

Czech University of Life Sciences Prague

Faculty of Economics and Management

Department of Economics



Bachelor Thesis

**Statistical Analysis of the Effects of the Glass Ceiling
Phenomenon in Kazakhstan**

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BACHELOR THESIS ASSIGNMENT

Akbota Amanzhol

Economics and Management

Thesis title

Statistical Analysis of the Effects of the Glass Ceiling Phenomenon in Kazakhstan

Objectives of thesis

The objective of the bachelor thesis is to determine the affects of a Glass Ceiling Phenomenon on the position of women on the labour market in Kazakhstan. Gender pay gap, women and men segregation in selected occupations and other indicators measuring female employee's ability to succeed on the labour market will be evalutaed throughout the years.

Methodology

In the Bachelor Thesis, various research methods, e.g descriptive and comparative statistical methods will be used. The information base of the research will consist of literary sources of a scientific nature and official Internet sites in the Republic of Kazakhstan. Statistical analysis will handle with official data of the Statistics Department of the Republic of Kazakhstan. Methods of exploratory data analysis as well as time series analysis will be used to describe the current state and development of selected labour market indicators. Methods of regression analysis will be used to quantify the effect of glass ceiling factors on women's positions on the labour market.

The proposed extent of the thesis

30-40 pages

Keywords

pay gap, female workers, gender biases, glass ceiling, Kazakhstan, segregation, women

Recommended information sources

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Declaration

I declare that I have worked on my bachelor thesis titled "Statistical Analysis of the Effects of the Glass Ceiling Phenomenon in Kazakhstan" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the bachelor thesis, I declare that the thesis does not break any copyrights.

In Prague on 30.11.2022

Akbota Amanzhol

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Statistical Analysis of the Effects of the Glass Ceiling Phenomenon in Kazakhstan

Abstract

The main goal of this thesis is to describe and investigate gender inequality in work conditions in Kazakhstan by examining the Glass ceiling phenomenon. The theoretical part of this thesis introduces and explains the glass ceiling, access to education, job segregation, wage gap, stereotypes, and cultural norms worldwide and in Kazakhstan. On top of that, it shows worldwide reports, global inequality indexes, and a general overview of the government's approaches toward equality.

The practical part includes testing the dependency between the independent variables and the glass ceiling using the SAS studio program. Microsoft Excel is used to visualize the preliminary data of the variables and survey results conducted in 2016 among 1500 respondents for interpretation of the biases and stereotypes of the country. The multiple linear regression tests the relationship between the target variable - the glass ceiling, and three explanatory variables - education access, pay gap, and job segregation variables. The regression model concludes that the glass ceiling variable has a significant relationship with education access and pay gap while having no significant relationship with job segregation

Keywords: pay gap, female workers, gender biases, glass ceiling, Kazakhstan, segregation, women

Statistická analýza účinků jevu skleněného stropu v Kazachstánu

Abstrakt

Hlavním cílem této práce je popsat a prozkoumat genderovou nerovnost v pracovních podmínkách v Kazachstánu zkoumáním fenoménu skleněného stropu. Teoretická část představuje a vysvětluje skleněný strop, přístup ke vzdělání, segregaci v zaměstnání, rozdíly v odměňování, stereotypy a kulturní normy ve světě a v Kazachstánu. Kromě toho ukazuje celosvětové zprávy, indexy globální nerovnosti a obecný přehled přístupů vlády k rovnosti.

Praktická část zahrnuje testování závislosti mezi nezávislými proměnnými a skleněným stropem pomocí programu SAS studio. Microsoft Excel se používá k vizualizaci předběžných údajů proměnných a výsledků průzkumu z roce 2016 mezi 1500 respondenty pro interpretaci předsudků a stereotypů země. Vícenásobná lineární regrese testuje vztah mezi cílovou proměnnou - skleněným stropem a třemi vysvětlujícími proměnnými - přístupem ke vzdělání, rozdíly v odměňování a pracovní segregace. Závěr Regresní modely: proměnná skleněného stropu má významný vztah k přístupu ke vzdělání a rozdílům v odměňování, zatímco nemá žádný významný vztah k pracovní segregaci

Klíčová slova: rozdíly v odměňování, pracující ženy, genderové předsudky, skleněný strop, Kazachstán, segregace, ženy

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Introduction

Thanks to feminism, women right's movements, and the fight for their freedoms, women have reached governmental support and non-discrimination laws in almost every part of the world. They have access to quality education and diversity programs. The wage gap is closing in developed countries. More women are working not only in fields historically constructed for them, like education and nursing but excel in various other fields. However, it is well-known that discrimination still exists in the 21st century. Although its impact and strength might vary in different countries due to the numerous political views, beliefs, biases, and other struggles. One of the few barriers to equality remains the glass ceiling phenomenon. Women's representation in higher positions stays weak. There is an inefficient representation of women in executive roles in numerous fields, including business, politics, religious emissaries, scientific fields, legal professions, and other occupations. There are mentally pressuring struggles that undervalue women's efforts and position in all areas, like a constant comparison to men or assigning women's achievements to someone else. Double standards on parenting require women to be the primary caregivers of their households and multiply their workload. Legal constraints in some countries restrict women's job choices and an existing wage gap between women and men performing in the same roles.

