in West Germany, using a survey of individuals who completed an apprenticeship between 1948 and 1992. He finds that since 1975 a low level of schooling has become a serious risk factor for young people in their transition to work, and the apprenticeship system has not been able to compensate for poor prior school qualifications. Newly qualified apprentices with low levels of schooling have been crowded out of jobs by more highly qualified school leavers, an effect that has been more widespread in more 'challenging' occupational sectors. Serving an apprenticeship in a small firm with less than 10 employees has a detrimental effect on job mobility and job prospects, as does training outside the set of authorised training companies.

#### **4. Career and occupational mobility**

Economic theory predicts that much apprenticeship training is highly firm-specific, since firms fear that trainees who receive general training will leave and go to work for a competitor who has not borne the costs of training programmes. The focus on firm-specific training is likely to reduce post-training mobility between firms (see Korpi and Mertens 2003). Inter-firm immobility reduces career options for individuals, and may reduce potential individual returns to training, although mobility can also be excessive, with unthinking 'job-shopping' leading to a depletion of initial skills over time. School-based vocational training can also be narrowly focused on a particular occupation, leading to low levels of inter-industry or occupational mobility. Some studies have addressed the determinants of individual job or career mobility within an industrial or occupational sector, with a focus on the individual returns to vocational education. Other studies have investigated the issues of occupational mobility which have wider macroeconomic consequences. In transition economies which are going through a process of economic restructuring, the demand for new skills and competencies within the labour force will increase. In this context, the ability of workers to cross over into new occupational sectors will support economic growth, while their inability to do so, due to narrow industry or occupation specific training, will be likely to hinder labour market restructuring and impose a barrier to economic

growth. Counter-arguments identify circumstances in which firms may provide general training, in addition to specific training. These circumstances include the presence of imperfect labour markets, complementarities between general and specific training, imperfect information leading to adverse selection (when competitors do not know the abilities of trainees) and so fear that trainees who have received general training will leave the firm is reduced. Women tend to miss opportunities for vocational training in early career, and women returners often take jobs for which they are over-qualified. Also, women access less in-work training than men.

Franz and Zimmermann (2002) investigate the determinants of job mobility of young apprentices in West Germany. They find that the probability that former trainees will leave the training company directly after completion of an apprenticeship increases with the age of the trainee, and with company size. Young women have a higher probability than men of leaving their training company directly after completing training, although if they stay with the firm the difference diminishes. Higher levels of initial education increase the probability of exit on completion of training. Craft firms over-employ apprentices in order to be able to choose the best, and so apprentices in those firms have a higher quit rate than elsewhere. Staying-on rates increase with the unemployment rate, reflecting the influence of labour market conditions.

Individual country studies are often open to the charge that the methodology is flawed due to the lack of a counter-factual. In order to overcome this problem, Korpi and Mertens (2003) study mobility among German apprentices and Swedish vocational students. After controlling for personal, firm, and business cycle factors, the differences in inter-firm and inter-industry mobility between the countries disappear. They conclude that apprenticeship does not confer exclusively firm-specific skills but also provides usable transferable skills. Consequently, it does not eliminate job-shopping, nor does it simplify labour market entrance. These findings are supported by Euwals and Winkelmann (2004) who analyse German data on job mobility after first apprenticeship job. They find no evidence of systematic wage differentials between movers and stayers when training intensity and firm size are controlled for. Stayers and movers also have similar job durations. They conclude that knowledge obtained during apprenticeship is transferable between firms. However, the Korpi and Mertens study also finds that German apprentices are more likely than Swedish workers to stay within their training occupation, while workers with vocational training are less mobile than those with general secondary education, suggesting that the German labour market is more structured around training occupations than the Swedish labour

market. In contrast to the cases of inter-firm and industry mobility, they find that occupational mobility is lower among German apprentices than among Swedish vocational school leavers, indicating that the skills obtained are less general than those gained through vocational school. Korpi and Mertens conclude that since there are no country differences in inter-firm or inter-industry mobility, both systems are conducive to industrial relocation. However the evidence also suggests that apprenticeship systems may hold back economic restructuring on a larger scale.

