



Researchers' Report 2014

Country Profile: Sweden



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1. Key data

National R&D intensity target

“Based on recent trends, Swedish progress towards the national R&D target of 4% of GDP has indeed come to a halt in recent years, with R&D intensity declining from a peak of 4.13% in 2001 to 3.56% in 2005 and to 3.37% in 2011¹. This is the result of a significant drop in business R&D intensity. Business R&D intensity fell from 3.20% in 2001 to 2.59% in 2005 and to 2.34% in 2011². This will make it a challenge to meet the Swedish target of reaching 4% R&D intensity by 2020. Within the business sector, R&D investment is highly concentrated in large, often foreign-owned, companies, which makes the Swedish prima-facie good position vulnerable to change of firm strategies. At the same time, R&D investment in SMEs has fallen almost 30% between 2005 and 2009.

Public funding of R&D has increased since the research bill of 2008, and this trend is planned to continue up to 2012 with a total increase of around EUR 500 million for 2008-2012. Sweden raised its public R&D budget by 3.2% in 2011 and another 4.5% in 2012. A new research bill covering 2013-2016 budget, plans an additional SEK 4 000 million for R&D. Sweden has received EUR 741 million of EU ERDF Structural Funds allocated to research, innovation and entrepreneurship over the period 2007-2013, with a high execution level (65.8%). In addition, up to early 2012, 2 782 Swedish research teams have been successful in the EU FP7 programme, receiving a total of EUR 1.0 billion (representing 3.83% of all EU funding from FP7). The success rate of applicants was 23.78% (above the EU average of 21.95%).

This public funding effort seems having a counter-cyclic effect on business R&D investment. All major R&D-intensive firms in Sweden increased their R&D investments between 2009 and 2011. More broadly, total R&D investment (GERD) in Sweden in current Euro increased by 13% in 2010, partly recovering from a 15% decrease between 2008 and 2009. The long-term trend of decreasing business R&D investment is partly linked to a reallocation of investment to countries outside of Sweden. The R&D investment flows are depending on the general globalisation of research and innovation. The outflow of R&D investment from Sweden increased between 2002 and 2007 to EUR 3 000 million. Inward R&D investment grew as well, but for Sweden the outflow of R&D business investment exceeded the inflow.”³

Key indicators measuring the country's research performance

The figure below presents key indicators measuring Sweden's performance on aspects of an open labour market for researchers against a reference group and the EU average⁴.

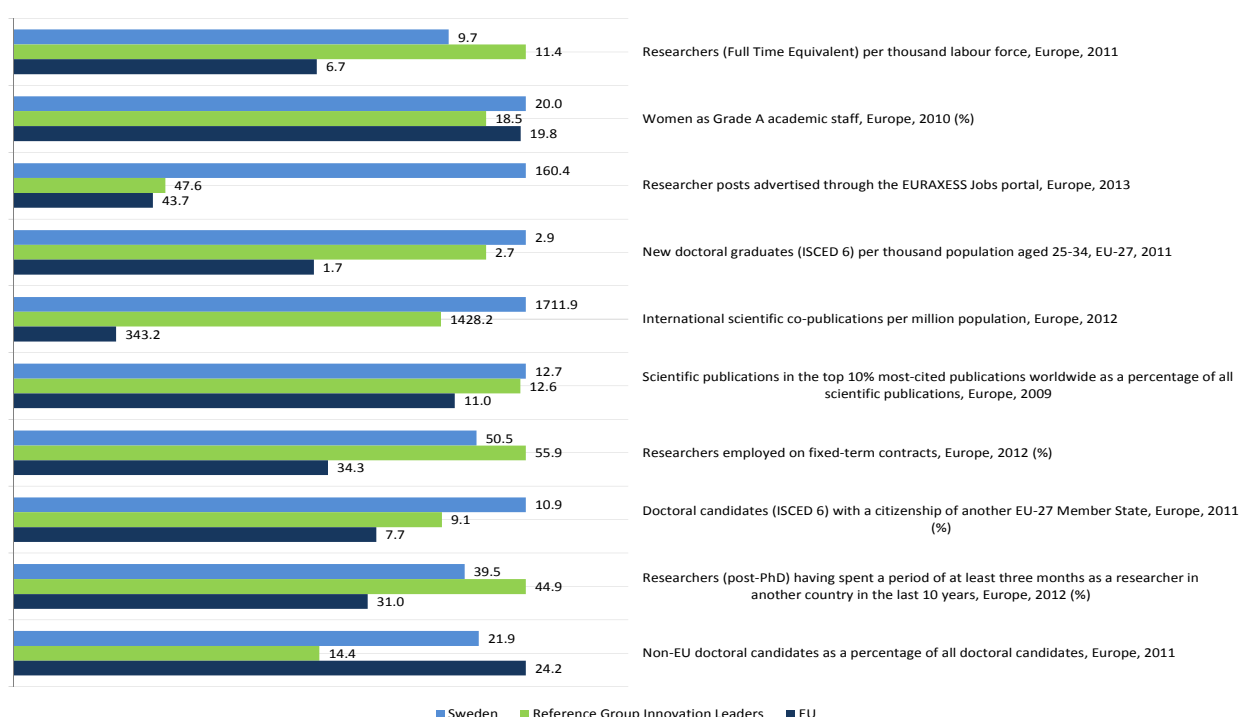
¹ In 2012, R&D expenditure was 3.41% (Eurostat, 2014).

