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Improving Education Outcomes in Germany

David Carey

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By

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ABSTRACT/RÉSUMÉ

Improving education outcomes in Germany

Improving education outcomes is important for Germany's long-term economic performance and social cohesion. While student achievement is above the OECD average in science and at the OECD average in reading and mathematics according to the 2006 OECD PISA study, weaker students tend to do badly by international comparison and socio-economic and/or immigrant backgrounds have a large impact. Another problem is that the proportion of younger people that completes tertiary education is relatively low. The authorities are undertaking wide ranging reforms touching all levels of education to tackle these problems. Nevertheless, there is scope to go further by: increasing participation in early childhood education and care of children from less advantaged socio-economic backgrounds and improving the quality of such education; improving teaching quality; reducing stratification in the school system; and making tertiary education more attractive and responsive to labour-market requirements. With the reforms underway or suggested, Germany would be able to look forward to higher education achievement and attainment and, especially, greater equality of education opportunity.

JEL classification: I2, I21, I28, J24

Keywords: Education; PISA; achievement; attainment; early childhood education and care; teacher quality; autonomy; accountability; school leadership; school system; stratification; early tracking; socio-economic background; immigrant background; equality of education opportunity; internal rates of return on tertiary education; Bologna reforms

This Working Paper relates to the 2008 *OECD Economic Survey of Germany* (www.oecd.org/eco/surveys/Germany).

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Améliorer les résultants de l'enseignement en Allemagne

Il importe d'améliorer les résultats de l'enseignement pour les performances économiques à long terme et pour la cohésion sociale de l'Allemagne. Si les élèves réussissent mieux que la moyenne de l'OCDE en sciences et atteignent la moyenne en compréhension de l'écrit et en mathématiques selon l'enquête PISA 2006 de l'OCDE, les élèves en difficulté ont généralement des résultats faibles par rapport à ceux des autres pays et l'influence du milieu socio-économique et/ou de l'origine est forte. Autre problème : la proportion des jeunes qui achèvent leurs études supérieures est relativement faible. Les autorités ont entrepris une vaste réforme de l'ensemble du système éducatif afin de résoudre ces difficultés. Néanmoins, il est possible d'aller plus loin, notamment en augmentant le nombre d'enfants de familles défavorisées inscrits dans les services d'éducation et d'accueil des jeunes enfants et en améliorant la qualité de ces services, en rehaussant la qualité de l'enseignement, en réduisant la stratification du système scolaire, et en rendant l'enseignement supérieur plus avantageux et plus réactif face aux exigences du marché du travail. Avec les réformes en cours ou proposées, l'Allemagne pourrait espérer des résultats scolaires et des niveaux de formation plus élevés et surtout, une plus grande égalité des chances dans le domaine de l'éducation.

Classification JEL : I2, I21, I28, J24

Mots clefs : Éducation; PISA; réussite scolaire; l'éducation et l'accueil des jeunes enfants; qualité de l'enseignement; autonomie; responsabilité; la direction des établissements scolaires; système scolaire; stratification; répartition des élèves par filière à un stade précoce; cadre socio-économique; élèves issus de l'immigration; égalité des chances scolaires; taux de rendements internes sur l'enseignement supérieur; processus de Bologne

Ce Document de travail se rapport à *l'Étude économique de l'OCDE de Germany 2008* (www.oecd.org/eco/etudes/Germany).

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Improving education outcomes in Germany

by

David Carey[1]

Human capital development is a major driver of long-term economic performance (see OECD 2008, Chapter 1). Its distribution is also an important factor in preserving social cohesion. Student achievement at age 15 in Germany is at or above the OECD average, depending on the subject (above average in science, average in reading and mathematics; OECD, 2007a), but is strongly influenced by socio-economic and/or immigrant background. At the same time, the tertiary attainment rate among younger cohorts is low by international comparison and again is strongly influenced by socio-economic background. Following an examination of the key education outcomes that need to be improved, this chapter analyses the causes of these weaknesses, discusses the reforms that are being undertaken to improve performance, and makes suggestions for building on these reforms. The areas of education policy discussed in the chapter concern early childhood education and care, teaching quality, school structure, and tertiary education. While vocational education and continuing education are also important for human capital development, they are not taken up here as they are less closely related to the specific achievement and attainment challenges focussed on in this chapter and because vocational education and continuing education have been or will be reviewed in other OECD publications.[2]

Education outcomes

Student achievement is at or above the OECD average, depending on the subject, but is significantly affected by socio-economic and immigrant backgrounds

Education achievement of 15-year olds in Germany is above the OECD average in science (ranking 8th highest among OECD countries) and average in reading and mathematics (ranking 14th highest

1. This paper is largely based on material from the *OECD Economic Survey of Germany* published in April 2008 under the authority of the Economic and Development Review Committee (EDRC). The author would like to thank Kathrin Höckel, Karin Zimmer, Deborah Nusche, Deborah Roseveare, Val Koromzay, Andrew Dean, Andreas Wörgötter, Felix Hüfner and Nicola Brandt for valuable comments on earlier drafts. The paper has also benefited from discussion with the German authorities. Special thanks go to Margaret Morgan for technical assistance and to Susan Gascard for technical preparation.

2. Continuing education was reviewed in OECD (2005a). An OECD study on vocational education is currently underway, with results likely to be published in 2009.

among OECD countries in both subjects) according to the 2006 OECD PISA study (Figure 1). The results for reading and mathematics are not statistically significantly different from those in 2000 and 2003, respectively, indicating that there is no trend in achievement over the longest periods for which inter-temporal comparisons can be made (*ibid.*, Figures 6.9 and 6.21); inter-temporal comparisons in science cannot be made owing to changes made to the examination.[3] The distribution of PISA scores is wide in Germany, especially in reading and mathematics. Germany's ranking among OECD countries rises in each successive achievement percentile above the 10th in reading and mathematics but only rises up to the 25th percentile in science. This suggests that a factor in the better average performance in science than in the other two subjects may be that Germany has been more successful in improving achievement among weaker students in this subject. This result would be consistent with the pattern observed across OECD countries: countries that have a smaller gap in achievement between the 25th and 75th percentiles, for example, tend to have higher average achievement.[4]

Socio-economic background (as measured by the OECD's ESCS index)[5] has a large impact on achievement in Germany by international comparison, explaining 19% of the variance in student performance in science, the results for which were analysed in depth in the 2006 PISA study, compared with an OECD average of 14% (*ibid.*, Figures 4.6 and 4.10)[6]. A decomposition of this effect shows that it reflects a steep overall socio-economic gradient, which measures the increase in achievement associated with a one unit increase in the ESCS index, and not wide variation in the ESCS index (the standard deviation of the ESCS index is near the OECD average [OECD 2007b, Table 4.4a]). The steep socio-economic gradient in Germany, which indicates low equality of education opportunity, mainly reflects a strong impact of a school's average student ESCS on performance, the within school effect of ESCS being relatively small (OECD, 2007a, Figure 4.11).

Students with an immigrant background in Germany have much lower scores in science (and the other subjects tested) than native students,[7] this gap in performance being one of the largest among OECD countries (Figure 2; OECD, 2007b, Table 4.2d for reading and Table 4.2e for mathematics). Given that Germany has a relatively large share of students with an immigrant background, this performance shortfall has a large negative impact on Germany's average PISA scores: Germany's rankings among OECD countries in science, reading, and mathematics were 3, 4, and 5 places higher, respectively, when only native students in Germany and other OECD countries are considered. An unusual feature in Germany is

3. Comparisons over time can only be made in a subject once a comprehensive test has been administered. Such tests occur when that subject is the special focus of a PISA study. Comprehensive tests were administered in reading, mathematics, and science in 2000, 2003, and 2006, respectively. Accordingly, inter-temporal comparisons can be made for reading since 2003 and for mathematics since 2006 and will be possible for science from 2009, the year in which the next PISA study is planned. Such comparisons are made using a representative sample of questions covering all fields examined in the comprehensive tests when the subject concerned is not the special focus.

4. The correlation coefficients between average achievement and the ratio of scores at the 75th to the 25th percentiles in science, reading and mathematics are -0.52, -0.73, and -0.64, respectively.

5. The index of economic, social and cultural status (ESCS) is derived from: the highest international socio-economic index of occupational status of the student's father or mother; the highest level of education of the father or mother converted into years of schooling; and the number of books at home as well as access to home educational and cultural resources. The student scores on the index are factor scores derived from a Principal Component Analysis that are standardised to have an OECD mean of zero and standard deviation of one. See OECD (2004a, p. 307) for further details.

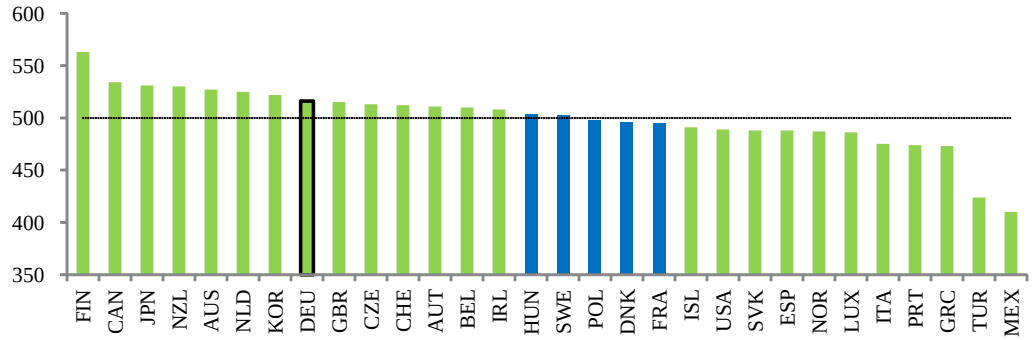
6. These results are based on a simple (*i.e.*, one explanatory variable) regression.

7. Native students were born in the country of assessment as was at least one of their parents.

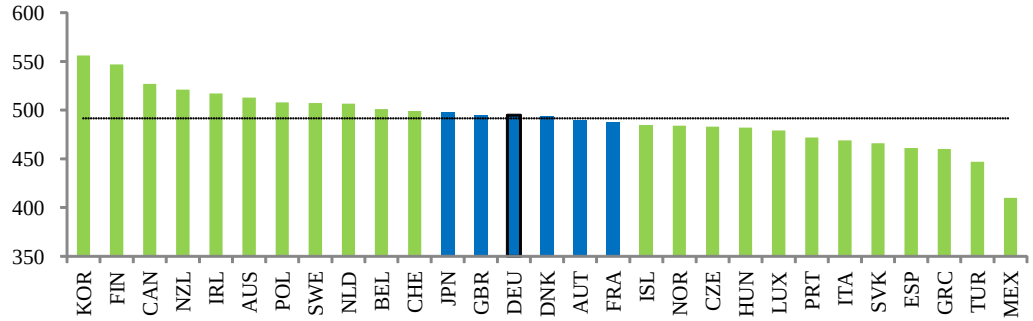
that achievement for second-generation students is lower than for first-generation students. This reflects the different populations from which first- and second generation students are drawn: a large proportion of first-generation students comes from the former Eastern-Bloc countries and acquired German language skills through their families; the great majority of second-generation students have Turkish immigrant backgrounds and often do not acquire their German language skills through their families. The difference in performance between those students speaking a language at home most of the time that is the same as the language of assessment (or other official languages or national dialects) and those students speaking a different language at home is larger than that for immigrants in general, as in other OECD countries, and is also one of the largest among OECD countries (see Figure 2; *ibid.*, Table 4.3a for science and Table 4.3b for reading and mathematics); these gaps also approximately correspond to those between native and second-generation students.

Figure 1. Student performance in the OECD 2006 PISA study

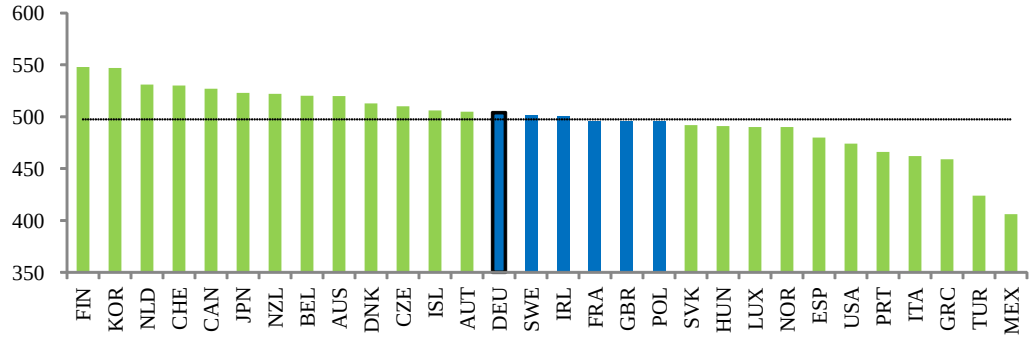
Science



Reading



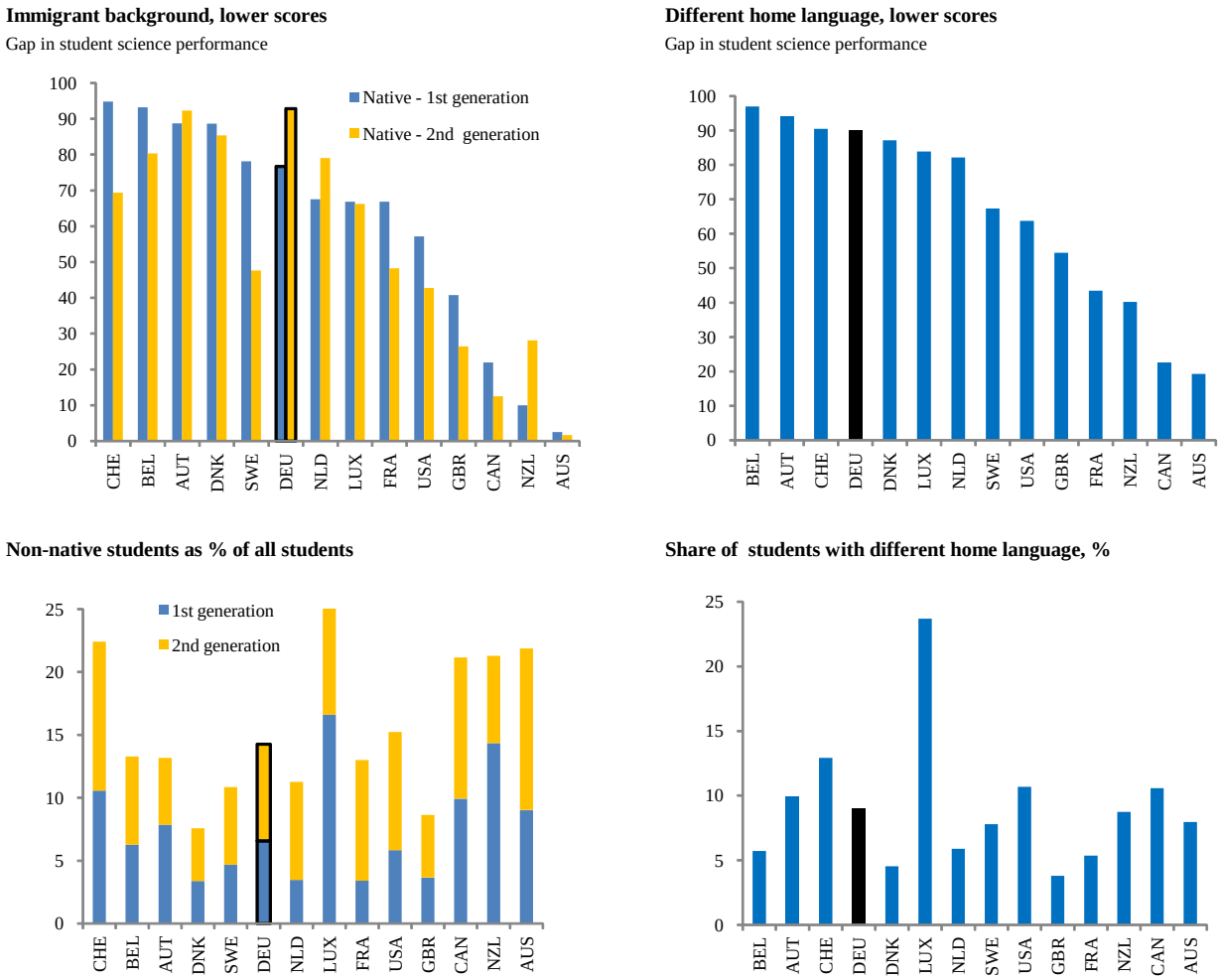
Mathematics



Note: The higher the score, the higher the performance. Dotted line indicates average of country performances. Darker bars indicate scores not statistically different from the OECD average.

Source: OECD (2007), *PISA 2006: Science Competencies for Tomorrow's World,* Vol. 1, OECD, Paris.

