A web tool-based equal gender pay analysis for a competitive Europe (equal pacE)
Overview, elements and lessons learned

Authors:

Andrea Hammermann
Phone: +49 (0) 221 4981-314
Mail: hammermann@iwkoeln.de

Jörg Schmidt
Phone: +49 (0) 30 27877-133
Mail: joerg.schmidt@iwkoeln.de

Oliver Stettes
Phone: +49 (0) 221 4981-697
Mail: stettes@iwkoeln.de

Frank Behrmann (PMSG PersonalMarkt Services GmbH)

Felicia Lonnes (Roland Berger GmbH)

Caroline Merk (Roland Berger GmbH)

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Executive Summary

The project equal pacE aimed to provide and promote a web tool by which companies can voluntarily analyse their pay structures and detect a potentially existing gender pay gap and its causes. The equal pacE web tool has been made available in five languages: Dutch, English, Finnish, French, and Polish. Its use is free of charge. The equal pacE web tool is based on the well-established web tool Logib-D that has been funded by the German Federal Ministry for Family Affairs, Senior Citizens, Women and Youth. It was adjusted for the country-specific requirements in Flemish-Belgium and the Netherlands, as well as in Finland, France, Poland, and the United Kingdom.

The equal pacE web tool is an interactive software application that performs econometric calculations with real firm data. These calculations comply with the high-quality standards of academic research. The equal pacE web tool can be easily and autonomously handled by human resource managers. The web tool produces an outcome report that informs the user about the extent of the unadjusted and adjusted gender pay gaps in his or her organisation and the significance of the most relevant drivers. The report is company-specific and includes a lot of instructions and hints regarding how to interpret the results of the calculations. The report empowers managers to design appropriate policies that deal, in particular, with gender-related issues at work, but the report also supports human resource managers who intend to find solutions for the challenges that generally arise from demographic change.

The multi-level and multi-language equal pacE website serves as the port of entry to the five equal pacE web tools. In addition, it provides a broad range of additional material supporting the autonomous use of the web tools, such as instructions, FAQs, and test datasets. Furthermore, the equal pacE website contributes to a better understanding of the issue gender pay gap and its causes by the provision of information about the selected countries and up-to-date news of recent research findings. Information and documents are available in Dutch, English, Finnish, French, and Polish.

equal pacE train-the-trainer workshops in Brussels (Belgium), Helsinki (Finland), London (United Kingdom), Paris (France), and Warsaw (Poland) introduced the equal pacE web tool to representatives of national authorities, multipliers, social partner organisations, and companies. In a full-day training session the participants were empowered to promote the usage of the equal pacE web tools among their business members or stakeholders. The workshops also informed the participants about strategies on how they can support their members in their efforts in attracting and retaining top talent and how action can be initiated.

equal pacE offers valuable and innovative support for employers in the five selected countries who wish to analyse their pay structures with a special focus on gender. The feedback from the workshops' participants revealed that the initiative had been warmly welcomed. The merits of the equal pacE web tools were broadly acknowledged and numerous comments proposed how the knowledge of equal pacE could be passed on. equal pacE was deemed to be a "promising start" for raising awareness for the topic gender pay gap. In this respect, having quantitative data at hand was regarded as an important step for addressing the business case when a company deals with gender issues in the highly sensitive area of wage setting.

Thus, equal pacE can help to generate a "double dividend". Firstly, companies can improve their employer branding by making gender pay equality an outstanding value in HR management. Secondly, the voluntary companies' efforts simultaneously support initiatives on a sectoral or national level that also address the issue of the gender pay gap.

1. Overview

The unadjusted gender pay gap averaged 16.1 percent in the EU-28 countries in 2014 (Eurostat Database, 2016[1]). The reduction of the gender pay gap is one of the priority policy areas of the European Commission to promote gender equality. Therefore, achieving gender equality at work requires answering one crucial question: What are the causes of an existing gender pay gap (GPG)? While empirical academic research has, for years, provided some evidence on potential causes at the macro-economic level, little evidence exists about the drivers that may explain a potential GPG at the company level. Identifying these drivers requires the deployment of analysis tools by which companies can check their pay structures with respect to gender issues.

In this context, the project equal pacE ("a web tool-based equal gender pay analysis for a competitive Europe") yields a substantial contribution. The project aims to provide and promote a web tool that enables companies to voluntarily analyse their pay structures. They can detect a potentially existing gender pay gap and identify its causes. Therefore, it supports companies to find starting points for human resource management to design effective and efficient policies with respect to gender. The equal pacE web tool is available free of charge in five languages (English, Finnish, French, Polish and, Dutch). Its features are adjusted for the country-specific requirements in Flemish-Belgium and the Netherlands, as well as in Finland, France, Poland, and the United Kingdom. It is based on the well-established web tool LOGIB-D whose name is a German acronym for "pay equality in companies – Germany". LOGIB-D has been funded by the German Federal Ministry for Family Affairs, Senior Citizens, Women and Youth and is a substantial enhancement of the original version Logib provided by the Federal Office for Gender Equality in Switzerland (see Federal Ministry for Family Affairs, Senior Citizens, Women and Youth (ed.), 2011, 2016[2]).

Prompting companies to deal with gender issues in wage setting requires that national promoters address the benefits of tackling the gender pay gap, as well as the capacities and benefits of applying a web-based analysis tool. As wage setting is a highly sensitive topic, promoters have to be deemed reliable partners by the companies. Thus, representatives of social partner organisations (particularly from employer and business associations) are informed and empowered to act as promoters and trainers. In a full-day train-the-trainer workshop that was held in each of the five selected countries they were able to learn about the functionality and

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[1] Data are provisional, see Eurostat Database, http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=earn_gr_gpgr2&lang=en [18.07.2016]
[2] Federal Ministry for Family Affairs, Senior Citizens, Women and Youth, 2016, Was ist Logib-D? in URL: http://www.logib-d.de/was-ist-logib-d/was-ist-logib-d/ [20.07.2016], and Federal Ministry for Family Affairs, Senior Citizens, Women and Youth (ed.), 2011, Logib-D: Versionsgeschichte, in URL: http://www.logib-d.de/fileadmin/doc/Versionsgeschichte%20Logib-D.pdf [20.07.2016].

explanatory power of the equal pacE web tool. Public authorities in these countries were invited to effectively support the involvement of both promoters and companies.

As awareness among businesses, social partners, public authorities and the general public in the issue of gender pay equality should be raised, and contact to the equal pacE team should be established, a multilevel website was created (www.equal-pacE.eu). The project's website not only serves as the port of entry to the country-specific equal pacE web tools: italso contributes to a better understanding of the issue of the gender pay gap by providing country-specific information for Belgium, the Netherlands, Finland, France, Poland and the United Kingdom. Furthermore, up-to-date news of related research findings were released periodically. Finally, a regularly distributed newsletter informed subscribers about recent developments in the project and summarised the published news.

2. The equal pacE web tool – features of an easy-to-use software application

The equal pacE web tool is an interactive software application for companies in the selected countries by which they can analyse their pay structure with reference to gender-issues. The tool calculates the unadjusted gender pay gap and runs regressions that not only indicate an adjusted gender pay gap but also identify the main drivers of a potentially existing intra-firm gender pay gap. In this respect, the web tool complies with the high quality standards set in empirical academic research.

 The equal pacE web tool produces an outcome salary report that informs companies about the size of the unadjusted and adjusted gender pay gap (see diagram 1). In addition, wages of men and women are depicted with reference to age, educational achievement, work experience, tenure, job complexity, and the management level.

Diagram 1: The equal pacE Outcome Report

Source: http://www.equal-pacE.eu

Thus, the company can learn what drives the size of a potentially existing gender pay gap at the firm level. The report includes a lot of hints and recommendations on how to interpret the findings. Therefore, human resource managers are empowered to design polici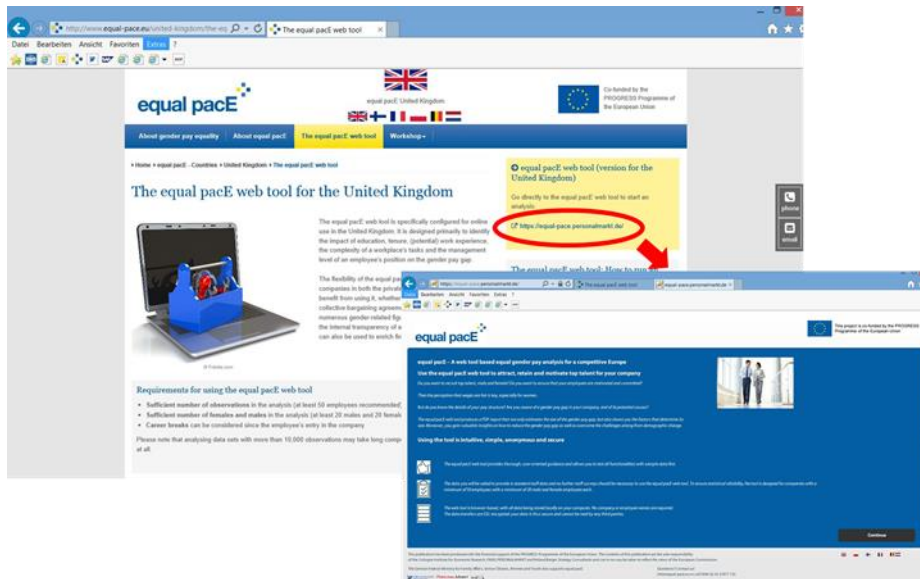es that may deal with gender-issues at work. However, as the users get in-depth insights into their own pay structure, the outcome report can also be applied for other topics, such as a starting point for designing incentive systems, human resource policies dealing with an ageing workforce, etc. In the end, the equal pacE web tool analyses can support the companies' efforts to improve employer branding.

The equal pacE web tool is developed for the autonomous and anonymous application. Its use is free of charge. The web tool is accessible via the equal pacE website (see diagram 2). A broad range of additional material provides support. These include instructions, help-files, FAQs, test data sets and example outcome reports based on fictional data. Background information about the relevance of gender in pay issues is presented on the various country-specific subpages and in

ad-hoc news. They allow users to compare the results of their analyses with the national averages.

