



Project acronym: EFFORTI
Project full title: Evaluation Framework for Promoting Gender Equality in R&I
Project number: 710470
Programme: Horizon 2020 - Science with and for Society (SWAFS)
Objective: GERI-3-2015, "Evaluation of initiatives to promote gender equality in research policy and research organizations"
Type of action: RIA

EFFORTI – Deliverable 2.2

Country Note Sweden

Authors: Evanthia Kalpazidou Schmidt, Ebbe Krogh Graversen, Sanne Schioldann Haase, Maria Lehmann Nielsen, Matias Engdal Christensen, Lea Forbig
Deliverable No.: D2.2 (Work package number: WP2)
Dissemination level: Public
Document version: 2.0 (Final)
Due date: 31st March 2017 (M10)
Date of first submission: 31st March 2017 (M10)
Date of Resubmission: 29th January 2018 (M20)

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 710470



Horizon 2020
European Union funding
for Research & Innovation

General Information on EFFORTI

EFFORTI (Evaluation Framework for Promoting Gender Equality in R&I) seeks to analyse and model the influence of measures to promote gender equality on research and innovation outputs and on establishing more responsible and responsive RTDI (research, technology, development, innovation) systems. For this purpose, EFFORTI will

- develop an evaluation framework which enables evaluators, science managers, policy-makers and programme owners to conduct a sound analysis of the research and innovation outputs, outcomes and impacts of gender equality measures across Europe, with a focus on the national level;
- design a differentiated concept to analyse a variety of policy measures and assess their performance, taking into account the diversity in the national policies as well as organisational contexts;
- derive general lessons for evidence-based and thus "good" policy-making in the field of gender equality within RTDI systems. This means that not only has progress towards more gender equality in RTDI been achieved, but also that RTDI has been able to benefit from this progress through enhanced scientific and innovation outputs and productivity, as well as through a higher responsiveness to societal needs and challenges.

Terms of use

This document was developed within the EFFORTI project, funded by the European Commission within Horizon 2020, by a consortium consisting of six partners, the Fraunhofer Society represented by the Fraunhofer ISI in Karlsruhe and the CeRRI in Berlin (coordinator, Germany), the UOC - UNIVERSITY OF CATALONIA (Spain), JOANNEUM Research (Austria), AU - AARHUS UNIVERSITY (Denmark), NaTE - THE ASSOCIATION OF HUNGARIAN WOMEN IN SCIENCE (Hungary), INTRASOFT International (Luxembourg).

This document may be freely used, copied, and distributed, provided that the document itself is not modified or shortened, that full authorship credit is given, and that these terms of use are not removed but included in every copy. This document is subject to updates, revisions, and extensions by the EFFORTI consortium.

Please address questions and comments to: Susanne.Buehrer@isi.fraunhofer.de.

Document history

Version	Date	Changes
1.0	31 st March, 2017	
2.0	29 th January 2018	Reference to EU funding on the front page

Content

0	Introduction	10
1	Innovation System.....	11
1.1	Structure of the research and innovation system	11
1.1.1	Ranking in the European Innovation Scoreboard (Rank and Class)	11
1.1.2	Development of the R&D sector and its subsectors	12
1.2	Knowledge intensity of economies	14
1.2.1	Share of ISCED 6 STEM graduates in the whole population	14
1.2.2	Proportion of scientists and engineers in total labour force	15
1.2.3	Employment in knowledge intensive activities (KIA)	15
1.2.4	Employment in knowledge intensive activities – business activities (KIABI)	15
1.2.5	Number of scientific papers in relation to the population size	16
1.2.6	Number of patents developed by publicly financed research per inhabitant/citizen	16
1.2.7	Share of tertiary educated population among the group of 25 to 34 years old	17
1.3	Governance	17
1.3.1	Main actors in research and innovation governance.....	17
1.3.2	Relevance of national and regional levels in R&I policy and financing	19
2	Gender Equality Policies.....	20
2.1	Employment and labour market policies	20
2.1.1	Description of equal opportunity/ anti-discrimination legislation	20
2.1.2	Description of Structures for Gender Equality	22
2.1.3	Description of relevant policy initiatives to foster equality	24
2.1.4	General assessment of the effectiveness of existing equal opportunity / anti-discrimination legislation / measures	26
2.2	Welfare and Gender Regimes.....	31
2.2.1	Fiscal policies	31
2.2.2	Parental leave policies.....	33
2.2.3	Empirical Evidence for Gender Regime.....	40
2.2.4	General assessment of the Gender Regime	53
2.3	Gender equality policies in RTDI (Current developments)	55
2.3.2	Main challenges concerning GE in RTDI	58

2.3.3	Policy measures promoting gender equality in RTDI	59
2.3.4	Actors responsible for GE in RTDI	63
2.3.5	Assessment of Gender Equality Policies in RTDI	67
3	Gender equality in RTDI	69
3.1	Gender Equality in RTDI on organizational level	69
3.1.1	Proportion of RPOs that have adopted gender equality plans	69
3.1.2	Proportion of R&D personnel working in RPOs that have adopted gender equality plans	69
3.2	Participation of women in tertiary education	70
3.2.1	Share of tertiary educated population among the group of 25 to 34 years old by sex	70
3.2.2	Gender ratio for all tertiary graduates, by field of education	72
3.2.3	Development of the number of women ISCED 6 graduates	74
3.2.4	Development of the proportion of women ISCED 6 graduates differentiated by field of study	75
3.2.5	Development of the proportion of women ISCED 6 graduates differentiated by narrow fields of study in the natural sciences and engineering	76
3.2.6	Distribution of ISCED 6 graduates across fields of study by sex	76
3.3	Labour Market Participation of women and men in the RTDI (whole sector)	77
3.3.1	General Labour market participation	77
3.3.2	Participation of women and men in RTDI	82
3.4	Horizontal segregation	86
3.4.1	General horizontal Segregation	87
3.4.2	Proportion of female researchers by economic activities (NACE Rev. 2) in the business enterprise sector, by sex	88
3.4.3	Distribution of researchers in the Higher Education Sector (HES), across fields of science, 2012	89
3.4.4	Horizontal segregation by scientific field in the higher education sector	90
3.5	Vertical Segregation	91
3.5.1	General vertical segregation	91
3.5.2	Vertical segregation in RTDI	96
3.6	Employment conditions/status/contracts	99
3.6.1	General working time culture	99
3.6.2	Working time in RTDI	100

3.6.3	Working contracts in RTDI.....	101
3.7	Gender Pay Gap.....	103
3.7.1	General Gender Pay gap.....	103
3.7.2	Gender Pay Gap in RTDI	104
3.7.3	Gender Gap in Scientific Outputs.....	105
3.8	Sex differences in international mobility of researchers	107
3.8.1	During their PHD	108
3.8.2	In their post-PhD careers	108
3.9	Women in decision making positions in RTDI	109
3.9.1	Proportion of women grade A staff by main field of science	109
3.9.2	Glass Ceiling Index.....	110
3.9.3	Proportion of women heads of institutions in the higher education sector	110
3.9.4	Proportion of women on boards, members and leaders.....	111
3.9.5	Percentage of research evaluation panels in RFOs that included at least 40% of target of under-representated sex in boards.....	112
3.10	Inclusion of gender in research and teaching	113
3.10.1	Support to the inclusion of gender contents in research agendas by funders.....	113
3.10.2	Inclusion of the gender dimension in research contents.....	113
3.10.3	Inclusion of the gender dimension in teaching/curricula	114
4	Evaluation Culture and Policy	115
4.1	Description of Evaluation Culture.....	115
4.1.1	Explicit legislation and adoption of evaluation standards	115
4.1.2	Budget, Number, frequency and public access to of evaluations.....	116
4.1.3	Actors and Institutions	117
4.1.4	What kind of evaluations are commissioned and conducted?	119
4.1.5	Relevance of gender equality in RTDI evaluations & evaluation of gender equality initiatives in RTDI.....	121
4.1.6	Recent trends/developments in RTDI policy evaluation.....	123
4.2	Evaluation utilisation and policy learning.....	124
5	Conclusions	126
5.1	Comparison between gender equality in the labour market and in RTDI.....	126

5.2 Main strengths and weaknesses of the innovation system and their impact on gender equality in RTDI	126
5.3 Main issues of evaluation culture and policy in RTDI.....	127
6 Annex	130
7 Glossary	132
8 Bibliography	134

Figures

Figure 1: Effect on individual extended income for women and men respectively (aged 20 and older).....	32
Figure 2: Comparison of maternity leave between EU countries.....	34
Figure 3: Duration of parental leaves in weeks	35
Figure 4: Days with parental leave benefit, 1974-2013 (in percentage)	41
Figure 5: Men's proportion of parental leave days taken, 2014	41
Figure 6: Duration of paid leave for men and women.....	43
Figure 7: Share of paid parental leave days taken by mothers and fathers	44
Figure 8: Mean age at birth of first child	46
Figure 9: Reason for part-time work for persons aged 20-64, 2015	49
Figure 10: Children aged 3-5 in daycare, %	51
Figure 11: Time used on domestic work for women and men 20-74 years, hours	51
Figure 12: Time for unpaid work for persons aged 20-64 by activity, 2010/2011	52
Figure 13: Change in percentage of the mother's income in 2012 monetary value in comparison with the father's part of parental leave.....	54
Figure 14: Percentage of female graduates in tertiary levels of education, 2014	72
Figure 15: Gender ratio for all tertiary* graduates, by field of education, 2014	73
Figure 16: Degrees at the undergraduate and graduate levels in higher education by field, 2014-2015	74
Figure 17: Employed aged 20-64 by sector, 1970-2015	78
Figure 18: Employed who work part-time by age, 1987, 2000 and 2015.....	81
Figure 19: Women and men on boards of listed companies, %, 2014	92
Figure 20: Developments in the number of women and men commencing PhD studies each year, 1977 to 2014.....	96

Figure 21:	Proportion of women and men at various rungs of the academic ladder in Denmark, Norway, Sweden and Finland, 2012	98
Figure 22:	The pay gap in Sweden	104
Figure 23:	Share of women among employed persons with managerial responsibilities.....	111

Tables

Tab. 1:	Summary innovation index of EIS for 2008 to 2015	11
Tab. 2:	Ranking in the EIS between 2008 and 2015 among EU28 countries solely.....	11
Tab. 3:	Development of GERD (gross domestic expenditure on R&D) as a percentage of GDP for 2005, 2010 and 2015	12
Tab. 4:	Development of GERD (gross domestic expenditure on R&D) as a percentage of GDP between 2005 and 2015 by sector of performance	12
Tab. 5:	Total researchers (FTE), by sectors of performance	13
Tab. 6:	Researchers (FTE) in different sectors as percentages of total number of researchers (FTE)	14
Tab. 7:	Share of ISCED 6 STEM graduates per million inhabitants	15
Tab. 8:	Proportion of scientists and engineers in the active population between 15 and 74 years, by year	15
Tab. 9:	Annual data on employment in knowledge-intensive activities as a percentage of total employment at the national level (from 2008 onwards, NACE Rev. 2).....	15
Tab. 10:	Employment in knowledge intensive activities – business activities (KIABI).....	16
Tab. 11:	Number of scientific papers in relation to the population size	16
Tab. 12:	Number of patents developed by publicly financed research per citizen.....	16
Tab. 13:	Share of tertiary educated population among the group of 25 to 34 years old	17
Tab. 14:	National bodies responsible for R&I	17
Tab. 15:	Major funding agencies	18
Tab. 16:	Relevant policy legislation and initiatives to foster equality between women and men	26
Tab. 17:	Fiscal incentive for secondary workers, 2011 – (sorted by AETR)	31
Tab. 18:	Recipients/users of publicly-administered paternity leave benefitors or publicly-administered paid paternity leave per 100 live births, 2006 and 2013.....	42
Tab. 19:	Number of weeks of paid parental leave in the Nordic countries in 2000 and 2014.....	43
Tab. 20:	Fertility rate, total (births per woman).....	45
Tab. 21:	Mean age of women at birth of first child by country and year.....	46

EFFORTI Country Report Sweden

Tab. 22:	One-parent families and children by sex of parent, measurement, country and year (number of families)	46
Tab. 23:	Family units by type of household, 2014-2015	47
Tab. 24:	Childcare by indicator, country and year.....	47
Tab. 25:	Percentage of children in formal childcare, 2012.....	50
Tab. 26:	Time spent in unpaid and paid work, by sex, 2010	52
Tab. 27:	Proportion of RPOs that have adopted gender equality plans, 2013.....	69
Tab. 28:	Proportion of research & development personnel working in RPOs who adopted gender equality plans, 2013.....	69
Tab. 29:	Share of tertiary educated population among the group of 25 to 34 years old by sex*..	71
Tab. 30:	Development of the number of women ISCED 6 graduates.....	75
Tab. 31:	Awarded doctoral degrees	75
Tab. 32:	Development of the proportion of women ISCED 6 graduates differentiated by field of study	76
Tab. 33:	Development of the proportion of women ISCED 6 graduates differentiated by narrow fields of study in the natural sciences and engineering	76
Tab. 34:	Distribution of ISCED 6 graduates across broad fields of study, by sex, 2012.....	77
Tab. 35:	Employment rates in the total population aged 20-64, by sex and gender gap	78
Tab. 36:	Employment rate of persons aged 25-49 by age of youngest child, sex and year	79
Tab. 37:	Employment rate of persons aged 25-49 without children by sex and year.....	79
Tab. 38:	Employment impact of parenthood (age 20-49)	80
Tab. 39:	Employed parents aged 20-64 with children at home, by number of children, the youngest child's age, and length of work time, 2015	80
Tab. 40:	Full-time equivalent (FTE) employment rates among women and men aged 20-64 (%) and gender gap (percentage points), 2010-2014	81
Tab. 41:	Proportion of scientists and engineers in the active population between 15 and 74 years, by sex and year	82
Tab. 42:	Annual data on employment in knowledge intensive activities as a percentage of total employment by sex (from 2008 onwards, NACE Rev. 2)	83
Tab. 43:	Employment in knowledge intensive activities – business activities (KIABI) by sex.....	83
Tab. 44:	Number of researchers in all R&D sectors by sex and years (in full-time equivalents)....	84
Tab. 45:	Share of women in R&D.....	84
Tab. 46:	Teaching and research staff, by employment category, 2014	84

EFFORTI Country Report Sweden

Tab. 47:	Number of researchers in BES, HES, GOV and PNP by sex and years (in full-time equivalents)	86
Tab. 48:	Gender segregation in occupations and in economic sectors, 2004 vs 2014.....	87
Tab. 49:	Employment by occupation, sex and year	88
Tab. 50:	Proportion of female researchers in the business enterprise sector, by economic activity (NACE Rev. 2), 2012	89
Tab. 51:	Distribution of researchers in the Higher Education Sector (HES), across fields of science, 2012	89
Tab. 52:	Dissimilarity index for researchers in the higher education sector and government sector	90
Tab. 53:	Share of male and female members of boards in largest quoted companies, supervisory board or board of directors	92
Tab. 54:	Managers by sector, 2014	93
Tab. 55:	Boards and management of listed companies, 2015	94
Tab. 56:	Board Members by function in limited companies, 2013	94
Tab. 57:	Top officials in Government offices 1985, 2000 and 2016	94
Tab. 58:	Composition of committees, 1981, 2001 and 2015	95
Tab. 59:	Positions of trust in municipalities and county councils by position, 2015.....	95
Tab. 60:	Proportion of women academic staff, by grade and total.....	97
Tab. 61:	Actual weekly working hours of full-time workers by gender.....	99
Tab. 62:	Actual weekly working hours of full-time employed persons in academic professions by gender	100
Tab. 63:	Part-time employment of researchers in the higher education sector out of total researcher population, by sex 2012	100
Tab. 64:	"Precarious" working contracts of researchers in the higher education sector out of total researcher population, by sex, 2012	101
Tab. 65:	Gender Pay* Gap	103
Tab. 66:	Gender pay gap (%) in the economic activity "Scientific research & development" and in the total economy, 2010.....	104
Tab. 67:	Numbers of scientific publications by country	105
Tab. 68:	Proportion of publications written by women as main author	106
Tab. 69:	Women to men ratio* of authorships (when acting as corresponding author) in all fields of science (2011-2013)	106
Tab. 70:	Women to men ratio of scientific authorship (when acting as corresponding author), by field of science, 2007-2009 and 2011-2013.....	106

EFFORTI Country Report Sweden

Tab. 71:	Number of patents.....	107
Tab. 72:	Proportion of patents filed by women	107
Tab. 73:	International mobility rates of HES researchers during their PhD, by sex and sex difference 2012.....	108
Tab. 74:	International mobility rates of HES researchers in post-PhD careers, by sex and sex difference 2012.....	108
Tab. 75:	Proportion of women grade A staff by main field of science, 2013	109
Tab. 76:	Glass Ceiling Index	110
Tab. 77:	Proportion of women heads of institution in the higher education sector	110
Tab. 78:	Proportion of women on boards, members and leaders	111
Tab. 79:	Support to the inclusion of gender contents in research agendas by funders (%)	113
Tab. 80:	Inclusion of the gender dimension in research content (% RPO).....	113

0 Introduction

This Sweden Country Note is one of seven country notes that were written as part of the H2020 project EFFORTI (Evaluation Framework for Promoting Gender Equality in Research and Innovation, No 710470) to analyse the context in which gender equality measures in RTDI (research, technology, development, innovation) take place. EFFORTI seeks to analyse and model the influence of measures to promote gender equality on research and innovation outputs and on establishing more responsible and responsive RTDI systems.

The main objective of this report is to understand the influence of wider contextual framework conditions in Sweden on structuring the situation of women in RTDI, their career opportunities and, subsequently, on the effects of gender equality measures in RTDI. Based on the objectives of the EFFORTI project we have considered the following contextual framework conditions as relevant:

- the structure and performance of the research and innovation system,
- gender equality policies in the labour market and welfare policies related to reproductive work and child-care,
- the governance and existing policies of gender equality in RTDI and
- the evaluation culture and policy especially in the field of gender equality in RTDI.

In the concluding chapter the findings of each country note are summarised. This provides a better understanding of how gender equality policies in RTDI are related to the innovation system, on the one hand, and to broader policies of gender equality and welfare regimes, on the other.

With this report we acknowledge the need to analyse the structure and governance of innovation systems and the societal environments in terms of the opportunities and constraints offered by various gender, welfare and innovation regimes for women's employment. This task is particularly important as programmes and initiatives to promote gender equality in RTDI are located at the interface of different policy environments of the innovation system and gender equality as well as welfare policies. For each EFFORTI country (Austria, Denmark, France, Germany, Hungary, Spain, Sweden) such a report was compiled because the selected programmes and initiatives that will be analysed as case studies, are embedded in different contexts and interact differently with their environment. The national country notes will provide a better understanding of these contexts.

Subsequently, the seven national country notes will be compared with each other in a comparative report. The comparative report will focus on the interfaces between the three domains innovation system, welfare and gender equality policy initiatives as well as of evaluation cultures and how they are reflected in gender equality programmes in RTDI. A special emphasis will be put on how gender equality policies are embedded in and aligned with national innovation policies.

Methodology

Most of the research carried out in preparation of the national country notes is desk-based (secondary data collection and analysis of international and national literature). Additional local and sector-level information has been obtained through expert interviews with key informants and through national workshops with stakeholders and evaluators in cases where the information was not available in the collected data or literature.

1 Innovation System

1.1 Structure of the research and innovation system

1.1.1 Ranking in the European Innovation Scoreboard (Rank and Class)

According to the European Innovation Scoreboard (EIS), Sweden is among the group of innovation leaders in the European Union (EU) with innovation performance well above the average. As Tab. 1 shows, Sweden has sustained high innovation performance since 2008, outperforming other countries with a considerable margin. The Swedish innovation performance had been improving until 2013 when it reached its peak with a score of 0.722, but has been declining since, with a considerable drop in 2015. As mentioned in the EIS report, “the performance relative to the EU has been declining over the whole period from its peak of 141% in 2008 and 2009 to 135% in 2015” (Hollanders et al. 2016, 73). Regardless of this decline, Sweden is still the best performer among the EU28 countries, where only Denmark has a score close to Sweden.

Tab. 1: Summary innovation index of EIS for 2008 to 2015

	2008	2009	2010	2011	2012	2013	2014	2015
EU28	0.495	0.502	0.511	0.514	0.519	0.521	0.523	0.521
Sweden	0.697	0.709	0.718	0.714	0.717	0.722	0.719	0.704

Source: (Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs 2016)

Tab. 2: Ranking in the EIS between 2008 and 2015 among EU28 countries solely

	2008	2009	2010	2011	2012	2013	2014	2015
EU28	15	15	15	15	15	15	15	15
Sweden	1	1	1	1	1	1	1	1

Countries outside EU28 are not included in the ranking

Source: (Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs 2016)

In regard to individual dimensions, Sweden is performing above the EU average for all dimensions, especially regarding *Human resources* and *Open, excellent and attractive research systems* (Hollanders et al. 2016, 73). Furthermore, Sweden is performing well in *Firm investments* and *Intellectual assets* where it reaches the top three. *Open, excellent and attractive research systems* is the dimension Sweden has improved the most (by 5.3 percentage points), whereas the *Finance and support* dimension has declined by 4.1 percentage points. However, there is room for improvement in the *Innovators* and *economics effect* dimensions, in which Sweden, among the EU28 countries, ranks number 6 and 7, respectively.

Sweden is among the innovation leaders regarding performance in *Human resources*, well above the EU average. According to the EIS report, this means that a high share of the workforce has the skills needed to participate in and further develop the knowledge-based economy (Hollanders et al. 2016, 19). Furthermore, Sweden has managed to improve its performance over the last eight years, but the improvement is smaller than the average in the EU, so that the rest of the countries are approaching the Swedish level. In regard to the *Human resources* indicators, Sweden has increased *Population share with a tertiary education* and *Youth upper secondary level education*, whereas the indicator *New doctorate graduates* has declined by 2.2 % (Hollanders et al. 2016, 73).

1.1.2 Development of the R&D sector and its subsectors

1.1.2.1 Development of GERD (share of gross domestic expenditure on R&D) between 2005 and 2015

Sweden has for a long time exceeded the 3 % target for the total gross expenditure on research and development (GERD) as a share of gross domestic product (GDP) (2 % BES and 1 % GOV + HES), and the investment share has been among the highest in the EU since 2005. Sweden has had the highest GERD percentage of the countries included in EFFORTI, and, in 2015, its GERD share amounted to 3.26 % of GDP, compared to an estimated average of 2.04 % for the EU28. However, the expenditure on research and development (R&D) as a share of GDP has been in decline since 2005, from 3.39 % in 2005 to 3.42 % in 2010 to 3.26 % in 2015, mainly due to a relative decline in business expenditure on R&D (BERD), which fell from 2.47 % of GDP in 2005 to 2.27 % in 2015. In spite of this decline, Sweden still spends the highest percentage of GDP on R&D among the countries in EFFORTI, well above the average in the EU28.

Tab. 3: Development of GERD (gross domestic expenditure on R&D) as a percentage of GDP for 2005, 2010 and 2015

	2005	2010	2015
EU28	1.76	1.93	2.04
Sweden	3.39	3.42	3.26

Source: (Eurostat n.d.)

Tab. 4: Development of GERD (gross domestic expenditure on R&D) as a percentage of GDP between 2005 and 2015 by sector of performance

	Time/sector	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
EU28	All sectors	1.74	1.77	1.77	1.84	1.93	1.93	1.97	2.01	2.03	2.04	2.04
	BES	1.10	1.12	1.12	1.16	1.19	1.19	1.24	1.28	1.29	1.30	1.30
	HES	0.39	0.39	0.4	0.42	0.46	0.47	0.46	0.47	0.48	0.48	0.47
	GOV	0.24	0.23	0.23	0.24	0.26	0.25	0.25	0.25	0.25	0.25	0.24
	PNP	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Sweden	All sectors	3.39	3.50	3.26	3.50	3.45	3.22	3.25	3.28	3.31	3.15	3.26
	BES	2.47	2.61	2.38	2.59	2.45	2.21	2.24	2.22	2.28	2.11	2.27
	HES	0.75	0.72	0.71	0.74	0.85	0.85	0.85	0.89	0.90	0.91	0.88
	GOV	0.17	0.16	0.16	0.16	0.15	0.16	0.14	0.16	0.12	0.12	0.11
	PNP	0.01	0.01	0.01	0.01	0	0	0.01	0.01	0.01	0.01	0.01

Source: (Eurostat n.d.)

Sweden is highly dependent on its business sector, which accounts for almost two thirds of GERD. As mentioned above, BERD has been declining since 2005, from 2.47 % of GDP in 2005 to 2.27 % in 2015. This is mainly due to the economic crisis in 2009, when BERD fell by 0.24 percentage point. Sweden's dependence on the business sector (BES) increases its vulnerability in times of market volatility, e.g. during a financial crisis. In addition, methodological changes in the statistics in 2005 and the evolution of the GDP may explain part of this decline (Dahlstrand et al. 2016, 12). Furthermore, BERD has declined from 2013 to 2014 by 0.16 percentage points, due to the fact that companies like Astra Zeneca, Ericsson and Sony have phased out some of their Swedish activity and thus decreased their research (Frostell 2015). In spite of this, BERD quickly recovered, increasing to

2.27 % in 2015. Sweden still has the highest BERD investment rates among the countries in EFFORTI, 0.97 percentage points above the average in the EU28.

While the business sector was affected by the financial crisis, public investments in R&D have been more stable, in part because public R&D budgets follow the suggestions outlined in the Research Bill (Dahlstrand et al. 2016, 12). In particular, GERD performed by the higher education sector (HES) has increased, going from 0.75 % in 2005 to 0.88 % in 2015, the second highest among the EU28 countries after Denmark. This increase is in line with the proposals in the 2012 Research Bill (Government Offices of Sweden 2012a). In the same period, the government sector (GOV) share has declined from 0.17 % to 0.11 %, which is one of the smallest percentages of GDP among the EU28 countries.

1.1.2.2 Development of number of researchers between 2005 and 2015 in the whole R&D sector and its subsectors

As Tab. 5 shows, Sweden's total number of researchers (full-time equivalent, FTE) in the whole R&D sector has increased by 25 % from 55 001 in 2005 to 68 670 in 2015. However, this increase is smaller than the one in the EU28 (at 32 %). In Sweden, the number of full-time equivalent researchers has been fluctuating heavily throughout the entire period, which is probably partly due to statistical redefinitions in the data collection process. This can be observed, for example, between 2006 and 2007, when the number of researchers fell by 10 000, and after 2013, when the number rose by 15 000. Together with Spain, Sweden has had the smallest increase in the number of researchers (FTE) in the whole R&D sector among the EFFORTI countries.

Tab. 5: Total researchers (FTE), by sectors of performance

Time	EU28	Sweden				
	Total	Total	BES	HES	GOV	PNP
2005	1 374 760	55 001	36 697	15 125	2 929	250
2006	1 422 499	55 729	37 700	14 740	3 041	248
2007	1 458 115	45 812	28 965	14 840	1 941	66
2008	1 523 247	50 220	33 378	14 896	1 770	176
2009	1 555 600	47 308	29 426	16 308	1 483	91
2010	1 602 756	49 312	30 440	16 959	1 892	21
2011	1 626 802	48 702	29 310	17 101	2 097	194
2012	1 681 342	49 280	30 497	16 561	2 002	220
2013	1 730 841	64 194	43 141	18 401	2 386	266
2014	1 760 232	66 643	44 433	19 616	2 304	290
2015	1 817 764	68 670	47 083	18 135	3 322	130

Source: (Eurostat n.d.)

Tab. 6: Researchers (FTE) in different sectors as percentages of total number of researchers (FTE)

Time	Sweden				
	Total	BES	HES	GOV	PNP
2005	100 %	66.7 %	27.5 %	5.3 %	0.5 %
2006	100 %	67.6 %	26.4 %	5.5 %	0.4 %
2007	100 %	63.2 %	32.4 %	4.2 %	0.1 %
2008	100 %	66.5 %	29.7 %	3.5 %	0.4 %
2009	100 %	62.2 %	34.5 %	3.1 %	0.2 %
2010	100 %	61.7 %	34.4 %	3.8 %	0.0 %
2011	100 %	60.2 %	35.1 %	4.3 %	0.4 %
2012	100 %	61.9 %	33.6 %	4.1 %	0.4 %
2013	100 %	67.2 %	28.7 %	3.7 %	0.4 %
2014	100 %	66.7 %	29.4 %	3.5 %	0.4 %
2015	100 %	68.6 %	26.4 %	4.8 %	0.2 %

Source: (Eurostat n.d.)

The fluctuating increase in the whole R&D sector is mostly due to the fact that Sweden's number of FTE researchers in BES has been shifting across the years. Just like in the whole R&D sector, the number of researchers (FTE) in BES dropped from 2006 to 2007, as well as between 2008 and 2009. In 2013, the share of researchers (FTE) employed in BES reached the same percentage as before the financial crisis, when the number of researchers (FTE) was on the rise. 68 % of researchers (FTE) in the whole R&D sector was employed in BES, the highest share of any country in EFFORTI and well above the 48 % average in the EU.

As evident from Tab. 5, the number of researchers (FTE) in the public sector, HES and GOV combined, has increased by 19 % since 2005, from 18 054 in 2005 to 21 457 in 2015. This shift mostly results from the HES's increase in the number of researchers (FTE) between 2008 and 2009, so that 34.5 % of all researchers (FTE) in 2009 were employed in this sector. Regardless of the increase, Sweden is the country with the lowest share of researchers (FTE) employed in the public sector (31.25 %) among the ones included in EFFORTI, also lower than the 51 % in the EU28. The number of researchers in the GOV has changed throughout the years, decreasing between 2005 and 2009, followed by an increase by 1 839 researchers (FTE) by 2015. From 2014 to 2015, 1 018 new researchers were employed in the GOV, probably partly due to a redefinition.

1.2 Knowledge intensity of economies

1.2.1 Share of ISCED 6 STEM graduates in the whole population

This subsection displays the share of ISCED 6 STEM graduates in the whole population; the share of graduates is shown per million inhabitants to create a clearer overview. ISCED is the International Standard Classification of Education developed by UNESCO to facilitate comparisons of education statistics, and, in this classification, level 6 includes secondary stage of tertiary education, e.g. PhD programmes. STEM refers to the academic disciplines of science, technology, engineering and mathematics.

Tab. 7: Share of ISCED 6 STEM graduates per million inhabitants

Time	2005	2006	2007	2008	2009	2010	2011	2012	2013
Sweden	134	220	211	196	184	173	173	178	178

Source: (Innovationsindikator 2015)

The data in Tab. 7 indicates that the share of ISCED 6 STEM graduates per million inhabitants has increased from 134 in 2005 to more than 200 in 2006 and 2007, while a declining tendency is observed since 2008.

1.2.2 Proportion of scientists and engineers in total labour force

Tab. 8 illustrates the proportion of scientists and engineers in the active population. As seen in the table, the proportion has risen by 3.6 percentage points, meaning that 10 % of the active population between 15 and 74 years in Sweden are either scientists or engineers.

Tab. 8: Proportion of scientists and engineers in the active population between 15 and 74 years, by year

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
EU28	:	:	:	4.9	4.9	5.0	6.4	6.5	6.6	6.6	6.8
Sweden	6.4	6.3	6.5	6.8	6.9	6.8	9.5	9.6	9.6	9.7	10.0

Source: (Eurostat n.d.)

Sweden had the largest increase between 2010 and 2011 when the proportion rose by 2.7 percentage points, but from 2013 onwards the development has been quite stable. The rise in 2011 is due to a statistical shift in definition of scientists and engineers in Sweden. In spite of this recent development, Sweden has one of the largest proportions of scientists and engineers in the active population among the countries included in EFFORTI, 3.2 percentage points above the average in the EU28.

1.2.3 Employment in knowledge intensive activities (KIA)

Tab. 9 shows the employment in knowledge intensive activities (KIA) as a percentage of total employment. Sweden has increased this share by 2.8 percentage points from 2008 to 2015, compared to a 1.8 percentage point increase in the EU28.

Tab. 9: Annual data on employment in knowledge-intensive activities as a percentage of total employment at the national level (from 2008 onwards, NACE Rev. 2)

	2008	2009	2010	2011	2012	2013	2014	2015
EU28	34.2	35.0	35.4	35.6	35.7	35.8	35.9	36.0
Sweden	41.6	42.3	42.6	42.7	43.3	43.4	43.9	44.4

Source: (Eurostat n.d.)

Sweden has increased the employment in KIA every year since 2008, going from 41.6 % in 2008 to 44.4 % in 2015, making Sweden the country with the highest share of employment in KIA as a percentage of total employment among the EFFORTI countries. In 2015, the Swedish employment in these activities was 8.4 percentage points above the one in the EU28.

1.2.4 Employment in knowledge intensive activities – business activities (KIABI)

Tab. 10 demonstrates the employment in knowledge intensive activities – business activities (KIABI). As seen in the table, Sweden has increased the employment in business activities by 1.6 percentage points between 2008 and 2015, well above the level in the EU28.

Tab. 10: Employment in knowledge intensive activities – business activities (KIABI)

	2008	2009	2010	2011	2012	2013	2014	2015
EU28	13.2	13.4	13.5	13.7	13.8	13.8	13.9	14.0
Sweden	16.6	16.8	16.9	17.2	17.6	17.7	17.9	18.2

Source: (Eurostat n.d.)

Sweden has 18.2 % of total employment in KIABI, meaning it has the highest share employed in knowledge intensive business activities among the EFFORTI countries. The Swedish employment in KIABI is 4.2 percentage points above the level in the EU28. This employment has increased more than the average in the EU28 almost every year since 2008.

1.2.5 Number of scientific papers in relation to the population size

The number of scientific papers in relation to the population size is shown in Tab. 11. The table shows that Sweden has increased this number by 604 from 1 880 in 2005 to 2 484 in 2014.

Tab. 11: Number of scientific papers in relation to the population size

Time	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Sweden	1 880	1 920	1 944	1 953	2 019	2 082	2 144	2 308	2 437	2 484

Source: (Innovationsindikator 2015)

Sweden has increased the number of scientific papers in relation to the population size every year since 2005. Sweden has a high number of scientific papers compared to the other countries in EFFORTI, and only Denmark (with 2 874) has a higher number of scientific papers in relation to population size than Sweden. In 2014, Austria produced 1 655 scientific papers in relation to the population size, France produced 1 060, Germany 1 225, Hungary 673 and Spain 1 163, all lower numbers than the one Sweden produced. The primary reason for this difference is Sweden's large HES sector with relatively many FTE researchers, with the number of researchers increasing throughout the years. Another possible reason behind the high number of papers might be found in the bibliometric research indicator system, which makes up approximately 5 % of the government's funding of the higher education sector (Högskolan Väst 2017).

1.2.6 Number of patents developed by publicly financed research per inhabitant/citizen

As shown in Tab. 12, Sweden has a very low number of patents developed by publicly financed research per inhabitant, according to Innovationsindikator (2015). Compared to the other countries in EFFORTI, Sweden develops the second lowest number of patents by publicly financed research, with only Hungary trailing behind.

Tab. 12: Number of patents developed by publicly financed research per citizen

Time	2005	2006	2007	2008	2009	2010	2011	2012	2013
Sweden	0.8	0.4	0.4	0.9	1.3	0.2	0.4	0.7	0.6

Source: (Innovationsindikator 2015)

Even though the numbers in Tab. 12 suggest that Sweden does not develop many patents, the reality seems quite different considering the overall level of patents developed. According to the Organisation for Economic Co-operation and Development (OECD), Sweden develops a relatively high number of patents per inhabitant, but they are primarily financed by the private sector, i.e. health and information communications technology (ICT) (Dernis et al. 2015).

1.2.7 Share of tertiary educated population among the group of 25 to 34 years old

The share of tertiary educated population among the group of 25 to 34 years old is shown below in Tab. 13. In Sweden, this share has increased by 9.2 percentage points from 2005 to 2015, so that 46.5 % of the 25 to 34 year-olds have a tertiary education in 2015.

Tab. 13: Share of tertiary educated population among the group of 25 to 34 years old

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
EU28	28.3	29.2	29.9	30.9	32.3	33.3	34.4	35.5	36.5	37.2	37.9
Sweden	37.3	39.2	39.9	40.9	42.4	42.3	42.8	43.5	44.9	46.0	46.5

Source: (Eurostat n.d.)

As evident from Tab. 13, the share of tertiary educated among the 25 to 34 year-olds has increased steadily every year since 2005. Sweden has an 8.6 percentage points higher share than the EU28; Sweden reached the EU's 2015 level back in 2005. However, the difference between the EU28 and Sweden in the share of tertiary educated among the group of 25 to 34 years old has not changed much since 2005. Lastly, it can be noted that Sweden has the highest share among the countries in EFFORTI.

1.3 Governance

1.3.1 Main actors in research and innovation governance

1.3.1.1 Ministries responsible for R&I

In Sweden, research and innovation (R&I) governance is placed within two different ministries: Ministry of Enterprise and Innovation and Ministry of Education and Research.

Tab. 14: National bodies responsible for R&I

	Main responsibility
Sweden	Ministry of Education and Research Ministry of Enterprise and Innovation

The Ministry of Enterprise and Innovation has the main responsibility for the innovation policy. The ministry has an objective to improve the Swedish innovation climate and capacity so that sustainable development can be achieved and new jobs can be created. This especially concerns new or improved solutions that create value for society, businesses and individuals (Government Offices of Sweden 2016a). To help achieve these goals, the government has established the National Innovation Council that presents proposals for initiatives that enhance the country's innovation climate. Sweden's overarching strategy for Research, Technology and Innovation (RTI) is presented in the Research Bill which serves as a guideline for the ministries and agencies. The bill represents the government's view on the direction of Sweden's research policy and introduces specific measures in 2017-2020 (Government Offices of Sweden 2016a). The measures proposed in the bill are means that can strengthen Sweden as a knowledge nation. Besides the Research Bill, every ministry has its own objectives which they work to improve.

Research is placed within the authority of the Ministry of Education and Research. The ministry has a goal to ensure that Sweden is a research nation characterised by high standards: "The objective of education and research is for Sweden to be a prominent research nation in which research and

innovation are conducted to a high standard, contributing to the development of society and the competitiveness of industry” (Government Offices of Sweden 2015g).

Furthermore, the Swedish governance is decentralised, with a lot of responsibility delegated to various agencies. These agencies have a lot of autonomy, and the government has no power to intervene in an agency’s decisions in matters relating to how the agency exercises its authority. Therefore, the activities and results of the agencies are followed up and evaluated every year when they submit an annual report to the government.

These agencies both provide policy advice to the government, e.g. through annual reports, and carry out the activities decided by the government. The main agencies under the authority of the Ministry of Education and Research are the Swedish Research Council and Vinnova, which gives advice to the government and works as a coordination actor. The Swedish Research Council acts as a funding agency, but it also advises the government on research-related issues, for instance, by identifying research areas for investments or making various evaluations and analyses of the Swedish research system. Whereas the Swedish Research Council is the main actor within research, Vinnova functions as Sweden’s innovation agency. It is the government’s expert agency within the field of innovation policy, and it promotes collaboration between universities, research institutes and companies. The Swedish Agency for Growth Policy Analysis is the most important actor within the Ministry of Enterprise and Innovation. The Swedish Agency for Growth Policy Analysis has an independent task of analysing areas that are most important for growth. The agency’s objective is mainly to strengthen the competitiveness of the Swedish economy, and its target groups are the government, the parliament and other institutions.

1.3.1.2 Major Funding Agencies (national & regional)

In 2016, government investment and other public investment in research and development totalled approximately EUR 4.4 billion, including funds from different Swedish funding agencies. There are four major research funding agencies in Sweden, and the Swedish Research Council (*Vetenskapsrådet*) is the biggest contributor, which allocated EUR 631.1 million to basic research in 2016 (Government Offices of Sweden 2015e).

Tab. 15: Major funding agencies

	Major funding agencies
Sweden	Swedish Research Council
	Vinnova
	Formas
	Forte

Furthermore, the Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning (Formas) is supporting the mentioned areas with basic and needs-driven research. Likewise, the Swedish Research Council for Health, Working Life and Welfare (Forte) supports and initiates research. Formas and Forte granted EUR 126.2 million and EUR 53.2 million, respectively, to RTDI activities in 2016 (Government Offices of Sweden 2015e).

Vinnova is also an important funding agency primarily for needs-driven research in the fields of technology, transport, communications and working life. Vinnova is working to develop the Swedish innovation system to promote sustainable economic growth. In 2016, they granted approximately EUR 273.5 million.

In addition to the agencies above, other agencies finance research funding in various areas. Among the other governmental research funding agencies are the Swedish Energy Agency, various defense agencies, and the Swedish International Development Cooperation Agency (SIDA).

1.3.2 Relevance of national and regional levels in R&I policy and financing

The Swedish national R&I system is governed through the Research Bill (Government Offices of Sweden 2016a) and the National Innovation Strategy with guidelines for innovation policy up to 2020 (Government Offices of Sweden 2012b). The National Innovation Strategy was constructed with input from all ministries within the Government Offices. In 2016, the government presented the newest research policy bill *Collaborating for knowledge – for society's challenges and strengthened competitiveness* to the parliament (Government Offices of Sweden 2016a). This bill presents the government's view on the budget and agenda for research for 2017-2020. Both the Research Bill and the National Innovation Strategy are created in consultation with main stakeholders in the sector.

Besides the Research Bill and the National Innovation Strategy, the Swedish approach to R&I governance is predominantly decentralised, with, as mentioned above, public expert agencies such as Vinnova, the Swedish Energy Agency and the Swedish Research Council serving as main actors in the policy system. These agencies have a key policy implementation role and are sources of advice and expertise to the ministries. Furthermore, the Innovation Council was added in 2014 as another advisory actor.

The regional level plays an important role in the government's Regional Growth policy. This policy is about taking advantage of the potential for growth, development and employment throughout Sweden, including areas like regional development strategies and regional business support. In June 2015, the Swedish government presented the National Strategy for Sustainable Regional Growth and Attractiveness 2015-2020 (Ministry of Enterprise and Innovation 2015). This strategy has a strong focus on regional research and innovation environments.

However, according to the Swedish Research and Innovation Observatory (RIO) Country report, there is no special regional budget, as the only funding data reported at the regional level is that going to medical research (Dahlstrand et al. 2016, 30).

2 Gender Equality Policies

Chapter 2 consists of a description of Swedish policies relevant to gender equality (GE).¹

2.1 Employment and labour market policies

All main issues of social security – except for unemployment benefits at income-replacement level – including parental leave benefits (*föräldrapenning*) are paid for by taxation.² Income-replacement benefits for employees and self-employed require a formal revenue/income in relation to the taxation system (Numhauser-Henning 2015a, 36).

Wage-setting is usually agreed upon through collective bargaining between the social partners. Furthermore, wages are an issue for the Swedish National Mediation Office (*Medlingsinstitutet*), as it is the task of the office to report and analyse gender pay gaps on a yearly basis (Numhauser-Henning 2015b, 12).

2.1.1 Description of equal opportunity/ anti-discrimination legislation

Main legislation transposing and implementing directives³

According to Almgren et al., legislation on gender equality in the workplace has existed since 1980, and a legal obligation to periodically establish gender equality plans since 1992 (2016, 7).

The Swedish legislation on equal opportunity and anti-discrimination is found in the Parental Leave Act (*Föräldraledighetslagen*), the Discrimination Act (*Diskrimineringslagen*) and the Social Security Code (*Socialförsäkringsbalken*). The Discrimination Act covers a range of gender-related and other issues, including transgender identity, sexuality, ethnicity, beliefs and religion, disability and age.⁴ The Discrimination Act exceeds the requirements of the EU law in regards to both the grounds for discrimination and the areas of society covered (Numhauser-Henning 2015a, 8).

Pregnancy and maternity protection

There is no definition of a pregnant worker in Swedish law, but protective measures regarding pregnancy and maternity protection and leave related to work-life balance are implemented in national law. Legislative regulations regarding pregnancy and maternity are found in the Working Environment Act (*Arbetsmiljölagen*, AML), the Parental Leave Act (PLA), and the Social Security Code (SSC) (Numhauser-Henning 2015a, 19-21).

The Working Environment Act (AML) states that employers are obliged to provide good (individual) working environment conditions, including to employees with special needs (Numhauser-Henning 2015a, 19).⁵

¹ For a brief overview of the most relevant gender equality policies, see *Gender equality policy in Sweden* (Regné and Wallström 2016).

² Taxation: employers' contributions on a payroll basis for employees and by self-contributions (*egenavgifter*) concerning the self-employed.

³ See *Country report, gender equality. Sweden* (Numhauser-Henning 2015a).

⁴ For a description of the contents and sections in the Swedish Discrimination Act, see *Discrimination Act 2008:567* (Government Offices of Sweden 2015c).

⁵ For more information on AML, see *Work Environment Act (1977:1160)* (Government Offices of Sweden 2013).

The Parental Leave Act (PLA) and the Social Security Code (SSC) include more information on the right to leave and employment rights and maternal/paternal/parental benefits (Numhauser-Henning 2015a, 22).

The Social Security Code provides benefits for all Swedish residents at the basic/guarantee and income-replacement level, covering a total of 480 days, in the form of maternity/paternity/parental leave (Numhauser-Henning 2015a, 36). Correspondingly, the Swedish Work Environment Authority (*Arbetsmiljöverket*) has adopted detailed requirements in relation to pregnant and breastfeeding workers (*Gravida och ammande arbetstagare*). If a pregnant or breastfeeding employee cannot continue her regular work or carry out physically demanding duties, the Parental Leave Act (PLA) provides the right to a transfer and/or leave. The Social Security Code (SSC) includes a special pregnancy benefit scheme – *Graviditetspenning* – for pregnant workers who are not able to carry out their regular job and who cannot be transferred to more suitable work. The scheme applies from day 60 of the pregnancy until 10 days before the expected date of delivery (Numhauser-Henning 2015a, 19).

Gender mainstreaming⁶

Gender mainstreaming has been on the political agenda in Sweden since 1993 (Swedish Secretariat for Gender Research n.d.-a).

In 2006, the Swedish government confirmed the Equality Policy Bill as the main strategy for achieving the objectives of the gender equality policy. The bill reinforced that each ministry and each policy area is responsible for gender equality within its areas of responsibilities and that ministries should formulate customised objectives. Furthermore, they should designate assignments to agencies and require follow-ups, reports and evaluations of the objectives and assignments (European Institute for Gender Equality 2015).

Gender mainstreaming continues to be the main strategy for achieving GE policy objectives in Sweden. The overall mainstreaming strategy is accompanied with more specific measures and legal provisions (European Institute for Gender Equality 2015).

See also part 2.3.3 *Policy measures promoting gender equality in RTDI*.

Full-time employment

In recent years, there has been an increase in temporary employment in the labour market. This trend especially affects women. A legislative amendment ensuring that fixed-term employment will be converted into indefinite-term employment if the aggregate length of employment in a general fixed-term position exceeds two years has been introduced (Regnér and Wallström 2016, 6).

Other

The principle of work of equal value⁷/equal pay for equal work is implemented in the Swedish legislation. For instance, the Discrimination Act (DA) states that “employers and employees are in

For an overview of legislation on labour, see *Swedish statutes in translation - labour legislation* (Ministry of Employment 2015).

⁶ For more information on mainstreaming in Sweden, see *Gender equality policy. Sweden* (NIKK 2016a).

particular to endeavour to equalise and prevent differences in pay and other terms of employment between women and men who perform work which is to be regarded as equal or of equal value. They are also to promote equal pay growth opportunities for women and men” (Numhauser-Henning 2015a, 15).