Figure 2. Relative performance in science of immigrants and natives



Note: Native students are those born in the country of assessment or who had at least one of their parents born in the same country. First generation students are those born in another country and whose parents were also born in another country. Second generation students are those born in the country of assessment but whose parents were born in another country. Language spoken at home most of the time is classified as the same or different from the language of assessment, from other official languages or from other national dialects.

Source: OECD (2007), *PISA 2006: Science Competencies for Tomorrow's World,* Vol. 1, OECD, Paris.

An important factor contributing to the relatively weak performance of students with an immigrant background is that they also tend to have a relatively low socio-economic background. Indeed, the gap between the average ESCS index for native students and for students with an immigrant background is considerably larger in Germany than in most other OECD countries (*ibid.*, Table 4.3d). Such differences account for approximately one half of the gap in performance between native and non-native students and one quarter of the gap in performance between students speaking the language of instruction at home most of the time and those speaking a different language (*ibid.*, Table 4.3c). Thus, while a large part of the gap in performance between native students and students with an immigrant background can be explained by the latter students' less favourable socio-economic backgrounds, there is still a significant additional disadvantage to having an immigrant background in Germany, especially if German is not spoken at home.

There are large differences in achievement across German *Länder*, with some *Länder* (Bavaria and Saxony) having average PISA 2003 scores in mathematics that are high by international comparison and others (Hamburg and Bremen) scores that are relatively low (Figure 3; Prenzel *et al.*, 2005); PISA 2003 data are used for this analysis because the 2006 state-level PISA data (PISA-E) are not yet available. Differences in performance between *Länder* narrow at higher percentiles, suggesting that the *Länder* with low average scores are being held back by particularly low achievement for weaker students; the same pattern holds in the international study.[8] A relatively high proportion of students by international comparison in the *Länder* with weak average scores perform at or below level 1 on the PISA scale for mathematics (which goes up to level 6), indicating that many students will have difficulties going further with their education (Figure 4); these problems are even more severe in reading, where 20-30% of students only perform at or below level 1 in three quarters of the *Länder*. In *Länder* with relatively high mathematics scores, socio-economic background tends to have a smaller impact on achievement than in *Länder* with relatively low scores (see Figure 3). Indeed, the slope of the socio-economic gradient is inversely correlated with average achievement across *Länder*.[9] Of the four *Länder*[10] scoring significantly above the OECD average, the average slope of the socio-economic gradient is below the OECD average (42) in all but one case whereas it is at or above the OECD average in three quarters of the other states.[11] The share of migrants is also inversely correlated with achievement across *Länder*.[12] The three *Länder* with the lowest PISA scores – Bremen, Hamburg, and North-Rhine-Westphalia – have migrant shares of 30-36%, well above the national average of 22%.

8. The correlation coefficient between the ratio of scores at the 50th to the 25th percentiles, reflecting the degree to which weaker students lag behind average students, and average scores is -0.58 across OECD countries. For the ratio of scores at the 75th to the 50th percentiles, reflecting the degree to which stronger students outperform average students, the negative relationship with average scores is less marked – the correlation coefficient is -0.36. The corresponding correlation coefficients for the German *Länder* are -0.76 and -0.69, respectively, indicating that this relationship is even stronger within Germany than across OECD countries.

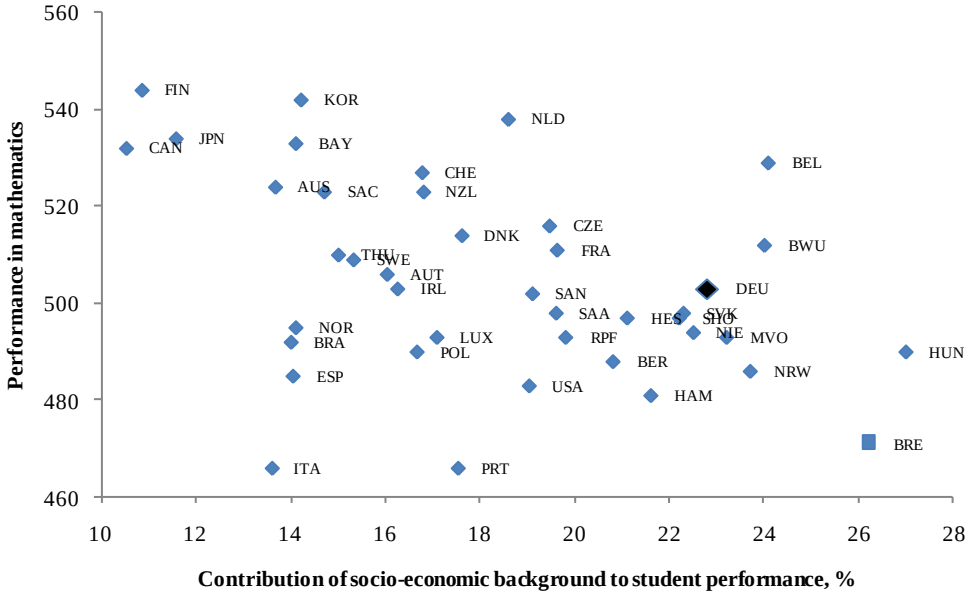
9. The correlation coefficient between *Länders* mean PISA scores in mathematics and the slope of the socio-economic gradient is -0.49. By contrast, there is virtually no relationship across OECD countries (excluding Mexico, which is an outlier) between mean PISA scores in mathematics and the slope of the socio-economic gradient (the correlation coefficient is 0.14).

10. These *Länder* are: Bavaria (mean 533, slope of the socio-economic gradient 38); Saxony (523, 39); Baden-Wurttemberg (512, 45); and Thuringia (510, 40).

11. The three *Länder* with below OECD average PISA scores and below average socio-economic gradients are: Brandenburg (mean 492, slope of the socio-economic gradient 38); Hamburg (481, 41); and Saarland (498, 40).

12. The correlation coefficient between *Länders* mean PISA scores in mathematics and the share of migrants is -0.43.

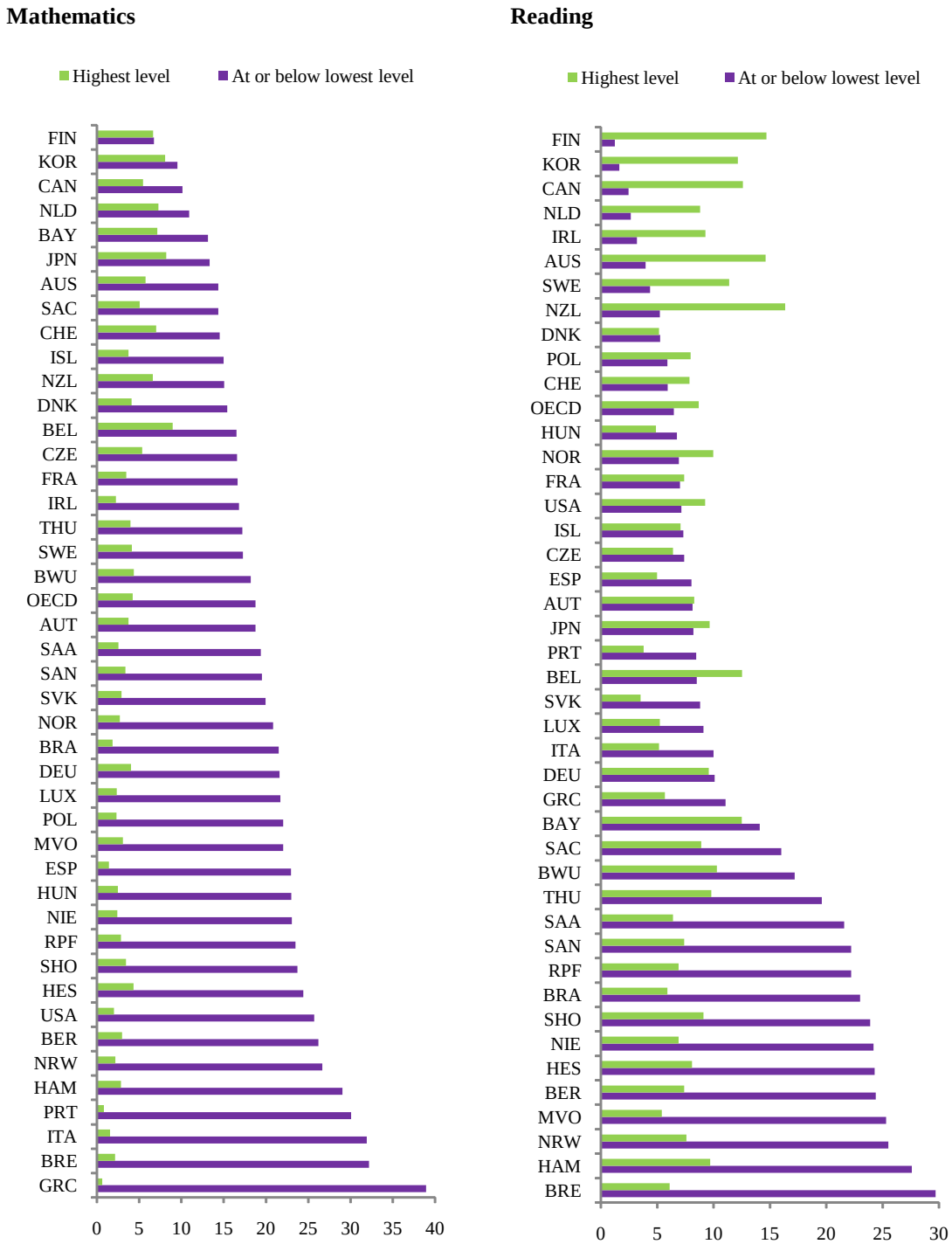
Figure 3. Performance in mathematics and the impact of socio-economic background



Note: Codes for the German States are in lower case and are in the Glossary. Student performance in mathematics (dependent variable) was regressed on the PISA index of economic, social and cultural status (ESCS). The contribution of socio-economic background to student performance is the R squared of this regression (multiplied by 100). It indicates the proportion of the variation in performance that is associated with the variation in background.

Source: OECD (2004), *Learning from Tomorrow's World: First Results from PISA 2003*, OECD, Paris and Prenzel, M. *et al.* (2005), *PISA 2003: "Ergebnisse des Zweiten Ländervergleichs Zusammenfassung*".

Figure 4. Proportion of students at lowest and highest 2003 PISA competence levels
Per cent



Note: Highest levels are 6 and 5 for mathematics and reading respectively. OECD refers to the arithmetic average of proportions for countries in the graph.
Codes for the German States are in lower case and are in the Glossary.

Source: OECD (2004), *Learning from Tomorrow's World: First Results from PISA 2003*, OECD, Paris and Prenzel, M. *et al.* (2005), *PISA 2003: "Ergebnisse des Zweiten Ländervergleichs Zusammenfassung*".

Attainment has stagnated and is now relatively low at the tertiary level

A relatively high proportion of the population aged 25-64 has at least upper secondary attainment (83% in 2005, OECD, 2007c, Table A1.2a). However, in contrast to most other OECD countries, there has been no tendency for this proportion to increase in successive age cohorts (Figure 5); the only rise that occurred is between the cohorts in the 45-54 and 55-64 age groups. Whereas the upper secondary attainment rate for the population aged 45-54 is the fourth highest among OECD countries, the rate for the 25-34-age group is only 13th highest (*ibid.*). The level of upper secondary attainment for the younger cohorts leaves a significant minority of persons (17%) without the minimum level of education attainment that is usually necessary to avoid marked difficulties on the labour market: the employment rate for persons with attainment below the upper secondary level was only 52% in 2005, compared with 71% for persons with upper secondary or post-secondary non-tertiary attainment[13] and 83% for persons with tertiary attainment (*ibid.*, Tables A8.3a); the unemployment rate in 2005 for persons with below upper secondary attainment was almost twice as high as that for persons with upper secondary or post-secondary non-tertiary attainment and four times as high as that for persons with tertiary attainment (*ibid.*, Tables A8.4a).

Tertiary attainment has also generally stagnated in Germany from one age cohort to the next, in contrast to the sharp increases that have occurred in most other countries (see Figure 5). While tertiary attainment for cohorts in older age groups is above the OECD average, such attainment is below average for the younger cohorts; for the population aged 25-64, tertiary attainment is 25% (*ibid.*, Table A.1.3a), which is around the OECD average. Tertiary graduation rates have increased somewhat in recent years, reflecting a rise in tertiary-type-A[14] graduation rates partially offset by a decline in tertiary-type-B[15] graduation rates, but remain low by international comparison (Figure 6); specifically, tertiary-type-A graduation rates are well below the OECD average whereas tertiary-type-B graduation rates are around the average. While the increases in tertiary graduation rates will lead to a future increase in tertiary attainment, the rise in graduation rates in most other countries has been even more pronounced, suggesting that tertiary attainment in Germany will fall even further behind the levels in most other OECD countries.[16]

The number of tertiary (A and B) science[17] graduates per 100 000 persons employed in the 25-34 age group is below the OECD average (OECD, 2007c, Chart A3.4). This reflects the low tertiary graduation

13. Post-secondary non-tertiary qualifications are upper secondary level qualifications that are acquired by persons who already have upper secondary qualifications. In Germany, for example, dual system qualifications acquired by persons already holding an unrestricted university entrance qualification (*Abitur*) would be so classified.

14. Tertiary-type-A programmes lead to university degrees corresponding to a Bachelor's or a Master's degree in the Bologna system. These degrees are classified in the International Standard Classification of Education (ISCED) as ISCED 5A. Such programmes take at least three years to complete (for a Bachelor's degree or its equivalent).

15. Tertiary-type-B programmes are classified at the same level of competencies as tertiary-type-A programmes but are more occupationally oriented and usually lead to direct labour market access. The programmes are typically shorter than type-A programmes – usually two to three years – and generally are not intended to lead to university-level degrees. Such programmes are classified as ISCED 5B.

16. A factor to bear in mind, however, when considering the consequences of the low overall tertiary graduation rate is that training for certain occupations, such as kindergarten teachers, occurs at the upper secondary level (ISCED 3) rather than at the tertiary-type-B level (ISCED 5B); contrary to popular perceptions, nursing qualifications in Germany are, however, classified at the tertiary-type-B level, as in other countries.

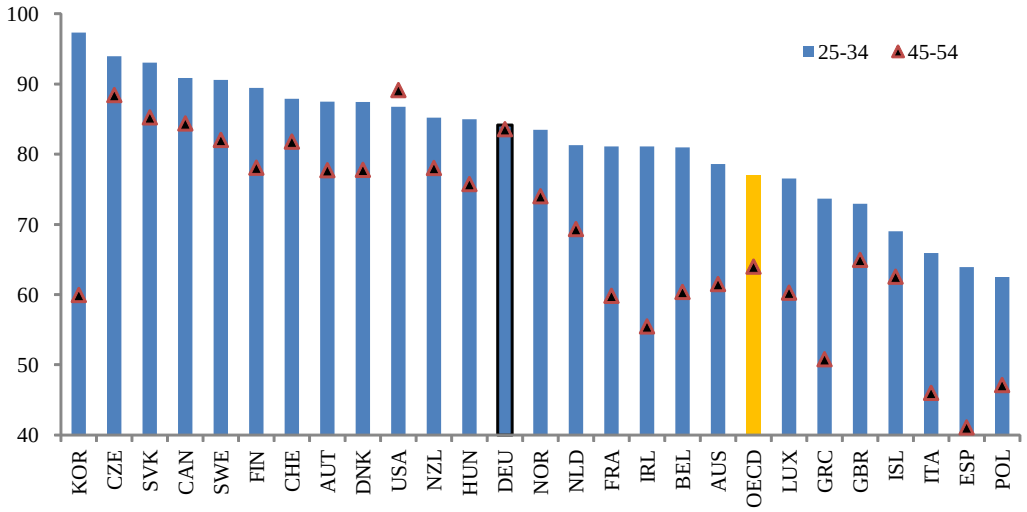
17. Science fields include: life sciences; physical sciences; mathematics and statistics; computing; engineering and engineering trades; manufacturing and processing; and architecture and building.

rate rather than a low share of students opting for these subjects; the share of science graduates in total graduates is actually second-highest in the OECD, after Korea (*OECD Education at a Glance Database*, Chart A3.7). A report commissioned by the Federal Economics Ministry states that the low supply of graduates in these fields could constrain expansion possibilities in sectors with high R&D intensities, notably the automobile industry, capital goods manufacturers and electronic companies.