Countries like Kazakhstan are developing but still have biases against working women, even though they represent more than half of the nation's workforce. The government almost achieved equality on an educational level. However, gender discrimination in the workplace remains, whether hiring or firing a female employee, accessing some jobs, or getting promoted. The research on the glass ceiling is essential for understanding the depth of inequality and the impact of social prejudice and national beliefs on women's careers. This thesis concentrates on the statistical analysis of the effects of the glass ceiling phenomenon. Also, it analyzes other factors influencing women's workplace environment and opportunities in Kazakhstan, like social biases, job segregation, and the wage gap.

1 Objectives and Methodology

1.1 Objectives

This thesis aims to overview and evaluate gender inequality statistics in Kazakhstan. The main goal is to describe and compare the glass ceiling phenomenon in Kazakhstan by analysing the main factors influencing it. Including evaluation of the wage gap, gender segregation, and access to education for both sexes. Also, an overview of Kazakh society's bias, stereotypes, and cultural predisposition will be conducted to describe their influence on women's career prospects.

1.2 Methodology

This bachelor thesis will examine the topic using various research methods and include a literature review and a practical part. The first part is a thorough review of related literature worldwide from local and international websites and organizations (e.g., WEF, WB, UNESCO, UNICEF, ILO, ASPR RK) and related to the glass ceiling issue scientific articles and studies from worldwide and Kazakhstan's researchers.

The second part of this thesis will represent data analysis of the gender equality index, unemployment rates, access to education by gender, wage gap, job segregation, and women ratio in managerial positions in Kazakhstan through a time-series examination from 2000-to 2020. All of the mentioned factors will be analyzed through graphic and numeric descriptions. Kazakhstan's bias and social norms will be evaluated through the surveys' conclusion of citizens' opinions on gender equality conducted by Kazakhstan's researchers. It will help estimate other women's struggles in the work environment and its influence.

The hypothesis testing will be conducted to evaluate the relationship between the ratio of women in managerial positions and factors of the glass ceiling, including the wage gap, education by sex, and job segregation. The SAS and Excel programs will complete the goal of quantifying the effect of glass ceiling factors on women's positions in the labor market.

1.2.1 Multiple regression analysis

Multiple regression analysis is used in cases where several independent variables are used to describe the dependent variable. This practical part of the thesis will test the hypothesis of the relationships between several variables. The variable being described is called the dependent variable (Y), and the variable used to describe the dependent is called the independent variable (X).

Equation 1. Multiple regression model

$$Y = \alpha + \beta_1 * x_1 + \beta_2 * x_2 + \dots + \beta_p * x_p + \varepsilon \quad (2.1)$$

$\alpha, \beta_1, \beta_2, \dots, \beta_p$ – parameters of the model

ε – error term

For relationship testing between variables, null (H0) and alternative(H1) hypotheses are essential. The null hypothesis represents no relationship between dependent and independent variables, while the Alternative hypothesis describes a significant relationship between Y and X. As the parameters of independent variables are generally unknown, to estimate the parameters of the hypothesis, the OLS method is used and the parameters found are then represented in the estimated multiple regression equation:

Equation 2. Least squares criterion

$$\sum_{i=1}^n (y_i - y'_i)^2 \rightarrow \min \quad (2.2)$$

y_i = observed value of the dependent variable for the i th observation

y'_i = estimated value of the dependent variable for the i th observation

Equation 3. Estimated multiple regression equation

$$y'_i = a + b_1 * x_1 + b_2 * x_2 + \dots + b_p * x_p \quad (2.3)$$

y'_i – estimated value of the dependent variable

a, b_1, \dots, b_p – estimated parameters

Once the equation parameters are known, the interpretation is available: b_p is an estimate of the transformation; the average change of Y variable, when X_p changes by one unit,

when other independent variables are constant. The next step is to measure the goodness of fit for the estimated multiple regression equation, in other words, the quality of the model:

Equation 4. Multiple coefficient of determination

$$R^2 = \frac{SSR}{SST} \quad (2.4)$$

SSR = sum of squares due to regression

SSE = sum of squares due to error

The next step is executing a significance test for a multiple regression relationship using an F-test for overall significance between dependent and all independent variables and a t-test for individual significance of each independent. The null hypothesis is rejected if $p < \alpha$, proving no significant relationship exists between dependent Y and independent X_1, X_2, \dots, X_p variables. If H_0 is accepted, that means there is not enough proof to decide that there is a relationship.