2.1.2 Description of Structures for Gender Equality

In this part, relevant formal structures supporting gender equality and gender mainstreaming in Sweden are listed with a brief description.

Gender mainstreaming or *jämställdhetsintegrering/genusintegrering* (integration of gender equality or integration of a gender perspective) is a political priority in Sweden and the government’s main strategy for improving GE in the Swedish society (Universitets- och högskolerådet 2014, 81).

In 1998, the **Swedish Secretariat for Gender Research** at the University of Gothenburg was inaugurated. The secretariat was part of a major Swedish parliamentary initiative for research with a gender perspective (European Institute for Gender Equality n.d.). From 2008 to 2010, the Secretariat for Gender Research was assigned by the Swedish government to work within the Gender Mainstreaming Programme (*Jämi*) to promote integration of gender equality in the country (European Institute for Gender Equality n.d.). The Swedish Secretariat for Gender Research’s main fields are gender research and gender equality (see also part 2.3.4 *Actors responsible for GE in RTDI*):

The overall task is to support and promote the research field on a broad scale and to promote the importance of the gender perspective. (...) Since 2008, the Secretariat has carried out several specific assignments in the gender equality field on behalf of for example the Swedish government and the Nordic Council of Ministers. The assignments include dissemination of knowledge and promotion and support of gender mainstreaming, which refers to the strategy to integrate the gender equality perspective in all decision making. (Swedish Secretariat for Gender Research n.d.-a)

Sweden has a different approach to mainstreaming and feminist policies than other Nordic countries like Denmark. In 2005, a new party called *Feministiskt Initiativ* was initiated (Numhauser-Henning 2015b, 8), and Sweden now has the first government that declares to be feminist. The webpage of the Government Offices of Sweden states that “Sweden has a feminist government pursuing a gender responsive budgetary policy” (Government Offices of Sweden 2016j), and that “feminist values will run through every policy area” (Government Offices of Sweden 2015i, Numhauser-Henning 2015b, 5).⁸

Similarly, the Swedish Institute states that:

The Swedish government has declared itself a feminist government, devoted to a feminist foreign policy. Even if the idea has been met with both praise and criticism – domestic and

⁷ Definition of work of equal value in the Discrimination Act 2008:567: “Work is to be regarded as of equal value to other work if, on an overall assessment of the requirements and nature of the work, it can be deemed to be equal in value to the other work. The assessment of the requirements of the work is to take into account criteria such as knowledge and skills, responsibility and effort. In assessing the nature of the work, particular account is to be taken of working conditions” (Government Offices of Sweden 2015c, 13).

⁸ For more information on the current Swedish government and on political gender initiatives, see *A feminist government* (Government Offices of Sweden n.d.).

international – the word feminism is not as charged in Sweden as in many other countries. The government uses the ‘F word’ to stress that gender equality is vital to society and that more needs to be done to achieve it. (2017)

Sweden has an equality body that seeks to implement the requirements of the EU gender equality law. For instance, **the Swedish Equality Ombudsman**⁹ can be addressed regarding incidents that conflict with the Discrimination Act.¹⁰ “The ombudsman is to try in the first instance to induce those to whom the Act applies to comply with it voluntarily” (Numhauser-Henning 2015a, 45). The ombudsman can bring a court action on behalf of an alleged victim. However, the ombudsman does not have the competence to decide on complaints himself/herself (Numhauser-Henning 2015a, 45) (see also part 2.3.4).

The **Ministry for Gender Equality** is currently located within the Ministry of Health and Social Affairs.¹¹ The minister is responsible for GE development and implementation of policy initiatives. Apart from the Minister for Children, the Elderly and Gender Equality at the Ministry for Health and Social Affairs, other ministries are also responsible for gender equality in Sweden, e.g. the ministries of labour, education and culture, etc. (Numhauser-Henning 2015b, 12).

The Swedish government has appointed an **expert group on gender equality** for the Minister of Higher Education and Research in May 2015. Members represent different stakeholders from the society. The expert group’s goal was to present ideas and proposals for the next governmental white paper on research in the autumn of 2016. Consequently, the expert group presented its main conclusions on how to increase gender equality in universities in the end of 2016. The goal is to increase the proportion of women among professors, work with gender mainstreaming and allocate research funding equally. The expert group is going to play a central role in shaping new reforms in this area (Ministry for Education and Research n.d.).

Each ministry must have an action plan containing a strategy for the management and implementation of gender mainstreaming, and each ministry has a gender coordinator who provides feedback from annual follow-ups, etc. Each year the Division of Gender Equality ensures a follow-up on the work in the government offices, provided by Statistics Sweden (European Institute for Gender Equality n.d.).

The **Division for Gender Equality** at the Ministry of Health and Social Affairs is responsible for the development, management and coordination of gender mainstreaming within government offices. The division supports various activities in the government (European Institute for Gender Equality n.d., Statistics Sweden 2016b, 6).

Furthermore, there is the **Interministerial Working Group on Gender Mainstreaming**, consisting of gender equality coordinators from each ministry.

⁹ See the Ombudsman’s website at www.do.se.

¹⁰ For more information on filing complaints to the Equality Ombudsman, see *Other areas of society* (Equality Ombudsman 2015).

¹¹ For more information on the Ministry of Health and Social Affairs, see *Ministry of Health and Social Affairs* (Government Offices of Sweden 2017b).

Government agencies are also in charge of gender mainstreaming. In the period 2013-2014, the Swedish Secretariat for Gender Research¹² was given the task to support the work with gender mainstreaming in government agencies (European Institute for Gender Equality n.d.). Furthermore, the secretariat has been commissioned by the government to support all state-funded higher education institutions (HEIs) in their gender mainstreaming work during the period 2016-2019.

The government's Council for Gender Equality, led by the Minister for Gender Equality, is a forum where representatives from 56 organisations and networks (e.g. political parties, various organisations, and NGOs) meet four times a year to discuss important issues of gender equality policy and to exchange information and ideas (European Institute for Gender Equality n.d.). See also part 2.3.4.

In a broader perspective, Sweden is also represented in NIKK, Nordic Information on Gender (2012-2015). NIKK is a cooperative body for the Nordic Council of Ministers which seeks to collect and share knowledge about Nordic GE policies, practices, facts and research of relevance to political stakeholders in the Nordic countries (Sweden, Denmark, Finland, Iceland, Norway, Greenland, Faroe Islands, Åland Islands) (NIKK 2016c, European Institute for Gender Equality n.d.).

See also part 2.3.4 *Actors responsible for GE in RTDI*, part 1.3.1.1 (on the Ministry of Education and Research) and part 2.1.4.

2.1.3 Description of relevant policy initiatives to foster equality

Sweden has a long tradition of awareness of issues related to gender equality and implementation, evaluation and improvement of GE policies and initiatives in a wide range of political, societal and cultural areas.¹³ Moreover, Sweden has a council against discrimination (Statistics Sweden 2016b, 6). The 2015 country report on GE in Sweden states that, with its prohibition of discrimination regarding basic schooling and higher education, the Swedish legislation goes beyond the requirements of Community law (Numhauser-Henning 2015a, 48). Moreover, the rights to parental leave are rather extensive, as they are related to social security benefits. There is general prohibition of unfair treatment for reasons connected with parental leave (the Discrimination Act), and gender discrimination concerning healthcare and social services is also outlawed – this goes beyond the requirements of Community law, as well (Numhauser-Henning 2015a, 48). As such, the prohibition against gender discrimination is spread to all societal areas, from basic schooling and higher education to healthcare and parental leave (Numhauser-Henning 2015a, 48).

In the period 2007-2014, government agencies received support for mainstreaming through the implementation of gender perspectives in the activities of the agencies. Since 2012-2013, agencies have been tasked with developing a plan for gender mainstreaming, detailing how they will achieve the gender equality policy objectives, also known as the *Gender Equality in Government Agencies* programme (Gender Equality Inquiry 2015, 7):¹⁴

¹² For more information on the secretariat, see *About the Secretariat* (Swedish Secretariat for Gender Research n.d.-a).

¹³ These also include gender representation in the media, GE issues in relation to the internet and social media, GE related to climate issues, etc. (Seidegård et al. 2015, 71f).

¹⁴ Examples of effective programmes can be found in *Policy objectives and a new government agency - effective governance of Swedish gender equality policy* (Gender Equality Inquiry 2015, 7).

The programme comprises 59 government agencies and one organisation, including agencies in the cultural, judiciary and health care sectors. These agencies are to integrate a gender equality perspective in their activities, based on a tailor made action plan developed by the respective agency. (Regnér and Wallström 2016, 5)

In 2011, the government adopted a five-point gender mainstreaming plan, including a strategy for government offices, a development programme for government agencies, regional support, quality assurance in municipalities and councils, and initiatives for gathering and sharing knowledge and experience regarding the implementation of the mainstreaming plan (Numhauser-Henning 2015a, 12-13). *The Strategy for the Work on Gender Mainstreaming in the Government Offices* (GMGA), initially covering the period 2012–2015, includes a description for rules, responsibilities and accountability for civil servants and political government officials (European Institute for Gender Equality 2015). Additionally, the *County Administrative Boards Advance Gender Equality* programme succeeded in improving and clarifying the county's administrative boards' gender equality mandate. Furthermore, the *Sustainable Gender Equality Programme* supported regions, county councils, municipalities and other providers in their work of developing gender-equal services by providing relevant knowledge and developing appropriate methods (Gender Equality Inquiry 2015, 7).

Recently, the Swedish Public Employment Service has been assigned the task of tailoring its activities to promote GE in order to address gender divisions in the labour market (Regnér and Wallström 2016, 6).

See also part 2.3.3 *Policy measures promoting gender equality in RTDI*.

2.1.4 General assessment of the effectiveness of existing equal opportunity / anti-discrimination legislation / measures

Tab. 16: Relevant policy legislation and initiatives to foster equality between women and men¹⁵

Equal economic independence	<ul style="list-style-type: none"> • Labour market participation • Work-life balance • Childcare facilities 	X X X
Equal pay for equal work and work of equal value	<ul style="list-style-type: none"> • Wage transparency • Awareness raising for consequences of part-time work and fixed-term contracts • Equal pay • Vocational orientation for non-traditional occupations 	X X (X)
Equality in decision-making	<ul style="list-style-type: none"> • Initiatives to improve the gender balance in decision-making • Monitoring the 25 % target for women in top level decision-making positions in research • 40 % of members of one sex in committees and expert groups • Support greater participation by women in European Parliament elections including as candidates 	X X (X)
Horizontal issues	<ul style="list-style-type: none"> • Promoting non-discriminatory gender roles in all areas of life such as education, career choices, employment • Equality bodies who monitor, enforce, evaluate and update the legal framework • Annual report on progress on gender equality 	X X X
Additional activities	<ul style="list-style-type: none"> • Gender budgeting in legislation 	X

X indicates that there are policy initiatives supporting the specific measure. (X) indicates that there is not a direct national policy initiative targeting the measure in question, but that there are related initiatives or initiatives covering closely related measures or objectives.

Equal economic independence (labour market participation, work-life balance, childcare facilities)

Policy initiatives concerning labour market participation are described above in 2.1 and below in 2.2. For information on work-life balance see 2.2.2.11. See also description of childcare facilities and leave in part 2.2.2 *Parental leave policies*, part 2.2.2.9 *Compensation rate for wages for parental leave* (including payment and funding), part 2.2.2.10 *Additional paid leave for working parents*, and part 2.2.3 *Empirical evidence for gender regime*.

National law provides workers with a legal right to reduce working time on request. As stated in the Parental Leave Act, all employees with children have the right to leave when on either parental or maternity/paternity leave (see also part 2.2.2.11). The leave schemes in Sweden are quite flexible, and parents can make use of different types of part-time or full-time leaves. If the employee is no longer entitled to compensation or benefits, the employee can make use of this possibility at his/her own expense (Åkerström 2017).

¹⁵ This table is based on the European Commission's strategy for equality between women and men 2010-2015.

Equal pay (wage transparency, part-time work and fixed-time contracts, non-traditional occupations / gender segregation)

The European Commission's Recommendation of 7 March 2014 on strengthening the principle of equal pay between men and women (as stated in the Discrimination Act, see part 2.1.1) through transparency is applied in Sweden (see also the description of gender budgeting below). It should be stressed that in Sweden pay and pay structures are decided by the social partners through collective bargaining (and there is also no such thing as a minimum wage). Strengthening the principle of equal pay and pay transparency is achieved, for instance, by the rules on active measures in the Discrimination Act and its requirement of the Equal Pay Action Plan, which includes a survey of provisions and practices regarding terms of employment, including pay differences between women and men performing equal work/work of equal value. This obligation is described as a prerequisite for the Equal Pay Action Plan. Furthermore, equal pay is pursued through requirements for the Swedish Mediation Office (Swedish state authority) to monitor wage developments in the labour market, which includes equal pay developments (Numhauser-Henning 2015a, 16). The government will present an action plan for equal pay in the near future (Regnér and Wallström 2016, 6).

The Swedish Parliament has decided that gender statistics must be part of the official statistics in Sweden: all official statistics concerning individuals must be divided into sex categories. Furthermore, the booklet *Women and men in Sweden* by Statistics Sweden presents gender statistics in an accessible way, and Statistics Sweden also publishes indicators on GE divided into thematic areas, thus providing material to assist the government to follow up on its gender equality policies (Statistics Sweden 2016a, 12, Numhauser-Henning 2015b, 13). Similarly, the Swedish Secretariat for Gender Research has developed a guide for assessing GE initiatives and gender mainstreaming (Swedish Secretariat for Gender Research 2014). Today, social partners, including trade unions, are required to conduct pay surveys annually (Regnér and Wallström 2016, 6).

In terms of GE, some of the prioritised objectives of the Swedish government have been to promote an equal distribution of unpaid domestic work and to improve economic GE. Among other aspects, this included focus on economic security in case of illness, and raising awareness of the effects of unemployment or part-time work for pension (Seidegård et al. 2015, 71; Gender Equality Inquiry 2015).

With the newly initiated mainstreaming strategy for the higher education sector for the period 2016-2019, the government – among other issues within the sector – has formulated the promotion of equal career opportunities in academia and the need to work against gendered education choices as priorities in academia (Swedish Secretariat for Gender Research 2016a). For additional information on the *Gender Mainstreaming Academia* (GMA) programme, see part 2.3.1 *Description of overall strategic gender equality policies in RTDI in place*.

See also part 2.1.1 on equal pay and parts 2.2.3.8 and 2.2.3.9 on part-time work.

Equality in decision-making (committees, expert groups, European Parliament elections)

The government in Sweden places a strong emphasis on gender mainstreaming and gender equality in all aspects, including support for awareness of gender distributions in all levels of decision-making in the Swedish society, including political positions. In Sweden, every second candidate for an election is usually female (Numhauser-Henning 2015b, 15).

Visibility and equal distribution of power and influence has been a central priority in the Swedish GE policy in recent years, and this also seems to be the case when looking at political decision-making. For instance, Seidegård et al. found that, for three years in a row, women comprised more than 50 % of members of the European Parliament (2015, 21, 71), and as mentioned elsewhere, political decision-making in Sweden is gender-balanced. According to the European Parliament, “the relative gender balance was achieved voluntarily and without the need to resort to gender quotas (women’s share in Parliament in recent years oscillated between 44 % and 47 % in recent years)” (Numhauser-Henning 2015b, 15). However, men still dominate other ‘powerful positions’ in the Swedish society, especially in the private sector (Seidegård et al. 2015, 21). See also part 3.4 on horizontal gender segregation in Sweden.

The Swedish business model is based on voluntary measures. The Swedish Corporate Governance Board administers guidelines targeting stock market listed companies and public limited liability companies; the Swedish Code on Corporate Governance, compiled by the Swedish Corporate Governance Board, applies to all companies listed at the OMX Nordic Exchange Stockholm and NGM Equity. The board made a range of changes to the Swedish Code on Corporate Governance in 2014, ensuring a specified aim at achieving a more equal gender balance in boards of at least 40 % of the underrepresented sex by 2020. But since this code is voluntary, it is not binding; the code is rather intended as a complement to other gender-sensitive legislation. However, companies are obligated to provide annual reports including a motivation of the final proposal regarding the composition of their board and explanations of deviations from the Governance Code (Swedish Women’s Lobby 2015, 13, Numhauser-Henning 2015b, 12, 15). However, gender balance in economic decision-making has long prospects in Sweden.

In accordance with the previous Gender Equality Act, the current Discrimination Act also encompasses the private sector. Still, the act does not address gender quotas, e.g. for government councils and committees. The question of quotas is continuously debated.¹⁶ But even without specific legislation, the principle of gender balance (40 % representation of the underrepresented gender) on bodies and boards *appointed by the government* is followed (Bergman 2013, 28), and in state-owned companies the goal of at least 40 % women on boards was reached in 2003. Now women constitute around 50 % (Numhauser-Henning 2015b, 15).

Today, there is still no quota legislation for women’s representation on company boards. However, as mentioned before, in 2014, when the share of women on boards was around 25 %, the government ‘foreshadowed’ a proposal for legislation specifically concerning gender quotas. The legislative proposal was to be announced after shareholders’ general meetings in 2016, if the share of women on company boards remains below 40 % (Numhauser-Henning 2015a, 12).

For additional information on decision-making see part 2.3.2.2 *Measures addressing gender balance in decision-making*.

Horizontal issues (non-discriminatory gender roles, equality bodies, progress reports)

See description of the equality body in part 2.1.2 above. See also part 2.3.1 *Description of overall strategic gender equality policies in RTDI in place* and part 2.3.4 *Actors responsible for GE in RTDI*.

¹⁶ For an overview of the political discussions of quotas in Sweden, see *The policy on gender equality in Sweden* (Numhauser-Henning 2015b, 16).

Additional activities (gender budgeting/gender-responsive policy making/evaluation)

Several evaluations of the GE strategies have been carried out, including evaluation of GE strategies for public schools, in Swedish culture (including GE in the film industry, at museums, in the music business), GE in the HES, public safety from a gender perspective, women's health, working environments for women, etc. (Seidegård et al. 2015, 334-370). However, even if these initiatives and evaluations put gender on the agenda in a wide range of areas and some have had effects at the organisational level, none of these studies have specifically evaluated the effects of the government's GE policy or GE initiatives on actual and lasting GE effects at the societal level (Seidegård et al. 2015, 339f, 368).

Since 2014, the Swedish government has had a renewed focus on gender budgeting in the state budget as one of gender mainstreaming tools. In the budgetary process, GE effects are evaluated, and the government strives towards a continual focus on GE implications (Government Offices of Sweden 2016d, Bergman 2013, 43, Numhauser-Henning 2015b, 13). Furthermore, the government is currently analysing the Swedish tax system from a gender perspective, studying the gender pay gap (Government Offices of Sweden 2016d, Bergman 2013, 43). The analysis will be completed in 2018.

Clear guidelines for using a gender perspective in key work processes are provided for the Government Offices, e.g. in the budgetary process and agency governance. Furthermore, the Budget Bill for 2017 states that the government intends to establish a gender equality agency that will help ensure effective implementation of GE policy (Government Offices of Sweden 2016d).¹⁷

See also parts 2.1.2 and 2.1.3 for a description of Sweden's gender mainstreaming policies.

Current societal/political discourses about gender equality (gender equality discussed publicly and in the media; topics, issues or policies discussed)

In terms of gender equality, Nordic countries such as Sweden have a very positive reputation (Niskanen 2011b, 11), and, in the Swedish context, GE issues are addressed as important societal topics. The Swedish self-declared feminist government perceives GE as a matter of justice and equal participation in society and decision-making (see also part 2.1.1 and part 2.2.4).

Some of recent public debates on gender equality policy have focused on issues regarding gender distribution in academic positions and gender quotas. The government has set voluntary quotas for universities for the recruitment of female full professors since the late 1990s. There are no sanctions for non-compliance, but there are expectations to meet the targets. These targets have contributed to the increase in the share of women among full professors from 9 % in 1996 to 24 % in 2013. However, the share of female full professors is not much higher compared to the EU average of 20 % (Wallon et al. 2015).

Bergman states that:

¹⁷ For more information of gender(-responsive) budgeting, see *Swedish Government to establish gender equality agency* (Government Offices of Sweden 2016g) and *Gender-responsive budgeting* (Government Offices of Sweden 2016d). For an overview of reforms in the Budget Bill for 2016 that contribute to gender equality, see *A feminist government ensures that decisions increase gender equality* (Government Offices of Sweden 2015a).

During the 1990s and up until the early 2000s, the practice of earmarking academic positions, including professorships, as a gender equality measure was hotly debated in Norway and Sweden. Many viewed such earmarking as controversial, and it proved to be difficult to implement for legal as well as political reasons. (2013, 26)

Furthermore, gendered violence is also a highly discussed topic in Sweden (Swedish Institute 2017, Government Offices of Sweden 2015f), and gender stereotypes in the Swedish society (also in connection with advertising) have been a point of attention in the debates.

Seidegård et al. find that the government's GE policies during the period 2007-2014 have had some effects – for instance, the awareness of GE issues has increased and new initiatives have been developed. They find that, especially regarding the issue of men's violence against women, initiatives have been improved,¹⁸ and a focus on gender issues in the labour market and in businesses has also been strengthened (Seidegård et al. 2015, 438f).

However, some challenges and unresolved issues remain; in an interview with the head of the Gender Equality Inquiry, set up by the Swedish government, Seidegård states that "(...) progress in Sweden is more or less standing still" (The Local 2015).

The 2015 report *Policy objectives and a new government agency – effective governance of Swedish gender equality policy* prepared by the Gender Equality Inquiry for the Ministry of Health and Social Affairs, addresses four areas or topics (Gender Equality Inquiry 2015):

- GE progress over a 10-year period,
- evaluation of the effectiveness of the implementation of GE policy,
- a review of GE policy objectives and indicators,
- suggestions for changes in the organisation and implementation of GE policy.

In the English summary of the report, the Gender Equality Inquiry states that "there are few, if any, reported effects at societal level of the special gender equality initiative to suggest that the various measures have enhanced gender equality" (2015, 6).

One of the reasons behind the lack of (reported) effects of GE policies could be the fact that it might take some time, especially for long-term initiatives, to give a so-called "positive return" that can also be measured. Additionally, it can be difficult to isolate GE-specific factors and other factors (Gender Equality Inquiry 2015, 6).

However, the Gender Equality Inquiry also found that those government agencies that took part in the *Gender Equality in Government Agencies* programme state that they have experienced an integration of GE perspectives in their work, and in the leadership and management of the activities at the agencies (2015, 7). Yet, even though the agencies made extensive reports, only "few of the evaluations have included any impact evaluations of a comprehensive nature" (Gender Equality Inquiry 2015, 7).

The Gender Equality Inquiry concludes that:

¹⁸ During the government period 2007-2014, the gender-based violence initiative received the highest governmental funding (SEK 2.1 billion and more than 200 measures) (Gender Equality Inquiry 2015, 6).

The Government's 2007-2014 gender equality initiative and the Government's management of gender equality policy in general have had an impact in society in that knowledge about gender equality has increased and methods and practices have been developed through gender equality work at different levels of society. However, there has been insufficient data in the form of analyses and evaluations to enable an understanding of how these have affected gender equality. (2015, 10)

Also in terms of hiring and promotion, there are still some challenges in terms of discrimination; for instance, Numhauser-Henning states that:

Even if discrimination is proven, there is no right to the position/promotion as such or to compensation for economic loss. Arguably, with regard to transparency, etc., one can also question the technique of the 2008 Act to prohibit any discriminatory decision in working life without expressly mentioning access to employment, pay, pregnancy, etc. This makes the prohibitions on discriminatory pay and occupational pension schemes far from transparent. (2015a, 48)

2.2 Welfare and Gender Regimes

2.2.1 Fiscal policies

Fiscal policies and fiscal benefits or disadvantages for households with two earners are factors which can have an influence on the labour market participation of women – however, this seems to be of greatest importance in countries where women's labour market participation is very low.

Until 1971, married couples were seen as a unit, and due to high taxation, employment of women was not financially rewarding for the household; therefore, a very important factor for women's labour market integration was the introduction of separate taxation in 1971 (Numhauser-Henning 2015b, 11, 5). Today, the Swedish taxation system is considered to be gender-neutral (Stanfors 2015, 223), also in regard to fiscal policies and national budgets (see Tab. 17). But the Swedish government still wants to increase the participation of women working full-time. Furthermore, the government has stated that there is a general issue of income inequality in Sweden, which will be addressed through specific initiatives (Government Offices of Sweden 2015j): "There are several explanations for the general phenomenon of increased income inequality. Increased income from capital combined with lower income-equalising taxes are the most important factors behind income disparities that are wider in 2013 than in 1995" (Government Offices of Sweden 2015j).

In the period 1995-2014, there has been an increase in income in all segments of income distribution, yet income differences also increased, especially in the period 2007-2010.

Tab. 17: Fiscal incentive for secondary workers, 2011 – (sorted by AETR)

	Secondary earner (AETR) Primary earner at 100 % of AW and 2 children	Single (net personal average tax)	Ratio (secondary earner/single)
Sweden	22.1	22.1	1
Unweighted average	31.3	23.7	1.4
Unweighted average	30	23.1	1.3

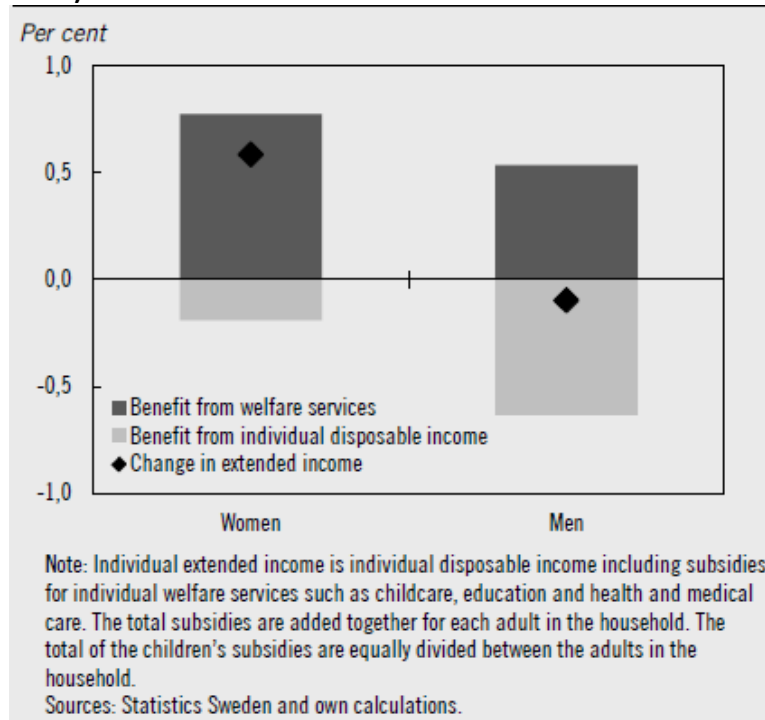
without joint taxation countries			
Unweighted average for joint taxation countries (FR, DE, IE, LU, PT)	37.3	26.9	1.4

Source: (Plantenga 2014, 41)

The table above shows fiscal incentives for secondary workers sorted by the average effective tax rate (AETR). In Sweden, fiscal incentives for secondary earners and single earners are the same, and it is quite normal for couples in Sweden to have roughly similar earnings (Rastrigina and Verashchagina 2015, 28).

Figure 1 shows the effects or benefits that welfare services, disposable income and income change have on the individual extended income for women and men (Government Offices of Sweden 2016e, 50).

Figure 1: Effect on individual extended income for women and men respectively (aged 20 and older)



The Swedish Fiscal Policy Council¹⁹ finds that “the Government should specify time-based targets for economic equality and regularly evaluate the policy pursued towards these targets” (Swedish Fiscal Policy Council 2016b, 4-5).

However, as Figure 1 shows, men and women benefit differently from different initiatives, e.g. improvement of welfare services is expected to have greater effects on the extension of the income for women than (taxation) improvements in the individual disposable income (Government Offices of Sweden 2016e, 50).

¹⁹ For more information on the Swedish Fiscal Policy Council, see *About the Swedish Fiscal Policy Council* (Swedish Fiscal Policy Council 2016a).

In the Budget Bill for 2016 and the Spring Fiscal Policy Bill for 2015, the government initiated a range of reforms and proposals which it expects to have positive GE effects, e.g. an increase in the basic income tax allowance for low-income pensioners, gradual reduction of earned income tax credit (allowance reduction for income above the threshold for state income tax, which often benefits men), and restriction of tax-subsidised deductions for various kinds of work at home (Government Offices of Sweden 2015a).

The government's targets for the Budget Bill of 2017²⁰ are improvements in the work environment, expansion of staff in sectors that employ a large number of women, higher large-family supplement, and higher income threshold in the housing allowance, in order to improve margins for women in precarious financial positions (Government Offices of Sweden 2016h).

Furthermore, the Swedish government is currently composing an analysis of the tax system from a gender perspective. The analysis will be finished in 2018, and the government will establish the Gender Equality Agency in regards to e.g. taxation (Government Offices of Sweden 2016j).

2.2.2 Parental leave policies

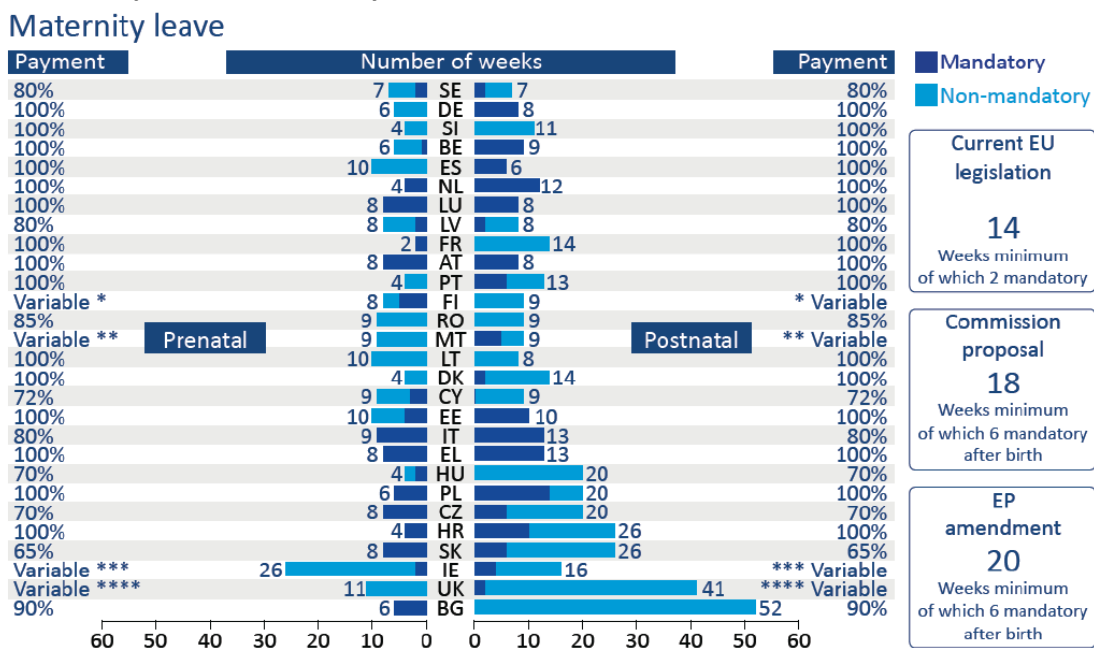
According to Danbolt, "Sweden was the first country in the world to introduce shared parental leave in the 1970s and offers the longest leave in the region today, with an income-related parental benefit of up to 70 weeks (or 480 days)" (2016b, 13). Today, the government's objective is a completely gender-equal use of parental leave and, to this end, the government has appointed an inquiry. Furthermore, the government has introduced a third month of parental leave reserved for each parent (Government Offices of Sweden 2016e, 8, Regnér and Wallström 2016, 7). The change means that parents of children born on or after 1 January 2016 are entitled to an additional third month of leave each, which cannot be transferred to the other parent (Statistics Sweden 2016b, 43, Danbolt 2016b, 14). Furthermore, the Gender Equality Inquiry will review the current rules for parental leave and parental insurance, identify problems and propose measures for improvement of the policies. The inquiry's report will be submitted in October 2017 (Government Offices of Sweden 2016c).

In 2016, the government appointed a commission for revising the parental leave system. The aim is to modernise the leave policy by providing support for gender-equal parenting and flexibility for various family constellations. The government's commission will provide a report in October 2017 (Regnér and Wallström 2016, 7). For more information see *Social insurance in Sweden* (Ministry of Health and Social Affairs 2016).

²⁰ "The Budget Bill is the Government's proposal for central government budget revenue and expenditure for the fiscal year 2017" (Government Offices of Sweden 2016b). For more information on the Budget Bill 2017, see *The central government budget for 2017 in figures* (Government Offices of Sweden 2016i).

2.2.2.1 Possible duration of maternity leave

Figure 2: Comparison of maternity leave between EU countries



Source: (Schulze and Gergoric 2015, 114)

The specific policies on leave are employed in the Parental Leave Act (PLA) and in the Social Security Code (SSC) (Numhauser-Henning 2015a, 22). According to the PLA, employees are entitled to maternity leave for a total period of 14 weeks, of which two weeks are compulsory; employees are entitled to seven weeks of maternity leave prior to the estimated date of birth and seven weeks after delivery (Numhauser-Henning 2015a, 20).

2.2.2.2 Possibility of paternity leave

Swedish national legislation provides for paternity leave in the Social Security Code (SSC) and Parental Leave Act (PLA) and for protection against dismissal or unfavourable treatment of employees taking paternity leave; see also part 2.2.2.12 *Protection against dismissal*.

In connection to the birth of a child, fathers (or the parent not giving birth) has 10 days of earmarked leave. Benefits are paid out under the parental benefits scheme regulated in the SSC. Out of the 480²¹ days of parental leave related to each child, there are now 90 days with benefits (from 2017) at income-replacement level. These 90 days (i.e. the 'daddy months') cannot be transferred between parents (Numhauser-Henning 2015a, 26). However, mothers still take out about 75 % of the benefit days (Numhauser-Henning 2015a, 26), see also part 2.2.3 *Empirical evidence for gender regime*.

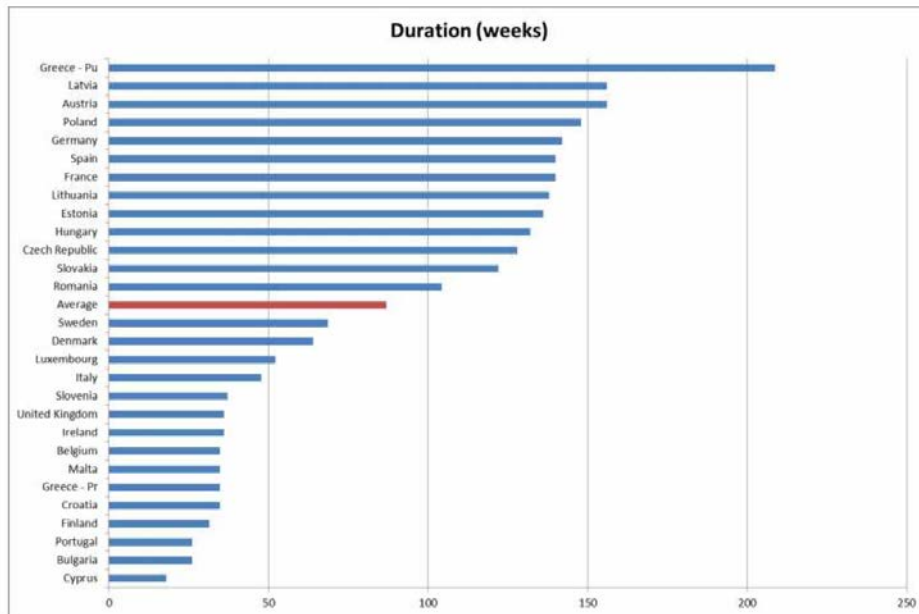
2.2.2.3 Possible duration of parental leave

In Sweden, parents are secured a total of 480 full days with leave benefits per child to be spent within the first 12 years of the child's life (this includes both parental leave and maternal and paternal leave). However, 384 days thereof can only be used until the child turns four years old (therefore, it is only possible to make use of 96 paid parental days for parents with children aged 4+).

²¹ Parents in Sweden are entitled to a total of 480 days or 16 months of parental leave, 3 months (90 days) thereof are earmarked for each parent, and the remaining 10 months can be divided between the parents as they wish.

Parental leave benefit days can be taken in various ways: they can be taken out as a whole, as three quarters, half of days, one quarter, or one eighth of a day. In this way, one full benefit day can equal to a number of part-time working days (Numhauser-Henning 2015a, 22).

Figure 3: Duration of parental leaves in weeks



Source: (Schulze and Gergoric 2015, 68)

As Figure 3 illustrates, the total duration of parental leave in Denmark and Sweden are quite similar, and below the EU average. One explanation for this might be the high enrollment of both women and men in the labour market. See also parts 2.2.2.5 and 2.2.2.11.

2.2.2.4 Who is entitled to take parental leave?

The 2015 EC Swedish Country Report states that:

The right to leave is individual for each of the parents. Some forms of leave require a right to parental benefit according to the SSC, though. Generally speaking, parental benefit days can be transferred between the parents. However, there is a limitation – 60 days [today: 90 days] must be taken by of each one of the parents and are thus untransferable. (Numhauser-Henning 2015a, 23)

2.2.2.5 Flexibility of Parental Leave arrangements

In order to enhance the flexibility of use, parental leave is counted in days, and not in weeks or months. Formerly, two months (or 60 days) of parental leave had been earmarked for each parent and could not be used by the other parent (Government Offices of Sweden 2015a). The government recently made adjustments so that each parent is now entitled to three months (or 90 days) of (earmarked) leave, as of 1 January 2016.²²

This means that today parents are entitled to “double days” (*dubbeldagar*) which means that both parents can take up to 90 days of paid leave at the same time in the child’s first year of life. “Parents

²² For more information on parental leave, see *A more equal parental insurance system* (Government Offices of Sweden 2015b).

cannot use any of the mother's quota or father's quota when using double days. Parents must use the remaining 105 wage-based days that each are entitled to, if they want to stay home at the same time" (Haas, Duvander and Hwang 2016, 3).

The total of 480 days of parental benefit days can be taken altogether in a continuous period, or split into different arrangements and different time blocks (e.g. one day of full-time leave can also be taken as two days of half-time leave or four days of quarter-time leave), and paid and unpaid leave days can also be combined in different ways. Specific leave arrangements and the distribution of the days at hand are usually done in accordance with the wishes of the employee after an agreement with the employer. Only parents on part-time leave are allowed to continue their work while on leave. According to the Parental Leave Act (PLA), the employee is expected to take leave in a way where he or she can resume their work without substantial disturbance to the workplace, unless this is very inconvenient for the employee in question (Numhauser-Henning 2015a, 23, Haas, Duvander and Hwang 2016, 3).

2.2.2.6 Policies in place for supporting paternity leave or usage of entitlements by fathers

In 1974, shared parental insurance was introduced in Sweden, and later on, fathers were given an earmarked period of paternity leave. Recently, the earmarked paternity leave period has been extended to three months; therefore, Sweden has the longest paternity leave period for fathers among Nordic countries (Swedish Institute 2017, NIKK 2016d).

Furthermore, the government provides an economic gender equality bonus (*jämställdhetsbonus*) in the form of a tax-free extra daily payment for both parents, if at least 270 days of the paid parental leave period are equally divided between both parents (Swedish Social Insurance Agency 2014, 18, Åkerström 2017). Parents can only receive the bonus in the period of wage-related leave (390 days), after the three earmarked months are used by both parents (i.e. 210 days). For every day that the parent who has taken the shortest period of leave takes additional leave – past their reserved 90 days – both parents receive EUR 5 tax-free. If parents share the leave equally, they can receive a total of EUR 1 122 tax-free as equality bonus (Haas, Duvander and Hwang 2016, 3).

However, the gender equality bonus is now considered ineffective for its purpose; therefore, in the Budget Bill for 2016, the government proposed that the bonus would be abolished (Government Offices of Sweden 2015h).

2.2.2.7 Regulations and initiatives supporting parents returning to work

The Parental Leave Act (PLA) secures employees' right to resume their work to the same extent as before the parental leave. Further, the act prohibits any kind of unfavourable treatment related to the leave, except in special cases where different working conditions or treatment are a necessary consequence of the leave taken, for example, if the parental leave arrangements in question are not compatible with the organisation of the work, and an employee therefore is temporarily transferred to another position or other working tasks (Numhauser-Henning 2015a, 24).

Parents in Sweden are guaranteed access to childcare services. Childcare for children aged 3-6 is free for up to 15 hours a week. Fees for childcare facilities are proportional to income and number of children (the more children, the lower the fee). All parents are provided child allowances (SEK 1 050 per month) from the government until the child turns 16 years old, and families with more children get extra family supplement (Swedish Institute 2017).

Additionally, Sweden has introduced a scheme giving temporarily employed researchers the right to an extension of their fixed-term contract when they take parental leave (Bergman 2013, 48).

2.2.2.8 Compensation rate for wages for maternity leave

Income-related pregnancy and maternity benefits correspond to sick leave benefits (Social Security Code, SSC). For unemployed mothers, there is instead a benefit at the lower guarantee level. Sickness benefits amount to 80 % of incomes up to ten 'basic amounts' (approximately EUR 49 000 annually, and maximum SEK 945 per day) (Numhauser-Henning 2015a, 20).²³

Numhauser-Henning states that "the rules on maternity leave benefits are fully integrated into the general parental benefit system. There are no qualifying requirements in relation to the parental leave system, thus regulating the right to leave in relation to the employer" (2015a, 21).

The compensation rate for wages for maternity leave amounts to a little less than 80 % of the earnings, up to an earnings ceiling of around EUR 35 000 per year. Payments are distributed by the Swedish Social Insurance Agency, to which employers contribute; employers pay around 30 % of all employees' earnings. Around 2 % thereof are earmarked for 'parental insurance'. The government makes up for any shortfalls (Haas, Duvander and Hwang 2016, 1-2).

2.2.2.9 Compensation rate for wages²⁴ for parental leave

Parental leave benefits based on the employee's income are called "parental benefit at sickness level." The rate depends on how many hours the employee has worked (Swedish Social Insurance Agency n.d.-a). The compensation rate for previous income during paternity leave is 80 % in Sweden, with a salary ceiling of around EUR 4 000 per month.

A public parental leave scheme is regulated in the Social Security Code (SSC), which states that benefits are paid at two levels: 1) an annual income-related benefit at-sickness-benefit level (80 % of incomes, up to 10 basic amounts, a total of about EUR 49 000), or 2) at guarantee level (approximately EUR 20) per day (Numhauser-Henning 2015a, 25).

In relation to the Parental Benefit system in the SSC there are certain requirements, though. Out of the 480 benefits in total in relation to a child only 390 days are at income-replacement level. These days require that one is insured for sickness benefits in cash through employment. Otherwise one will only have a right to parental benefits at the lower, guarantee, level. For the first 180 days at income-replacement level there is an additional requirement of having been insured for sickness benefits in cash through employment continuously for 240 days immediately prior to the birth of the child. The right to sickness benefits in cash is based on presumed employment for the forthcoming year. (Numhauser-Henning 2015a, 21)

Additionally, Numhasuer states that:

To make parental leave less inconvenient for the parent earning more than the other (...) the 'ceiling' on the public parental benefits scheme was increased a few years ago from 7.5 basic

²³ For 390 of the days, parents are entitled to nearly 80 % of their normal pay. Benefits are calculated on a maximum monthly income of SEK 37 083, as of 2015. The remaining 90 days are paid at a flat rate. Those who are not in employment are also entitled to paid parental leave (Åkerström 2017).

²⁴ % of wages covered by leave benefits during leave period.

amounts to 10 basic amounts. There was also a gender-neutral reform concerning the so-called 'Equality Bonus' (Jämställdhetsbonus) (...) to encourage parents to share the parental benefits more equally regardless of their earnings. Concerning income-replacement benefits, after 60 such benefit days the parent having taken out such benefits for the smallest amounts of days receive an extra SEK 50 (about EUR 5) per day for him/herself and another SEK 50 for the other parent up to a maximum of SEK 13 500 (approx. EUR 1 421). (2015a, 28)

In the period 2016-2019, the Swedish government will increase the public finances for the basic level of parental benefits from SEK 261 million in 2016 to SEK 270 million in 2019. The government argues that this reform on the basic level of parental benefit presented in the Budget Bill for 2016 and the Spring Fiscal Policy Bill for 2015, will particularly benefit women, as they claim more days of basic parental benefit than men (Government Offices of Sweden 2015a).

A total of 195 days of leave are paid at nearly 80 % of earnings, up to an earnings ceiling of EUR 47 501 per year. The remaining 60 days are paid at a flat rate payment of EUR 19 a day. Parents not eligible for wage-related leave can receive a flat rate of EUR 27 a day for a total of 480 days (Haas, Duvander and Hwang 2016, 3). All parental leave benefits, including both income-related and flat rate benefit, give pension credits.

The Swedish government has raised the national maintenance support paid to single parents who do not receive child support from the other parent (Government Offices of Sweden 2015d).

2.2.2.10 Additional paid leave for working parents

There are five different kinds of family insurance in Sweden: parental benefit (described in parts 2.2.2.1-2.2.2.9), temporary parental benefit, pregnancy benefit, child pension, and pension rights for childcare years (Ministry of Health and Social Affairs 2016, 5).²⁵

Women who are not able to continue their work duties until the end of pregnancy, can receive a pregnancy benefit (Ministry of Health and Social Affairs 2016, 5). Pregnancy benefits are paid by the Swedish Social Insurance Agency (*Försäkringskassan*) (Åkerström 2017). The agency has created an online tool where employees can calculate how much leave benefit they can get.²⁶

Child pension is for parents of diseased children (Ministry of Health and Social Affairs 2016, 6). Pension for childcare years is a financial compensation for parents with children below five years of age, who are on parental leave or working reduced working hours, who therefore contribute less to their own pensions; "in addition to pension entitlement for the childcare years, pension contributions are made when a parent receives parental benefit and when care allowance is paid out" (Ministry of Health and Social Affairs 2016, 6).

After an agreement with the employer, parents can get temporary paid leave (*tillfällig föräldrapenning*) for up to 120 days per child (for children below 12 years of age) without a doctor's certificate (Åkerström 2017). According to the Government Offices:

A parent who needs to stay at home from work to look after a sick child under the age of 12 (in some cases 16) is entitled to temporary parental benefit. Temporary parental benefit may

²⁵ For a complete overview and descriptions of social in Sweden, see (Ministry of Health and Social Affairs 2016).

²⁶ See *What Försäkringskassan can do for you* (Swedish Social Insurance Agency n.d.-b).

also be paid in cases when the child's regular caregiver is ill. The benefit can be paid for up to 60 days per child per year. Once these days have been used up, the benefit can be paid for a further 60 days. However, these extra days may not be used in the event of the regular caregiver falling ill. Additionally, the father of a newborn baby is entitled to 10 days of temporary parental benefit, known as 'father days', in connection with the child's birth. For adoptive parents, five days each are paid out. The compensation level is approximately 80 % of the benefit-qualifying income. To help single parents in cases where they fall ill and cannot look after their child, since 2010, another insured person who forgoes paid work has been able to receive temporary parental benefit to look after the child. (2016, 5)

2.2.2.11 Legal right to reduce working time on request

Parents are entitled to parental leave and reduced working hours. The Parental Leave Act (PLA) ensures that employees with children up to eight years old can make use of regulations about reduced working hours by up to one quarter, e.g. working 75 % (Åkerström 2017).

In an effort towards more gender-equal work-life balance solutions, each parent has a number of non-transferable leave days. Furthermore, the ceiling for parental benefits has been increased, and when fathers take part in leave beyond the non-transferable days, the families are provided with a financial equality bonus which is automatically paid out to both parents.