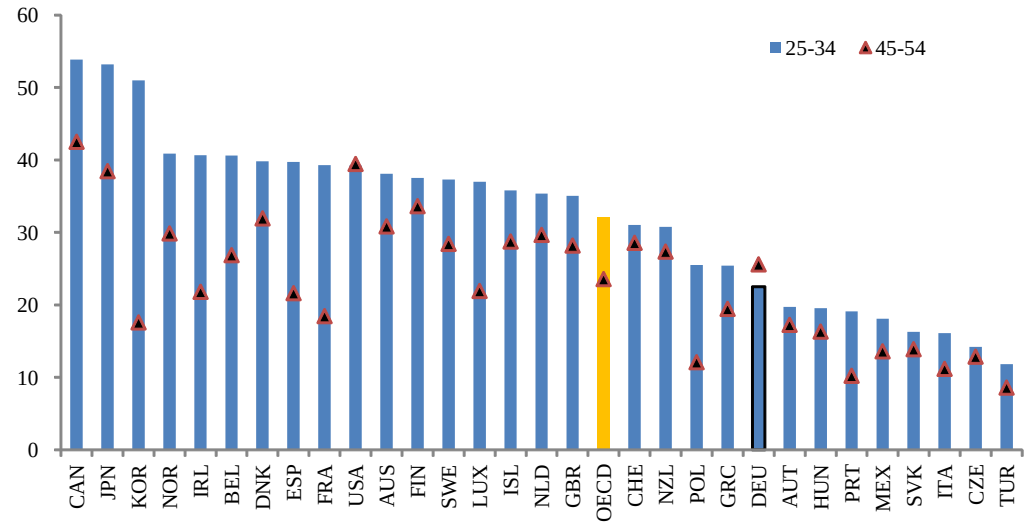
Earnings (not adjusted for the length of study programmes) for persons with tertiary education have increased quite sharply in recent years in relation to earnings for persons with upper secondary attainment, from 133% in 1997 to 156% in 2005, suggesting that supply has not kept up with demand for such persons. This contrasts with developments in most other OECD countries, where expansion in the supply of persons with tertiary attainment has been associated with relative stability in the earnings premium for tertiary qualifications. The increase in relative earnings in Germany is entirely attributable to a large rise in tertiary-type-B earnings, from 102% of upper secondary attainment earnings in 1997 to 115% in 2000 and 132% in 2005; tertiary-type-A earnings have remained steady at slightly over 160% of upper secondary earnings. The fact that tertiary-type-B graduation rates have declined over the same period (see above) points to a lack of flexibility in the education system to respond to changes in labour market conditions.

Figure 5. Education attainment by age-group, 2005
Per cent of population in age-group

At least upper secondary education



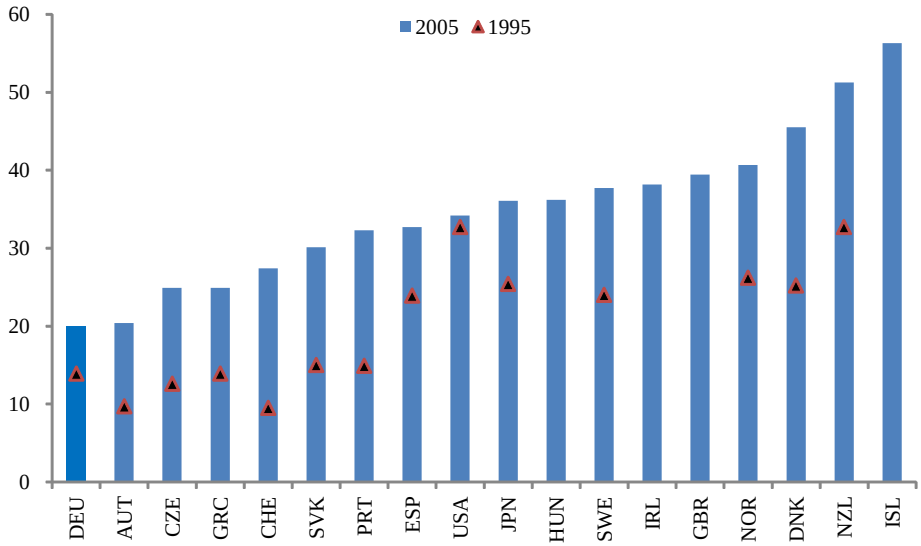
All tertiary



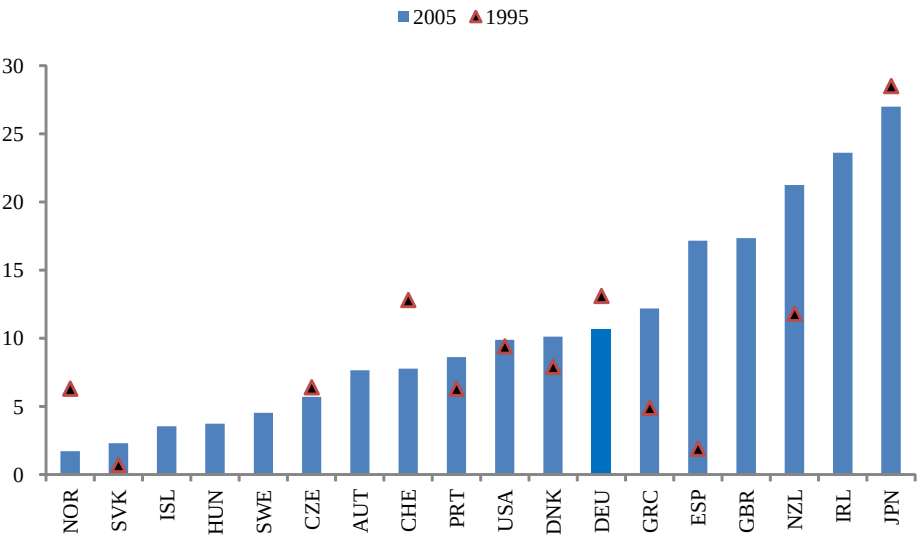
Source: OECD (2007), *Education at a Glance 2007: OECD Indicators*, OECD, Paris.

Figure 6. Tertiary graduation rates
Per cent

A. Tertiary-type A



B. Tertiary-type B



Note: Tertiary-type-A programmes provide qualifications for advanced research or higher skill professions. Tertiary-type-B programmes focus on practical, technical or occupational skills. Data are not available for all countries for earlier years.

Source: OECD (2007), *Education at a Glance 2007: OECD Indicators*, OECD, Paris.

Socio-economic background of parents has a large impact on students' participation in higher education in Germany (BMBF, 2004). The odds of a higher education student having a blue-collar father are low by international comparison (OECD, 2007c, Chart A7.1.) while the odds of having a father with higher education are high (*ibid.*, Chart A7.2b). Inequalities in the performance of students in PISA appear

to be carried forward to higher education (*ibid.*, pp. 120-121 for this statement and the remainder of the paragraph). Providing an equitable distribution of learning outcomes and opportunities at school would appear to be important in order to have more students from less affluent backgrounds participating in higher education.

Reforms to enhance outcomes

Increasing participation in early childhood education and care and enhancing its quality

Early childhood education and care (ECEC), which covers both childcare arrangements for infants and toddlers and pre-school education (kindergarten) is the foundation upon which lifelong learning is built. The skills acquired in ECEC impact on learning in subsequent stages of education – skill begets skill (Carneiro and Heckman, 2003). There is evidence that high-quality centre-based programmes improve education achievement and behaviour of young children, especially of poor children and children whose parents have little education (Brooks-Gunn, 2003). By developing skills that are important for success in education and labour markets, quality ECEC can contribute more effectively than later policy interventions to raising the proportion of the population with tertiary education attainment (Caneiro and Heckman, 2003). Very early interventions accompanied by parent mentoring can be particularly effective in reducing the impact of socio-economic background on education outcomes (Box 1). Unfortunately, enrolment in pre-school education in Germany appears to be less effective in reducing the impact of socio-economic background on education achievement than in most other countries based on evidence from cross-country studies (Wöβmann, 2007).[18] Language skills are an impediment to learning for some children, essentially immigrants, when they begin primary school – indeed, it is estimated that 5-6% of children at the age for beginning compulsory schooling are not ready to do so (Aktionsrat Bildung, 2007). Such deficiencies in language skills are an important factor contributing to lower education achievement of immigrant students (as found in successive PISA studies, for example) as these weaknesses contribute to later enrolment and grade repetition for these students, factors that are associated with lower achievement (Ammermueller, 2007).

The German authorities have embarked on a series of reforms to improve the quality of ECEC, especially for children from lower socio-economic or immigrant backgrounds. Following the lead of Bavaria and Saarland, which introduced integrated education programmes in the 1970s and 1980s for children aged 0-6, other *Länder* are now doing likewise. The *Länder* agreed in 2004 a framework to guide this development ("*Gemeinsamer Rahmen der Länder für die frühe Bildung in Kindertageseinrichtungen*"*;* and "*Stärkung und Weiterentwicklung des Gesamtzusammenhangs von Bildung, Erziehung und Betreuung*"). A priority is to ensure that there is a strong linkage between education programmes in the last year of pre-school and the first year of primary school (which is compulsory from age 6).[19] To avoid language skills being an impediment to learning, compulsory language competence tests are administered to children one to two years prior to beginning school, whether or not they attend kindergarten, followed by compulsory intensive language training for a period of 6 months to 1 year in the event that German language skills are inadequate. Some *Länder* give kindergartens extra funds for immigrant children in recognition of the extra costs entailed in getting them ready to begin primary school; in Bavaria, for example, there is a 30% premium for immigrant children.

18. Education achievement in Wöβmann's (2007) study is measured by students' scores in mathematics in the 2003 PISA study and enrolment in pre-school education refers to enrolment rates for 3-5 year olds.

19. Measures that help enhance relevant co-operation and curricula development include, for example, joint conferences in connection with children's entry into school, topic-oriented parents' evenings, two-way guest teaching programmes, and early intensive language programmes with methods suitable for children.

Box 1. Targeted programmes to enhance skill development of children from disadvantaged backgrounds

A large body of empirical work has established that fundamental cognitive and non-cognitive abilities are produced in the early years of childhood, long before children are five years old (Heckman and Masterov, 2007, p. 34).[1] Empirical evidence suggests that children from disadvantaged families receive much less cognitive and emotional stimulation than other children, retarding development of their abilities (*ibid.*, 2007, Figures 8c and 8d). Experience with voluntary programmes in the United States (entailing enriched pre-school centres made available to disadvantaged children with home visitation programmes to help parents mentor their children)[2] that partially compensate children from disadvantaged environments for these deficits in cognitive and emotional stimulation shows that abilities can be permanently increased through early interventions (*ibid.*).[3] Given that learning and motivation are dynamic, cumulative processes, the strengthening of cognitive and non-cognitive abilities early in life facilitates subsequent learning, resulting in very high rates of return from the programmes (*ibid.*, Figure 12 and Table 7); they also contribute to reducing social inequality. Similarly, a home visitation programme (*i.e.*, like the US programmes but without the enriched pre-school centres) in New Zealand (Early Start) targeted on children from disadvantaged backgrounds yielded significant improvements in child health, participation in early childhood education, parenting behaviours and child behaviour.

A pilot project that overlaps aspects of the US and NZ programmes is underway in the city of *Monheim* in North Rhine-Westphalia (*Monheim für Kinder, Mo.Ki*) (OECD, 2004b, Box 8). This project aims to prevent and overcome the consequences of poverty on young children from birth through to age 12. The programme has three main fields of action: preventative programmes for children (care and early promotion); strengthening parents' competencies; and coordinating and connecting existing programmes and supporting new ones. Childcare centres have been chosen as the first line of action. The lessons drawn from this and comparable international projects should be used to develop programmes specifically aimed at compensating very young children (from a few months old) from disadvantaged backgrounds for lacuna in their home environments for the development of abilities. Such programmes could be highly effective in reducing the large impact of socio-economic backgrounds on education outcomes in Germany.

1. Cognitive abilities include IQ and the capacity to learn. Non-cognitive abilities refer to emotional characteristics such as perseverance, motivation, time preference, risk aversion, self-esteem, self-control, and preference for leisure that are important for success both in developing cognitive abilities and more generally in life (Heckman and Masterov, 2007).
2. The programmes discussed by Heckman and Masterov (2007) include the following: Perry Preschool Experiment; Abecedarian Project; and the Chicago Child-Parent Centre and Expansion Programme.
3. The average age of children entering the Abecedarian Project in the United States (between 1972 and 1977) was 4.4 months. This programme appears to have had a lasting effect on IQ, but it is concentrated primarily among girls (Heckman and Masterov, 2006).

The decentralised funding arrangements for ECEC services in Germany contribute to geographic inequalities in provision. There are wide variations in funding across *Länder* and municipalities, leading to difficulties in access or a lowering of quality (owing to larger groups with less experienced personnel) in low-income and immigrant districts (OECD, 2004b); these inequalities are attributable to the different funding standards of the various authorities responsible for ECEC services, not to differences in the fiscal capacity of local districts. Yet these are the areas where providing suitably adapted ECEC services is likely to be most expensive (*e.g.* for paying extra language training and for extra teachers to provide more individual attention) but to have the greatest potential benefits (notably by compensating for lacuna in children's home environments for the development of skills). The variety of financing procedures and support also leads to uncertainty for private providers (*freie Träger*). This uncertainty limits their capacity to respond adequately to new needs (*ibid.*). The federal government, *Länder*, municipalities and major stakeholders should cooperate to develop common funding standards that ensure more equitable treatment of children from disadvantaged and/or immigrant backgrounds.

Training of educators in the ECEC sector in Germany mostly occurs at the post-secondary non-tertiary level in state-accredited specialised technical schools (*Fachschulen*).[20,21] This is a lower level of education than in any other western European country other than Austria, where such educators are also trained at the post-secondary non-tertiary level (*ibid.*). There is evidence that "staff who have more formal education and more specialised early childhood training provide more stimulating, warm, and supportive interactions with children, not least in the area of language (development)" (*ibid.*). Another disadvantage of training taking place outside the university sector is that the ECEC field remains to a great extent outside the field of university research (*ibid.*). The authorities should consider upgrading training of ECEC educators to tertiary level, preferably at the university level, and providing more specialised training for educators of very young children (aged less than 3) in childcare institutions (*Kindertageseinrichtungen*). Such children need more individual attention than do older children. Meeting this need may also call for training more teachers for this group. It may also be worth considering upgrading training requirements for private childcare providers (*Kindertagespflege*), which are much lower than for educators in childcare institutions: such training consists of a two-day crash course and another 60 hours of tuition.

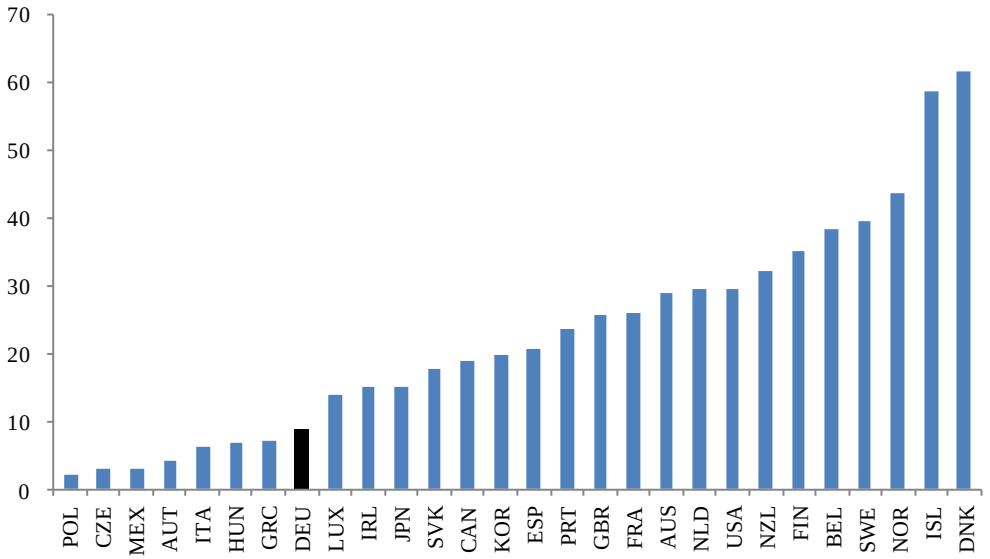
Enrolment of children aged less than 3 in formal childcare arrangements (*Kindertageseinrichtungen* and *Kindertagespflege*) is low by international comparison (Figure 7); enrolment rates for immigrant children are particularly low at around two thirds of the native rate. For children up to age one, the low overall enrolment rates seem to reflect social preferences – demand for childcare places for this age group is very low. However, for 1-2 year olds, there is a severe shortage of (publicly subsidised) childcare places; a factor supporting strong demand for such places is that parental childcare costs net of benefits and tax concessions are very low by international comparison (Immervoll and Barber, 2005, Figure 2.3). The federal and *Länder* governments have committed themselves to increasing the number of childcare places for children aged under 3 by 465 000 by 2013, from 285 000 places currently.[22] This will increase the number of places available as a proportion of the population aged less than 3 to around 35%, which is higher than is currently available in most other countries. The federal government will contribute € 4 billion annually towards the cost of this expansion, even though childcare is a state responsibility under the federal constitution; public subsidies for childcare currently cost around € 11 billion. The federal and *Länder* governments plan to guarantee access to a childcare place for each child aged less than 3 by 2013, as is currently the case for kindergarten places for children aged 3-6, and there are plans to pay a monthly fee to parents who instead care for their children themselves. Experience with pilot arrangements along these lines has shown that such an offer to pay a fee leads to participation in childcare declining. Unfortunately, this decline in participation tends to concern children from lower socio-economic backgrounds, the very group that has most to gain from participating in quality childcare, especially in terms of developing language competencies if they come from an immigrant background.

