As a result of the high fixed costs incurred in implementation of the AIFM Directive, funds could find it necessary to maintain higher investment volumes in future. And the need for such increases, in turn, could force funds to focus their investments more on larger companies. Funds with large numbers of small investments would have even greater administrative overhead. Consequently, companies would find it even more difficult to attract smaller investments. Ultimately, such developments could worsen the shortage of financing in this area.[28]

Furthermore, restriction of institutional investors to investments in European-regulated venture capital funds, as is currently planned, would increase risks for investors, since such restriction would hamper regional diversification. In all likelihood, investments would tend to concentrate largely on European funds.

The Expert Commission also maintains that venture capital investors based outside of the EU would then become reticent to invest in European companies. To be able to invest in Europe, fund managers from third countries have to apply for an EU passport, and thus they have to fulfill the same provisions that European fund managers have to fulfill. In particular, such a trend would tend to close access to the expertise that capital providers − especially venture-capital providers from the U.S. − often also provide.

The venture capital market for early-phase financing is likely to shrink as a result of implementation of the AIFM Directive. And yet German start-up entrepreneurs need more venture capital, not less. At the same time, the European provisions in this area are an opportunity, as well as a challenge, for German policymakers. In implementation of the directive, by no means should any attempt be made to make use of the option for expanding the directive's scope to include smaller funds that manage less than EUR 500 million in assets.[29] Instead, AIFM implementation should be taken as an opportunity, finally, to draft legislation for an internationally competitive, growth-promoting framework for venture-capital providers and business angels.

EDUCATION AND RESEARCH A 3

The Federal Government boosts financing for education and research

The 2011 federal budget earmarks more than EUR 11 billion for the BMBF. That figure is 7.2 percent higher that last year's allocation. And it will benefit the three central Federal-*Länder* programmes. The Higher Education Pact, the Initiative for Excellence and the Pact for Research and Innovation will all be continued and expanded.[30]

In 2011, the Higher Education Pact will enter a second project phase. The *Länder* are to be enabled to accept additional numbers of new students (pillar 1). Along with the increase originally planned, the measure now, following the discontinuation of conscription for the military and alternative civilian services, includes funding for an additional 35,000 to 59,000 new students through 2015.[31] The second pillar of the Higher Education Pact comprises federally funded overhead payments, amounting to 20 percent of the relevant project volume, for research projects, at higher education and research institutions, receiving grants from the *Deutsche Forschungsgemeinschaft* (German Research Foundation).[32] Through 2015, the Federal Government is providing over EUR 5 billion for those two measures. The Quality Pact on Teaching (*Qualitätspakt Lehre*) is the new, third pillar of the Higher Education Pact. The Federal Government plans to invest some 2 billion euros in it through 2020.

Cutting-edge research is being funded in the framework of the *Initiative for Excellence II*. From 2012 to 2017, it will provide support to universities amounting to a total of 2.7 billion euros.

Financing of the country's five non-university science and research organisations[33] is managed via the Pact for Research and Innovation. From 2011 to 2015, funding in that framework will be increased by 5 percent, for an expected total volume of some 4.9 billion euros.[34]

The Expert Commission welcomes the clear commitment to education and research seen in these measures. At the same time, it notes that the Federal Government's own goal of having the country's

expenditures on education and research reach 10 percent of its gross domestic product (GDP) has not yet been reached. Efforts toward that goal need to be continued energetically.[35]

Competence levels of German pupils are growing

Reading skills are core competences (reading to learn) that are of critical importance with regard to innovation. The PISA 2009 results for Germany, when compared to the corresponding results from the PISA 2000, 2003 and 2006 studies, show higher average values in the area of reading competence.[36] That is of course a welcome development. On the other hand, Germany ranks only about average, for OECD countries overall, in that key competence. The percentage of school pupils with outstanding reading competences at competence levels V and VI[37], 7.6 percent, is precisely the OECD average. The countries with considerably higher percentages of pupils with excellent reading skills include New Zealand (15.7 percent), Finland (14.5 percent), Japan (13.4 percent), Korea (12.9 percent), Australia (12.8 percent), Canada (12.8 percent) and Belgium (11.2 percent). The percentage of pupils with low reading competence, i.e. at a competence level below II, is 18.5 percent in Germany, which is close to the OECD average of 18.8 percent. Korea (5.8 percent) and Finland (8.1 percent) are the two countries with the lowest percentages of pupils with poor reading competence.[38]