See description of work-life balance policies including description of possibilities for working reduced hours in part 2.1.3 *Description of relevant policy initiatives to foster equality*.

2.2.2.12 Protection against dismissal

Employees are protected under the Employment Protection Act, the Discrimination Act, and the Parental Leave Act. Yet dismissal during pregnancy and up until the end of the maternity leave is not explicitly prohibited in Swedish law, although there are several provisions to protect workers against less favourable treatment or dismissal on the grounds of an application for, or the taking of, parental leave. Numhauser-Henning states that "paternity leave is thus part of the general parental leave scheme regulated in the SSC and protected in the PLA and its Sec. 16, prohibiting any unfavourable treatment in relation to parental leave" (2015a, 26).

Any dismissal requires a just cause according the Employment Protection Act (EPA) (*Anställningsskyddslagen*). Dismissal related to e.g. pregnancy or maternity imply direct discrimination (the Discrimination Act, DA) and unfavourable treatment (the Parental Leave Act, PLA). Moreover, the PLA states that if an employee is given notice of termination or is summarily dismissed solely for reasons related to parental leave, the notice of termination or summarily dismissal will be declared invalid, on the request of the employee in question (Numhauser-Henning 2015a, 19, 26).

The PLA contains a prohibition of unfavourable treatment in any form related to parental leave, implying a right to return to the same job – or in case this is not possible, return to an equivalent/similar job in consistence with the employment contract. Prohibition against unfavourable treatment also implies that acquired rights continue to apply during absence due to parental leave. It is stated in both the PLA and the EPA, that if an employee is given notice of termination or is summarily dismissed solely for reasons related to parental leave, then the notice of summary dismissal or termination will be invalid on request of the employee. Furthermore, the employee's rights (e.g. to an increase in wages), must also be taken into account during leave. In

general, the employment relationship continues during leave, and there are also no changes in social security coverage (Numhauser-Henning 2015a, 19, 24).

2.2.3 Empirical Evidence for Gender Regime

The Social Insurance Agency perceives maintenance of work-life balance as an important public health issue and encourages organisations to adjust the working conditions to the particular needs of parents with small children. Moreover, the agency emphasises that the issue of work-life balance in the labour market is important in maintaining the level of Sweden's competitiveness in the globalised economy (Swedish Social Insurance Agency 2015, 10). In the annual social insurance report on GE and sick leave, the Swedish Social Insurance Agency concludes that through parental insurance and extensive childcare provisions, parents in Sweden have good opportunities to combine parenthood with employment, from an international perspective. This is also reflected in the high labour force participation of women, and the fact that today a vast majority of men make use of parental insurance – to some degree (Swedish Social Insurance Agency 2015, 10).

Even though the conditions in Sweden are quite good, women still claim three quarters of parental benefit days, and it is also women who carry out the majority of unpaid work at home. Furthermore, women work part-time more often, they take more sick leave than men, their career developments are poorer than men's, and their pensions are 30 % lower than men's pensions (Government Offices of Sweden 2016c). The differences in pensions between women and men are relatively large, and larger than the gender pay differences. The project *Gender-equal pensions* initiated by the Working Group on Pensions, aimed at tackling the challenge presented by the large differences in pensions between men and women. Based on the analysis of nine different sub-areas, measures have been proposed on how to achieve more gender-equal pensions (Government Offices of Sweden 2017a).

See also part 3.7.1 *General gender pay gap*.

2.2.3.1 Usage of parental leave

Women's share of parental leave has decreased and today women take 75 % of the parental leave – still significantly more than men (Gender Equality Inquiry 2015, 4), and, according to the Gender Equality Inquiry, most parental leave is taken by middle-income earners who take the highest number of days with parental benefits. Both men and women of low income take less leave: "The conditions for taking advantage of the flexibility parental insurance offers therefore vary between women and men in different income groups" (2015, 4).²⁷

²⁷ However, as described in part 2.2.3.3 on the main barriers for increasing participation of men in leave, the Swedish Social Insurance Agency finds that income plays a very small role in the distribution of leave between the genders (fathers and mothers).

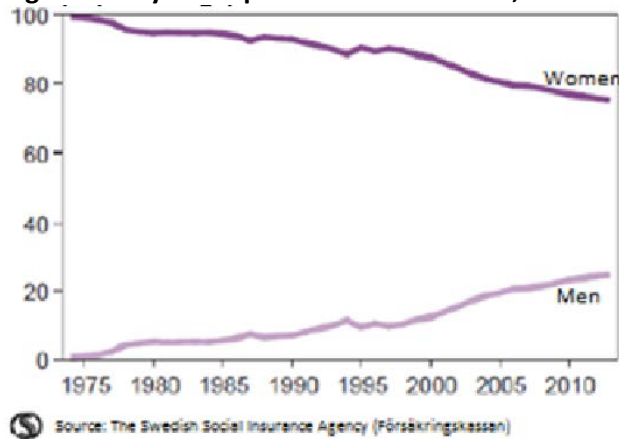
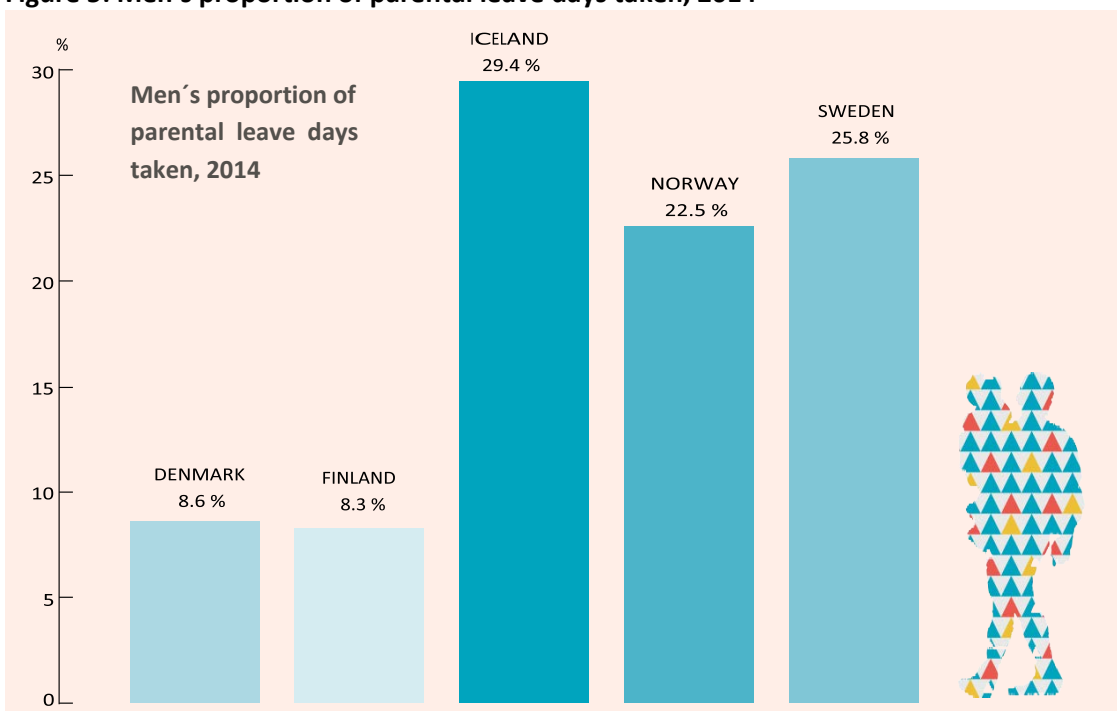
Figure 4: Days with parental leave benefit, 1974-2013 (in percentage)

Figure 4 shows the development in the share of parental leave taken by mothers and fathers in the period 1974-2013. While there has been a decrease in mothers' take-up of leave and a comparable increase in fathers' share of leave, by 2013, fathers take about 25 % of parental leave days (Lidbeck 2015).²⁸

The Nordic Council of Ministers finds that the introduction of earmarked paid paternal/paternity leave has had a positive effect on fathers' share of leave (Danbolt 2016b), which has increased from 2013 to 2014 (Haas, Duvander and Hwang 2016, 6). In the present section, a closer look at developments and explanations for the take-up of parental leave by fathers will be provided. Additional information on how both mothers and fathers manage work-life balance including leave follows in the sections below.

Figure 5: Men's proportion of parental leave days taken, 2014

Source: (NIKK 2016d)

²⁸ Table text freely translated from Swedish.

According to NIKK, Nordic Information on Gender,²⁹ even though fathers in Nordic countries, e.g. Sweden, take more parental leave than fathers in many other countries, there are differences between the Nordic countries worth noticing (NIKK 2016d). Figure 5 from a factsheet recently disclosed by NIKK gives an overview of the differences within some of the Nordic countries regarding the share of leave taken by fathers in 2014 (NIKK 2016d). The table shows that fathers in Iceland, Sweden and Norway took between 22.5 % - 29.4 % of the overall parental leave days in 2014. When comparing the usage of paternity leave between e.g. Denmark and Sweden, paternity leave is more used in Sweden, as seen in the table and the figure, which might be explained by the fact that Sweden has earmarked paternity leave, whereas Denmark does not. However, a gender divide remains, even though women in Sweden had decreased their share of parental leave from 83 % to around 70 % - 75 % (Gender Equality Inquiry 2015, 4).

Also in academia, the public childcare system is considered satisfactory in its coverage:

It is common and generally accepted practice for both female and male researchers to take several months of parental leave, even if women take more. In addition to the altogether 16 months of parental leave, parents have the right to take paid leave to take care of sick children. While the ordinary parental leave can be planned ahead of time, the occasional but frequent days for care for sick children are often a question of negotiation between the needs of the parents. (Salminen-Karlsson et al. 2014, 57)

Both male and female PhD students are claimed to be on parental leave almost equally (Salminen-Karlsson et al. 2014, 69).

Tab. 18: Recipients/users of publicly-administered paternity leave benefitors or publicly-administered paid paternity leave per 100 live births, 2006 and 2013

	2006	2013
Sweden	73.6	72.3

Source: (OECD 2016b)

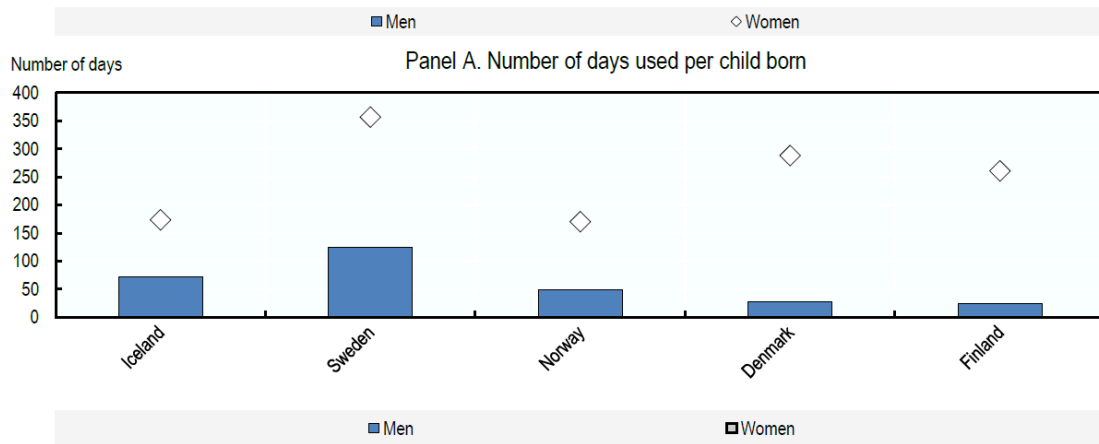
Tab. 18 shows the share of fathers or other partners using publicly-administered paternity leave or claiming publicly-administered paternity leave benefits in a given year per 100 live births in the same year (OECD 2016b). As the table shows, the share of paternity leaves using publicly-administered schemes or claiming publicly-administered benefits for paternity leaves are very high in Sweden and have been stable from 2006 to 2013.

²⁹ NIKK is a Nordic cooperative body for the Nordic Council of Ministers. NIKK provides knowledge about policies, practices and research related to GE in Denmark, Finland, Iceland, Norway, Sweden, Greenland, Faroe Islands and Åland Islands (NIKK 2016c).

2.2.3.2 Average duration of parental leave periods by sex (measured in days)

Figure 6: Duration of paid leave for men and women

Number of days of maternity, paternity and parental leave benefits used by gender, 2014



Source: (OECD 2016b, 6)

As seen in Figure 6, the duration of paid leave for men and women is relatively high in Sweden, when comparing with other Nordic countries, e.g. Denmark. When comparing the duration of paid leave for men and women in 2014, the gender gaps are rather large in all Nordic countries, yet men in Sweden have the highest duration of paid leave, and it has been increasing continually over the past 40 years. However, the numbers are also sector-divided; in general, it appears that people living in a metropolitan area and men and women employed in the public sector, are more equal in terms of how much leave they take, than those employed in the private sector (Numhauser-Henning 2015b, 21).

Sweden is characterised by relatively long periods of paid parental leave and an established fathers' quota of eight weeks in both 2000 and 2014. Since 2000, there has been a small increase in the number of weeks of paid parental leave. The duration of paternity leave has been stable (two weeks) (Eydal et al. 2015). Tab. 19 shows the number of paid parental leave weeks (Eydal et al. 2015).

Tab. 19: Number of weeks of paid parental leave in the Nordic countries in 2000 and 2014

Number of weeks	Total	Fathers quota	Paternity leave ^b
<i>Denmark</i>			
2000	30	2	2
2014	50	0	2
<i>Finland</i>			
2000	44	0	3
2014	48	6	3
<i>Iceland</i>			
2000	26	4	0
2014	39	13	0
<i>Norway</i>			
2000	42/52 ^a	10	2
2014	49/59 ^a	10	2
<i>Sweden</i>			
2000	64	8	2
2014	69	8	2

^a57 weeks with 80% replacement or 47 weeks with 100% replacement.

^bLeave that the father can take during the first weeks afterbirth when the mother is also on leave.

Source: (Eydal et al. 2015)

Duration is also a question of time period and the child's age:

Women are much more likely than men to spread out their parental leave. Women take parental leave just over 13 months during the child's early years, and 9.5 of these are with parental benefits. The corresponding figures for men are 3.5 months, 2 of which are with parental leave benefits. (Gender Equality Inquiry 2015, 4)

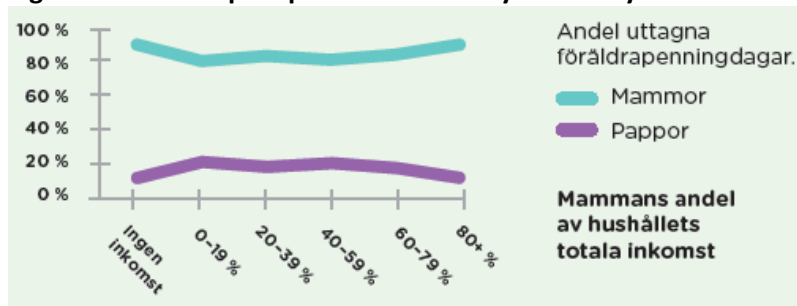
2.2.3.3 What are the main barriers for increasing the participation of men in parental leave?

NIKK finds that “the most gender-equal use of the parental insurance is found in countries that stipulate a certain portion of the total parental leave granted for a child can only be taken by the father” (NIKK 2016d).

One of the main barriers that influences the gender differences in parental leave is that collectively bargained family rights are mostly found or more well-developed in women-dominated sectors (Numhauser-Henning 2015b, 20). According to the government, how much leave men take also depends on other factors, such as income and education level (Government Offices of Sweden 2015a), and also the municipal childraise allowance,³⁰ which the government has proposed to be abolished. The government argues that the allowance counteracts economic GE, since more than 90 % of parents receiving the allowance are women (Government Offices of Sweden 2015d).

However, the Swedish Social Insurance Agency (*Föräldrasäkeringskassan*) finds that income plays a very small role in regard to the distribution of parental leave days. “*Andel uttagna föräldrapenningdagar*” in Figure 7 refers to the share of paid parental leave days taken by mothers (blue) and fathers (purple), respectively (Swedish Social Insurance Agency 2014, 12).

Figure 7: Share of paid parental leave days taken by mothers and fathers



Regardless of how high the mother's share of the overall income of a household (*mammans andel av hushållets totala inkomst*) is, mothers (*mammor*) still take out 80 % - 100 % of parental leave benefit days. The numbers even show a slight decrease in the share of parental leave benefit days taken by fathers (*pappor*), when the mother's share of the overall household income is above 60 % (Swedish Social Insurance Agency 2014, 12). This challenges the idea that the main reason why men take less leave than women is because they earn more.

Other barriers include cultural understandings of gender and parenting, e.g. motherhood and fatherhood (Stanfors 2015, 225); “women are expected to go on parental leave immediately after the baby is born, while men are expected to do so later, and preferably when it suits the work at the

³⁰ See also part 2.2.2.8 *Compensation rate for wages for maternity leave.*

department” (Salminen-Karlsson et al. 2014, 72). Similarly, studies have problematised that while childcare and women are connected in perceptions of responsibility, this does not appear to be the case for men, and in public debates parental leave for fathers or paternity leave is addressed as a right or an opportunity, rather than as a responsibility of the male parent. The GE debates in regard to leave are thus characterised by arguments stressing the possibilities of free choice rather than stressing the parental responsibility of fathers (Wahl 2014, 94).

On request of the Ministry of Employment, in 2013 the Danish National Centre for Social Research (SFI) performed a literature study on experiences with earmarked leave for fathers in Nordic countries and the factors that influence how and if parents take parental leave. SFI found that fathers in the Nordic countries are resistant to take (some of the) leave that can be shared between the parents, if the leave is not earmarked for the fathers. SFI also found that factors such as pay compensation and flexibility are influential factors. On the basis of the study, SFI concluded that policies on earmarked leave can support more gender-equal norms about parental leave and contribute to the normalisation of paternity leave (Jacobsen et al. 2013).

Another challenge might be found within the Swedish parental leave system (*föräldraförsäkring*), since improvements here seem to have led to a retention of women who are taking the main responsibility for the children (and family) in the private homes (Seidegård et al. 2015, 233).

2.2.3.4 Fertility rate

In the Nordic countries, including Sweden, it is likely that good parental leave allowances and childcare keep up the fertility rate (Nordic Council of Ministers 2015c, 6). As Tab. 20 shows, the number of births has been rather stable in Sweden in the period 2006-2014. The relatively high Swedish fertility rate might be explained by the focus on work-life balance for families (Swedish Institute 2017), while the almost unchanged fertility rates might be due to the high labour market participation of women in the Nordic countries.

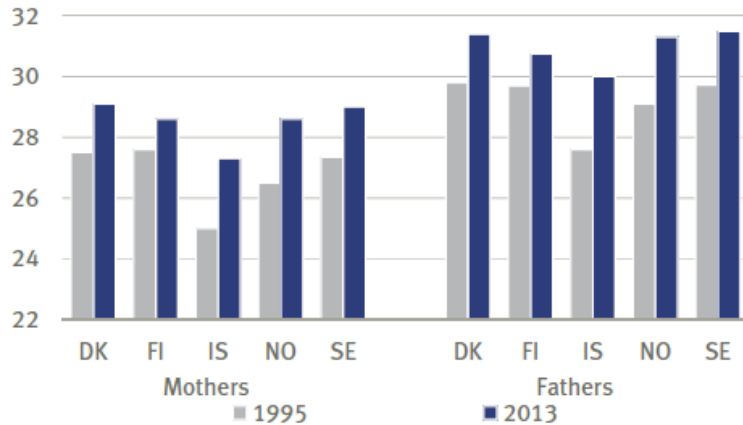
Tab. 20: Fertility rate, total (births per woman)

	2006	2007	2008	2009	2010	2011	2012	2013	2014
EU28	1.53	1.56	1.61	1.60	1.61	1.58	1.58	1.54	1.54
Sweden	1.85	1.88	1.91	1.94	1.98	1.9	1.91	1.89	1.89

Source: (World Bank n.d.)

2.2.3.5 Mean age of women at birth of first child

As Figure 8 shows, the mean age at birth of the first child has increased for both women and men since the 1990s. By 2013, the mean age for women was about 29 years and about 31 years for men, while in 1996, the respective mean age of women was 27.3 and of men 29.8 years (Nordic Council of Ministers 2015c, 7).

Figure 8: Mean age at birth of first child

Source: Nordic Statistical Institutes

In the 2000s, the level of education in the population has increased, and in the same period, the average age of women and men when they have children has increased (as has the foreign-born population) (Statistics Sweden 2013b, 13). Yet, the mean age of women at birth of first child has been quite stable in the period 2005-2013.

Tab. 21: Mean age of women at birth of first child by country and year

	2005	2006	2007	2008	2009	2010	2011	2012	2013
Sweden	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	29.0

Source: (UNECE 2017b)

2.2.3.6 One parent families and children by sex of parent

As Tab. 22 shows, there has been a decrease in the share of one-parent families with a female parent and an increase in the share of one-parent families with a male parent, when comparing 2005 and 2012. In 2012, approximately one in three parents in one-parent families were men.

Tab. 22: One-parent families and children by sex of parent, measurement, country and year (number of families)

	2005	2006	2007	2008	2009	2010	2011	2012
Female Parent								
Sweden	233 167	220 313	219 787	203 864	222 213	228 626	212 914	222 838
Male Parent								
Sweden	60 612	76 444	60 500	55 890	65 857	67 154	70 535	69 825

Source: (UNECE 2016)

As Tab. 23 shows, the share of single men with children is most prevalent within the age group 45-64. Comparing different age groups, no differences are found in the number of single women with children (Statistics Sweden 2016b, 16).

Tab. 23: Family units by type of household, 2014-2015*Numbers in 1 000s and percentage distribution. Children aged 0–18*

Type of household	20–44 years		45–64 years	
	Number	%	Number	%
Cohabiting without children	286	14	429	28
Cohabiting with children	646	30	448	29
Single woman with children	120	6	120	8
Single man with children	42	2	62	4
Single woman living alone	248	12	211	14
Single man living alone	425	20	271	17
Other family households	356	17	22	1
Total	2 124	100	1 563	100

Source: Survey of Living Conditions, Statistics Sweden

In comparison to other Nordic countries, by 2013, Sweden had the highest proportion of single fathers (Nordic Council of Ministers 2015c, 8).

2.2.3.7 Enrolment rate of children aged under 3 years in childcare facilities

As Tab. 24 shows, the rate of children enrolled in childcare has been rather stable during the period 2005/2006 to 2012/2013: “due to parental leave very few of the youngest children are in daycare” (Nordic Council of Ministers 2015c, 11).

Tab. 24: Childcare by indicator, country and year

	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
Sweden	48	48	49	50	50	49	51	51

Source: (UNECE 2017a)

One reason why the Swedish rate is lower than e.g. the Danish one could be due to the fact that in 2007/2008 Sweden introduced the so-called *Vårdnadsbidrag*, a special ‘care support-benefit’ for employees in municipalities, making it possible and more attractive for parents with children age 1-3 to choose an alternative to public childcare. Parents choosing to receive the care support receive a benefit that can be combined with wage-work. Parents receiving the care support benefit cannot at the same time make use of public childcare facilities (Numhauser-Henning 2015b, 22).

Furthermore, Nordic countries, including Sweden, have a high share of men and women that have children and are enrolled in the labour force, compared to other European countries (Nordic Council of Ministers 2015c, 11).

2.2.3.8 Women not working or working part time because of inadequacy of childcare services

Nordic countries, including Sweden, have extensive publicly subsidised childcare provisions, and the Swedish tax-financed system for childcare and parental leave is perceived as among the most extensive from the international perspective (Neuman 2014, 11). Therefore, statistics for women not working or working part-time due to inadequacy of childcare facilities are difficult to find and maybe less relevant in the Swedish context.

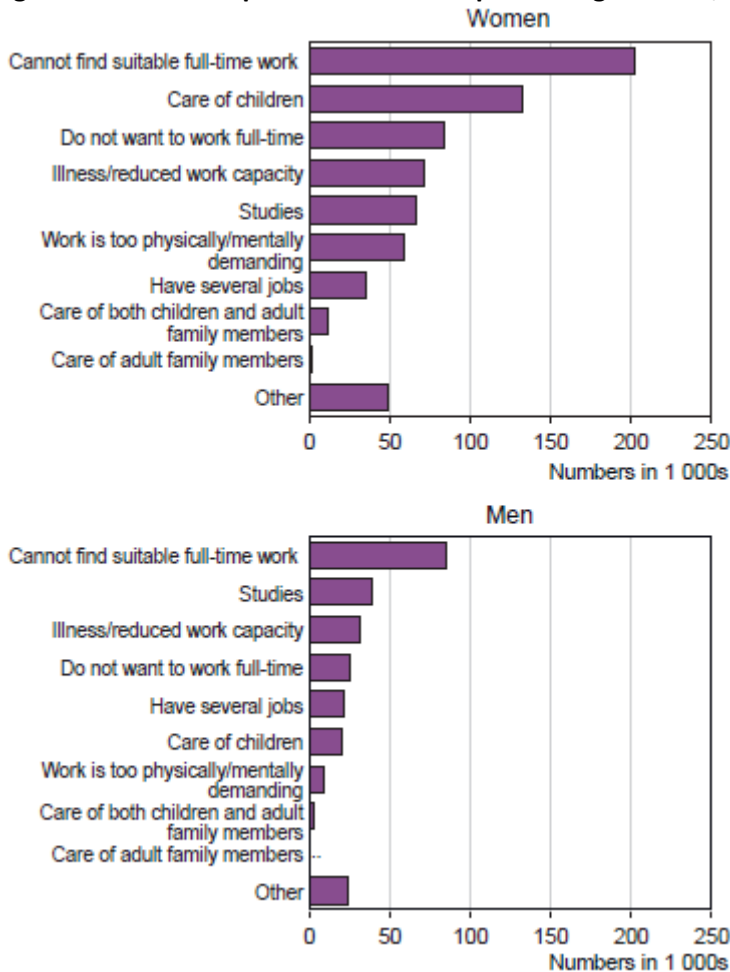
2.2.3.9 Main reasons for women not working or working part time

The share of mothers working part-time increases with the number of children (Hedborg et al. 2015, 169).

There are several reasons why more women than men are working part-time. The main reasons are that women cannot find a suitable full-time job or that they are taking care of their children (Regnér and Wallström 2016, 6). But the reason for part-time employment among the 'older' age groups of women (with older children, if any) is that there are fewer full-time positions in sectors and fields dominated by women (e.g. in care), see figure in part 3.3.1.3 (Seidegård et al. 2015, 164; Statistics Sweden 2016b, 53).

At the same time, Swedish part-time arrangements are also characterised by a certain level of flexibility (Swedish Institute 2017). From 1987 to 2015, the shares of part-time workers have generally decreased for both genders except for young women and men (see part 3.3.1.3). However, part-time work has increased again since a low level base in 2010 for both male and female workers (Roland Berger Strategy Consultants 2013). Part-time schemes are well-established in the Swedish business community and go hand in hand with substantial public benefits for young parents. There are additional programmes and incentives to promote work-family balance. Sweden has thus one of the highest fertility rates in Europe (Roland Berger Strategy Consultants 2013, 6). See also part 2.2.3.4 *Fertility rate*.

Figure 9 provides an overview of reasons for part-time employment (Statistics Sweden 2016b, 53).

Figure 9: Reason for part-time work for persons aged 20-64, 2015

Source: Labour Force Survey (LFS), Statistics Sweden

For both women and men, the main reason for part-time employment among the age group 20-64 is that they cannot find a suitable full-time job. However, more women than men also state that they work part-time because they take care of children, whereas only relatively few men provide this explanation (Regnér and Wallström 2016, 6, Bergman 2013, 48). Considering the share of women with children that can actually have childcare demands, the share of them with this reason is considerably higher, as mentioned by Regner and Wallström (2016). Also, more women than men cannot work full-time due to illness and/or reduced work capacity. According to Seidegård et al., the share of women with illnesses has increased since 2012 (2015, 24). This might also have an impact on the labour market participation by women.

Further, a relatively large share of women also stated that they do not want to work full-time, and this is worth noticing when promoting initiatives for engaging more women in full-time employment.

Compared with other EU countries, Sweden has a large proportion of women in gainful employment. However, it is still very common for women to work part-time, especially women in families with children. When children are born, women reduce their time in gainful employment, while men's time in gainful employment increases. (Regnér and Wallström 2016, 6, Bergman 2013, 48)

Similarly, the Swedish Women's Lobby finds that:

Involuntary part-time work and insecure employment conditions in the form of hourly-pay, temporary and short-term contracts are more widespread among women and within female-dominated sectors. In 2013 30 % of women worked part-time (against 11 % of men). The most common reasons why women works part-time are that there are no suitable full-time jobs available or because they care for children. Of those working part-time due to caring for a child or adult relative, 88 % are women. Women account for 75 % of paid parental leave and 63 % of temporary parental benefit to care for a child. On an average day women spend approximately one more hour on unpaid work than men. (2015, 27)

It can be argued that while good public childcare services might increase women's labour market participation, flexible working contracts or flexible working time arrangements might keep women with children in employment, but they might also be more likely to work on reduced time. Parents with children aged 1-3 years who choose to stay at home with the child instead of sending the child(ren) to preschool are entitled to a childraising allowance cash payment, provided by the Swedish municipalities (Government Offices of Sweden 2015d). It is a possibility that this might encourage some parents, especially mothers, to stay at home.

Besides the parental leave/benefit scheme as such, e.g. the number of non-transferable days, there are no special measures to encourage men to make use of reduced working hours.

Yet, as stated above, the main reason why all age groups of women in 2015 work part-time is because they "cannot find suitable full-time work" (Statistics Sweden 2016b, 30, 53). See also description in part 2.2.3.8 above, part 3.3.1.3 *General employment by full-time and part-time status, sex*, and part 3.7.1 *General gender pay gap*.

2.2.3.10 Percentage of children in formal child care

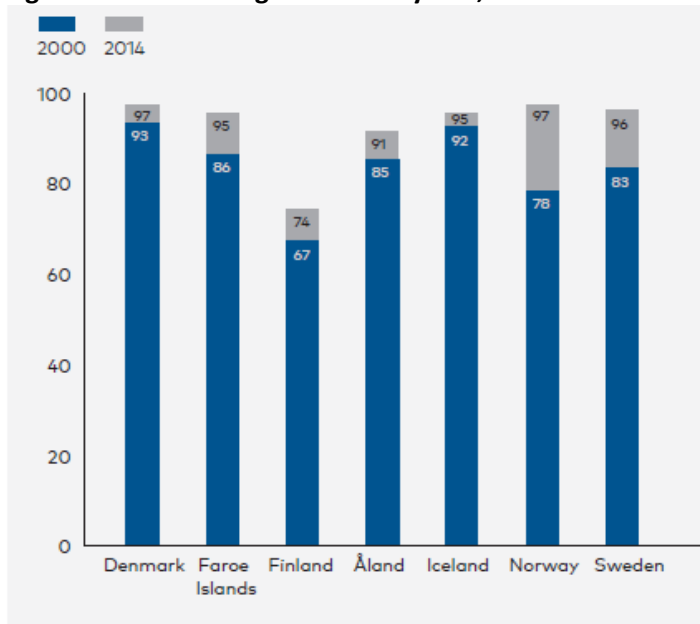
As Tab. 25 shows, the percentage of children enrolled in formal childcare increases when comparing children in childcare below the age of three with children 3+ years old. The percentage of children enrolled in childcare more than 30 hours a week is almost doubled when comparing small children below the age of three with 3+ years olds. This might be caused by parent's entitlement to parental leave.

Tab. 25: Percentage of children in formal childcare, 2012

	Below age 3			Between age 3 and compulsory schooling age		
	1-29 hours	30 hours +	Total	1-29 hours	30 hours +	Total
EU28	15	15	30	37	46	83
Sweden	19	32	51	31	64	95

Source: (Plantenga 2014, 44)

Comparing 2000 and 2014, there has been an increase in the share of 3+ year-olds in daycare. By 2014, 96 % of children in Sweden aged 3-5 years old were enrolled in daycare (Danbolt 2016b, 17). See also description of children in childcare in part 2.2.3.7.

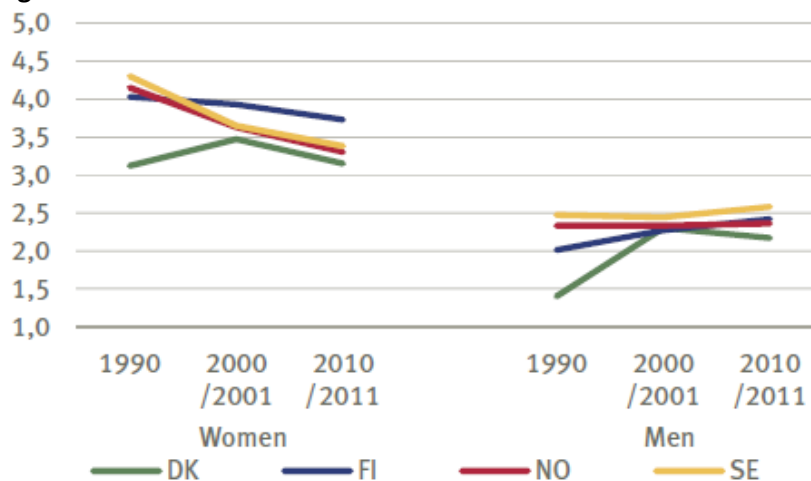
Figure 10: Children aged 3-5 in daycare, %

Source: Nordic Statistics, 2016c.

Note: Åland 2004 and 2014. See definition 2 page 31.

2.2.3.11 Time spent on unpaid work

Figure 11 shows the developments in time spent on domestic work in Nordic countries, comparing 1990, 2000/2001 and 2010/2011 (Nordic Council of Ministers 2015c, 12).

Figure 11: Time used on domestic work for women and men 20-74 years, hours

Note: DK domestic work includes the age group 18–74, and it also includes fewer codes for domestic work, than for FI, NO and SE

Source: UNECE, Nordic Statistical Institutes and "Hvad bruger vi tiden til", Rockwool Fonden 2012

In Sweden, there has been a decrease in the time women use on domestic work and since 2000/2001, a slight increase in time men use on domestic work. Men and women do roughly the same amount of housework when living in separate homes. However, when they become parents, there is a tendency that the total time women spend on housework increases considerably. Overall, women do significantly more housework than men do. Gender difference in the amount of time

spent on housework has diminished because women now spend less time on these chores (men do not spend a lot more time on household work than they did earlier) (Gender Equality Inquiry 2015, 4, Hedborg et al. 2015, 167-168).

One explanatory factor as to why women spend more time on unpaid work than men, as seen in Tab. 26, might be that more women than men work part-time, and therefore do more unpaid work. See also part 3.3.1.3 on full- and part-time employment. Another factor is the flexibility in parental leave policies, where families might strengthen traditional gendered patterns (Seidegård et al. 2015, 233).

Tab. 26: Time spent in unpaid and paid work, by sex, 2010

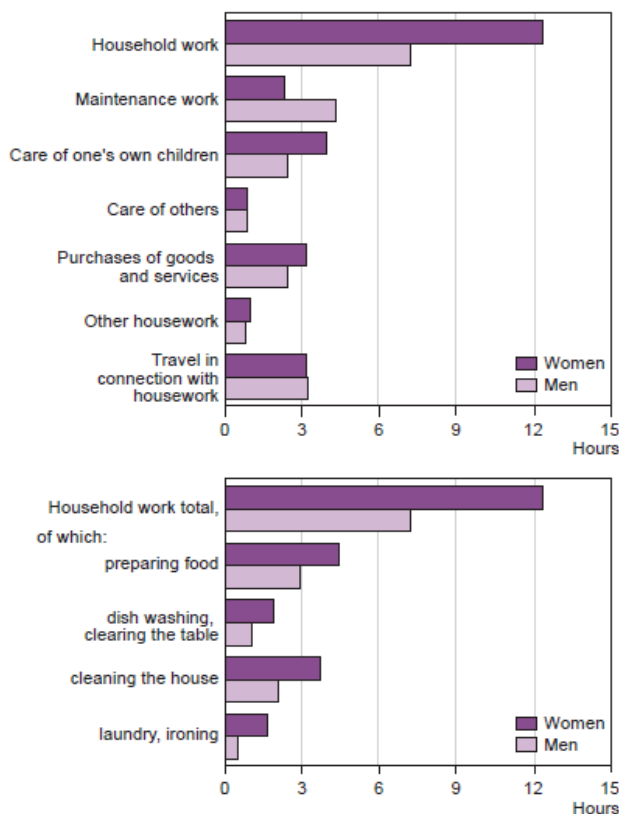
	Paid work		Unpaid work	
	Women	Men	Women	Men
OECD Average	215.3	328.5	271.7	137.6
Sweden	268.7	321.9	206.5	154

Source: (OECD n.d.)

As Figure 12 shows, unpaid domestic work is still gender-divided, as some tasks are typically done by women or mothers and other types of tasks by men or fathers (Statistics Sweden 2016b, 37).

Figure 12: Time for unpaid work for persons aged 20-64 by activity, 2010/2011

Hours per week



Source: Time use study, Statistics Sweden

Women have changed their behaviour more than men (Seidegård et al. 2015, 232). Changing these patterns might require a change in gendered norms and expectations of “who does what,” including more equality in terms of women’s and men’s prerequisites on the labour market (Hedborg et al. 2015, 167-168). According to professor Maria Stanfors, more detailed research on the influence of age, education level, family status and nationality is needed to explore differences (2015, 225).

2.2.4 General assessment of the Gender Regime

In terms of gender equality, Nordic countries such as Sweden have a very positive reputation (Niskanen 2011b, 11), and GE issues are addressed as important societal and democratic topics in the Swedish society.

However, there are still challenges to be addressed. In December 2016, the Swedish government made an assessment of the current GE status in Sweden:

The progress made towards gender equality has contributed to Sweden's high levels of employment and growth. But it has not happened by itself; it is largely the result of political struggle and decisions, together with hard work from a strong civil society. However, important challenges remain and there is work to do for the feminist government. Women and men, girls and boys still do not have access to resources and power on equal terms. (Regnér and Wallström 2016, 1)³¹

In terms of employment, factors other than fiscal policies should be emphasised when taking a closer look at the factors influencing labour market participation of women in the Nordic countries (NIKK 2015, Government Offices of Sweden 2016e, 41, 46). In 2015, NIKK reviewed part-time employment in the Nordic countries and found that more women than men are working part-time because (NIKK 2015):

- a) The domestic responsibilities are unequally distributed;
- b) Female-dominated sectors offer fewer full-time positions than male-dominated sectors;
- c) Women (not men) with smaller children are expected to reduce their working hours (cultural factors);
- d) Health problems or working conditions can account for other factors.

The Swedish Higher Education Authority (UKÄ) states that if the developments in the labour market proceed in the same way as they do now, the Swedish labour market will still be gender-segregated by 2035. UKÄ even stipulates that gender segregation will increase among the higher education cohort (Dryler et al. 2016, 114-115).

In terms of mainstreaming policies, the government finds that the GMGA strategy for government agencies has had positive effects, and reports from the participating agencies show that the agencies have identified critical issues and challenges, but have also shown positive results of their own contribution to the achievement of the national GE policy objectives (Regnér and Wallström 2016, 5).

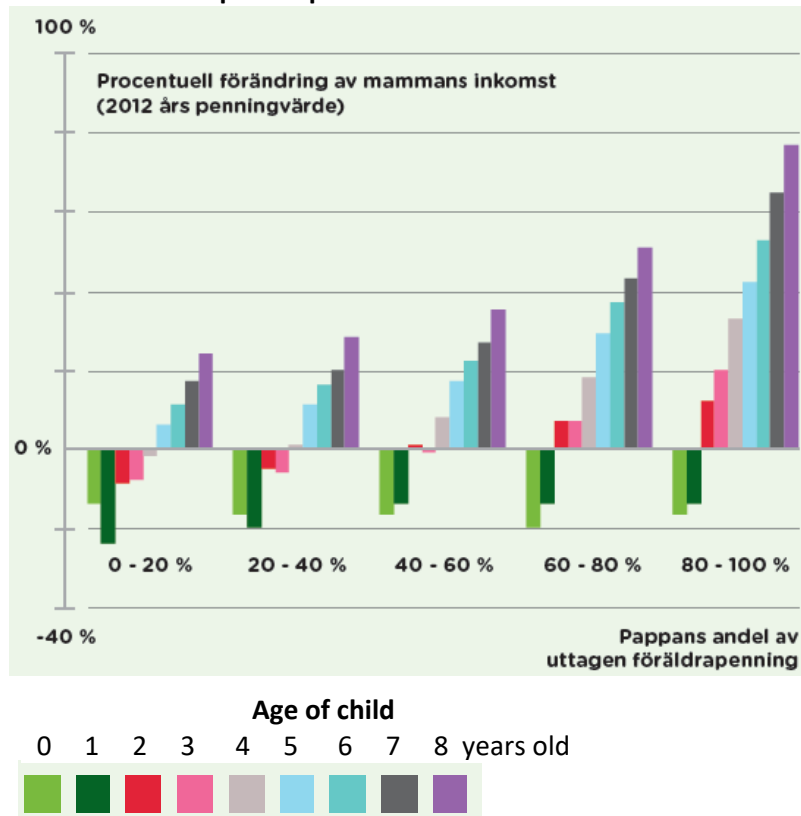
Regarding parental leave, some challenges remain:

Despite the measures of non-transferable months taken so far, the usage of the parental leave is still unevenly distributed between women and men. Women use three quarters of the parental leave. The uneven usage of parental leave combined with existing structures in work life and childcare leads to economic consequences in terms of the gender pay gap and the uneven distribution of unpaid domestic work, part-time employment and sick leave. (Regnér and Wallström 2016, 7)

³¹ For a detailed assessment of GE policies in the different GE programmes in governmental authority bodies (i.e. JIM in 2012-2015 and 2015-2018), see Seidegård et al. (2015, 307ff).

According to statistics by the Swedish Social Insurance Agency (*Försäkringskassan*), in families where the father takes 0 % - 20 % of the parental leave benefit (*föräldrapenning*), it takes the mother five years before she arrives at her previous income level, compared to families where fathers take out 80-100 % of the leave benefits – here the mother's income is back to the previous level in two years (Swedish Social Insurance Agency 2014, 11).

Figure 13: Change in percentage of the mother's income in 2012 monetary value in comparison with the father's part of parental leave



This is illustrated in Figure 13 by the Social Insurance Agency, showing the change in percentage of the mother's income in 2012 monetary value (*procentuell förändring av mammas inkomst (2012 års penningvärde)*) in comparison with the father's part of parental leave (*pappans andel av uttagen föräldrapenning*) (Swedish Social Insurance Agency 2014, 11). See also part 2.1.4.

Overall, Seidegård et al. find that there has been a lack of clear and long-term government strategies and structures for GE, which also makes it difficult to base future GE strategies and initiatives on past experiences. They further criticise the government for not having prioritised evaluative work on the GE initiatives taken, and that there is an overall lack of analysis and sharing of knowledge and experience. They state that, as long as there is a lack of evaluation and follow-ups, there is a risk that GE will not be a very high priority and will remain a voluntary possibility among other possible initiatives (Seidegård et al. 2015, 439, 443f). Overall, the implication is that GE initiatives are less effective than they could have been, if long-term policies had been initiatives and if follow-ups and evaluations had been made on a regular basis. However, Seidegård et al. also stress that it is, in general, difficult to develop evaluations that can measure the exact effects of a given initiative, and it might also take a while before the effects of GE initiatives can be observed and studied. Furthermore,

Swedish government initiatives have focused on raising awareness and providing information of the status of GE in Sweden (Seidegård et al. 2015, 439; Gender Equality Inquiry 2015, 6).³²

2.3 Gender equality policies in RTDI (Current developments)

2.3.1 Description of overall strategic gender equality policies in RTDI in place - Overall strategic orientation

As mentioned earlier, gender mainstreaming is the main strategy used to achieve gender equality policy objectives in Sweden (for further details see 2.1.1 and 2.1.2.),³³ and the problem of low levels of female researchers is well-acknowledged by the Swedish government. Topics addressing gender mainstreaming and gender equality in research and innovation have been on the Swedish agenda since the 1990s. Today, all university committees must work towards an equal gender representation, and GE is an indicator in the reports of university performance,³⁴ and most universities already have policies addressing such issues as, for instance, recruitment of female researchers (Dahlstrand et al. 2016, 48).

The *Strategy for the Work on Gender Mainstreaming in Government Offices*, GMGA,³⁵ initiated by the Swedish government was extended to include additional 30 universities and university colleges (Regnér and Wallström 2016, Swedish Secretariat for Gender Research 2016b). For the period 2016-2019, the Swedish Secretariat for Gender Research has been commissioned by the government to support all state-funded higher education institutions in their gender mainstreaming work – also known as *Gender Mainstreaming Academia* (GMA).³⁶ This also means that all state-funded HEIs must develop a gender mainstreaming plan aimed at structural changes. The plans shall describe how gender equality will be integrated into the operations of the higher education institutions' everyday life, such as in management processes (Dryler et al. 2016, 16, Swedish Secretariat for Gender Research 2016a). This mainstreaming strategy is initiated to address the issue that even though more women than men attend and graduate from higher education, only 26 % of professors are women.

Another issue that the mainstreaming strategy is meant to address is that men in academia have greater access to resources and funding for research. Therefore, the Swedish government has set up a target that by 2030, half of all newly appointed professors shall be women.³⁷ The government has

³² The Gender Equality Inquiry finds that in the period 2007-2014, “measures have first and foremost aimed to increase knowledge about gender equality and develop new working methods. A large share of the measures has focused on municipalities, country councils and organisations” (2015, 6).

³³ The Swedish Secretariat for Gender Research has developed a range of guidelines for gender mainstreaming in different areas, see *Tutorials* (Includegender.org 2016).

³⁴ For the list of HEIs in the GMA programme, see *Higher education institutions in the GMA programme* (Swedish Secretariat for Gender Research n.d.-b).

³⁵ See part 2.1.1 *Description of equal opportunity/anti-discrimination legislation* on gender mainstreaming and GMGA.

³⁶ See also *Guidelines for Gender Mainstreaming Academia* (Swedish Secretariat for Gender Research 2016a) and guidelines for *Gender mainstreaming of the allocation of grants* (Swedish Secretariat for Gender Research 2015).

³⁷ See the 2016 research bill *Collaborating for knowledge* (Government Offices of Sweden 2016a).

also appointed a national group of experts for increasing gender equality in higher education in Sweden (Regnér and Wallström 2016, 5).³⁸ More specifically:

The government identifies equal career opportunities in academia, the need to work against gendered education choices and improvements of women's and men's completion rates as particularly important areas. The [mainstreaming] plans shall also describe how gender equality will be integrated into the institutions' everyday operations, such as in management processes. The universities and university colleges are to present their plans by 15 May 2017 and continuously report implemented measures and results to the government throughout the programme period. (Swedish Secretariat for Gender Research 2016a)

The Swedish Secretariat for Gender Research developed guidelines on how to perform gender mainstreaming in academia (Swedish Secretariat for Gender Research 2016c).

Legal basis / Acts

The role of universities and other higher education institutions in promoting gender equality is made explicit in the Swedish Higher Education Act and in the directives governing HEIs. Moreover, the general anti-discrimination legislation, which applies to the rest of society, applies to HEIs – however, HEIs are responsible for the application thereof themselves (Deloitte 2014, 5).