20. The only exception is Baden-Württemberg, which trains ECEC educators, primary school teachers, part of lower secondary teachers, and special education teachers at non-university tertiary (*i.e.*, tertiary type-B) institutions (*Pädagogische Hochschulen*) (Halász *et al*., 2004).

21. Educators of children aged below three in childcare institutions (*Kindertageseinrichtungen*) and of children aged 3-6 in kindergartens receive essentially the same training.

22. This commitment is enacted in the 2005 Children's day-care expansion Act (*Tagesbetreuungsausbaugesetz*).

Figure 7. Proportion of children aged 0 to 2 years using formal childcare arrangements
Per cent



Note: Data refer to early 2000s.
Source: *OECD Family Database*.

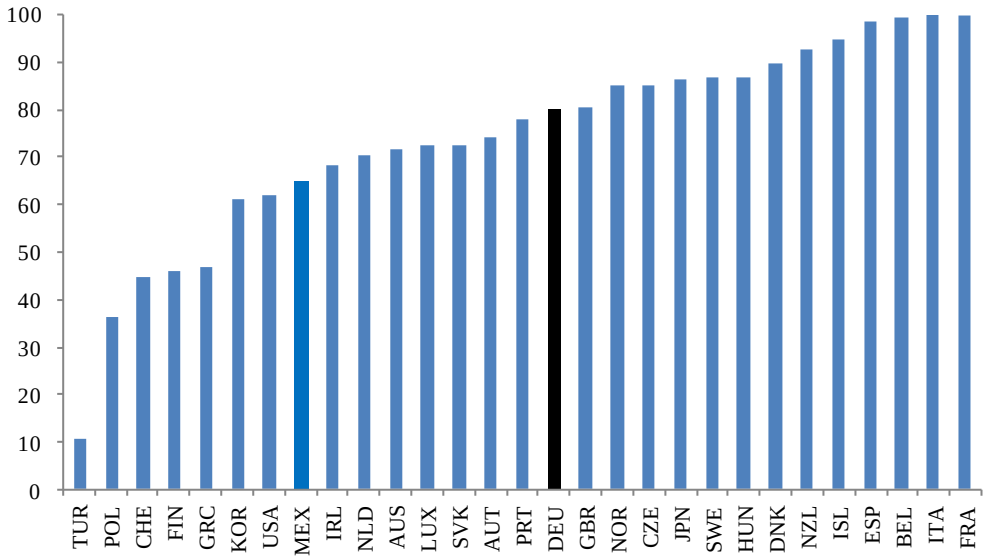
The net enrolment rate of children aged 3-5 in pre-school education is 80% (although many of these enrolments are only for four hours per day), which is above the OECD average but significantly lags the rates recorded in many countries where participation is universal or nearly so (Figure 8). As a (half-day) kindergarten place is guaranteed for every child in this age range, the less than universal participation reflects a lack of demand.. Unfortunately, children not enrolled in kindergarten are most likely to come from lower socio-economic backgrounds (*Bundesministerium für Bildung und Forschung*, and *Kultusminister Konferenz*, 2006, p. 150), even though these are precisely the children who would gain most from attending.[23] The lower attendance of children from such backgrounds is unlikely to reflect affordability issues as fees are generally waived for children from poorer households.[24] In view of the large impact of socio-economic background on education outcomes in Germany, it is vital to increase enrolment rates of children from lower socio-economic backgrounds. Efforts are being made to convince parents with low levels of education of the importance for their children of participating in kindergarten from age 3. These efforts seem to be more effective if kindergarten is promoted to the family by friends or associations. Nevertheless, it remains important to understand better why enrolment rates for children from such backgrounds are not higher and take steps to overcome these barriers. The shortfall in enrolment rates for immigrant children – rates are 7 percentage points lower than for native children in the 3-6 age-group – appears to reflect their socio-economic background rather than immigrant status (*Bundesministerium für Familie, Senioren, Frauen und Jugend*, 2004).[25]

23. Roughly 80% of children aged 3-6 whose parents are married and have a monthly income of at least € 3 800 were enrolled in pre-school education in 1999. In the family income range of € 500-900 per month, only 64% of children were enrolled in pre-school education (*Bundesministerium fúr Familie, Senioren, Frauen und Jugend*, 2004).

24. Parents with low incomes generally do not have to pay kindergarten fees. In the case of Berlin, no fees are paid by parents of half of the students.

25. Specific national origins have little impact on children's kindergarten attendance rates once socio-economic background is taken into account (*Bundesministerium für Bildung und Forschung, und*

Figure 8. Enrolment rates of children aged 3 to 5 years in pre-schools
Per cent



Note: Data refer to early 2000s.
Source: OECD Family Database.

The government is also encouraging the development of all-day kindergarten places. These are comparatively rare in western Germany (only 24% of places) but are universal in eastern Germany. Such a development should help mothers to reconcile family and work responsibilities as well as providing extra time to develop children's abilities at kindergarten. It is to be hoped that the planned improvements in the education component of kindergarten education will be marked for the afternoon sessions of all-day kindergartens because these sessions, which have generally had little or no educational content, do not appear to have been particularly beneficial to students in terms of enhancing their lifetime education prospects.[26]

The planned and suggested reforms to enhance the quality of ECEC services and participation are undoubtedly costly for public budgets. Nevertheless, it does seem that an expansion in public expenditure on ECEC services could be warranted given that such expenditure in Germany is low (0.42% of GDP in 2001)[27] compared with the level of investment in other European countries and the target proposed by the EC Childcare Network (1996) of 1% of GDP (OECD, 2004b).

Kultusministerkonferenz, 2006). This study also shows that on the whole foreign children's attendance rates moved closer to native children's rates over 1991 to 2004.

26. Landvoigt *et al*. (2007) find that not attending kindergarten and attending kindergarten full time are associated with lower participation in the grammar school track (*Gymnasium*). Full-time participation is a disadvantage, even when adjusting for socio-economic background. The authors speculate that such participation does not compensate enough for the missing educational stimulation at home.

27. Including parents' and providers' contributions, funding of ECEC services in Germany was 0.57% of GDP in 2001.

Improving teaching quality

Most current research suggests that teacher quality is very important in determining student achievement (Hanushek and Wöβmann, 2007; Hanushek and Rivkin, 2006). Some teachers consistently produce more gains in student achievement than others. Based on a study in a single large urban district in the United States, Hanushek (1992) finds that a teacher near the top of the quality distribution range (95th percentile) will get a gain of 1½ grade-level equivalents in a year from his/her students whereas a low quality teacher (5th percentile) will only get a gain of one half of a grade-level equivalent. Not only are the effects of teacher quality large, they are cumulative (Sanders and Rivers, 1996). Having a succession of high quality teachers could substantially narrow the average achievement gap between students from low-income and high-income families (Hanushek, 2003; OECD, 2005b). Raising teaching quality is perhaps the policy direction most likely to lead to substantial gains in school performance (Hanushek, 2004).

The difficulty in raising teacher quality is that it does not seem to be closely related to most common teacher characteristics, such as education attainment (Hanushek and Wöβmann, 2007). In view of this difficulty, Hanushek and Wöβmann (2007) conclude that policy should focus on ensuring that institutions and incentives promote high quality education outcomes. In particular, giving schools autonomy to decide how to achieve education goals and holding educators responsible for outcomes enables school leaders to identify and promote high quality teaching. The effectiveness of such a process can be reinforced by providing high-quality teacher training and by strengthening school leadership.

Increasing autonomy in schools that are held accountable for outcomes

There is empirical evidence that increased autonomy in schools that are held accountable for outcomes contributes to improved student achievement.[28] Autonomy allows schools to make better use of local knowledge to improve student performance but also increases scope for opportunistic behaviour (Wöβmann, 2005, for this statement and the rest of the paragraph). The main decision areas concerned by this trade-off are teacher salaries and course contents. In decision areas where opportunistic behaviour is possible but local knowledge advantages are minor (school autonomy in budgeting; teacher influence on the subject matter to be covered in class; decisions on firing teachers; and teachers of a school collectively having a say on the curriculum to be taught), central exit exams result in school autonomy not having a negative effect on student performance.

Traditionally, German schools have had little autonomy. Schools have operated in a highly regulated environment: most of the rules of their operation are defined by higher authorities, and schools themselves have had relatively little impact on teaching programmes, personnel, or material resources (Halász *et al.*, 2004). Measured by the 2000 PISA index of school autonomy, German schools (3.9) have been less autonomous than the OECD average (5.0). New laws have come into effect giving schools greater autonomy and responsibility in the areas of school development, quality assurance, and evaluation. An important reform in this respect was the Civil Service Law Reform Act, 1997, which introduced "pay-for-performance" elements and new career paths where promotion is no longer based on seniority but on performance (*ibid.*); following a probationary period, teachers are civil servants in the old *Länder*. Greater use of financial incentives by school managers for good teaching based on adequate evaluation of performance could be an important instrument for raising teaching quality. There is evidence that monetary incentives for teachers based on their students' performance does improve student learning (Hanushek and Wöβmann, 2007; Vegas, 2005; Vegas and Umansky, 2005). Financial incentives for teachers based on

28. Wöβmann (2005) finds that school autonomy generally improves student performance in a system with centralised exit exams, which hold schools accountable for student achievement, but has the opposite effect in the absence of external exit exams.

their students' achievement appear to have been very effective in improving performance in Israel (Lavy, 2002, 2004) and in the United Kingdom (Atkinson *et al*., 2004).

Making educators more accountable

Germany has recently made considerable progress in clearly establishing high achievement goals for students. The *Kultusministerkonferenz* (KMK) agreed education standards for German schools in 2004 and evaluation instruments for ensuring compliance with these standards in 2006. The education standards have already been implemented in all *Länder*. The Institute for Quality Development in the Education System (*Institut zur Qualitätsentwicklung im Bildungswesen, IQB*) was established in 2004 to support the verification of these standards in schools and to further develop the standards. For the purposes of reviewing achievement of education standards on the basis of *Länder* random samples, the *IQB* has developed central testing procedures that conform to the technical and methodological standards of international comparison studies. In the primary school sector, the *Länder* comparisons in German and mathematics will be carried out at five-year intervals, tied to the PIRLS/IGLU[29] cycle, with the first such test occurring in 2011. In the lower secondary school sector, the *Land* comparison will be carried out in two subject groups - German, English and French; and mathematics, biology and chemistry – and will be tied to the relevant PISA cycle.[30] *Länder* comparisons will in future be made using these tests and not, as in the past, using the IGLU-E[31] or PISA-E formats. The key aims of education monitoring are to identify learning performance in education systems, to analyse the possible reasons for any unsatisfactory results and then to derive appropriate reform measures in education policy and administration. In the process, information about the education system will be closely linked to measures for instructional and quality improvement that can be applied in all schools.

The testing of random samples of students to check compliance with the national education standards described above holds each *Land* accountable for student outcomes. Accountability of individual schools and teaching staff is being strengthened through greater use of external exit exams centralised in each *Land*: all *Länder* but one (Rhineland-Palatinate) that did not already have such exams have either (re)introduced them (Brandenburg, 2005; Hamburg, 2005; Berlin, 2006; Lower Saxony, 2006; Bremen, 2007; Hesse, 2007; North-Rhine-Westphalia, 2007) or plan to do so (Schleswig-Holstein, 2008). These central exit exams concern both the school-leaving certificates at the end of lower secondary school and the *Abitur* higher education entrance qualification. This development is positive as empirical evidence suggests that some form of external accountability mechanism, such external exit exams, improves student achievement; such mechanisms do not, however, appear to have any significant effect on the impact of socio-economic backgrounds on outcomes.[32] Furthermore, comparative testing and other central test

29. *Internationale Grundschul-Lese-Untersuchung (IGLU)* is the German name for the Progress in International Reading Literacy Study (PIRLS).

30. This means that the first group of subjects will be examined for the first time in 2009, while the second group will be examined for the first time in 2012.

31. Extension (E) refers to the extension of the study from the national level to the *Land* level.

32. Wößmann (2005) finds that central exit exams improve student achievement as measured in three recent international student achievement tests: the 1996 Third International Mathematics and Science Study (TIMSS); the 1999 TIMSS-Repeat study; and the 2000 Programme for International Student Assessment (PISA) in reading, mathematics and science. This effect tends to increase with student ability, although it does not differ substantially for most measured family-background statistics. The effect of central exit exams increases during the course of secondary education, and regular standardised examinations have additional positive effects. Similarly, based on 2003 PISA data, Wößmann (2007) finds that central exit exams are associated with higher student performance but are not related to the equity of outcomes. This result holds for both the sample of the 16 German *Länder* and the wider sample also including OECD countries. Jürges, Schneider and Büchel (2005) and Bishop (1997) also find that education standards and

procedures are carried out for various age groups to test students' achievement levels. The primary aim of this testing is to support schools with large numbers of pupils who do not achieve adequate learning outcomes in terms of the applicable learning goals in order to help these schools to achieve better results in the future.

In view of the poor achievement of students at the lower end of the achievement distribution in Germany, it will be important to hold individual schools and teachers accountable for the progress of all students, including the weaker ones, and to provide the support needed to raise performance. Taking responsibility for students falling behind means providing the individualised tuition that is necessary to bring these students quickly up to the required level – as occurs in Finland[33] – rather than simply failing students or relegating them to a less demanding education track; repeating classes, which is generally recognised to be bad educational practice, remains frequent for weaker students in Germany (Prenzel *et al*., 2005). Schools with a relatively large proportion of weaker students would need to be given extra resources to be able to offer such services. Such measures would also enhance equality of education opportunity as weaker students tend to come from lower socio-economic and/or immigrant backgrounds.

Strengthening school leadership

School leadership has an important, though indirect effect on student learning (Leithwood *et al*., 2004; Marzano *et al*., 2005). School leadership significantly influences school climate, teaching and learning conditions, and school development. Until the early years of this decade, the German school principal was not commonly viewed as the leader of collective efforts of the teaching staff to achieve commonly agreed goals. Principals were often teachers with part-time administrative duties and were "rarely expected to lead processes like school development or school-based self-evaluation" (Halász *et al*., 2004, describing the situation in 2002). Since then, the role of school leaders in Germany has begun to change. New laws give schools greater autonomy and responsibility in the areas of school development, quality assurance, and evaluation. The perception that school leaders have of their role and their actual role have been changing significantly owing to their ability to influence their school's profile. The implementation of agreements on objectives between schools and school authorities and/or agencies for quality assurance and quality development has resulted in a higher degree of accountability of school principals. This development has obliged principals to focus on improving teaching quality. In light of these changes, requirement profiles for school principals now call for a greater management orientation. In addition to the traditional administrative tasks,[34] school principals must also focus on quality development and assurance and human-resource development. Various support arrangements are often available to help principals carry out their duties. These include that the responsible ministry of education and cultural

external exams help to improve student achievement. However, a multiple regression analysis of the 2006 PISA results for science failed to find a significant relationship between standards-based external examinations and average science scores (OECD, 2007a).

33. Processes and structures are in place within schools in Finland to identify when individual students are starting to fall behind, with interventions following to improve the child's performance. There are specialised teachers who coach small groups of students falling behind so as to bring back up to the required standard in regular classes quickly. Some 30% of students participate in such classes at one time or another.

34. These tasks include making instruction assignments, preparing schedules, supervisory plans and substitution plans and managing school administrative tasks, such as procuring teaching tools and equipment. The school principal must inform himself/herself about the work taking place in the various classes by visiting classrooms, reviewing pupils' written work. He/she participates in parents' and pupils' assemblies and is responsible for assuring that various regulations pertaining to compulsory education and health and to accident prevention are respected.

affairs (*Kultusministerium*) can request teachers to consult with special advisors who guide and support teachers in their professional duties.[35]

Improving initial teacher training[36]

Teacher training in Germany consists of two phases, both ending with an examination regulated by *Land* authorities. The first stage (3 to 4 years) is provided at universities while the second (1½ to 2 years) follows the dual model, being partly organised in schools as on-the-job training, and partly in non-university teacher training institutions ("Seminars"). During the second stage, trainee teachers work under the supervision of a mentor teacher. While this dual approach to initial teacher education is a major strength in helping entrants to the profession to improve their teaching practice, there may be scope to do better. Initial teacher education could be improved by linking the first and second phases together more closely and linking them both more closely to teachers' continuous professional development. A problem in this regard is that the institutions responsible for initial teacher education, induction and continuous training operate separately from each other, despite the efforts of several *Länder* to make them cooperate. Care will also be needed in implementing the Bologna Bachelors/Masters degree reforms to ensure that the dual approach to initial teacher education, which is a major strength of the German system, does not get downgraded.