While the above studies make overall comparisons between the experiences of apprentices and graduates of school-based vocational education programmes, other studies have looked within these broad categories to ask what differences can be observed in relation to different social groups. Fitzenberger and Kunze (2005) argue that apprenticeship training schemes lock women into low-wage careers, while men are selected by firms which offer better training opportunities and higher wage growth. This leads to occupational segregation, and a gender wage gap which widens with the length of job tenure. Furthermore, lower job mobility among women causes a lock-in effect resulting in a persistent gender wage gap. They divide the data from the German Federal Bureau of Labour database of 60,000 workers with apprenticeship training into three cohorts from 1975 to 2001. The analysis shows that skilled men and women are trained and work in quite different occupations. More than 50 per cent of both men and women are employed in the four most popular training occupations<sup>3</sup>. Moreover, the gender gap in occupational mobility increases over time, suggesting that women are locked into their training occupations, and have lower occupational mobility. There is a large gender wage gap at entry which persists throughout early career, but this declined over time from about 25% at entry in the early cohort, to 17% in the last, third, cohort. Men's wages from occupational mobility are higher than women's, an effect which widens the gender wage gap by up to 11 percentage points after 7-9 years. The same applies for the second cohort. However, for the last cohort the gender gap is reversed for low experience, with wage gains higher for females than for males. Thus, the wage gains associated with mobility changed considerably across the three cohorts, and this may have contributed to the reduction in gender wage gap in the last period, especially in the lower part of the distribution. Women at the lower end of the wage distribution are less mobile,

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<sup>3</sup> These are, for men, mechanical assemblers; technical occupations in electronics; occupations related to construction and woodworking; and sales occupations. For women, the most popular are sales occupations; business, finance, and administrative occupations; occupations in the health sector; and other service occupations. Occupational mobility is lower for women than for men.



and gain less from mobility compared to men. Hence, lock-in effects are seen to work even more strongly at the bottom of the distribution.

Fahr and Sunde (2007) investigate occupational mobility and transferable skills among workers who received apprenticeship training in Germany. The analysis shows that among occupational 'stayers' there are no gender differences in the use of original apprenticeship skills, while frequent job change between different employers within the same occupation reduces the use of original apprenticeship skills. Women stayers are also significantly less likely than men to obtain further formal training, while individuals with high school qualifications are more likely to participate in further formal training. Among 'movers', women use their apprenticeship skills less often than men, probably because they have fewer voluntary career changes, often returning to work after a career break. They also have significantly less formal further training. Taking stayers and movers together, occupational mobility reduces the use of initial apprenticeship skills due to their obsolescence, a process which affects men and women equally. Taking stayers and movers together, occupational mobility is associated with an increase in further formal training as workers try to recover skills lost due to moving away from the initial training occupation. However, there is a negative interaction with gender, so that women are less likely to engage in catch-up training of this sort. Thus, mobility is not necessarily a channel for women to improve their relative position, compared to men.

#### **4.1. Returns to vocational education**

Returns to vocational education have a bearing on the issue of equity, because of selection: lower social-economic status individuals are often selected into vocational tracks or schools. Therefore, whether returns to vocational education exceed or fall short of returns to general education will determine the subsequent evolution of earnings between different socio-economic groups. The returns to education also have a bearing on the question of mobility, since more mobile workers can achieve higher returns by seeking better paying jobs. In the USA, about a third of early career wage growth among young male workers can be explained by job mobility (Fitzenberger and Kunze (2005)).

The findings of studies comparing returns to vocational and general education in the USA and Europe differ substantially. For the USA most studies, especially those covering the 1970s and the 1980s, show higher returns to vocational education than to general education courses. More recently, returns to vocational education seem to have fallen behind those to general education (Meer 2007).