Section 5 in the Swedish Higher Education Act states that “equality between women and men shall always be taken into account and promoted in the operations of higher education institutions” (Swedish Council for Higher Education 2015b). In the Swedish Higher Education Ordinance (section 5) of the Higher Education Act (1992:1434), the following appointment procedures for GE among representatives are enforced:

If a group of individuals are to submit a proposal on the applicants to be considered for appointment to a teaching post, women and men shall be equally represented in the group. This does not apply, however, if there are extraordinary reasons to the contrary. Ordinance (2010:1064). (Swedish Council for Higher Education 2015a)

Moreover, Swedish legislation requires that hiring committees for lecturers and professors include both male and female members (Bergman 2013, 26). The Swedish directive governing HEIs allowed favouring the underrepresented gender in order to achieve a more even gender distribution. During 2000-2011, the scheme was mainly used to increase the share of men in educational programmes where women were overrepresented. However, the directive has been amended, therefore, this practice is no longer applicable. Today, preferential treatment of the underrepresented gender is solely allowed in connection with recruitment for positions in higher education (HE) in Sweden, and if it is not in conflict with the EU regulations (the Swedish Discrimination Act) (Bergman 2013, 26). According to Bergman, “moderate preferential treatment of the underrepresented gender, such as for hiring in academia, does not conflict with the legislation. However, it is difficult to know the degree to which moderate gender quotas or preferential treatment is practiced, as no systematic overviews have been compiled in any of the countries” (2013, 27).

³⁸ For an evaluation of GE issues in relation to research funding see *Observations on gender equality in a selection of the Swedish Research Council's evaluation-panels 2012* (Ahlqvist et al. 2013).

The government also decided in 2015, that the Swedish Council for Higher Education (UHR) must mainstream their core activities within the period 2015-2018 and report on the process (Universitets- och högskolerådet 2016, 27). Also, the Swedish Research Council, the Swedish Council for Working Life and Social Research (FAS), the Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning (Formas) and the Swedish Governmental Agency for Innovation Systems (Vinnova) have specific provisions in their regulations that they must promote gender equality. Moreover, they regularly have to report on their gender equality activities (Bergman 2013, 38-39). See also part 1.3.2 *Relevance of national and regional levels in R&I policy and financing*.

For more information on GE and mainstreaming in research, see also part 2.3 on current GE developments in RTDI (strategies and policies in RTDI, part 2.3.1) and part 2.3.3 *Policy measures promoting gender equality in RTDI* (part 2.3.3.2 on gender balance in decision-making).

GE policies focused on R&D sectors

In terms of gender equality policies that are focused on the R&D sector, Sweden in general employs more holistic measures, meaning an implementation of more preventive measures that aim at changing attitudes, cultures and behaviours (Nordic Council of Ministers 2015a, 9).

The Nordic cooperation is fostering a gender equality mainstreaming strategy as a cross-cutting strategy which is implemented through several cross-sectoral projects and cooperations (Nordic Council of Ministers 2015b, 19).

According to Bergman, the Swedish national assembly introduced special recruitment targets for the share of female professors at university colleges and universities as early as 1997 (2013, 29-30). The recruitment target for 2012-2015 was that women must comprise at least 36 % of the newly appointed professors.

The Swedish Secretariat for Gender Research has been commissioned by the Swedish government to support all state-funded higher education institutions as well as Chalmers University of Technology and Jönköping University in their gender mainstreaming efforts during 2016-2019.

Among universities engaged in career planning, mentoring, tenure track positions, etc., measures for promoting talented academic staff have increased. They also have initiatives, for instance, leadership courses and mentoring programmes, to promote women in higher academic levels and decision-making levels. In this regard, a target percentage for professors is existing at each university since 1997, under the supervision of the Ministry of Education. There are no sanctions yet for not reaching the quota, but according to evaluations, the number of female professors has risen to 20 % (Salminen-Karlsson et al. 2014, 56).

In the annual report by the Swedish Research Council, the council finds that in terms of GE, a gender-equal research system requires more attention and measures. Even though the average proportion of recent female PhD graduates is about 50 % in all academic subjects, the rate of increase in the proportion of women at professor level is slow: "Several studies indicate that fewer women than men are still being appointed to the highest positions within academia. The effort relating to gender

equality must be integrated throughout the research system, amongst both research funding bodies and research institutions”³⁹ (Swedish Research Council 2016b, 10).

In 2015, an expert group was initiated by the government to improve GE in Swedish university colleges (Dryler et al. 2016, 16). A tool⁴⁰ was generated to gather and spread experience and knowledge about practical implementation of gender mainstreaming. Includegender.org is a cooperative venture by the European Social Fund’s Thematic Group on Equality, the Swedish Secretariat for Gender Research, the Swedish Association of Local Authorities and Regions and Vinnova, the Swedish Agency for Innovation Systems; it offers methods, models and interactive tools to simplify and quality assure gender mainstreaming efforts (Ministry of Education and Research 2014, 2).

One of the most recent policy initiatives has been the government’s encouragements for HEIs to once more set targets for female representation among research staff, especially in the recruitment or promotion to professorship, including visiting professors, in the period 2012-2015. However, this is not a completely new initiative, since such encouragements were initiated in 1997 (Swedish Higher Education Authority 2016c, 51) (see also part 3.3 on labour market participation in RTDI).

2.3.2 Main challenges concerning GE in RTDI

Generating indicators to distribute research funding neutrally and objectively has also been discussed in Sweden. With peer review as the established model for allocating external funding – which is also used when recruiting new staff and assessing manuscripts for publication in journals – a group of researchers who are considered able to represent the research field assesses the quality of the submitted research proposals. The subsequent decisions about who is granted funding and who is not are then based on this assessment. Although peer review is generally considered as the best available model, research has shown that it is far from objective or neutral. This is because the reviewers’ definitions and understanding of quality depends on disciplinary background, bias and many other mechanisms. This may be disadvantageous to women, but also to critical and interdisciplinary research, according to the Swedish Secretariat for Gender Research (Bondestam and Grip 2015).

Also concerning funding, the Swedish Research Council underlines that:

Studies have been conducted which show that women have been disadvantaged by initiatives targeting centres of excellence and excellent researchers. Women have received a considerably lower proportion of this funding (19 percent) than would correspond to their proportion of professors (24 percent) or their proportion of Swedish researchers who have the highest number of citations (30 percent). (2016b, 42)

In an evaluation of the Swedish Research Council’s (research funding) evaluation process, the authors, among other more subtle issues, found that, in meetings with evaluation panels, “the role of the officer from the Swedish Research Council was often unclear, and their ways of dealing with procedural and policy questions during evaluation meetings differed. Similarly, the chairpersons’ ways of structuring and running the evaluation meetings varied” and that “objectivity in evaluations

³⁹ For an evaluation of GE issues in relation to research funding, see *Observations on gender equality in a selection of the Swedish Research Council’s evaluation-panels 2012* (Ahlqvist et al. 2013).

⁴⁰ See the tool at www.includegender.org.

was seldom treated as problematic by members” (Ahlqvist et al. 2013). The authors conclude that “members [of the evaluation panels] felt there was a shortage of tools and clear guidelines for dealing with the issue of gender distribution in a more coherent and consistent manner” (Ahlqvist et al. 2013).⁴¹

Regarding recruitment, retention and career progression of female researchers, it can be noted that there are hardly any legislative barriers to gender equality in the public R&D system in Sweden. The Swedish government largely leaves it up to the institutions themselves to achieve gender balance in the academic sector (Directorate-General for Research and Innovation 2015, 611). Dryler et al. stress a similar problem: since gender divides are taking place at a much earlier stage, which is reflected in educational choices, not all GE issues can be solved by management in the HES (2016, 16).

UHR finds that “a number of reports convey the image that academia, oppositely to its self-image, negatively discriminates against women, [which] makes this discrimination difficult to disregard” (Universitets- och högskolerådet 2014, 24).

In their review of GE projects, UHR also finds that the aim and the problems that GE projects are supposed to address are not always sufficiently specified; therefore, GE work can seem vague and unclear which makes it more difficult to go from talking to action (Universitets- och högskolerådet 2014, 44-45).

In their study of perceptions on research excellence at universities in Sweden, Bulgaria and Germany, Salminen-Karlsson et al. asked researchers whether they had experienced gender biases in regard to the acknowledgement of research excellence. In the Swedish part of the study, they found that “choices of research questions are very much governed by male preferences and self-proclaimed excellent people are usually men who are looking for someone like themselves” (2014, 71).

To sum up, both formal and informal systems of structure and resistance towards a ‘gender-sensitive’ or GE-aware critical review of the systems seem to be at work in the HES, and the discrimination that women in the HES face is described as sophisticated, refined, and working ‘under the surface’; therefore, it is difficult to fully comprehend and work against (Universitets- och högskolerådet 2014, 9-10, 15-16). Even if some initiatives are taken and reports and evaluations are produced, their conclusions and recommendations are not always or not sufficiently implemented (Universitets- och högskolerådet 2014, 13).⁴²

2.3.3 Policy measures promoting gender equality in RTDI

2.3.3.1 Measures addressing GE in scientific careers

A delegation for gender equality in higher education (*Delegationen för Jämställdhet i högskolan*) was appointed by the Swedish government in 2009. The delegation received a budget of around EUR 7 million that funded 37 projects within HEIs. The work of the delegation ended in 2011, but many projects continued until 2013 (Universitets- och högskolerådet 2014).

⁴¹ For more details, see *Observations on gender equality in a selection of the Swedish Research Council’s evaluation-panels 2012* (Ahlqvist et al. 2013).

⁴² For an English summary of the challenges outlined in the UHR-report, see *Jämställdhet i högskolan - ska den nu ordnas en gång för alla?* (Universitets- och högskolerådet 2014, 17-28).

The delegation concluded in its final report that the efforts made had not yielded the desired results. Furthermore, the delegation emphasised that short-time projects and occasional investments to address gender inequality might not be the solution. Instead, the need for a more structural and long-term orientation in future gender equality work was emphasised.

In 2014, the Swedish Council for Higher Education (UHR) published a report reviewing final reports of projects funded by the Delegation for Gender Equality in Higher Education. In the report, UHR states that the following aspects are particularly important: knowledge on promoting GE in HE and knowledge-sharing between HEIs and organisations, as well as structural changes and long-term effects (Universitets- och högskolerådet 2014, 20).⁴³

One of the Research Council's tasks is to suggest how to promote the mobility of researchers and scientists at the beginning of their career (Swedish Research Council 2016b). It follows several objectives: to achieve and maintain an equal gender distribution in its evaluation panels; to ensure that the percentages of female and male applicants for grants from the Swedish Research Council correspond to the percentages of women and men among the potential research grant applicants; to ensure that women and men have the same success rates and receive the same average grant amount, taking into account the nature of the research and the type of grant; to include a gender equality perspective in each analysis and evaluation, where possible; and to integrate a gender equality perspective in the council's external communication (Swedish Research Council 2014).

The Government places gender distribution requirements on new professorships at every higher education institution. These targets are intended to raise the ambition of achieving a more even gender distribution among all professors as compared with today, and every higher education institution has to report and analyse its performance annually. (Björklund 2014, 16)

Since 2008, the Swedish Research Council has been conducting biannual gender equality observations in selected evaluation panels. Reports are available in English and contain conclusions and recommendations from the gender equality observations. A new series of observations is being conducted in 2016 by the council, with a report planned for publication in 2017. The objective of the observations is to study patterns and differences in the evaluation process for funding applications as regards gender, since they are often subtle, unconscious and difficult to identify. The observations have led to the production of a series of recommendations on how the evaluation process can be developed and improved in order to attain gender equality. The observations are used in the training of review panels, by decision-making bodies, and by the staff of the council (Haubenwallner 2017); see also part 2.3.3.

In 2016, the Swedish Research Council proposed to coordinate initiatives preventing situations where a number of funding bodies award larger funds to the same individuals. This should be carried out in cooperation with other funding bodies that support researcher leaders. The initiative was based on reviews of the government's previous so-called 'excellence initiatives' and aimed at increasing awareness and implementation of specific actions to create an equal gender distribution (Swedish Research Council 2016b, 16).

⁴³ For an overview of UHR's review of projects funded by the Delegation for GE in HE, see *Jämställdhet i högskolan - ska den nu ordnas en gång för alla?* (Universitets- och högskolerådet 2014, 17-28).

In addition, the four programmes and initiatives to promote gender equality in RTDI that are selected as case studies in the EFFORTI project are briefly described in the following:

- (i) **VINNMER:** Researcher qualification for VINNMER fellows (female doctorates). The programme ran over the period of 2007-2014 with a total budget, including co-funding, just over SEK 600 million. The programme budget was strengthened by the European Commission People FP7 (Marie Curie Actions) with EUR 5 million. VINNMER applied positive action to achieve equality effects for the underrepresented gender in different fields at the level of professor or similar position.
- (ii) **The Strategy for Gender Equality at the Swedish Research Council.** The aim is to strive for gender equality throughout the organisation through the following operational goals:
 - achieve and maintain an equal gender distribution in its evaluation panels;
 - ensure that the percentages of female and male applicants for grants from the Swedish Research Council correspond to the percentages of women and men among the potential research grant applicants;
 - ensure that women and men have the same success rates and receive the same average size of grants, taking into account the nature of the research and the type of grant.
- (iii) **The Delegation for Equality in Higher Education** was tasked with supporting initiatives and proposing measures to promote gender equality in higher education (2009-2010, budget SEK 47 million). In total, 37 projects were funded, among others projects focusing on women's and men's differing opportunities for research careers, as well as the unequal gender distribution in senior and management positions in higher education.
- (vi) Lund University's **AKKA** (*Academic women's responsibility*) leadership programme. A pan-university initiative, including an integrated perspective on research management. The programme started in 2004 exclusively for senior women scientists. In the third and fourth programme, participants included men as well. In the period 2004-2011, 97 women and 27 men had been involved in the AKKA programme.

The question of quotas for women on boards have been addressed in several parts of this report (see parts 2.1.3, 2.3.3 and 2.3.3.1, part 3.5.1.1).⁴⁴ However, Sweden very recently decided not to initiate such quotas (see part 5.2).

2.3.3.2 Measures addressing gender balance in decision-making

Though quotas are not mandatory in Sweden, there is an expectation that membership of boards, committees, panels, etc., either already are or will be as gender-balanced as possible.

In Sweden, there is no legislation on quotas for the representation of women on company boards. However, companies must provide annual reports including information on gender distribution. The Swedish Corporate Governance Board set up a voluntary target that there should be an equal (40 %) gender balance in boards of stock market listed companies by 2020 (Swedish Women's Lobby 2015); see also part 2.1.4 on equality in decision-making.

⁴⁴ For further information on quotas (in Swedish), see *Mål och myndighet* (Seidegård et al. 2015, 121f).

As mentioned above, both higher education institutions (that have to set individual targets for new recruitment of professors) and research councils are obliged by the regulations to promote gender equality. The Swedish Research Council is in the process of gender-balancing its committees and panels. The council has been involved in a gender mainstreaming project for national authorities. Vinnova aims to promote gender equality in connection with funding, gender mainstreaming within research, as well gender balance within the organisation. Formas and Forte have similar policies (Forte 2016, 19, Forte 2012).

For an overview and description of measures, see also parts 2.3.4 and 3.1.2 on Vinnova; parts 2.3.4, 3.1.2 and 3.9.5 on the Swedish Research Council's Strategy for Gender Equality; parts 2.3.4, 3.5.2.1 and 3.7.3.1 on the Delegation for Gender Equality in Higher Education; part 2.3.3.4 for the leadership programme AKKA (*Academic women's responsibility*).

2.3.3.3 Measures addressing the integration of gender dimension in research

According to the Swedish Ministry of Transportation, gender equality has been a declared goal of public transportation policies in Sweden since the late 1990s, upon establishment of the Gender Equality Council for Transport and Information Technology. There are, for instance, projects *Development of mobility services* and *Urban mobility planning and design* (Civitas 2016, 8, 22).

Starting in 2019, a new model has been proposed for the allocation of funding to Swedish higher education institutions. Within this, an expert panel will assess three aspects of research: scientific/artistic quality, quality-developing factors, and the impact of the research outside academia. "Gender equality is included as one of five items under quality-developing factors. Scientific/artistic quality would determine 70 per cent of the total score and the other two categories would contribute 15 per cent each" (Swedish Secretariat for Gender Research 2016d).

The Swedish Research Council has no policy or strategy on the integration of the gender dimension in research. The council considers gender/sex analysis in research to be established, and it will not receive additional support. According to the council, it is managed within the frame of the regular research funding from the council on equal terms with other research. However, there is one specific programme, development research, with an annual budget of about EUR 20 million that has special relevance specifications; the research should be relevant to the overall goals of the Swedish development policy (Pépin et al. 2015).

2.3.3.4 Other measures

Other measures comprise various projects and initiatives carried out and implemented at different levels. A GE project at the Uppsala University (*Implementering och utvärdering av jämställdhetsindikatorer*) has used quantitative methods and indicators to study gender equality. UHR concludes that quantitative measurements are good for looking at measures such as gender segregation (horizontal and vertical), employment conditions (pay gaps, work tasks, tenure tracks and the like), take-up of parental leave, allocation of resources in an organisation, etc. (Universitets- och högskolerådet 2014, 69).

A GE project at the Stockholm University (*Genusmedvetna chefer – ett villkor för ett genusmedvetet universitet*), a project at KTH (*Inventera kopplingen mellan kön och faktisk arbetssituation inom fakulteten*), and a project at Malmö Högskola (*Jämn könsfördelning på mellancheftsnivå*) used combinations of quantitative and qualitative methods. In the final reports, they state that qualitative measures are necessary to complement quantitative measures, in order to address e.g. norms and

values of how understandings of gender are constructed in both the culture and the informal structure of e.g. an organisation, since power mechanisms, naturalised norms and complex social processes secure that gender inequality is maintained. The findings from these projects point to the need for a qualitative focus in order to address barriers to women's career paths (Universitets- och högskolerådet 2014, 70-73).

NordForsk finances research in the Nordic countries, and has recently allocated NOK 41.8 million (EUR 4.5 million) to NORDICORE (Nordic Centre for Research on Gender Equality and Innovation) at the Institute of Social Research, and to the project *Beyond the Gender Paradox* at the Nordic Centre of Excellence (Uppsala University), respectively, for two 5-year research projects on the so-called "gender paradox," namely the question of GE issues in the research sector in Nordic countries (Mesna 2016, NordForsk 2017b).

Since 2007, the Swedish Agency for Economic and Regional Growth has run the programme *Promoting women's entrepreneurship*, with an annual budget of SEK 100 million. The programme aims at creating growth and renewal in Swedish trade and industry; more than 900 ambassadors for women's entrepreneurship were appointed to the programme (Löf 2014, 42). Furthermore, "in order to strengthen women's entrepreneurship, Almi's innovation financing has been enhanced by SEK 10 million" (Löf 2014, 42). Moreover, the government has invested SEK 1 million in 2013 and SEK 5 million in 2014 to encourage more women to undertake decision-making positions in trade and industry, while the Swedish Agency for Economic and Regional Growth has invested in the Gold Rules of Leadership⁴⁵ with the aim to enhance knowledge development, leadership training and mentoring of female talent (Löf 2014, 43).⁴⁶

The Swedish Research Council is preparing recommendations or models for university-level curricula development in scientific and technological fields (other than humanities and social sciences), including multidisciplinary approaches.

Moreover, the Swedish Secretariat for Gender Research at the Gothenburg University is responsible for integrating sex/gender analysis into science and engineering university-level curricula (Pépin et al. 2015).

For an overview and description of relevant measures, see also parts 2.3.4, 3.1.2, 3.5.2.1, 3.7.3.1 and part 3.9.5 (Vinnova, Strategy for GE, Delegation for GE in HE, and AKKA).

2.3.4 Actors responsible for GE in RTDI

In accordance with the Swedish gender mainstreaming strategy, each minister has described where they see gender equality issues and how they approach them within the political fields for which they are responsible. This overview can be found in *Gender equality. The responsibility of the entire government* (Government Offices of Sweden 2015f).

⁴⁵ "The Golden Rules of Leadership is a result of Sweden's involvement in the former U.S. Secretary of State Hillary Rodham Clinton's "International Council on Women's Business Leadership" (...) Sweden is the first to launch" (Löf 2014, 43).

⁴⁶ Additional information can be found in *A warm welcome or a cold shoulder?* (Growth Analysis 2015a); *Governance of universities* (Growth Analysis 2014); *Evaluation of regional structural funds programmes* (Growth Analysis 2016); *Young researchers' career paths* (Growth Analysis 2015b).

An overview of political actors responsible for GE in general can be found in parts 1.3.1.1, 2.1.2, 2.1.4, 2.3.3 and 3.2.1.

The Gender Mainstreaming Strategy in Higher Education (2016-2019) includes the following actors: the National Agency for Education, the National Board of Student Aid, the Council for Higher Education, the Higher Education Authority, the National Agency for Higher Vocational Education, the Research Council for Health, Working Life and Welfare, the Swedish Research Council, and Vinnova (Sweden's innovation agency).⁴⁷

GE actors in research and education:

- The **Equality Ombudsman** (see below)
- The Swedish **Agency for Economic and Regional Growth** (*Tillväxtverket*) (see below)
- SUHF, the **Association of Swedish Higher Education** (see below)
- **UKÄ, the Swedish Higher Education Authority** (*Universitets Kanslers Ämbetet*) (see description below)
- UHR, the Swedish **Council for Higher Education** (*Universitets- och högskolerådet*) (see below)
- **Vinnova** (see below)
- the **Swedish Secretariat for Gender Research** (see below)
- The **Delegation for Gender Equality in Higher Education** (see below)
- The **Council for Gender Equality** (see description below)
- the **Swedish Research Council** (see below)
- **Forte**⁴⁸ (see part 1.3.1.2 *Major funding agencies* and part 3.1.2 *Proportion of R&D personell working in RPOs that have adopted gender equality plans*)
- **Agricultural Sciences and Spatial Planning (Formas)** (see parts 1.3.1.2 and 3.1.2)
- the **Committee for Gender Balance in Research (KIF-committee)** (Bergman 2013, 32-33, 36-37, NordForsk 2017b, Mesna 2016)⁴⁹

NordForsk (see part 2.3.3.4).

The **Equality Ombudsman** is a government agency that reviews situations and conditions concerning gender equality in the workplace and education systems, and ensures the application of law by mainly overseeing compliance with the Discrimination Act. Furthermore, the Ombudsman has developed a Gender Equality Index with nine different performance indicators to demonstrate important gender equality indicators (Statistics Sweden 2016b, 6, European Institute for Gender Equality 2016, Regnér and Wallström 2016). See also parts 2.1.2 and 2.1.3.

Furthermore, **the government's Gender Equality Inquiry** finds that the government, the municipalities and the county councils are responsible for improving GE issues, but also social partners, the business committee, civil society organisations, etc. (Gender Equality Inquiry 2015, 10).

⁴⁷ See *Gender mainstreaming in 41 Swedish government agencies* (Dahlgren n.d.).

⁴⁸ For Forte's objectives on GE, see *Research meets society: Forte's proposal to the national research policy 2017-2027* (Forte 2016, 19) or their GE strategy for 2013-2016 (in Swedish) (Forte 2012).

⁴⁹ See *Gender in the Nordic Research and Innovation Area* (NordForsk 2017b); *Two new Nordic Centres of Excellence to solve the Nordic Gender Paradox* (Christiansen 2016); *Beyond the gender paradox* (NordForsk 2017a).

Ministry of Health and Social Affairs: Sweden has appointed a Minister for Gender Equality, responsible for policy implementation as well as development. This minister is currently located within the Ministry of Health and Social Affairs. In each ministry, there is an appointed Gender Equality Coordinator, and together they form an Interministerial Working Group on Gender Mainstreaming (European Institute for Gender Equality n.d.); see also part 2.1.2.

The Swedish Agency for Economic and Regional Growth is the managing authority for Sweden's regional structural fund programmes. The agency contributes towards regional sustainable growth initiatives by facilitating entrepreneurship in companies (Vinnova 2016a).

SUHF, the Association of Swedish Higher Education (*Sveriges universitets- och högskoleförbund*), consists of 37 Swedish universities and university colleges. The association is not regulated by law; therefore, its tasks are voluntary. The association aims at promoting the HE sector's interests and strengthening internal cooperation. The association initiates different activities, including those related to gender problems in the recruitment of academic leaders (Association of Swedish Higher Education u.d.).

Higher education institutions (HEIs): Sweden's Higher Education Act (1992: 1434) states that HEIs should always consider and promote gender equality, and national guidelines for HEIs state that HEIs should promote gender equality in their areas of work. Furthermore, the same anti-discrimination legislation that applies to the society as a whole applies to HEIs, as well. However, the HEIs can themselves decide how to apply the legislation (Deloitte 2014, 5).

UKÄ, the Swedish Higher Education Authority (*Universitets Kanslers Ämbetet*), is a government agency. UKÄ is centred around three main areas: 1) quality assurance in higher education and appraisal of degree-awarding powers of public-sector HEIs, 2) legal supervision of higher educations, and 3) monitoring efficiency, follow-ups, and horizon-scanning. UKÄ is furthermore responsible for statistics in the HES (Swedish Higher Education Authority 2017b). UKÄ also has the specific task of following up on how HEIs handle teacher recruitment from a gender standpoint.

UHR, the Swedish Council for Higher Education (*Universitets- och högskolerådet*), carries out tasks for the government and the Ministry of Education and Research, including tasks on gender equality in higher education (Swedish Council for Higher Education n.d.). UHR 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 (Deloitte 2014, 5-7).

Tillväxtverket, the Swedish Agency for Economic and Regional Growth, is a government agency under the Ministry of Enterprise and Innovation. The agency aims at ensuring that EU funds are invested in projects promoting growth and employment in Sweden (Swedish Agency for Economic and Regional Growth 2016a). Also, in the period 2007-2014, the government commissioned the agency to promote women's entrepreneurship (Swedish Agency for Economic and Regional Growth 2016b).

Vinnova, the Swedish Governmental Agency for Innovation Systems: "in the 2013 proposition for research and innovation the Swedish government allocated SEK 32 million (2013– 2014) to Vinnova for research on improving gender equality at HES (universities and university colleges), in trade and industry, and in the public sector" (Bergman 2013, 39). Vinnova aims at increasing competitiveness among Swedish researchers and companies by promoting sustainable growth and increasing

collaborations between universities and other research institutions, companies, and other organisations in the Swedish innovation system. Vinnova has offices in Stockholm and Brussels and their annual investment budget is EUR 220 million (Vinnova 2016a). Vinnova also 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 the gender mainstreaming project for the national authorities (Deloitte 2014, 6). See also part 4.1.3 on actors and institutions within Swedish evaluation culture and policy.

The **Swedish Secretariat for Gender Research** was inaugurated in 1998. The secretariat's main tasks are to survey gender research in Sweden in all disciplines, as well as analyse the need for it. The secretariat actively spreads research results both in the academic world and outside of it. The secretariat works to enhance gender consciousness about gender research and the meaning of gender perspective.

The Swedish government appointed the **Delegation for gender equality in higher education** (*Delegationen för Jämställdhet i högskolan*) in January 2009:

The Swedish government appointed the Delegation for Gender Equality in Higher Education for the period 2009–2011. The task of the delegation was to promote gender equality in academia. Its mandate included education and research, as well as the organisation of universities and university colleges. Over SEK 47 million was allocated to institutions and other stakeholders for various types of gender equality measures. The delegation compiled overviews of ongoing activities to promote gender equality in academia, initiated surveys, published reports and organised conferences and seminars. (Bergman 2013, 31-33, 36-37)

“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” (Deloitte 2014, 7). See also parts 2.3.3 and 2.3.3.1 and part 3.7.3.1.

The Swedish government has the **Council for Gender Equality** led by the Minister for Gender Equality. This council is a forum that brings together specially invited representatives of various organisations, including political parties and NGOs in the gender equality field, since 1983. The council meets four times a year and discusses important issues of gender equality policy to exchange information and ideas (European Institute for Gender Equality n.d.). See also part 2.1.2 *Description of structures for gender equality*.

According to the Swedish Research Council's Strategy for Gender Equality (2010–2012), the Council seeks to “achieve and maintain an equal gender distribution in its evaluation panels,” which is interpreted to mean that the underrepresented gender must comprise 40 per cent of the members of evaluation committees. The Swedish Research Council is also charged with ensuring that the proportion of women and men among those seeking research funding corresponds with the proportion of women and men among those researchers who could potentially seek funding. In addition, it is the Council's task to ensure that the level of allocations to women and men is roughly equal and that women and men are awarded the same funding amounts on average, taking into account the nature of the research and form of support. This is followed up every year through special reporting. (Bergman 2013, 39)

In 2013, the Swedish Research Council (*Vetenskapsrådet*) was tasked to develop a plan for how the council should contribute to gender equality. “The plan is expected to be implemented in 2014” (Directorate-General for Research and Innovation 2015, 611). Furthermore, the Swedish Research Council is a member of the Science Europe Working Group on Gender and Diversity, that will examine new ways to integrate sex and gender analysis into the research content (Pépin et al. 2015).

See also description of the actors in part 3.1.2 *Proportion of R&D personnel working in RPOs that have adopted gender equality plans*.

2.3.5 Assessment of Gender Equality Policies in RTDI

The 2015 report by the government’s GE Inquiry states that:

There are few, if any, reported effects at societal level of the special gender equality initiative to suggest that the various measures have enhanced gender equality. However, this should be viewed from the perspective that the impact of long-term effects can only be studied after a longer period of time and that it is difficult to isolate the effects from other factors than the measures included in the initiative. (Gender Equality Inquiry 2015, 6)

As it is not unusual for the GE legislation to be more pronounced in the public sector than in the private sector (and in terms of GE, the latter is often characterised by voluntary measures), more effort seems to be put on GE issues and initiatives in the public sector, e.g. the HES. Additionally, during the period 2007-2014, GE policies and government initiatives have particularly focused on GE in municipalities, county councils and organisations (Gender Equality Inquiry 2015, 6f). More than 40 years ago women entered universities in significant numbers. From then on, the issue of gender equality in higher education in Sweden has been on the agenda. Several political projects and initiatives had been implemented, as well as emphasised by Swedish policy-makers since the 1990s to improve gender equality in academia (Swedish Secretariat for Gender Research 2016a). Nielsen (2013) found that one of the differences in the GE debates in academia is that GE issues are debated as structural and cultural issues in Sweden.

Despite the promotion and political engagement, it seems that in Sweden women either start their careers late or that it takes longer for them to reach the top than in other European countries. Because Sweden is a small country, personal connections and networks can be easily made, and they are more important than in large international arenas when it comes to applying for positions, promotions and funds (Salminen-Karlsson et al. 2014, 57). There is hence still some work to be done:

The 2014 annual report on Swedish Higher Education showed that about 30 % of scientific employees at Swedish universities have temporary positions and that there is a slight majority of women in this category. Generally, the situation varies across fields within the same university but on average the ratio of male to female scientific employees was on average 60-40. However, the gender distribution among professors is changing only very slowly. (Dahlstrand et al. 2016, 50)

In their report, UHR showcases the AKKA leadership programme at the Lund University (*Ledarskapsprogrammet AKKA*) as a GE project with successful implementation of gender mainstreaming (Universitets- och högskolerådet 2014, 81). But even with some successful projects in

recent years, UHR outlines the following GE tasks as issues that have not been solved or have not been solved to a sufficient degree (Universitets- och högskolerådet 2014, 5-6):⁵⁰

- Gender segregation in educational choices and in progression (exams, drop-out, etc.);
- Fewer men in higher education;
- Gender differences in research career;
- Gender segregation and vertical segregation in HES positions.

In the 2016 report *Direction to the future Swedish Research System*, the Swedish Research Council (*Vetenskapsrådet*) concluded that further attention and new measures are needed to achieve a gender-equal research system. The council also concluded that while the average proportion of female PhD graduates is approximately 50 % in all academic subjects, the increase in the share of female professors is very slow. The council proposed the integration of gender equality efforts throughout the research system, i.e. research funding bodies and research institutions (Swedish Research Council 2016d). Following this, the Swedish Secretariat for Gender Research has been commissioned to administer the government initiative *Gender mainstreaming in academia, during the period 2016-19* (Swedish Secretariat for Gender Research 2016a), described in 2.3.1 *Description of overall strategic gender equality policies in RTDI in place*.

For further discussion of challenges to GE in research and innovation in the Nordic countries in general, see *The Nordic Region - A step closer to gender balance in research?* (Bergman 2013).

⁵⁰ An English summary of the UHR report can be found in *Jämställdhet i högskolan - ska den nu ordnas en gång för alla?* (Universitets- och högskolerådet 2014, 19-28).

3 Gender equality in RTDI

As mentioned earlier, it can be difficult to identify and evaluate the exact effects of GE initiatives, and it might also take a while before the effects of GE initiatives can be observed and studied (Seidegård et al. 2015, 439; Gender Equality Inquiry 2015, 6). In the sections below, we have attempted to point to studies stressing possible explanations for developments related to GE; however, it should be noted that there might be additional and other explanations than the ones provided here.

3.1 Gender Equality in RTDI on organisational level

3.1.1 Proportion of RPOs that have adopted gender equality plans

In Sweden, the national gender equality legislation has for decades included gender equality planning for all employers, including research performing organisations (RPOs). In recent years, the legislation has explicitly specified the equality planning duties for universities and other educational organisations. Sweden has adopted legislative rules for universities and educational and research institutions to develop gender equality plans (GenPORT n.d., 2).

Tab. 27: Proportion of RPOs that have adopted gender equality plans, 2013

	2013
EU28	36
Sweden	79

Data only for 2013, based on ERA Survey 2014

Source: (Directorate-General for Research and Innovation 2016, 116)

This is exemplified by the relatively high share of Swedish RPOs that have adopted GE plans, which is much above the EU average, as seen in Tab. 27. The reason why Sweden is such an outlier might lie in the Swedish focus on GE in general, including in RTDI:

Today Nordic universities and university colleges are required to draw up their own action plans for equality between the genders and to submit regular reports on their gender equality measures and the results achieved. For instance, the action plans set targets for the proportion of women in the various position categories and outline various types of recruitment strategies and measures to achieve these targets. (Bergman 2013, 43)

Several Swedish HE institutions have established administrative units with gender equality and/or diversity as their area of responsibility, while other institutions have appointed personnel in the administration responsible for gender equality or have organised their gender equality efforts in other settings.

3.1.2 Proportion of R&D personnel working in RPOs that have adopted gender equality plans

Tab. 28: Proportion of research & development personnel working in RPOs who adopted gender equality plans, 2013

	2013
EU28	70
Sweden	99

Data only for 2013, based on ERA Survey 2014

Source: (Directorate-General for Research and Innovation 2016, 117)

Not only the proportion of RPOs that have adopted GE plans is high in Sweden, also the proportion of R&D personnel in such RPOs is correspondingly high. This might be due to a continually sharpened political focus on GE in RTDI. For instance, Bergman (2013) states that the central GE actors, such as the Swedish Research Council, the Swedish Council for Working Life and Social Research (FAS), the Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning (Formas) and the Swedish Governmental Agency for Innovation Systems (Vinnova) have provisions in their regulations which state that they must promote gender equality and that they have to submit regular reports on their activities from a GE perspective. Moreover, the research councils, especially the Swedish Research Council, regularly compiles overviews of the distribution of research funding by scientific field and gender (Bergman 2013, 39).

In the Swedish Research Council's Strategy for Gender Equality (2010-2012), the council stated that it strives towards an equal gender distribution in evaluation panels, whereas the underrepresented sex comprises at least 40 % of the members in evaluation committees. Additionally, the Swedish Research Council is charged with ensuring a gender-balanced proportion among applicants for research funding, which must correspond with the proportion of women and men among those researchers who could potentially seek funding. Moreover, the council is tasked with ensuring that the level of allocations are roughly equally distributed among women and men, and that they are, on average, provided the same amount of funding, taking the nature of the research and the form of the support into consideration. The council provides annual follow-ups (Bergman 2013, 39).

Similar regulations and criteria are established at Vinnova, FAS, and Formas. Vinnova states in its regulations that it works to promote both gender perspectives and GE in research and within their area of activity. Similarly, FAS emphasises the importance of paying attention to the distribution of research funding from a gender perspective, and Formas has developed guidelines on the implementation of a gender equality perspective in Formas' evaluation committees. In addition, the Swedish Research Council, Vinnova, FAS, and Formas have established a joint working group on how best to promote GE and to approach the allocation of research funding in an equal way (Bergman 2013, 39).

3.2 Participation of women in tertiary education

In 1998/1999, the Swedish education nomenclature (SUN, *Svensk Utbildningsnomenklatur*) was adjusted to match ISCED 97. Earlier Swedish nomenclatures including level 8 or 9 included more educations or studies than the updated version, SUN 2000. It should therefore be noted that SUN 2000 has not formally been adjusted in accordance with ISCED 2011 (Statistics Sweden n.d., Statistics Sweden 2000, UNESCO Institute for Statistics 2012, OECD 1999, Halldén 2008). For an overview of SUN 2000 and how the different levels can be translated to ISCED 97 and ISCED 2011, see the table in annex.

3.2.1 Share of tertiary educated population among the group of 25 to 34 years old by sex

In 2014, 45 % of women and 33 % of men in Sweden had at least two years of tertiary education (Swedish Higher Education Authority 2016c, 5). A reason why many people in Sweden have shorter tertiary education "is because this includes up to 2-3 years of studies in higher education without a qualification being awarded. There is free access to Sweden's higher education system and many

students take courses without aiming for a qualification” (Swedish Higher Education Authority 2015, 7).

Tab. 29: Share of tertiary educated population among the group of 25 to 34 years old by sex*

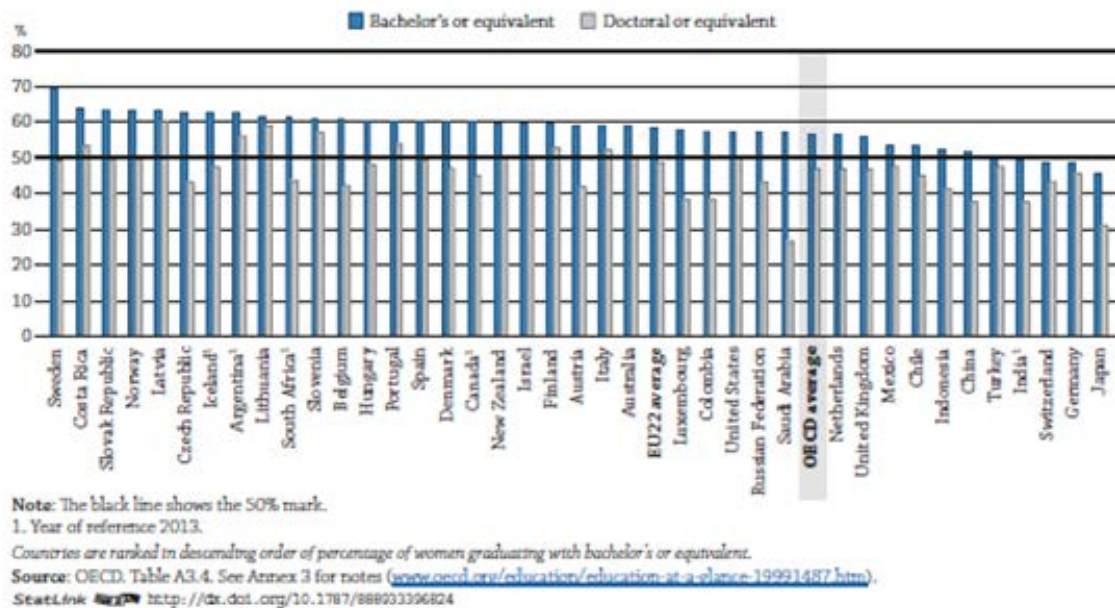
	Sex/Time	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
EU28	Total	28.3	29.2	29.9	30.9	32.3	33.3	34.4	35.5	36.5	37.2	37.9
	Males	25.4	25.9	26.4	27.2	28.2	29.1	30.0	30.8	31.7	32.5	32.9
	Females	31.1	32.5	33.6	34.8	36.4	37.6	38.8	40.2	41.3	42.0	42.9
Sweden	Total	37.3	39.2	39.9	40.9	42.4	42.3	42.8	43.5	44.9	46.0	46.5
	Males	32.4	33.8	34.3	35.5	36.6	35.9	35.8	37.2	38.4	38.8	38.9
	Females	42.4	44.8	45.8	46.5	48.4	48.9	50.2	50.2	51.7	53.6	54.5

** Introduction of the ISCED 2011 classification: data up to 2013 are based on ISCED 1997, as from 2014 ISCED 2011 is applied. The data at this level of aggregation data are directly comparable for all available countries except Austria.*

Source: (Eurostat 2017)

As seen in Tab. 29, there has been an overall increase in the share of tertiary educated people, both women and men. The increase in the share of female graduates is double the increase in the share of male graduates during the period 2005-2015. The table illustrates that in 2015 the share of women who attained a tertiary degree was much higher than the share of men among the 25-34 year-olds. Hence, employees in the public sector are more often demanded to have a tertiary education, often on ISCED level 5 or 6, see also below.

Sweden has a large public sector and an exhaustive social system of care and education facilities for its citizens, and these occupations are overpopulated by women. Especially the public sector formalises its educational demands to employees by equivalents in the educational system; since the 1970s, there has been an overall increase in the number of fields traditionally or culturally perceived as female-oriented, which might explain part of the developments over time with an overall or average increase of female students (Dryler et al. 2016, 24). Therefore, when looking at the share of people with at least three years of higher education studies (i.e. BA), Sweden is above the OECD average, which might be due to the fact that many degrees at this level are women-dominated fields, e.g. nurses, pre-school teachers and school teachers (Dryler et al. 2016, 121).

Figure 14: Percentage of female graduates in tertiary levels of education, 2014

Source: (OECD 2016a, 64)

As Figure 14 shows, by 2013, 70 % of graduates in tertiary education in Sweden with a Bachelor's degree were women, while 50 % of those that had a doctoral degree or equivalent education were women. Hence, there seems to be evidence of an above-average share of women across short-term tertiary educations, e.g. ISCED 2011 level 5 and 6 (short-cycle tertiary education, and bachelor or equivalent).

When looking at other characteristics, such as age and type of educational programme, the numbers for tertiary educated people vary. In the 2016 annual report, the Swedish Higher Education Authority (UKÄ) found that gender differences in tertiary educational attainment were substantially larger among the younger population than those among the adult population as a whole, i.e. 15 percentage points in 2014. Thus, 54 % of the women had attained tertiary education, compared to 39 % of the men (Swedish Higher Education Authority 2016c, 6).

Moreover, the UKÄ report concludes that a look on gender and social background reveals that daughters of parents with research qualifications are most likely to enroll in higher education (86 %) while sons of parents who have not completed upper-secondary education are least likely to do so (16 %) (Swedish Higher Education Authority 2016c, 34).

In addition, the Gender Equality Inquiry finds that:

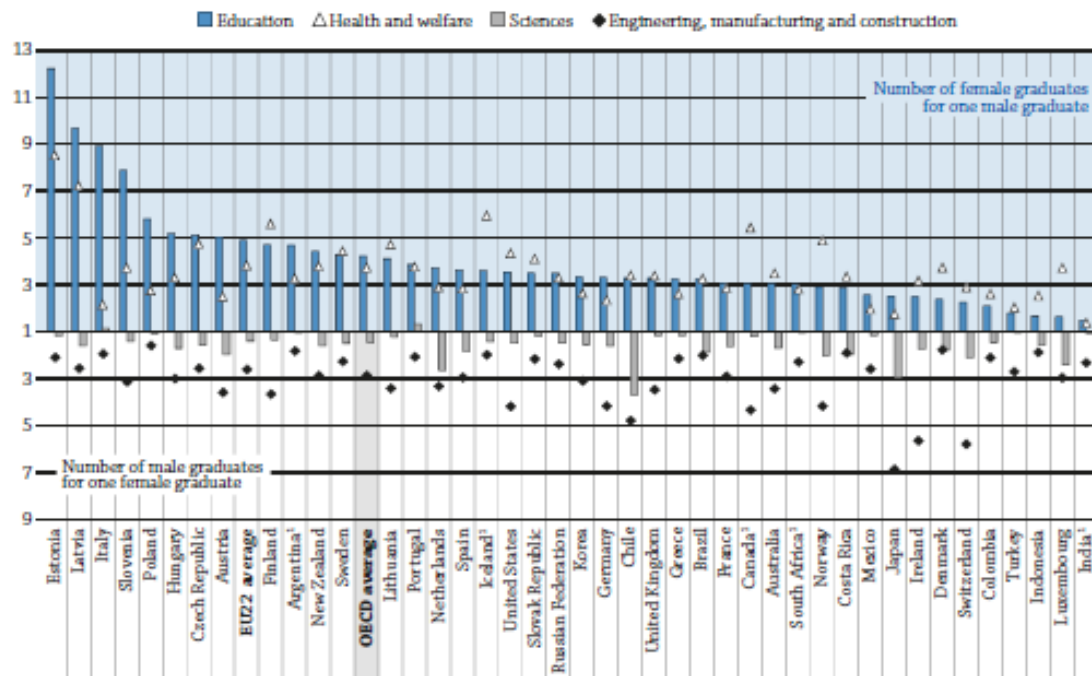
Although girls and women (...) have a higher level of education than men, this has not had any obvious effects in terms of a better position in the labour market. Nor has it paid off financially in the form of correspondingly higher earnings. Return on human capital is therefore lower for women than for men. (2015, 4)

3.2.2 Gender ratio for all tertiary graduates, by field of education

Some fields of study have an unbalanced gender distribution, and looking at higher education in general, the gender divide tendency remains: more women than men apply within education and

teaching, health science, nursing, and social care, and more men than women apply to educational programmes within technology and manufacturing, natural sciences, mathematics and computer science. The gender differences in field of study are somewhat smaller in medicine, engineering, architecture, and upper-secondary education (Swedish Higher Education Authority 2016c, 21-22).

Figure 15: Gender ratio for all tertiary* graduates, by field of education, 2014



1. Year of reference 2013.

Countries are ranked in descending order of the number of female graduates for one male graduate in the field of "Education".

Source: OECD, Table A3.3. See Annex 3 for notes (www.oecd.org/education/education-at-a-glance-19991487.htm).

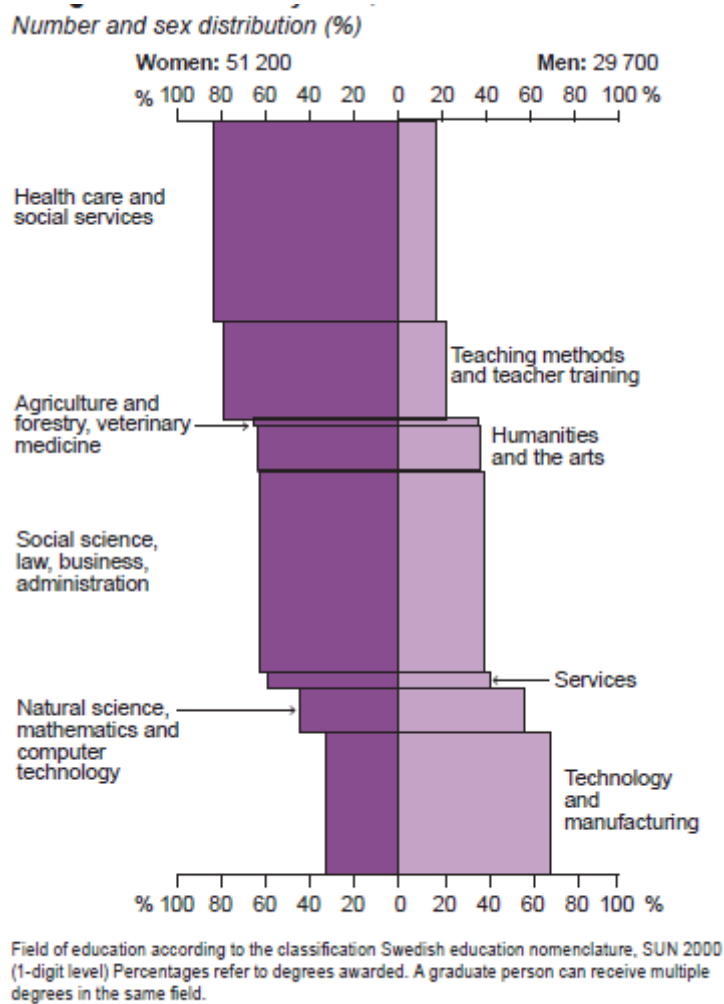
StatLink  <http://dx.doi.org/10.1787/888933396834>

*Tertiary graduates include short-cycle tertiary, bachelor's or equivalent, master's or equivalent, and doctoral
Source: (OECD 2016a)

As Figure 15 illustrates, more female students attain a degree within health and welfare, i.e. above the OECD average, while more male students attain a degree within engineering, manufacturing and construction. Similarly, the report on policy objectives and governance of GE policy by the Gender Equality Inquiry states that "women and men in higher education largely pursue different fields of study. Hence their study choices remain consistently gender-stereotypical and continue to be so throughout their educational careers" (2015, 3).

