Investments in Education: The Early Years Offer Great Potential

by C. Katharina Spieß

Investments in education are of great importance for the competitiveness of the German economy. In particular, early childhood education programs promise high returns—because children can benefit from them even years later and find it easier to acquire new skills. These are the results of research in the field of the economics of education in recent years, at least when high quality programs are studied.

However, these findings do not necessarily reflect public spending on the different education sectors—in reality, comparatively little is invested in young children. There is a need for more investment in education—especially to increase the quality of education programs—but not only in early childhood. Also, with regard to the expansion of all-day schools, more should be invested in the quality of such programs. In higher education, efforts are needed to improve access of educationally disadvantaged groups and therefore improve intergenerational mobility. All these measures could facilitate a more effective and efficient use of human capital. This is also of particular importance against the backdrop of a forecast decline in labor force potential and predicted skill shortages.

Education plays a key role in the future of modern economies. Effective and efficient investment[1] in an economy's human capital makes a significant contribution to increasing competitiveness and can also safeguard the prosperity of individual citizens. This applies equally to the German economy where investment in education is of paramount and increasing importance. The aging of German society has led to a drop in the number of people available for work. Targeted investment in education can, therefore, help to prevent the predicted skill shortages.

German Investment in Some Areas of Education Low by International Comparison

In 2009, Germany spent 5.3 percent of its GDP on formal educational establishments[2] such as pre-primary facilities, schools, vocational colleges, and institutes of tertiary education (see Table 1). This ranks Germany below average both when compared with the 21 EU countries (EU average: 5.9 percent) and with the 33 member states of the Organisation for Economic Co-operation and Development (OECD average: 6.2 percent).[3] In this EU comparison, Denmark invests the most in education (almost eight percent of its GDP), followed by Sweden and Finland.

1 The definition of investment used in this article is not the same as that used in the national accounts (Volkswirtschaftliche Gesamtrechnungen, VGR). Here, investment refers to spending by regional administrative authorities which increases the future competitiveness of the German economy.

2 Expenditure on formal educational establishments refers to the amount of spending that is conventionally used in international comparisons. According to the education category in the national budget, this figure was 6.9 percent of GDP (see Federal Statistical Office, ed., Bildungsfinanzbericht (Wiesbaden: 2012).

3 However, it must be borne in mind that the Länder regard Germany's spending on education to be vastly underestimated by the OECD's calculations; see Federal Statistical Office, ed., Bildungsfinanzbericht (Wiesbaden: 2012).

Table 1

Expenditure on Formal Educational Establishments in Percent of GDP (2009)

	Day care for children under 3 years	Pre-primary education	Primary and lower secondary education	Upper secondary education	Tertiary education	Pre-primary to tertiary education
Belgium	0.1	0.6	1.5	2.9	1.5	6.7
Denmark	0.7	1	3.4	1.3	1.9	7.9
Germany	0.1	0.6	2.1	1.1	1.3	5.3
Finland	0.8	0.4	2.5	1.6	1.9	6.4
France	0.4	0.7	2.6	1.4	1.5	6.3
Ireland	0	0.1	3.4	0.9	1.6	6.3
Italy	0.2	0.5	2	1.2	1	4.9
Netherlands	0.5	0.4	2.8	1.3	1.7	6.2
Norway	0.9	0.4	2.8	1.4	1.4	6.2
Austria	0.4	0.6	2.4	1.4	1.4	5.9
Portugal	0	0.4	2.7	1.2	1.4	5.9
Sweden	0.9	0.7	2.8	1.4	1.8	6.7
Switzerland	0.1	0.2	2.7	1.7	1.3	6
Spain	0.6	0.9	2.6	0.8	1.3	5.6
UK	0.5	0.3	3	1.5	1.3	6
OECD-33	0.3	0.5	2.6	1.3	1.6	6.2

Note: All data refer to OECD (2012a) with the exception of data on day care for children under the age of three, for information on this, see OECD (2012b). For further explanatory notes, see respective sources.
Sources: OECD (2012a: Education at a Glance 2012: OECD Indicators, OECD Publishing, Paris, Table B2.2) and OECD (2012b): OECD Family Database, OECD, Paris. (www.oecd.org/social/family/database, download: June 2013, Chart PF 3.1.A), compiled by DIW Berlin.