In particular, the percentage of 15-year-old male pupils with reading competence below competence level II, at 24 percent (2000: 26.6 percent), is still very high. The corresponding figure for girls is 12.6 percent (2000: 18.2 percent).[39] That figure for male pupils means that nearly one-fourth of male pupils are unable, "within a text passage, [to] follow logical and linguistic links, with the aim of localising or interpreting information; or of relating information distributed throughout a text or text passages, in order to determine the author's intention."[40]

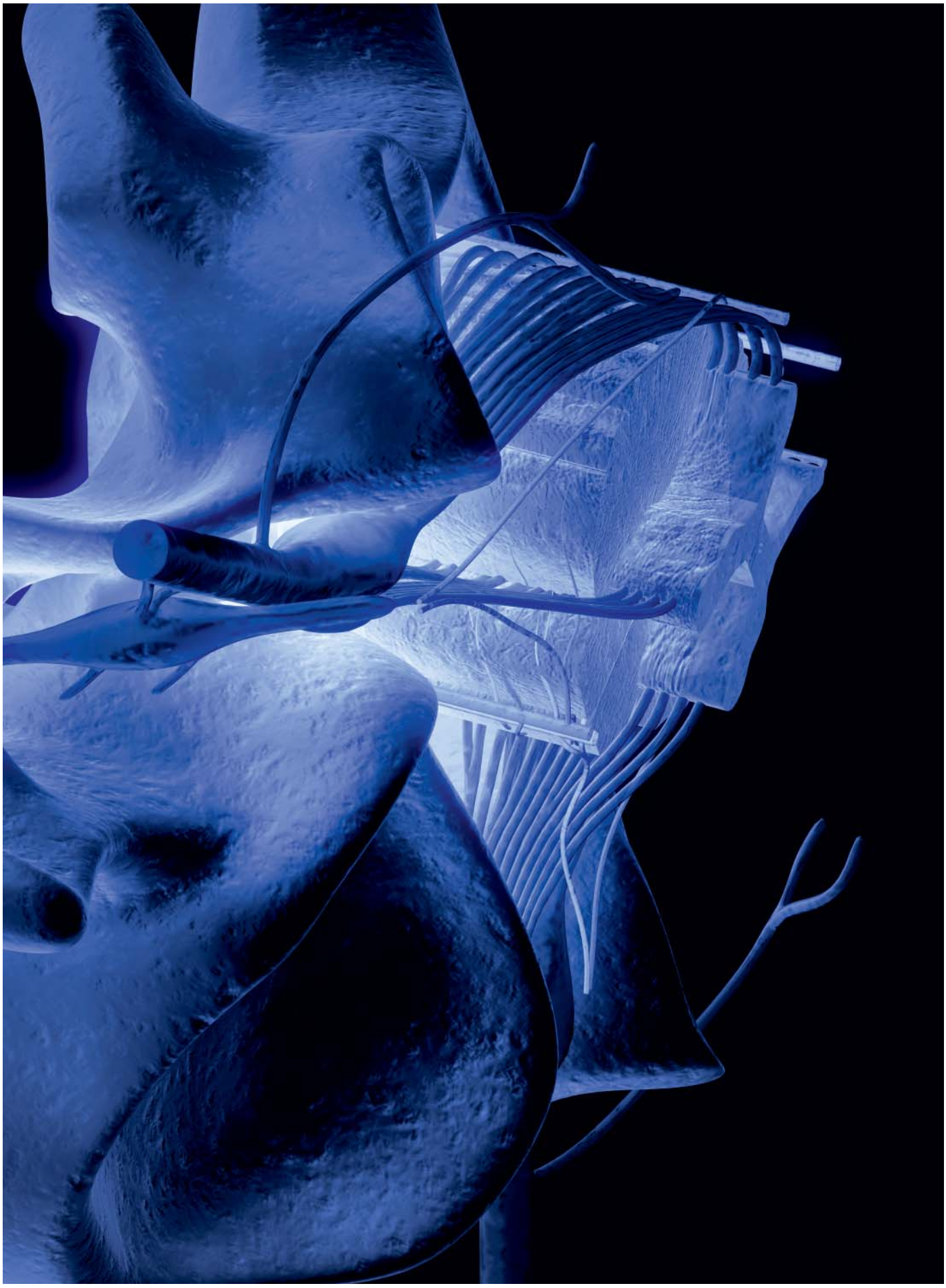
It is true that no reliable data are yet available on the ways in which biographies of young people with low reading competence progress. In light of the great deficits in competence involved, however, it must be assumed that such young people are inadequately prepared for education and careers in the knowledge society.[41] Measures for reducing the numbers of pupils at risk are urgently needed. And such measures must take account of special regional and local circumstances. The Expert Commission thus disapproves of the decision of the Standing Conference of the Ministers of Education and Cultural Affairs of the *Länder* in the Federal Republic of Germany (KMK) to refrain from evaluating the PISA studies by individual *Länder*; that decision makes it impossible to identify the strengths and weaknesses of the different *Länder*. That assessment remains valid in spite of the comparison, carried out by the *Institut zur Qualitätsentwicklung im Bildungswesen* (IQB; Institute for development of quality in education), of the 9th class level throughout all *Länder*, for the subjects German and English.