Figure 16 from the 2016 Statistics Sweden report *Women and men in Sweden. Facts and figures* shows women's and men's degrees for educational attainment (graduate and undergraduate level) (Statistics Sweden 2016b, 31).

Figure 16: Degrees at the undergraduate and graduate levels in higher education by field, 2014-2015



Source: Swedish Higher Education Authority

As Figure 16 shows, there is a gender divide in the undergraduate and graduate levels, which might reflect, for instance, a gender divide in interests. Far more women than men attain educational degrees within healthcare and social services, teaching methods and teacher training, as well as agriculture and forestry, and veterinary medicine, whereas far more men attain an educational degree in technology and manufacturing, and natural science, mathematics and computer technology. There is no scientific field that demonstrates complete gender balance.

3.2.3 Development of the number of women ISCED 6 graduates

As mentioned in the annex (part 6), it should be noted that the current Swedish education terminology (*Svensk utbildningsnomenklatur, SUN 2020*) is different from the international ISCED 2011 system and more comparable with the earlier ISCED 1997 nomenclature.⁵¹ However, there are still some precautions to consider in the translation of the Swedish SUN to ISCED; therefore, comparisons with other countries on the basis of numbers from Eurostat, *She Figures* (or *Education at a glance*) should be done with care and reservation (Dryler et al. 2016, 117); see part 3.2.

⁵¹ For an overview (in Swedish), see *The Swedish educational system and classifying education using the ISCED-97* (Halldén 2008).

Tab. 30: Development of the number of women ISCED 6 graduates

	2006		2007		2008		2009		2010		2011		2012	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
EU27	55 163	43 519	57 196	46 754	59 784	50 743	54 876	46 586	56 162	47 185	62 626	54 628	63 472	56 916
Sweden	1 456	1 204	2 094	1 810	1 999	1 626	1 846	1 718	1 744	1 627	1 787	1 569	1 802	1 541

Data estimated for EU28, EU27. ISCED 6 covers tertiary programmes (above master's level) which lead to the award of an advanced research qualification, including (but not limited to) doctor of philosophy programmes.

Source: (Directorate-General for Research and Innovation 2016, 36, Directorate-General for Research and Innovation 2013, 78)

The Swedish population of ISCED 6 is somewhat larger than the actual number of PhD degrees given in the years, since it covers research education in general (PhD and equivalent, e.g. licentiate degree), see also Tab. 31.

Tab. 31: Awarded doctoral degrees

Year		2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Country	Gender	2 768	2 853	2 914	2 722	2 615	2 619	2 577	2 650	2 852	2 854
Sweden	Both genders	1 269	1 352	1 375	1 382	1 309	1 290	1 223	1 318	1 385	1 338
	Women	1 499	1 501	1 539	1 340	1 306	1 329	1 354	1 332	1 467	1 516
	Men	2 768	2 853	2 914	2 722	2 615	2 619	2 577	2 650	2 852	2 854

Source: (Nordisk institutt for studier av innovasjon, forskning og utdanning 2017)

As seen in Tab. 31, there has been an increase in the number of both male and female PhDs/ISCED 6 graduates (ISCED-97), when comparing 2006 and 2012. However, there are still more male than female PhDs, even if the difference is not large.

3.2.4 Development of the proportion of women ISCED 6 graduates differentiated by field of study

As Tab. 32 shows, in 2012, the proportion of PhDs is almost gender-equal in humanities and arts, in agriculture and veterinary, and in social sciences, business and law. Women dominate more in education and in health and welfare, whereas there is a much smaller share of female PhDs in engineering, manufacturing and construction, followed by science, mathematics and computing, and services.

Tab. 32: Development of the proportion of women ISCED 6 graduates differentiated by field of study

		Education	Humanities & arts	Social sciences, business and law	Science, mathematics and computing	Engineering, manufacturing and construction	Agriculture and veterinary	Health and welfare	Services
EU27	2006	64	52	47	41	25	51	54	
	2010	64	54	49	40	26	52	56	
	2012	64	54	51	42	28	57	59	45
Sweden	2006	58	54	42	37	29	46	62	
	2010	71	54	53	41	31	56	63	
	2012	63	54	49	42	26	53	62	44

Source: (Directorate-General for Research and Innovation 2016, 26, Directorate-General for Research and Innovation 2013, 79, Directorate-General for Research 2009, 51)

3.2.5 Development of the proportion of women ISCED 6 graduates differentiated by narrow fields of study in the natural sciences and engineering

When taking a closer look at some of the fields which are male-dominated, it appears that female PhDs are mainly found within life science, where the proportion of women has somewhat increased in the period 2004-2012, while we notice a negative development within physical sciences, engineering, manufacturing, and architecture and building.

Tab. 33: Development of the proportion of women ISCED 6 graduates differentiated by narrow fields of study in the natural sciences and engineering

		Life science	Physical science	Mathematics and statistics	Computing	Engineering and engineering trades	Manufacturing and processing	Architecture and building
EU27	2004	53	34	31	18	19	30	36
	2010	57	34	32	19	23	42	34
	2012	58	37	36	21	25	35	38
Sweden	2004	54	35	31	28	22	35	44
	2010	54	41	28	30	28	40	48
	2012	58	37	32	31	23	31	35 ⁵²

Source: (Directorate-General for Research and Innovation 2016, 31, Directorate-General for Research and Innovation 2013, 80)

3.2.6 Distribution of ISCED 6 graduates across fields of study by sex

As seen in Tab. 34, there is a great gender divide in PhDs depending on the field of study. The largest divides are found in some of the fields, such as engineering, manufacturing and construction that are

⁵² It seems rather unlikely that there should have been such relatively large drops in e.g. manufacturing and processing and in architecture and building; therefore, it can be assumed that the proportion of female ISCED 6 graduates in 2012 are similar to the numbers in 2010.

male-dominated, and in health and welfare that are female-dominated. There is gender balance in the distribution of graduates within agriculture and veterinary sciences.

The Swedish Higher Education Authority (UKÄ) stated that half of the research-educated (i.e. PhDs) in 2014 were awarded in technology, which constitutes more men than women, and that “the proportion of women has varied during the period 2003–2013, but in the last few years it has remained at the same level” (Swedish Higher Education Authority 2016b).

Tab. 34: Distribution of ISCED 6 graduates across broad fields of study, by sex, 2012

		Teaching and education science	Humanities and arts	Social sciences, business and law	Science, mathematics and compu- ting	Engineering, manufacturing and construction	Agriculture and veterinary	Health and welfare
EU28	Women	4	14	20	26	9	4	23
	Men	2	10	17	32	21	3	14
Sweden	Women	3	7	10	24	14	2	40
	Men	2	5	9	28	34	2	20

Data only for 2012

Source: (Directorate-General for Research and Innovation 2016, 29)

3.3 Labour Market Participation of women and men in the RTDI (whole sector)

3.3.1 General Labour market participation

Seidegård et al. find that even though there has been a decrease in gender differences over the past 10 years, men still dominate significantly in politics, in the government, and in the business sectors (2015, 142).

As the Swedish labour market participation is high for both genders and the influences from fiscal incentives are equal, differences seem to be field-specific, such as lower gender shares in science and higher shares in humanities. See also part 3.2.4.

3.3.1.1 Employment rate by sex

In Sweden, unemployment declined for men and especially for women between 2004 and 2014. In 2013 and 2014, unemployment declined, including for people, especially women, both with and below upper-secondary education, and both women’s and men’s occupancy rates have also risen, irrespective of educational attainment level (Swedish Higher Education Authority 2016c, 49).

2005-2008 was characterised by favourable economic conditions, i.e. a cyclical upturn. In 2009, the financial crisis occurred and brought the employment rates down. In recent years, the rates have been rising again (Dryler et al. 2016, 103), especially for women, who are often employed in different sectors, fields or positions than men.

Tab. 35: Employment rates in the total population aged 20-64, by sex and gender gap⁵³

		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
EU28	Males	75.9	76.8	77.6	77.8	75.7	75.1	75.0	74.6	74.3	75.0	75.9
	Females	60.0	61.1	62.1	62.8	62.3	62.1	62.2	62.4	62.6	63.5	64.3
	Gender gap	15.9	15.7	15.5	15.0	13.4	13.0	12.8	12.2	11.7	11.5	11.6
Sweden	Males	80.5	81.7	83.1	83.5	80.9	81.1	82.1	81.9	82.2	82.2	82.5
	Females	75.2	75.8	77.1	77.2	75.7	75.0	76.5	76.8	77.2	77.6	78.3
	Gender gap	5.3	5.9	6.0	6.3	5.2	6.1	5.6	5.1	5.0	4.6	4.2

Source: (Eurostat n.d.)

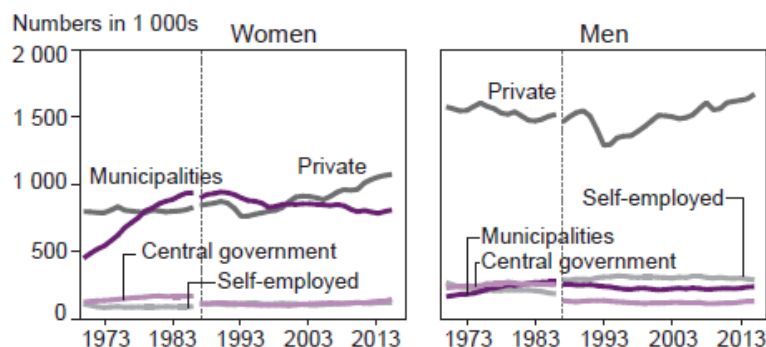
As Tab. 35 shows, the employment rates for women at all education levels in Sweden is generally higher than the EU28 average, and it has gradually risen above the EU28 employment average for men as well, and in 2015 it reached 78.3 % for women. Also, the gender employment gap has decreased rapidly in recent years. Even though the gender gap is now smaller, the Swedish labour market is still highly gender-segregated (Numhauser-Henning 2015b, 10).

In general, more women than men are employed in the public sector and more men than women in the private sector. However, from 2005 to 2015, the public sector decreased, and there has been a small increase in the share of women in the private sector (Dryler et al. 2016, 110).

UKÄ states that:

Unemployment gender differences were not as large as in the proportion of those gainfully employed. The differences in the unemployment rates for men and women with qualifications from tertiary education in Sweden increased, however, between 2013 and 2014, when among women unemployment dropped from 5.2 to 4.6 per cent while it has remained the same for men at 5.3 per cent. (Swedish Higher Education Authority 2016c, 45).

Hence, the unemployment rate is lower for tertiary educated women than men.

Figure 17: Employed aged 20-64 by sector, 1970-2015

A new measurement method was introduced in 1987. All persons who worked in limited companies were classified as employees before 1987. Thereafter company leaders were classified as self-employed. Since there are more self-employed men than women, the break in the series is more visible for men than women.

Information for 1970–1986 refers to the 16–64 age group.

Source: Labour Force Survey (LFS), Statistics Sweden

⁵³ This means the difference of employment rates between women and men. It is calculated by subtracting the employment rate for women from that of men, and is measured in percentage points.

As Figure 17 shows (Statistics Sweden 2016b, 50), men have been mainly employed in private industries throughout the period 1970 to 2015. Though private companies appear to be male-dominated also in 2015, a larger share of the female labour force is also employed in private companies in 2015. Furthermore, throughout the entire period, far more women than men are employed in municipalities and other local public sector institutions.

3.3.1.2 Employment rate by age of children and sex

When comparing the period between 2005 and 2013, the employment rates for both men and women with children, regardless of the children's age, have increased. The smallest increases in employment rates are found among the fathers, whose employment is generally higher than the mothers', because mothers usually take more parental leave; the lowest employment rate (77.8 %) is found among mothers with children below three years of age. Children between the age of three and five (or above) are usually enrolled in full-day childcare facilities; therefore, the employment rates for these groups of parents, mothers in particular, rise again. In general, the employment rates for comparable age groups and genders with and without children do not deviate much in size. As such, the decrease in employment around 2008-2010 might be explained by an overall decrease in employment due to the financial crisis in 2009. However, the growth in employment rate for women with children aged below three years is slower than for the other groups.

Tab. 36: Employment rate of persons aged 25-49 by age of youngest child, sex and year

			2005	2006	2007	2008	2009	2010	2011	2012	2013
Sweden	Female	Child aged under 3	74.8	76.2	77.4	79.7	78.2	76.3	77.4	77	77.8
		Child aged 3-5	79.2	80.8	83.3	83.7	82.4	82.3	83	83.8	83.4
		Child aged 6-16	85.7	85.2	86.2	86.9	85.5	84.9	86.8	87.7	88.1
	Male	Child aged under 3	89.8	91.2	93.6	93.9	90.8	91.2	91.9	91.9	92
		Child aged 3-5	91.6	93.7	93.8	94.5	93.2	93.4	93.4	93.3	92.7
		Child aged 6-16	92.6	93.8	94.3	94.4	93.2	93.3	93.7	94.3	94.4

Source: (UNECE n.d.)

The lower employment rate of persons aged 25-49 without children in Tab. 37 is caused by other differences, namely, the composition of the age group 25-49 with and without children. A large fraction of the youngest in the group is still in education, hence the lower employment rate. At the same time, the age of first birth among women in Sweden is closer to 30, and older for consecutive children. This means that the average age of women in the age group 25-49 with and without children is quite different. Hence, the figures are not immediately comparable.

Tab. 37: Employment rate of persons aged 25-49 without children by sex and year

		2005	2006	2007	2008	2009	2010	2011	2012	2013
Sweden	Female	78.7	79.6	81.8	81.5	78.9	77.5	78.5	78.6	78.8
	Male	80.6	81.4	83.2	83.9	80.2	80.3	81.4	80.9	81

Source: (UNECE n.d.)

It also appears that even though the impact of parenthood is positive for Swedish men (translating into a negative score in Tab. 38), the impact of parenthood is also rather neutral (or slightly positive) for women in Sweden (Plantenga 2014, 7). See also description above.

Tab. 38: Employment impact of parenthood (age 20-49)

	Males	Females
OECD average	-11.3	10
Sweden	-14.8	-0.1

Negative score (-): Parenthood has a positive effect on employment (higher employment rates)

Positive score (+): Parenthood has a negative effect on employment (lower employment rates)

Source: (Plantenga 2014, 40)

According to Tab. 38, parenthood has a positive effect on employment rates among men and probably also women. However, it might be misleading to interpret parenthood as a factor which increases employment rates in the Swedish context with already large employment rates among both genders. It seems more likely that the older men and women in the age cohort get higher employment rates because they finish their studies.

But of course, as Tab. 39 shows, having children can also affect the composition of employment, e.g. between full-time and part-time employment (Statistics Sweden 2016b, 52).

Tab. 39: Employed parents aged 20-64 with children at home, by number of children, the youngest child's age, and length of work time, 2015

Proportion (%) of age group

Number of children Youngest child's age	Women		Men	
	Full-time	Part-time	Full-time	Part-time
One child				
0 years	78	22	91	9
1-2 years	59	41	90	10
3-5 years	66	34	89	11
6-10 years	67	33	91	9
11-16 years	70	30	94	6
Two children				
0 years	70	30	89	11
1-2 years	54	46	90	10
3-5 years	57	43	92	8
6-10 years	65	35	94	6
11-16 years	72	28	96	4
Three children or more				
0 years	62	38	93	7
1-2 years	46	54	88	12
3-5 years	51	49	93	7
6-10 years	63	37	91	9
11-16 years	67	33

1 Employed also includes those who are absent, e.g. on parental leave.

Source: Labour Force Survey (LFS), Statistics Sweden

In general, part-time employment rates for men with children are much lower than for women with children. As seen in Tab. 39, around 60 % of women and 90 % of men have full-time employment in the first years of their child's life. Where there is a decrease in the number of full-time employed women (and an increase in part-time employed women) with two or more children, full-time employment rates for fathers with several children remain relatively stable.

3.3.1.3 General employment by full-time and part-time status, sex

Even though "the Government's objective is that full-time work should be the norm, and part-time a possibility" (Regnér and Wallström 2016, 6), around 30 % of women work part-time. However, studies show that many part-time working women would prefer to work more than they do, and that the main reasons why many women work part-time is that they can not find a suitable full-time job or that they are taking care of their children (Regnér and Wallström 2016, 6).

Tab. 40: Full-time equivalent (FTE) employment rates among women and men aged 20-64 (%) and gender gap (percentage points), 2010-2014

		2010	2014
EU28	Males	73.1	72.7
	Females	53.5	54.5
	Gender gap	19.6	18.2
Sweden	Males	78.6	80.0
	Females	66.8	70.2
	Gender gap	11.8	9.8

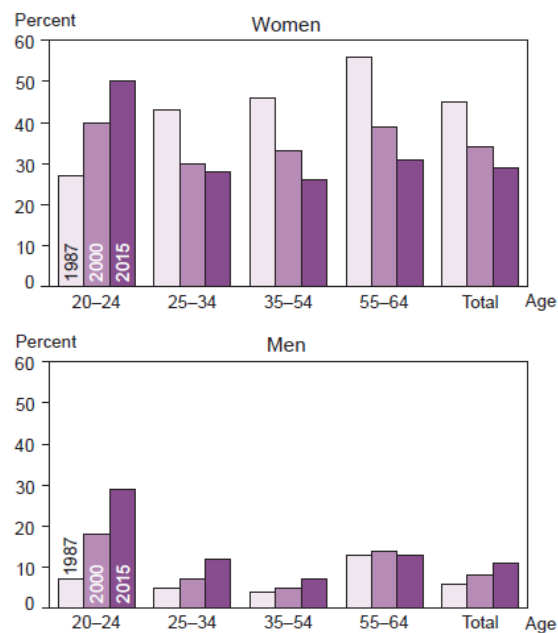
Source: (Directorate-General for Justice and Consumers 2016, 49)

As Tab. 40 shows, there has been an overall increase in full-time employment rates in the period (due to the cyclical upturn), and furthermore, the gender gap has decreased. In general, Swedish men and especially women still have a considerable higher FTE employment rate than the EU28 average.

Figure 18 from the annual *Facts & Figures* of women and men by Statistics Sweden provides an overview of developments in the number of male and female part-time workers (Statistics Sweden 2016b, 51) (reasons for women working part-time can be found in part 2.2.3.9 *Main reasons for women not working or working part-time*).

Figure 18: Employed who work part-time by age, 1987, 2000 and 2015

Percentage (%) of age group



Source: Labour Force Survey (LFS), Statistics Sweden

As seen in Figure 18, in 1987, 2000 and 2015, the level of part-time employment has been much higher for women than for men. In 2015, around 30 % of women aged 20-64 worked part-time, where the same could be found for about 10 % of men in the same age group.

In the 2016 status report on higher education by the Swedish Higher Education Authority, the authors state that:

Even if Sweden is one of the OECD countries where the gender difference is lowest in the proportion of those with tertiary education who are employed, the picture changes if the proportions with full-time employment are taken into account. On average in the OECD 80 per cent of the men and 58 per cent of the women in the 35–44 age group with tertiary education who were employed had full-time jobs, a difference of 22 percentage points. The corresponding figures in Sweden are 83 per cent of the men and 59 per cent of the women, a difference of 25 percentage points, which is just over the average for the OECD. (Swedish Higher Education Authority 2016c, 49)

UKÄ further finds that this is due to women being more likely to have child leave periods than men; besides, women in Sweden have relatively good opportunities of working part-time when children are small, compared to other OECD countries (Swedish Higher Education Authority 2016c, 49).

3.3.2 Participation of women and men in RTDI

For a description of the general labour market employment, including labour market participation for the tertiary educated population, see part 3.3.1 *General labour market participation*.

3.3.2.1 Proportion of scientists and engineers in total labour force, by sex

Tab. 41: Proportion of scientists and engineers in the active population between 15 and 74 years, by sex and year

	Sex/Time	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
EU28	Total	:	:	:	4.9	4.9	5.0	6.4	6.5	6.6	6.6	6.8
	Males	:	:	:	6.0	6.1	6.2	7.3	7.2	7.3	7.4	7.5
	Females	:	:	:	3.5	3.5	3.6	5.5	5.5	5.7	5.8	6.0
Sweden	Total	6.4	6.3	6.5	6.8	6.9	6.8	9.5	9.6	9.6	9.7	10.0
	Males	7.6	7.5	7.6	8.1	8.1	8.0	9.1	9.5	9.4	9.4	9.8
	Females	5.0	5.0	5.3	5.4	5.4	5.4	9.9	9.8	9.9	9.9	10.3

Source: (Eurostat n.d.)

As Tab. 41 shows, there has been an overall increase in the proportion of scientists and engineers in Sweden, even though the development has been rather stable over the period 2005–2015.

Between 2010 and 2011, there is a data break which explains the jump in shares, especially among women in Sweden as well as in the EU28. The redefinition of scientists and engineers in the Human Resources in Science and Technology statistics increased the shares among women in Sweden so that there was a larger share of female than male scientists and engineers in 2015. In the entire period, the share of scientists and engineers in Sweden is 50 % higher than in the EU28 and shows a much more gender-equal distribution.

3.3.2.2 Employment in knowledge intensive activities (KIA) by sex

Another characteristic of the use of knowledge in the economy is to analyse employment in KIA. As Tab. 42 shows, the Swedish employment share in KIA is increasing towards 50 %, and in 2015 it is almost 10 percentage points higher than the EU28 share.

Tab. 42: Annual data on employment in knowledge intensive activities as a percentage of total employment by sex (from 2008 onwards, NACE Rev. 2)

	Sex/Time	2008	2009	2010	2011	2012	2013	2014	2015
EU28	Total	34.2	35.0	35.4	35.6	35.7	35.8	35.9	36.0
	Males	27.2	28.0	28.5	28.7	28.8	28.9	29.1	29.1
	Females	42.7	43.5	43.8	43.8	43.9	43.9	44.0	44.2
Sweden	Total	41.6	42.3	42.6	42.7	43.3	43.4	43.9	44.4
	Males	32.6	33.2	33.9	34.3	34.8	35.1	35.7	35.6
	Females	51.6	52.1	52.2	52.1	52.4	52.4	52.8	53.8

Source: (Eurostat n.d.)

As seen in the table, there has been a slow but stable increase in the relative employment within knowledge intensive activities (KIA). As in the EU28, KIA is also dominated by a relatively higher share of women than men in Sweden. This is caused by the fact that relatively more female-dominated sectors have more than 33 % of its employees educated at the tertiary level, which defines a KIA activity or sector. These are often public sector activities.

3.3.2.3 Employment in knowledge intensive activities – business activities (KIABI) by sex

Yet another measure of the economies' use of tertiary knowledge in knowledge intensive sectors are the subgroup of KIA called KIABI. Here only business sectors according to the NACE 2 definitions are considered. An approximative translation in Sweden corresponds to the private sector solely, where KIA covers all sectors.

Tab. 43: Employment in knowledge intensive activities – business activities (KIABI) by sex

	Sex/Time	2008	2009	2010	2011	2012	2013	2014	2015
EU28	Total	13.2	13.4	13.5	13.7	13.8	13.8	13.9	14.0
	Males	13.3	13.6	13.9	14.1	14.2	14.4	14.5	14.6
	Females	13.1	13.2	13.1	13.2	13.3	13.2	13.3	13.4
Sweden	Total	16.6	16.8	16.9	17.2	17.6	17.7	17.9	18.2
	Males	18.8	19.0	19.2	19.7	20.0	20.0	20.3	20.7
	Females	14.2	14.5	14.4	14.6	14.9	15.2	15.4	15.6

Source: (Eurostat n.d.)

In regard to knowledge intensive business activities (KIABI), there has also been a slow but steady increase in the total employment share. In opposition to the other knowledge intensive activities (KIA), a higher share of men than women are employed within KIABI. However, as illustrated in Tab. 43, the gender divide is not as large as in KIA, where women dominate the activities.

Compared to the EU28, the Swedish share of employment in KIABI is higher for men and women. The differences in shares are lower, around 4 percentage points, while for KIA they were at around 8 percentage points. All in all, the KIA and KIABI figures illustrate that a considerably higher proportion of the Swedish labour force works in knowledge intensive activities than in the EU28.

See also part 1.2.4 for a general description of developments in KIABI.

3.3.2.4 Researchers in all R&D sectors

The total number of FTE researchers in R&D is also given in Tab. 5 in section 1.1.2.2. Below the numbers are presented by gender.

Tab. 44: Number of researchers in all R&D sectors by sex and years (in full-time equivalents)

	Time/Sex	2005	2006	2007	2008	2009	2010	2011	2012	2013
EU28	Total	1 374 760	1 422 499	1 458 115	1 523 245	1 555 606	1 602 765	1 626 802	1 680 987	1 731 241
	Females	:	:	:	:	:	:	:	:	:
	Males	:	:	:	:	:	:	:	:	:
Sweden	Total	55 001	55 729	45 812	50 220	47 308	49 312	48 702	49 280	64 194
	Females	15 960	:	13 475	:	14 080	:	14 721	:	17 989
	Males	39 041	:	32 337	:	33 228	:	33 981	:	46 205

Source: (Eurostat n.d.)

When comparing 2005 and 2013, the number of researchers in R&D has increased; see also section 1.1.2.2 for comments on the unexplainable data break in total numbers, e.g. the jump in totals from 2012 to 2013. However, the divide between the share of men and women in R&D does not appear to have changed or improved much in the period, which Tab. 45 also illustrates. The increase in the number of male researchers is much higher than in the number of female researchers, which remains stable for the studied period.

Tab. 45: Share of women in R&D

	2005	2007	2009	2011	2013
Sweden	29 %	29 %	30 %	30 %	28 %

Source: (Eurostat n.d.)

This also means that the share of women in R&D remains relatively unchanged during the period 2005-2013. Given the short length of the period, no changes were anticipated, and the main variation is caused by statistical definition changes.

See also general description on the developments in the sector in part 1.1.2.2 *Development of number of researchers between 2005 and 2015 in the whole R&D sectors and its subsectors.*

Tab. 46: Teaching and research staff, by employment category, 2014*Number and sex distribution (%)*

Employment category	Number		Sex distribution	
	W	M	W	M
Professors	1 550	4 810	24	76
Lecturers	4 410	5 160	46	54
Qualifying appointment	1 410	1 670	46	54
Instructors	3 740	2 690	58	42
Other research and teaching staff with doctorate	1 850	2 290	45	55
Other research or teaching staff without a doctorate ¹⁾	2 680	2 930	48	52
Total	15 360	19 290	44	55

If a person has two jobs with different categories, then the person is counted once for each employment category, but only once at the aggregate level for all staff.

¹ The group other teaching and research staff without a doctorate includes other research and teaching staff for which information on degrees is not available.



Source: Swedish Higher Education Authority

As can be seen in Tab. 46 (Statistics Sweden 2016b, 33), the largest differences in gender distribution among research and teaching staff in 2014 are found among professors in the higher education

sector. However, men in Sweden are also still overrepresented among lecturers, among staff in “qualifying appointment,” and among other research and teaching staff (with/without a doctorate), except for instructors.

3.3.2.5 Researchers differentiated by R&D sectors

As shown in the differences of employment between KIA and KIABI, also in terms of research employment, the BES sector is relatively male-dominated. Comparing 2005 and 2013, the BES sector has experienced growth in the number of full-time researchers employed, however, also in this subsector of the entire economy women still only comprise less than one third of researchers in the business sector.

The HES has had a relatively stable development in the share of full-time researchers employed, and by 2013, the gender gap seems to have decreased. However, still most researchers in the HES are male. The HES has had a relatively stable development in the share of full-time researchers employed, and by 2013, the gender gap seems to have decreased. However, due to (historical) male professor and lecturer dominance most researchers in HES are still male, see Tab. 46.

The sectors with the most gender-equal distribution of full-time researchers are the government sector (GOV) and the private non-profit sector (PNP). As seen in chapter 2, the GOV sector employs relatively many women, and the research employees are no exception – even if there are more male than female full-time research employees in GOV. In terms of full-time researchers employed, the GOV sector has actually experienced a decrease; in 2013, fewer full-time researchers were employed than in 2005. However, the gender gap in 2013 is relatively small, when comparing with previous years in GOV. In 2013, both the overall share of researchers in full-time employment and the gender gap between male and female researchers in the PNP sector are close to the same levels as in 2005.

See also part 1.1.2.2 for a description of general developments within and between the different sectors.

Tab. 47: Number of researchers in BES, HES, GOV and PNP by sex and years (in full-time equivalents)

Time		EU28				Sweden			
		BES	HES	GOV	PNP	BES	HES	GOV	PNP
2005	Total	626 081	551 459	181 758	15 462	36 697	15 125	2 929	250
	Females	:	:	:	:	9 064	5 738	1 046	112
	Males	:	:	:	:	27 633	9 387	1 883	138
2006	Total	654 004	566 464	185 036	16 995	37 700	14 740	3 041	248
	Females	:	:	:	:	:	:	:	:
	Males	:	:	:	:	:	:	:	:
2007	Total	667 464	585 624	188 306	16 721	28 965	14 840	1 941	66
	Females	:	:	:	:	7 120	5 573	753	29
	Males	:	:	:	:	21 845	9 267	1 188	37
2008	Total	695 179	618 351	192 370	17 345	33 378	14 896	1 770	176
	Females	:	:	:	:	:	:	:	:
	Males	:	:	:	:	:	:	:	:
2009	Total	695 602	642 780	199 210	18 014	29 426	16 308	1 483	91
	Females	:	:	:	:	7 444	6 075	517	44
	Males	:	:	:	:	21 982	10 233	966	47
2010	Total	719 935	663 331	201 547	17 952	30 440	16 959	1 892	21
	Females	:	:	:	:	:	:	:	:
	Males	:	:	:	:	:	:	:	:
2011	Total	747 215	656 965	203 821	18 802	29 310	17 101	2 097	194
	Females	:	:	:	:	7 298	6 511	836	76
	Males	:	:	:	:	22 012	10 590	1 261	118
2012	Total	792 692	661 902	207 428	18 965	30 497	16 561	2 002	220
	Females	:	:	:	:	:	:	:	:
	Males	:	:	:	:	:	:	:	:
2013	Total	830 713	675 973	210 635	13 920	43 141	18 401	2 386	266
	Females	:	:	:	:	9 703	7 144	1 017	125
	Males	:	:	:	:	33 438	11 257	1 369	141

Source: (Eurostat n.d.)

In general, one third of the employees in the R&D sectors are women, and the share seems stable over time and over sectors as well (for a description of general developments within and between the different sectors, see also part 1.1.2.2).

3.4 Horizontal segregation

The Gender Equality Inquiry states that:

Although participation in the labour market has increased for both women and men, they work in different sectors and occupations. And even if they are in the same sector and occupation, they often hold different positions. Thus segregation of the labour market is both horizontal and vertical. (2015, 2)

In the following we discuss more in detail the horizontal segregation in economic sectors.

3.4.1 General horizontal Segregation

From a gender equality view, there is still some potential to be reached if occupational as well as sectoral gender equality is the goal. As the previous sections have shown, there are large differences in employment shares across scientific fields of education in Sweden, as well as in the EU. These differences have been rather stable over time: they have decreased only slightly in Sweden, although still relatively more than in the EU28, where inequality across sectors actually increased between 2004 and 2014.

3.4.1.1 Gender segregation in occupations and in economic sectors, 2004 vs 2014

Tab. 48: Gender segregation in occupations and in economic sectors, 2004 vs 2014

	Gender segregation in occupations (%)		Gender segregation in sectors (%)	
	2004	2014	2004	2014
EU28	24.7	24.4	17.7	18.9
Sweden	27.6	25.3	21.4	20.6

The index reflects the proportion of the employed population that would have to change occupations/sectors in order to bring about an even gender distribution across occupations or sectors. The index varies between 0 (no segregation) and 50 (complete segregation) (Directorate-General for Justice and Consumers 2016, 52).

Source: (Directorate-General for Justice and Consumers 2016, 52)

As Tab. 48 shows, the proportions of employees that would need to change their occupation or economic sector in order to equalise the distribution of men and women, are still 25.3 and 20.6, for occupations and economic sectors, respectively. There has been some smaller changes in the gender segregation both in occupations and in economic sectors when comparing 2004 and 2014. However, both in occupations and sectors in general, the gender segregation among employees is still relatively high. A similar breakdown of employment shares by gender on occupations shows again a diversified and sector-specific pattern. However, in most occupations, gender equality has increased since 2004.

Tab. 49: Employment by occupation, sex and year

Sweden		2004	2014
Legislators, senior officials and managers	Female	30.3	37.1
	Male	69.8	62.9
Professionals	Female	51.2	57.4
	Male	48.8	42.6
Technicians and associate professionals	Female	50.9	43.8
	Male	49.1	56.2
Clerks	Female	71.9	68
	Male	28.1	32
Service workers and shop and market sales workers	Female	74.7	68.5
	Male	25.3	31.5
Skilled agricultural and fishery workers	Female	22.4	25.3
	Male	77.6	74.6
Craft and related trade workers	Female	6	5.9
	Male	94	94.1
Plant and machine operators and assemblers	Female	16.3	13.9
	Male	83.7	86.1
Elementary occupations	Female	52.3	54.6
	Male	47.7	45.4
Armed forces	Female
	Male	92.1	93.2

Source: (UNECE n.d.)

There are some differences to be found in the gender-segregated labour market, depending on e.g. job functions, as seen in Tab. 49. Positions within armed forces, plant and machine operationing and assembly, craft and related trade work, skilled agricultural and fishery workers are still very male-dominated in 2014. A more equal gender distribution is found in positions such as professionals (57.4 % are women in 2014), technicians and associate professionals (56.2 % women), and elementary occupations (54.6 % women).

Among legislators, senior officials and managers, the share of women amounts to only around one-third (37.1 % in 2014), while the same is the case for men among clerks (32 %), service workers and shop and market sales workers (31.5 %).

3.4.2 Proportion of female researchers by economic activities (NACE Rev. 2) in the business enterprise sector, by sex

The proportion of female researchers by economic activity of workplace is a precarious figure in economies where a few large firms contribute with a large fraction of all R&D activities. As such, the fluctuations shown in Tab. 50 mirror the results found earlier for the business sector.

Tab. 50: Proportion of female researchers in the business enterprise sector, by economic activity (NACE Rev. 2), 2012

		Manufacturing	Manufacture of chemicals and chemical products	Manufacture of basic pharmaceutical products and preparations	Services of the business economy	Other NACE category
EU27	2009	15	27	45	19	83
	2012					
Sweden	2009	23		56	29	47
	2012	24	31	46	23	16

Source: (Directorate-General for Research and Innovation 2016, 60)

However, looking at the labour force in the business enterprise sector, the largest share of women occupies positions within manufacturing of basic pharmaceutical products and preparations. The proportion of women in business economy services and in manufacturing, including manufacturing of chemicals and chemical products, is somewhat lower.

The changes from 2009 to 2016 in the other NACE category seem odd and could not be justified. Hence, the general impression is again differences between fields (economic activity sectors), but stable patterns over time.

3.4.3 Distribution of researchers in the Higher Education Sector (HES), across fields of science, 2012

The point given on differences in women employment shares across fields can be seen in Tab. 51. Here, the proportion of female staff varies depending on subject area or scientific fields. A similar picture can be found as regards the share of employed female students distributed into scientific fields and positions in the labour market.

Tab. 51 shows the distribution of scientists across a sub-selection of scientific fields. In natural and life sciences, there is an overrepresentation of women in medical sciences and a matching overrepresentation of men in engineering and technology.

Tab. 51: Distribution of researchers in the Higher Education Sector (HES), across fields of science, 2012

Country	Gender	Natural sciences	Engineering and technology	Medical sciences	Agricultural sciences	Social sciences	Humanities
Sweden	Women	18	22	51	9	:	:
	Men	22	47	25	7	:	:

Source: (Directorate-General for Research and Innovation 2016, 56)

Similarly, UKÄ, the Swedish Higher Education Authority, finds that the smallest proportions of women are found in engineering (24 %) and natural sciences (29 %), and that the largest proportions of women are found in medicine and health science (58 % in total) (2016c, 52).

According to the Swedish Research Council, gender distribution is more even within humanities and social sciences than in other research fields, except amongst professors. In natural and engineering

sciences, gender distribution is generally skewed; here women are a minority at all career stages. Gender distribution is a little more even in natural sciences.

However, UKÄ concludes that progress has been made over the ten-year period from 2003 to 2013: the proportion of women amongst lecturers within engineering increased by 10 percentage points, while within medicine and health, the proportion of women increased sharply in all career stages and, with the exception of professor positions, women nowadays are in the majority and account for approximately 60 % of recently appointed lecturers (Swedish Higher Education Authority 2013).

To sum up, the share of women amongst the positions of lecturers is almost 50 %. This trend is expected to lead to an even more balanced gender distribution amongst professors in the future. The earlier mentioned studies of Centres of Excellence (CoE) demonstrated that women were disadvantaged by initiatives targeting CoEs and excellent researchers. Female researchers have been awarded a considerably lower proportion of this type of funding, i.e. 19 % than what would correspond to the share of women professors (24 %) or the share of Swedish female researchers with the highest number of citations (30 %) (Swedish Research Council 2016b, 42).

3.4.4 Horizontal segregation by scientific field in the higher education sector

As evidenced by the under-/overrepresentation of women and men, horizontal segregation is more pronounced in specific sectors and occupations in Sweden than in others, and the SGS (gender segregation indicator) is relatively high. Therefore, the Swedish government also tries to motivate graduates to enter gender-atypical sectors and occupations (Roland Berger Strategy Consultants 2013).

A comparable measure on the inequalities is the Dissimilarity Index (DI). It “indicates the percentage of either women or men (all scientific fields combined) who would have to move across different scientific fields to ensure that the proportions of women (out of total women across all scientific fields) and men (out of total men across all scientific fields) were equal in each scientific field; note that this does not ensure parity of the sexes in each scientific field” (Directorate-General for Research and Innovation 2016, 79).

Tab. 52 shows DI values⁵⁴ for the Swedish HES and GOV sectors solely in three different years if applicable.

Tab. 52: Dissimilarity index for researchers in the higher education sector and government sector

	Dissimilarity Index 2006		Dissimilarity Index 2009		Dissimilarity Index 2012	
	HES	GOV	HES	GOV	HES	GOV
EU27	0.14	0.18	-	-	-	-
Sweden	0.31	0.00	0.19	0.29	-	0.17

Source: (Directorate-General for Research and Innovation 2016, 80, Directorate-General for Research and Innovation 2013, 77, Directorate-General for Research 2009, 64)

As Tab. 52 illustrates, the dissimilarity index in 2006 was higher in Sweden than in the E27 within HES, while it was virtually zero in the government sector. However, the dissimilarity index for the latter sector increased to 0.29 in 2009 and fell to 0.17 in 2012, while no data are available for the HE

⁵⁴ A value of “1” indicates that only either women or men are present in each of the scientific fields. A value of “0” indicates that the frequency distribution of women and men, respectively, across scientific fields is identical (Directorate-General for Research and Innovation 2016, 79).

sector. Due to the large variability of the DI measure, it seems extremely difficult to judge or justify its actual value. The huge differences between index values within three-year periods appear invalid and must be due to changes in measures, definition of fields, labour force or sectors.

For further description, see part 3.3 on labour market participation.

3.5 Vertical Segregation

3.5.1 General vertical segregation

According to Seidegård et al., Sweden is still characterised by vertical gender segregation in the labour market, which is particularly visible in the private business sector where many leaders and board members are male; however, the public sector or government administration are also characterised by few women in top leadership positions (2015, 143-144).

A place where the difference is still present, but at a remarkably small scale is the Swedish Paliament.

Of 349 members of the Riksdag (Parliament), 197 are men (56.4 %) and 152 women (43.6 %). This is a decrease compared to the 2006 and 2010 elections. In 2014 women accounted for 54 % of ministers, 37 % of under-secretaries and 67 % of senior civil servants. In 2013 men constituted 63 % of Supreme Court judges, 83 % of Court of Appeal Presidents, and 65 % of Courts of Appeal Heads of Division. (Swedish Women's Lobby 2015, 19).

Especially in the private sector part of the RTDI system and in the natural sciences part of the Swedish HES, vertical segregation is still present. SFI concludes that in the Nordic countries it is still much more likely for a man to become a top leader than it is for a woman to a very high degree, and that this can be concluded across different sectors (private, municipal/regional and government sector) (Larsen et al. 2016, 14). More specifically:

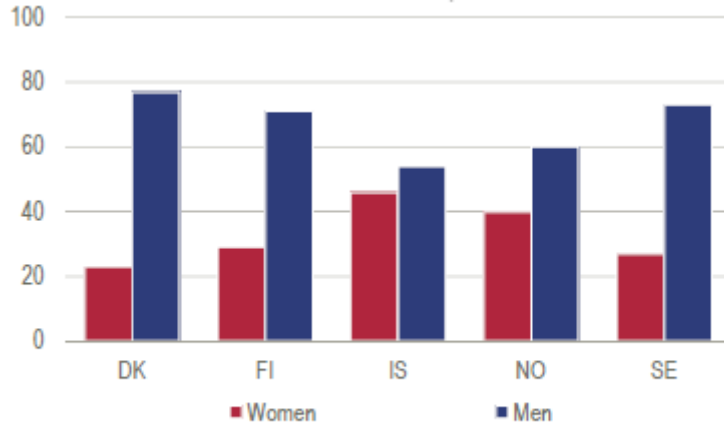
In the private sector, despite some progress, a high degree of male dominance persists on corporate boards and in management positions. The pattern is clear: the higher the position, the fewer the women. Male dominance increases in the top management positions, in management groups and on corporate boards. (Gender Equality Inquiry 2015, 2)

There are more female top leaders in Sweden and Norway than in Denmark, but the differences between the Nordic countries have become smaller (Larsen et al. 2016, 14).

3.5.1.1 Share of male and female members of boards in largest quoted companies, supervisory board or board of directors

Figure 19 shows the share of men and women on boards of listed companies⁵⁵ in the Nordic countries in 2014 (Nordic Council of Ministers 2015c, 34). An examination of the largest publicly listed companies in the Nordic countries reveals that, on average, approximately three of ten board members are women (Nordic Council of Ministers 2015c, 34). Thus, in the Nordic perspective, Sweden, Denmark and Finland, with a share of less than 30 % of women, were outperformed by Iceland and Norway in regard to the share of women on boards of listed companies in 2014.

⁵⁵ Listed companies: "publicly listed means that the shares of the company are traded on the stock exchange" (Nordic Council of Ministers 2015c, 34).

Figure 19: Women and men on boards of listed companies, %, 2014

Source: European Commission, database on men and women in decision making

Even though vertical segregation in Sweden still exists, it is very much the case within the private sector, and not (at all) in the political system, as Tab. 53 shows. However, gender equality figures as regards the private sector are much more equal than the corresponding EU28 figures.

Tab. 53: Share of male and female members of boards in largest quoted companies, supervisory board or board of directors

	Share of female ministers	Share of female members of parliament	Share of female members of regional assemblies	Share of female members of boards, in largest quoted companies, supervisory boards or board of directors	Share of female members of central bank
EU28	22	25	31	16	17
Sweden	50	45	47	26	29

Source: (Humbert et al. 2015, 173)

As the Swedish Women's Lobby concludes:

Private sector companies are far from achieving gender balance. Even though we have seen an increase in the total number of female board members in stock market listed companies over recent years, by 2014 women accounted for only 25 % of the total. As of 2014 95 % of chairpersons in boards were men. At management level inequality is even more striking. Men make up 81 % of management groups and 94 % of CEOs and Managing Directors. These figures have hardly improved since 1999. (2015, 13)⁵⁶

Gender balance of state-owned company boards (in both fully or partly state-owned companies) is relatively equal; here 47 % on the boards are women and 53 % are men. But women only account for

⁵⁶ "The Swedish Women's Lobby is a politically independent, non-governmental umbrella organisation for women's organisations in Sweden. It unites 45 member organisations with the aim to strengthen the position of women in the Swedish society. The organisation rests on a feminist ground and the foundations of our activities are the UN Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) and the Beijing Platform for Action (BPfA). The Swedish Women's Lobby works to integrate women's perspectives and gender equality into all political, economic and social processes, locally and nationally as well as at a European and international levels" (Swedish Women's Lobby 2015).

37 % of the chairpersons, and only 29 % of chief executive officers (CEOs) or managing directors are women (Swedish Women's Lobby 2015, 19, Niskanen 2011b, 44-45).

Tab. 54 illustrates the differences at the leadership level within the public sector (Statistics Sweden 2016b, 99).

Tab. 54: Managers by sector, 2014

Number and sex distribution (%)

Sector	Number		Sex distribution	
	Women	Men	Women	Men
Private sector	58 800	134 600	30	70
Public sector	34 100	21 000	62	38
Central government	6 000	8 300	42	58
Municipality	21 300	10 100	68	32
County councils	6 800	2 700	72	28
Total	92 900	155 600	37	63

Source: Wage and salary structures, National Mediation Office and Statistics Sweden

In the public sector, women managers are overrepresented in municipalities and especially in county councils, while men are overrepresented in central government.

Looking at the management structure and the share of female CEOs in the Nordic countries, the picture is not particularly positive: “between 93 and 97 per cent of all CEOs and between 85 and 90 per cent of the management group members of listed companies [in the Nordic countries, red.] are men” (Niskanen 2011a, 5). However, in Sweden “(...) the threat of a gender quota law and the so-called company code [The Swedish Code on Corporative Governance] has resulted in an increase in the proportion of women on the boards of listed companies to 19 per cent in 2008 from 4 per cent in the late 1990s” (Niskanen 2011a, 114).

Numhauser-Henning also finds that “this is most certainly because the state is also the owner of these companies, and is thus in a position to implement its gender equality policy” (2015b, 16), because the government here is responsible for nominating candidates to the boards and in this respect has an indirect influence on the boards of state-owned companies (Norman 2014, 45).

The Swedish Code on Corporative Governance⁵⁷ for listed private and public limited liability companies states that companies must strive towards an equal gender representation on company boards (Numhauser-Henning 2015b, 5, 15). However, the implementation of this rule is voluntary and, despite the fact that the code has been in place for some years, women are still far from being equally represented on company boards. The government has declared that quota legislation might be an option should the proportion of women on company boards persist to be below 40 % (Numhauser-Henning 2015b, 5, Danbolt 2016a, 25).

The proportion of women on boards of listed companies was at 28 % in 2015, compared to 22 % in 2013. Due to the fact that the share of women on boards had not reached the target of 40 %, the government decided to present the Corporate Gender Quotas Bill to the parliament in the spring of 2017 (Danbolt 2016a, 18). However, the government has recently decided not to opt for this solution.