By international standards, Germany spends a relatively small share of its GDP on education.

In particular, investment in primary education (Grundschule), lower secondary education (Hauptschule (low-track secondary school), Realschule (intermediate-track secondary school), and Gesamtschule (comprehensive school)), and upper secondary education (Gymnasium (academic-track secondary school)) is—relatively speaking—low. At 0.1 percent of GDP, expenditure on early education and care for children under the age of three in Germany is also below the OECD average of 0.3 percent and lower than in the Scandinavian countries.

Based on expenditure on education per student in relation to per capita GDP (see Figure 1), almost all OECD countries invest least in the pre-primary sector. Further, by international comparison, Germany spends relatively little on its students, particularly those in primary education. A further distinction between private and public expenditure illustrates that, when private investment is excluded, Germany is also below the OECD average when it comes to the pre-primary sector (see Figure 2).[4]

In absolute terms, in 2009, Germany's education budget was 164.6 billion euros (including 11.8 billion euros for research and development at institutes of tertiary education).[5] A total of 126.4 billion euros, or over three-quarters, was spent on formal educational establishments. Private households spent a total of 5.5 billion euros.[6] Investment in non-formal education such as on-the-job, teacher, and other forms of training, and after-school care, crèches, youth work, and similar was 19.5 billion euros in 2009. An analysis of the individual formal education sectors shows investment of approximately 14 billion euros in children's day care facilities, almost 56 billion euros in school education, and 21.5 billion euros in basic funding of regional administrative authorities for institutes of tertiary education.

Between 1995 and 2009, public spending on education grew by 32 percent or 24 billion euros. The increase in investment in children's day care facilities (approximately 64 percent), in schools (just over 25 percent), and in institutes of tertiary education (around 32 percent) was particularly strong. Youth work, however, experienced

4 It is not possible to distinguish between private and public spending across all education sectors using the OECD's data.

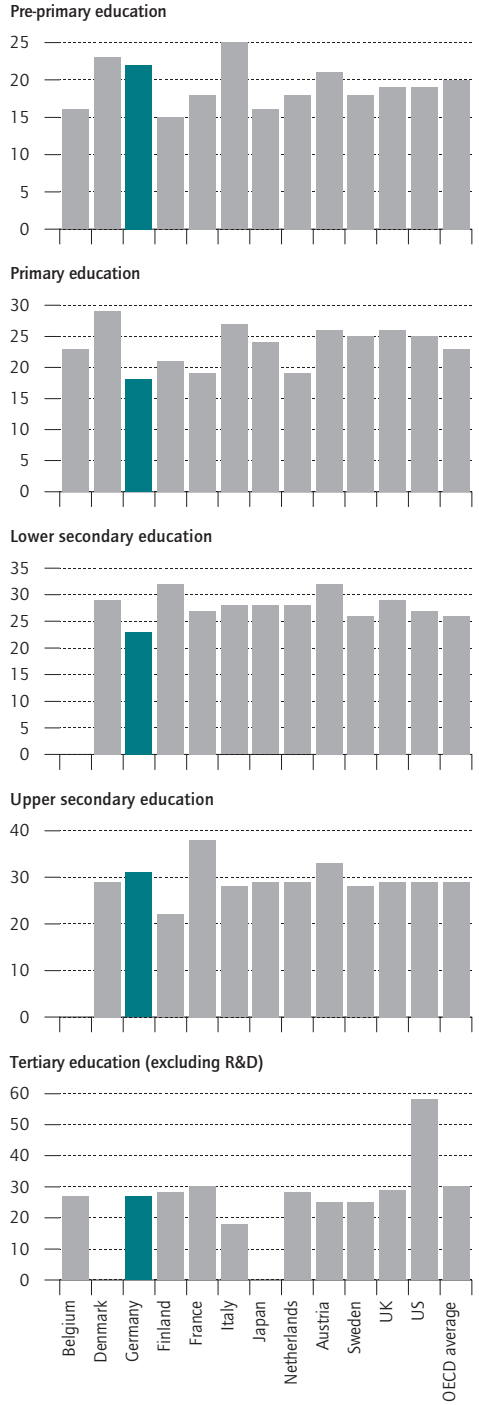
5 Unless otherwise indicated, expenditure on education refers to the 2012 Report on Education Finance (Bildungsfinanzbericht 2012), Federal Statistical Office, ed., Bildungsfinanzbericht (Wiesbaden: 2012).