However, even in this case, the education system seems to have been efficient in sorting students into courses to which they are most suited, and have the greatest aptitude. Changing courses would not have increased students earnings, given their abilities and characteristics. The only exception is for students on the business track who could have earned 10% more had they been on the academic track. However, vocational education does not appear to have yielded such benefits to students in Europe. In the UK, studies have shown that at best, controlling for characteristics, returns to vocational qualifications were not lower than returns to academic qualifications. In the Netherlands, extending vocational education by one year did not yield any net benefits over one year of work experience (Osterbeek and Webbink 2007). Brunello and Checchi (2007) find that vocational education yields ‘reasonable returns’ only in countries with well-developed systems of vocational education.

Mane (1999) compares returns to academic and vocational course work for “non college bound” students in the USA who graduated in 1972, 1980, and 1992. Short and medium term payoffs to vocational courses rose substantially between 1972 and 1980 and remained high in 1992. Academic course work had a smaller labour market payoff than vocational course work for non college-bound students. Bishop and Mane (2004) study high school graduates from 1992/3 and find that those who trained for specific occupations were more successful in the labour market. They spent more time in employment, found better jobs, and earned significantly more than students who did not take advanced vocational education courses. Benefit-cost ratios and internal rates of return to vocational education courses were high, and internal rates of return exceeded 18% for all combinations of vocational courses. Taking a vocational education course at high school, and not going on to college, gives higher internal returns due to the time cost of college attendance. However, students do not lose if they obtain post-secondary vocational education, especially if they spend some time earning before going to college. School-based occupational training is beneficial because schools have competitive advantages in the training market once skills become standardized. They offer students flexibility and choice of courses; the hourly costs of training are lower due to economies of scale; teaching staff are specialized; certification of skills makes them more portable; schools and students have access to public subsidies not available when training takes place within firms; and individuals have more choice of training occupation. Meer (2007) investigates the impact of different tracks of secondary education on students’ subsequent earnings in the USA. He asks what earnings would have been, had students followed difference tracks to the ones actually followed. Meer demonstrates that students who took the vocational track in 1992 earned substantially less in 2000 than those who

took the academic track. Those who took the technical track earn 11.4% less than those on the academic track, and those on the business track 15.8% less. However, calculation of counterfactuals shows evidence of comparative advantage of the chosen tracks. This means that for example those who chose the technical track could not have done better by choosing a different track. However, the business track proves to be an exception since those on this track could have earned 10% more had they been on the academic track. Specific education in white collar skills does not seem to lead to enhanced income. Further, those on the general track would have enhanced their income by 9.5% had they chosen the technical track. A further finding is that men benefit more from the technical track than do women, and whites benefit more than blacks. The authors conclude that technical education is best serving those who are already committed to it, while those on the business track would be better served by focusing on more general skills.

Dearden et al. (2002) compare returns to vocational and academic education in the UK in the 1980s and 1990s. The study explains wage rates as a function of all qualifications obtained at school or in training. If no account is taken of the time invested to acquire each qualification, the wage premium for academic qualifications is higher than for vocational qualifications at the same level. However, taking account of the length of time to obtain qualifications, the returns per year of study for vocational qualifications are close to those for academic qualifications. This suggests that the education system is broadly efficient, as there are few excess premia for taking particular courses. There are no gender differences in the returns per year of study for particular NVQ levels. Men and women earn their highest premia from different types of vocational qualifications, e.g. women earn high premia from teaching and nursing qualifications. The value of vocational qualifications is approximately twice as high for individuals of low ability. Hence, the vocational route is of critical importance for the less able student. Returns also depend on routes through the education system. In using two different data sets, the authors show that errors due to ability, and measurement error, offset each other, and so estimates that only control for employer characteristics, region and gender (such as LFS) offer reasonable estimates of the true returns. In the UK, returns to education for almost all qualifications remained unchanged between 1996 and 2002, suggesting that the demand for skills increased at least as fast as the supply, and that returns to vocational qualifications remain fairly constant throughout working life (McIntosh 2006). Among lower achievers, individuals who do not achieve any school qualifications benefit from a wide range of post-school qualifications, in particular with high returns to NVQ level 2 and 3. However, NVQ 1 and 2 provide no benefit at whatever stage they are acquired.

Machin and Vignoles (2005) have suggested that the proliferation of qualifications reduced the value of vocational education as a signal to employers.