In this connection, the Expert Commission welcomes the nation-wide support programme *Lesestart – drei Meilensteine für das Lesen* (Starting reading – three milestones for reading) that has been announced for 2011. That programme, which is receiving a total of EUR 26 million in support from the BMBF over an eight-year period, is being carried out in co-operation with the *Stiftung Lesen* foundation (Reading Foundation), in communities with disadvantaged neighbourhoods. The programme begins reaching children when they are in their key early formative years, and it stays with them for long periods of time to encourage their interest in reading.[42] The Expert Commission calls critical attention to the many comparable model projects also in place that are not being evaluated and are not being expanded. With a view to considerably reducing numbers of pupils at risk, the Expert Commission recommends that such projects be evaluated and that successful programmes be widely introduced. A campaign against poor educational performance can also be expected to help sever the links between young people's educational performance and their social background.

Record numbers of new students and of persons eligible for higher education

In 2009, the percentage of persons with higher education entrance qualifications, with respect to the relevant age cohort, reached 45.9 percent, a new record (449,400 persons eligible for higher education).

In 2009, new students accounted for a total of 43 percent of the relevant age cohort for that year, thereby



Spinal cord segment

River Tollense region in Germany

surpassing the politically established goal of 40 percent.[43] At the same time, the figure includes foreigners who have come to Germany for studies.[44] When one considers only new students with higher education entrance qualifications earned in Germany, the applicable new-students percentage in 2009 was 36.5 percent.[45] The percentage calculated in the latter manner has also increased over the past few years, however, although special effects, such as changes in statistical methods and school-system reforms, have to be taken into account.[46] All in all, higher education institutions, especially universities of applied sciences, have registered considerable growth. For example, new enrollments at universities of applied sciences increased from 119,182 in 2007 to 156,140 in 2009, i.e. by 31 percent.[47] New enrollments at universities grew by only 10.3 percent between 2007 and 2009. The Expert Commission welcomes the growth in enrollments.

Social selectivity continues to be a problem

Opportunities for higher education continue to correlate closely with social background in Germany. While 71 percent of children from academic families take up studies, only 24 percent of children from non-academic families go on to higher education.[48] At the same time, the percentage of new students from non-academic families grew by 6 percentage points between 2006 and 2008, while the percentage of new students from academic families grew by only 2 percentage points.[49] In surveys of persons who have held higher education entrance qualifications for half a year, young people from non-academic families often report that they are not planning to take up higher education studies because they lack the necessary financial resources.[50]

Expand grant programmes

In the 2009 summer semester, a total of 23 percent of all students in Germany received support under the Federal Education and Training Assistance Act (*BAföG*).[51] Throughout all of 2009, a total of 550,369 students in Germany received such support, with 39 percent receiving full-level support. The relevant federal and *Länder* expenditures in that year amounted to nearly EUR 1.9 billion.[52] As of 1 October 2010, the maximum rates of *BAföG* support dependent on parents' income levels increased by 2 percent; they now amount to EUR 422 and 597 (which amount applies depends on whether students live at home with their parents or have moved out).[53] In addition, changes of subject area have been facilitated[54], and the applicable age threshold has been changed: persons who have not yet turned 35 when they begin a master's degree programme are now eligible to apply; the previous age limit was 30. The Expert Commission welcomes the new provisions, and it recommends, in the interest of assisting people in juggling work and family responsibilities, that the age limit for students in bachelor's degree programmes also be raised. That age limit is still 30.