6 This figure includes, for example, expenditure on extra tuition, school materials, and similar. To fund the subsistence costs of those in formal education, public budgets provided 13.1 billion euros in 2009 (student grants (BAföG), child benefits for adult children undergoing a vocational course of education).

Figure 1

Expenditure on Education per Child/Student by Education Sector, 2009

Relative to per capita GDP



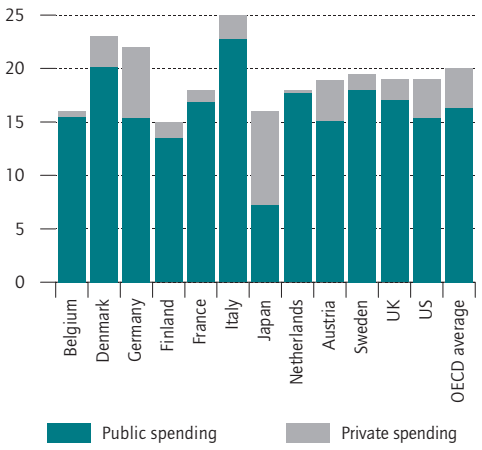
Notes: Data for the tertiary education sector do not include expenditure on research and development. There are no data available for Belgium (lower and upper secondary), Denmark or Japan (tertiary).
Sources: OECD (2012: Education at a Glance 2012: OECD Indicators, OECD Publishing, Paris, Table B1.4); compiled by DIW Berlin.

Germany's expenditure per student is particularly low in the primary education sector.

Figure 2

Expenditure on Education per Child in Pre-Primary Education by Financing Categories, 2009

Relative to per capita GDP



Note: Lower bar segment: share of public spending; upper bar segment: share of private spending.
Source: OECD (2012: Education at a Glance 2012: OECD Indicators, OECD Publishing, Paris, Tables B1.4 und B3.2a); compiled by and calculations by DIW Berlin.

Private investment accounts for a relatively high share of spending in the pre-primary sector.

a drop in investment of seven percent between 1995 and 2009.

The role played by the different German Länder and municipalities in financing the individual education sectors varies quite dramatically.[7] This applies in particular to spending on children's day care facilities. However, measured against GDP, eastern German Länder such as Thuringia and Brandenburg spend more than western German ones with stronger economies such as Bavaria and Baden-Württemberg (see Table 2).

For some years now, an increasing number of educational facilities have also been in private hands, this are non-profit and for-profit providers. Between 1998 and 2010, the number of school and university students attending such establishments increased by 26.3 percent. The majority of these facilities are funded with public money. Thus, for example, in 2009, private schools were able to cover 85 percent of their outgoings with public

7 For differences between the Länder, see Federal Statistical Office, ed., Bildungsfinanzbericht (Wiesbaden: 2012).

Table 2

Expenditure on Day Care Facilities by German Federal State (2011)