#### **4.2. Minorities**

Neuman and Ziderman (2003) examine the impact of vocational education on the wage levels of four minority groups in Israel: recent immigrants, Sephardic Jews, Israeli Arabs, and women. Their argument is that vocational education benefits most those who find a job in a matched occupation. Vocational education is often seen as a way to improve the employability of disadvantaged groups and augment their wages. But vocational skills of migrants may not be readily transferable, while other groups, such as Arabs and women, may suffer discrimination, reducing the benefits of vocational education. Regression results showed no wage premia for workers who had taken vocational courses compared to those taking academic courses. However, workers who had taken a vocational course and were employed in a matched occupation received a wage premium of 7.9%. This premium was not found for immigrants, who gained no advantage from matching. The conclusion is that vocational qualifications do not easily transfer across borders. Sephardic students have lower educational attainment than Westerners, but benefit more from vocational education. When employed in a matched occupation, they gained a 10% wage premium over non-matched workers. Arab students are generally taught in single track academic schools, and have less access to vocational education. They do not benefit from the potential advantages of vocational education. In addition they have lesser chance of entering tertiary education. Consequently their upward mobility in Israeli society is blocked. Women are less represented in vocational schools than men. Most study secretarial courses, bookkeeping, sewing, and fashion and so are steered into relatively low-wage jobs. The average hourly wage rate is 30% higher for men than for women, which cannot be explained by differences in education, years of experience, or ethnic origin. Women do not receive any wage premium for working in matched occupations. Indeed, women in matched clerical and business occupations receive a wage disadvantage of 7%. The conclusion is that women are excluded from the potential wage advantages of vocational education, and should receive improved career guidance encouraging them to take more rewarding vocational courses.

Brekke (2007) studies the impact of ethnic minority status on earnings and employment following vocational education in Norway. Ethnic minorities with vocational education have lower earnings immediately after graduation. However the ethnic earnings gap declines over time. The ethnic differences in earnings are

small for individuals in full-time employment. The first generation minorities have a lower level of employment than the majority, but this difference disappears in the second generation. However, first generation minorities have fewer earning and employment disadvantages when educated in fields such as hotel and food-processing trades.

#### **4.3. The case of a developing transition country: Egypt**

El-Hamidi (2006) explains individuals' decisions to choose general secondary versus vocational secondary education in Egypt, and estimates returns to different levels of education. Mincer's earnings function explains earnings as a function of years of schooling and work experience. The author follows the argument that the relation between earnings and years of education input is non-linear. If a diploma serves as a signal of productivity, then the years in which a diploma is earned count for more than other years. This is known as the 'sheepskin effect'. Empirical analysis is based on the Egyptian Labour Market Survey 1998. The sample is restricted to 4,843 urban private sector workers. The results show a strong influence of parental education status on the choice of school courses. For example, the higher a father's education, the less likely his son chooses vocational education. In the second stage model, the coefficients on the education dummies all have the expected positive sign, and are significant at the 1% level. For men, the returns to vocational education are estimated to be 29% higher than the returns to general secondary education. The returns to higher education are 11% greater than to vocational education. For women, the returns to vocational education are similar to the returns to general education or even slightly lower, while the returns to higher education are only 4% above those to vocational education.

#### **4.4. The effects of an additional year of vocational education**

Several studies conducted in Scandinavian countries have investigated the effects of extending the period of vocational education. These studies have taken advantage of the gradual nature of educational reforms in these countries, which produce natural experiments in which students who attended two-year and three-year courses have been taught contemporaneously in different schools in the same country. Murray and Skarlind (2005) compare how young adults with and without vocational education have fared in the Swedish labour market after leaving school. Based on a pilot scheme which extended school-based vocational training from two to three years in Sweden in the mid-1990s, they investigated the impact of the extra year of vocational education on the employment rate and the earnings of the two groups. The coverage was young adults born in 1974 who