Funding for the 12 German foundations that support gifted students (*Begabtenförderwerke*)[55] has now been reduced, following increases over the past few years. Initially, the draft budget for 2011 called for relevant funding to be cut, with respect to 2010, by EUR 61.1 million, to a level of EUR 136.7 million. Now, funding resources that the BMBF did not use in 2010, amounting to EUR 33 million, are to be allocated to the foundations.[56] The Expert Commission explicitly regrets that a cut of ultimately EUR 28 million was still made in 2011.

The Germany grant (*Deutschlandstipendium*) is a new form of support for students. As of the 2011 summer semester, gifted and excellent students can receive support of up to EUR 300 per month, depending on available income, under the new programme. Financing for the grants is to be shared equally by private donors and the Federal Government. The relevant federal funding is tailored so that the number of students receiving support in 2011 will, initially, amount to 0.45 percent of all students. In addition, an option has been provided for gradually increasing the funding to a maximum at which 8 percent of all students receive support. Two examples illustrate the scope of the *Deutschlandstipendium* programme. Humboldt University in Berlin has 36,636 students. In the final stage of the programme, it would be able to support 2,930 students. Total support in that case would amount to EUR 10.6 million per year, of which EUR 5.3 million would have to come from private donors. The corresponding figures for Ludwig-Maximilians University in Munich are as follows: up to 3,735 students would receive support, and EUR 6.7 million would have to come from private donors each year.

The Expert Commission welcomes the establishment and development of the *Deutschlandstipendium* programme. At the same time, it proposes that mechanisms be provided to prevent any considerable regional and subject-oriented concentration in the effort. Such concentration clearly emerged during the pilot phase of the grant programme in North Rhine-Westphalia.[57] Since Germany does not yet have a well-developed culture of fundraising, the Expert Commission warns against cutting funding for the foundations that support gifted students, as a means of boosting funding for the *Deutschlandstipendium* programme.

Unsatisfactory development in MINT subjects

In 2009, some 16.7 percent of all new students chose to study math or science.[58] The corresponding figure in 2000 was 18.7 percent. The percentage of new students going into engineering subjects increased markedly as of the year 2000, reaching 20.3 percent in 2009 (2000: 16.8 percent).[59] The numbers of women who graduate in MINT subjects (mathematics, informatics, natural sciences and technology), as a percentage of all graduates in such subjects, continue to be low. In math and sciences, the relevant percentage decreased slightly, from 40.9 to 40.1 percent, while in engineering fields it is stagnating at 22.6 percent (2008: 22.8 percent).[60] Thus far, only a few German *Länder* are supporting the National Pact for Women in MINT Careers, which the BMBF initiated in 2008.[61] In the second programme phase of the Higher Education Pact 2020, the *Länder* committed themselves to increasing percentages of new students in MINT subjects.[62] Consequently, the Expert Commission is expecting support to broaden for the National Pact for Women in MINT Careers, and thus is expecting the percentage of women studying MINT subjects to increase noticeably in the coming years.

International mobility for students in bachelor's degree programmes needs to be expanded

The percentages of students in Germany who undertake part of their studies abroad have been increasing for years. In 2008, a total of 102,800 German students enrolled in foreign higher education institutions. That figure translates into 58 German students at higher education institutions abroad for every 1000 German students at higher education institutions in Germany. The countries most frequently chosen for studies abroad are Austria, the Netherlands, the UK, Switzerland, the U.S. and France.[63] German students are thus more mobile than students of comparable industrialised countries. While the Expert Commission considers this trend to be positive, it notes that international mobility continues to be tied strongly to students' social background.[64]

Bachelor's degree programmes continue to offer too few opportunities for international studies. The percentage of German bachelor's degree students (universities) who carried out part of their studies abroad was 15 percent in both 2007 and 2009. Among students in master's degree programmes, the percentage of students who carried out part of their studies abroad decreased slightly, from 30 percent (2007) to 27 percent (2009).[65] The Expert Commission recommends that enough time and flexibility be allowed, in bachelor's degree and master's degree programmes, to enable students to travel abroad for part of their studies. One way in which German higher education institutions could achieve that aim would be to plan their programmes from the outset in co-operation with foreign higher education institutions and to allow students to earn double degrees.