The equal pacE web tool can be used by companies and organisations from all sectors that are interested in analysing their pay structure with reference to gender issues. It is available in five languages (Dutch, English, Finnish, French, and Polish) and is adjusted to the specific conditions in Flemish-Belgium, the Netherlands, Finland, France, Poland, and the United Kingdom. As the underlying econometric calculations stipulate some technical preconditions, achieving reliable results requires that companies should include data of at least 50 employees. In addition, the recommended

Diagram 2: Port of entry to the equal pacE web tool

Source: http://www.equal-pacE.eu

minimum number of both female and male employees should come to a total of least 20 persons. Although small(er) companies may also use the equal pacE web tool it is recommended that they interpret the results with caution. It could not be ruled out that the outcome of the calculations is biased.

The analysis of the web tool can be aligned with the specific requirements or interest of the users. That means that a user can, depending on the availability of appropriate data and compliance with the preconditions, separately perform gender-related analyses for each salary component and unit of the company. For example, the user can easily detect whether the gender pay gap can be attributed to gender differences in obtaining bonus payments, overtime compensation or any other salary component (as long as the technical requirements are met). In addition, the analyses with the equal pacE web tool can also be repeated for any subsidiary or subgroup within the company, such as all employees from a specific department, and fixed-term or part-time employees. By converting the data to the default "full-time full-year", valuable conclusions can be drawn regarding the reasons for gender-related differences in payments in these subgroups.

Finally, the equal pacE web tool enables the user to identify the impact of career-breaks in a two-step-procedure. In many companies' datasets, tenure is automatically derived from the comparison of the entry date and the reference date of the calculation. Career-breaks, irrespective of the length, are often included in firm-data on tenure. Performing the calculations firstly with the original data and

afterwards with an amended dataset whose tenure variable is adjusted by hand to cover the length of career breaks (i.e. adjusted tenure = tenure minus the cumulative duration of career breaks) show the impact of the latter.

Diagram 3: Comparing the unadjusted and adjusted gender pay gap – on company level

The unadjusted gender pay gap equals the difference in average salaries of women and men as a share of the average salaries of men (in percent). The adjusted gender pay gap depicts the gap in salaries (in percent) which would remain if women and men would not differ regarding their educational attainment, potential employment experience, tenure, job complexity and management level.
Source: Illustration taken from the equal pacE outcome report 1, p. 6, results based on test data[3].

The outcome report shows the unadjusted and adjusted gender pay gap that result from the calculations by the equal pacE web tool with real firm data. The adjusted gender pay gap takes into account some of the drivers which have been proved to be most significant in empirical research at the macro-economic level. This applies to education attainment, tenure, (potential) employment experience, job complexity and the management level. The size of the unadjusted and the adjusted gender pay gaps is presented in an easily interpretable chart (see diagram 3). The user is informed that the remaining adjusted gender pay gap may result from workers' or jobs' characteristics which are not taken into consideration in the equal pacE web tool calculation.

Users also obtain valuable information on the proportion of the gender pay gap that can be attributed to each of these characteristics (see diagram 4). Although the indicated figures are only approximations of the real value due to technical reasons, they already allow the user to identify issues that can be deemed the most promising starting points for interventions of the human resource management.

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[3] See http://www.equal-pace.eu/fileadmin/files/pdf/Outcome_report_1_en_2015-09-09.pdf [18.07.2016]

Diagram 4: Comparing the drivers of the gender pay gap – on company level

The pointers indicate the approximate share of the pay difference caused by the variables shown. Example: An indicator pointing to the left approximately displays the percentage points by which the gender pay gap would be reduced if men and women (on average) do not differ in their educational attainment. Conversely, an indicator pointing to the right approximately displays the percentage points by which the gender pay gap would be increased if men and women (on average) do not differ in their educational attainment.
Source: Illustration taken from the equal pacE outcome report 1, p. 9, results based on test data[4].

In addition, comprehensive gender-related data is provided concerning the link between wages and workers' characteristics. This includes bar charts about the wage structure e.g. according to age, educational attainment etc. and numerous tables about the composition of the workforce with respect to these criteria. Hence, human resource managers get in-depth insights into the distribution of males and females along wage-relevant characteristics. They also obtain information on whether female employees are under-represented in specific domains and, therefore, whether they can initiate special programs to support women in their career advancement.

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[4] See http://www.equal-pace.eu/fileadmin/files/pdf/Outcome_report_1_en_2015-09-09.pdf [18.07.2016]

3. From individual data to the equal pacE web tool report in just a few steps

Users have to compile the required individual data of those employees who are to be covered by the analysis. The individual data should be rendered anonymous and afterwards inserted in the template (csv.-format)[5] which is available for download.

Diagram 5

	A	B	C	D	E	F	G	H	I	J	K
1	id	date of birth	date of entry	tenure_2014	educational a	gender	job complexity	management	basic paymer	holiday payme	christmas bor
2	1	26.03.1962	23.08.1990	24	1	m	3	1	43132		
3	2	15.09.1974	20.08.2000	14	1	m	2	1	29733		
4	3	10.08.1973	29.03.1992	22	1	m	2	1	29822		
5	4	28.10.1970	02.11.1999	15	1	f	2	1	27834		
6	5	23.02.1993	12.01.2006	8	1	f	3	1	23272		
7	6	10.09.1975	07.06.2004	10	1	m	2	1	24053		
8	7	16.06.1988	07.12.2004	10	1	m	2	1	22562		
9	8	07.10.1970	07.06.2004	10	1	m	2	1	24441		

Source: http://www.equal-pacE.eu, help-file

Extended help- and FAQs-files instruct the user on how the dataset should be prepared and how the value of valuables should be defined properly. The finalised dataset can be uploaded to the web tool. The uploaded data is only stored for the purpose of generating an outcome report (PDF-format) and is deleted afterwards. Thus, data protection is ensured.

Diagram 6: Choosing the information for an analysis with equal pacE

Easy to use: Drag the column header (on the left-side) and drop it into the Data fields (on the right side). Source: Illustration taken from the equal pacE web tool (version for the United Kingdom), results based on test data[6].

After uploading the data, the equal pacE web tool applies an easy-to-use drag-and-drop procedure to start the calculations. The user is requested to fill in the fields of

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[5] A csv-file can be produced within Microsoft Excel.
[6] See https://equal-pace.personalmarkt.de/ [18.07.2016]

variables that should be taken into account. He or she can easily drag the variable label into the column header and drop it into the corresponding data field in the selection basket. The variable label and the corresponding data field in the basket will turn green. After filling all required data fields in the basket, the start button is unlocked and the calculations can be started by clicking on the start button (see diagram 6). Performing the calculations and generating an outcome report may last some minutes depending on the size of the dataset. Text modules are merged with the results of the calculations that are depicted in tables and figures. Finally, the user can download his or her individual outcome report.

4. Train-the-trainer workshops – Disseminating knowledge about equal pacE and the issue of gender pay equality

Train-the-trainer workshops, which are available in all five countries, introduce the equal pacE web tool and complement the web-based services and products (see diagram 7). They empower social partners and multipliers to promote the usage of

Diagram 7: Focus countries of equal pacE

the equal pacE web tool to their business members or stakeholders. The train-the-trainer workshops inform its participants about equal pacE and present strategies and tools, which the participants can use to support their members in attracting and retaining top talent, irrespective of gender. Public authorities can learn about the functionality and explanatory power of the equal pacE web tool and share their knowledge and their ambitions with multipliers and social partner organisations. In this respect, the train-the-trainer workshops also contribute to a better understanding of the gender pay gap, its most significant causes and the effectiveness and

Source: Own illustration based on Roland Berger (2015), equal pacE: A web tool based equal gender pay analysis for a competitive Europe, Workshop manual, London, November 2015, p. 10 (unpublished).

efficiency of policies that deal with gender issues at work.

The workshops are structured in four sessions (see Diagram 8). In the first session, participants obtain general information about the initiative and the framework the project is fitted in (part I). In the second session, they learn more about the situation of the gender pay gap in their country and its most relevant drivers on the macro-economic level (part II). While the aim of parts I and II is to raise awareness of the relevance of the topic and increase the knowledge of what might be promising starting points for action,the third session is the core of the train-the-trainer workshops. In this session, participants become familiarised with the features of the equal pacE web tool and are trained to apply the equal pacE web tool appropriately. They receive recommendations on how to use the web tool for a variety of applications and obtain hints on how to interpret the results (part III). The fourth session informs its participants on the benefits of getting involved in equal pacE (part

IV). Strategies and tools are presented and discussions are held regarding how the equal pacE web tool can be promoted amongst their members and stakeholders. Generally, the train-the-trainer workshops also allow participants to share their own knowledge and experience by discussing related issues in the field of gender equality at work.