⁵⁷ For a short description of the Code, see *All about business* (Danbolt 2016a, 18).

As mentioned above and evident from Tab. 55, men and women still occupy different functions, e.g. within boards and managements (Statistics Sweden 2016b, 98, 99).

Tab. 55: Boards and management of listed companies, 2015
Number and sex distribution (%)

	Number		Sex distribution	
	Women	Men	Women	Men
Chairperson	13	239	5	95
Managing Director	16	236	6	94
Board members	482	1 161	29	71

Source: Styrelser och revisorer i Sveriges börsföretag 2014–2015 SIS Ägarservice AB (Boards and auditors in Sweden's listed companies).

Tab. 56: Board Members by function in limited companies, 2013
Percentage distribution (%), number and sex distribution (%)

Function	Percent		Sex distribution	
	Women	Men	Women	Men
Chairperson	5	15	13	87
Board members	31	58	20	80
Deputy members	61	23	55	45
Other	3	4	28	72
of whom Managing Director ¹⁾	6	15	16	84
of whom employee representatives ¹⁾	1	1	28	72
Total percent	100	100	32	68
number	172 500	372 800		

1 These are a subset of the of the above positions, i.e., the percentages will not add up to 100.

Source: Labour statistics based on administrative register (RAMS), Statistics Sweden

Even though 20 % of board and management members in limited companies (2013) and 29 % of boards members and 55 % of deputy members in listed companies were women (2015), 87 % of the chairpersons in limited companies and 95 % of chairpersons in listed companies were still men. This leads to the conclusion that even though women are represented in boards and managements, they rarely function as chairpersons.

Tab. 57 and Tab. 58 from Statistics Sweden provide an overview of gender distribution among top officials in government offices and positions of trust in municipalities and county councils (Statistics Sweden 2016b, 93, 96).

Tab. 57: Top officials in Government offices 1985, 2000 and 2016
Sex distribution (%)

Position	1985		2000		2016	
	W	M	W	M	W	M
Ministers ¹⁾	25	75	55	45	50	50
State secretaries ²⁾	12	88	38	62	60	40
Top administrators	11	89	27	73	38	62

1 Incl. Prime Minister

2 Incl. cabinet secretaries

The data for 2016 was produced in February.

Source: Administrative Affairs, Government Offices

Tab. 58: Composition of committees, 1981, 2001 and 2015
Sex distribution (%) and number

Function	1981		2001		2015	
	W	M	W	M	W	M
Chairperson, etc.	10	90	33	67	41	59
Members	21	79	41	59	46	54
Specialists, etc.	13	87	43	57	52	48
Secretaries and other	22	78	49	51	61	39
Total percent	16	84	26	74	52	48
number	920	4 780	1 900	2 610	1 900	1 740

Source: Committee Report for each year

Even though the share of female ministers is high in Sweden, women often hold ministerial positions in less prestigious areas and in areas traditionally associated with women, e.g. social issues, culture, education and gender equality (Niskanen 2011a, 115). However, the general development points towards an increased equality in gender distribution at all levels in the public sector institutions. Hence, vertical segregations seems to decrease in the public sector, while it remains roughly at the same level in the private sector. This may be a special Swedish (and Norwegian) case because, as Niskanen concludes “consideration for the autonomy of industry and respect for private self-governance has put limits to the gender equality discussion” in the Nordic countries (2011a, 116).

The table below shows noteworthy gender equal distribution in trusted positions in the public sector (Statistics Sweden 2016b, 93).

Tab. 59: Positions of trust in municipalities and county councils by position, 2015
Sex distribution (%)

Position	Municipalities		County councils	
	W	M	W	M
Chairperson	37	63	50	50
Deputy chairperson	41	59	49	51
Other ordinary members	43	57	49	51
Replacement members	45	55	50	50
Total	43	57	49	51

Source: Survey on representatives elected to municipalities and county councils, Statistics Sweden

Generally, there is a larger share of male leaders, even though the differences in education level have changed in the period 2005-2013 so that female leaders today are “better educated” or often have a higher educational degree than male leaders. Almost every second female leader has a post-secondary education (*eftergymnasial utbildning*) with a duration of at least three years, while this applies to only about one in three male leaders – in other words, the gap in the educational difference of female and male leaders reached 16 percentage points in 2013 (Dryler et al. 2016, 112).

Swedish studies have pointed towards different explanations for the gender divide in the business sector including gender differences in the overall labour market employment, in take-up of family responsibilities and in educational and career choices. Other studies have pointed to “homosociality” and cognitive biases, where women’s competences are regarded differently than men’s

competencies. These studies argue that this trend is a crucial factor in the hiring of business leaders (Seidegård et al. 2015, 123).⁵⁸

Further explanations and tables can be found in *Mål och myndighet. En effektiv styrning av jämställdhetspolitiken* (Seidegård et al. 2015).

3.5.2 Vertical segregation in RTDI

In general, when comparing Sweden to the other Nordic countries, it becomes evident that they all share unequal gender balance in research, and that this unequal balance progresses with seniority (Højgaard and Sinkjær 2014, 4).

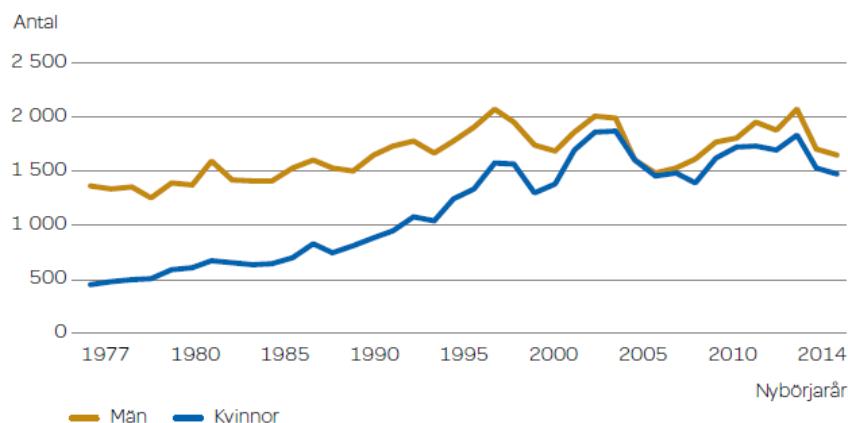
Today, around 24 % of full professors are women and “the proportion of women amongst professors is rising only slowly and is actually appearing to level off. A number of longitudinal studies show that women find it more difficult to progress to the highest positions within academia” (Swedish Research Council 2016b, 42).

3.5.2.1 Proportion of women academic staff, by grade

Figure 20 shows developments in the number of women and men (*kvinnor och män*) commencing PhD studies (*doktorandnybörjare*) for each year (*nybörjarår*) in the period 1977 to 2014 (Dryler et al. 2016, 70). The yellow line shows the development in new male PhDs, while the blue line indicates the number of female PhDs.

Figure 20: Developments in the number of women and men commencing PhD studies each year, 1977 to 2014

Figur 16. Doktorandnybörjare 1977–2014: antal kvinnor och män.



As Figure 20 shows, there has been a remarkable increase in the number of women starting in PhD programmes in the period 1977-2014, and by 2014, the uptake of men and women is close to even, with 47 % women enrolled in PhD programmes compared to 53 % men (Dryler et al. 2016, 69-70).

Tab. 60 shows the proportion of women academic staff in total and by grades. Overall, the numbers in Sweden roughly follow those of the EU27 and EU28 countries. As Tab. 60 shows, there is a relatively equal share of male and female academic staff in 2013; however, at full professor level (grade A), women only account for less than one in four professors.

⁵⁸ Similar explanations (in Swedish) can be found in *Ökad medvetenhet men långsam förändring* (Strengthened awareness but slow change) (Wahl 2014).

Tab. 60: Proportion of women academic staff, by grade and total

		Grade A	Grade B	Grade C	Grade D	Total
EU27	2007	19	36	44	44	38
	2010	20	37	44	46	40
EU28	2013	21	37	45	47	41
Sweden	2007	18	47	42	51	44
	2010	20	48	43	50	45
	2013	24	45	46	50	45

Source: (Directorate-General for Research and Innovation 2016, 129, Directorate-General for Research and Innovation 2013, 90, Directorate-General for Research 2009, 75)

One explanation for the proportion of grade A staff is that less professors have been recruited over the past years (Seidegård et al. 2015, 125). However, this does not appear to be the only explanation. Other studies found that the HES in Sweden is characterised by gendered hierarchies, gendered ideals of a researcher and other understandings of gender which all contribute to a difference in the work conditions for men and women in higher education and research (Seidegård et al. 2015, 126).

The Swedish Research Council concludes that “the proportion of women amongst professors is rising only slowly and is actually appearing to level off. (...) The trend for men to become professors more frequently applies to most fields of research, and women also take longer than men to progress up the career ladder” (2016b, 42). Apparently, it takes longer for women than men after graduating with a PhD to obtain a position as a professor (Swedish Research Council 2016b, 30). Another structural difference is that women within humanities and social sciences tend to be more often employed as lecturers and spend more time on teaching activities, while men in the same research fields often hold positions with more time for research (Swedish Research Council 2016b, 30).

Similarly, the Swedish Women’s Lobby points to this leaking pipeline and emphasises the issue that women drop out along the way from a research student to a professor, and that the earlier increase in the number of female professors has somewhat slowed down in recent years (2015, 24).

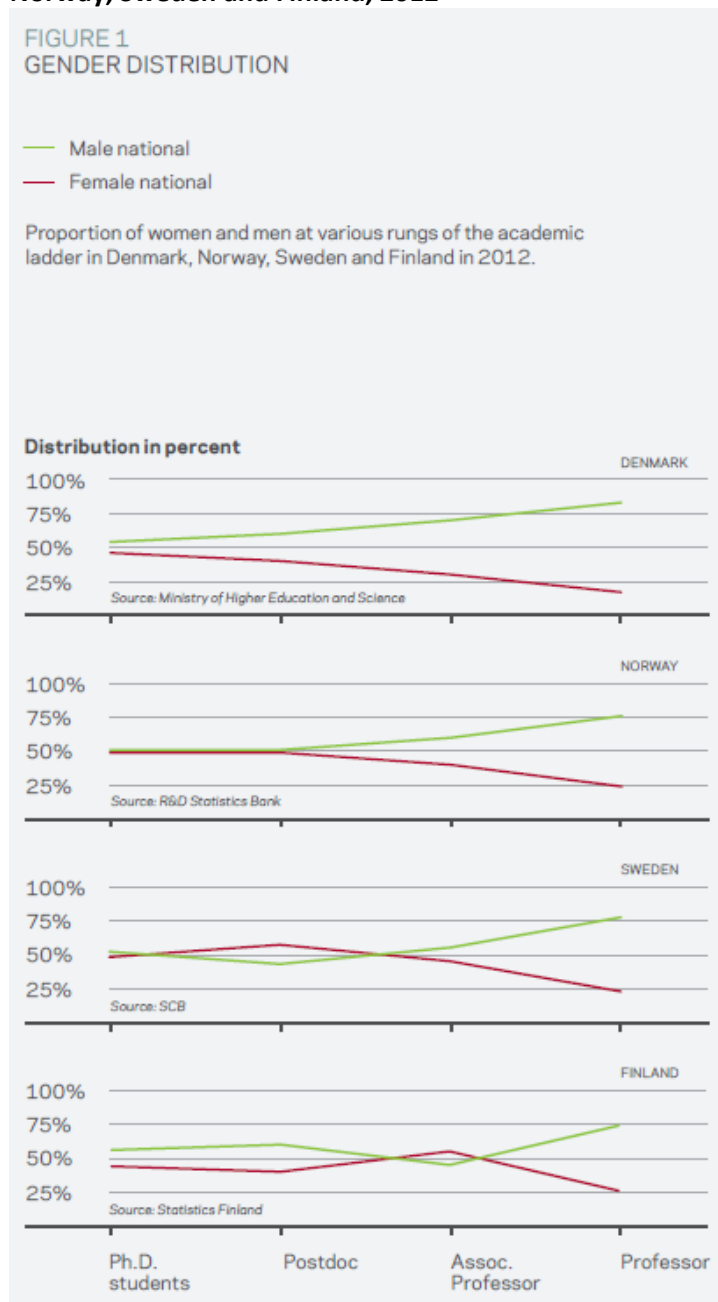
When interpreting numbers of academic staff at different grades by gender, it is also worth noting the tendency that male researchers enrolled in PhD programmes are often between 30-39 years old, while there are more women in the age group 40+. This means that it is likely for more men than women to have a longer academic career after their PhD. Dryler et al. found this tendency to be rather strong throughout the period 2000-2014 (2016, 73).

Besides age, another interesting factor is the increase of PhD students from abroad. In 2000, around 19 % of doctoral students came from another country, while the number of international doctoral students had increased and made up for about 40 % in 2012, and also in 2014. Since many international doctoral students are enrolled in male-dominated fields such as natural sciences and technology, there is a higher share of men among international PhDs than among doctoral students with Swedish background (Dryler et al. 2016, 74).

The Swedish government set up targets for the period 2012-2015 for the improvement of the share of female professors, and the government has stated that new initiatives will be initiated in 2017 (Dryler et al. 2016, 91).⁵⁹

It is also interesting to examine gender distribution in the Nordic Centres of Excellence at different levels; Figure 21 shows gender distribution at the Danish National Research Foundation's (DNRF) Centres of Excellence in Sweden in comparison to those in Norway, Denmark and Finland (Højgaard and Sinkjær 2014, 4).

Figure 21: Proportion of women and men at various rungs of the academic ladder in Denmark, Norway, Sweden and Finland, 2012



⁵⁹ More information about the 2012-2015 targets can be found in *Higher education in Sweden. 2013 status report* (Swedish Higher Education Authority 2013).

As Figure 21 shows, the Nordic countries have roughly the same share of female PhD students (around 50 % in 2012) at Centres of Excellence, but at the postdoc level, Sweden is an outlier with more than 50 % women. However, the curve also drops significantly between postdoc and associate professor level in Sweden. At professor level, just around one in four professors in CoEs in the Nordic countries are women.

Women researchers have more difficulties in obtaining funds, both in terms of shares and amount per researcher and in relation to the overall percentage of women involved in research. In addition, a survey of a number of higher education institutions reveals that only 39 % of funds went to the salaries of female researchers in 2013. In comparison, 61 % went to male researchers' salaries. One explanation for the uneven gender distribution of funds is that men are active in research fields that are considered more strategic and prioritised (Swedish Women's Lobby 2015, 24). The Delegation for Gender Equality in Higher Education estimated that resources between SEK 0.5 billion and 1 billion have been redistributed from female to male researchers as a result of the Swedish government's initiative *Investments in Excellence*. Moreover, in recent years, basic funding at universities has decreased while external funding has increased, which has benefited male researchers since men apply for external funding more frequently (Swedish Women's Lobby 2015, 24).

3.6 Employment conditions/status/contracts

The employment conditions for researchers reflect the targeted approach of Sweden regarding family support combined with diversity efforts. It is common and viewed positively when both parents care for their children. The government as well as employers have institutionalised work-life balance programmes combined with incentives for young families (Roland Berger Strategy Consultants 2013).

As such, all kinds of employment conditions and contracts are gender-equal. There is no evidence of differences in official working time as researchers in RTDI work full-time. However, as part of the extensive family support and childcare systems, parental leave periods are longer for women than men in RTDI as well. The differences between the entire economy and RTDI is minor as the following sections show.

3.6.1 General working time culture

As Tab. 61 shows, the average working hours of FTE workers are an hour shorter in Sweden than in the EU28.

Tab. 61: Actual weekly working hours of full-time workers by gender

		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
EU28	Women	39.4	39.2	39.2	39.1	38.9	39.1	39.1	39.0	38.9	38.9	38.9
	Men	42.5	42.3	42.3	42.1	41.7	41.9	41.9	41.7	41.6	41.5	41.5
	Total	41.4	41.2	41.2	41.0	40.7	40.8	40.8	40.7	40.6	40.5	40.5
Sweden	Women	38.1	38.1	38.1	38.2	37.9	38.5	38.4	38.4	38.2	38.1	37.9
	Men	40.8	40.6	40.5	40.5	40.0	40.7	40.5	40.3	40.2	39.9	39.8
	Total	39.8	39.7	39.6	39.6	39.2	39.9	39.7	39.6	39.4	39.2	39.1

Source: (Eurostat n.d.)

As the table also shows, there has been a slight reduction in the total working time of women and men, and men still work a few more hours than women in Sweden. The difference in the working hours of women and men might be explained by women's larger engagement with domestic work and childcare. For example, Statistics Sweden finds that women spend about an hour more than men on unpaid work (Statistics Sweden 2016b, 34-35), and that "cohabiting women with children under age 7 comprise the group with the lowest actual working time" (Statistics Sweden 2016b, 54).

For further description, see part 3.3.1.3 *General employment by full-time and part-time status, sex*.

3.6.2 Working time in RTDI⁶⁰

During the entire period from 2005 to 2015, men in academic professions have had longer actual weekly working hours than women, as Tab. 62 illustrates.

Tab. 62: Actual weekly working hours of full-time employed persons in academic professions by gender

		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
EU28	Women	38.0	38.0	38.2	38.2	38.1	38.3	38.1	38.2	38.2	38.3	38.3
	Men	42.3	42.0	42.0	41.8	41.6	41.6	41.7	41.7	41.4	41.2	41.2
	Total	40.4	40.3	40.4	40.2	40.1	40.2	40.1	40.1	40.0	39.9	39.8
Sweden	Women	39.2	38.9	39.0	39.1	38.8	39.3	38.7	38.6	38.5	38.2	38.0
	Men	40.9	40.3	40.2	40.2	39.6	40.1	40.3	39.9	39.7	39.5	39.0
	Total	40.2	39.7	39.7	39.7	39.2	39.7	39.5	39.2	39.1	38.8	38.5

Source: (Eurostat n.d.)

Once again, the average working hours are slightly lower in Sweden than in the EU28. However, the average difference between men and women has been reduced to only one hour. This indicates that RTDI jobs, compared to the entire economy, are more often occupied by men and women working full-time. This is a common finding that knowledge- and technology-intensive jobs are more often occupied with full-time employees. In this view, part-time employment seems to be more common for women than for men, in HES, as seen in Tab. 63. As these numbers include employees with children, it is not surprising in the Swedish context.

Tab. 63: Part-time employment of researchers in the higher education sector out of total researcher population, by sex 2012

	Men	Women
EU28	8.5	13.5
Sweden	6.9	13.7

Source: (Directorate-General for Research and Innovation 2016, 102)

A report by the Swedish Higher Education Authority, UKÄ, on the labour market prospects for students states that "one of the factors that may contribute to the larger proportion of women in Sweden working part-time is that many of them (and men) aged 25–34 have small children and women devote more of their time to unpaid work in their homes" (Andersson and Nilsson 2016, 15).⁶¹ In the same report, comparing Sweden with other countries, UKÄ points out that the

⁶⁰ For gender differences in perceived work environment conditions, see *Women and men in Sweden. Facts and figures 2016* (Statistics Sweden 2016b, 35).

⁶¹ Note that the report by UKÄ covers the labour market prospects for men and women with at least two years of tertiary education: "In Sweden this includes completed studies in higher education or higher vocational

differences noticed between the countries may be attributed to differences in the possibilities offered to parents with small children to take up part-time jobs.

For a general description of working time for women and men, see part 3.3.1.3 *General employment by full-time and part-time status, sex*. See also part 3.3.1.2.

3.6.3 Working contracts in RTDI

3.6.3.1 Fixed-term contracts vs. permanent positions/contracts

In academia, especially younger researchers are subject to “precarious” working conditions with temporary employment contracts, and since there are more men than women in higher academic positions, the numbers in Tab. 64 might reflect the unequal distribution of women and men at different academic levels or career stages.

Tab. 64: "Precarious" working contracts of researchers in the higher education sector out of total researcher population, by sex, 2012

	Men	Women
EU28	7.3	10.8
Sweden	10.4	13.8

Source: (Directorate-General for Research and Innovation 2016, 104)

The table supports the findings of Silander (2010), who identifies the lack of progress in academia among women to be caused by slower career progress, but not by women leaving academia.

Since the 2011 implementation of the Quality and Autonomy reform, the HE institutions gained more autonomy. The reform entailed a far-reaching deregulation of the institutions’ organisation, procedures for recruitment of teachers and researchers, categories of teachers to recruit, and promotion (Kalpazidou Schmidt 2014). Accordingly, Salminen-Karlsson et al. found that after PhD level, one third of all teachers and researchers at Swedish universities have temporary contracts covering 3-4 years:

In addition to providing insecure employment, which is unattractive to many, this means that a research career to a great extent is dependent on managing to get funds in competitive situations which are susceptible to chance (who happen to be the competitors and evaluators at every single instance), and also that a great deal of the time that could be used to achieve research results is used to write applications. (2014, 55)

Hence, a large fraction of employed researchers have time-limited contracts, whose continuation requires an intense effort, i.e. long working hours. The MORE2 project finds that the career track system in Swedish academia is vulnerable and does not deliver fixed positions before full professorships (IDEA Consult 2013). Furthermore, the Swedish system does not include tenure-track positions. As such, and building on the findings from MORE2, a career track system without permanent positions, especially in the career start, disfavours women more than men when it comes to childbirth and childcare effects on career development.

See also descriptions above, and in part 3.6.3.2 on career opportunities below.

education of at least two years even though no qualifications has been awarded” (Andersson and Nilsson 2016, 7).

3.6.3.2 Career opportunities

In Sweden, a PhD is not formally required for an appointment to lectureship at HEIs as long as the lecturer contributes with a relevant and advanced knowledge base. However, the streamlining and formalisation of PhD education towards the Anglo-American system, together with the HEIs' aim to increase the share of research-based education, has resulted in a radical decrease in the number of lecturers since 2005. It seems to be a conscious action by the HEIs to improve the interaction between education and research and increase the research expertise in general (Swedish Higher Education Authority 2016a). The development towards professionalisation of the teaching expertise also follows.

Salminen-Karlsson et al. state that career planning, mentoring, tenure track positions, etc., have not been common in Sweden, but that they are increasing in amount and distribution. They add that today an increasing number of universities is introducing such initiatives for their academic staff, and especially for selected researchers with excellence potential. A large fraction of the universities also have initiatives on increasing the number of women on higher levels in the organisation, e.g. leadership courses and specialised mentoring programmes. These initiatives are more or less caused by the university-specific target percentages of professors set up by the Ministry of Education in 1997 (Salminen-Karlsson et al. 2014, 56).⁶²

Furthermore, since the 2008 Research Bill, there has been an increasing focus on enabling career paths for younger researchers. This is, for example, done by earmarked project funding targeting younger researchers, e.g. postdocs who have been abroad (Dahlstrand et al. 2016, 33), and various local support services and networks (Dahlstrand et al. 2016, 49). However, currently there does not seem to be any targeted measures at the university level for reintegrating postdocs who have been abroad (Dahlstrand et al. 2016, 49). However, both universities and research councils are paying attention to the issue (Dahlstrand et al. 2016, 49, Salminen-Karlsson et al. 2014, 56).

In academia in general, most frequent job openings, i.e. entrant positions, are at the postdoc and PhD levels with fewer possibilities for career improvements at higher levels. This is also the case in Sweden, which has resulted in some efforts being made to address the tenure track dilemma. However, a tenure track system is difficult to implement in a functional version in the Swedish regulated labour market where it is difficult to dismiss low-productivity employees. At the same time, there is a cultural conflict where academia appreciate the tradition of open recruitment for every step in academic career developments (Dahlstrand et al. 2016, 49). Dahlstrand et al. continue that "universities and research councils are currently very focused on making career paths for junior researchers as clear as possible. This involves a number of support services and networks at the local level as well as funding calls directed exclusively to junior researchers" (2016, 49).

Another cross-cutting issue in career opportunities of Swedish researchers is the low level of mobility between sectors as well as HEIs. Mobility between industry and science is very common while the mobility between HEIs is low, which reduces more permanent knowledge exchange. More than half of teachers have a PhD from the institution where they teach (Dahlstrand et al. 2016, 57). Relatively low mobility can partly be explained by the fact that many young researchers find partners and have

⁶² See also *A warm welcome or a cold shoulder?* (Growth Analysis 2015a) and *Women and men in Sweden. Facts and figures 2016* (Statistics Sweden 2016b).

children within the first years of their research careers, therefore, they are less flexible in terms of moving from one part of the country to another (Dahlstrand et al. 2016, 57), let alone going abroad (see also part 3.8.2). A large share of Swedish couples both working and having a career together with a prioritisation of children's daily learning environment reduces the individual researcher's mobility potential. For instance, Dahlstrand et al. find that mobility incentives are further reduced in scientific fields and institutions where graduate students do a large portion of the teaching. They apparently become automatically employed after graduation, thus reducing their incentive to look further afield for jobs (Dahlstrand et al. 2016, 57). A long row of research programmes has tried to target intersectoral mobility from firms and companies to universities. These mobility flows are especially difficult to increase or even start since experience and excellence in these build on different merit systems. More seldom, initiatives are targeted the other way. A recent example is FLEXIT that targets young researchers from humanities and social sciences. Since 2010, 20 researchers have shifted from academia to industry under this initiative (Dahlstrand et al. 2016, 70). Industrial doctoral students probably represent the largest and most fluid exchange of personnel between academia and industries (Swedish Higher Education Authority 2015).

For an overview of the distribution of researchers at different levels and in different sectors and fields, see part 3.3 *Labour market participation of women and men in the RTDI*, parts 3.4.2 to 3.4.4 on horizontal segregation and part 3.5.2 *Vertical segregation in RTDI*.

3.7 Gender Pay Gap

3.7.1 General Gender Pay gap

As Tab. 65 shows, there has been a slight decrease in the gender gap when comparing the latest numbers with older findings. Yet the gap has not been eliminated and remains rather unchanged over the past years, as Figure 22 illustrates (Swedish Institute 2017).

Tab. 65: Gender Pay* Gap

	2007	2008	2009	2010	2011	2012	2013	2014
EU28	:	:	:	16.1	16.5	16.6	16.4	16.1
Sweden	17.8	16.9	15.7	15.4	15.8	15.9	15.2	14.6

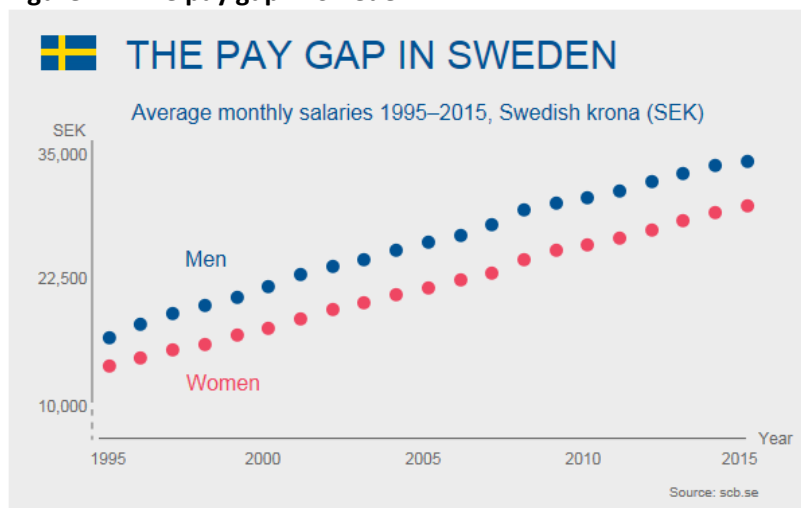
* The gender pay gap is the difference between average gross hourly earnings of male and female paid employees, expressed as a percentage of the former.

Source: (Eurostat n.d., Directorate-General for Research and Innovation 2016, 51)

The Swedish Women's Lobby state that:

The wage gap between women and men in Sweden in 2014 was 13.2 %¹. The gap has remained largely unchanged for over 30 years. Women as a group also have worse working conditions and lower pensions. However, instead of ensuring that the wage gap diminishes through annual wage surveys, today such a review is required only every third year and only in workplaces employing 25 or more people. There is clear evidence that where wage surveys are carried out, the gender wage gap decrease. (2015, 27)

The pay gap in pensions is around 30 % (Strandhäll 2016).

Figure 22: The pay gap in Sweden

The gender pay gap can be partially explained by the fact that men often are employed in sectors, fields and positions with higher salaries. However, even when accounting for these explanatory factors, including age, an inexplicable pay gap of 5 % remains (2014 numbers) (Dryler et al. 2016, 112-113, Seidegård et al. 2015, 23). The largest differences are found in the private sector (6.2 % gender pay gap in total in 2014, 8.1 % for civil servants). The pay gap in the public sector is 2.2 %; it is the largest among state employees (4.4 %) (Dryler et al. 2016, 113) and smallest in the municipal sector (Numhauser-Henning 2015b, 18). The reason for lower wage differences in the public sector is a collective salary agreement, where a majority of the salary level is based on one's education level and years of work experience since graduation. However, part-time employment or various leaves can reduce the salary levels compared to others (men and women) without these factors in their work career.

See also parts 2.2.3 *Empirical evidence for gender regime* and 2.2.3.9 *Main reasons for women not working or working part-time*.

3.7.2 Gender Pay Gap in RTDI

The gender pay gap in RTDI requires more careful consideration, as Tab. 66 shows a larger pay gap in the primarily private subsector of scientific research and development⁶³. This is a rather small and specialised sector with a large fraction of technological, engineering and consultancy firms. As mentioned above, this sector is one where the gender pay gap can be explained by the fact that men often are employed in sectors, fields and positions with higher salaries.

Tab. 66: Gender pay gap (%) in the economic activity "Scientific research & development" and in the total economy, 2010

	Scientific research and development services	Total economy
EU28	17.9	16.6
Sweden	20.1	15.6

Source: (Directorate-General for Research and Innovation 2016, 109)

⁶³ This subsector consists of NACE rev. 2 code 72.

Due to the slower career progress of women in RTDI, the gender pay gap in scientific R&D activities, including HES in Sweden, is somewhat lower than the EU28 average. However, it widens with each progressive increase in age. Moreover, in the Swedish system, rights-based entry wages are supplemented with effort-based additional benefits at a later career stage.

3.7.3 Gender Gap in Scientific Outputs

Receivers of both national and international funds for research excellence are in most cases male, and Karlsson-Salminen et al. found that “the concentration of resources on these individuals and their group influences the power balance at institutions and departments” (2014, 75).

As gender inequality among researchers in HES increases by occupation levels, and since principal investigators (PIs) in research groups are usually the professors, this fact is still very common, also in Sweden. A more equal distribution of research finance will require a more equal distribution of funding applicants as well. Especially in natural sciences, there is place for improvement in regard to gender distribution. However, correcting for gender and experience among applicants, success rates become more equal.

3.7.3.1 Gender Gap in Scientific publications

Both Bergman (2013, 52) and Salmin-Karlsson et al. (2014, 13-14) find that female researchers have less favourable possibilities for receiving funding for their work than men. An example of the inequality in funding is the research excellence funds, which targets established researchers (who usually are men). The Delegation for Gender Equality in Higher Education commissioned a study on women’s and men’s chances of receiving research funding from the *Excellence in Research* programmes in the 2000s, in comparison with their scientific productivity (Sandström et al. 2010). The study found that more than 87 % of this funding was allocated to men: “of the 20 researchers who received the largest share of the excellence in research funding, 19 were men” (Bergman 2013, 52). The conclusion of the researchers was unambiguous and direct: “the progress on gender equality achieved in research in the latter part of the 1990s has largely been wiped out” (Bergman, 2013, p. 10). According to the study, ten years of excellence in research policy in Swedish research funding has had serious negative consequences for gender equality in academia (Bergman 2013, 52).

Another way to illustrate the experience-caused differences is through the number of publications. Swedish researchers are situated just below the most productive countries worldwide.

Tab. 67: Numbers of scientific publications by country

Men and women	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Sweden	11 085	11 690	11 841	11 920	12 645	12 859	13 534	14 217	15 153	14 964

Source: (Scopus, calculations by Fraunhofer ISI)

As Tab. 67 shows, there has been an increase each year in the number of scientific publications in Sweden in the period 2005-2014.

This increased development is common in academia in the period and is caused by an increased demand of publications for career progress, i.e. productivity and competition, and a resulting larger supply, i.e. production, and an increased number of journals, i.e. demand.

Looking at the proportion of publications written by women over time, Tab. 68 shows a very stable and slightly increasing share. However, it is important to be cautious since the data concerns only publications with a woman as the main author. Since there exists an increasing skewness in gender composition with career stages in academia, main author is in many cases the PI, who is a more often a man.

Tab. 68: Proportion of publications written by women as main author

Share of women	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Sweden	29 %	30 %	32 %	32 %	32 %	33 %	34 %	34 %	34 %	35 %

Source: (Scopus, calculations by Fraunhofer ISI)

Yet in 2014, just around one third of all scientific publications had a woman listed as the main author. This and the points mentioned above can also be found in Tab. 68.

Tab. 69: Women to men ratio* of authorships (when acting as corresponding author) in all fields of science (2011-2013)

	Ratio
EU28	0.5
Sweden	0.5

* Parity between women and men = 1

Source: (Directorate-General for Research and Innovation 2016, 153)

As Tab. 69 shows, the women-to-men ratio of authorships is still far from parity, yet, as Tab. 70 shows, the numbers vary, as expected by the previously found gender composition differences, depending on the field of science. The fields closest to gender parity are medical sciences (0.9), followed by agricultural sciences, social sciences, and humanities. In the natural sciences, and in engineering and technology, the gender ratio is still far from equal (0.3).

Tab. 70: Women to men ratio of scientific authorship (when acting as corresponding author), by field of science, 2007-2009 and 2011-2013

		Natural sciences	Engineering and technology	Medical sciences	Agricultural sciences	Social sciences	Humanities
EU28	2007-09	0.3	0.2	0.5	0.6	0.5	0.6
	2011-13	0.3	0.3	0.5	0.7	0.6	0.6
Sweden	2007-09	0.3	0.3	0.8	0.8	0.6	0.7
	2011-13	0.3	0.3	0.9	0.8	0.7	0.6

Source: (Directorate-General for Research and Innovation 2016, 155)

3.7.3.2 Gender Gap in Scientific patents

A similar, yet slightly more extreme, story concerns the number of patents filed in Sweden. Tab. 71 and Tab. 72 give the number of patents and the share filed by women and show, on the one side, a stable increase in the number of patents in Sweden, and on the other side, at best a fixed share filed by women.

Tab. 71: Number of patents

Men and women	2005	2006	2007	2008	2009	2010	2011	2012	2013
Sweden	2 753	3 086	3 482	3 262	2 952	3 078	3 139	3 388	3 141

Source: (Patstat, calculations by Fraunhofer ISI)

Tab. 72: Proportion of patents filed by women

Share of women	2005	2006	2007	2008	2009	2010	2011	2012	2013
Sweden	8 %	8 %	8 %	7 %	7 %	7 %	7 %	7 %	7 %

Source: (Patstat, calculations by Fraunhofer ISI)

As Tab. 2 illustrates, the proportion of patents filed by women has not changed much during the period 2005–2013. It is remarkable that only 7 % of the patents filed in 2013 were filed by women.

An examination of the sectors filing the patents explains these numbers. Patents are usually filed by PIs or managers, and the sectors mainly cover natural sciences, engineering and technology, meaning that they come mainly from the private sector. All three characteristics are in the sections above found significantly to decrease the presence of women.

Looking at the development of patent applications with the European Patent Office (EPO) over a 10-year period, we notice that Sweden (together with the Netherlands, Finland and Denmark) is in a leading position well above the EU average in terms of patents filed per million inhabitants in 2015 (Danish Patent and Trademark Offices 2016).

3.8 Sex differences in international mobility of researchers

In general, as regards both male and female researchers, poor career opportunities within Swedish universities have traditionally been a key problem for mobility, and international mobility of Swedish researchers has been lower than in other European countries (NordForsk 2014, 87, IDEA Consult 2013).

Studies show that explanations can be found in the fact that almost all couples where one of the partners is a researcher pursue dual careers. This may be a problem for the mobility of female researchers, in particular at the postdoc level, but is increasingly also an issue for young male researchers (Salminen-Karlsson et al. 2014, 57).

The Swedish government has addressed the issue of mobility in recent bills on research and innovation (Government Offices of Sweden 2008, Government Offices of Sweden 2012a) to improve the conditions for young researchers and create more attractive career opportunities. Thus, a number of policy measures have been introduced to increase mobility of researchers. Research funding bodies have incorporated international mobility as a positive criterion in their assessments for research funding or have specific targeted programmes for mobile researchers (NordForsk 2014, 87). Vinnova has initiated a programme dedicated to mobility called *Mobility for Growth*. The

programme runs from 2012 to at least 2017 with an overall budget of EUR 35 million, of which EUR 10 million is co-funded from the Marie Curie Actions Scheme (NordForsk 2014, 87).⁶⁴

3.8.1 During their PhD

The international mobility of PhD students is often required by governments or universities. However, in Sweden it is not mandatory to be abroad as part of a PhD programme, and as PhDs often may have younger children, the mobility rates are lower than the corresponding for the EU27.

Tab. 73: International mobility rates of HES researchers during their PhD, by sex and sex difference 2012

	Women	Men	Sex difference
EU27	17.6	18.9	1.3
Sweden	12.6	12.3	-0.3

Source: (Directorate-General for Research and Innovation 2016, 106, 124)

However, in Sweden, international mobility rates found among male and female PhDs are roughly the same. This indicates that it may be the lacking demand for international mobility in general that causes the lower shares in Sweden. Dahlstrand et al. emphasise the following:

In the last three years, Sweden has intensified its efforts at internationalisation of the higher education and research sectors. The most significant developments in this regard are the international fellowships aimed at promoting mobility of young scholars. This effort is aimed at both attracting young scholars to Sweden as well as encouraging Swedish scholars to travel abroad. In 2014 nearly all Swedish public research funders had at least one call which was directed at promoting mobility among young researchers. (2016, 45)

3.8.2 In their post-PhD careers

As the employment rates of both genders in Sweden are very high, and since women pursue careers on equal terms to men, mobility and especially international mobility for researchers with families has been complicated. In the PhD students' post-PhD careers, the sex difference in the international mobility rate is quite different from that of PhD students. Here a quite lower share of women are 'internationally mobile'.

Tab. 74: International mobility rates of HES researchers in post-PhD careers, by sex and sex difference 2012

	Women	Men	Sex difference
EU28	25.1	34.2	9
Sweden	30.9	44.7	13.8

Source: (Directorate-General for Research and Innovation 2016, 107, 125)

The change might be explained by the difference in age when comparing PhD students and researchers in their post-PhD careers; in the latter, women and men will have more (demanding) children, more obligating dual careers, and therefore be less mobile.

⁶⁴ For an overview of initiatives targeting research mobility, see *Crossing borders – Obstacles and incentives to researcher mobility* (NordForsk 2014, 88).

There might be several reasons why women in particular are less mobile: age differences where the man is older and further in his career can be a barrier for a woman's research career. Children and the Swedish childcare system can be another. Yet another major cause may be gender inequality in the composition of researchers across scientific fields: while researchers in natural sciences are more internationally mobile than researchers from humanities or life sciences, the gender compositions there explain the differences in Tab. 74.

In their comparative study of excellence in research in Sweden, Bulgaria and Germany, Salminen-Karlsson et al. find that in Sweden, "many [researchers] mention going abroad as something that is problematic if you have a family (...) If you are moving around you are really dependent on having a partner who has a flexible job or who can follow you" (2014, 70). In a report based on a qualitative study on barriers for research mobility one of the findings was the following: "the researchers interviewed pointed out potential problems that could arise with regard to social security abroad and upon returning to Sweden, as well as conditions for combining a career in academia with raising a family" (NordForsk 2014, 88). So because many academic tenure-track careers include intensive mobility in the earlier stages, where family logistics are significantly present, international mobility becomes less attractive from a Swedish perspective living in a country with extremely good family-related facilities.

3.9 Women in decision making positions in RTDI

As the 'scissor' still exists in distribution of gender shares at academic positions, the shares of women are decreasing with the significance of decision-making position. It is similar in managerial positions, among principal investigators (PIs), in certain scientific fields as described in the sections above.

3.9.1 Proportion of women grade A staff by main field of science

The proportion of women grade A staff (top level academics) illustrates the upper part of the 'scissor' picture across field differences, and is also present in Sweden, as Tab. 75 shows.

Tab. 75: Proportion of women grade A staff by main field of science, 2013

		Natural sciences	Engineering and technology	Medical sciences	Agricultural sciences	Social sciences	Humanities
	2007	-	-	-	-	-	-
EU27	2010	13.7	7.9	17.8	15.5	19.4	28.4
EU28	2013	15.8	9.8	23.3	22.7	23.5	30
Sweden	2007	12.2	8.3	17.4	19.6	21.2	29
	2010	14.3	10.1	20.2	19.6	23	30.2
	2013	16.2	12.6	28.1	30.2	28.2	36.1

Source: (Directorate-General for Research and Innovation 2016, 133, Directorate-General for Research and Innovation 2013, 93, Directorate-General for Research 2009, 116)

As Tab. 75 shows, the proportion of women classified as grade A staff is largest in humanities, followed by agricultural sciences, social sciences and medical sciences. The smallest proportion of women is found in engineering and technology and in natural sciences. Compared to the EU averages, the proportion of women is higher for all scientific fields in Sweden.

For further description, see part 3.4 on horizontal segregation (e.g. part 3.4.4 *Horizontal segregation by scientific field in the higher education sector*).

3.9.2 Glass Ceiling Index

Another way to illustrate the persistence of gender inequality is the glass ceiling index shown in Tab. 76. The index shows how overrepresented men are in grade A positions. The figures in the table show a remarkable development in Sweden towards a more equally represented distribution, although there is still place for improvement. For the EU, no similar progress in equality has been recorded.

Tab. 76: Glass Ceiling Index⁶⁵

	2004	2007	2010	2013
EU27	2	1.8	1.8*	1.8*
Sweden	2.5	2.3	1.7	1.6

* Data for EU28

The GCI compares the proportion of women in grade A positions to the proportion of women in academia. A GCI of 1 indicates that there is no difference between women and men being promoted. A score of less than 1 means that women are overrepresented at grade A level and a GCI score of more than 1 points towards a Glass Ceiling Effect

Source: (Directorate-General for Research and Innovation 2016, 136, Directorate-General for Research and Innovation 2013, 96, Directorate-General for Research 2009, 78)

The GCI indicates a development, although slow, that increases gender equality in grade A positions in Sweden. However, there are still some structural barriers to overcome as the following shows. Salminen et al. (2014) found that in Sweden, male researchers receive more funds than female, and that “the concentration of resources on these individuals and their groups influences the power balance at institutions and departments. (...) In Sweden, the gender composition is normally attended to when composing committees and electing people with formal power. However, when some senior male researchers gain relatively more power, the gender power balance shifts more heavily to women’s disadvantage” (Salminen-Karlsson et al. 2014, 75).

According to Women’s Business Research Institute (Wombri), there is also a tendency that women are given less possibilities for training and work duties that are qualifying for the highest [business] positions (Women’s Business Research Institute n.d.).

3.9.3 Proportion of women heads of institutions in the higher education sector

Yet another measure of gender equality in decision-making positions is to look at the proportion of women heads of institutions, see Tab. 77.

Tab. 77: Proportion of women heads of institution in the higher education sector

	2007	2010	2014
EU27	13	16	20*
Sweden	27	27	50

* Data for EU28

⁶⁵ “The glass ceiling concept is used to describe invisible structural barriers (non-legislative), which hamper the careers of women. In their attempts to advance and gain real influence, the women come up against an invisible ceiling. The glass ceiling is a metaphor for structural barriers or, in other words, structural discrimination” (Niskanen 2011a, 74).

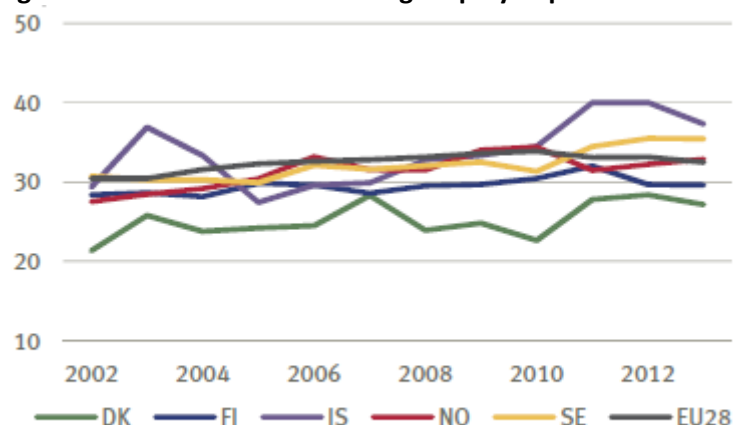
Source: (Directorate-General for Research and Innovation 2016, 141, Directorate-General for Research and Innovation 2013, 115, Directorate-General for Research 2009, 97)

Sweden shows a noteworthy development as to the proportion of women heads of institutions in HE, achieved within a very short period of time and is the only country within the EU28 where female heads of higher education institutions are at 50 % (up from 27 % in 2010). The share of women heads of universities or institutions accredited to offer PhD programmes is even more striking. The share of Nordic women on academic institutions' boards (in the capacity of board members and leaders) has reached well above the 40 % target in Sweden with over 50 % (Danbolt 2016a, 14).

3.9.4 Proportion of women on boards, members and leaders

Figure 23 shows the development in the share of women with managerial responsibilities (at all levels) in the Nordic countries in the period 2002-2012. "Managers include employees with managerial responsibilities" (Nordic Council of Ministers 2015c, 36).

Figure 23: Share of women among employed persons with managerial responsibilities



Source: OECD

As Figure 23 shows, Sweden is not only far above the EU average, but also has the second highest share of women with managerial responsibilities among the Nordic countries, only exceeded by Iceland. In Sweden, women account for about one third of employees with managerial responsibilities in 2012, a slight increase since 2002.

Looking at Tab. 78, the gender compositions at Swedish boards is remarkable, compared to the EU28, as the composition in Sweden is very close to equal. According to Wahl, more equal gender composition among leaders in the private sector that have appeared over the past 20 years might partly be explained by the privatisation of public sector work, especially in the care and educational areas (2014, 35).

Tab. 78: Proportion of women on boards, members and leaders

	2007	2010	2014	
			Members	Leaders
EU27	22	36	28*	22*
Sweden	49	49	55	44

* Data for EU28

Source: (Directorate-General for Research and Innovation 2016, 143, Directorate-General for Research and Innovation 2013, 117, Directorate-General for Research 2009, 98)

However, as Tab. 78 also illustrates, even if the share of female members on company boards is above 50 %, still less than half of the chairs are women (for further description see part 3.5.1.1 on the general vertical gender segregation). This might be explained by the ‘homosociality phenomenon’ that male leaders often chose other male leaders (Wahl 2014, 36).⁶⁶

3.9.5 Percentage of research evaluation panels in RFOs that included at least 40% of target of under-represented sex in boards.

The policy aim of gender equality and gender mainstreaming in the society also influences research funding and research funding organisations (RFOs), as well as research evaluating bodies in Sweden. For instance, the Swedish Secretariat for Gender Research points to studies that show that the success regarding assessment of gender research applications depends – among other things – on the assessor panel for funding’s knowledge of the research area in general (Bondestam and Grip 2015, 50). This is reflected in the spoken as well as written demand of equality in all evaluation boards, see also part 4.1.5 and below.