left school in 1990 at age 16, and whose labour market experience was observed from 1994 to 1998. Differences between employment outcomes from two and three year courses depended on grades achieved. When grades were high, three-year course graduates had an improved employment outcome. However, for those with poor grades, graduates from the three-year course had a lower employment rate than graduates from the two-year course. Similar results hold for earnings outcomes. Thus while there is a clear advantage to having completed a vocational upper-secondary education, compared to lacking an upper-secondary education altogether, a three-year education produces only a moderate advantage over a two-year education. Osterbeek and Webbink (2007) evaluate the long-term wage effects of an extra year of vocational education in the Netherlands. Data are drawn from the 1995 Wage Structure Survey containing administrative data on wages, gender, age, and job characteristics. The results show only small, and sometimes negative, effects of the extended programme. The target group of the reform gain equally from an extra year in vocational school as from an extra year of work experience. The reason for the small impact of the increased year of vocational education is that the contents of the extra year were mainly general. The findings suggest that individuals attending basic vocational programmes do not benefit in terms of increased earnings from additional general education. This contrasts with the supposition of many policy initiatives that aim to provide young people in vocational education with a minimum level of general skills.

## **5. Retraining for drop-outs**

In many countries, a high proportion of pupils drop out of lower secondary education. For example in Turkey in 2001, 47% of 20-24 year olds had not completed lower secondary education (OECD 2007). The reason for drop-out may be that students find the academic school work unappealing. For these students, providing vocational education may be a solution. The OECD (2007) shows that there is an inverse relation between drop-out rates and the percentage of students in vocational education. It argues that better guidance and counselling is needed to make sure that pupils follow the most appropriate route. In some countries, vocational education students are prone to dropping out compared to pupils on more academic tracks. Better links with employers are also important. Good quality apprenticeship training may reduce early school leaving and assist integration into the labour force. Other important remedies to correct for early drop out include providing second chance opportunities such as adult learning institutions, and recognition of prior learning.

Bishop and Mane (2004) show that rates of return to vocational education in the USA were higher than for government training programmes targeting high school drop-outs. Second chance programmes had smaller medium-term earnings impacts than high school vocational education; they had higher costs, and correspondingly lower rates of return. They conclude that it is better to prevent students from dropping out, and to encourage them to take part in vocational education at their school or local technical college.

In another study carried out in the USA, Hebbar (2006) examines the impact of vocational training on high school dropouts and unemployed women enrolled in engineering and computer programming courses. The data are drawn from New Jersey's Individual Training Grant programme. The study compares re-employment and wage recovery rates with a matched comparison group. A difference-in-difference approach is applied to the wage equation, while a linear probability model is used to establish employment effects. Women enrolled in the male-dominated fields of engineering and computer programming experience re-employment rates lower or similar to those in the comparison group, but experience higher wage-recovery rates. Hispanic high-school dropouts experience both higher re-employment and wage recovery rates compared to their comparison group. White and black high school dropouts experience no re-employment or wage recovery advantage. Overall, participants in the programme experience a higher re-employment rate but no wage recovery advantage.

## **6. Transition and structural change**

In the post-socialist transition countries, a high share of the labour force had secondary education or above. Many of those with secondary education qualifications had been taught in lower vocational schools, which offered only one or two years of compulsory schooling (Boeri 2000). The training was carried out in cooperation with local enterprises, and mainly firm specific skills were taught. Upper vocational schools offered five-year courses, but these did not open up pathways to tertiary education. The vocational skills that were taught did not enable workers to easily move from one occupation to another. In East European transition countries, workers with vocational training accounted for more than one-third of the unemployed in the mid-1990s. The probability of job loss was up to 10% higher for workers with vocational training than for those with general secondary qualifications. Job-finding rates for workers with vocational education were 15% lower than for jobless people with general secondary education. Workers

with general secondary education earned about one quarter more than those with vocational education, compared to a 10% wage premium before transition.

The inadequacies of the vocational education system in these countries persist to the present day. Even in one of the most advanced Western Balkan countries, Croatia, vocational education subject-specific specialization takes place too early, while the curriculum is too narrowly focused on subject specific skills, competencies, and attitudes (Bejaković 2004: 120). These specific specialisations are becoming increasingly obsolete. Many vocational students drop out of education. Structural change associated with transition in these countries has had an enormous impact on the demand for skills. Transition has involved a bias against unskilled workers who have suffered a disproportionate loss of employment, while new job creation has been biased against workers with low educational attainment and skills (Commander and Kollo 2004). In the Western Balkans, workers with vocational education suffer disproportionately from unemployment, indicating that secondary vocational education has provided skills that were specific to now-outdated technologies and working practices (Bartlett 2007).