Despite the focus on building practical skills, teacher training in Germany does not do enough to develop methodological skills and general teaching competencies. According to Halász *et al*. (2004), German teachers are not sufficiently prepared to develop students' learning competencies, to individualise teaching, to enhance self-regulated learning, or to organise learning in cooperative teams. Consistent with these observations, German students expressed low satisfaction in the PISA study with the support they receive from their teachers. In the context of increasing teachers' accountability for student outcomes (see above), it is vital that both initial teacher training and continuing education for teachers be adapted to overcome these weaknesses.

Reducing stratification in the school system

Germany's education system is highly stratified: it has three tracks into which students are sorted; first selection between tracks occurs early, at age 10, earlier than in any other OECD country except Austria, where first selection also occurs at age 10;[37] and the different tracks are mostly offered in separate school types, except in the new *Länder* and Rhineland-Palatinate where the lower- and middle ability tracks are offered in a single school type (similar arrangements will also apply in Hamburg and Schleswig-Holstein from 2008) – Annex 4.A1 describes the basic structure of the school system. Approximately 32% of students enter the grammar school (*Gymnasium*) track, which is for the most academically able students, 26% enter the *Realschule* track for students in the middle ability group, with a further 22% entering the *Hauptschule* track for the less academically able group, although there is considerable variation in these proportions across *Länder*. In addition, 8% of students enter comprehensive schools (*Integrierte Gesamtscule*), which offer courses leading to an unrestricted university entrance certificate (*Allgemeine*

35. Other forms of support are that the deputy school principal takes responsibility for ongoing tasks, and/or that some organisational and administrative tasks are assigned to individual teachers. In addition, some *Länder* have begun appointing administrative directors to schools.

36. This section is based on Halász *et al.* (2004).

37. First selection only occurs at age 12 in Berlin and Brandenburg. Based on a *Kultusministerkonferenz* (*KMK*) agreement, the other *Länder* have an "orientation period" in grades 5 and 6 (the first two years of secondary school, which follow the initial tracking decision) during which students can still decide which track to follow. Curricula are structured during this period to enable pupils with suitable achievement to make the transition into a different track.

Hochschulreife, as in a *Gymnasium*), a *Realschule* leaving certificate (*Mittlerer Schulabschluss*), or a *Hauptschule* leaving certificate, and a further 7% of students enter the two-track school type (*Schularten mit mehreren Bildungsgängen*) referred to above offering the *Hauptschule* and *Realschule* tracks, with remaining students mainly in special education facilities for students with special needs.

The first tracking decision in Germany does not predetermine a student's subsequent school career as he/she may change tracks at a later stage. According to data collected by the authorities, some 10% of 9th grade students in the 2004/05 school year were in a different track from their 5th grade track in 2000/01 (Bundesministerium für Bildung und Forschung, und Kultusminister Konferenz, 2006). Nevertheless, permeability is much more pronounced in terms of moving to a lower track than to a higher track: approximately 60% of the track changes between the 5th and 9th grades were classified as being downwards, while only 20% were classified as being upwards (the remaining movements could not be classified as up or down) (*ibid*). Nor does failure to enter the *Gymnasium* track preclude acquiring a higher education entrance qualification – it is possible for students from the *Hauptshule* and *Realschule* tracks to acquire higher education entrance qualifications. In 2006, of the 415 267 individuals who acquired a general or restricted higher education entrance qualification, 258 272 were graduates of general education courses whereas 156 993 graduated from vocational schools. Since the mid-1990s, the proportion of students who acquired a general higher education qualification in vocational education has increased in almost all *Länder* (overall, the proportion is 14%, although it is much higher in some *Länder*, particularly in Baden-Württemberg, where about one third of the students acquire a general higher education entrance qualification at *Berufliche Gymnasien*). Non-traditional pathways to acquire higher-level school leaving qualifications have also increased. In recent years, school leaving qualifications have tended to be much less linked to specific school types than in the past (*Bildung in Deutschland*, p. 76).

Selection into tracks is based on the teacher's assessment of his/her students' aptitudes, although these recommendations often can be overridden by parents. Such selection is intended to allocate the most academically able students to the *Gymnasium* track and the least academically able students to the *Hauptschule* track, which by and large is what happens. Nevertheless, socio-economic background has a large influence on whether or not children go to a *Gymnasium*, even after controlling for ability. Prenzel *et al*. (2005) find that after controlling for reading and mathematics scores in PISA, a child from the top quartile of socio-economic background is 4.0 times more likely to go to a *Gymnasium* than a child from the second lowest quartile of socio-economic background, on average in Germany; without controlling for achievement in PISA tests, the ratio is 6.9 (Table 1). This finding suggests that the process of selecting students according to teacher recommendations does not work very well. Spinath (2005) finds that diagnostic competencies among German teachers regarding primary school students (grades 1-4) are very poor. In addition, parents with more advantaged socio-economic characteristics may override teachers' recommendations more often to get their children into a more academically demanding track, notably the *Gymnasium* track. The fact that students are being selected to a large degree on the basis of their socio-economic background independently of their ability suggests that early tracking in Germany leads to the reproduction of social inequalities and, accordingly, to relatively low intergenerational social mobility.

Table 1. Odds of attending a grammar school in the *Länder* by socio-economic background
ESCS[1]

	75-100% - Quartile		50-75% - Quartile		25-50% - Quartile		0-25% - Quartile	
	Model I	Model II	Model I	Model II	Model I	Model II	Model 1	Model II
Bavaria	7.77	6.65	2.35	2.06	1	1	0.51	0.93
Saxony-Anhalt	10.44	6.16	2.76	2.30	1	1	0.39	0.68
Rhineland-Palatinate	8.28	4.60	2.68	2.03	1	1	0.37	0.61
Baden-Wurttemberg	8.41	4.40	2.57	1.94	1	1	0.35	0.65
North Rhine-Westphalia	8.07	4.35	2.57	2.04	1	1	0.28	0.61
Hamburg	7.53	3.55	1.89	1.63	1	1	0.30	0.53
Saarland	6.71	3.48	2.28	1.51	1	1	0.35	0.57
Mecklenburg-W. Pomerania	7.96	3.47	2.24	1.58	1	1	0.31	0.50
Thuringia	5.13	3.23	2.34	2.53	1	1	0.36	0.56
Schleswig-Holstein	6.24	2.88	1.85	1.25	1	1	0.23	0.45
Bremen	9.06	2.83	2.32	1.39	1	1	0.55	1.05
Saxony	4.49	2.79	2.19	1.72	1	1	0.36	0.69
Hesse	5.70	2.71	2.38	1.55	1	1	0.50	0.81
Berlin	4.45	2.67	1.77	1.57	1	1	0.34	0.79
Lower Saxony	6.45	2.63	2.24	1.52	1	1	0.40	0.73
Brandenburg	3.71	2.38	1.72	1.70	1	1	0.44	0.84
Germany	6.87	4.01	2.30	1.79	1	1	0.37	0.68

Model I = Without controlling for PISA reading and mathematics scores.

Model II = Controlling for PISA reading and mathematics scores.

Note: ESCS is the PISA index of economic, social and cultural status. Its derivation is described in footnote 4 of the main text.

Source: Prenzel *et al*. (2005), *PISA 2003, Der zweite Vergleich der Länder in Deutschland – Was wissen und können Jugendliche?*, Waxmann, Münster.

Based on a multilevel regression analysis of the 2006 PISA science results, early tracking increases the impact of socio-economic background on student achievement but has no effect on average scores (OECD, 2007a, Box 5.2).[38] In a review of the empirical literature, Meier and Schütz (2007) reach the same conclusions, namely that early tracking reduces the equality of education opportunities but does not have a significant effect on average achievement.[39] Hence, there does not appear to be a trade-off between efficiency and equity from reducing the intensity of tracking. Concomitantly, this result suggests that the gains in teaching efficiency from having more homogenous classes in an early tracking system are offset by the adverse effects on lower ability students of being separated from more able students.[40]

38. The early tracking variables included in the analysis were: system with early selection (each additional year between the first age of selection and the age of 15); and system-level number of school types or distinct educational programmes available to 15-year olds. The following demographic and socio-economic background factors were included in the analysis at the student level – the PISA index of economic, social and cultural status of the student, gender, students' and parents' country of birth and the language spoken at home —, at the school level – the socio-economic intake of the school, the school location and the school size – and at the country level – the national average economic, social and cultural status.

39. However, Waldinger (2006) finds that early tracking does not have a significant effect on equality of education opportunity based on 2003 PISA scores. While socio-economic background has a significantly greater effect on 2003 PISA achievement in early-tracking countries, he finds that this inequality of education opportunity was already present before tracking occurs. A drawback of this study, however, is the relatively small sample of countries included (Meier and Schütz, 2007).

40. Education entails joint production, with the abilities of all students in a class entering as factors of production. High ability students are able to support classmates in learning. Such students may also

There is also evidence that inequality of achievement tends to increase in tracked school systems between the primary and secondary levels, with the effect being particularly marked in Germany (Hanushek and Wöβmann, 2005). Wöβmann (2007) finds that the intensity of tracking is positively associated with inequality of opportunity across German *Länder*, whether this effect is measured by the number of tracks or the proportion of students attending the lowest exiting track in a *Land* (reflecting the exclusion of low-performing students from the mainstream), and that delayed tracking is negatively related with the inequality of education opportunity.[41] Furthermore, there is evidence that early tracking increases the impact of socio-economic background on labour-market outcomes, notably by increasing the influence of socio-economic background on attaining a tertiary education qualification (Brunello and Checchi, 2006[42]; Meghir and Palme, 2005[43]).

Expectations of continuing to theoretical higher education given PISA maths scores are more dependent on socio-economic background in Germany than in most other OECD countries (OECD, 2007c, Table A4.4; see OECD (2006) for more information about these and the other estimates discussed in this paragraph).[44] This could reflect that children from lower socio-economic backgrounds have already been placed in education tracks that diminish such education expectations, despite their ability to profit from higher education. Second-generation immigrants overall are much less likely to expect to continue to theoretical tertiary education, although this is not so for some ethnic groups. However, controlling for socio-economic background and maths scores, immigrant children are much more likely to expect to continue to such education than native children. This result points to high motivation and positive attitudes to education among immigrant children.

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stimulate others and themselves to make greater efforts. Moreover, expectations for achievement are likely to be higher in a class with more able students. On the other hand, weaker students are more likely to disrupt the learning process. In a tracked education system, these peer group effects would tend to be positive for higher ability students, who are separated from weaker students, and negative for lower ability students. The fact that the overall impact of early tracking on achievement is insignificant despite the production efficiencies associated with having more homogenous classes suggests that the adverse peer group effects on weaker students outweigh the positive effects on more able students.

41. Wöβmann (2007) did not find any significant difference in the equity of student outcomes between the four *Länder* with the so called orientation period and those with tracking at age 10; nor did he find any significant difference in the efficiency of student outcomes between these two groups of *Länder*.

42. Brunello and Checchi (2006) find that early tracking increases the impact of socio-economic background on education attainment and on earnings of 20-24 year olds but reduces the impact of this factor on adult literacy and on access to training. These results suggest that the reinforcing effect of socio-economic background on attainment in early tracking systems outweighs the favourable reinforcing effects on adult literacy and access to training. The authors confirm the results in other empirical literature that show that early tracking increases the impact of socio-economic background on reading achievement in the PISA study, indicating that early tracking reduces the impact of socio-economic background on literacy between the ages of 15 and 20-24.

43. In a study of the Swedish education reform in the 1950s that abolished early tracking, extended compulsory schooling, and introduced a national curriculum, Meghir and Palme (2005) find that the reform increased education attainment of individuals with unskilled fathers, with the effect being particularly strong for the more able students. Earnings for individuals with unskilled fathers increased significantly. However, earnings of individuals with skilled fathers declined, suggesting that the quality of education for this group, which formerly attended the academic track, declined, and/or that they were subject to more competition in the labour market from the children of unskilled fathers.

44. This paragraph is based on OECD (2007c, Indicator A4). Note that an odds ratio in OECD (2007c, Tables A4.4 and A4.5) greater than one means that students from a high socio-economic background or immigrant background, respectively, are more likely to expect to complete university studies than students with a low socio-economic background and/or native background.

In view of the findings of the empirical literature on the effects of early tracking, *Länder* governments could reduce the intergenerational transmission of inequality by reducing the degree of early tracking in their education systems.[45] Some suggestions for doing so are discussed in the remainder of this section.

Delaying the first tracking decision

A problem with making the tracking decision at a young age is that there is an increased risk of making a mistake in measuring true ability, and hence of assigning a child to the wrong track. This is so because ability is only revealed gradually and there are large differences in maturity amongst younger children (Meier and Schütz, 2007); indeed, younger children in a class are more frequently upgraded following an earlier tracking decision (Puhani and Weber, 2007). Making the tracking decision at a younger age increases the influence of socio-economic background on the placement decision; for example, Bauer and Riphahn (2006), using data for the 26 Swiss cantons, find that making the tracking decision early greatly increases the advantage of children with highly educated parents in being placed in the academic education track. Younger children are more dependent on their parents and parental resources than older children (OECD, 2005c). It is interesting to note that, controlling for reading and mathematics performance in PISA tests, a child from the top quartile of socio-economic background is only 2.4 and 2.7 times more likely to attend a *Gymnasium* than a child from the second quartile of socio-economic background in Brandenburg and Berlin, respectively, these being the two *Länder* that delay the first tracking decision until age 12, compared with a Germany wide average of 4.0 (see Table 1). Other *Länder* wanting to reduce the intergenerational transmission of socio-economic inequality should also consider raising the age of first selection. At least for the four *Länder* that have a two-year orientation period before the tracking decision becomes final, this would not represent a major organisational change – curricula during this two year period are already common. Permeability between education tracks should also be increased so that tracking decisions that do not reflect a child's subsequently revealed academic ability can be more easily corrected. As noted above, most transfers between education tracks are currently to a less academically demanding track.

Combining the Hauptschule and Realschule tracks in one school type

As noted above, some *Länder* (the new eastern *Länder* and Rhineland-Palatinate) have adopted two-school type systems or are moving towards such an arrangement (Hamburg and Schleswig-Holstein) in which the tracks leading to the *Hauptschule* leaving certificate and *Realschule* leaving certificate are offered in one school type, with the other school type being the *Gymnasium* (grammar school). Such an arrangement reduces socio-economic segregation between schools and avoids the risk of very weak students being grouped together in a single school type (*Hauptschule*) with low achievement expectations. By so doing, these arrangements tend to reduce the impact of socio-economic background on student achievement. Other *Länder* wishing to reduce the impact of socio-economic background on education outcomes should consider such a reform, especially where the proportion of students attending the *Hauptschule* track is low (say less than 25%), representing a rump of poor performance and low expectations. Some other countries with similar early tracking education systems (Luxembourg, the Slovak Republic) are encouraging similar reforms.

Making tertiary education more attractive and responsive to labour market requirements

There are factors on both the demand and supply sides of the market for tertiary education that contribute to explaining the relatively low new[46] tertiary graduation rate in Germany. Based on a panel

45. "Thus, in tracked systems the final school degrees of parents and their rank in the wage distribution will to a higher extent be mirrored in the achievements of their children", Meier and Schütz, 2007, based on: Dustmann, 2004; Bauer and Riphahn, 2006; and Pekkarinen *et al*., 2006.

regression analysis for OECD countries, Martins *et al*. (2007) find that new tertiary graduation rates as a share of the population aged 20-29 are positively related to internal rates of return on tertiary education (a demand factor) and to tertiary education supply flexibility/accountability (summarised in the Composite Supply Indicator for Tertiary Education, STE – the coverage of the indicator is outlined in Annex 4.A2)[47] but negatively related to liquidity constraints (another demand factor). Germany stands out as having low internal rates of return (Figure 9) and low university supply flexibility as summarised by the STE indicator (Figure 10); liquidity constraints in Germany are relatively low. The main factors giving rise to the low internal rates of return on tertiary education in Germany found in this study are low gross wage premiums per year of tertiary education, a relatively progressive income tax system (*ibid.*, Box 2, Figure A for both gross and net wage premiums per year of tertiary education), long study programmes, and high gross out-of-work replacement rates (reducing the value of the lower probability of being unemployed for tertiary graduates) (Martins *et al.*, Box 2, Figure B). German universities have little flexibility or autonomy concerning either inputs or outputs, lowering the STE indicator; these effects are partly attenuated by above OECD average accountability requirements (see Figure 10). The low input flexibility reflects low autonomy in selecting students; autonomy in the areas of budgets and staff policy is around the OECD average. The low output flexibility reflects *numerus clausus* provisions,[48] the limited supply of short programmes (maximum duration 3 years), low regional mobility of students, and limited autonomy of institutions in setting course content. Accountability is average in terms of funding rules but slightly above average in terms of evaluation of outputs.