Diagram 8: Which topics were addressed in the workshops

	Introduction	
	PART I →	**PART II** →
Question	How does equal pacE contribute to a reduction of the gender pay gap (GPG)?	How significant is the gender pay gap in the EU and the UK and what are the main drivers of the gender pay gap?
Main points	> Framework equal pacE > Importance of reducing the gender pay gap > Elements of equal pacE	> Status quo and development of the gender pay gap (GPG) in the EU-28 > Status quo and development of the gender pay gap (GPG) in the UK > Main drivers of the GPG
Takeaways	**Getting to know equal pacE and understanding what the initiative offers to organisations**	**Understanding the status quo of the GPG and its main drivers**

	Working sessions	
	PART III →	**PART IV** →
Question	How can companies detect a gender pay gap and what can companies do to reduce it?	How can organisations engage systematically in the reduction of the GPG and position themselves successfully?
Main points	> Introduction of the equal pacE web tool (e.g. requirements, features, field of application) > Exemplary use of the web tool and analysis of data > Interpretation of results	> Discussion of benefits of an engagement > Presentation of good practices > Discussion of starting points to introduce and promote the topic and the tool throughout the member network
Takeaways	**Understanding how to detect and analyse a gender pay gap by using the equal pacE web tool**	**Understanding how to promote the reduction of GPG among your member organisations**

Source: Roland Berger (2015), equal pacE: A web tool based equal gender pay analysis for a competitive Europe, Workshop manual, London, November 2015, pp. 6-7 (unpublished).
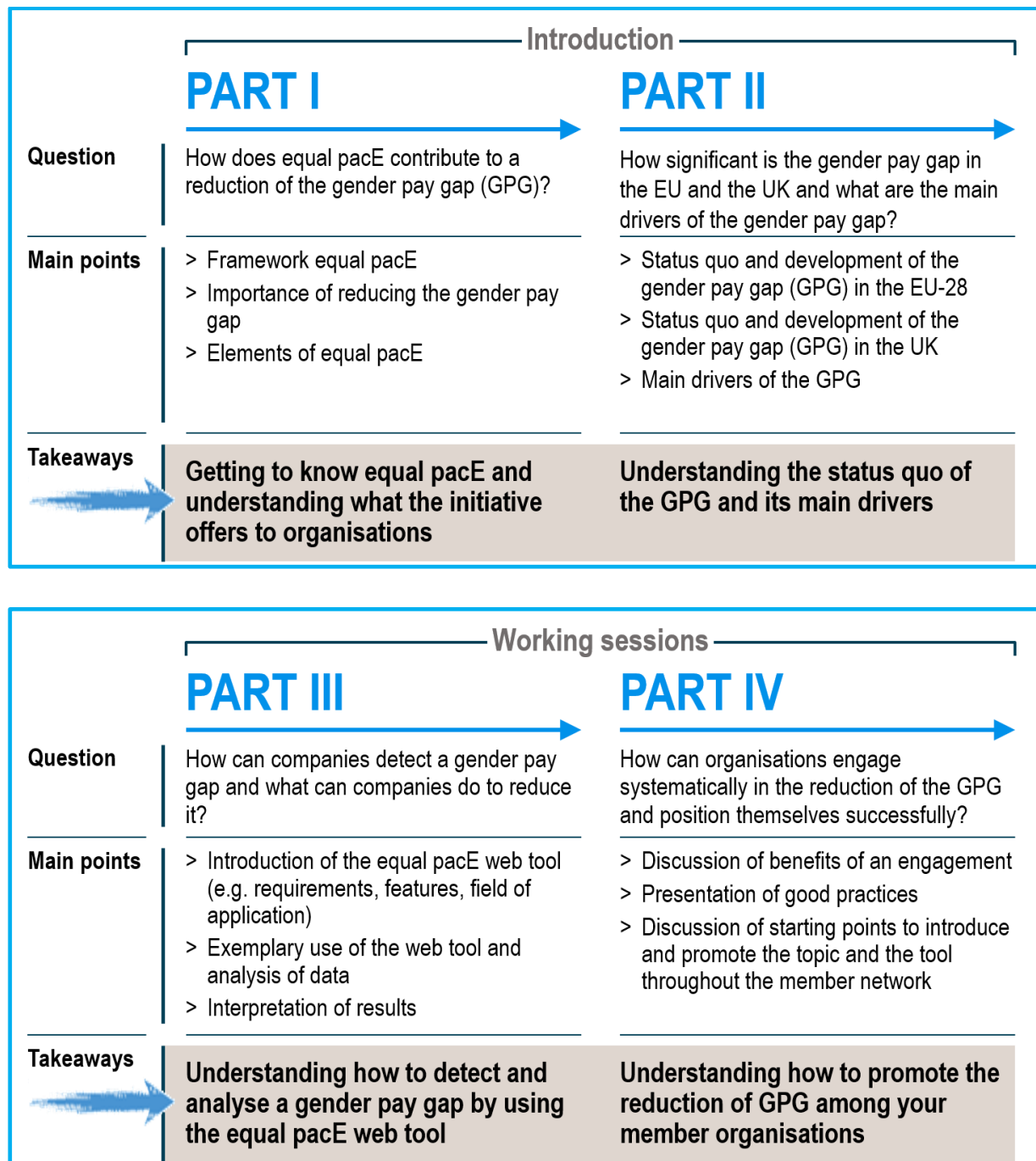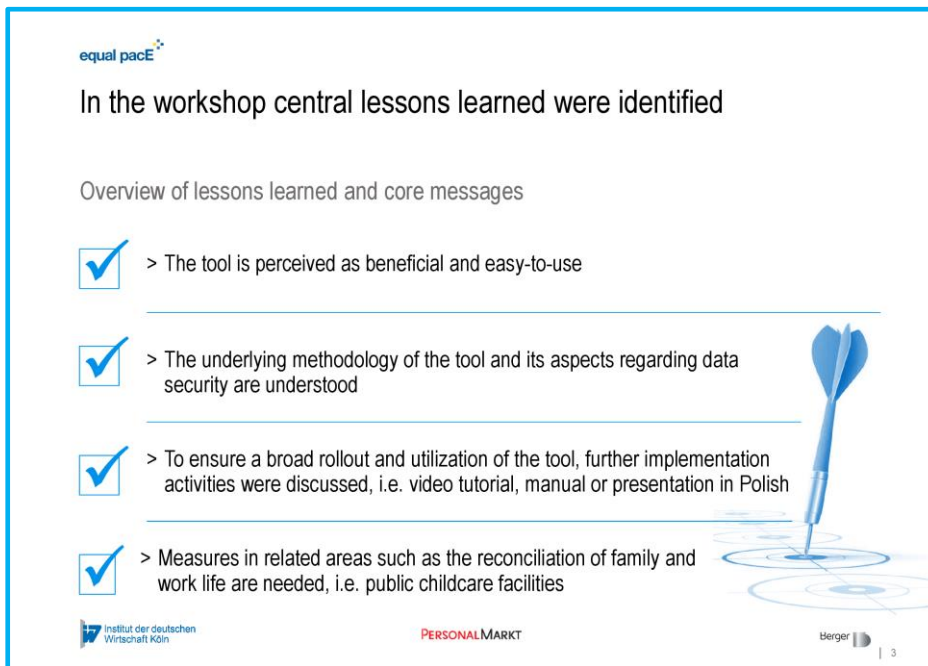
So far, the audience of the events has contained representatives from various organisations, such as women's associations, researchers, companies, diversity networks, governmental bodies, unions, and universities. The participants provided valuable and generally positive feedback and welcomed the initiative (see Diagram 9 for the feedback in the workshop in Poland). The merits of the equal pacE web tool were broadly acknowledged and numerous comments proposed how the knowledge of equal pacE can be passed on. The participants emphasised that equal pacE is a very "good start" for raising awareness of the topic of gender

Diagram 9: Lessons learned: Workshop in Poland

Source: Roland Berger (2015), equal pacE: A web tool based equal gender pay analysis for a competitive Europe, Workshop protocol, Warsaw, September 2015, p. 3 (unpublished).

pay equality. Having quantitative data at hand is useful when putting focus on the business case of dealing with gender issues, as far as wage setting is concerned. Other comments proposed that the implementation of a label or certificate as a testimony of the companies' awareness in the field of gender pay equality could effectively support and complement the initiative. According to the participants, a broad roll-out and utilisation of the equal pacE web tool requires additional support from national authorities as well as the provision of supplementary training material, such as video tutorials. Follow-up meetings could increase the level of awareness of equal pacE.

However, some participants stressed that equal pacE cannot substitute policies that aim to improve the reconciliation of work and family life, such as the provision of affordable, publicly available childcare facilities. It was also controversially debated whether the equal pacE web tool can be, and, with respect to its voluntary approach, should be integrated into existing or upcoming legislative initiatives.

5. Some final remarks – lessons learned

The project equal pacE offers a valuable and innovative software tool to employers in Belgium, Finland, France and Poland, as well as in the Netherlands and the United Kingdom. The equal pacE web tool allows human resource managers to easily and autonomously analyse the organisation's pay structure with a special focus on gender. They can obtain comprehensive information about the causes of a potentially existing gender pay gap at firm level. Human resource managers can infer from the analysis which policies and measures may be most promising when they deal with gender-related issues at work.
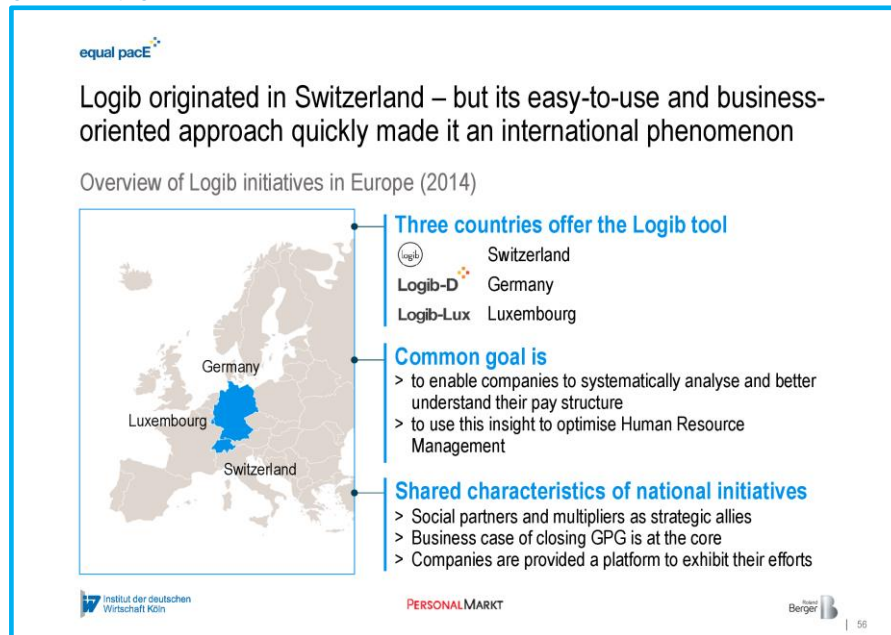
The issue of the gender pay gap at firm level falls within the domain of the highly sensitive topic of wage setting. The sensitivity is even higher when legislative initiatives are announced, upcoming, or even already in place. Motivating and attracting companies to voluntarily use the equal pacE web tool and share their knowledge and experience with other companies and stakeholders then becomes a challenge. Evidence at macro-economic and firm level suggests that companies cannot directly influence the most relevant causes of a potentially existing gender pay gap. The analyses of numerous empirical studies during the equal pacE project have shown that pay differences between female and male employees predominantly result from decisions of individuals during the life course they take with regard to individual preferences (e.g. occupational choices), the institutional framework (e.g. the availability of childcare facilities) and the societal background (e.g. conforming to stereotypes). The appendix provides the results of a meta-study. Action directed towards companies and human resource management is likely to fail and voluntary engagement is likely to be crowded out.