Roberts et al. (2000) report a rather different picture for some of the countries from the former Soviet Union. They carried out a qualitative research analysis of education systems under transition in Ukraine, Georgia and Armenia where vocational education under communism was based on close ties between education institutions and industry. With the collapse of industry old relationships broke down. By the mid-1990s students who only had secondary general education experienced high unemployment. However, those with vocational education experienced more favourable labour market outcomes. Despite that, many vocational schools had closed down or been converted to general secondary schools.

In a more recent study, Walker (2007) presents a less sanguine view of the benefits of vocational education in post-Soviet Russia. He carried out qualitative research into the transition to work of young people graduating from vocational training courses in the Ul'ianovsk region in 2004. The Soviet education system had emphasised vocational education, and a close functional fit between education and subsequent employment. The collapse of the planned economy caused a crisis in the vocational education system as courses became obsolete and relevant employment opportunities decayed. Skills mismatch developed on the labour market. VET colleges have been reluctant to change their course curricula or move towards courses more suited to service industries, which have in any



case been slower to develop in Russia than in Eastern Europe. Despite reforms, the VET system continues to foster a Soviet era school-to-factory transition, which Walker characterises as a 'zombie' system. In response to poor quality employment prospects in the factories, young people graduating from the VET sector pursue long periods of combined work and part-time study in an attempt to improve their prospects in the labour market. The transition to work has become individualised, as the formal apprenticeship system has declined. However, this process has not resulted in improved social mobility.

## **7. Policy Conclusions**

Vocational education enrolment rates vary in transition countries in the Western Balkans and the EU neighbourhood from a low of 3% to a high of 62%. Gender parity tends to increase with higher enrolment rates, but also varies independently from a low of 0.4 to highs close to equality. All those countries are undergoing a more or less rapid process of structural change. While skills are needed for development, the education system is in many cases producing graduates with obsolete skills, or skills that are not readily transferable from one sector to another. This inflexibility in labour skills, and the associated lack of adaptability, may hold back growth even in countries with high levels of vocational enrolment. Skill-biased technological change is giving rise to a demand for ever more highly educated workers. Rates of return to education are increasing in transition countries, yet in the absence of effective vocational education systems many young people will be excluded from the benefits of growth.

Such problems are not unique to the countries of the Western Balkans and the EU neighbourhood countries. The USA and the EU, as well as other OECD countries, have all at various times experienced the dislocation associated with economic restructuring. Not surprisingly, there is a substantial literature on the impact of vocational education on equity and occupational mobility which addresses the challenges of such structural change. Naturally, most of the literature is focused on those more advanced countries. What lessons can be drawn from it? In this paper, I have identified three key issues corresponding to different stages of the pathways between education and the labour market. The *first* has been the impact of choices concerning academic versus vocational secondary education on education outcomes. The *second* has been the impact of vocational education and apprenticeship on initial labour market outcomes. The *third* has been to do with the longer run impact on the performance of the labour market, in terms of occupational mobility and returns to education.



The literature identifies a strong relationship between early selection into academic or vocational pathways, and social differentiation within the education system. Selection and social differentiation seem to reinforce each other, and may lead to widening gaps in educational outcomes in selective systems. Selection between schools, or 'tracking' within them, is nevertheless promoted in some quarters for the benefit it provides to students through interacting with others of equal ability, and through the supposed benefits of specialisation. On the other hand, it prevents wider peer effects and may block pathways for many to tertiary education. What is the empirical evidence to support these arguments? Research findings differ. Evidence from Finland suggests that abolishing early tracking, as has been done in many cases of education reform, has disadvantaged boys and favoured girls who mature earlier. In Germany early tracking seems to reinforce social differences. Cross-country analysis of measured achievement from school attainment tests shows increased inequality in educational outcomes due to early tracking and/or selection. On the other hand, more recent findings show no correlation between selection and the average level or spread of school attainment. Early selection, combined with school choice may pose risks to equity, but postponing selection in favour of comprehensive education may inadvertently worsen labour market outcomes for disadvantaged young people who would otherwise benefit from effective vocational education. In the absence of strong conclusions from studies of education outcomes, what does research tell us about the impact of vocational education on the transition from school to work, and hence on labour market outcomes?