² There is a break in series between 2005 and the previous years for both R&D intensity and business R&D intensity in Sweden

³ European Commission (2013), “Research and Innovation performance in EU Member States and Associated countries. Innovation Union progress at country level 2013”

⁴ The values refer to 2013 or the latest year available

Figure 1: Key indicators – Sweden



Source: Deloitte

Data: Eurostat, SHE Figures, EURAXESS Jobs Portal, UNESCO OECD Eurostat education survey, Innovation Union Scoreboard 2014, MORE2.

Notes: Based on their average innovation performance across 25 indicators, Denmark, Germany, Finland and Sweden show a performance well above that of the EU average. These countries are the “Innovation leaders”⁵.

Stock of researchers

The table below presents the stock of researchers by Head Count (HC) and Full Time Equivalent (FTE) and in relation to the active labour force.

Table 1: Human resources – Stock of researchers

Indicator	Sweden	EU Average/Total
Head Count per 1 000 active labour force (2011)	15.96	10.55
Head Count (2011)	80 039	2 545 346
FTE per 1 000 active labour force (2011)	9.69	6.75
Full time equivalent (FTE) (2011)	48 589	1 628 127

Source: Deloitte

Data: Eurostat

2. National strategies

The Swedish Government has put in place measures aimed at training enough researchers to meet its R&D targets and at promoting attractive employment conditions in public research institutions. The table below presents key programmes and initiatives intended to implement the strategic objectives to train enough researchers to reach Sweden’s R&D targets, to promote attractive working conditions, and to address gender and dual career issues.

Table 2: National strategies ⁶

Measure	Description
Academia for this day and age (Govt. Bill 2009/10:149)	The Academia for this day and age Bill covered greater autonomy for higher education institutions and further opportunities to transform the organisations. Higher education institutions’ status is still that of state agencies, but faculty boards are no longer mandatory or

⁵ European Commission (2014), “Innovation Union Scoreboard 2014”

⁶ Sweden Country Page. Erawatch, Available at:

http://erawatch.jrc.ec.europa.eu/erawatch/opencms/information/country_pages/se/country?section=ResearchPolicy&subsection=Highlights

	regulated by the State.
Budget Bill 2012	The budget bill for 2012 had the following implications for education and research: – Quality evaluation system for higher education: those education programmes that received the best assessment in evaluations carried out by the Swedish National Agency for Higher Education (which since January 2013 has been the Swedish Higher Education Authority) received a quality premium of approximately SEK 100 million (some EUR 11 million) in 2013; this rose to approximately SEK 200 million (some EUR 22 million) in 2014 and will be approximately SEK 300 million (some EUR 33 million) per year from 2015 onwards; – EUR 56 million was allocated to investments in strategic research areas and EUR 34 million was allocated to higher education institutions' appropriations for research and education at doctoral level; – The National Agency for Higher Education, the Agency for Higher Education Services and the International Programme Office for Education and Training were merged into two new agencies in January 2013: the Swedish Council for Higher Education's remit includes providing support for admission to higher education institutions, evaluating foreign qualifications and being the national agency for EU programmes and other international programmes for the education sector. The second new agency, the Swedish Higher Education Authority, is among other things responsible for quality assurance of higher education, legal supervision of higher education, monitoring of efficiency and statistics in the higher education sector.
Budget Bill 2013	The budget bill for 2013 contained a measure related to increasing the number of researchers in the form of an additional EUR 5.4 million to create a clear career track for younger researchers.