However, putting the emphasis on the business case is crucial for initiatives such as equal pacE. Companies can improve their employer branding if they make gender pay equality an outstanding value in human resource management. As they can position themselves as fair employers, they gain a competitive advantage in times of skill shortages and the "war for talents" – particularly with respect to the exploitation of female labour supply. In this regard, the involvement in projects, such as equal pacE, can effectively complement human resource policies that focus on the reconciliation of the work and family life or the career advancement of female talents. In the end, a coherent approach which is aligned with the specific requirements of an individual company, can lead to a more equal distribution of men and women along wage-relevant job characteristics inside a company and, thus, can contribute to a reduction of the unadjusted intra-firm gender pay gap.

The experiences made in the project equal pacE and its German twin-project LOGIB-D clearly show that a large-scale usage of the web tools not only takes a great deal of time, it also requires combined efforts to disseminate the knowledge of the goals of these projects and the benefits of using the tools among employers, social partners and multipliers. Combined efforts can include several activities: a large-scale

Diagram 10: equal pacE and Logib: Business-oriented approaches to reduce the gender pay gap

Source: Roland Berger (2015), equal pacE: A web tool based equal gender pay analysis for a competitive Europe, Workshop manual, London, November 2015, p. 56 (unpublished).

communication campaign should be set up to introduce the project, its objectives and partners to the general public and the target groups. A pilot stage should be implemented which includes the involvement of selected members of the final target groups, i.e. the companies. These first-movers can firstly give valuable feedback concerning the initiative's general approach, and secondly conduct test runs with the software application and thus contribute to the optimisation of functionalities and features of the tools as well as to the customisation of complementing services (e.g. consulting). Thirdly, the first movers can then serve as testimonials in a second stage of the project that aims to roll out the web tools on a large scale. The roll-out activities can be promoted by the implementation of a label or certificate that indicate the existing awareness of a company for the issue of gender pay equality. The implementation of network meetings (regional or national) facilitates the exchange of ideas, experiences and best practices. However, the implementation of this bundle of complementing activities requires a financial and substantial contribution from public authorities who are aware of the sensitivity and complexity that governs the issue of the gender pay gap.

Appendix

Authors	Contents
Arulampalam, Wiji / Booth, Alison / Bryan, Mark (2006)	The authors use harmonised data for Austria, Belgium, Britain, Denmark, Finland, France, Germany, Ireland, Italy, Netherlands and Spain from the European Community Household Panel, a large-scale survey conducted annually from 1994 to 2001. They apply quantile regression techniques to control for the effects of individual and job characteristics at different points of the wage distribution. In particular, Arulampalam et al. (2006) investigate the extent to which gender affects the location, scale and shape of the conditional wage distribution, and whether or not these patterns differ across the public and private sector. Therefore, the authors deviate from the common Oaxaca-Blinder-decomposition model by looking at the effects of gender and other covariates on different quantiles of the log wage distribution.
	There are eight countries – Austria, Belgium, Britain, Denmark, Finland, France, Italy and the Netherlands – where the gender wage gap is highest at the 90th percentile of the wage distribution. The authors interpret the exceeding of the gender wage gap at the 90th percentile of at least two percentage points compared to any other estimated wage gap in the wage distribution as an indication for the existence of glass ceilings in women's career. With the exception of Finland and the Netherlands, the estimated wage gaps are generally higher in the private sector compared to the public sector. In Finland, the wage gap increases from about 15 percent at the 10th percentile to the highest gap with about 32 percent at the 90th percentile. Moreover, in three countries – Austria, France and Ireland – gender wage gaps at the bottom of the wage distribution (10th percentile) are higher relative to those at the 25th percentile. Because this deviation is higher than at least 2 percentage points, the authors call this the sticky floor phenomenon.
	To explain the varying gender pay gaps among the European countries the author analyse the countries' differences concerning institutional settings, gender specific policies and pay-bargaining institutions. Arulampalam et al. (2006) find evidence that union coverage mitigates the glass ceiling but increases the magnitude of the stick floor phenomenon. Furthermore, their results indicate an ambiguous effect of family-friendly policies. On the one hand, these policies could help to strengthen the ties of women and their employers and, therefore, increase women's incentive to invest in specific human capital. On the other hand, these policies could increase women's time out of workforce after childbearing. According to the authors, these thoughts might explain why family-friendly policies are positive correlated with the existence of glass ceilings but are negative correlated with sticky floors.
Azmat, Ghazala/ Ferrer, Rosa (2015)	The authors use data from "After the JD", a nationally representative, longitudinal survey of associate lawyers in the United States, representing lawyers first admitted to the bar in 2000. They analyse the hours billed and the new client revenues as two prevalent performance measures for

lawyers. The survey was first conducted in 2002 and repeated in 2007. Azmat and Ferrer (2015) concentrate on the second survey wave, which includes the two performance measures as well as other relevant aspects like the aspiration to become a partner. The data set contains information on over 1,100 lawyers.

On average, male lawyers bill 153 more hours per year than female lawyers. An in-depth analysis reveals that childrearing responsibilities explain a great deal of this performance gap. Beside a greater share of household responsibilities, female lawyers show lower career aspirations irrespective of the presence of children. While 60 percent of men state a high aspiration to become an equity partner in their firm (score of eight or above on a scale from one to ten) this applies barely to one out of three women (32 percent). As the results show, career aspirations are strongly related to performance outcomes.

Different career aspirations explain a part of the gender gap in hours billed as well as the lower revenue of newly acquired clients by female lawyers. For the latter, gender becomes an insignificant explanatory variable if career aspirations are included in the multivariate regression. In other words, career oriented women and men show the same performance level. Furthermore, both performance measures have a strong effect on the probability of a promotion and explain around 40 percent of the promotion gap of female and male lawyers after controlling for further individual and firm characteristics.

The study by Azmat and Ferrer (2015) shed light on the strong relationship of earnings and promotions with individual work performance. Even though this result is intuitive, it is often neglected in the discussion of the gender pay gap. Whereas workplace discrimination is not evident in the data, main drivers of the observed gender performance gap are differences in childrearing responsibilities and career aspirations. Even if the study focus on the particular case of a legal profession, its results are most likely applicable to other occupations. Empirical evidence on the subject is, however, rare based on the reason that job performance is normally less comparable across firms and areas of specialization.

Bargain, Olivier / Doorley, Karina / Van Kerm, Philippe (2016)	Bargain et al. (2016) use panel data of the Living in Ireland Survey and the British Household Panel Survey from 1999 to 2001 in Ireland and 1998 and 2000 in the UK. By applying a distribution regression method, the authors estimate the gender pay gap before and after the introduction of the national minimum wage at different points of the wage distribution. Thus, they are able to deduce the effect of the minimum wage at the bottom of the wage distribution as well as possible spillover effects further up in the distribution. The study provides evidence that the gender pay gap in Ireland declined after the introduction of the minimum wage, while there seems to be no effect in Britain. Because of the similar "bite" of the minimum wage in each country, the authors suggest that the different results for the two neighbor countries may be due to a higher degree of compliance to the minimum wage in Ireland. Furthermore, they found a negligible effect of the minimum wage at the mean gender wage gap and correction by up to 100 percent at

	the bottom of the gender pay gap. The authors assume that a pre-existing spreading trend in the gender wage gap further up in the wage distribution combined with potentially negative spillover effects of the medium wage could be responsible for the stable mean gender wage.
Blau, Francine D. / Kahn, Lawrence M. (2016)	The authors use microdata from the Michigan Panel Study of Income Dynamics (PSID) and the March Current Population Survey (CPS) to analyse trends and sources of the US gender wage gap. The study suggests that after a long period of a stable female/male earnings ratio of 60 percent, women's relative wages rose sharply in the 1980s and continued to increase slower and more uneven since then. In addition, Blau and Kahn (2016) find that women at the top of the wage distribution gained less compared to those at the bottom or middle of the wage distribution.
	According to the study, the narrowing of the gender pay gap came along with an increase of women's relative labour market qualifications and commitment to work. A decomposition analysis shows that differences in occupation and industry remain important explanations of the gender pay gap even though women have upgraded in their occupational careers. The role of unionization and human capital factors, instead, became less important as gender differences have been decreasing over time. In particular, women narrowed the education gap compared to men. By 2011, women were even more likely to have higher average levels of schooling and an advanced degree.
	In the second part of their study, Blau and Kahn (2016) reviewed existing literature to shed light on the different explanatory factors of the gender pay gap. Their study gives an up-to-date overview on research considering the gender differences in occupations, industries and the particular roles of women's work force interruptions and lower working hours for the gender pay gap. Besides, the authors discuss experimental literature on special soft-skills of women and men to give further arguments to the so far unexplained part of the gender pay gap, which remained roughly stable since the 1980s.
Boll, Christina / Leppin, Julian Sebastian (2014)	In their research approach based on the German SOEP cross-section and panel data, the authors splitted the individual attained years of schooling in over-, undereducation and required education according to job-specific requirements. Thereafter, they measured separately the different returns to education for male and female graduates from East and West Germany. Finally, they decomposed the gender wage differentials by applying the Oaxaca-Blinder-Method.
	The findings of Boll and Leppin (2014) indicate that high returns depend on good matches of educational qualification and job-specific requirements. In contrast to the concept saying "the more education, the better", the attained required education pays off more than overeducation. Additionally, the returns differ significantly between the sexes, particularly undereducation induces a lower wage penalty for men than for women. Nevertheless, women achieve higher rates for proper job-education-matches, and this in turn especially in the Western part of Germany.
	Overeducation, however, does not seem to affect the gender pay gap