Two debates are relevant. Firstly studies compare vocational and general education, and secondly within the vocational track, they compare school-based vocational education and apprenticeship. In a wide ranging review, Ryan (2001) concludes that school-based vocational education has significant advantages over apprenticeship. In the USA, several studies have shown convincingly that school-based vocational education confers advantages on participants. Similar positive assessments have been made from as far afield as Australia and Hungary. Positive evaluations of school-based vocational education have also been made in Israel, but with the caveat that specific social groups including immigrants and minorities might not benefit as much as others, while women may be steered into low-paying occupations from which it is difficult to exit. In France, apprenticeship has received a more positive assessment. However, recent studies of the German dual system have begun to reassess earlier positive findings on apprenticeship. These studies found that in the 1990s increased competition on the labour market from graduates from more academic programmes began to crowd out apprenticeships from increasingly scarce employment opportunities.

Following initial entry into the labour market, whether from school-based vocational courses or from apprenticeships, the subsequent labour market choices seem to be of special importance in globalised economies which are undergoing rapid structural change. Do vocationally educated students have the transferable skills needed to negotiate a rapidly changing job market? Specifically, the concern is that apprenticeship may impart too many firm-specific skills. In Germany it seems that there are few differences in career mobility between apprentices and graduates of school-based vocational programmes, although among apprentices older workers and women workers are likely to be more mobile. The apprenticeship system does not appear to reduce mobility between firms in the same industry, or between firms in different industries within the same occupation. However, broader occupational mobility does seem to be reduced by apprenticeship systems, which may be less suitable than school-based vocational education for economies undergoing deep structural change. Moreover, there is some evidence that the apprenticeship system in Germany has locked women into low paying jobs, although this gender wage gap has diminished over time, and the position of women apprentices has improved in recent years. At the same time, too frequent job changes can lead to depreciation of initial vocational skills. While workers can rectify this by further formal vocational training, it seems that women have been less able to do so, and so can actually be disadvantaged by too much mobility.

Turning to the issue of the returns to vocational education which may incentivise mobility, there appear to be significant differences in conclusions from studies carried out in the USA and the UK. Early US studies showed high returns to school-based vocational education compared to general education, while studies in the UK showed at best no significant difference, or even lower returns to vocational education. However, more recent US evidence shows a pattern similar to that in the UK, suggesting that globalisation and labour market competition may have eroded some of the advantages of vocational education. Nevertheless, the US evidence remains strong that vocational education can provide special benefit to young people with lower abilities. Evidence from Norway shows no long term earnings gap for immigrant minorities who have followed a vocational education, whereas evidence from Israel shows a significant initial earnings gap, suggesting that vocational qualifications do not travel well across borders. In Egypt vocational education provides higher returns than general education for men, while providing similar returns for women. Scandinavian evidence shows that extending the length of vocational education, and enriching its content with units of general education, does not improve its effectiveness in improving labour market outcomes.

Transition countries had a bad experience of vocational education inherited from the socialist system, since it involved too early tracking and selection and was too specialised to specific industries, or even to firms in the locality which supported the vocational programmes. How should these countries best respond to the new challenges of structural change and transition? Broadly the evidence from the OECD/EU countries reported above seems to suggest four main conclusions.