Source: Deloitte questionnaire and Erawatch portal

3. Women in the research profession

Measures supporting women researchers in top-level positions

In 2010, the percentage of women grade A academic staff was 20.0% in Sweden compared with 18.5% among the Innovation Union reference group and an EU average of 19.8%⁷.

Sweden's Higher Education Act (1992: 1434) contains a paragraph stating that HEIs should always consider and promote gender equality. Anti-discrimination legislation that applies to society as a whole also applies to HEIs. The responsibility then lies with the HEIs themselves to apply it. National guidelines for higher education also state that HEIs should promote gender equality in their areas of work. However, the Government bill 'Academia for this day and age' (Govt. Bill 2009/10:149) reduced the overall amount of detailed regulation of teaching positions contained in higher education legislation.

The Swedish Higher Education Authority has the specific task of following up on how HEIs handle teacher recruitment from a gender standpoint.

The Swedish Council of Higher Education has been tasked with compiling, analysing and spreading knowledge about different kinds of gender projects supported by the former Delegation for Gender Equality in the Higher Education sector. The report was submitted to the Ministry of Education and Research in April 2014.

The government has recently decided to study the budget process at a couple of universities/higher education institutions, and specifically the budgetary allocations to research and education for research, from a gender perspective.

Measures to ensure a representative gender balance

In Sweden, quotas/national targets are not mandatory. However, there is an expectation that membership of boards, committees, panels etc. will be as gender-balanced as possible.

Sweden has for many years given the higher education institutions specific, individual targets for new recruitment of professors.

⁷ See Figure 1 "Key indicators – Sweden"

VINNOVA, the Swedish Governmental Agency for Innovation Systems⁸, aims to promote gender equality in appraisal of funding and within the organisation, and gender mainstreaming within research.

The other financiers (Swedish Research Council, FORMAS, FORTE) have similar internal policies; the Swedish Research Council is particularly active in gender-balancing its committees and panels. It is also very closely involved in a gender mainstreaming project for national authorities.

Parental leave

In Sweden, there are no maternity leave provisions for PhD students receiving stipends/grants (see also below) as the provisions are connected to employee status and are the same regardless of profession.

Parents are entitled to 480 days of parental leave when a child is born or adopted. This leave can be taken by the month, week, day or even by the hour. Women still take most of the days – in 2012, men took about 24 per cent of parental leave.

For 390 days, the maximum parental allowance is SEK 946 (ca. EUR 105) a day (as of 2013). For the remaining 90 days, the daily allowance is SEK 180. Sixty days of leave are allocated specifically to each parent, and cannot be transferred to the other. In addition, one of the parents of the new-born baby gets 10 extra days of leave in connection with the birth or 20 days for twins.

Parents who share the transferable leave allowance equally get a SEK 50 daily bonus for a maximum of 270 days.

Adopting parents are entitled to a total of 480 days between them from the day the child comes under their care. A single parent is entitled to the full 480 days.

Doctoral students with doctoral grants (a specific type of grant for doctoral students) keep their grants if they become ill or take parental leave.

4. Open, transparent and merit-based recruitment

Recruitment system

The Employment Ordinance (1994)⁹ requires HEIs to announce all job vacancies (both permanent or for a fixed period) for academic staff (including teachers and researchers) and to advertise all relevant information e.g. on the EURAXESS portal.

To ensure that the information on the EURAXESS Sweden portal is adequate, VINNOVA has been appointed to administer the portal in cooperation with the Swedish Research Council, the Swedish Research Council Formas and the Swedish Council for Working Life and Social Research¹⁰.

Open recruitment in institutions

The table below presents information on open recruitment in higher education and public research institutions.

