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Researchers' Report 2013

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 2011. 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 2011¹. 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”.²

Key indicators measuring the country's research performance

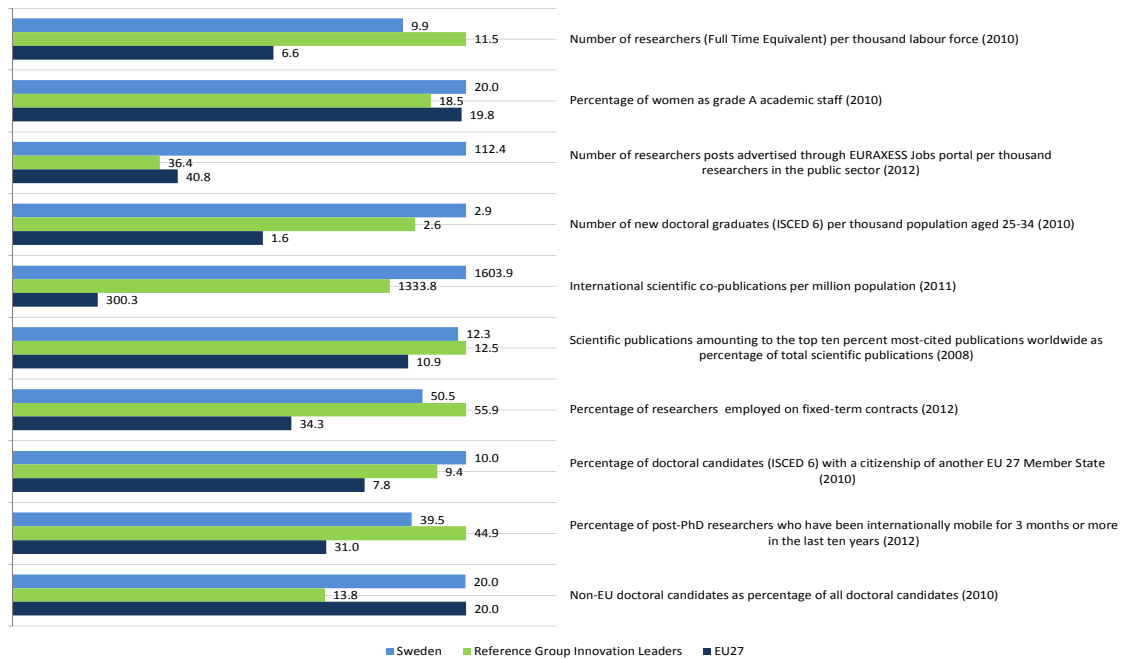
The figure below presents key indicators measuring Sweden's performance on aspects of an open labour market for researchers against a reference group and the EU-27 average³.

¹ There is a break in series between 2005 and the previous years for both R&D intensity and business R&D intensity in Sweden

² European Commission (2013), “Research and Innovation performance in EU Member States and Associated countries. Innovation Union progress at country level 2013”

³ The values refer to 2012 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 2013, MORE2

Notes: Based on their average innovation performance across 25 indicators, Denmark, Finland, Germany and Sweden show a performance well above that of the EU-27. These countries are the Innovation leaders⁴.

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 (2010) | 15.38 | 10.17 |
| Head Count (2010) | 76 295 | 2 435 487 |
| FTE per 1 000 active labour force (2010) | 9.94 | 6.64 |
| Full time equivalent (FTE) (2010) | 49 312 | 1 589 140 |

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 strategies⁵

| 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 regulated by the State. |

⁴ European Commission (2013), “Innovation Union Scoreboard 2013”

⁵ Sweden Country Page. Erawatch, Available at:

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

| Measure | Description |
|-------------------------|---|
| Budget Bill 2012 | <p>The budget bill for 2012 had the following implications for research:</p> <ul style="list-style-type: none"> – 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 receive a quality premium of approximately SEK 100 million (some EUR 11 million) in 2013, approximately SEK 200 million (some EUR 22 million) in 2014 and then 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 to merge into a larger agency responsible for development of higher education and provision of fundamental services, and a new agency responsible for quality assurance and supervision was to be formed. The new agency structure will be in place January 2013. |

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%⁶.

Measures to ensure a representative gender balance

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

VINNOVA (since 2001), the Swedish Governmental Agency for Innovation Systems⁷, aims to promote gender equality in appraisal of funding and within the organisation, and gender mainstreaming within research.

Maternity leave

In Sweden, there are no maternity leave provisions for PhD students receiving stipends/grants.

4. Open, transparent and merit-based recruitment

Recruitment system

The Employment Ordinance (1994)⁸ 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, in cooperation with the Swedish Research Council, the Swedish Research Council Formas and the Swedish Council for Working Life and Social Research has been appointed to administer the portal⁹.