German federal state	(Pure) expenditure	Share of federal state's GDP
	In thousand euros	In percent
Baden-Württemberg	1,910,196	0.5
Bavaria	2,195,901	0.5
Brandenburg	551,159	1
Bremen	137,156	0.5
Hamburg	489,062	0.6
Hesse	1,249,511	0.6
Mecklenburg-Western Pomerania	261,935	0.7
Lower Saxony	1,272,766	0.6
North Rhine-Westphalia	3,072,587	0.5
Rhineland-Palatinate	938,894	0.8
Saarland	180,740	0.6
Saxony	863,863	0.9
Saxony-Anhalt	422,679	0.8
Schleswig-Holstein	377,647	0.5
Thuringia	469,700	1
Germany	14,399,361	0.6

Note: Data on after-school care and facilities for school children are not included. No data are available for Berlin.
Sources: Federal Statistical Office, Statistik der Kinder- und Jugendhilfe, Ausgaben (Auszahlungen) und Einnahmen (Einzahlungen) für die Jugendhilfe 2011 (Wiesbaden: 2012) and AK VGR- Arbeitskreis, National Accounts of the Federal States on behalf of the statistical offices of the 16 Länder, the Federal Statistical Office, and the Citizens Registration Office (Bürgeramt), Statistik und Wahlen (2013): Bruttoinlandsprodukt, Bruttowertschöpfung in den Ländern der Bundesrepublik Deutschland 1991 bis 2012. Reihe 1, Band 1, (Frankfurt am Main: 2013), compiled by and calculations by DIW Berlin.

Eastern German Länder invested more in children's day care than those in western Germany.

funds. Even for children's day care facilities (in this case mainly non-profit providers), the corresponding figure was as high as 74 percent in 2010.

In the education sector as a whole, private investment does not play a particularly significant role. Its average contribution of approximately 20 percent is primarily made up of the fees paid by private households to educational establishments.

Research Shows Skills Must Be Fostered Early

For many years, literature in the field of the economics of education has focused on the returns on investment in education, particularly on the individual level. In recent years, researchers have increasingly concentrated on analyzing the returns on investment in education throughout the phases of one life cycle. In this context, the research of the Nobel Laureate in Economics, James Heckman, and his co-authors is particularly pertinent. Heckman's series of works point to the high returns on investment in early childhood education and care programs.[8] According to Heckman, investment here, particularly for disadvantaged children, produces higher returns than investment made at a later age — this does not imply, however, that later investment fails to achieve its aim.

In a series of well-founded international cost-benefit analyses, attempts were made to quantify the high returns on investment in early childhood education and care. A cost-benefit ratio of between 1:2 and 1:16 can be achieved through the education and care programs that formed the basis of the analysis. These programs primarily consisted of very high-quality programs, with frequent close involvement of parents.[9]

However, in principle, high returns are not only produced by very high-quality education and care programs: the family itself is also significant for early educational processes. This is substantiated by various empirical analyses which, for example, illustrate the importance of family quality and also socioeconomic characteristics for children's development. Ultimately, on average, the family environment provided more of an explanation for developmental disparities between children than formal education.[10]

The fact that the returns on investment in early childhood educational programs are particularly high can be attributed to the "self productivity of skills": the skills acquired in early childhood provide the basis for easier acquisition of further skills at a later age. However, this complementarity of skills requires further in-

8 F. Cunha, J. J. Heckman, L. Lochner, and D. V. Masterov, "Interpreting the Evidence on Life Cycle Skill Formation," Handbook of the Economics of Education 1 (2006): 697–812 and recent paper by J. J. Heckman and L. K. Raut, "Intergenerational long term effects of preschool – structural estimates from a discrete dynamic programming model," NBER Working Paper 19077 (Washington D.C.: National Bureau of Economic Research, 2013). For an overview of European studies, see recent paper by K. U. Müller et al., "Förderung und Wohlergehen von Kindern," Politikberatung kompakt, no. 73 (Berlin: DIW Berlin, 2013).

9 For an overview, see L. A. Karoly, "Toward Standardization of Benefit-Cost Analysis of Early Childhood Interventions," Journal of Benefit-Cost Analysis 3, no. 1 (2012): 1–43 or C. K. Spieß, "Effizienzanalysen frühkindlicher Bildungs- und Betreuungsprogramme – das Beispiel von Kosten-Nutzen-Analysen," Zeitschrift für Erziehungswissenschaft (2013) (online first).