Equation 5. F-test

$$F = \frac{MSR}{MSE} \quad (2.5)$$

MSR – Mean squares due to regression

MSE – Mean square due to error

Suppose the F-test's null hypothesis is rejected. In that case, the next step is the t-test for individual significance for each independent variable. While examining the individual relationship, the new null and alternative hypotheses will be constructed. If any of the H_0 is rejected ($p < \alpha$), that would mean a significant relationship is present in that particular relationship.

Equation 6. t-test

$$t = \frac{|b_i|}{s_{b_i}} \quad (2.6)$$

b_i - estimated parameter

s – standard deviation of the parameter,

After deciding to reject/accept the hypothesis, the final step is to check it for multicollinearity. Multicollinearity refers to the strength of dependency between the independent variables. It lies between $<-1; 1>$, where 1 is an absolute positive

correlation, and -1 is a negative decreasing correlation. If the dependency/correlation is high ($>0,7$), the independent variables have a significant relationship among themselves, which can end in misleading regression results. Therefore it can be unreliable. The correlation is examined by calculating the "R" coefficient of correlation, which is always a square root of the Coefficient of determination of the independent parameters.

The formula is as follows:

Equation 7. Coefficient of correlation

$$r = \pm\sqrt{R^2} \tag{2.7}$$

R – coefficient of correlation

R^2 – coefficient of determination

We could then calculate the sample correlation coefficient r to determine the extent to which the variables are related. The easiest way to get rid of multicollinearity is to take out the parameter with a strong correlation from the equation.

2 Literature Review

2.1 Introduction to the Glass ceiling

2.1.1 Definition of the Glass ceiling

Despite the progress toward equality that women have reached, there are still difficulties in getting higher positions, even in developed countries. One of these issues is named the "glass ceiling," "glass ceiling effect," or "glass ceiling phenomenon." It represents a drawback women and minorities face when going up the career "ladder" to higher positions. They get stuck in one role or are not getting a promotion, and it is as if they hit the highest point. Therefore, it is called the "ceiling." Also, in contrast to usual barriers like lack of experience or education, the basis for the glass ceiling most of the time are culture, society, and individual and psychological factors. So, it is not easily visible, therefore "glass."

The term was created in 1978 by Marilyn Loden, US (Loden, 2017) and was first printed in local news, AdWeek article in 1984. It has become rapidly sealed in the lexicon and researched since. The phenomenon's impact was significant, and the government created a special US labor department in 1991. They recognized the glass ceiling as "artificial barriers based on a behavioral or organizational bias that prevent qualified employees from advancing upward in their organization into management-level positions" (Martin, 1991

2.1.2 How Glass ceiling is measured

As it is not easy to justify the sources of the glass ceiling phenomenon, there are many debates about its presence in enterprises in developing and developed countries (Grout, Park, and Sonderegger, 2009). Estimating the probability of a female worker's promotion to a top-level position worldwide remains challenging due to the lack of direct statistics in many countries, including Kazakhstan. Except for the authorized data, another source can be direct data about employees from enterprises. However, most corporations prefer to keep this information private because women performing on the same level as men would climb the career ladder in companies with equal organizational opportunities. So, suppose such data existed and showed that qualification and competence do not guarantee a

woman's promotion to the same managerial position as an equivalently performing man. In that case, it would be evidence of discrimination and show its influence on the work evaluation in such a company. Some researchers use the Fortune 500 or Global 500 list to compare the number of all females and males who serve as CEOs (Dezsö and Ross, 2012, Hoobler et al., 2016, Glass and Cook, 2016). The list does help to comprehend the difference between female and male CEOs. Still, as it only includes the most significant companies worldwide, it does not illustrate the environment and conditions for average female employees and CEOs in the rest of the companies.

Various researchers identified the most influential factors that power gender inequality and can help analyze the glass ceiling. These factors are usually available and necessary when detailed official data on the glass ceiling effect do not exist. Some researchers prefer to include all indicators, and some prefer to classify them into three categories. For example, Choi and Park (2014) and Hoobler et al. (2009) chose to divide these factors into "socio-psychological," "human capital," and "systematic barriers" categories. Socio-psychological approximates social roles and gender stereotype perspectives. Human capital is related to views of women not being like men regarding education, experience, and competence. Systematic barriers are difficulties originating in companies' systems, like lack of organizational support, that burden women's promotion and reach of top-level positions (Choi and Park, 2014, Hoobler et al., 2009). At the same time, Sabharwal (2013) pinpointed all factors that affect women's approach to top-management positions separately:

- lack of access to good education,
- bias and stereotypes,
- cultural predisposition,
- occupational segregation by gender,
- wage gap

The most challenging factors for studies to analyze are Bias and cultural-social bars. Researchers examine it through already created studies or using the qualitative method. Most studies examine the subject, conducting in-depth interviews with female executives in different fields and completing sociological surveys, pursuing workers' opinions and experiences (Zhumagali, 2018, Ganiyu and Oluwafemi, 2018). Surveys and interviews usually include questions about women's backgrounds, discrimination experiences, views

on the subject, and work-life balance. An example of such might be, "Do you believe discrimination exists in Kazakhstan?", "What is your opinion on working mothers?" to get an opinion on differences between male and female employment. It helps to understand the depth of stereotypes, biases, and cultural predispositions and identify the main prejudices women meet while working in a specific field. It can show the stereotypical thinking of the population and what this population assumes about women's performance as an employee.