	among the analyzed graduates. Instead, women exhibit averagely fewer years of required education than men. Consequently, the pay gap is largely driven by differences in gendered education duration apart from other overall differences in characteristics of job biographies.
	Since the general labor market participation of men and women differ in East and West Germany and the principal effects of over-, undereducation and required education are roughly similar in both regions, the authors conclude that prevailing gender roles and stereotypes cause education investments and employment biographies, which affect the wage payments. All in all, gendered educational inadequacies play only a minor role in explaining the gender pay gap.
Boll, Christina / Hüning, Hendrik / Leppin, Julian / Puckelwald, Johannes (2015)	The study is based on the 2012 wave of the German Socio-Economic Panel (SOEP), which is a representative survey of private households in Germany including particular information on employment biographies. The study applies two scenario frameworks to analyse the effects of the statutory minimum wage on the gender pay gap both with and without considering potential labour market effects. The authors use a special decomposition model, which is based on the approach of Oaxaca (1973) and Blinder (1973).
	As expected, a newly introduced minimum wage reduces the unadjusted gender pay gap by compressing the bottom of the wage distribution to tackle the sticky-floor effect. As a result, in the first scenario without labour market effects the unadjusted gender pay gap declines by 2.5 percentage points from 19.6 percent to 17.1 percent. The gender pay gap even further declines by 1.2 percentage points if employment effects are incorporated and a neoclassical model is assumed with a high labour demand elasticity. In this scenario, however, it becomes evident that job losses are more likely for women than for men.
	As the investigation with real data are not yet feasible, Boll et al. (2015) analyse the potential effects of the introduction of the minimum wage on the gender pay gap by simulations for the year 2012 and find evidence that the reform can cut down the pay differentials between men and women at the bottom of the income distribution. The study, however, can only give an impression of possible effects but it could not capture any shiftings in the wage distribution until the reform comes into force in 2015. In addition, a precise prediction of the effects seem to be difficult since the effects on the gender pay gap vary with the assumed labour market model and labour demand elasticity. Therefore, further analyses are necessary to verify the study results.
Busch, Anne / Holst, Elke (2008)	Busch and Holst (2008) focus on gross wages of female and male employees aged between 18 and 65 years. They use data from the 2005 and 2006 waves of the German Socio-Economic Panel (SOEP). The authors apply an Oaxaca-Blinder decomposition model to split the gender pay gap in an explained part and an unexplained part. While the former can be traced back to differences in male and female job biographies, educational backgrounds or occupational segregation, the unexplained part of the gender pay gap includes unobserved differences of female and male

	employees, which might be different evaluations of their characteristics due to social or cultural framing.
	The study supports prior research results of a negative correlation between the extent of the regional unemployment rate and the regional wage level. One possible reason could be that a high unemployment rate reduces employee's bargaining power in wage negotiations. However, by splitting female and male employees in two sub samples, Busch and Holst (2008) find evidence for the negative relation of unemployment and wages exclusively for women. The wage level of female employees decreases by 6.4 percent if the unemployment rate in the respective region doubles. Moreover, the explainable part of the gender pay gap rises from 77 percent to 82 percent if regional variables like the place of residence, regional unemployment rates and the settlement structure are included into the decomposition model.
	The study by Busch and Holst (2008) provides evidence of the high importance of regional aspects for wages and, in particular, for the gender pay gap. The authors conclude that one reason why women's wages are stronger affected by the extent of local unemployment might be their higher preferences for family-friendly jobs and, thereby, their lower job mobility. According to the authors, another disadvantage of women in areas with high unemployment rates might be their focus on only a narrowed range of jobs. Both aspects lower women's bargaining power in wage negotiations especially in tight job markets.
Carlsson, Magnus / Reshid, Abdulaziz Abrar / Rooth, Dan-Olof (2014)	The study is based on data from LISA (Longitudinal integration database for health insurance and labour market studies) which are linked with information from a multi-generation register. It covers the years 2001 to 2008 and focuses on recent and "yet childless" college graduates who graduated from college one year before.
	The results show that an average wage gap between male and female college graduates of about 12 percent could be observed at labour market entry. After controlling for pre-labour market factors, such as age, level of education, field of study and year of graduation (fixed effects), the gap drops to 2.9 percent. By adding controls for occupations and sectors the gap slightly decreases to 2.4 percent. A decomposition analysis reveals that the field of study by itself explains the largest part of the pay gap, e.g. this is about half of the gender pay gap without considering controls for occupations and sectors, whereas this proportion is about one third when including occupations and sectors.
	The results suggest that gender pay inequality among recent college graduates in Sweden can mainly be explained by pre-labour market factors and, in particular, by choosing the field of study. As the authors point out, their study only focuses on the gender pay gap at career entry. Therefore, they propose future research to investigate why men and women choose different fields of education and to explain the dynamics of the gender pay gap over the life cycle.
Claussen, Jörg / Czibor,	The dataset contains of over 4 million games from the largest online "Schafkopf" gaming platform sauspiel.de. In total, the study is based on

Eszter / van Praag, Mirjam (2015)	roughly 16 million observations of more than 15 thousand individual players. Schafkopf is a zero-sum game played by four participants using the Bavarian deck of cards with a traditionally quite low percentage of female players (8.5 percent). According to the Claussen et al. (2015), the dataset is therefore suitable to analyse men and women in an uncertain, competitive and male-dominated environment similar to top career positions.
	The authors find a significant and sizeable gender gap in the likeliness to start a game and to raise stakes. While on average, male players have a likelihood of 18.3 percent of taking the initiative, female players initiating rate is only 15 percent. Further study results suggest that women who take the initiative have better cards than men when they initiate a game.
	Based on the observable differences in the playing behaviour of women and men, Claussen et al. (2015) conclude that women are more risk averse. However, the authors draw attention to the fact that women who have entered the game community are not more averse regarding risks or competition. Instead, women seem less willing to initiate these kind of situations. The study results might therefore contribute to explain why women are less likely to participate in promotion tournaments even if they self-selected into male-dominated industries.
	The study is based on a large data set and its experimental character provides control variables like the ability of playing and players game history. This allows to exclude other explanatory factors for gender differences like a lower interest in winning or certain competitive attitudes in gender homogeneous or heterogeneous groups. As a drawback of the study design, the transfer of study results into real work situations has to be regarded with caution. Nevertheless, the study provides interesting empirical evidence of gender differences in preferences relevant in many economic decision making situations.
Cortés, Patricia / Pan, Jessica (2016)	Cortés and Pan (2016) use data drawn from the 1980 to 2000 Censuses and the 2011 American Community Survey three-year aggregate (2009-2011). The authors focus on gender wage gaps and returns to working long hours at the occupational level of native-born individuals aged between 25 and 64 with at least a bachelor`s degree working full time with 35 hours or more per week.
	The authors' research design is affected by a previous study of Goldin (2014), which provide evidence that occupations characterized by high monetary returns to overwork are also those with the largest gender gap in earnings. Cortés and Pan (2016) use variation in low-skilled immigrant flows as exogenous shocks for the supply of women's working hours to verify if a causal link between a high demand for long working hours in certain jobs and womens' relational lower wages exists.
	Given their dual roles in home production and in the labour market, women seem to place a higher value on temporal flexibility. However according to the authors, a simple correlation between occupations with a high tendency for overtime work and a high gender pay gap is not sufficient to prove a causal link. They argue that an observed relationship could be biased by other job characteristics, e.g. a particular high competitiveness among the

	work force or sorting of workers. By focusing on supply side shocks in form of a greater availability of market substitutes for household services, the authors could isolate a positive effect of women working longer hours on narrowing the gender pay gap.
Couppié, Thomas / Dupray, Arnaud / Moullet, Stéphanie, (2014)	The data set consists of the Céreq's Génération 98 survey data, which contains about 55,000 observations and which is representative for young people leaving the educational and training system in 1998. Individuals who were unemployed (10 per cent) or inactive (8 per cent) at the survey date are excluded, leaving 44,337 observations. The computation of segregation indexes is based on the flows of young labour market entrants from the same cohort. Couppié et al. decompose the occupational segregation index proposed by Karmel and MacLachlan (1988) into education pre-sorting and labour market sorting (e.g. through employers' hiring and assignment behavior).
	The authors find that one-third of the 77 observed occupations have a strong link to educational pre-sorting. This applies mainly for male-dominated occupations. Thus, for men the education and training system seems to be a better predictor of the subsequent occupational assignment. While women prefer service-oriented courses, such as health and social work, courses related to industry, technology and sciences are male-dominated. In particular, women tend to have a more restricted choice on few courses, whereas men select into various education and training courses.
	An Oaxaca-Blinder decomposition further reveals that the gender pay gap (gpg) of young workers is lowest in occupations where skill requirements are strongly linked to the courses of study. In contrast, the gpg is higher if occupations are accessed from a wide range of educational backgrounds. In occupations with a balanced gender mix, the differences in the wage treatment of men's and women's characteristics account for most of the wage gap. Moreover, the male-dominated occupations have a comparatively low wage gap, while the unexplained component of the gpg is much higher than in female-dominated occupations. In other words, women are paid the same as men in male-dominated occupations but they show a positive selection bias based on education and experience.
	Altogether, the study of Couppié et al. (2014) indicates a strong explanatory power of educational segregation for the gender pay gap. This could mainly be traced back to the hierarchy of educational types being highly important for wage schemes and job assignments. As a result, improving the fit of applicants' educational background and job vacancies with respective skill requirements seems to be a promising starting point to reduce the gender pay gap in France.
Drydakis, Nick (2015)	The study is based on the UK Behavioural Study dataset for the years 2011 to 2013. Within this period, questionnaires were sent every six month to a selection of households across the country. The survey contains information about wages and questions of the E-S theory for measuring the typical brain type. Furthermore, demographic, socioeconomic and further cognitive questions were included.