As mentioned earlier, in Sweden, quotas or national targets are not mandatory, but there is an expectation that the number of members on boards, (evaluation) committees, panels, etc., is relatively gender-balanced, e.g. around 40 % of the underrepresented sex (Directorate-General for Research and Innovation 2015, Bergman 2013, 39), and the Swedish Research Council is obliged to establish and maintain equal gender representation on discipline councils, evaluation panels, and peer review assessment boards and committees involved in the recruitment of academic staff. The council has adopted its own Strategy for Gender Equality (2010-2012) based on the government’s regulations (Bergman 2013, 39): “the share of the under-representing gender participate in committees involved in recruitment and career advancement as well as in establishing and evaluating research programmes has thus reached to 49 %” (Directorate-General for Research and Innovation 2015, 613-614).

Moreover, among all the ERA countries, Sweden lies fourth, with gender-balanced evaluation panels in around 75 % of all panels. The European Commission states that:

Within the ERA-compliant cluster in Sweden, the share of gender-balanced recruitment committees for leading researchers in research-performing organisations is higher than within the EU ERA-compliant cluster. The share of gender-balanced research evaluation panels amongst responding research funding organisations in Sweden is higher than the EU average. (Directorate-General for Research and Innovation 2015, 613)

However, currently Swedish research funding leads to both fewer and smaller research grants for women; therefore, it appears that Swedish RFOs are not specifically concerned with GE, and that they reinforce unequal gender conditions (Helldén 2015).⁶⁷

⁶⁶ Similar explanations can be found in *Mål och myndighet* (Seidegård et al. 2015).

⁶⁷ See also *Gender mainstreaming at Gender Summit 7* (Helldén 2015).

3.10 Inclusion of gender in research and teaching

For about 40 years, it has been possible to be enrolled in gender studies in Sweden; it is possible to take both bachelor's and master's degrees in gender studies in Sweden (Lundberg and Werner 2013, 4). However, the Swedish Secretariat for Gender Research calls for more studies in potential explanations for gender issues related to research funding (Bondestam and Grip 2015, 34).

3.10.1 Support to the inclusion of gender contents in research agendas by funders

The Swedish Secretariat for Gender Research finds that when analysing granted research applications, especially within educational research, humanities and social sciences, it is not uncommon to include gender as either a category or a perspective in research. This is contrary to e.g. medical studies where gender or gender perspectives are less likely to be included in licensed/funded research applications (Bondestam and Grip 2015, 50).

Gender mainstreaming can be viewed in the relatively large proportion of research agendas which include gender contents as shown in Tab. 79. Yet the Swedish Research Council currently has no plan to introduce a policy or strategy for integrating gender analysis in research, as the council considers it already sufficiently integrated into research (Pépin et al. 2015). This conclusion seems to be in contrast with a report on research funding by the Swedish Secretariat for Gender Research, that finds that especially cross-disciplinary (gender) research is at risk of being assessed by different kinds of cognitive biases and misunderstandings of the research projects; therefore, clear guidelines for the assessment of (the quality of) gender research are lacking (Bondestam and Grip 2015, 47-50).

Tab. 79: Support to the inclusion of gender contents in research agendas by funders (%)

	Frequently	Occasionally	None	Not applicable	No answer
Sweden	16.8	17.5	61.4	4.2	0

Source: (Directorate-General for Research and Innovation 2015, 85)

The Swedish government aims at increasing the share of funders who frequently include gender in research contents (or at least think gender into the research agendas) to 100 %, and a warning of sanctions, like the implementation of quotas, if the request for inclusion of gender content in research is not met by funders.

3.10.2 Inclusion of the gender dimension in research contents

Proof of the fact that gender mainstreaming actually is present in Swedish HES and RPOs are the shares reported in Tab. 80.

Tab. 80: Inclusion of the gender dimension in research content (% RPO)

	Yes	No	Not known	Not applicable
Sweden	52.9	18.2	4.1	24.8

Source: (Directorate-General for Research and Innovation 2015, 85)

More than half of all RPOs include gender dimensions in their research, and only 20 % do not. In general, this documents that gender is widely included in Swedish research, but also that gender contents are not present everywhere, even though the Swedish government wishes so.

Research funding programmes aiming at integrating sex or gender analysis in research have been initiated in recent years, e.g. a research programme with an annual budget of EUR 20 million on the Swedish development policy, which includes GE (Pépin et al. 2015).

3.10.3 Inclusion of the gender dimension in teaching/curricula

Following the implemented gender equality perspectives in the Swedish society in general, some effort is also put into gender mainstreaming education as well. The recent initiative *Gender mainstreaming in academia* supports and underpins the demand for such teaching and curricula. The Swedish Higher Education Authority, UKÄ, is in charge of gender dimension in teaching as well: “gender equality and gender mainstreaming are key quality factors to be considered in the reviews and, like many other authorities, including the HEIs, it is an area that UKÄ has been tasked to develop” (Swedish Higher Education Authority 2016e, 17).

In addition, UKÄ has been part of the Government’s GMGA programme, *Gender Mainstreaming in Government Agencies (JiM* in Swedish), where UKÄ developed a plan for supporting gender mainstreaming in its operations. This is included as an assignment in the UKÄ’s instructions (Swedish Higher Education Authority 2016e, 20; Seidegård et al. 2015, 307ff). Furthermore, the Swedish Secretariat for Gender Research functions as the national organisation responsible for the integration of sex/gender analysis in science and engineering, and the Swedish Research Council is developing a recommendation for university curricula development in scientific and technological fields (Pépin et al. 2015).

4 Evaluation Culture and Policy

The chapter on evaluation culture and policy in Sweden explicitly deals with public evaluation culture and public evaluation policy, as solely private trends and activities are not publicly accessible. The fields of gender equality, RTDI, and gender equality in RTDI are largely under governmental regulation. Hence, the majority of non-governmental agents actively engaged in evaluation activities within these fields are most likely consultants responding to a tender for public procurement of evaluation.

4.1 Description of Evaluation Culture

4.1.1 Explicit legislation and adoption of evaluation standards

In Sweden, there is no legislative framework guiding the overall initiation of evaluation activities, nor are there any catch-all standards for ways in which evaluations should be carried out. However, Sweden does have a strong tradition of monitoring and reporting on gender (im)balances throughout the public sector and beyond, and in many cases such monitoring is also mandatory, as will be described in section 4.1.4 and 4.1.5. In relation to specific public funding, it is often a requirement following a grant that projects/initiatives are evaluated. Furthermore, it is customary that many public RTDI organisations are regularly evaluated according to formalised routines. Many evaluations are made publicly available and, in many cases, at least an excerpt of them is translated into English. However, this does not take place in a systematic, binding manner, so some information might be lacking.

Evaluation is not a fixed term, and, depending on the construal of the concept, a variety of activities can be included in the listing of public evaluation activities: inspection, revision, benchmarking, reporting, auditing, analysis, monitoring, assesment, accreditation, evaluation, reviewing, quality assurance. The term ‘evaluation’ can be construed as an overarching family label containing a number of more narrowly defined activities (Johansson and Lindgren 2013, Hansen 2003). Whenever specific evaluation examples are referred to, an inclusive notion of the term ‘evaluation’ will be used. However, the stated self-referral – as a ‘study’, an ‘audit’, etc. – will be mentioned.

According to Bredgaard (2016), public policy evaluation needs to be understood not only as a technique addressing a specific evaluation question or problem; evaluation is embedded in public administration and is part of governance (Tranquist 2015). During the 2000s in Sweden, the increase in evaluation activity mainly holds for evaluations with a control-oriented purpose. Public evaluation culture tends to focus more and more on calling public and private organisations to account and ensuring that they live up to their legal responsibilities (Johansson and Lindgren 2013). The inclination of public policy evaluation to assert a control focus in line with the New Public Management-inspired policy development has been recognised by the expert interviewees contributing to this report, and they also agree with the findings in the academic literature (Johansson and Lindgren 2013, Kalpazidou Schmidt 2014, Vedung 2010, Tranquist 2015, Dahler-Larsen 2012) that public policy evaluation is an influential activity that takes place throughout the public sector. For more on this, see section 4.1.4. A government bill effective of 2010 (prop. 2009/10: 175) prescribed a pluralistic approach to public policy evaluation. Various sources of knowledge should be given access to contribute to the qualification and effectivisation of the public policy process. Hence, a multitude of different actors form the net of public policy evaluation bodies, and external actors from Sweden or abroad can also be relevant contributors.

The trends and standards practised in Swedish public policy evaluation have changed over the years, as thoroughly investigated by Evert Vedung who finds that four waves characterising the development can be identified. Remnants of all these four waves currently coexist; the former waves have layered and carried with them ideas that have not vanished, but in their importance and salience, they have become overshadowed by newer waves (Vedung 2010). The general public administration development identified by Vedung is also recognised by the expert interviewees that contributed to this report within the RTDI field more specifically.

The first wave identified in the Swedish evaluation history was a scientific one in which evaluation emerged as an element of radical rationalism during the 1960s and early 1970s. The public policy narrative of the time involved a belief in planning and careful design as means to achieve societal and political goals. Vedung (2010) uses the engineering model as a metaphor for this instrumental perception of the ideal policy process, that could and should be effectivised and adjusted in adherence to proper scientific test results in the early phase of the policy cycle in order to succeed with the best possible problem solving.

The next phase occurring from the mid-1970s was characterised by fading trust in the usability of experimental methods for policy-making and by belief in the value of inclusive bottom-up processes. Much larger emphasis was placed on the role of stakeholders in the evaluation process, and communication was an ideal in this so-called dialogue-oriented wave (Vedung 2010).

The third wave involved a neoliberal evaluation ideal that derived from market-driven fields and implied confidence in customer orientation and mechanisms of the free market. According to Vedung (2010), this wave is an example of the public sector reform movement New Public Management and carries with it a focus on results, rather than processes. Furthermore, the ideals of this period revolve around three issues, namely leadership/management, mechanisms of indirect control and customer focus. Hence, evaluations under the influence of this wave largely have a control function and often include performance measurements or accountability instruments along with benchmarking tools helping to identify the public 'products' and ensuring value for money (Vedung 2010).

The fourth and most recent wave implies to some extent a return of the scientific approach to evaluation in that experimentation has gained new foothold. The mantra of the 2000s is evidence-based policy-making where evaluations providing certain types of knowledge are seen as an important instrument. Idealised evaluation practice is often considered to involve meta-analysis (Vedung 2010). However, the prioritisation of experimentation with randomised control trials as the 'golden standard' over a multitude of other forms of knowledge production is highly contested among evaluation and public policy theorists (Vedung 2010, Krogstrup 2011, Cartwright and Hardie 2012). It is, however, too soon to point to potential future directions in the Swedish evaluation landscape.

4.1.2 Budget, Number, frequency and public access to of evaluations

In all probability, most public evaluation that results in a report is made publicly available, however, as mentioned before, this does not cover all public evaluation activity, as, for example, statistical results of an evaluation or organisational process evaluation may not be communicated in the form of a report. There is no requirement for public authorities to report on their evaluation activities, neither are they obligated to report their spending on evaluations or to make evaluation results or reports publicly available.

Evaluation activity has become an increasingly routinised part of the everyday public administration practice (Bredgaard 2016, Hansen 2013, Johansson and Lindgren 2013, Kalpazidou Schmidt 2014, Tranquist 2015, Vedung 2010, Andersen et al. 2009, Dahler-Larsen 2012), and the general obligation for the Swedish public sector to perform responsibly and adhere to public procurement regulations applies.

Some evaluation practices occur in a systematic, cyclical routine, whereas many take place on a more ad hoc basis (Swedish Agency for Public Management 2015). An example of a cyclical, recurring evaluation activity is the ongoing process of gathering information for the Swedish Research Council's guide to research infrastructure which is updated every second year (Swedish Research Council 2016c).

In 2014, the Swedish Agency for Public Management published an analysis of ten different autonomous sector-specific evaluation agencies operating in different policy fields. The analysis investigated the evaluation activities of these agencies to a minor extent; the main focus was on scrutinising the advantages and disadvantages related to this particular way of organising evaluation activities in contrast to, for example, evaluation actors that span a range of sectors as the agency itself exemplifies (Swedish Agency for Public Management 2014c). One of the main conclusions is communicated in the English resume of the report:

There is no evident control model that suits all evaluation agencies and the steering and monitoring should conform to what the Government wants to achieve. It is particularly important that the Government clearly defines the evaluation agency's tasks and target groups. Government commissions play an important role in the direction of the agency's activities, and with a structured dialogue on planned government assignments and self-initiated studies, the agency's operations can more easily gain relevance. (Swedish Agency for Public Management 2015)

As for budgetary issues, the report did not go into details with specific evaluations, but referred to the general obligation of publicly initiated evaluation activities in Sweden to pursue utility, feasibility, propriety and accuracy (Swedish Agency for Public Management 2015, 21).

4.1.3 Actors and Institutions

As mentioned, Sweden has a pluralistic ideal of public policy evaluation (government bill effective of 2010, prop. 2009/10: 175) (Swedish Agency for Public Management 2015). This means that public policy evaluation takes place in many forms and structural contexts.

In Sweden, all higher education is governed in a one-tier system including both universities and other HEIs. All HE policy aspects are under the responsibility of the Ministry of Higher Education and Research. When it comes to implementing, administering and evaluating policy, the field of higher education runs relatively separate from the field of RTDI. Both policy fields are dealt with by the same ministry, but innovation support policies and more business-oriented policy belong to the field of the Ministry of Enterprise, Energy and Communications.

Public financing of research and development is provided by means of direct appropriation from the central government, municipalities and county councils, and also via research councils, research funding agencies and the EU. Research and development are also supported by research foundations

and private foundations. The greatest proportion of resources for research in Sweden, however, comes from industries (Ministry of Education and Research 2016).

One of the actors tending to evaluations at the overarching level is the Swedish National Audit Office. The office performs audits with the intent to control and assess financial and performance issues throughout the chain of executive power in Sweden's public administration. The National Audit Office is an independent body (Swedish National Audit Office 2011).

Another overarching actor is the Swedish Agency for Public Management (*Statskontoret*), which is the government's official organisation for analysis and evaluation of state and state-funded activities. This organisation provides the government and its ministries with studies aimed at making the public sector more efficient and effective (Swedish Agency for Public Management 2017).

Evaluation within the specific field of RTDI takes places throughout the policy system. Expert agencies like Vinnova and the Swedish Research Council are the major players. They perform evaluations of own policy programmes as well as other aspects of the policy system regarding innovation and research, respectively. These two players have large evaluation capacity and often perform evaluations independently. From time to time, they collaborate with other partners on such tasks.

The Swedish Research Council is under the authority of the Ministry of Education and Research and aims at developing Swedish research. Besides research funding, the agency advises the government on research-related issues and participates actively in the discussions to foster the understanding of long-term benefits of research. This also involves a range of evaluation activities (Swedish Research Council 2016a).

From time to time, individual researchers are also commissioned with evaluation tasks by public policy actors. Research institutes and the private consultancy sector are also frequent evaluation actors.

As described earlier, Vinnova is a Swedish government agency working under the Ministry of Enterprise and Innovation. The agency provides funding for research, which is believed to be important for the renewal of Swedish industry. Hence, the agency is part of the public innovation support system. Vinnova focuses strategically on growth potential and societal benefits including sustainability. The agency is obliged to evaluate, analyse and account for impacts of governmental initiatives for sustainable growth, industry and regional development in the whole country, and provide support and policy recommendations within these fields. Its programmes target those actors in the society that are important for Sweden's innovativeness, such as knowledge-intensive companies, universities, colleges, research institutes and actors within the public sector. Some programmes involve companies applying for funds for their development projects, some require actors to merge to jointly manage large, long-term projects (Vinnova 2016b). A binding obligation for funding is that gender equality is addressed in applications. Self-evaluation within the organisation also occurs, and, in its own practice, Vinnova has contributed to an increased focus on some of gendered mechanisms involved in the review processes of assessing incoming applicants. Recently, guidelines for reviewers have been updated with a focus on risks of gender bias. Vinnova routinely performs evaluations of programmes and projects funded, and is also covered by gender mainstreaming initiatives for government offices (Ministry of Education and Research 2014).

However, procedures for evaluating effects of gender mainstreaming initiatives have not been developed yet.

The Swedish Better Regulation Council is a specific decision-making body organised under the auspices of the Swedish Agency for Economic and Regional Growth. Its task is to review and issue opinions on the quality of impact assessments to proposals with effects to business. On request from regulators, the council also reviews impact assessments on EU proposals that are assessed to have a great impact on businesses in Sweden (Swedish Better Regulation Council 2016).

The Swedish Agency for Growth Policy Analysis belongs to the Ministry of Enterprise and Innovation and is commissioned by the government to evaluate and analyse the Swedish growth policy and provide an advanced knowledge base for this policy field (Growth Analysis n.d.).

The Swedish Higher Education Authority (UKÄ) is responsible for analysing issues related to the Swedish HE system.

Since 1998, the Swedish Secretariat for Gender Research has been a central actor in gender research and gender equality. As will be described in section 4.1.5 and 4.1.6, the secretariat has played a major role in the current initiative *Gender mainstreaming in academia*, and will also be involved in the follow-up and development of evaluation instruments to assess gender equality initiatives in academia (Regnö 2014).

4.1.4 What kind of evaluations are commissioned and conducted?

There is no systematic repository of publicly commissioned evaluations in Sweden. This implies that overall conclusions on evaluation practice and extent should be made with some reservations. However, as addressed in section 4.1.1, evaluations of diverse nature take place at all levels of Swedish public administration and have become an integral aspect of current public governance systems (Johansson and Lindgren 2013).

Mentioning of RTDI evaluations with a specific gender perspective are presented and discussed in section 4.1.5. Current trends in public governance of RTDI-related matters will be described in section 4.1.6, and some examples of evaluations addressing RTDI or gender equality issues will be mentioned here.

Statistics and descriptive data on other RTDI aspects (performance, growth, excellence, etc.) and, to some extent, also on gender distribution within RTDI are performed by different authorities. For example, the Swedish Research Council regularly publishes a Research Barometer using a range of indicators to describe the performance of Swedish research. The barometer focuses on publicly funded research and research conducted by higher education institutions. It consists of 30+ indicators including some that address gender equality and innovation (Monaco et al. 2016).

Furthermore, the government has appointed the Swedish Higher Education Authority, UKÄ, to be in charge of the official statistics on higher education, published once a year (Swedish Higher Education Authority 2017a).

Statistics Sweden is responsible for developing, producing and distributing official statistics for research as well as for decision-making. Their tasks are mainly assigned by the government and different agencies, but the private sector and independent researchers are also among their clients (Statistics Sweden 2013a).

Evaluations of RTDI policy initiatives are conducted on a fairly regular basis, often at the initiative of the government. Recently, the Swedish Research Council was appointed by the government to carry out a number of evaluations to qualify the subsequent decision-making processes in the field of research policy. The task given to the Swedish Research Council by the government was to develop some recommendations based on the evaluations that could contribute to the attaining of the politically stated targets, including that of making Sweden an outstanding research nation. A range of evaluations addressed conditions, infrastructure, and performance in specific disciplines, others focused on specific thematic issues of research policy such as career systems (Swedish Research Council 2015c), internationalisation and mobility (Swedish Research Council 2015e), publication activity (Swedish Research Council 2015d), and questions concerning equality (Swedish Research Council 2015g). In the final report (Swedish Research Council 2015f) summarising the evaluations, one of the recommendations was to ensure that gender equality is integrated into every research initiative. Another analysis that should provide background information in advance of the Research Bill in 2016 was also undertaken by the Swedish Research Council and consisted of eight evaluations of 'special initiatives' carried out from 2010 to 2015. Four evaluations concerned excellence-oriented initiatives whereas the other four concerned strategic initiatives in specific research areas. Gender perspectives were also applied in the analyses as were bibliometric indicators (Swedish Research Council 2015a).

In 2014, the Swedish Research Council proposed a model called FOKUS (*Forskningskvalitetsutvärdering i Sverige – Research quality evaluation in Sweden*). The proposal recommended that a new model for quality-based resource allocation should replace an indicator-based research funding model. FOKUS has the objective to promote the quality of research carried out by Swedish universities and university colleges (Monaco et al. 2015).

Moreover, in 2015, the Swedish Research Council, Formas, Vinnova and the Swedish Energy Agency commissioned an evaluation of an initiative that became effective in 2008 consisting of a range of strategic research areas in 43 research settings (Swedish Research Council 2015b). The evaluation was undertaken by external experts in collaboration with the commissioning partners.

Within the higher education system, the Swedish Higher Education Authority commissioned an evaluation of two political reforms in the higher education system – a quality reform (with a new quality assurance system) and an autonomy reform (Graversen and Ryan 2015, Haase and Ryan 2015, Kalpazidou Schmidt 2014, Sørensen and Mejlgaard 2014, Sørensen, Haase et al. 2015, Sørensen et al. 2016).

In 2014, the Swedish Agency for Public Management was responsible, for example, for the evaluation of Vinnova's spendings (Swedish Agency for Public Management 2014b) and analysis of research and research education at the universities with a gender equality perspective (Swedish Agency for Public Management 2014a).

As mentioned in section 2.1.3, the existing evidence of previous gender equality initiatives in RTDI is scarce (Seidegård et al 2015, Gender Equality Inquiry 2015). Evaluations of gender initiatives in RTDI are carried out by the Swedish Secretariat for Gender Research. The secretariat is heavily involved in the initiative *Gender mainstreaming in academia* (see section 4.1.5) with the stated aim of contributing towards the nationally declared gender equality objective of equal power between

women and men (Swedish Secretariat for Gender Research 2016a). This involves a range of evaluation activities currently in the pipeline for the coming years.

4.1.5 Relevance of gender equality in RTDI evaluations & evaluation of gender equality initiatives in RTDI

Sweden has a long tradition of focusing on gender equality, and the national gender equality discourse is highly acknowledged and politically prioritised, even in comparison with Denmark that is normally considered to be similar to Sweden. The term 'gender equality' was introduced in Sweden as early as the 1960s (Swedish Secretariat for Gender Research 2016b).

Gender equality initiatives in RTDI programmes are increasingly present in Sweden and have progressed steadily during several decades. In 2016, the government commissioned the Swedish Secretariat for Gender Research at the University of Gothenburg to support the current initiative *Gender mainstreaming in academia* during the period 2016-2019, by assessing gendered inequalities, addressing operational processes, and guiding questions (Swedish Secretariat for Gender Research 2016c). Concepts, definitions, regulations, governance, and activity types are listed in the guidelines. As Swedish universities have been obliged to undertake gender mainstreaming work since 1994, and the National Secretariat for Gender Research has existed since 1998, most organisations are in due process implementing all kinds of gender equality initiatives. The 2016-2019 initiative *Gender mainstreaming in academia* is planning to further enhance, streamline and harmonise best practice gender equality initiatives in all parts of academia.

In Swedish academia, gender is not only construed as a limited field of research next to all other fields. Gender equality also relates to the desire not to exclude women from the academic workforce in order to take advantage of all potential brain power to the maximum. Gender is also considered to be a perspective that has specific implications for fields like medicine where biological sexes have different implications for studies in, for example, cardiology issues. But apart from these perspectives, the most unique characteristic of the Swedish approach to gender might be that it is generally accepted as an issue that relates to all disciplines in that all disciplines may deal with gendered issues. During the 2000s, the Swedish National Agency for Higher Education (now replaced by the Swedish Higher Education Authority) published a range of discipline-specific analyses that mapped the gender perspective of most higher education subject areas (Swedish Higher Education Authority 2016d). These research reports highlight gendered aspects of research that have now become a frame of reference that researchers relate to when applying for funding.

Similarly, gender is a natural dimension of all kinds of evaluations of RTDI initiatives at various levels. Especially after the government gave all universities and university colleges a special assignment to develop their gender mainstreaming work in 2016, gender and mainstreaming are addressed in all initiatives in terms of a statistical overview, and unequal gender representation is by no discussion justified by presupposed discrimination, unequal treatment and rights as an existing organisational problem (Neuman 2014).

The Swedish Discrimination Act even has an opportunity to employ affirmative action favouring women (Nielsen 2015). Hence, "assumptions related to matters of justice and equal rights (...) recur in (...) Swedish policy statements" (Nielsen 2014, 192). Nielsen further concludes that the Swedish authorities interpret the existing inequalities as "problems related to the organisation rather than the women" (Nielsen 2016, 9). It is also one of Nielsen's conclusions that Sweden has made particular

efforts to raise awareness of cultural and systemic barriers to gender equality, and thereby challenged “the existing gendered organisational norms and standards” (Nielsen 2016, 17), e.g. the Swedish government committee supporting institutional projects in 2007-2010.

Even though gender equality and mainstreaming are an inherent part of RTDI in Sweden, there is still potential for improvement due to discrepancies between what is being said and what is happening, i.e. a mismatch between gender equality intentions and actual outcomes of actions. One example of that is when the general director in the Swedish Science Council suggested that the government should make an evaluation of the Swedish research system. It should focus on quality (and research excellence) but can also include structural framing such as the gender equality aspect (Stafström 2016); see also Bondestam and Grip (2015). This illustrates a widespread view that gives preference to excellence and quality over gender equality without scrutinising the often gendered notions of excellence and quality. The problems and challenges of evaluating GE actions have been formulated and to some extent addressed, but not resolved. Sweden has come a long way in spreading awareness and general acceptance of gender equality as a relevant concept in RTDI and also in initiating a broadening of gender equality policies to aim not only at equal representation (a ‘headcount’ focus). However, the intentions to also focus on actual equality in influence, impact and power still need to trickle down throughout the system and bear fruit. Sweden may be a front runner in terms of GE policy evaluation in that it faces the challenge of having realised that evaluating GE initiatives by means of headcounts does not do the job, whereas the problem of finding new, nuanced indicators that clarify and monitor gendering mechanisms is still unresolved. When working with entrepreneurship and innovation, it is not satisfactory to simply pay attention to incoming ideas of both men and women because much more men than women will formulate an ‘idea’. The concept of an idea and what counts as an idea worth mentioning seems to be gendered in itself, as one interviewee mentions. This is what much future focus will be directed at, for example, via the *Gender mainstreaming in academia* project.

Nielsen (2015) characterises the Swedish RTDI system as one where gender equality is highly institutionalised and implicitly present in all actions taken; see also Bondestam and Grip (2015). Hence, there exists a huge amount of evidence, advisory sources and intended gender mainstreaming actions in all part of the Swedish RTDI system. An evaluation of a recent initiative *User-driven research on gender equality* also finds a multitude of evidence on necessary prerequisites for the success of various methods, tools, and processes for solutions to increase gender equality, as an output of the programme (Heikkilä 2016).

Similarly, Bondestam and Grip (2015) carried out an extensive meta-study for the National Secretariat for Gender Research on research funding, equality and gender in Sweden. The study collects evidence on causes and consequences of gendered differences in funding structures and outcomes and contribute to an inexhaustible need for evidence, e.g. Brundin (2015) among others. Furthermore, the Swedish Research Council (Ahlqvist et al. 2015) has conducted two analyses to gather evidence of lacking equality in the RTDI funding system for their advice to the government’s research proposition from 2016 (Government Offices of Sweden 2016f). As part of this (also later implemented in the *Gender mainstreaming in academia* initiative), all institutions have to present renewed equality plans in the spring of 2017 and report results and implement initiatives continuously afterwards (Swedish Secretariat for Gender Research 2016c), that is to become part of a sustainable systematic evaluation culture on all kinds of initiatives at all levels of the RTDI system. These plans to actualise the GE evaluation ideals have not led to any published evaluations yet.

4.1.6 Recent trends/developments in RTDI policy evaluation

Sweden is home to the internationally renowned evaluation researcher Evert Vedung who, among other issues, has specialised in characterising the development of evaluation practice and evaluation policy. According to Vedung:

The development of evaluation has also been driven by the various types of public policies that governments have implemented. Evaluation has in some sense been driven by the dominant way of thinking in the public sector. In the sixties, the dominant idea was that central public planning would eradicate all miseries and inequalities (...) experimental findings of the most efficient means to achieve policy objectives would be inserted. Such a scientification would replace talks, debates, and irrationalities, and would in the long run create a better world. There was a strong left-wing political support for this way of thinking, indicating that evaluation should be based on experimental methods (...) Another driver is New Public Management. Undoubtedly, evaluation has been fueled by New Public Management, which in turn is part of a neoliberal stream of thought. This wave comes from the right-wing on the political scale. In this case, the right includes Social Democrats like Göran Persson in Sweden and Tony Blair in the United Kingdom, who became the major providers of this ideology in Europe. The core of this line of thought has been to diminish bureaucracy, and create a more lean and efficient public sector. This perspective has been embraced by the Social Democratic right, which strives for efficiency but in a different manner. Earlier, left-wing social reformers wanted to rationalize capitalism in a political way by public sector planning. Even if this worked to some extent, they later noticed that it also produced some unwanted side effects. A stronger top-level leadership combined with decentralization of power to a local level became the new recipe. This would create more efficiency and increased value for money. Let the municipalities take care of primary and secondary schools, said Prime Minister Göran Persson, and let us get rid with some of the rules and regulations from the central government; the central level should be satisfied with evaluation of the results. Evaluation has been closely associated with these waves of public policy. (Tranquist 2015, 574)

A New Public Management-inspired drive along with an emphasis on experiment-based ways of substantiating claims for evidence-based knowledge are recurring issues that can be traced throughout the Swedish RTDI policy system (Kalpazidou Schmidt 2014). However, all expert interviewees underline the need for nuanced evaluation procedures and policies, if progress is to be achieved in relation to gender equality in RTDI. Instead of focusing on equality in gender representation, increased attention must be put on how actual assurance of equal influence and power can be ensured; headcounts must be put aside and replaced by more nuanced, context-sensitive, qualitative measures. There is no quick fix to assure gender equality in RTDI, as there is no quick fix to make RTDI policy evaluation gender-sensitive. Several actors in the Swedish RTDI system are currently working on the task of developing indicators and measures that can be used to monitor and evaluate the progress of the ambitious plan of integrating and mainstreaming gender perspectives throughout public policy. Vinnova and the Swedish Secretariat for Gender Research are two of the public bodies currently underway with new initiatives regarding how to assess gender mainstreaming initiatives. They both seem to emphasise the necessity of argumentation and thorough scrutiny of gender analysis in all RTDI projects and programmes, however, time will show

which specific suggestions, evaluation instruments and indicators result from the gender mainstreaming initiatives in RTDI and beyond.

4.2 Evaluation utilisation and policy learning

Among evaluation theorists it has been subject to much debate how – if at all – policy evaluation influences the policy cycle and future decision-making. However, a distinction must be made between intended use and unintended use. A range of critical voices have pointed to the seemingly low level of direct compliance of actual evaluation use with initially stated evaluation purposes (Dahler-Larsen and Larsen 2001, Vedung 2002). Evaluations do not always have the expected outcome and are thus not always used in forming policy (Kalpazidou Schmidt 2009). In part, this might be related to deficient focus on explicitly stating evaluation purposes and evaluation questions.

Another fundamental problem related to the assessment of policy evaluation utility has to do with the inadequacy of the theoretical understanding of decision-making as a rational, logically forward-moving process to actually explain what takes place in reality. As highlighted by Albæk:

The applied – or practical – nature of evaluation research has forced it to reconsider a number of its assumption about the nature of the policy making process because these assumptions quite simply do not fit reality. Three such central assumptions have been: a) policy goals are – or can be – clearly formulated by policy-makers; b) evaluation research analyses a direct cause-effect relationship between policy means and policy goals/effects; c) hierarchical organizational structures guarantee that policies are implemented in such a way that programme activities are directed towards reaching the intended policy goals. (1988, 8)

Three overall uses of policy evaluations seem to coexist in most theoretical typologies, namely control, learning, and what may be termed as enlightenment or knowledge generation (Vedung 2002; Bemelmans-Videc et al. 1998; Hansen 2003; Dahler-Larsen and Larsen 2001; Kalpazidou Schmidt 2003).

However, policy evaluations are also utilised in much more subtle ways. Dahler-Larsen (2016) lists strategic, tactical and symbolic uses of evaluations, and also points to the constitutive effects of policy evaluation. In recent years, evaluation theorists have suggested replacing the term ‘evaluation use’ with the concept ‘evaluation influence’ to emphasise that evaluation processes, evaluation activities, evaluation results, evaluation culture, and evaluation discourse all seem to contribute to society in complex interaction with other societal activities (Krogstrup 2016).

The intentions of making constructive use of public policy evaluations are definitely present, and administrative cycles for adjustment of policy after evaluative activity are often routinely set in motion. The previously mentioned report by the Agency for Public Management (2015) also holds that efficiency and efficacy of evaluating bodies are narrowly related to the notion of utility (Swedish Agency for Public Management 2014c).

As mentioned in section 4.1.5, there has been a tendency in Sweden – as elsewhere – to focus on the mere provision of a statistical overview of gender representation in various fields. However, when evaluating GE initiatives, such statistical descriptions are insufficient, which has led to the conception of a mismatch between GE intentions and outcomes of political actions (interviewees and (Bondestam and Grip 2015, Nielsen 2015, Stafström 2016). Sweden may have come a long way in

realising that headcounts do not suffice as a means of evaluating an inequality problem with structural, cultural and discursal implications, or evaluating the initiatives set in motion to remedy this problem. The intentions to also focus on actual gender equality in influence, impact and power are definitely present, but they still need to trickle down into the system, and considerable work needs to be done in terms of developing new, more nuanced indicators and approaches to evaluating GE initiatives in the field of RTDI.

As mentioned, a thorough investigation of a variety of RTDI perspectives has been carried out over the recent years in Sweden, including gender-related perspectives. According to the Swedish government, the results of these evaluation activities mainly initiated by the Swedish Research Council have contributed to the development of a new bill named *Collaborating for knowledge – for society's challenges and strengthened competitiveness* that the Swedish government has recently proposed to the parliament (Government Offices of Sweden 2016a). It is, of course, difficult to trace any causal relations between evaluations and government bills, not to mention the influence of eventual new policy on subsequent RTDI practice and culture. The current Swedish government declares itself a feminist government (Government Offices of Sweden n.d.) which in itself has contributed to heightening the position of gender equality on the political agenda. As previously mentioned, initiatives have also been taken to start developing systems for monitoring the development of gender mainstreaming initiatives commenced not only in academia, but in many other policy fields.

5 Conclusions

5.1 Comparison between gender equality in the labour market and in RTDI

Assessing the status of gender equality in Sweden depends on the frame of reference. Compared to the situation in some countries, Sweden is a gender-equal society. Like the other Nordic countries, Sweden has an extended welfare system and is characterised by high participation of women in the labour market, family-friendly policies and regulations in the labour market targeting equal pay and anti-discrimination. One might think that problems related to gender equality were nonexistent in a country like Sweden. However, there are important gender-related issues. In spite of good intentions and political statements by the self-declared feminist government in Sweden, there is still unequal access to societal power and economic decision-making, segregated labour market, and inequalities in educational and research systems.

A gender pay gap exists in Sweden, and it has remained stable over the last 30 years. Among the reasons for it are gender biases in sectors and disciplines. Women are underrepresented in the private sector and where women are overrepresented, the wages are lower. Women are also less successful than men in gaining optimal pensions, permanent positions and satisfying work environments. In academia, in private parts of the RTDI system and elsewhere in industry, women's career progress seems to take place at a much slower pace than that of men; there is vertical gender segregation.

In RTDI, the wage gap between genders increases with age, probably because women have slower career progress and because men are more successful in acquiring bonuses and salary increments that are dependent on an assessed added value of an employee's work. It appears these negotiated processes favour men. Gender biases are also salient when it comes to research publications and grants for innovation and research.

Horizontal gender segregation in the workforce with women and men finding their way into different sectors and disciplinary fields is reproduced in the education system where students seem to segregate along similar lines.

5.2 Main strengths and weaknesses of the innovation system and their impact on gender equality in RTDI

Assessments of innovation performance are based on a number of indicators that are prioritised slightly differently. In any case, Sweden is an innovation leader among the EU28 countries. Sweden is relatively strong in human resources and attractiveness of its research systems. Knowledge intensive activities also contribute to Sweden's position of strength. Sweden is also fairly strong in terms of research publication activity. Publicly financed research results in a relatively low level of patents, but this needs to be balanced with the large number of patents developed on the basis of private RTDI funding.

Several ministries have been identified as relevant actors in the RTDI policy system, and Sweden has a large number of decentralised public administration authorities that operate to support research, innovation and growth.

Gender equality is generally recognised as an intrinsically valid goal rather than just a means to an end in the Swedish public discourse. Introducing gender equality initiatives does not have to be legitimised as a means to achieve the maximum benefits for the entire workforce, as is the case, for

instance, in Denmark. Nonetheless, Sweden does not approach the issue in the same way as, for example, Norway and Iceland, where quotas for gender representation of boardroom positions have been implemented. Sweden very recently decided not to opt for this type of solution (NIKK 2017).

Instead, gender analysis and active inclusion of gendered aspects of research and innovation activities have become common in the RTDI system, and gender is at various levels a natural dimension of all kinds of evaluations of RTDI initiatives. At the very least, gender has to be addressed in terms of a statistical overview. However, the decision to implement gender mainstreaming throughout the public sector has been enacted. From 2017, this will include mandatory gender budgeting and gender analyses that offer explanations to gender inequalities found. It is the intention to develop indicators that go beyond the provision of statistical data and 'headcounts' in order to better capture gender inequalities in actual power and influence that may relate to, for instance, gendered networking practices. The focus on excellence and quality in RTDI funding and support systems as well as in the instruments for performance measurement may often reinforce gender inequality, because these normative terms involve biased notions of 'good' science that are most often in favour of male-dominated research practices and disciplines. Sweden has started to realise that academia, its quality criteria and its meritocratic system for career progression are not gender-blind. Awareness of such complex, interrelated gender equality problems has begun to emerge in the Swedish RTDI policy system. Whether a unique Swedish solution to these gender equality issues may be around the corner is probably too soon to tell, and there is definitely potential for improving the alignment between political objectives and actual status of gender equality in RTDI.

5.3 Main issues of evaluation culture and policy in RTDI

Public policy evaluation is an influential activity that takes place throughout the public sector, embedded in public administration as a part of governance. In relation to specific public funding, it is often a requirement following the grant that projects/initiatives are evaluated. Furthermore, it is customary that many public RTDI organisations are regularly evaluated. Many evaluations are made publicly available and, in many cases, at least an excerpt of them is translated into English. However, this does not take place in a systematic, binding way, and there is no public repository of public policy evaluations in Sweden.

A variety of activities can be included in the listing of public evaluation activities; the term 'evaluation' includes a number of more narrowly defined activities. In general, Sweden holds a pluralistic approach to public policy evaluation. This implies that various sources of knowledge should be included. Hence, a multitude of different actors form a net of public evaluation bodies, and external actors are also relevant contributors.

As gender equality has been highly prioritised on the political agenda for decades in Sweden, the country also has a long tradition of monitoring gender equality. However, along with the current plans to further enhance, streamline and harmonise best practice gender equality initiatives in all parts of the public sector and in academia, new ideas are also starting to emerge in relation to the measurement of gender equality initiatives.

During the 1990s, an increase in evaluation activity took place in Sweden. However, in line with the New Public Management ideals, the focus increasingly lies on calling public and private organisations to account and ensuring that they live up to their legal responsibilities. Hence, the current tendencies of the Swedish evaluation culture reflect this control-oriented purpose. A recurring ideal that can be

traced throughout evaluation practices of the Swedish RTDI policy system is the emphasis on experiment-based ways of substantiating claims for evidence-based knowledge.

A competing line of argumentation and reasoning is found in connection with the evaluation activities currently in the pipeline for the coming years related to gender mainstreaming initiatives. Instead of focusing on equality in gender representation, increased attention must be put on how equal influence and power can be ensured; headcounts must be put aside and replaced by more nuanced, context-sensitive, qualitative measures. There is no quick fix to assure gender equality in RTDI, as there is no quick fix to make RTDI policy evaluation gender-sensitive.

Acknowledgement

The country note is mainly based on literature and document studies. However, expert interviews have been undertaken to supplement data gathering. We gratefully acknowledge the contribution made by the following interviewees:

Fredrik Bondestam, PhD, Head of Operations, Gender Mainstreaming Academia (GMA) in Sweden, Swedish Secretariat for Gender Research.

Sophia Ivarsson, PhD, Programme Manager, Industrial Technologies and Innovation Management Division, Vinnova.

Charlotte Silander, PhD, Senior Lecturer in Political Science, Department of Education, Linnaeus University.

The contribution of **Victoria Antonova** to proofreading of the report is gratefully acknowledged.

6 Annex

When interpreting the tables in part 3.2 *Participation of women in tertiary education*, it should be noted that there have been different ways of registering education levels over the years, as well as national differences of registering. Therefore, comparing national Swedish statistics with tables from Eurostat, *She Figures* or *Education at a glance*, might be misleading, if the different classifications of the respective ISCED levels are not taken into account, because those statistics are based on different definitions than those in the national Swedish education nomenclature (SUN) (Dryler et al. 2016, 117). For instance, data from *She figures 2015* is measured in ISCED-97. Up to 2013, data from the Eurostat sources are based on ISCED-97 (in Eurostat, ISCED 2011 is applied from 2014). *Education at a Glance 2015* uses a mix of ISCED 2011 and ISCED-97 (Eurostat 2016, OECD 2016a). Furthermore, it should also be taken into account that the OECD average numbers also reflect an increase in the number of OECD countries over time.

The table below provides an overview of the SUN 2000 system and ISCED-97 and 2011, respectively (see also *The Swedish educational system and classifying education using the ISCED-97* (Halldén 2008)).

Level	SUN 2000 (national category) ⁶⁸	ISCED 97 (Eurostat code)	ISCED 2011 ⁶⁹
0	Pre-school (<i>Förskola</i>)	Pre-primary education (Eurostat 0)	Early childhood education (01, 02)
1	Compulsory primary school, (<i>Grundskola</i>) (1 st stage: the first 6 of the total 9 years)	Primary education, 1 st stage of basic education (Eurostat 1)	Primary education
2	Compulsory primary school (<i>Grundskola</i>) (2 nd stage: years 7-9)	Lower secondary education, 2 nd stage of basic education (Eurostat 2A)	Lower secondary education
3	Upper secondary education: Vocational (<i>yrkesinriktad</i>), Theoretical/prep. for higher studies (<i>teoretisk studieförb.</i>), Vocational university entrance qualification (<i>yrkesinriktad, gymnasium</i>), General university entrance qualification (<i>teoretisk studieförb., gymnasium</i>)	Upper secondary education: Not giving access to ISCED 5 (Eurostat 3C voc/gen), Giving access to ISCED 5 (Eurostat 3A voc/gen)	Upper secondary education
4	Post-secondary non-tertiary education: (<i>högskoleutbildning, eftergymnaisal utbildning</i>)	Post-secondary non-tertiary education: Not giving access to ISCED 5 (Eurostat 4C voc), Giving access to ISCED 5 (Eurostat 4A gen)	Post-secondary non-tertiary education, Tertiary education
5	Tertiary education: Vocational/lower professional	Tertiary education (1 st stage): Practical/technical/occupationally	Short-cycle tertiary

⁶⁸ For a detailed description of the Swedish educational system and SUN 2000, see *The Swedish educational system and classifying education using the ISCED-97* (Halldén 2008).

⁶⁹ An overview of ISCED-97 to 2011 and specifications on the different levels can also be found in *Education at a Glance 2016* (OECD 2016a).

EFFORTI Country Report Sweden

	(<i>högskolor</i>), Academic/higher professional tertiary education (<i>högskolor</i> , <i>universitet</i>)	specific tertiary programmes (Eurostat 5B), Theoretically based/research prep. programmes or programmes giving access to professions with high skill requirements (Eurostat 5A med, 5A long)	education
6	Tertiary education (2 nd stage): Research education (<i>Forskarutbildning</i>) / doctorate or licentiate	Tertiary education (2 nd stage): Doctoral or equivalent (Eurostat 6)	Bachelor's or equivalent
7	-	-	Master's or equivalent
8	-	-	Doctoral or equivalent

7 Glossary

AETR	average effective tax rate
AML	Working Environment Act (Arbetsmiljölagen)
BERD	business expenditure on research and development
BES	business enterprise sector
BPfA	Beijing Platform for Action
CEDAW	Convention on the Elimination of All Forms of Discrimination against Women
CEO	chief executive officer
CoE	Centre of Excellence
DA	Discrimination Act
DI	dissimilarity index
DNRF	Danish National Research Foundation
EFFORTI	Evaluation Framework for Promoting Gender Equality in Research and Innovation
EIS	European Innovation Scoreboard
EPO	European Patents Office
EPA	Employment Protection Act
ERA	European Research Area
EU	European Union
EUR	Euro
FAS	Swedish Council for Working Life and Social Research
FOKUS	Forskningskvalitetsutvärdering i Sverige [Research quality evaluation in Sweden]
FTE	full-time equivalent
GDP	gross domestic product
GE	gender equality
GERD	gross expenditure on research and development
GMA	Gender Mainstreaming Strategy for Academia
GMGA	Gender Mainstreaming in the Government Offices
GOV	government sector
HE	higher education
HEI	higher education institution
HES	higher education sector
ICT	information communications technology
ISCED	International Standard Classification of Education
KIA	knowledge intensive activities
KIABI	knowledge intensive activities – business activities
NACE	Statistical Classification of Economic Activities in the European Community (Nomenclature statistique des activités économiques dans la Communauté européenne)
NGO	non-governmental organisation
NIKK	Nordic Information on Gender
NOK	Norwegian krone
NORDICORE	Nordic Centre for Research on Gender Equality and Innovation
OECD	Organisation for Economic Co-operation and Development
PhD	Doctor of Philosophy
PI	Principal Investigator
PLA	Parental Leave Act
PNP	private non-profit sector
R&D	research and development

EFFORTI Country Report Sweden

R&I	research and innovation
RFO	research funding organisation
RIO	Research and Innovation Observatory
RPO	research performing organisation
RTDI	Research, Technology, Development, Innovation
RTI	Research, Technology and Innovation
SCB	Statistics Sweden
SEK	Swedish krona
SGS	gender segregation indicator
SFI	Danish National Centre for Social Research (Socialforskningsinstituttet; Det Nationale Forskningscenter for Velfærd)
SIDA	Swedish International Development Cooperation Agency
SMEs	small and medium enterprises
SSC	Social Security Code
STEM	Science, Technology, Engineering, Mathematics
SUHF	Association of Swedish Higher Education (Sveriges universitets- och högskoleförbund)
SUN	Swedish education nomenclature (Svensk Utbildningsnomenklatur)
TRF	total fertility rate
UHR	Swedish Council for Higher Education (Universitets- och högskolerådet)
UKÄ	Swedish Higher Education Authority (Universitets Kanslers Ämbetet)
UNESCO	United Nations Educational, Scientific and Cultural Organisation
WP	work package

8 Bibliography

- Ahlqvist, Veronica, Johanna Andersson, Cecilia Hahn Berg, Camilla Kolm, Lisbeth Söderqvist, and John Tumpane. 2013. *Observations on gender equality in a selection of the Swedish Research Council's evaluation-panels 2012*. Stockholm: Swedish Research Council.
<https://publikationer.vr.se/en/product/observations-on-gender-equality-in-a-selection-of-the-swedish-research-councils-evaluation-panels-2012/>.
- Ahlqvist, Veronica, Johanna Andersson, Lisbeth Söderqvist, and John Tumpane. 2015. *En jämställd process?* Stockholm: Swedish Research Council. <https://publikationer.vr.se/produkt/en-jamstalld-process/>.
- Åkerström, Lola Akinmade. 2017. *10 things that make Sweden family-friendly*. March 10.
<https://sweden.se/society/10-things-that-make-sweden-family-friendly/>.
- Albæk, Erik. 1988. "Policy evaluation: Design and utilization." *Knowledge in Society*, 6-19.
- Almgren, Nina, Minna Salminen-Karlsson, Andrea Wolfram, Manuela Aye, Liria Veronesi, Liv Baisner, and Eva Sophia Myers. 2016. *FESTA Toolkit WP3.2: Toward raising organizational awareness*. Female Empowerment in Science and Technology Academia. http://www.festa-europa.eu/sites/festa-europa.eu/files/toolkit%20and%20appendices%20in%20one%20-%20final%20280214_0.pdf.
- Andersen, Vibeke Normann, Peter Dahler-Larsen, and Carsen Strømbæk Pedersen. 2009. "Quality assurance and evaluation in Denmark." *Journal of Education Policy* 24 (2): 135-147.
- Andersson, Håkan, and Staffan Nilsson. 2016. *Labour market prospects after tertiary education. Sweden in an international perspective - A comparison based on Education at a Glance*. Stockholm: Swedish Higher Education Authority.
<http://english.uka.se/download/18.5d85793915901d205f911087/1487932595210/labour-market-prospects-after-tertiary-education-sweden.pdf>.
- Association of Swedish Higher Education. n.d. *The Association of Swedish Higher Education*.
<http://www.suhf.se/inenglish>.
- Bemelmans-Videc, Marie-Louise, Ray C. Rist, and Evert Vedung. 1998. *Carrots, sticks, and sermons: Policy instruments and their evaluation*. Comparative Policy Evaluation.
- Bergman, Solveig. 2013. *The Nordic Region - A step closer to gender balance in research?* Copenhagen: Nordic Council of Ministers.
- Björklund, Jan. 2014. In *Gender equality. The responsibility of the entire Government*. Government Offices of Sweden.
- Bondestam, Fredrik, and Louise Grip. 2015. *Fördelning eller förfördelning? Forskningsfinansiering, jämställdhet och genus - en forskningsöversikt*. Göteborg: Nationella Sekretariatet för Genusforskning.
- Bredgaard, Thomas. 2016. *Evaluering af offentlig politik og administration*. Hans Reitzel Forlag.