10 See, for example, recent paper by G. Conti and J. J. Heckman, "The Economics of Child Well-Being," IZA Discussion Paper, no. 6930 (Bonn: 2012) or, for example, also E. Berger, F. Peter, and C. K. Spieß, "Wie hängen familiale Veränderungen und das mütterliche Wohlbefinden mit der frühkindlichen Entwicklung zusammen?," Vierteljahrshefte zur Wirtschaftsforschung 79, no. 3 (2010): 27–44.

vestment over the life course—if this does not occur, the full return potential will not be achieved.[11] Based on these findings, both the public authorities and families themselves should invest in the development of children's skills at a very early age, while, at the same time, ensuring that early childhood education is not the only area of investment.

Opportunities for Further Investment in Education

Against this backdrop, what are the opportunities for further investment in the German education system? And who should be making this investment? The education system is characterized by a high share of public investment, which, not least due to various market imperfections, makes sense from an education economics perspective. Therefore, the following sections primarily outline potential areas for public investment while private investment opportunities only play a peripheral role.

Early Childhood Education: Promoting High Quality and Integrating All Target Groups

Given the significance of and high returns on investment in early childhood education, Germany in fact spends relatively little on this sector. However, the expansion of day care for children under three over recent years already demonstrates some progress in this area: the objective is that, by August this year, 35 percent of children under three are in day care – either in day care centers or in family day care. At the same time, the legal entitlement to day care from age one will also come into force. However, as a result of the difficult financial situation, particularly in the municipalities and also the Länder, some of the western German states are unlikely to meet this target. Further investment would be required to rectify this situation.[12]

Since the federal government also stands to profit from investment in early childhood education and care, it makes economic sense for public funds to be allocated to fostering children's early development.[13] For the first time, in the context of the Childcare Funding Act (KiFöG)[14] the federal government has made an explicit pledge to contribute 4.5 billion euros towards expenditure in this area. Appropriate long-term financial commitments should be secured from the federal government.

Further, the available funds should be allocated to the different service providers by way of a fair competition open to all quality assured providers of children's day care. Public, non-profit and for-profit providers should have access to public financing either through child-centered grants awarded directly to their organization, or indirectly provided to the parents as vouchers or similar transfers. The later is a system that has been introduced in Berlin and Hamburg.[15] To date, public transfers to all providers is not the case in every German state. However, equal access to funding for all providers could contribute to a more rapid expansion of children's day care facilities.[16]

Further, early childhood education and care must reach all target groups. Recent analyses indicate that not all groups make equal use of early childhood education and care options outside the family. Children under the age of three, particularly those from families where German is not spoken at home and those whose parents have a low level of education or low income,[17] are underrepresented in day care facilities, i.e., those who, on average, are usually classified as disadvantaged. Ideally, further investment would primarily benefit the regions with the greatest need for development here thus enabling all children to reach their full potential.

From an education economics perspective, there should be a stronger focus on the quality of early childhood education and care, in particular, since early childhood

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11 F. Cunha, J. J. Heckman, L. Lochner, and D. V. Masterov, "Interpreting the Evidence on Life Cycle Skill Formation," Handbook of the Economics of Education vol.1 (2006): 697–812.

12 Federal Ministry of Family Affairs, Senior Citizens, Women and Youth (Bundesministerium für Familie, Senioren, Frauen und Jugend, BMFSFJ), ed., Bericht über die Lebenssituation junger Menschen und die Leistungen der Kinder- und Jugendhilfe in Deutschland – 14. Kinder- und Jugendbericht (Berlin: 2013).