	Firstly, the results indicate that systemising traits are associated with higher wages than empathising traits regardless of gender. As men are in general associated with more systematising traits then emphasising traits while for women the inverse relation holds true, the decomposition analysis provides evidence that the gender pay gap can be attributed to a greater extent to systemising than to empathising traits.
	In addition, by capturing interactions between the traits and occupations, the study suggests that wage returns for both traits vary by certain types of employment and that each trait might provide an absolute wage-return advantage in certain professions. Empathising traits are, for instance, associated with higher wages then systemising traits for occupations in the social care provision and the education sector while vice versa systemising traits receive higher wages in management, IT administration, engineering and banking jobs. Therefore, different job choices of women and men could be rational if the assumption is true that on average men and women have different brain types. Women with systemising traits, though, would be better off in male-dominated jobs.
	Altogether, the study of Drydakis (2015) indicates explanatory power of specific brain types and their associated traits for the gender pay gap on the UK labour market. Even if the study contributes to existing literature by introducing brain types as a new dimension in the discussion on the gender pay gap, the results resemble existing research on occupational segregation. If and how the results on gender differences in brain types can yield practical implications to reduce the gender pay gap is not clear.
El Badaoui, Eliane / Matteazzi Eleonora (2014)	In their study, Eliane El Badaoui and Eleonora Matteazzi (2014) use data from the European Union Statistics on Income and Living Conditions (EU-SILC) and restrict their analysis to Italy and the United Kingdom (UK) for the year 2009. Firstly, by applying multivariate calculations they show that fertility and labor market participation are interrelated and should be considered as joint decisions. Secondly, the authors find that mothers in Italy earn on average more than childless women whereas they observe a notable pay gap in favor of childless women in the UK. For Italy, they conclude that (among other things) delayed motherhood and the selection process of childless women into employment are important in explaining the pay gap.
	For the UK, on the contrary, the negative wage gap could mainly be explained by observable characteristics. According to Badaoui/Matteazzi, job segregation is of high relevance: Mothers in the UK tend to work more frequently in sectors and occupations with lower earnings perspectives compared to childless women. In addition, mothers are under-represented in managerial positions. As a conclusion, the authors point to the high importance of the timing of motherhood and job continuity for the wage profiles of women and, therefore, argue that (among other things) an improved childcare provision could be useful to limit the duration of parental leave and its drawbacks for the careers of mothers.
Erne, Roland / Imboden,	The authors use a qualitative comparative research design and assess the formation and effectiveness of the two Swiss equal pay policy regimes for

Natalie (2015)	women and men and one for workers of different origins. The approach is based on the most similar case design of two pay policy regimes evolved within the same political system during the same period.
	The Gender Equality Act came into force in 1996 and in 1999 the bilateral Agreement on the Free Movement of Persons between the European Union and Switzerland were approved by the Swiss people in conjunction with a package of accompanying measures that abolished unequal legal treatment of workers of different origin on the Swiss labour market. While the enforcement of the EPG [equal pay by gender] relies on litigation, which means that remedies must be sought by individual complainers through the court system, the EPN [equal pay by nationality] principle is enforced by bi- or tripartite commissions. As a result, the enforcement of equal pay policies across gender and national origin differ considerably and in the opinion of the authors the EPN is much more effective.
	The author conclude that EPG and EPN policy regimes and outcomes vary because of different interest politics dynamics and the particular frames of reference that guide the policymaking process. On the one hand, equal pay policies for men and women were framed in the language of anti-discrimination policy and aimed at re-allocating money from capital to female workers. On the other hand, the principle of equal pay for workers of different origins was not portrayed as a conflict that sets different class interests against one another but framed as a debate about employment practices that undermine fair competition.
	Consequently, employer organisations opposed the Gender Equality Act as interfering with the employer's autonomy. In contrast, employers' attitude towards the EPN policy were ambiguous. Whereas the export-oriented companies rejected the measures, the domestic-oriented companies supported them. The latter group saw the chance that the EPN measures would prevent unfair competition from competitors who would not adhere to Swiss wage agreements and working conditions. In order to provide the most effective framework for the closure of the gender pay gap, Erne and Imboden (2015) argue to reframe the gender equal pay policies in the way of the EPN by avoiding anti-discrimination language.
Estrin, Saul / Stephan, Ute / Vujic, Suncica (2014)	The used data set consists of 159 social entrepreneurs in the United Kingdom (UK) in 2011, drawn from the second wave of the SELUSI data set which is an unbalanced panel of over 500 social enterprises in Hungary, Romania, Spain, and the UK. A social enterprise was defined by two main characteristics. Firstly, a social enterprise shall follow a social mission and, secondly, it shall gain a minimum of 5 percent of its revenues by selling products and services in the market. To avoid self-employment and voluntary organisations by itself at least one full time employee was specified as mandatory. This definition includes both revenue-generating not-for-profit enterprises as well as for-profit enterprises with a social mission. Thereby, a social enterprise has a hybrid nature by combining profit and social objectives. In order to generate a statistically representative sample of the relatively small group of social enterprises in the UK, the authors apply the Respondent Driven Sampling (RDS) methodology which is a "network-based" sampling method including a mathematical model to

	allocate weights to compensate for non-random sampling.
	A main finding of the study is that female social entrepreneurs still earn around 23 percent less than their male counterparts even after controlling for individual and job characteristics. These results seem remarkable as female and male CEOs both set their own pay. By applying various regression analyses, Estrin et al. (2014) provide some evidence that women and men might engage in a social entrepreneurship for different reasons. Women seem to act mainly on a desire of `doing good´ while men seem to pursue a combined aim of `doing good and doing well´. Furthermore, the study provides evidence that female social entrepreneurs are more satisfied with their job than their male counterparts. This seems to be a robust finding even if entrepreneur's salary is controlled for. This supports the assumption that income is not the only motivation for setting up a (social) enterprise. Especially women seem to draw higher job satisfaction from non-monetary job aspects like work flexibility, social approval or simply a good feeling by helping others.
	The provided results by Estrin et al. (2014) are in line with the literature of the gender pay gap among entrepreneurs in general and the so-called paradox of the "contented female business owner". According to this paradox, women seem to weight non-monetary returns of work more strongly than men. It might be worthwhile for further research to analyse the non-monetary preferences of male and female (social) entrepreneurs in more detail.
Fitzenberger, Bernd/ Kunze, Astrid (2005)	Based on the longitudinal IAB employment survey (IABS) from 1975 to 2001, Fitzenberger and Kunze (2005) analyse gender differences within the sample of young workers from Western Germany. Hence, they can identify wages and work histories from the entry in the labour market and follow them continuously over time. Additionally, they separate and compare three age cohorts to investigate the development of wages within subgroups and different percentiles in the entire wage distribution.
	The study results show that the gender gaps in entry wages are much higher for low-paid workers and the wage gaps decrease across cohorts from the mid-1970s to the mid-1990s. According to the authors, differences in the fraction of stayers in the training occupation could contribute to explain this pattern. While men change their occupation after vocational training more often, so-called lock-in effects are still strong for women.
	In a nutshell, mobility is seen as a driving factor of wage growth among young workers. The authors conclude that women are stuck into low wage careers due to a lower occupational mobility while men more frequently move to better paid occupations with better career prospects.
Görlich, Dennis / de Grip, Andries (2009)	The authors use data from 1994 until 2005 of the German Socio-Economic Panel (GSOEP). The selected sample contains men and women aged between 20 and 55 who work in full or part-time jobs in West Germany. Within the last five years, 44.6 percent of all female workers and 5.6 percent of all male workers took an employment break for family reasons.
	Görlich und de Grip (2009) assume that women might take the different human capital deprecation during parental leave in female and male-

	dominated occupations into account when choosing their favoured job. This behaviour might explain parts of the well-known pattern of occupational sex segregation. To test their hypothesis the authors construct six occupational groups according to the degree of segregation (male-dominated/female-dominated/integrated) and the skill requirements (low-skilled/high-skilled).
	By estimating a fixed effects model on the log gross hourly wages of female workers, Görlich and de Grip (2009) found supportive evidence for their initial assumption that human capital depreciation rates during family-related career interruptions are lower in female occupations than in male occupations. Consequently, occupational self-selection of women might be a rational choice when optimizing their lifetime earnings. This, however, only seems to hold true for high-skilled occupations.
	The study by Görlich and de Grip (2009) contributes to existing literature by focusing on family-related career breaks as a highly relevant explanatory aspect of the gender pay gap. The authors give thought to problems of high human-capital depreciation rates of workers with family-related career breaks in male occupations, which could be serious thresholds for women to choose these occupations.
Grönlund, Anne / Magnusson, Charlotta (2016)	The authors compare how the mechanism of gender segregation and workplace skill development affect the gender pay gap of high- and low-educated groups in different countries. The analysis is based on regressions with pooled wage data from the European Social Survey of 2004 and 2010 for Germany, Sweden and the UK. These countries were chosen to represent different welfare states and family policy models. The aim of the study is to test the assumption that policies designed to promote womens' employment by facilitating the reconciliation of work and family life have negative consequences for women's relative wages.
	The raw gender wage gap is considerably larger among the high-educated employees than among the low-educated employees in all three countries. Moreover, men hold jobs involving more on-the-job training and this seems to be an important factor for explaining men's higher wages. Furthermore, access to on-the-job training and occupational segregation explains a considerably larger share of the gender wage gap among the low-educated employees. Conventional human capital variables as work experience and tenure, instead, contribute to the explanation of the gender wage gap exclusively in Germany.
	In sum, the empirical data do not support the trade-off hypothesis between family-friendly policies and women' wages. In particular, Grönlund and Magnusson (2016) find no evidence that segregation and work-related training are more important in Sweden than in the other countries with less extensive family policies.
Hammer-mann, Andrea / Schmidt, Jörg (2015)	The study – released in German language – focuses on the question, what are the (key) drivers of the gender pay gap in Germany. By using the German Socio-Economic Panel (SOEP), a representative dataset provided by the German Institute for Economic Research (DIW), an advanced regression technique is applied to single out those personal, job-related and firm-specific characteristics which help to explain the difference in average