Table 3: Open recruitment in higher education and public research institutions

Do institutions in the country currently have policies to ...?	Yes/No	Description
– publish job vacancies on relevant national online platforms	Yes	In line with the Employment Ordinance, institutions should publish job vacancies on national online platforms.
– publish job vacancies on relevant Europe-	Yes	In line with the Employment Ordinance, institutions

⁸ VINNOVA's overall aims i to stimulate Swedish participation in European and international cooperation, disseminate R&D information to performers and users of R&D research, and the public, and also to increase young researchers' possibilities for better working conditions

⁹ Swedish Code of Statutes 1994:373, Employment Ordinance (1994:373), sections 6, 7 & 8

¹⁰ Sweden Country Page. Erawatch, available at:

http://erawatch.jrc.ec.europa.eu/erawatch/opencms/information/country_pages/se/country?section=ResearchPolicy&subsection=Highlights

Do institutions in the country currently have policies to ...?	Yes/No	Description
wide online platforms (e.g. EURAXESS)		should publish job vacancies on Europe-wide online platforms.
– publish job vacancies in English	Yes/No	Many institutions have policies to publish job vacancies in English.
– systematically establish selection panels	Yes	Institutions have policies to systematically establish selection panels.
– establish clear rules for the composition of selection panels (e.g. number and role of members, inclusion of foreign experts, gender balance, etc.)	Yes	Institutions have policies to establish clear rules for the composition of selection panels.
– publish the composition of a selection panel (obliging the recruiting institution)	Yes/No	The composition of a selection panel is not published online, but the information may be given to applicants.
– publish the selection criteria together with job advert	Yes	The selection criteria (assessment grounds) are generally either directly stated in the advert or indirectly by referring to web-accessible documents stating the criteria. Information about the general regulations of selection criteria, application process etc. is published online.
– regulate a minimum time period between vacancy publication and the deadline for applying	Yes	Typically at least three weeks, for senior positions the period is normally longer.
– place the burden of proof on the employer to prove that the recruitment procedure was open and transparent	Yes	According to state regulation, all universities must have appointment procedures including general regulations on the recruitment procedure.
– offer applicants the right to receive adequate feedback	Yes/No	Mixed practices. Feedback may be given upon request or written evaluation reports from external reviewers may be sent to applicants.
– offer applicants the right to appeal	Yes	According to the Higher Education ordinance appeals may be made to the Higher Education Appeals Board..

Source: Deloitte

EURAXESS Services Network

In 2013, the number of researcher posts advertised through the EURAXESS Jobs portal per thousand researchers in the public sector was 160.4 in Sweden compared with 47.6 among the Innovation Union reference group and an EU average of 43.7¹¹.

Information on entry conditions, transfer of social security and pension contributions, accommodation and administrative assistance is available on the EURAXESS portal. Information on social security can be also found on the Swedish Social Insurance Agency website, which is linked to the EURAXESS Sweden portal. In addition, the Nordic Social Insurance Portal¹² deals with information on social security for mobility between the Nordic countries.

The 'Study in Sweden' portal¹³ contains links to all Swedish universities and university colleges as well as related information for foreign students about the Swedish higher education system.

5. Education and training

Measures to attract and train people to become researchers

In Sweden, there are initiatives to attract people to follow a research career, such as the 'Science in society' initiative that involves several stakeholders in promoting interest in science.

The government in January 2009 appointed a Delegation for gender equality in higher education (*Delegationen för Jämställdhet i högskolan*). With a total budget of SEK 60 million (some EUR 7 million), it funded 37 projects within the HEI. The work of the Delegation ended in 2011, but many projects continued until 2013. The Swedish Council for Higher Education has been commissioned to compile, analyse and disseminate the results

¹¹ See Figure 1 "Key indicators – Sweden"

¹² Nordic Social Insurance Portal. Available at: <http://nordsoc.is/>

¹³ Study in Sweden portal. Available at: <http://www.studyinsweden.se/>

and experiences from the projects. The Council presented the report in April 2014 and the recommendations included reviewing the decision paths in academia – with clear guidelines and routines to contribute to transparency within all decision-making processes. Other examples of recommendations were that all the universities should work with gender mainstreaming and that all HEI's should carry out national gender equality mapping.

Doctoral graduates by gender

The table below shows the number of doctoral graduates in Sweden by gender as a ratio of the total population.