1. *Specialisation, tracking, and educational outcomes.* Decisions about the structure of the schooling system are fundamental issues of education policy. Should schools specialise on vocational education, or should there be streaming (or tracking) within otherwise comprehensive school systems? The evidence is mixed. The debate is not helped by a tendency to obscure the distinction between specialised schooling and tracked schooling. Overall, the benefits of comprehensive education and late streaming/tracking seem to relate mainly to potential improvements in equity of educational achievement. Whether this is attained at the expense of the level of achievement seems to be undecided. The disadvantages of abandoning effective vocational schooling relate to the worsened labour market outcomes for the less able and disadvantaged children. For countries in transition, this adverse effect may be especially important. Therefore it is not advisable to dispense with specialised schooling, but rather to strengthen the inadequate vocational school systems and ensure that pathways to higher levels of education are built into them.
2. *Transition from school to work: apprenticeship or school-based vocational education?* Apprenticeship systems have advantages in enabling lower ability students, and minorities to access the labour market. However, for women there are dangers of being locked in to traditional female occupations, and for them school-based vocational education seems to offer advantages. The lesson appears to be to implement policies which encourage women to take up non-traditional apprenticeships, and to continue to offer school-based alternatives to those who feel they could benefit from them. However, these should be well organised and resourced, and should not be lengthened to delay labour market entry. Providing school-based vocational education may furthermore reduce school drop-out rates.
3. *Career and occupational mobility: labour market outcomes.* Occupational mobility can be improved by effective school-based vocational education. If returns to such education are sufficiently high, they can incentivise mobility. Whether or not returns to school-based vocational education are higher or lower than general education is disputed. In developed economies, there

appears to be little difference in properly measured rates of return. In less-developed and transition economies, returns from different types of education may differ. Recent evidence from Egypt suggests that returns to vocational education are higher than returns to general education. Apprenticeships may impart skills that are too firm-specific, and may inappropriately limit occupational mobility.

4. *The Importance of Life-long learning.* While occupational mobility is needed for countries undergoing structural change, it should be noted that too much mobility can also be harmful to the skill retention, especially for women. Special attention should therefore be given to providing complementary opportunities for retraining and for lifelong learning to all workers, but especially to women, to encourage and support the desired degree of mobility in the labour market.

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Appendix: Vocational Enrolment in Western Balkan and the EU Neighbourhood Countries (ISCED 3)

Lower Secondary Country	Vocational education		Enrolment		Enrolment in technical & vocational programmes		Vocational gross enrolment ratio	
	Entrance age	Duration	All programmes	Vocational programmes	All (%)	Gender Participation (Female/Male)	All (%)	GPI (Female/Male)
Armenia	15	2	96,676	4,757	5	0.62	4	0.71
Azerbaijan	15	2	269,620	20,753	8	0.56	6	0.53
Georgia	15	3	98,812	9,296	9	0.39	4	0.39
Israel	15	3	356,404	124,629	35	0.78	39	0.75
Jordan	16	2	177,887	34,855	20	0.85	15	0.88
Kazakhstan	16	3	565,579	90,778	16	0.57	10	0.59
Kyrgyzstan	16	1	190,502	25,972	14	0.55	23	0.57
Lebanon	15	3	148	39,773	27	0.70	18	0.76
Palestinian Authority	16	2	92,309	4,283	5	0.37	3	0.43
Syria	15	3	387,940	121,744	31	0.87	9	0.83
Tajikistan	14	2	149,773	25,546	17	0.70	8	0.41
Turkey	14	3	3,314,812	1,261,077	38	0.85	29	0.59
Uzbekistan	16	3	1,021,495	366,927	36	0.90	21	0.82
Albania	14	5	132,976	20,032	15	1.04	7	1.04
Belarus	16	1	204,468	4,744	2	0.44	3	0.55
Croatia	15	4	196,147	145,510	74	0.84	62	0.89
Macedonia	15	4	95,950	58,891	61	0.82	45	0.79
Moldova	16	2	102,623	22,647	22	0.54	14	0.60
Russia	15	2	4,907,006	1,413,885	29	0.54	29	0.53
Ukraine	15	2	1,570,913	356,213	21	0.52	22	0.51
Algeria	16	3	1,198,601	192,692	16	0.63	9	0.86
Egypt	14	3	3,684,955	2,355,481	64	0.93	48	0.89
Morocco	15	3	610,135	77,755	13	0.73	4	0.63
Tunisia	17	2	524,037	15,855	3	0.44	4	0.53

Source: UIS (2006)

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