13 For a more detailed account, see also C. K. Spieß, "Sieben Ansatzpunkte für ein effektiveres und effizienteres System der frühkindlichen Bildung in Deutschland in T. Apolte and U. Vollmer, ed., Bildungsökonomik und Soziale Marktwirtschaft. (Stuttgart: Lucius & Lucius, 2010), 3–18.

14 German Bundestag, "Entwurf eines Gesetzes zur Förderung von Kindern unter drei Jahren in Tageseinrichtungen und in der Kindertagespflege (Kinderförderungsgesetz – KiföG)," Bundestag printed paper 16/9299, May 27, 2008.

15 Hamburg and Berlin are the two German Länder using a "voucher system" to provide direct funding to families, i.e., the "subjects," rather than the providers, i.e., the "objects." Therefore, providers in these two city-states are only funded indirectly in the sense that parents select certain providers. On the benefits of "subject funding," see C.K. Spieß, "Zehn Mythen über Kinderbetreuungsgutscheine" in T. Betz, A. Diller, and T. Rauschenbach, ed., Kita-Gutscheine. Ein Konzept zwischen Anspruch und Realisierung (Munich: 2010), 99–112.

16 For a more detailed account, see also C. K. Spieß, "Sieben Ansatzpunkte für ein effektiveres und effizienteres System der frühkindlichen Bildung in Deutschland" in T. Apolte and U. Vollmer, ed., Bildungsökonomik und Soziale Marktwirtschaft (Stuttgart: 2010), 3–18.

17 P. Schober and C. K. Spiess, "Early Childhood Education Activities and Care Arrangements of Disadvantaged Children in Germany" in Child Indicators Research (2012) (online first).

education and care programs can only achieve high returns if they are of high quality. Relevant analyses reveal that, on average, children's day care facilities in Germany only achieve moderate quality levels; and in fact, a significant proportion is even of inadequate quality.[18] One possible way to improve quality could be to develop a system of more advanced training for day care teachers, for example.[19] Individual initiatives have already been launched in this sector.[20] The success of steps to develop the aforementioned system of advanced training and an increasing academization of this occupation will, however, necessitate higher salaries which, in turn, will increase personnel costs. On average, those working in this sector currently earn significantly less than teachers working in other schools (Grundschule, Hauptschule, and Realschule).[21] The situation in Scandinavia, however, is quite different: the Nordic countries generally invest more in early childhood education—and, compared to teachers, personnel in this sector earn more than those in Germany.[22]

As well as the quality of education and care programs outside the family, in early childhood, the quality of the educational environment within the family is also particularly important. In Germany, this also varies dramatically,[23] indicating a need for a stronger focus on families and the family environment. One method of achieving this would be, for example, by investing more in service centers for families.[24] These centers, which involve the whole family, can increase the rate of return on early childhood education.

Further investment in early childhood education and care—whether in the form of children's day care facilities or through supporting the family—can also help to improve reconciliation of work and family. Empirical analyses demonstrate that the expansion of day care, particularly for children from ages one to three, increases the participation of mothers in the workforce.[25] From a family and labor market policy perspective, therefore, this might also be an effective and efficient investment which could counteract the declining labor force potential and the associated shortage of skilled professionals.[26]

School Education: Improving Quality of All-Day Programs

Investment in education should not be restricted to the early childhood sector. The human capital of older children, adolescents, and young adults is also of considerable economic importance. The aim here should be to increase investment to ensure that as many students as possible graduate from school with a school-leaving qualification, to reduce the share of "at risk students,"[27] and to maximize the number of young people acquiring the skills required for successful integration into the labor market and society. The extent to which the current expansion of all-day schools can contribute to this cannot be clearly determined using existing empirical studies. All-day schooling does not necessarily improve all students' academic performance.[28] However, when a high-quality school is combined with longer term participation in all-day schooling, it is possible to see positive effects on school grades, motivation to learn, and the probability of graduating to the next grade.[29] However, in general, more positive effects of all-day schooling are identified for social behavior.[30]

18 W. Tietze, F. Becker-Stoll, J. Bensel, A. Eckhardt, G. Haug-Schnabel, B. Kalicki, H. Keller, and B. Leyendecker, NUBBEK. Nationale Untersuchung zur Bildung, Betreuung und Erziehung in der frühen Kindheit. Fragestellungen und Ergebnisse im Überblick (Berlin: 2012).