	wages of women and men.
	The study gives evidence that the gender pay gap is predominantly driven by differences in wage relevant endowments, such as education, labour market experience in full-time jobs, skill requirements, occupational autonomy and an unequal representation of males and females in firms of different size and different sectors. In addition, further results of the multivariate analysis suggest that parental leave periods could also play a crucial role when taking the effects of the number of kids into account. To sum up, the study illustrates that the key drivers of gender pay differences are well-known and, therefore, should be picked as starting points for reform projects to tackle the gender pay gap in Germany.
Kahn, Lawrence (2015)	Based on data from the OECD Employment Outlook 2014, Kahn (2015) uses a cross-country comparison approach to identify possible relations between wage compressions and the existence of wage-setting institutions in different countries with the extent of the respective gender pay gaps. In general, wage compression should raise women's wages by more than men's because women are more frequent at the bottom of the distribution. However, by reducing occupational wage differentials, women as well as men may have fewer incentives to acquire skills and additionally women's incentives to enter male-dominated occupations could be reduced.
	By focusing on Scandinavian countries, i.e. Denmark, Finland, Norway and Sweden, and English-speaking countries, i.e. Canada, the UK and the US, as two opposite poles of labor market institutions, the comparison suggests an inverse relationship between collective bargaining and wage compression on the one hand and the gender pay gap on the other. The author concludes that wage compression caused by labor market institutions such as unions and minimum wages tends to narrow the gender pay gap but may also have some adverse employment consequences for women.
	Therefore, Kahn (2015) alerts policymakers to balance the advantages against the disadvantages of labour market interventions. Alternatively, the author speaks in favor of measures, which encourage women to increase their labour market commitment and entry into male-dominated sectors. According to the author, facilitating women's participation and retention in the labour market and reducing barriers to entry into male-dominated occupations are also likely to narrow the gender pay gap but without adverse employment consequences of centralized wage-setting institutions.
Kangasniemi, Mari / Kauhanen, Antti (2011)	The study uses Finnish linked employer-employee panel data and differentiates between blue-collar and white-collar employees. While the income of white-collar employees is generally based on fixed (monthly) salary and possible bonus payments, blue-collar employees' income consists of hourly wages – i.e. fixed hourly wages, reward rates / piece rates – and possible bonus payments. Because information on the existence of a bonus plan is lacking, the study defines a company to have a bonus plan for an employee group after it has paid a bonus for at least one employee in an employee group.
	The results of the study are mainly derived from multivariate analyses:

	Whereas piece rates / reward rates tend to increase gender wage differences for blue-collar employees regardless of the applied estimation method, the picture is more complex with respect to bonus payments. By using a standard estimation technique, bonus plans seem to reduce gender wage differences for both types of employees because women apparently can benefit more from such payments. This result changed when taking individual and firm-specific fixed effects into account to adjust for unobserved heterogeneities, and by checking for different definitions of bonus plans (e.g. one alternative definition is that a bonus plan is applied if the person receives a bonus at least once during an employment relation). As the authors point out, the standard technique tends to show that bonus payments decrease gender wage differences, "while accounting for person and firm [fixed] effects leads to the conclusion that the gender wage gap is mostly unchanged". In this respect, the unobserved characteristics of workers and firms seem to be of high relevance and indicate that applying a bonus plan – everything else being equal – does not have any (significant) impact on gender wage inequality.
Kaszubowski, Mariusz / Wolszczak-Derlacz, Joanna (2014)	The study of Mariusz Kaszubowski and Joanna Wolszczak-Derlacz (2014) is based on survey data from academic employees of institutions under the administration of the Ministry of Science and Higher Education in Poland. Hereafter, the focus lies on the analyses of the wage gap in salaries: The authors find a raw pay gap of about 18 percent based on the comparison of women's and men's standardised gross monthly salaries.
	The results of multivariate analyses show that the gender pay gap is mainly explained by gender differences in academic rank (such as assistants, associate professors and full professors) and, also, by differences in the teaching load. Furthermore, an unexplained gender gap seems to be primarily evident at the top of the distribution, in particular above the 80th percentile. From the authors' point of view this might indicate the existence of a glass ceiling phenomenon. However, an impact due to unobserved heterogeneities or missing covariates can also not be ruled out.
Lackner (2016)	Based on findings of laboratory and field experiments, Lackner (2016) suggests that a substantial gender gap exists in the willingness to engage in competitions. This seems to result from differing attitudes to taking risks which could affect promotion processes into managerial positions as well as the tendency to initiate salary negotiations with a corresponding impact on gender wage equality. However, as he points out, the main sources and driving forces to explain this finding are still under debate.
	In this context, Lackner (2016) mentions some literature focused on nature-related factors, such as biological or genetic factors, that can influence competitive behavior, whereas other studies plead for nurture-related explanations. The latter are seen as a topic of socialization and refer to the social environment of girls and boys during their early life. The author points to some experimental evidence which suggests that female and male adolescents perform differently depending on if they are growing up in a patriarchal or a matrilineal society. In addition, women were more often observed in experimental studies to avoid competitive settings and they exhibit higher levels of competiveness when competing only among women

	than when they compete in mixed-gender groups. However, general conclusions are hard to draw since the findings of laboratory and field experiments are derived under specific environments and other (social) settings may lead to differing results.
	Lackner (2016) summarizes that some of the existing labour market outcomes could partly be the result of gender differences in the attitudes towards competition. As he points out, these differences most likely are formed early on in childhood and appear to be rather persistent over the life cycle. Amongst others, he concludes that these early stages (especially in the educational system) seem to be more efficient starting points for policy actions than affirmative action policies (e.g. like gender quotas) to reduce gender gaps in competitiveness.
Olivetti, Claudia / Petrongolo, Barbara (2016)	Olivetti and Petrongolo trace the evolution of female employment by using an unbalanced panel of nineteen high-income countries (e.g. United States, Canada, Australia, Japan and several European countries) between 1850 and 2008. On average, female employment increased between the mid-19th century and the first decade of the 21st century by about a tenth of a percentage point per year. With few exceptions (e.g. Japan), gender trends converted in most countries. Moreover, the authors provide evidence that on average, the female/male earnings ratio increased by approximately 0.4 percentage points per year between 1970 and 2010.
	By drawing information on labour inputs by gender and country from the EU KLEMS database, the study covers a large cross-section of countries from 1970 onwards. The trend in the share of female hours are on average weaker than trends in female employment. This difference reflects the diffusion of part-time work among women during the past few decades. Evidence of a shift-share decomposition analysis further suggest that the striking growth in the service share in most developed countries can explain at least half of the overall variation in female hours, both across countries and over decades.
	Overall, Olivetti and Petrongolo (2016) show that while levels of female labour market participation differ widely among countries, most countries share similar trends in female outcomes, with clear signs of international convergence. Further evidence on the relation of women's working time and the share of the service sector would, however, be beneficial for a deeper understanding of the causes and consequences of gender disparities.
O'Reilly, Jacqueline / Smith, Mark / Deakin, Simon / Burchell, Brendan (2015)	O'Reilly et al. (2015) organized their paper by splitting the issue of equal pay over the past forty years into four key themes: ▪ theoretical and conceptual debates: The authors discuss research on different factors driving the inequality in men and women's pay separately by four main analytical approaches (the economic, sociological, organizational and institutional approach). One interesting aspect seems to be that human resource management could be a more efficient driver for change in terms of equal pay than legal initiatives. ▪ legal developments and their impacts: The authors compare different studies on country specific institutions and legal differences between countries. They conclude that a fragmented wage-setting environment

	and a diminishing role of trade unions are likely to make it more difficult to enforce pay equality. However, this might not apply if certain groups of workers are less well integrated into these wage-setting arrangements because of the effects of labour market segmentation. ▪ wage setting institutions and changing employer demands: Relating to thoughts in the former section, O'Reilly et al. (2015) highlight how wage setting environments and their effects on the gender pay gap can differ between countries, sectors or even organisations. The authors, therefore, speak in favour of a more fine-grained analysis of specific sectors and groups of workers to conduct further conclusions. ▪ newly emerging pay inequalities between and within educational and ethnic groups: In the fourth section, O'Reilly et al. (2015) discuss four papers, which explore differences in the gender pay gap between different segments of the labour market where educational and ethnic markers of social status and integration are at their most extreme. The authors state that due to several changes in labour market structures (such as wage setting institutions and performance reward systems), the concern for equal pay for women have become much more complex. The paper of O'Reilly et al. (2015) contributes to existing literature on the gender pay gap by illustrating shifts in the goal setting and the achievements to close the gap so far. The collected studies highlight a broad and diverse range of players and their contribution and give thoughts for further research.
Polachek, Solomon W. (2014)	By analysing the annual earnings of women and men in the United States, Polachek (2014) finds that the gender pay gap has declined from 70 percent in 1815 to a current gap of 22 percent. This trend is observable for most countries and goes along with an increase in women's lifetime labour force participation. Interestingly, the gender pay gap is usually smallest for young women and men and rises with age. Moreover, U.S. data reveal that the gender pay gap is around 22 percent for married women and men whereas for singles - never married - the gender pay gap is only 2.8 percent. These empirical findings are in line with the life-cycle human capital theory. Labour market participation of married women and men differs significantly over the life cycle while labour market participation rates of single women and men of the same age are similar. Therefore, Polachek (2014) concludes that different professional experience most likely explains a large part of the currently observed gender pay gap in the United States and in other countries. According to the author, the human capital theory might also contribute to explaining parts of the occupational gender segregation. This argument claims that women who expect to work fewer years might choose jobs that require less training. On the contrary, the assumption that women are discriminated in the labour market does not explain why the gender pay gap depends on age and the marital status. Polachek (2014) emphasises that there is no plausible reason why employers should exclusively discriminate older married women. In addition, the discrimination assumption seems to ignore companies' aim of profit maximization. As the author points out, if women