- Brundin, Ethel. 2015. *Hurra så jämställt – eller hur står det till i den akademiska världen?* <http://vertikals.se/ethel-brundin/2015/03/08/jamstallt/>.
- Cartwright, Nancy, and Jeremy Hardie. 2012. *Evidence-based policy: A practical guide to doing it better*. Oxford University Press.
- Christiansen, Anne Munk. 2016. *Two new Nordic Centres of Excellence to solve the Nordic Gender Paradox*. <https://www.nordforsk.org/en/news/two-new-nordic-centres-of-excellence-to-solve-the-nordic-gender-paradox>.
- Civitas. 2016. "Smart choices for cities. Gender equality and mobility: mind the gap!"
- Dahler-Larsen, Peter. 2016. "Reflections on vocabularies in research on evaluation." *Education Inquiry*, 7(3), 373-380.
- . 2012. *The evaluation society*. Stanford: Stanford University Press.
- Dahler-Larsen, Peter, and Flemming Larsen. 2001. "Anvendelse af evaluering - Historien om et begreb, der udvider sig." In *Tendenser i Evaluering*, by Peter Dahler-Larsen and Hanne Kathrine Krogstrup, 211-220. Odense: Syddansk Universitetsforlag.
- Dahlgren, Lillemor. n.d. *Gender mainstreaming in 41 Swedish government agencies*. http://gender-summit.com/images/GS7_Speakers/GS7_ppts/GS7Eu_Dahlgren_FINAL.pdf.
- Dahlstrand, Åse Lindholm, Maren Sprutacz, and Merle Jacob. 2016. *RIO Country Report 2015: Sweden*. Luxembourg: Publications Office of the European Union.
- Danbolt, Iselin Løvslett. 2016a. *All about business. Nordic women on boards and in leadership*. Denmark: Nordic Council of Ministers.
- Danbolt, Iselin Løvslett. 2016b. *The ultimate balancing act. Work and family in the Nordic region*. Copenhagen: Nordic Council of Ministers.
- Danish Patent and Trademark Offices. 2016. *Key figures*. <http://www.dkpto.dk/information/om-os/noegletal/#ScrollToGraph>.
- Deloitte. 2014. "Researchers' report 2014: Sweden." https://cdn5.euraxess.org/sites/default/files/policy_library/sweden_country_profile_rr2014_final.pdf.
- Dernis, Helene, Mafini Dosso, Fernando Hervás Soriano, Valentine Millot, Mariagrazia Squicciarini, and Antonio Vezzani. 2015. *World corporate top R&D investors: Innovation and IP bundles*. Luxembourg: Publications Office of the European Union.
- Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs. 2016. "European Innovation Scoreboard 2016 - Database." <http://ec.europa.eu/DocsRoom/documents/17823/attachments/1/translations/en/renditions/native>.

- Directorate-General for Justice and Consumers. 2016. *Report on equality between women and men 2015*. Brussels: European Commission. http://ec.europa.eu/justice/gender-equality/files/annual_reports/2016_annual_report_2015_web_en.pdf.
- Directorate-General for Research and Innovation. 2015. *European Research Area: Facts and figures 2014. Sweden*. Brussels: European Commission, 602-621. https://ec.europa.eu/research/era/pdf/era_progress_report2014/country_fiches/era-se.pdf.
- Directorate-General for Research and Innovation. 2013. *She Figures 2012. Gender in research and innovation: statistics and indicators*. Luxembourg: Publications Office of the European Union. http://ec.europa.eu/research/science-society/document_library/pdf_06/she-figures-2012_en.pdf.
- Directorate-General for Research and Innovation. 2016. *She Figures 2015*. Luxembourg: Publications Office of the European Union. https://ec.europa.eu/research/swafs/pdf/pub_gender_equality/she_figures_2015-final.pdf.
- Directorate-General for Research. 2009. *She Figures 2009. Statistics and indicators on gender equality in science*. Luxembourg: Publications Office of the European Union. https://ec.europa.eu/research/science-society/document_library/pdf_06/she_figures_2009_en.pdf.
- Dryler, Helen, Magdalena Inkinen, Ingeborg Amnéus, Per Gillström, Jacob Severin, Anders Viberg, and Per Helldahl. 2016. *Kvinnor och män i högskolan*. 2016:16, Stockholm: Universitetskanslerämbetet.
- Equality Ombudsman. 2015. *Other areas of society*. <http://www.do.se/other-languages/english-engelska/other-areas-of-society/>.
- European Institute for Gender Equality. 2015. *Sweden*. <http://eige.europa.eu/gender-mainstreaming/countries/sweden>.
- . n.d. *Sweden. Structures*. <http://eige.europa.eu/gender-mainstreaming/countries/sweden/structures>.
- . 2016. *Sweden: Promoting gender equality in research*. <http://eige.europa.eu/gender-mainstreaming/tools-methods/gear/legislative-policy-backgrounds/sweden>.
- Eurostat. n.d. *Database*. <http://ec.europa.eu/eurostat/data/database>.
- . 2016. *Educational attainment level and transition from education to work (based on EU-LFS)*. http://ec.europa.eu/eurostat/cache/metadata/en/edat1_esms.htm.
- . 2017. *Population by educational attainment level, sex and age (%) - main indicators*. http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=edat_ifse_03&lang=en.
- . 2013. *Quality of life indicators - productive or main activity*. http://ec.europa.eu/eurostat/statistics-explained/index.php?title=Quality_of_life_indicators_-_productive_or_main_activity&oldid=249494#Work-life_balance.

- Eydal, Gudny Björk, Ingólfur V. Gíslason, Tine Rostgaard, Berit Brandth, Ann-Zofie Duvander, and Johanna Lammi-Taskula. 2015. "Trends in parental leave in the Nordic countries: has the forward march of gender equality halted?" *Community, Work & Family*, 18(2), 167-181.
- Forte. 2012. "Jämställdhetsstrategi 2013 - 2016." <http://forte.se/wp-content/uploads/2015/11/fas-jamstalldhetsstrategi-2013-2016.pdf>.
- . 2016. "Research meets society: Forte's proposal to the national research policy 2017-2027." <http://forte.se/en/wp-content/uploads/sites/2/2016/04/research-meets-society.pdf>.
- Frostell, Ellen. 2015. *Sverige tappar 35 miljarder i FoU-investeringar*. https://www.svensktnaringsliv.se/fragor/forskning/sverige-tappar-35-miljarder-i-fou-investeringar_616279.html.
- Gender Equality Inquiry. 2015. *Policy objectives and a new government agency - effective governance of Swedish gender equality policy*. Ministry of Health and Social Affairs.
- GenPORT. n.d. "Policy Brief 8 - Implementing gender equality plans in RPOs." Accessed December 29, 2016. http://www.genderportal.eu/sites/default/files/resource_pool/PB8_GEP_RPO_Inno.pdf.
- Government Offices of Sweden. n.d. *A feminist government*. <http://www.government.se/government-policy/a-feminist-government/>.
- . 2015a. *A feminist government ensures that decisions increase gender equality*. <http://www.government.se/articles/2015/11/a-feminist-government-ensures-that-decisions-increase-gender-equality/>.
- . 2015b. *A more equal parental insurance system*. <http://www.government.se/articles/2015/06/a-more-equal-parental-insurance-system/>.
- . 2008. "A scientific tradition with strong historical foundations." <http://www.government.se/49b731/contentassets/696ce41a7c7441358ae534f5ff85aefd/a-boost-to-research-and-innovation--a-summary-of-government-bill-20080950>.
- . 2016a. *Collaborating for knowledge – for society's challenges and strengthened competitiveness*. <http://www.government.se/press-releases/2016/11/collaborating-for-knowledge--for-societys-challenges-and-strengthened-competitiveness/>.
- . 2015c. "Discrimination Act 2008:567." <http://www.government.se/information-material/2015/09/discrimination-act-2008567/>.
- . 2015d. *Efforts for gender equality are prioritised - excerpt from the Budget Statement*. <http://www.government.se/articles/2015/11/efforts-for-gender-equality-are-prioritised/>.
- . 2015e. *Finansiering av forskning i Sverige*. <http://www.regeringen.se/regeringens-politik/hogskola-och-forskning/finansiering-av-forskning-i-sverige/>.

- . 2016b. *From the Budget Bill for 2017: Budget statement.*

<http://www.government.se/information-material/2016/09/from-the-budget-bill-for-2017-budget-statement/>.

Government Offices of Sweden. 2015f. *Gender equality. The responsibility of the entire government.* Stockholm: Government Offices of Sweden.

<http://www.government.se/49b751/contentassets/04c1afaa68be41569484b159b4b6f683/gender-equality---the-responsibility-of-the-entire-government>.

- . 2016c. *Gender-equal parenting and good conditions for children to grow up in, a review of parental insurance.* <http://www.government.se/articles/2016/02/gender-equal-parenting-and-good-conditions-for-children-to-grow-up-in/>.

- . 2017a. *Gender-equal pensions.* <http://www.government.se/articles/2017/02/gender-equal-pensions>.

- . 2016d. *Gender-responsive budgeting.* <http://www.government.se/articles/2016/10/gender-responsive-budgeting/>.

- . 2015g. *Goals and visions.* <http://www.government.se/government-policy/education-and-research/goals-and-visions/>.

Government Offices of Sweden. 2016e. *Guidelines for Economic and Budget Policy.* Stockholm: Government Offices of Sweden.

<http://www.government.se/49f5af/globalassets/government/dokument/finansdepartementet/varbudget-2016/guidelines-for-economic-and-budget-policy---april-2016>.

- . 2016f. "Kunskap i samverkan – för samhällets utmaningar och stärkt konkurrenskraft." <http://www.regeringen.se/rattsdokument/proposition/2016/11/prop.-20161750/>.

- . 2017b. *Ministry of Health and Social Affairs.* <http://www.government.se/government-of-sweden/ministry-of-health-and-social-affairs/>.

Government Offices of Sweden. 2012a. *Research and innovation: A summary of Government Bill 2012/2013:30.* Stockholm: Government Offices of Sweden.

http://www.government.se/contentassets/9131b15c802a44b9b196d442b498afdb/research-and-innovation---a-summary-of-government-bill-2012_13_30.pdf.

- . 2016g. *Swedish Government to establish gender equality agency.*

<http://www.government.se/press-releases/2016/09/swedish-government-to-establish-gender-equality-agency/>.

- . 2015h. *The 2016 Budget in five minutes.* <http://www.government.se/articles/2015/09/the-2016-budget-in-five-minutes/>.

- . 2016h. *The 2017 Budget in five minutes.* Accessed December 27, 2016.

<http://www.government.se/articles/2016/09/the-2017-budget-in-five-minutes/>.

- . 2016i. *The central government budget for 2017 in figures*.
<http://www.government.se/articles/2016/09/the-central-government-budget-for-2017-in-figures/>.
 - . 2016j. *The direction of fiscal policies - September 2016*. Accessed December 27, 2016.
<http://www.government.se/articles/2016/09/the-direction-of-fiscal-policy---september/>.
 - . 2015i. *The direction of fiscal policy in the budget for 2016*. Accessed December 27, 2016.
<http://www.government.se/articles/2015/09/the-direction-of-fiscal-policy-in-the-budget-for-2016/>.
 - . 2015j. *The Spring Budget Bill for 2015 in 5 minutes*.
<http://www.government.se/articles/2015/05/the-spring-budget-in-five-minutes/>.
- Government Offices of Sweden. 2012b. *The Swedish Innovation Strategy*. Stockholm: Government Offices of Sweden.
<http://www.government.se/contentassets/cbc9485d5a344672963225858118273b/the-swedish-innovation-strategy>.
- . 2013. "Work Environment Act (1977:1160)."
<http://www.government.se/4ac754/contentassets/86e9091526644e90b78d2ff937318530/sf-s-19771160-work-environment-act>.
- Graversen, Ebbe Krogh, and Thomas Kjeldager Ryan. 2015. *Autonomi och kvalitet – ett uppföljningsprojekt om implementering och effekter av två högskolereformer i Sverige. Delredovisning 3: Enkätundersökning till studieansvariga*. Riksdag.
- Growth Analysis. 2015a. "A warm welcome or a cold shoulder? How men and women are treated in the business promotion system." <http://www.tillvaxtanalys.se/in-english/publications/pm/pm-working-paper/2015-11-26-a-warm-welcome-or-a-cold-shoulder----how-men-and-women-are-treated-in-the-business-promotion-system.html>.
- Growth Analysis. 2016. *Evaluation of regional structural funds programmes*. Östersund: Growth Analysis. <http://www.tillvaxtanalys.se/in-english/publications/reports/reports/2016-06-09-evaluation-of-regional-structural-funds-programmes.html>.
- Growth Analysis. 2014. *Governance of universities – An analysis with eight international case studies*. Östersund: Growth Analysis. <http://www.tillvaxtanalys.se/in-english/publications/pm/pm-working-paper/2014-12-08-governance-of-universities-----an-analysis-with-eight-international-case-studies.html>.
- . n.d. *Knowledge for growth*. <https://www.tillvaxtanalys.se/in-english/about-growth-analysis.html>.
- Growth Analysis. 2015b. *Young researchers' career paths – tenure tracks, equality, researcher mobility and research funding*. Östersund: Growth Analysis. <http://www.tillvaxtanalys.se/in-english/publications/direct-response/direct-response/2016-03-30-young-researchers-career-paths----tenure-tracks-equality-researcher-mobility-and-research-funding.html>.
- Haas, Linda, Ann-Zofie Duvander, and C. Philip Hwang. 2016. "Sweden country note."
http://www.leavenetwork.org/fileadmin/Leavenetwork/Country_notes/2016/Sweden.pdf.

- Haase, Sanne, and Thomas Kjeldager Ryan. 2015. *Autonomi och kvalitet – ett uppföljningsprojekt om implementering och effekter av två högskolereformer i Sverige. Delredovisning 4: Den fallstudiebaserade undersökningens första fas*. Riksdagen.
- Halldén, Karin. 2008. *The Swedish educational system and classifying education using the ISCED-97*. http://www.mzes.uni-mannheim.de/publications/misc/isced_97/hall08a_the_swedish_educational_system_and_classifying_edu.pdf.
- Hansen, Helle Foss. 2003. *Evaluering i staten: Kontrol, læring eller forandring*. Copenhagen: Samfundslitteratur.
- . 2013. "Systemic evaluation governance. New logics in the development of organisational fields." *Scandinavian Journal of Public Administration*, 18(3), 16 ed.: 47-64.
- Haubenwallner, Sabine. 2017. *Practical guide to improving gender equality in research organisations*. Brussels: Science Europe. http://www.scienceeurope.org/wp-content/uploads/2017/03/20170228_WSGenderEquality_Presentation_Sabine_Haubenwallner.pdf.
- Hedborg, Anna, Lena Abrahamsson, Lena Granqvist, Anders Knape, Sineva Ribeiro, Karl-Petter Thorwaldsson, Christer Ågren, et al. 2015. *Hela lönen, hela tiden. Utmaningar för ett jämställt arbetsliv*. Stockholm: Statens Offentliga Utredningar.
- Heikkilä, Mia. 2016. "Forskning och utveckling för ökad jämställdhet: Följeforskning om Vinnovas regeringsuppdrag." http://www.vinnova.se/upload/EPiStorePDF/vr_16_04T.pdf.
- Helldén, Ulrika. 2015. *Gender mainstreaming at Gender Summit 7*. <http://www.genus.se/en/newspost/gender-mainstreaming-at-gender-summit-7/>.
- Högskolan Väst. 2017. *Bibliometri*. <http://hv.se.libguides.com/c.php?g=243067&p=1617075>.
- Högskoleverket. 2012. *Högskoleverket lades ned vid årsskiftet 2012/13 – två nya myndigheter bildades*. <http://www.hsv.se/>.
- Højgaard, Liselotte, and Thomas Sinkjær. 2014. *Getting all talents in play*. Copenhagen: The Danish National Research Foundation.
- Hollanders, Hugo, Nordine Es-Sadki, and Minna Kanerva. 2016. *European Innovation Scoreboard 2016*. Brussels: European Commission. <http://ec.europa.eu/DocsRoom/documents/17822>.
- Humbert, Anne Laure, Viginta Ivaškaitė-Tamošiūnė, Nicole Sarah Oetke, and Merle Paats. 2015. *Gender Equality Index 2015: Measuring gender equality in the European Union 2005-2012*. Brussels: European Institute for Gender Equality. <http://eige.europa.eu/sites/default/files/documents/mh0415169enn.pdf>.
- IDEA Consult. 2013. *Support for continued data collection and analysis concerning mobility patterns and career paths of researchers*. Brussels: European Commission. https://cdn4.euraxess.org/sites/default/files/policy_library/final_report_0.pdf.

- Includegender.org. 2016. *Tutorials*. <http://www.includegender.org/toolbox/tutorials-2/>.
- Innovationsindikator. 2015. "Liste der Einzelindikatoren des Innovationsindikators." http://www.innovationsindikator.de/fileadmin/2015/PDF/Liste_der_Einzelindikatoren_2015.pdf.
- Jacobsen, Sara Jul, Alice Hedegaard Klynge, and Helle Holt. 2013. *Øremærkning af barsel til fædre*. Copenhagen: SFI - Det Nationale Forskningscenter for Velfærd.
- Johansson, Vicki, and Lena Lindgren. 2013. *Uppdrag offentlig granskning*. Lund: Studentlitteratur.
- Kalpazidou Schmidt, Evanthia. 2014. *Autonomi och kvalitet – ett uppföljningsprojekt om implementering och effekter av två högskolereformer i Sverige. Delredovisning 1: Skrivbordsstudie om autonomi- och kvalitetsreformerna*. Riksdagen.
- Kalpazidou Schmidt, Evanthia. 2009. "Evaluation." In *Handbook on the Socialisation of Scientific and Technological Research*, by Luciano d'Andrea and Wiebe E. Bijker, 169-189. Rome: Social Sciences and European Research Capacities .
- . 2003. "Evaluation and science policy in the use of evaluations in Europe." *European RTD Evaluation Network Meeting*. Femmøller: Danish Institutes for Studies in Research and Research Policy.
- Krogstrup, Hanne Kathrine. 2016. *Evalueringsmodeller*. Hans Reitzels Forlag.
- . 2011. *Kampen om evidens: resultatmåling, effektevaluering og evidens*. Hans Reitzels Forlag.
- Larsen, Mona, Helle Holt, and Malene Rode Larsen. 2016. *Et kønsopdelt arbejdsmarked. Udviklingstræk, konsekvenser og forklaringer*. Copenhagen: SFI - Det Nationale Forskningscenter for Velfærd.
- Lidbeck, Monica. 2015. "Om att dela föräldraledighet." http://www.psykologforbundet.se/Documents/Yrkesf%C3%B6reningar/MBHV-psykologerna/Nationella%20konferensen/NK%20Bor%C3%A5s%202015/Lidbeck_Om%20att%20dela%20f%C3%B6r%C3%A4ldraledighet%20NK%202015.pdf.
- Lööf, Annie. 2014. In *Gender equality. The responsibility of the entire Government*. Government Offices of Sweden.
- Lundberg, Anna Eds, and Ann Werner. 2013. *Gender studies education and pedagogy*. Swedish Secretariat for Gender Research.
- Mesna, Marte. 2016. *On a mission to solve the Nordic gender paradox*. <http://kifinfo.no/en/2016/11/gender-paradox-solution-horizon>.
- Ministry for Education and Research. n.d. *Ministry for Education and Research*. <http://www.government.se/government-of-sweden/ministry-of-education-and-research>.
- Ministry of Education and Research. 2014. *Gender mainstreaming*. <http://eige.europa.eu/sites/default/files/documents/05%20Fact%20sheet%20-%20gender%20mainstreaming%20in%20Sweden.pdf>.

- Ministry of Education and Research. 2016. *Towards an outstanding knowledge nation with equal education and world-class research*. Government Offices of Sweden.
<http://www.government.se/4ad0ba/contentassets/1b098730913a430aa4150f448831602d/towards-an-outstanding-knowledge-nation-with-equal-education-and-world-class-research.pdf>.
- Ministry of Employment. 2015. *Swedish statutes in translation - labour legislation*.
<http://www.government.se/government-policy/labour-law-and-work-environment/swedish-statutes-in-translation---labour-legislation/>.
- Ministry of Enterprise and Innovation. 2015. *Sweden's National Strategy for Sustainable Regional Growth and Attractiveness 2015–2020*. Government Offices of Sweden.
- Ministry of Health and Social Affairs. 2016. *Social insurance in Sweden*. Stockholm: Government Offices of Sweden.
http://www.government.se/globalassets/government/dokument/socialdepartementet/socialinsurancensweden_august-2016.pdf.
- Monaco, Sara, Marianne Wikgren, Stina Gerdes Barriere, Jonas Gurell, Staffan Karlsson, and Henrik Aldberg. 2016. *The Swedish Research Barometer 2016: An overview of the Swedish research system in international comparison*. Stockholm: Swedish Research Council.
<https://publikationer.vr.se/produkt/the-swedish-research-barometer-2016/>.
- Monaco, Sara, Sten Söderberg, Maud Quist, John Tumpane, Malin Eklund, Andreas Augustsson, Marianne Wikgren, Staffan Karlsson, Elisabeth Sjöstedt, and Bo Sandberg. 2015. *Research quality evaluation in Sweden – FOKUS*. Stockholm: Swedish Research Council.
<https://publikationer.vr.se/en/product/research-quality-evaluation-in-sweden-fokus-2/>.
- Neuman, Emma. 2014. *Culture, assimilation and gender gaps in labour market outcomes*. Linnæus University. Centre for Labour Market and Discrimination Studies.
- Nielsen, Mathias Wullum. 2013. "Italesættelser og retfærdiggørelser af ligestilling i nordisk akademika." *Forskningspolitikk*, 22-23.
- Nielsen, Mathias Wullum. 2015. *New and persistent gender equality challenges in academia*. Aarhus: Politica.
- . 2014. "Justifications of gender equality in academia: Comparing gender equality policies of six Scandinavian universities." *Nordic Journal of Feminist and Gender Research*, 187-203.
- . 2016. "Scandinavian Approaches to Gender Equality in Academia: A Comparative Study." *Scandinavian Journal of Educational Research*, 1-24.
- NIKK. 2015. *Part time culture and full time norm*. NIKK.
- . 2016a. *Gender equality policy. Sweden*. <http://www.nikk.no/en/facts/gender-equality-policy/sweden/>.
- . 2017. *Kvoteringslag ingen "quick fix"*. <http://www.nikk.no/nyheter/kvoteringslag-ingen-quick-fix/>.

- . 2016b. "The design of parental insurance influences men's use of it." *NIKK, Latest News*. 10 10. Accessed 11 14, 2016. http://www.nikk.no/wp-content/uploads/nikk_foraldraledighet_eng_webb.pdf.
- . 2016c. *This is NIKK*. <http://www.nikk.no/en/about-nikk/>.
- NIKK. 2016d. *Why dads take parental leave: Fact sheet about the parental insurance systems in the Nordic countries*. NIKK. http://www.nikk.no/wp-content/uploads/nikk_foraldraledighet_eng_webb.pdf.
- Niskanen, Kirsti. 2011a. *Gender and power in the Nordic countries - with focus on politics and business*. Oslo: NIKK.
- Niskanen, Kirsti. 2011b. *Gender and power in the Nordic countries: A comparative perspective*. Oslo: NIKK.
- NordForsk. n.d. *About NordForsk*. <https://www.nordforsk.org/en/about-nordforsk>.
- . 2017a. *Beyond the Gender Paradox: Women's careers in technology-driven research and innovation in and outside of academe*. <https://www.nordforsk.org/en/programmes-and-projects/projects/beyond-the-gender-paradox-womens-careers-in-technology-driven-research-and-innovation-in-and-outside-of-academe>.
- NordForsk. 2014. *Crossing borders – Obstacles and incentives to researcher mobility*. Nordforsk. [file:///C:/Users/au485652/Downloads/Policy%20Brief%203-2014-%20crossing_borders_net%20\(1\).pdf](file:///C:/Users/au485652/Downloads/Policy%20Brief%203-2014-%20crossing_borders_net%20(1).pdf).
- . 2017b. *Gender in the Nordic Research and Innovation Area*. <https://www.nordforsk.org/en/programmes-and-projects/programmes/gender-in-the-nordic-research-and-innovation-area>.
- Nordic Council of Ministers. 2015a. *Gender mainstreaming in the work performed by municipalities*. Copenhagen: Nordic Council of Ministers.
- Nordic Council of Ministers. 2015b. *Nordic co-operation programme on gender equality 2015–2018*. Copenhagen: Nordic Council of Ministers.
- Nordic Council of Ministers. 2015c. *Nordic gender equality in figures 2015*. Copenhagen: Nordic Council of Ministers.
- Nordisk institutt for studier av innovasjon, forskning og utdanning. 2017. *R&D statistics bank*. <http://www.foustatistikbanken.no/nifu/>.
- Norman, Peter. 2014. In *Gender equality. The responsibility of the entire Government*. Government Offices of Sweden.
- Numhauser-Henning, Ann. 2015a. *Country report, gender equality. Sweden*. Luxembourg: Publications Office of the European Union.
- Numhauser-Henning, Ann. 2015b. *The policy on gender equality in Sweden*. Brussels: European Parliament. Policy Department C: Citizens' Rights and Constitutional Affairs.

- [http://www.europarl.europa.eu/RegData/etudes/STUD/2015/510011/IPOL_STU\(2015\)510011_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/STUD/2015/510011/IPOL_STU(2015)510011_EN.pdf).
- OECD. 1999. *Classifying educational programmes*. <http://www.oecd.org/edu/1841854.pdf>.
- OECD. 2016a. *Education at a Glance 2016*. Paris: OECD Publishing. http://www.oecd-ilibrary.org/education/education-at-a-glance-2016_eag-2016-en;jsessionid=1vam6u5inrsvv.x-oecd-live-03.
- . n.d. *Time spent in unpaid, paid and total work, by sex*. <http://www.oecd.org/gender/data/time-spent-in-unpaid-paid-and-total-work-by-sex.htm>.
- . 2016b. "Use of childbirth-related leave by mothers and fathers." <http://www.oecd.org/els/family/PF2-2-Use-childbirth-leave.pdf>.
- Pépin, Anne, Federico Zemborain, and Abigail Forson. 2015. *Compendium of national initiatives on the integration of the gender dimension in research contents*. Gender-Net.
- Plantenga, Janneke. 2014. "Searching for welfare, work and gender equality." http://www.foreurope.eu/fileadmin/documents/pdf/Workingpapers/WWWforEurope_WPS_no059_MS206.pdf.
- Rastrigina, Olga, and Alina Verashchagina. 2015. *Secondary earners and fiscal policies in Europe*. Luxembourg: Publication Office of the European Union.
- Regnér, Åsa, and Margot Wallström. 2016. *Gender equality policy in Sweden*. Government Offices of Sweden.
- Regnö, Klara. 2014. "JiM 2015 – Delrapportering." <http://www.genus.se/media/8556/>.
- Roland Berger Strategy Consultants. 2013. *The current situation of gender equality in Sweden - Country Profile*. Brussels: European Commission. http://ec.europa.eu/justice/gender-equality/files/epo_campaign/131006_country-profile_sweden.pdf.
- Salminen-Karlsson, Minna, Nina Almgren, Manuela Aye, Andrea Wolfram, Georgi Apostolov, and Dimitrina Kerina. 2014. *Excellence and gender in the working environment. Results of mapping the present situation in Germany, Bulgaria and Sweden*. Uppsala: FESTA, Female Empowerment in Science and Technology Academia.
- Sandström, Ulf, Agnes Wold, Birgitta Jordansson, Björn Ohlsson, and Åsa Smedberg. 2010. "Hans Excellens – om miljardsatsningarna på starke forskningsmiljöer. Slutrapport." <http://jamda.ub.gu.se/bitstream/1/692/1/excellens.pdf>.
- Schulze, Erika, and Maja Gergoric. 2015. *Maternity, paternity and parental leave: Data related to duration and compensation rates in the European Union*. Brussels: European Parliament, Policy Department C: Citizens' Rights and Constitutional Affairs. [http://www.europarl.europa.eu/RegData/etudes/STUD/2015/509999/IPOL_STU\(2015\)509999_9_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/STUD/2015/509999/IPOL_STU(2015)509999_9_EN.pdf).

- Seidegård, Cecilia Schelin, Lenita Freidenvall, Petra Mårselius, Maria Ehnage, and Linda Österberg. 2015. *Mål och myndighet. En effektiv styrning av jämställdhetspolitiken*. Stockholm: Statens Offentliga Utredningar.
- Silander, Charlotte. 2010. "Pyramider och Pipelines: Om högskolesystemets påverkan på jämställdhet i högskolan." Linnaeus University Press.
- Sørensen, Mads P., and Niels Mejlgaard. 2014. *Autonomi och kvalitet – ett uppföljningsprojekt om implementering och effekter av två högskolereformer i Sverige. Delredovisning 2: Intervjuundersökning med rektorer*. Riksdagen.
- Sørensen, Mads P., Andreas Kjær, and Evanthia Kalpazidou Schmidt. 2016. *Autonomi och kvalitet – ett uppföljningsprojekt om implementering och effekter av två högskolereformer i Sverige. Delredovisning 5: Intervjuundersökning med kvalitetsansvariga och den fallstudiebaserade undersökningens andra fas*. Riksdagen.
- Sørensen, Mads P., Sanne Haase, Ebbe Krogh Graversen, Evanthia Kalpazidou Schmidt, Niels Mejlgaard, and Thomas Kjølager Ryan. 2015. *Autonomi och kvalitet – ett uppföljningsprojekt om implementering och effekter av två högskolereformer i Sverige. Hovedrapport*. Riksdagen.
- Stafström, Sven. 2016. *Nationell utvärdering behövs för att höja svensk forsknings kvalitet*. <http://www.tidningencurie.se/debatt/nationell-utvardering-behovs-for-att-hoja-svensk-forskning-kvalitet/>.
- Stanfors, Maria. 2015. "Underlag till Jämställdhetsutredningen U 2014:06. Delmål 3: En jämn fördelning av det obetalte hem- och omsorgsarbetet." In *Forskarrapporter till Jämställdhetsutredningen*, by Seidegård, 179-226.
- Statistics Sweden. 2013a. *About Statistics Sweden*. http://www.scb.se/en/_/About-us/.
- Statistics Sweden. 2000. *Allmänt om SUN*. Örebro: Statistics Sweden. http://www.scb.se/Statistik/UF/UF0506/_dokument/MISSUNKORT.PDF.
- . 2013b. "Half-siblings now less common." http://www.scb.se/en/_/Finding-statistics/Statistics-by-subject-area/Population/Population-projections/Demographic-Analysis-DEMOG/Aktuell-Pong/55356/Behallare-for-Press/Having-children-in-new-relationships-Demographic-Analysis/.
- Statistics Sweden. 2016a. *Statistics in action. Newsletter from Statistics Sweden*. Örebro: Statistics Sweden.
- . n.d. *SUN, Svensk utbildningsnomenklatur*. <http://www.scb.se/hitta-statistik/statistik-efter-amne/utbildning-och-forskning/befolkningens-utbildning/befolkningens-utbildning/produktrelaterat/Fordjupad-information/sun-svensk-utbildningsnomenklatur/#>.
- Statistics Sweden. 2016b. *Women and men in Sweden. Facts and figures 2016*. Örebro: Statistics Sweden. http://www.scb.se/Statistik/_Publikationer/LE0201_2015B16_BR_X10BR1601ENG.pdf.

- Strandhäll, Annika. 2016. *Adapt parental insurance to suit modern working life*.
<http://www.government.se/opinion-pieces/2016/02/adapt-parental-insurance-to-suit-modern-working-life/>.
- Swedish Agency for Economic and Regional Growth. 2016a. *Swedish Agency for Economic and Regional Growth*. <https://tillvaxtverket.se/english.html>.
- . 2016b. *Women's entrepreneurship*. <https://tillvaxtverket.se/english/womens-entrepreneurship.html>.
- Swedish Agency for Public Management. 2015. *Evaluation of different areas. An analysis of sector-specific evaluation agencies*. <http://www.statskontoret.se/In-English/publications/2014---summaries-of-publications/evaluation-of-different-areas.-an-analysis-of-sector-specific-evaluation-agencies-20147/>.
- Swedish Agency for Public Management. 2014a. *Forskningsanslagen ur ett jämställdhetsperspektiv*. Stockholm: Swedish Agency for Public Management.
<http://www.statskontoret.se/globalassets/publikationer/2014/201427.pdf>.
- . 2017. *In English*. <http://www.statskontoret.se/InEnglish>.
- Swedish Agency for Public Management. 2014b. *Innovationer till en rimlig kostnad? En analys av Vinnovas förvaltningsutgifter*. Stockholm: Swedish Agency for Public Management.
<http://www.statskontoret.se/globalassets/publikationer/2014/201405.pdf>.
- Swedish Agency for Public Management. 2014c. *Utvärdering på olika områden: En analys av sektorsspecifika utvärderingsmyndigheter*. Stockholm: Swedish Agency for Public Management. <http://www.statskontoret.se/globalassets/publikationer/2014/201407.pdf>.
- Swedish Better Regulation Council. 2016. *Enklare regler för företag och näringsliv*.
<http://www.regelradet.se/en/>.
- Swedish Council for Higher Education. n.d. *About the Swedish Council for Higher Education*.
<https://www.uhr.se/en/start/about-the-council/>.
- . 2015a. "The Higher Education Ordinance." <https://www.uhr.se/en/start/laws-and-regulations/Laws-and-regulations/The-Higher-Education-Ordinance/>.
- . 2015b. "The Swedish Higher Education Act." <https://www.uhr.se/en/start/laws-and-regulations/Laws-and-regulations/The-Swedish-Higher-Education-Act/>.
- Swedish Fiscal Policy Council. 2016a. *About the Swedish Fiscal Policy Council*.
<http://www.finanspolitiskaradet.se/english/swedishfiscalpolicycouncil/abouttheswedishfpc.4.6f04e222115f0dd09ea8000950.html>.
- Swedish Fiscal Policy Council. 2016b. *Swedish Fiscal Policy 2016 - Summary*. Stockholm: Swedish Fiscal Policy Council.
<http://www.finanspolitiskaradet.com/download/18.21a8337f154abc1a5dd28c13/1463336738723/Summary+2016.pdf>.

Swedish Higher Education Authority. 2017a. *Analys och uppföljning*. <http://www.uka.se/statistik--analys/analys-och-uppfoljning.html>.

—. 2016a. *Annual statistics on higher education in Sweden*. <http://english.uka.se/statistics/annual-statistics-on-higher-education-in-sweden-2016.html>.

—. 2016b. *Gender equality in Swedish higher education*. <http://english.uka.se/statistics/gender-equality.html>.

Swedish Higher Education Authority. 2013. *Higher education in Sweden. 2013 status report*. Stockholm: Swedish Higher Education Authority. <http://english.uka.se/download/18.5d85793915901d205f911834/1487932593308/status-report-statistics-higher-education-sweden-2013.pdf>.

Swedish Higher Education Authority. 2015. *Higher education in Sweden. 2015 status report*. Stockholm: Swedish Higher Education Authority. <http://english.uka.se/download/18.5d85793915901d205f9117b3/1487932594286/status-report-statistics-higher-education-sweden-2015.pdf>.

Swedish Higher Education Authority. 2016c. *Higher education in Sweden. 2016 status report*. Stockholm: Swedish Higher Education Authority. <http://english.uka.se/download/18.5d85793915901d205f916275/1487932593678/status-report-statistics-higher-education-sweden-2016.pdf>.

—. 2016d. *Högskoleverkets genusskrifter*. <http://www.uka.se/om-oss/publikationer-fran-uka/hogskoleverkets-genusskrifter.html>.

—. 2016e. *National system for quality assurance of higher education: Presentation of a government assignment*. <http://www.uka.se/download/18.4eb7720115a179d46c919d0/1486987267849/National+system+for+quality+assurance.pdf>.

—. 2017b. *What we do*. <http://english.uka.se/about-us/what-we-do.html>.

Swedish Institute. 2016. *10 things that make Sweden family-friendly*. <https://sweden.se/society/10-things-that-make-sweden-family-friendly/>.

—. 2017. *Sweden and gender equality*. <https://sweden.se/society/sweden-gender-equality/>.

Swedish National Audit Office. 2011. *About the Swedish NAO*. <http://www.riksrevisionen.se/en/Start/About-us/>.

Swedish Research Council. 2016a. *About the Swedish Research Council*. <http://www.vr.se/inenglish/aboutus.4.69f66a93108e85f68d48000123.html>.

Swedish Research Council. 2015a. *Analys och utvärdering av särskilda satsningar – underlag till Vetenskapsrådets inspel till 2016 års forskningsproposition*. Stockholm: Swedish Research Council. <https://publikationer.vr.se/produkt/analys-och-utvardering-av-sarskilda-satsningar-underlag-till-vetenskapsradets-inspel-till-2016-ars-forskningsproposition/>.

- Swedish Research Council. 2016b. *Direction to the future Swedish research system. Goals and recommendations*. Stockholm: Swedish Research Council.
<https://publikationer.vr.se/en/product/direction-to-the-future-swedish-research-system-goals-and-recommendations/>.
- Swedish Research Council. 2015b. *Evaluation of the Strategic Research Area Initiative 2010-2014*. Stockholm: Swedish Research Council. <https://publikationer.vr.se/produkt/evaluation-of-the-strategic-research-area-initiative-2010-2014/>.
- Swedish Research Council. 2015c. *Forskningens framtid! Karriärstruktur och karriärvägar i högskolan*. Stockholm: Swedish Research Council. <https://publikationer.vr.se/produkt/forskningens-framtid-karriarstruktur-och-karriarvagar-i-hogskolan/>.
- Swedish Research Council. 2015d. *Forskningens framtid! Svensk vetenskaplig produktion och publiceringsmönster i ett internationellt perspektiv*. Stockholm: Swedish Research Council. <https://publikationer.vr.se/produkt/forskningens-framtid-svensk-vetenskaplig-produktion-och-publiceringsmonster-i-ett-internationellt-perspektiv/>.
- Swedish Research Council. 2015e. *Forskningens framtid! Svenska forskares mobilitet*. Stockholm: Swedish Research Council. <https://publikationer.vr.se/produkt/forskningens-framtid-svenska-forskares-mobilitet/>.
- Swedish Research Council. 2015f. *Forskningskvalitet för framtiden. Redovisning av regeringsuppdrag (U2015/1362/F) – analys från Vetenskapsrådet*. Stockholm: Swedish Research Council. <https://publikationer.vr.se/produkt/forskningskvalitet-for-framtiden-redovisning-av-regeringsuppdrag-u20151362f-analys-fran-vetenskapsradet/>.
- Swedish Research Council. 2015g. *Jämställdheten i högskolan och Vetenskapsrådets forskningsstöd*. Stockholm: Swedish Research Council. <https://publikationer.vr.se/produkt/jamstalldheten-i-hogskolan-och-vetenskapsradets-forskningsstod/>.
- . 2014. "Strategy for gender equality at the Swedish Research Council."
<https://www.vr.se/download/18.70a7940b146b8f937949f953/1403793852159/Strategy+Gender+Equality+SRC+2014.pdf>.
- . 2016c. *The Swedish Research Council's guide to infrastructures*.
<http://www.vr.se/inenglish/researchinfrastructure/guidetoresearchinfrastructures.4.2b56827a13380c5abfd80001506.html>.
- . 2016d. *The Swedish Research Council's tasks in research policy*.
<http://www.vr.se/inenglish/shortcutsareas/researchpolicy/theswedishresearchcouncilstasksinresearchpolicy.4.4ba5020e152f65ed2b0b5e27.html>.
- Swedish Secretariat for Gender Research. n.d.-a. *About the Secretariat*.
<http://www.genus.se/en/about-us/about-the-secretariat/>.
- . 2014. "From statistics to analysis and improvement." <http://www.includegender.org/wp-content/uploads/2015/06/From-Statistics-to-Analysis-and-Improvement-pdf.pdf>.

Swedish Secretariat for Gender Research. 2015. "Gender mainstreaming of the allocation of grants." <http://www.includegender.org/wp-content/uploads/2015/06/Gender-mainstreaming-of-the-allocation-of-grants-pdf.pdf>.

—. 2016a. "GMA: Gender Mainstreaming in Academia." *Swedish Secretariat for Gender Research*. <http://www.includegender.org/wp-content/uploads/2015/06/Guidelines-for-Gender-Mainstreaming-Academia.pdf>.

—. 2016b. *GMGA: Gender Mainstreaming in Government Agencies*. <http://www.genus.se/en/about-us/our-assignments/gmga/>.

Swedish Secretariat for Gender Research. 2016c. *Guidelines for gender mainstreaming academia*. Gothenburg: Swedish Secretariat for Gender Research. <http://www.genus.se/en/mediapost/guidelines-for-gender-mainstreaming-in-academia/>.

—. n.d.-b. *Higher education institutions in the GMA programme*. <http://www.genus.se/en/actors/higher-education-institutions-in-the-gma-programme/>.

—. 2016d. *Research funding*. <http://www.genus.se/en/policy-organisation/research-funding/>.

Swedish Social Insurance Agency. 2014. *Föräldraförsäkringen och den nya föräldranormen*. Stockholm: Försäkringskassan.

—. n.d.-a. *Parental benefit*. https://www.forsakringskassan.se/privatpers/foralder/nar_barnet_ar_fott/foraldrapenning/!ut/p/z1/04_Sj9CPykssy0xPLMnMz0vMAfljo8ziTTxcnA3dnQ28_U2DXQwczTwDDcOCXY1CDc31g1Pz9AuyHRUBTbm8uw!!/.

Swedish Social Insurance Agency. 2015. *Socialförsäkringsrapport 2015:03 Jämställdhet och sjukfrånvaro*. Stockholm: Försäkringskassan.

—. n.d.-b. *What Försäkringskassan can do for you*. https://www.forsakringskassan.se/privatpers/foralder/nar_barnet_ar_fott/foraldrapenning/!ut/p/z1/04_Sj9CPykssy0xPLMnMz0vMAfljo8ziTTxcnA3dnQ28_U2DXQwczTwDDcOCXY1CDc31w8EKDHAARwP9KPz6g1PzgGZE4VXmbIpfgauTEboCC3djUwPHwABDYxN_ly-vYAOoAjwO9dKPSs_JTwJ6OtxZPzKnuM.

Swedish Women's Lobby. 2015. *Living up to CEDAW - What does Sweden need to do?* Stockholm: Swedish Women's Lobby. http://tbinternet.ohchr.org/Treaties/CEDAW/Shared%20Documents/SWE/INT_CEDAW_NGO_SWE_22781_E.pdf.

The Local. 2015. *Sweden is not some kind of equality paradise*. <https://www.thelocal.se/20150310/sweden-is-not-some-kind-of-equality-paradise>.

Tranquist, Joakim. 2015. "The oral history of evaluation: The professional development of Evert Vedung." *American Journal of Evaluation*, 36(4), 570-583.

UNECE. 2017a. *Statistical database: Child care enrolment and availability rates*. http://w3.unece.org/PXWeb2015/pxweb/en/STAT/STAT__30-GE__98-

- GE_LifeBalance/0104_en_GELB_Child_CARE_r.px/?rxid=c435b0ec-2113-4c07-8b14-9960f8e370b4.
- . 2017b. "Statistical database: Mean age of women at birth of first child."
http://w3.unece.org/PXWeb2015/pxweb/en/STAT/STAT__30-GE__02-Families_households/04_en_GEFHAge1stChild_r.px/?rxid=d666e163-3739-46fb-b1c0-badf85132762.
- . 2016. "Statistical database: One parent families and children by sex of parent."
http://w3.unece.org/PXWeb2015/pxweb/en/STAT/STAT__30-GE__02-Families_households/07_en_GEFHOneParFam_r.px/?rxid=d666e163-3739-46fb-b1c0-badf85132762.
- . n.d. *Statistical database: Work and economy*.
http://w3.unece.org/PXWeb2015/pxweb/en/STAT/STAT__30-GE__03-WorkAndeconomy.
- UNESCO Institute for Statistics. 2012. *International Standard Classification of Education ISCED 2011*. UNESCO. <http://www.uis.unesco.org/Education/Documents/isced-2011-en.pdf>.
- Universitets- och högskolerådet. 2014. *Jämställdhet i högskolan - ska den nu ordnas en gång för alla?* Universitets- och högskolerådet.
- Universitets- och högskolerådet. 2016. *Universitets- och högskolerådets Årsredovisning 2015*. Universitets- och högskolerådet.
- Vedung, Evert. 2010. "Four waves of evaluation diffusion." *Evaluation*, 16(3) 263-277.
- . 2002. "Utvärdering som megatrend och gigatrend." Uppslag Universitet. 1-15.
- Vinnova. 2016a. *About Vinnova*. <http://www.vinnova.se/en/About-Vinnova/>.
- . 2016b. *Our activities*. <http://www.vinnova.se/en/Our-activities/>.
- Wahl, Anna. 2014. *Ökad medvetenhet men långsam förändring - om kvinnor och män på ledande positioner i svenskt näringsliv*. Stockholm: Statens Offentliga Utredningar.
- Wallon, Gerlind, Sandra Bendiscioli, and Michele S. Garfinkel. 2015. *Exploring quotas in academia*. Robert Bosch Stiftung.
http://www.embo.org/documents/science_policy/exploring_quotas.pdf.
- Women's Business Research Institute. n.d. *Wombri*. <http://wombri.se/index.asp?lang=eng>.
- World Bank. n.d. *Fertility rate, total (births per woman)*.
<http://data.worldbank.org/indicator/SP.DYN.TFRT.IN?end=2014&locations=AT&start=2005>.