Strengthening the demand for tertiary education

From the information on internal rates of return on tertiary education and on relative earnings (see above), it can be deduced that it is the internal rate of return per year of tertiary-type-A education that is low by international comparison: tertiary-type-B earnings relative to upper secondary earnings are quite high in Germany, while programme length is similar to that in other countries (by definition, tertiary-type-B programmes last less than three years). This would concord with the tertiary-type-A graduate rate being low by international comparison but the tertiary-type-B graduation rate being around the OECD average (see Figure 6). It is also consistent with the observation that many students who are qualified to enter tertiary-type-A programmes do not in fact do so – after five years, only 75% of persons with such

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46. Graduates are only counted the first time they graduate. Graduation from subsequent degrees is not counted again. This is to increase comparability between countries having long degree programmes, which deliver few degrees to a graduate, and countries having shorter modular programmes, which deliver more degrees to a graduate. Thus, the share of graduates in the population aged 20-29 is being measured rather than the ratio of graduations to this age group.

47. The three main sub-categories of institutional features covered by the STE indicator are:

- *Input flexibility*, which comprises the criteria for the selection of students, institutional autonomy to decide on the sources and structure of funding and staff policy;
- *Output flexibility*, which includes the possibility to decide on course content, product diversity (short-term, part-time, distance learning), regional restrictions on access to universities (captured by the degree of regional mobility of students), and *numerus clausus* provisions; and
- *Accountability*, which covers features of the type of evaluation and its public availability and of funding (output based, grandfathering, inputs based, and the types of private entities that provide funding) Martins *et al.* (2007).

48. *Numerus clausus* provisions restrict the number of entrants to certain programmes of study to a lower level than the number of applicants. The only nationwide *numerus clausus* provisions are in medicine and psychology.

qualifications have entered tertiary-A programmes, with this proportion being particularly low (50%) for students with a restricted university entrance certificate (*Fachhochschulreife*).[49] Many of these students are undoubtedly attracted to tertiary-type-B programmes by their relatively favourable internal rates of return. Another factor underlying the choice of some of these students not to enter a university of applied science (*Fachhochschule*) is that they find such good career options in the dual system that they do not feel the need to go on to tertiary education, at least within five years of gaining their *Fachhochschulreife*: companies are eager to hire such persons and offer them opportunities to rise to management positions without having a university education.[50]

The move to the two-tier (Bachelors/Masters degree) Bologna system, which now covers about 60% of university programmes and should cover almost all of them by 2010, should help to increase internal rates of return on university education by shortening programmes, focusing them on occupational qualifications (along with scientific foundations and methodological competence), and reducing dropout rates (by enabling students to interrupt or terminate their studies after a Bachelors degree without being classified as a dropout). The social partners influence the content of the new degree programmes in the context of accrediting them, making them more labour-market relevant.[51] This makes graduates more attractive to employers. The fact that the programmes are shorter reinforces this attraction as graduates are able to start gaining work experience and adapting to business culture at an earlier age, when such induction may be more efficient.

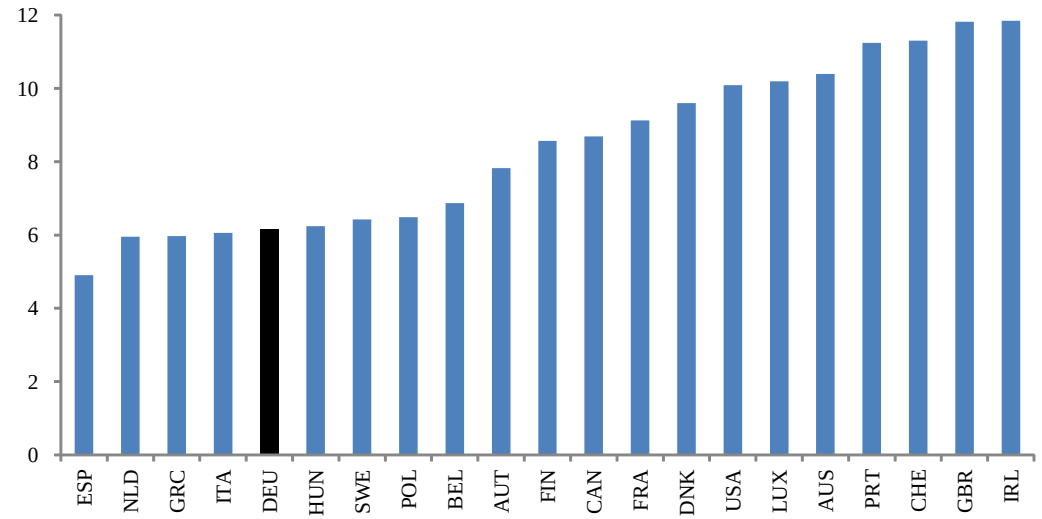
49. The *Fachhochschulreife* gives access to a university of applied sciences (*Fachhochschule*). *Fachhochschule* is a type of higher education institution established in the 1970s that has the particular function of providing application-oriented teaching and research, particularly in the fields of engineering, business, administration, social services, and design.

50. According to the 2007 *Vocational Training Report*, 10.3% of persons with a higher education entrance qualification commenced a dual vocational programme in 2005.

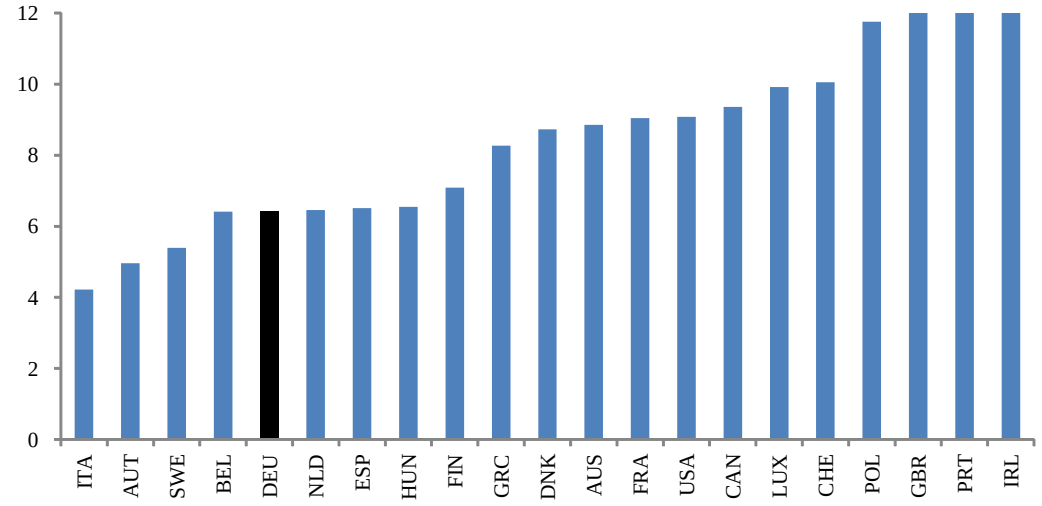
51. The quality assurance system in Germany has been expanded in the context of the introduction of the Bologna system. This was positively assessed in the 2007 Stocktaking of progress by European countries in implementing the system.

Figure 9. Estimates of the internal rates of return to tertiary education
Per cent

Men



Women

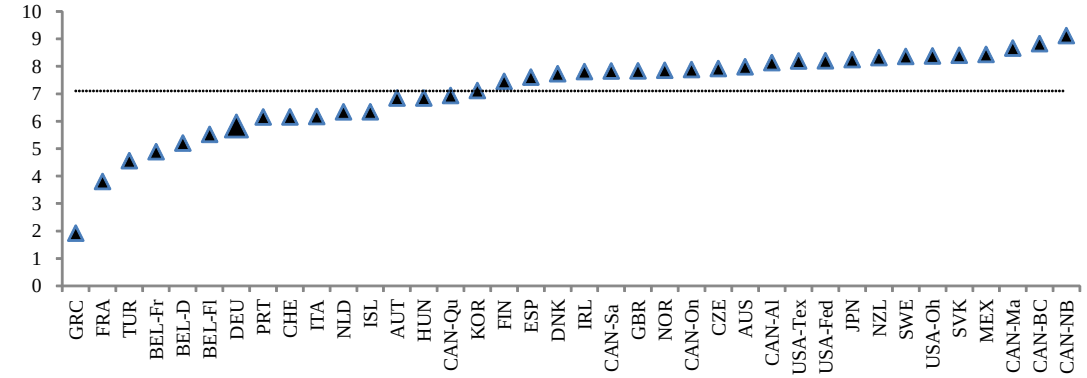


Note: Uniform labour productivity growth across countries assumed to be 1.75% per year. Data is for 2001 except Poland and Switzerland: 2000 and Hungary: 1997.

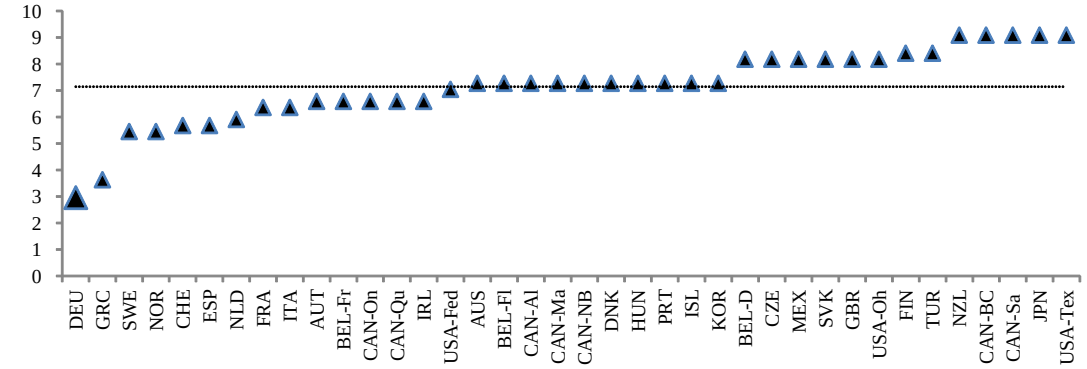
Source: Martins *et al.* (2007), "The Policy Determinants of Investment in Tertiary Education", *Economics Department Working Paper* No. 576, OECD, Paris.

Figure 10. Tertiary education supply indicator by category, 2005-06
Increasing flexibility or accountability indicated from 0 to 10, dotted line is average

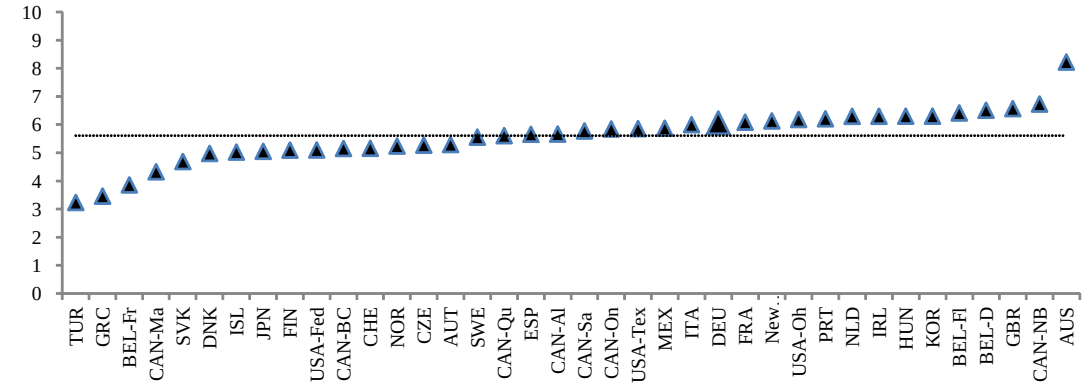
Input flexibility



Supply flexibility



Accountability



Note: Accountability for USA-Fed is indicative as federal funds only account for a small share of total funding of tertiary education institutions.
Codes for the regions or states of Belgium, Canada and USA are in the Glossary.

Source: Martins *et al.* (2007), "The Policy Determinants of Investment in Tertiary Education", *Economics Department Working Papers,* No. 576, OECD, Paris.

The impact of the Bologna system reforms on rates of return from *Fachhochschulen* (universities of applied sciences) degrees is likely to be less marked than for other university-level degrees as the *Fachhochschulen* degrees were already relatively short and occupationally oriented. Nevertheless, they have been upgraded to bring them into line with a Bachelors/Masters schema. This upgrading would appear to meet employers' demands for graduates in occupationally-oriented disciplines with a higher level of education that is nevertheless completed at a relatively young age. By better meeting employers' demands, the internal rate of return on *Fachhochschulen* degrees might also be expected to rise, increasing demand for such education, notably from secondary school graduates with a *Fachhochschulreife*. On the other hand, the fact that the Bologna reforms are making degree programmes in general universities shorter and more occupationally oriented could reduce the relative attractiveness of *Fachhochschulen*.[52]

As noted above, the other factors that depress the internal rate of return on tertiary education in Germany are the relatively progressive income tax system and high out-of-work benefits. Policies in these areas depend on many other factors than incentives to acquire tertiary education. The fact that these policies nevertheless also affect tertiary-education incentives suggests that this factor should also be taken into account when making decisions in these areas. The *Hartz* reforms that reduced the generosity of unemployment benefits in recent years were rightly aimed principally at reducing long-term unemployment and inactivity. But they also increased incentives to acquire tertiary qualifications as tertiary graduates have a lower risk of unemployment than other persons. This factor has not been taken into account in the estimates of internal rates of return on tertiary education presented above because they relate to 2001, before the *Hartz* reforms came into effect. Future decisions about the appropriate degree of progressivity in the income tax system should take the impact of this factor on incentives to acquire tertiary qualifications into account, amongst other effects.

Making supply of tertiary education more responsive to demand

Input flexibility is being increased in some *Länder* by giving universities the right to select students; this measure should also contribute to reducing dropout rates, raising expected internal rates of return on tertiary education. Another measure that is increasing input flexibility is that universities in some *Länder* have recently been given the right to set tuition fees.[53] A constitutional constraint in setting these fees is that they must not result in some students being excluded because they cannot afford the fees. This requirement has been satisfied by setting fees for full-time students at a low level (€ 300-500 per semester) and providing student loans. The *Länder* that have not already increased their universities' input flexibility should consider doing so.

Output flexibility is being increased by the introduction of shorter courses in the context of the Bologna system, as discussed above, and by further easing of *numerus clausus* restrictions. To assist the *Länder* to reduce *numerus clausus* restrictions, the federal government has entered into the "Higher Education Pact 2020" ("*Hochschulpakt 2020*") with them in order to expand the number of study places.[54]

52. Another factor that may increase the rate of return on general university programmes relative to *Fachhochschulen* programmes is the shortening of *Gymnasium* programmes from nine years to eight years, giving graduates an extra year to amortise their education investments; presently, one year less of study is normally required to obtain the *Fachhochschulreife* than the *Allgemeine Hochschulreife*. The first students from the shorter *Gymnasium* programme will graduate from secondary school in 2010.

53. None of the new *Länder* has given its universities the right to levy tuition fees on full-time students. This approach has been taken to attract students and reflects a concern to maintain student numbers in coming years in the face of very adverse demographic trends.

54. The federal government and the *Länder* are sharing the relevant costs – the cost to the federal government is € 565 million for the years up to 2010.

The aim is to increase university entry rates to 40% of a cohort (from around 30% presently). Special attention is to be given to increasing the number of new students in universities of applied sciences (*Fachhochschulen*), which train a large proportion of the country's engineers.

A constraint on there being an adequate number of university places in Germany is that they are mainly financed by the *Länder* in which they are located without there being a compensation mechanism for students attending university outside their home *Land*. In these circumstances, there is an incentive for *Länder* to restrict the number of university places (especially for students from other *Länder*). The Rhineland-Palatinate government recently proposed a formula to the *Kultusministerkonferenz* for providing partial compensation for these costs.[55] However this solution does not address the free-rider problem that the *Land* that finances a graduate's university education is not necessarily the same one that receives taxes on his/her subsequent earnings. *Länder* with net immigration of high-skilled workers, notably Bavaria, benefit greatly from the current arrangements and would continue to do so if the Rhineland-Palatinate government's proposal were implemented, although this benefit is diminished through fiscal equalisation; as a net contributor to the fiscal equalisation system, Bavaria only keeps about 40% of extra tax receipts. A preferable solution to these free-rider problems could be for universities to charge notional tuition fees on a cost recovery basis with repayment of these fees being made out of tax revenue in the *Land* where the graduate subsequently works.