	indeed would earn lower wages despite being as experienced and productive as men, employers would have a competitive advantage by just hiring female employees. None of these considerations is covered with the data.
	Consequently, Polachek (2014) concludes that if unequal salaries of women and men are the result of different individual choices rather than discrimination, government intervention could lead to a distorted allocation of resources. Policies helping to increase women's lifetime work participation and professional experience, however, like e.g. the expansion of day care utilization are from the author's point of view promising to further reduce the gender wage gap. Therefore, Polachek (2014) appeals to politics not to rely on the raw gender pay gap to justify corrective actions because there might be nothing to correct.
Polachek, Solomon W. / Xiang, Jun (2015)	Polachek and Xiang (2015) use data from the International Social Survey Programme, the Luxembourg Income Study and OECD wage data for 35 countries covering a period from 1970 to 2002. The authors concentrate on labour market institutions, which are assumed to affect women's lifetime work behaviour and by that affect the gender pay gap.
	Firstly, the authors expect high fertility rates to be positively correlated with the gender pay gap. This is because women are expected to drop out of the labour force after childbirth more frequently than men and, consequently, acquire less work experience. Secondly, a more pronounced age gap in a marriage is likely to come along with a larger gap in the accumulated work experiences and wages of a husband and wife. Therefore, the authors assume that women in countries with a larger age gap between husband and wife are more likely to have fewer incentives to participate in the labour market. Thirdly, Polachek and Xiang (2015) examine the effect of country-specific income tax regimes on the gender pay gap.
	According to the authors, high income taxes should have a stronger negative effect on women's earnings because their labour supply is more elastic. In other words, married women are more likely to drop out of the labour market or reduce working hours than married men when a larger proportion of the second earners income is lost due to a higher marginal tax rate. Furthermore, females' educational attainment is expected to induce higher labour force participation of women and increases their human capital stock. Both should have a diminishing effect on the gender pay gap.
	The study of Polachek and Xiang (2015) provide empirical evidence for the hypotheses discussed above. The results support the assumption that the gender wage gap is at least partly affected by women's lifetime labour force participation. Therefore, it provides an explanation why the gender wage gap is narrowing despite a wider dispersion in the overall wage structure.
Reuben, Ernesto / Sapienza, Paola / Zingales, Luigi (2015)	In 2006, the authors conducted a laboratory experiment with a cohort of MBA students of the University of Chicago Booth School of Business. Following the experimental design of Niederle and Vesterlund (2011), the competitiveness was measured by the participants' choice between a tournament and a piece-rate payment scheme and taking the participants' ability, beliefs and risk preferences into account. As in other studies, male

participants were twice as likely to choose a tournament pay scheme. After students' graduation in 2008, Reuben et al. (2015) match their experimental results on competitiveness with administrative data about their academic achievements and demographic characteristics as well as information about the participant's earnings in their first job upon graduation. Finally, in September 2015, the authors track the participants via LinkedIn, a business-oriented social network, to record their career progress seven years after graduation. Out of the 550 students in the cohort, 390 participants could be acquired via LinkedIn.

The study shows that female MBA graduates are 8 percent more likely to work in low-paying industries and earn on average around 15 percent less per year than male MBAs. The authors find evidence that competitive individuals earn around 9 percent more than their less competitive counterparts. In addition, competitiveness explains around 10 percent of the gender differences in earnings. This result for the gender pay gap remains unaffected after including other control variables. This indicates that competitiveness is an important part of the gender gap in earnings that is not captured by standard explanatory variables.

Furthermore, the study provides evidence that participants who opted for a tournament pay scheme in the experiment are more likely to choose a job in consulting or finance rather than in other industries. Competitiveness seems to be a good predictor of the self-selection in this context: In particular, more competitive business professionals are more likely to choose high-paying industries, a finding that is persistent even seven years after graduation.

To conclude, the empirical analysis shows that competitive individuals obtain higher earnings after graduation and that the gender difference in competitiveness account for a significant share of the gender pay gap. The strength of this study lies in its' sequential analytical design which reduces the potential bias of reverse causality. However, the underlying sample of MBA students of an elite business makes it difficult to draw general conclusions. Furthermore, it is not quite clear why competitiveness pays off: The authors speculate that competitive individuals might be more successful in negotiating higher earnings or that they might cope better with stress or long and inflexible working hours.

References

Arulampalam, Wiji / Booth, Alison / Bryan, Mark (2006), Is there a glass ceiling over Europe? Exploring the Gender Pay Gap across the Wages Distribution, Discussion paper No. 510, Centre for Economic Policy Research, The Australian National University, Canberra

Azmat, Ghazala/ Ferrer, Rosa (2015), Gender Gaps in Performance: Evidence from Young Lawyers, IZA Discussion Paper No. 9417, Institute for the Study of Labor, Bonn

Bargain, Olivier / Doorley, Karina / Van Kerm, Philippe (2016), Minimum Wages and the Gender Gap in Pay: Evidence from the UK and Ireland, LISER Working Papers No. 2016-02, Luxembourg

Blau, Francine D. / Kahn, Lawrence M. (2016), The Gender Wage Gap: Extent, Trends and Explanations, IZA Discussion Paper No. 9656, Institute for the Study of Labor, Bonn

Boll, Christina / Leppin, Julian Sebastian (2014), Overeducation among graduates: An overlooked facet of the gender pay gap? Evidence from East and West Germany, SOEPpapers on Multidisciplinary Panel Data Research No.627, German Institute for Economic Research, Berlin

Boll, Christina / Hüning, Hendrik / Leppin, Julian / Puckelwald, Johannes (2015), Potential effects of a statutory minimum wage on the gender pay gap - A Simulation-Based Study for Germany, HWWI Research Paper No. 163, Hamburg Institute of International Economics, Hamburg

Busch, Anne / Holst, Elke (2008), "Gender Pay Gap": In Großstädten geringer als auf dem Land, DIW Wochenbericht Nr. 33, German Institute for Economic Research, Berlin (only available in German language)

Carlsson, Magnus / Reshid, Abdulaziz Abrar / Rooth, Dan-Olof (2014), Explaining the Gender Wage Gap Among Recent College Graduates – Pre-Labor Market Factors or Employer Discrimination? In: URL: https://medarbetare.lnu.se/polopoly_fs/1.109960!Explaining%20Gender%20Wage%20Gap%20Among%20Recent%20College%20Graduates.pdf [27.07.2016]

Claussen, Jörg / Czibor, Eszter / van Praag, Mirjam (2015), Women do not play their aces: the consequences of shying away, IZA Discussion Paper No. 9612, Institute for the Study of Labor, Bonn

Couppié, Thomas / Dupray, Arnaud / Moullet, Stéphanie (2014), Education-based occupational segregation and the gender wage gap: evidence from France, in: International Journal of Manpower, 35 Vol., 3 No., pp. 368-391

Cortés, Patricia / Pan, Jessica (2016), When Time Binds: Returns to Working Long Hours and the Gender Wage Gap among the Highly Skilled, IZA Discussion Paper No. 9846, Institute for the Study of Labor, Bonn

Drydakis, Nick (2015), Brain Types and Wages, IZA Discussion Paper No. 9426, Institute for the Study of Labor, Bonn

El Badaoui, Eliane / Matteazzi, Eleonora (2014), To be a Mother or not to be? Career and Wage Ladder in Italy and the UK, Working Paper 2014-30, EconomiX - Université de Paris Ouest Nanterre – La Dèfense, Nanterre cedex

Erne, Roland / Imboden, Natalie (2015), Equal pay by gender and by nationality. A comparative analysis of Switzerland's unequal equal pay policy regimes across time, in: Cambridge Journal of Economics, Vol. 39, 2 No. 2, pp. 675-674

Estrin, Saul / Stephan, Ute / Vujic, Suncica (2014), Do Women Earn Less Even as Social Entrepreneurs?, IZA Discussion Paper No. 8650, Institute for the Study of Labor, Bonn

Fitzenberger, Bernd / Kunze, Astrid (2005), Vocational Training and Gender: Wages and Occupational Mobility Among Young Workers, IZA Discussion Paper No. 1766, Institute for the Study of Labor, Bonn

Görlich, Dennis / de Grip, Andries (2009), Human capital depreciation during hometime, in: Oxford Economic Papers Vol. 61, i98–i121

Grönlund, Anne / Magnusson, Charlotta (2016), Family-friendly policies and women's wages – Is there a trade-off? Skill investments, occupational segregation and the gender pay gap in Germany, Sweden and the UK, European Societies Vol.18, Iss. 1

Hammermann, Andrea / Schmidt, Jörg (2015), Facetten des Gender Pay Gap – Empirische Evidenz auf Basis des Sozio-oekonomischen Panels, IW Policy Paper Nr. 8/2015, Köln (only available in German language)

Kahn, Lawrence (2015), Wage compression and the gender pay gap – Wage-setting institutions narrow the gender pay gap but may reduce employment for some women, IZA World of Labor 2015: No. 150, Institute for the Study of Labor, Bonn

Kangasniemi, Mari / Kauhanen, Antti (2011), Performance-related: Pay and gender wage differences, ETLA Discussion Papers, The Research Institute of the Finnish Economy (ETLA), No. 1249, Helsinki

Kaszubowski, Mariusz / Wolszczak-Derlacz, Joanna (2014), Salary and reservation wage gender gaps in Polish academia, GUT FME Working Paper Series A, No. 1/2014 (19), Gdansk University of Technology, Faculty of Management and Economics, Gdansk

Lackner, Mario (2016), Gender differences in competitiveness - To what extent can different attitudes towards competition for men and women explain the gender gap in labor markets?, IZA World of Labor 2016: No. 236, Institute for the Study of Labor, Bonn

Olivetti, Claudia / Petrongolo, Barbara (2016), The evolution of gender gaps in industrialized countries, IZA Discussion Paper No. 9649, Institute for the Study of Labor, Bonn

O'Reilly, Jacqueline / Smith, Mark / Deakin, Simon / Burchell, Brendan (2015), Equal Pay as a Moving Target: International perspectives on forty-years of addressing the gender pay gap, Cambridge Journal of Economics, Vol. 39, No. 2, pp. 299-317.

Polachek, Solomon W. (2014), Equal pay legislation and the gender wage gap. Despite major efforts at equal pay legislation, gender pay inequality still exists in the developed economies. How can this be put right?, IZA World of Labor 2014: No. 16, Institute for the Study of Labor, Bonn
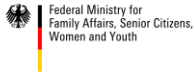
Polachek, Solomon W. / Xiang, Jun (2015), The Gender Pay Gap Across Countries: A Human Capital Approach, LIS Working Paper Series No. 646, Esch-Belval (Luxembourg)

Reuben, Ernesto / Sapienza, Paola / Zingales, Luigi (2015), Competitiveness and the Gender Gap among Young Business Professionals, IZA Discussion Paper No. 9446, Institute for the Study of Labor, Bonn

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equal pacE was jointly performed by:

Cologne Institute for Economic Research (IW Köln)

PO Box 10 19 42

50459 Köln / Germany

http://www.iwkoeln.de

PMSG PersonalMarkt Services GmbH

Hoheluftchaussee 18

20253 Hamburg / Germany

http://www.personalmarkt.de

Roland Berger GmbH

Sederanger 1

80538 München / Germany

http://www.rolandberger.com