Table 4: Doctoral graduates by gender

Indicator	Sweden	EU Average
New doctoral graduates (ISCED 6) per 1 000 population aged 25-34 (2011)	2.9	1.7
Graduates (ISCED 6) per 1 000 of the female population aged 25-34 (2011)	2.8	1.6
Graduates (ISCED 6) per 1 000 of the male population aged 25-34 (2011)	3.0	1.8

Source: Deloitte

Data: Eurostat

Funding of doctoral candidates

The table below presents different funding paths accessible to doctoral candidates. According to the provisions in the Higher Education Ordinance, state HEIs are only permitted to admit an applicant whose funding is considered to be guaranteed for the entire programme. In the last three years before their dissertation, doctoral students with doctoral grants are entitled to a doctoral position with an employment contract.

Table 5: Funding opportunities for doctoral candidates

Measure	Description
Stipend/Grant	Stipends for foreign students (8%), doctoral grants (8%).
Employment contract	Doctoral students (61%), industrial PhD students (4%), externally employed (6%).
Other	Internally employed (associate professors (5%), doctor of medicine (5%), etc. (5%)).

Source: Deloitte questionnaire, based on the Swedish Higher Education Authority¹⁴

Since 1998, all applicants for doctoral studies must have guaranteed financing for the whole doctoral period. As the table shows, there is a variety of funding opportunities for doctoral students. In 2013, 61% of doctoral students had employment contracts providing the same social benefits as other employees at the higher education institution concerned. Some universities already provide employment for all doctoral students. State funding may not be used for stipends. A doctoral grant is supposed to be converted to an employment relationship for a doctoral student in the last three years before their dissertation.

Measures to increase the quality of doctoral training

Since 2001, the Swedish National Agency for Higher Education (which since January 2013 has been the Swedish Higher Education Authority) has had the responsibility for the quality of the higher education system. Its duties include evaluations of the study programmes and their subject areas¹⁵.

Skills agenda for researchers

Some Swedish universities offer research communication skills, IPR awareness, career management and entrepreneurship training in their effort to improve researchers' employment skills and competencies.

6. Working conditions

Measures to improve researchers' funding opportunities

The Research and Innovation Bill passed in 2012 (Gov. Bill 2012/2013:30) allocated additional resources to research and innovation of approximately EUR 400 million for the period 2013-2016.

¹⁴ 2013, Report 2013:3 Swedish Higher Education Authority

¹⁵ Sweden Country Page. Erawatch, Available at:

http://erawatch.jrc.ec.europa.eu/erawatch/opencms/information/country_pages/se/country?section=ResearchPolicy&subsection=Highlights

Remuneration

Swedish policy on researcher remuneration is that universities have a responsibility for it to be attractive.

For further information, see the country profile on remuneration of researchers from the MORE2 study on the EURAXESS website.¹⁶

Researchers' Statute

The Swedish Higher Education Act (1992: 1434) as well as the Higher Education Ordinance (1993: 100) spell out the employment conditions for academic staff, including researchers.

'European Charter for Researchers' & 'Code of Conduct for the Recruitment of Researchers'

The Association of Swedish Higher Education (SUHF)¹⁷ – the Swedish Rector's Conference – signed the 'Charter & Code' in 2007 on behalf of Swedish universities.

Autonomy of institutions

The Government Bill (2009) provides HEIs with greater autonomy in the appointment of academic staff and other related policies, such as publishing job vacancies online.

Career development

Higher education institutions and national funders are responsible for taking measures on researchers' career development. Some institutions offer the possibility of a tenure track.

Shift from core to project-based funding

In 2012, 33% of the employees in the higher education sector were employed on short-term work contracts receiving short-term funding.

Social security benefits (sickness, unemployment, old-age)

In Sweden, stipends and doctoral grants do not provide sickness or unemployment benefits. Researchers on employment contracts are entitled to full cover. Old-age benefits are regulated by collective agreement between employers and unions.

Doctoral grants carry entitlement to the national retirement pension and all kinds of employment carry an entitlement to an occupational pension. For doctoral students with stipends, the state HEIs provide insurance cover to apply when the doctoral student's stipend ceases to be paid because of absence from study on the grounds of illness or parental leave.

7. Collaboration between academia and industry

The Swedish government has not put in place measures to encourage researchers to move from the public to the business sector and vice-versa. The researcher flow in Sweden is almost in one direction, namely towards industry. However, the Swedish Higher Education Ordinance provides for a position of 'adjunct professor' of up to six years part-time (20-50%). The adjunct professor should be an expert from the industry given the opportunity to work within a university for a certain period of time.