Concerning accountability, the *Länder* have been reforming university financing, most of which they provide, to strengthen incentives for improved performance. Global budgets, along with increasingly merit-oriented funding allocations – including within universities – and merit-oriented salary structures for university teachers are being adopted. In this way, university autonomy is being increased. Nevertheless, the proportion of funding competitively allocated remains low in some *Länder*. Through the "Excellence Initiative", the federal government awards extra funds to the universities with the highest quality research.[56]

Improving access to university studies for persons from lower socio-economic backgrounds

The federal government together with the *Länder* finance a variety of programmes to improve access to university studies of persons from less favourable socio-economic backgrounds. In particular, funding is provided to students subject to parents' income under the Federal Education and Training Assistance Act (*BAföG*), which is also available for other forms of education and vocational training at school. Such funding is provided as a subsidy if school training is concerned and as half subsidy and half loan (up to a maximum amount for the loan of € 10 000) in the tertiary sector. Following the 2001 *BAföG* reform, the proportion of *BAföG* recipients among students grew to 25% (2000: 21%). The average funding amount provided was increased to € 375 (2000: € 326).[57] The recent amendment Act increases the amount of individual support significantly (10% or more) from autumn 2008 and will also increase the number of students supported (the proportion of students receiving *BAföG* support is expected to rise to 28% by the end of 2009). Besides the *BAföG* support, the federal "*KfW-Förderbank*" offers bank loans for all students.

55. Under these arrangements, Berlin would receive the greatest amount of compensation while Brandenburg would have to pay the most.

56. The Excellence Initiative aims to strengthen science and research in Germany in the long term, improve its international competitiveness and raise the profile of the top performers in academia and research. Two of the three universities so far rewarded are in Munich. It would appear that greater funding and higher quality university appointments than in the rest of Germany have contributed to this success. In addition, the top performers have had a greater influence on university management decisions in Bavaria than in other parts of Germany.

57. The maximum debt level resulting from *BAföG* support has been limited to € 10 000 per individual.

These are not means tested (so called "*Studienkredit*") and are designed as an additional option for individual study financing, but not as part of social benefits. In some *Länder*, students in special social hardship situations are supported via students' associations (*Studentenwerke*), and by universities themselves, with loans of various sizes. In addition, a range of foundations – both at the federal and local levels, the latter mostly being smaller and private - also support gifted students, the aim being to provide stipends to the most talented 1% of students (*Begabtenförderungswerke*). While all of these measures are helpful, the most effective approach to improving access to university studies of persons from lower socio-economic backgrounds is to reduce the impact of socio-economic background on achievement at earlier stages of education. Much is being done by German education authorities in this respect, and there remain considerable possibilities to build on these reforms, as discussed in the earlier sections of this chapter.

Box 2. Policy recommendations to improve education outcomes

Increase participation in early childhood care and education (ECEC) and enhance its quality by:

- pilot-testing programmes aimed at compensating very young children from disadvantaged backgrounds for lacuna in their home environments, which hinder the development of their abilities;
- developing common funding standards across localities that ensure more equitable treatment of children from socially disadvantaged backgrounds;
- upgrading training of educators in ECEC to the tertiary level, preferably at the university level, and providing more specialised training for educators of very young children (aged less than 3);
- rethinking the payment of a monthly fee to parents who look after their children themselves instead of placing them in a childcare facility, as is currently being considered;
- identifying strategies to raise participation of children from lower socio-economic backgrounds in kindergarten from age 3 onwards; and
- improving the quality of all-day kindergarten programmes.

Improve teacher quality by:

- holding individual schools and teachers accountable for the progress of all students and putting in place the structures needed to support this development;
- making greater use of financial incentives for good teaching in schools that are held accountable for outcomes based on adequate evaluation of performance;
- developing school principals as more effective leaders; and
- focusing teacher training more on developing methodological skills and general teaching competencies.

Reduce stratification in the school system by:

- delaying the first tracking decision until after age 10, the age at which this decision currently occurs in most *Länder*;
- offering the *Hauptschule* and *Realschule* tracks in one school type; and
- increasing permeability between education tracks in practice

Make tertiary education more attractive and responsive to labour-market requirements by:

- increasing universities' input flexibility, including by allowing them to charge tuition fees (and introducing loans with income-contingent repayments to ensure that students are not excluded for liquidity reasons) where this is not already the case; and
- overcoming the free-rider problem between *Länder* in the financing of university education by charging notional tuition fees on a cost recovery basis that are repaid out of tax receipts in the *Land* where the graduate subsequently works.

Bibliography

Aktionsrat Bildung (2007), Bildungsgerechtigkeit. Jahresgutachten 2007. Vereinigung der Bayerischen Wirtschaft e.V. (ed.), VS Verlag für Sozialwissenschaften, GWV Fachverlage GmbH, Wiesbaden.

Allington, R. L. and P. H. Johnston (2000), "What Do We Know About Effective Fourth Grade Teachers and Their Classrooms?" *CELA Research Report 13010*, National Center on English Learning and Achievement, Albany, New York.

Ammermueller, A. (2007), "Poor Background or Low Returns? Why Immigrant Students in Germany Perform so Poorly in the Programme for International Student Assessment", *Education Economics*, Vol. 15, No. 2, pp. 215-230, June 2007.

Atkinson, A., S. Burgess, B. Croxson, P. Gregg, C. Propper, H. Slater, and D. Wilson (2004), "Evaluating the Impact of Performance-related Pay for Teachers in England", *CMPO Working Paper 04/113*, University of Bristol, December.

Barber, M. and M. Mourshed (2007), *How the World's Best Performing School Systems Come Out on Top*, McKinsey and Company.

Bauer, P. and R. T. Riphahn (2006), "Timing of School Tracking as a Determinant of Intergenerational Transmission of Education", *Economics Letters 91*, pp. 90-97.

Bishop, J. H. (1997), "The Effect of National Standards and Curriculum-Based Exams on Achievement", *American Economic Review 87(2)*, pp. 260-264

Brooks-Gunn, J. (2003), "Do You Believe in Magic? What We Can Expect from Early Childhood Intervention Programs", *Social Policy Report*, XVII (1), pp. 3-7.

Brunello, G. and D. Checchi (2006), "Does School Tracking Affect Equality of Opportunity? New International Evidence", *IZA Discussion Paper* No. 2348, Bonn.

Bundesministerium für Bildung und Forschung (BMBF) (2004), Die wirtschaftliche und soziale Lage der Studierenden in der Bundesrepublik Deutschland 2003. 17, Sozialerhebung des Deutschen Studentenwerks durchgeführt durch HIS Hochschul-Informations-System, Bonn.

Bundesministerium für Bildung und Forschung, und Kultusminister Konferenz (2006), *Bildung in Deutschland.*

Bundesministerium für Familie, Senioren, Frauen und Jugend (Federal Ministry for Family Affairs), Senior Citizens, Women and Youth (2004), *OECD Early Childhood Policy Review 2002-2004, Background Report Germany.*

Carneiro, P. and J. Heckman (2003), "Human Capital Policy", *Working Paper 9495*, National Bureau of Economic Research, Cambridge, MA.

Clotfelter, C., H. Ladd, and J. Vigdor (2006), "Teacher-Student Matching and the Assessment of Teacher Effectiveness", *Working Paper No. 11936*, National Bureau of Economic Research, Cambridge, MA.

Clotfelter, C., H. Ladd, and J. Vigdor (2007), "How and Why Do Teacher Credentials Matter for Student Achievement", *Working Paper No. 12828*, National Bureau of Economic Research, Cambridge, MA.

Cunha, F., J.J. Heckman, L.J. Lochner, and D.V. Masterov (2006), "Interpreting the Evidence on Life Cycle Skill Formation", in: E.A. Hanushek and F. Welch (eds.), *Handbook of the Economics of Education*, North-Holland, Amsterdam.

Dahl, R. E. (2004), "Adolescent Brain Development: A Period of Vulnerabilities and Opportunities", in: R.E. Dahl and L.P. Spear (Eds.), *Annals of the New York Academy of Sciences*, New York Academy of Sciences, New York.

Dustmann, C. (2004), "Parental Background, Secondary School Track Choice, and Wages", *Oxford Economic Papers 56*, pp. 209-230.

Halász, G., P. Santiago, M. Ekholm, P. Matthews, and P. McKenzie (2004), *Attracting, Developing and Retaining Effective Teachers, Country Note: Germany*, OECD, Paris.

Hanushek, E. (2002), "Publicly Provided Education", in: A. Auerbach and M. Feldstein (eds.), *Handbook of Public Economics*, Vol. 4, Elsevier, Amsterdam.

Hanushek, E. (2003), "The Failure of Input-Based Schooling Policies", *The Economic Journal*, Vol. 113, pp. 64-98.

Hanushek, E. A., and L. Wöβmann (2005), "Does Educational Tracking Affect Performance and Inequality? Differences in Differences Evidence across Countries", *Working Paper No. 11124*, National Bureau of Economic Research, Cambridge, MA.

Hanushek, E. A., and L. Wöβmann (2007), "The Role of School Improvement in Economic Development", *CESifo Working Paper No. 1911*, February.

Heckman, J. J. and D. V. Masterov (2007), "The Productivity Argument for Investing in Young Children", *Working Paper No. 13016*, National Bureau of Economic Research, Cambridge, MA.

Immervoll, H. and D. Barber (2005), "Can Parents Afford to Work? Childcare Costs, Tax-benefit Policies and Work Incentives", *OECD Social, Employment and Migration Working Papers*, No. 31, OECD, Paris.

Jürges, H., K. Schneider and F. Büchel (2005), "The Effect of Central Exit Examinations on Student Achievement: Quasi-Experimental Evidence from TIMSS Germany", *Journal of the European Economic Association 3(5)*, pp. 1131-1155.

Landvoigt, T., G. Muehler, and F. Pfeiffer (2007), "Duration and Intensity of Kindergarten Attendance and Secondary School Track Choice", *ZEW Discussion Paper No. 07-051*, July.

Lavy, V. (2002), "Evaluating the Effect of Teachers' Group Performance Incentives on Pupil Achievement", *Journal of Political Economy 110*, No. 6, pp. 1286-1317, December.

Lavy, V. (2004), "Performance Pay and Teachers' Effort, Productivity and Grading Ethics, *NBER Working Paper 10622*.

Leithwood, K., L. Seashore, K., S. Anderson and K. Wahlstrom (2004), *How Leadership Influences Student Learning*, Wallace Foundation, New York.

Martins, J., R. Boarini, H. Strauss, C. de Maisonneuve and C. Saadi (2007), "The Policy Determinants of Tertiary Education", *OECD Economics Department Working Papers*, No. 576, OECD, Paris.

Marzano, R., T. Waters and B. McNulty (2005), *School Leadership That Works*, Association for Supervision and Curriculum Development, Alexandria, VA.

Meghir, C. and M. Palme (2005), "Educational Reform, Ability and Family Background", *American Economic Review 95*, pp. 414-424.

Meier, V. and G. Schütz (2007), "The Economics of Tracking and Non-Tracking", *Ifo Working Paper No. 50*, Munich.

OECD (2004a), *Learning for Tomorrow's World: First Results from PISA 2003*, OECD, Paris.

OECD (2004b), *OECD Country Note: Early Childhood Education and Care Policy in The Federal Republic of Germany*, OECD, Paris.

OECD (2005a), *Promoting Adult Learning*, OECD, Paris.

OECD (2005b), *Teachers Matter: Attracting, Developing and Retaining Effective Teachers*, OECD, Paris.

OECD (2005c), *Education at a Glance: OECD Indicators*, OECD, Paris.

OECD (2006), *Where Immigrant Students Succeed – A Comparative Review of Performance and Engagement in PISA 2003*, OECD, Paris.

OECD (2007a), *PISA 2006: Science Competencies for Tomorrow's World*, Vol. 1, Analysis, OECD, Paris.

OECD (2007b), *PISA 2006*, Vol. 2: Data, OECD, Paris.

OECD (2007c), *Education at a Glance: OECD Indicators*, OECD, Paris.

OECD (2008), *OECD Economic Surveys: Germany*, OECD, Paris.

Pekkarinen, T., R. Uusitalo and S. Pekkala (2006), "Education Policy and Intergenerational Income Mobility: Evidence from the Finnish Comprehensive School Reform", *IZA Discussion Paper No. 2204*, Bonn.

Puhani, P. A., and A. M. Weber (2007), *How Persistent is the Age of School Entry Effect in a System of Flexible Tracking?* University of Hannover, mimeo.

Prenzel, M., J. Baumert, W. Blum, R. Lehmann, D. Leutner, M. Neubrand, R. Pekrun, J. Rost, and U. Schiefele (Hrsg.) (2005), *PISA 2003: Ergebnisse des zweiten Ländervergleichs Zusammenfassung*, PISA-Konsortium Deutschland.

Rutter, M. (2006), *Genes and Behaviour: Nature-Nurture Interplay Explained*, Blackwell Publishers, Oxford, UK.

Rutter, M., T. E. Moffitt, and A. Caspi (2006), "Gene-environment Interplay and Psychology: Multiple Varieties But Real Effects", *Journal of Child Psychology and Psychiatry 47 (3/4)*, pp. 226-261.

Sanders W. and J. Rivers (1996), "Cumulative and Residual Effects of Teachers on Future Student Academic Achievement", Research Progress Report, University of Tennessee Value-Added Research and Assessment Center, Knoxville, TN.

Schuerger, J. M. and A. C. Witt (1989), "The Temporal Stability of Individually Tested Intelligence", *Journal of Clinical Psychology*, 45, pp. 294-302.

Vegas, E. (ed.) (2005), *Incentives to Improve Teaching: Lessons from Latin America,* The World Bank.

Vegas, E. and L. Umansky (2005), *Improving Teaching and Learning through Effective Incentives: What Can we Learn from Education Reforms in Latin America?,* The World Bank.

Waldinger, F. (2006), Does Tracking Affect the Importance of Family Background on Students' Test Scores?, London School of Economics, mimeo.

Walsh, K. and C. O. Tracy (2004), *Increasing the Odds: How Good Policies Can Yield Better Teachers,* National Council on Teacher Quality, Washington DC.

Willms, J.D. and L. Paterson (1995), "A Multilevel Model for Community Segregation", *Journal of Mathematical Sociology*, 20, pp. 23-40.

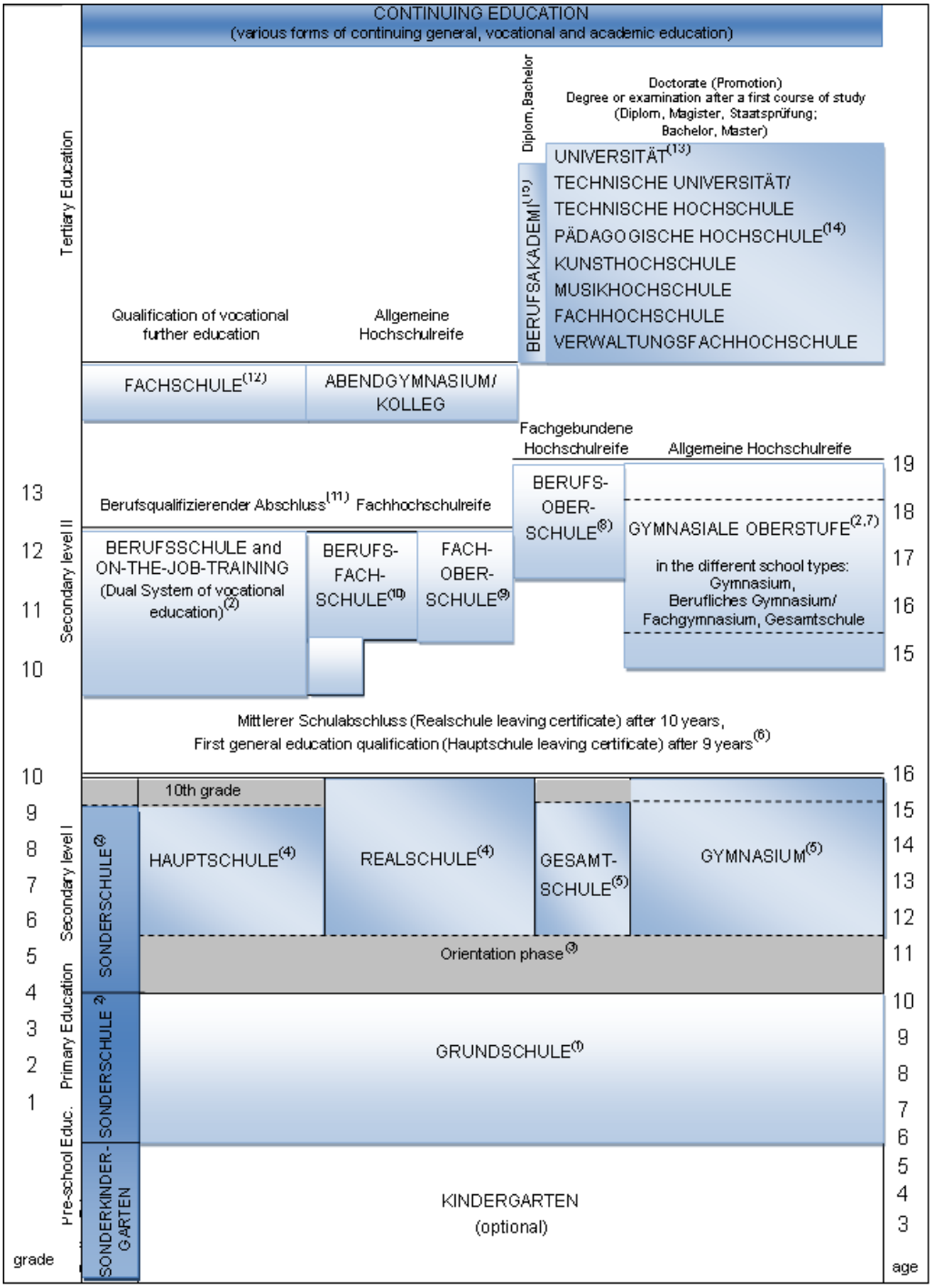
Wößmann, L. (2005), "The Effect Heterogeneity of Central Examinations: Evidence from TIMMS, TIMMS-Repeat and PISA", *Education Economics,* Vol. 13, No. 2, pp. 143-169, June.