19 See, for example, L. Wößmann and M. Schlotter, "Frühkindliche Bildung und spätere kognitive und nichtkognitive Fähigkeiten: Deutsche und internationale Evidenz" in Vierteljahrshefte zur Wirtschaftsforschung 79, no. 3 (2010): 99–120.

20 See WIFF Initiatve, www.weiterbildungsinitiative.de/ (download: June 2013).

21 Author's own estimates based on the 2009 Microcensus revealed that the net salary of early childhood education personnel was about 60 percent of that of teachers.

22 OECD, Education at a Glance 2012: OECD Indicators (OECD Publishing: Paris, 2012) (Indicator D3). There are no recent calculations on the potential extent of the short- and longer-term costs of the academization or the higher professional grading of early childhood education personnel. For earlier calculations, see P. Pasternack and A. Schildberg, "Die finanziellen Auswirkungen einer Akademisierung der ErzieherInnen-Ausbildung" in Sachverständigenkommission Zwölfter Kinder und Jugendbericht, ed., Entwicklungspotentiale institutioneller Angebote im Elementarbereich 2 (Munich: 2005), 9–133.

23 W. Tietze, F. Becker-Stoll, J. Bensel, A. Eckhardt, G. Haug-Schnabel, B. Kalicki, H. Keller, and B. Leyendecker, NUBBEK. Nationale Untersuchung zur Bildung, Betreuung und Erziehung in der frühen Kindheit. Fragestellungen und Ergebnisse im Überblick (Berlin: 2012).

24 For more detail on this recommendation, see G. Stock, H. Bertram, A. Fürnkranz-Prskawetz, W. Holzgreve, M. Kohli, and U. M. Staudinger, eds., Zukunft mit Kindern (Campus Verlag: Frankfurt and New York, 2012).

25 See recent paper by K. U. Müller et al., "Förderung und Wohlergehen von Kindern," Politikberatung kompakt, no. 73 (DIW Berlin: Berlin, 2013).

26 Federal Ministry of Labour and Social Affairs (Bundesministerium für Arbeit und Soziales), Fortschrittsbericht 2012 zum Fachkräftekonzept der Bundesregierung (Berlin: 2012).

27 The PISA studies define "at risk students" as those who, at the age of 15, have reading and math skills that do not exceed primary school level. On this, see L. Wößmann and M. Piopiunik, Wirksame Bildungsinvestitionen. Was unzureichende Bildung kostet. Eine Berechnung der Folgekosten durch entgangenes Wirtschaftswachstum, a study commissioned by the Bertelsmann Foundation (Gütersloh: 2009).

28 See, for example, E. Klieme and T. Rauschenbach, "Entwicklung und Wirkung von Ganztagsschule. Eine Bilanz auf Basis der StEG-Studie" in N. Fischer et al., ed., Ganztagsschule: Entwicklung, Qualität, Wirkungen (Weinheim et al.: 2011), 342–350.

29 StEG-Konsortium, Ganztagsschule: Entwicklung und Wirkungen – Ergebnisse der Studie zur Entwicklung von Ganztagsschulen 2005–2010 (2010), www.bmbf.de/pubRD/steg_2010.pdf (June 2013).

30 H. P. Kuhn and N. Fischer, "Entwicklung der Schulnoten in der Ganztagsschule. Einflüsse der Ganztagsteilnahme und der Angebotsqualität" in

Further investment should be focused on improving the quality of these education and care programs. All-day schooling also supports family and labor market policy goals. It helps mothers of primary school children, in particular, to reconcile family and working life.[31] All-day schools—albeit only the high-quality programs—counteract the forecast shortage of skilled professionals in two respects: in the short term, because they may well increase the probability of mothers taking up employment, and in the long term because they should broaden the skills acquired by children and young people. From a macroeconomic perspective, investment that fulfills education, family and labor policy goals makes particular sense.