A Boost to Research and Innovation (Government Bill of 2008) established technology transfer offices at eight universities promoting innovation, and the use and transfer of knowledge in order to facilitate commercialisation of research results¹⁸. The measure was continued in Research and Innovation (Gov. Bill

¹⁶ <http://ec.europa.eu/euraxess/index.cfm/services/researchPolicies>

¹⁷ The Association of Swedish Higher Education was founded in 1995 as an organisation for institutional co-operation on a voluntary basis. Forty one universities and university colleges in Sweden are members (15 universities, 19 university colleges and 7 university colleges of art). The Association aims at safeguarding the external interests of the institutions and at strengthening their internal co-operation. The Association was set up by the universities and university colleges themselves, the initiative being taken by the rectors concerned. It was the result of a merger between two existing rectors' conferences. There are no official duties or responsibilities, since the Association is not regulated by law. The Association has no legal status, although in practice it is acknowledged as the representative of universities and university colleges as a sector

¹⁸ Ministry of Enterprise, Energy and Communications (2007), "A national strategy for regional competitiveness, entrepreneurship and employment 2007-2013"

2012/2013:30) with an added EUR 1.8 million until 2016 targeting the establishment of transfer offices at more universities.

The government agency VINNOVA also promotes sustainable growth by financing RTD within areas such as technology, transport, communication and working life, and developing effective innovation systems under the VINNPRO programme running from 2006-2014. VINNOVA was granted EUR 10 million by the government for doctoral candidates in order to increase the number of industry-based doctoral students.

The VINN Excellence Centres (2004-15) are developed by the Swedish Competence Centres Programme (Centres of Excellence in Research and Innovation) and aim to strengthen the crucial link in the Swedish National Innovation System between academic research groups and industrial R&D¹⁹.

8. Mobility and international attractiveness

In 2011, the percentage of doctoral candidates (ISCED 6) who were citizens of another EU-27 Member State was 10.9% in Sweden compared with 9.1% among the Innovation Union reference group and an EU average of 7.7%²⁰. In the same year, the percentage of non-EU doctoral candidates as a percentage of all doctoral candidates was 21.9% in Sweden compared with 14.4% among the Innovation Union reference group and an EU average of 24.2%²¹.

Measures aimed at attracting and retaining 'leading' national, EU and third country researchers

Since 2006, EEA citizens have not needed a work permit to reside in Sweden. The Swedish government transposed the Scientific Visa Directive in 2008²². HEIs may decide to allocate funding or other resources to retain or recruit outstanding researchers.

Inward mobility (funding)

Inward mobility is mainly promoted through the universities' recruitment processes.

The largest government research funding agency, the Swedish Research Council (SRC) funds a return phase for researchers who have spent some 50% of their study time abroad.

Outbound mobility

No mobility or cooperation agreements have been concluded at government level. It is the national agencies, the public research foundations and the universities themselves that set up bilateral and multilateral agreements.

The Swedish Foundation for Strategic Research (SSF) has a number of specific mobility grants targeting both European and non-European countries. Mobility grants for exchange with Japan exist in a number of different forms and programmes organised by the SSF and VINNOVA.

The Swedish Research Council also funds outgoing post-doctorates in all scientific areas.

Portability of national grants

The Swedish Research Council has signed the EUROHORCS 'Money follows Researchers' Letter of Intent allowing portability of individual grants. However, not all institutions subscribe to the 'Money follows Researchers' principle²³.

¹⁹ Sweden Country Page. Erawatch, Available at: http://erawatch.jrc.ec.europa.eu/erawatch/opencms/information/country_pages/se/country?section=ResearchPolicy&subsection=Highlights

²⁰ See Figure 1 "Key indicators – Sweden"

²¹ Ibid.

²² Sweden Country Page. Erawatch, Available at: http://erawatch.jrc.ec.europa.eu/erawatch/opencms/information/country_pages/se/country?section=ResearchPolicy&subsection=Highlights

²³ Ibid

Access to cross-border grants

Grants from the Swedish Research Council, covering all research areas, are open to non-residents if they have an agreement with a Swedish HEI to perform the research at the Swedish HEI. Researchers awarded a grant are free to use the money to fund non-resident researchers in their country of residence or as guest researchers in Sweden as long as this is in accord with the grant proposal.