Wößmann, L. (2007), "Fundamental Determinants of School Efficiency and Equity: German States as a Microcosm for OECD countries", *IZA DP No. 2880,* June.

ANNEX A1. BASIC STRUCTURE OF THE EDUCATIONAL SYSTEM IN THE FEDERAL REPUBLIC OF GERMANY

Figure A1.1. Basic structure of the educational system in the Federal Republic of Germany

As at November 2007



Source: Secretariat of the Standing Conference of the Ministers of Education and Cultural Affairs of the *Länder* in the Federal Republic of Germany.

Diagram notes

Diagram of the basic structure of the education system. The distribution of the school population in grade 8 as per 2005 taken as a national average is as follows: *Hauptschule* 22.5%, *Realschule*25.8%, *Gymnasium* 30.9%, *integrierte Gesamtschule* 8.5%, types of school with several courses of education 6.3%, special schools 5.3%.

The ability of pupils to transfer between school types and the recognition of school-leaving qualifications is basically guaranteed if the preconditions agreed between the *Länder* are fulfilled. The duration of full-time compulsory education (compulsory general education) is nine years (10 years in four of the *Länder*) and the subsequent period of part-time compulsory education (compulsory vocational education) is three years.

1. In some *Länder* special types of transition from pre-school to primary education (*Vorklassen, Schulkindergärten*) exist. In Berlin and Brandenburg the primary school comprises six grades.
2. The disabled attend special forms of general-education and vocational school types (partially integrated with non-handicapped pupils) depending on the type of disability in question. Designation of schools varies according to the law of each Land.
3. Irrespective of school type, grades 5 and 6 constitute a phase of particular promotion, supervision and orientation with regard to the pupil's future educational path and its particular direction (*Orientierungsstufe* or *Förderstufe*).
4. The *Hauptschule* and *Realschule* courses of education are also offered at schools with several courses of education, for which the names differ from one Land to another. The *Mittelschule* (Sachsen), *Regelschule* (Thüringen), *Erweiterte Realschule* (Saarland), *Sekundarschule* (Bremen, Sachsen-Anhalt), *Integrierte Haupt- und Realschule* (Hamburg), *Verbundene oder Zusammengefasste Haupt- und Realschule* (Berlin, Hesse, Mecklenburg-Vorpommern, Niedersachsen) *Regionale Schule* (Mecklenburg-Vorpommern, Rheinland-Pfalz), *Oberschule* (Brandenburg), *Regionalschule* (Schleswig-Holstein) and *Gemeinschaftsschule* (Schleswig-Holstein), as well as comprehensive schools (*Gesamtschulen*) fall under this category.
5. The *Gymnasium* course of education is also offered at comprehensive schools (***Gesamtschule***). In the cooperative comprehensive schools, the three courses of education (*Hauptschule, Realschule* and *Gymnasium*) are brought under one educational and organisational umbrella; these form an educational and organisational whole at the integrated *Gesamtschule*. The provision of comprehensive schools (*Gesamtschulen*) varies in accordance with the respective educational laws of the *Länder*.
6. The general education qualifications that may be obtained after grades 9 and 10 carry particular designations in some *Länder*. These certificates can also be obtained in evening classes and at vocational schools.
7. Admission to the *Gymnasiale Oberstufe* requires a formal entrance qualification which can be obtained after grade 9 or 10. At present, in the majority of *Länder* the *Allgemeine Hochschulreife* can be obtained after the successful completion of 13 consecutive school years (nine years at the *Gymnasium*). Yet in almost all *Länder* the gradual conversion to eight years at the *Gymnasium* is currently under way, where the *Allgemeine Hochschulreife* can be obtained after a 12-year course of education.
8. The **Berufsoberschule** has so far only existed in a few *Länder* and offers school-leavers with the *Mittlerer Schulabschluss* who have completed vocational training or five years' working experience the opportunity to obtain the *Fachgebundene Hochschulreife*. Pupils can obtain the *Allgemeine Hochschulreife* by proving their proficiency in a second foreign language.

9. The **Fachoberschule** is a school type lasting for two years (grades 11 and 12) which admits pupils who have completed the *Mittlerer Schulabschluss* and qualifies them to study at a *Fachhochschule*. Pupils who have successfully completed the *Mittlerer Schulabschluss* and have been through initial vocational training can also enter the *Fachoberschule* directly in grade 12.

10. **Berufsfachschulen** are full-time vocational schools differing in terms of entrance requirements, duration and leaving certificates. Basic vocational training can be obtained during one- or two-year courses at *Berufsfachschulen* and a vocational qualification is available at the end of two- or three-year courses. Under certain conditions the *Fachhochschulreife* can be acquired on completion of a course lasting a minimum of two years.

11. Extension courses are offered to enable pupils to acquire qualifications equivalent to the *Hauptschule* and *Realschule* leaving certificates.

12. **Fachschulen** cater for vocational continuing education (1-3 year duration) and as a rule require the completion of relevant vocational training in a recognised occupation and subsequent employment. In addition, the *Fachhochschulreife* can be acquired under certain conditions.

13. Including institutions of higher education offering courses in particular disciplines at university level (*e.g.* theology, philosophy, medicine, administrative sciences, sport).

14. **Pädagogische Hochschulen** (only in Baden-Württemberg) offer training courses for teachers at various types of schools. In specific cases, study courses leading to professions in the area of education and pedagogy outside the school sector are offered as well.

15. The **Berufsakademie** is a tertiary sector institution in some *Länder* offering academic training at a *Studienakademie* (study institution) combined with practical in-company professional training in keeping with the principle of the dual system.

Glossary

Abendgymnasium

Establishment of the so-called *Zweiter Bildungsweg* at which adults can attend evening classes to obtain the general higher education entrance qualification.

Allgemeine Hochschulreife

General higher education entrance qualification. Entitles holder to admission to all subjects at all higher education institutions and is usually obtained at upper Gymnasium level (*Gymnasiale Oberstufe*) by passing the Abitur examination. The certificate of *Allgemeine Hochschulreife* incorporates examination marks as well as continuous assessment of pupil's performance in the last two years of upper Gymnasium level (*Qualifikationsphase*).

Bachelor

The Bachelor's degree as a first degree provides basic qualification for a profession. It can be obtained after a standard period of study (*Regelstudienzeit*) of at least three and at most four years at universities and equivalent institutions of higher education, at colleges of art and music, at *Fachhochschulen* and at *Berufsakademien*. Together with the Master's degree, the Bachelor's degree is part of a recently introduced graduation system of consecutive degrees (two-cycle degree system) that exists alongside the traditional system of higher education qualifications (→*Diplom,* →*Magister,* →*Staatsprüfung*).

Berufliches Gymnasium

Type of school at upper secondary level offering a three-year course of education which includes both the general education subjects taught at upper Gymnasium level (*Gymnasiale Oberstufe*) and career-oriented subjects, such as business and technology, but which also leads to the general higher education entrance qualification.

Berufsschule

Vocational school at upper secondary level generally providing part-time instruction in general and vocational subjects to trainees receiving vocational education and training within the dual system.

Diplom

The *Diplom* degree as a higher education qualification provides qualification for a profession. It may be obtained either at universities and equivalent institutions of higher education (particularly in social or economic sciences and in natural and engineering sciences) or likewise at *Fachhochschulen* (in all subjects, with the specification *Fachhochschule* or FH added to the degree title). The *Diplom* degree may also be obtained as a tertiary education qualification providing qualification for a profession at *Berufsakademien* (with the specification *Berufsakademie* or BA added to the degree title).

Fachgebundene Hochschulreife

Qualification entitling holder to study particular subjects at a higher education institution. May be obtained through certain courses of vocational education at upper secondary level.

Fachhochschule

University of applied sciences. Type of higher education institution established in the 1970s, which has the particular function of providing application-oriented teaching and research, particularly in engineering, business, administration, social services and design.

Fachhochschulreife

Qualification entitling holder to study at a *Fachhochschule*. May usually be obtained after 12 years of schooling at a *Fachoberschule* or - under certain conditions - at other vocational schools.

Grundschule

Compulsory school for all children of the age of six onwards. It comprises four grades, except in Berlin and Brandenburg where it covers six grades.

Gymnasiale Oberstufe

The upper level of the *Gymnasium*, which can however be established at other types of school such as the *Gesamtschule*. It comprises grades 11-13 (or 10-12, 11-12, depending on the Land). Course of general education concluded by the Abitur examination, which leads to the general higher education entrance qualification (*Allgemeine Hochschulreife*).

Gymnasium

Type of school covering both lower and upper secondary level (grades 5-13 or 5-12) and providing an in-depth general education aimed at the general higher education entrance qualification. At present, in almost all *Länder*, there is a change from the nine-year to the eight-year Gymnasium in which the *Allgemeine Hochschulreife* is acquired after grade 12.

Hauptschule

Type of school at lower secondary level providing a basic general education. Compulsory school, unless pupil is attending a different type of secondary school, usually comprising grades 5-9.

Kindergarten

Pre-school establishment for children aged between three and six as part of child and youth welfare services – may be either publicly or privately maintained (not part of the school system).

Kolleg

Establishment of the so-called *Zweiter Bildungsweg* where adults attend full-time classes to obtain the general higher education entrance qualification.

Kunsthochschule / Musikhochschule

The colleges of art/colleges of music teach the entire gamut of artistic subjects or only certain branches of study, in some cases also the pertaining theoretical disciplines.

Magister

Higher education degree awarded by universities and equivalent institutions of higher education or colleges of art and music, particularly in arts subjects, on the basis of the Magister examination; course of study comprises either two equally weighted major subjects or a combination of one major subject and two minor subjects.

Master

The Master's degree as a further higher education degree provides an advanced qualification for a profession. The entry requirement for a Master's study course is a first higher education degree qualifying for a profession. The Master's degree can be obtained after a standard period of study of one to two years at a university or equivalent institution of higher education, at colleges of art and music, as well as at

Fachhochschulen. Together with the Bachelor's degree, the Master's degree is part of a recently introduced graduation system of consecutive degrees (two-cycle degree system) that exists alongside the traditional system of higher education qualifications (→*Diplom,* →*Magister,* →*Staatsprüfung*).

Mittlerer Schulabschluss

General education school leaving certificate obtained on completion of grade 10 at →Realschulen or, under certain circumstances, at other lower secondary level school types. It can also be obtained at a later stage during vocational training at upper secondary level. In some *Länder* called *Realschulabschluss*.

Promotion

Award of a doctoral degree on the basis of a doctoral thesis and either an oral examination or a defence of the student's thesis. As a rule, the doctorate is embarked on after completing a first course of study culminating in the →*Magister,* →*Diplom* or →*Staatsprüfung*, as well as after obtaining a Master's qualification, and the promotion serves as proof of ability to undertake in-depth academic work.

Realschule

Type of school at lower secondary level, usually comprising grades 5-10. Provides pupils with a more extensive general education and the opportunity to go on to courses of education at upper secondary level that lead to vocational or higher education entrance qualifications.

Sonderkindergarten

Pre-school establishment for children with disabilities – also known as a *Förderkindergarten*.

Sonderschule

Special school – school establishment for pupils whose development cannot be adequately assisted at mainstream schools on account of disability. Also known as *Förderschule, Schule für Behinderte* or *Förderzentrum.*

Staatsprüfung

State examination concluding a course of study in certain subjects (*e.g*. medical subjects, teaching, law). Also refers to examination taken by law students and teaching students at the end of their preparatory service (known as the Second State Examination). The examinations are administered by examination committees staffed not only by professors from the institutions of higher education but also by representatives of the state examination offices of the *Länder*.

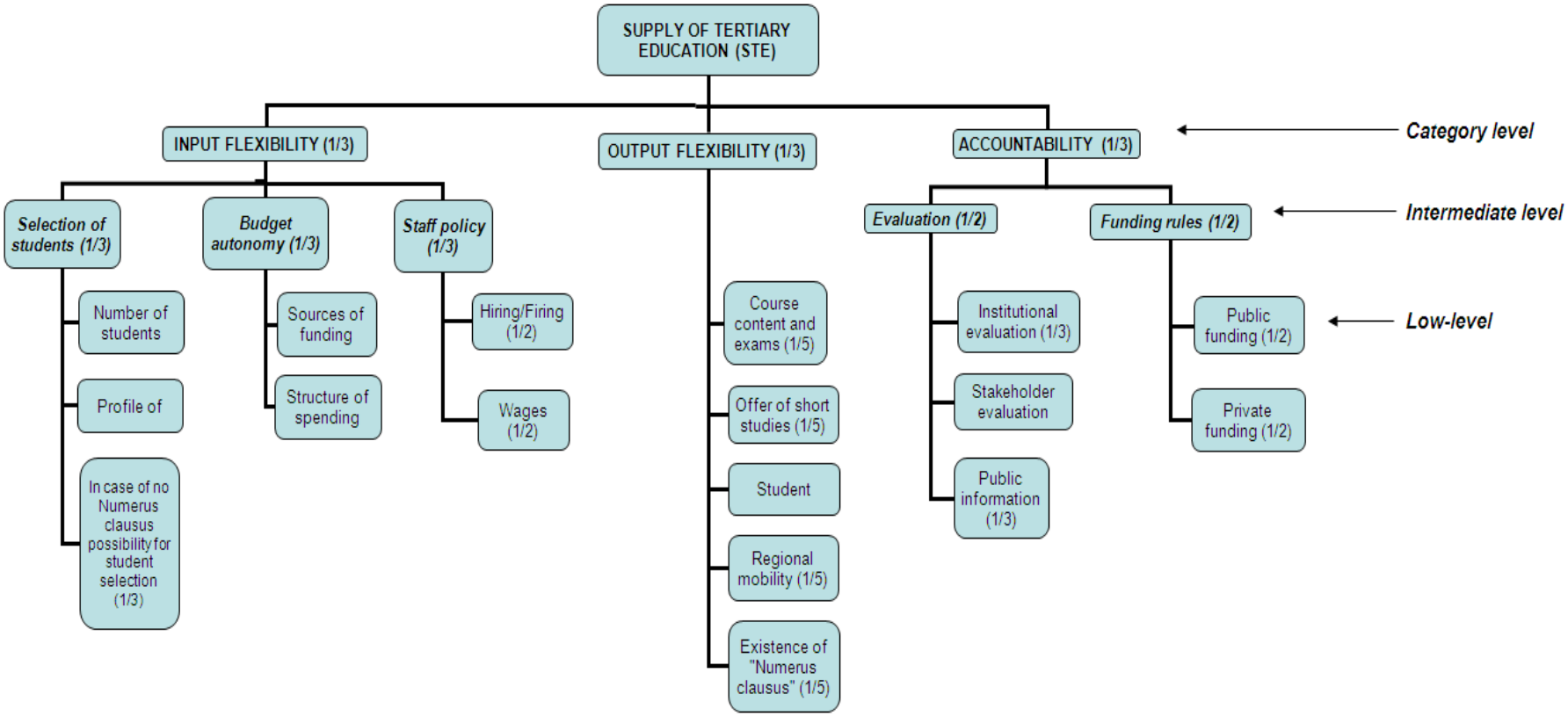
Technische Hochschule / Technische Universität

Type of higher education institution equivalent in status to university. Focus traditionally lies in natural science and engineering.

Verwaltungsfachhochschule

Fachhochschule maintained by the Federation or a Land which trains civil servants in a particular sector of public administration for careers in the so-called higher level of the civil service.

ANNEX A2. THE STRUCTURE OF THE SUPPLY OF TERTIARY EDUCATION INDICATOR



Note: The weights of each sub-level indicator are in parentheses.
Source: Martins, J., R. Boarini, H. Strauss, C. de Maisonneuve and C. Saadi (2007), "The Policy Determinants of Tertiary Education", *OECD Economics Department Working Paper,* No. 576, OECD, Paris.

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