Open recruitment in institutions

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

⁶ See Figure 1 "Key indicators – Sweden"

⁷ VINNOVA overall aims 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

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

⁹ Sweden Country Page. Erawatch, available at:

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

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-wide online platforms (e.g. EURAXESS) | Yes | In line with the Employment Ordinance, institutions 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 | Institutions have policies to offer applicants the right to appeal. |

Source: Deloitte

EURAXESS Services Network

In 2012, the number of researcher posts advertised through the EURAXESS Jobs portal per thousand researchers in the public sector was 112.4 in Sweden compared with 36.4 among the Innovation Union reference group and an EU average of 40.8¹⁰.

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 Portal¹¹ deals with information on social security for mobility between the Nordic countries.

The 'Study in Sweden' portal¹² 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.

¹⁰ See Figure 1 "Key indicators – Sweden"

¹¹ Nordic Social Insurance Portal. Available at: <http://nordsoc.is/>

¹² Study in Sweden portal. Available at: <http://www.studyinsweden.se/>

The government in January 2009 appointed a Delegation for gender equality (*Delegationen för Jämställdhet*). With a total budget of SEK 60 million SEK (some EUR 7 million) it funded 37 projects within the HEI. The work of the Delegation ended in 2010, but many projects are continuing.

Doctoral graduates by gender

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

Table 4: Doctoral graduates by gender

| Indicator | Sweden | EU Average |
|---|--------|------------|
| New doctoral graduates (ISCED 6) per 1 000 population aged 25-34 (2010) | 2.9 | 1.5 |
| Graduates (ISCED 6) per 1 000 of the female population aged 25-34 (2010) | 2.9 | 1.4 |
| Graduates (ISCED 6) per 1 000 of the male population aged 25-34 (2010) | 3.0 | 1.6 |

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 two years before their dissertation, doctoral students 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 (9%), doctoral grants (10%). |
| Employment contract | Doctoral students (56%), industrial PhD students (4%), externally employed (6%). |
| Other | Internally employed (associate professors (5%), doctor of medicine (4%), etc. (5%). |

Source: Deloitte questionnaire, based on the Swedish national agency for higher education¹³

Since 1998, all applicants for doctoral studies must have guaranteed financing for the whole doctoral period. Universities must allocate at least 75% of the funding for research students for employment, and state funding may not be used for stipends. Some universities already provide employment for all doctoral students. A research student grant is supposed to be converted to an employment relationship for a doctoral student within two years.

Measures to increase the quality of doctoral training

Since 2001, the Swedish National Agency for Higher Education has had the responsibility for the quality of the higher education system. Its duties include evaluations of the study programmes and their subject areas¹⁴.

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

A Boost to Research and Innovation (Government Bill of 2008) covered the period 2009-2012 and allocated additional resources of approximately EUR 500 million.

Remuneration

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

For further information, see the new country profile on remuneration of researchers from the MORE2 study (forthcoming, on the EURAXESS website).

¹³ Fall 2010, Report 2011:8 R, Swedish national agency for higher education

¹⁴ Sweden Country Page. Erwatch, Available at:

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

Researchers' Statute

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

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

The Association of Swedish Higher Education (SUHF)¹⁵, representing the Rector's conference, signed the 'Charter & Code' in 2007.

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 2010, 35% of the employees in the higher education sector were employed on short-term work contracts receiving short-term funding. The external funding of university research has been at approximately the same level since the mid-1980s.

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

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 results¹⁶.

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. VINNOVA was granted EUR 10 million by the government for doctoral candidates in order to increase the number of industry-based doctoral students.

¹⁵ 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 as 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

¹⁶ Ministry of Enterprise, Energy and Communications (2007), "A national strategy for regional competitiveness, entrepreneurship and employment 2007-2013"

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&D¹⁷.

8. Mobility and international attractiveness

In 2010, the percentage of doctoral candidates (ISCED 6) who were citizens of another EU-27 Member State was 10.0% in Sweden compared with 9.4% among the Innovation Union reference group and an EU average of 7.8%¹⁸. In the same year, the percentage of non-EU doctoral candidates as a percentage of all doctoral candidates was 20.0% in Sweden compared with 13.8% among the Innovation Union reference group and an EU average of 20.0%¹⁹.

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 since 2008²⁰. HEIs may decide to allocate funding or other resources to retain or recruit outstanding researchers.

Inward mobility (funding)

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

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' principle²¹.

Access to cross-border grants

Grants from the Swedish Research Council, covering all research areas, are open for 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.

¹⁷ Sweden Country Page. Erawatch, Available at:

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

¹⁸ See Figure 1 "Key indicators – Sweden"

¹⁹ Ibid.

²⁰ Sweden Country Page. Erawatch, Available at:

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

²¹ Ibid