Higher Education: Increasing Intergenerational Mobility in education

The level of investment in tertiary education, i.e, in higher education, is, in relative terms, already quite high. However, there is certainly no room for cutbacks: one weakness, for example, is the intergenerational mobility of German school and university students which is, by international comparison, quite limited. This ultimately means that the human capital available in Germany is not fully captured. The impact of parental education on their children's access to higher education in Germany is significant—not least as a consequence of inequalities and disparities in academic achievement in the earlier stages of education. Yet, even with the same levels of achievement and a higher education entrance qualification, higher education admission rates depend heavily on parental educational background. If at least one parent has a university degree, the probability of their child going to university is 81 percent—for children with at least one parent who has completed an apprenticeship or has no vocational qualification, the corresponding figure is only 62 percent. Recent years have seen barely any change in this disparity.[32]

Various education policy measures which could contribute to an improvement in educational mobility are currently being discussed. When starting higher education, students should have access to information, on the one hand, about the medium- to long-term benefits of a degree and, on the other hand, about the available funding opportunities: the risk of unemployment after graduating is, on average, following a downward trend, and the probability of earning a higher income—compared to those with vocational qualifications—is on the increase. A second policy measure is the provision of effective financial assistance. Empirical analyses indicate that an increase in the size of student grants (under the Federal Education and Training Assistance Act, BAföG) does have an impact, if only marginal.[33] As well as public investment, private investment is also an option in the form of grants provided or programs implemented by private foundations that focus on access to university for educationally disadvantaged groups.[34]

Conclusion

Investment in human capital is of major importance for the German economy. Research findings from the field of education economics indicate opportunities for public investment in various areas of education:

In the early childhood education and care sector, further investment, including the long-term financial commitment of the German government, should advance the expansion of children's day care. Nationwide, all providers fulfilling predetermined quality criteria should receive public funding. The quantitative expansion should—and this is key—be accompanied by further investment to facilitate an improvement in the quality of early childhood education and care. As a matter of principle, all children, regardless of their parents' level of education, should have access to high quality education and care programs. Further, families should receive support to help them care for and foster the development of their child. The expansion of centers for families could be a starting point here. Investment in early childhood education is, also from a family and labor market policy perspective, extremely beneficial.

In the field of school education, with the expansion of all-day schooling, particular attention should be paid to the quality of education and care. Here too, it is possible to achieve education, family, and labor market policy goals simultaneously.

The primary objective in the tertiary education sector should be to improve intergenerational mobility in re-

N. Fischer et al., ed., Ganztagsschule: Entwicklung, Qualität, Wirkungen (Weinheim et al.: 2011), 207–226.

31 For an overview, see C. K. Spieß, "Vereinbarkeit von Familie und Beruf – wie wirksam sind deutsche „Care Policies"?" in Perspektiven der Wirtschaftspolitik, Special Issue 12 (2011): 4–27.

32 Autorengruppe Bildungsbericht, Bildung in Deutschland 2012. Ein indikatorengestützter Bericht mit einer Analyse zur kulturellen Bildung im Lebenslauf (Bielefeld: 2012).

33 V. Steiner and K. Wrohlich, "Financial Student Aid and Enrolment in Higher Education: New Evidence from Germany," Scandinavian Journal of Economics 114 (2012): 124–147.

34 On this, see, for example, the Federal Ministry of Education and Research (BMBF) initiative, "Alliance for Education" (Allianz für Bildung), that unites private and public actors. www.bmbf.de/de/15799.php (download: June 2013).

spect to edcuation. To increase the share of university entrants from groups from families with lower edcuation, better information should be made available regarding the benefits of a degree and the existing funding opportunities, and the financial hurdles to start university should be reduced. Further investment aimed at specific target groups would be the most advisable step to take here.

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