Shortages of skilled people are becoming a problem

Basic economic and demographic trends are going to change significantly in Germany over the coming decades. The demand for labour will increase markedly, with the largest such increases occurring in the areas of business-oriented services and health and social services. At the same time, the total available workforce in Germany will shrink from about 44.8 million (2008) to 41.1 million (2025).[66] In the economy as a whole, the number of gainfully employed persons will probably increase by 0.4 million persons through the year 2020. But that number is expected to decrease by 0.5 million persons between 2020 and 2025, for demographic reasons, as job losses in some areas gradually constrain the potential for growth in the employment market.[67]

A comparison of the total available workforce and the numbers of gainfully employed people shows that total underemployment – persons registered as

unemployed, and the hidden labour reserve – could theoretically decrease to below 1.5 million people by 2025. At the same time, it is likely that too many persons of working age will lack the necessary vocational qualifications, and thus it will not be possible to meet growing demand for highly qualified employees. If that situation materialised, i.e. if the demand for labour could not be met with the available workforce, actual underemployment would then be considerably higher than underemployment as theoretically forecast. To counter the threatening shortage of skilled employees effectively, an entire package of measures is needed. A qualification campaign is urgently needed, designed to raise individual educational levels and to establish programmes for retraining and further training.[68] Schools and companies alike are called on to act in this area. In addition, higher education institutions and Germany's dual system of vocational training must begin allowing people in their middle years to pursue additional (second) education, and they must set up relevant suitable programmes. The Expert Commission again calls for exploiting possibilities for suitably educating additional numbers of people; for increasing the percentages of women in the workplace, and the amounts of work entrusted to women[69]; and for making concerted efforts to attract skilled people from abroad. It would be short-sighted to rely on just one of these measures.

Among German-speaking countries, Germany is a "migration loser", in both quantitative and qualitative terms.[70] Although migration into Germany is currently in balance with migration out of Germany, demographically caused shrinkage of the available workforce continues nonetheless. What is more, the trained persons who leave Germany are, on average, better trained and better paid than the persons who immigrate to Germany and than gainfully employed persons overall in Germany. In the view of the Expert Commission, transparent, effective concepts urgently need to be established for guiding and promoting immigration of qualified persons to Germany. At the European level, the possibility of establishing a ministry of migration should be considered; such a ministry could enhance Europe's attractiveness for qualified immigrants from third countries.

COLLECTION OF STATISTICS ON INNOVATION-RELATED ACTIVITIES A 4

Improve the currentness of statistics

In light of the importance of research and innovation, the quality of procedures for "surveying" the knowledge economy needs to be reviewed and improved regularly. To be able to make suitable, proper decisions, decision-makers in the industrial and political sectors need maximally timely, precise information about new developments. At present, such decision-makers are not always receiving such information.

Although research and experimental development within the meaning of the OECD's Frascati definition[71] is not a sine qua non for innovation (cf. the discussion in Chapter B 4), R&D expenditures are still a centrally important indicator for R&I policy. And yet precise data on R&D expenditures in OECD countries become available, for a given report period, only after a considerable time lag. In Europe, a European Commission regulation[72] requires Member States to provide their final data for all sectors no later than 18 months after the end of year being surveyed. In Germany, provisional data on private sector's R&D expenditures in 2009 became available by the beginning of December 2010. Initial data on state R&D expenditures are published considerably less promptly. Intensive efforts to shorten such time lags need to continue.

In the view of the Expert Commission, R&D-relevant data should be collected in the framework of standard household surveys, in order to ensure that reliable information about development of R&D activities is available as early as possible, and to develop additional possibilities for analysis.[73] The Expert Commission especially recommends that the annual Mikrozensus survey also be used as an opportunity to collect data on numbers of people employed in the areas of research, development and innovation. In each case, such data could be provided at a relatively early date, and thus would usefully complement available data on research and innovation.

Identify and eliminate statistical inconsistencies

In the past, relevant political interest has focussed especially on R&D expenditures. Because R&D