2.1.3 Related terms

Several phrases are associated with the glass ceiling effect and define phenomena in women's workplaces with some (or many) similarities to the glass ceiling effect. They describe situations that happen to women regularly. They are used and mentioned by Social, Psychological, Economic, and other studies that researched gender-based career progression.

2.1.2.1 Sticky floor

Using a sticky floor with a glass ceiling in one sentence is common in literature. It describes a situation where men and women have the same qualification. Men climb the hierarchical ladder without delay, and women often get stuck in one position for years. Studies also mention that women have less access to institutional resources and growth prospects at the start of their employment (Brown et al., 2020.) However, two effects only sometimes go in hand. The element that distinguishes the sticky floor effect from the glass ceiling is that it holds a specific group of workers at the bottom of the job hierarchy. Examining the wage gap by education in Spain in 2007 by de la Rica, Dolado and Llorens, has concluded that females with high education experienced a glass ceiling. The primary and secondary educated women encountered a sticky floor (de la Rica, Dolado and Llorens, 2007). The gender pay gap investigation in 11 European countries concluded that the glass ceilings prevail over the sticky floors in most countries (Arulampalam et al., 2007). Still, it makes sense that studies use two terms at the same time often. Women who encounter the glass ceiling are usually more educated and have steady jobs with higher salaries than those who experience the sticky floor. However, women in both situations have similarities. A woman cannot get promoted, run into the glass ceiling, and can remain

in one position simultaneously. Therefore, women employees can experience the sticky floor effect, have low mobility, and be unable to better their situation (Ganiyu and Oluwafemi, 2018).

2.1.2.2 Glass Cliff

The second term, "glass cliff," is a recent theoretical discovery. Researchers identified that women in top positions were likely to be assigned to "in-crisis firms" associated with an unrewarding environment and a high chance of failure (Haslam and Ryan, 2005, Cook and Glass, 2014). Multiple bodies of scholars find empirical support for this theory. For instance, studies that ask participants to match candidates with leadership positions discover that they are more likely to hire female candidates from struggling organizations (Haslam and Ryan, 2008). Other studies confirmed that tendency. Firms that experience scandal, turbulence, or dramatic change are more likely to have a significant proportion of female executives than less volatile firms (Brady et al., 2011). In addition, observers are more likely to blame leaders for poor organizational performance than the circumstances (Meindl, 1995, Meindl, Ehrlich, and Dukerich, 1985).

Researchers described several reasons for the glass cliff and women leaders' promotion to risky positions. First, organizations in crisis, more often than not, decide to experience leadership turnover (Pearson and Clair, 1998). Women tend to be assigned to these positions because typical candidates may view the job as too risky. So, women, out of fear that a similar opportunity may not occur in the future might be more persuadable to accept it. They want to take the risk and try something new, which is why crises may open previously unavailable opportunities for women to take on leadership positions (Boin and Hart, 2003). Second, women may look more suitable for the job due to particular skills and traits that make them fit to deal with crises (Eagly and Carli, 2003). Specifically, the qualities described as typically feminine — emotional intelligence, strong interpersonal skills, ability to raise morale, and a cooperative supervision style—may be more appreciated during the crisis (Bruckmuller and Branscombe, 2010, Haslam and Ryan, 2007). Such qualities may also make women candidates more attractive when decision-makers perceive a job or assignment as exceptionally high-risk or challenging. Finally, crisis motivates decision-makers to promote non-traditional leaders, including women,

signaling stakeholders that the enterprise is heading on a brave, fresh path (Khurana, 2002).

2.2 Factors influencing the glass ceiling

2.2.1 Education, job segregation, and the wage gap

Education is one of the most influential aspects that power careers even before employment begin. It is considered critical when evaluating a candidate for a job position and promotion. (Bussemakers, van Oosterhout, Kraaykamp and Spierings, 2017). Many countries, primarily undeveloped or with influential cultural beliefs, offer different educational opportunities for female and male students. However, it is a significant step toward equality and one of the global priorities of the Sustainable Development Goals (UNESCO, 2015). Educational statistics are a substantial sign of gender inequality. Worldwide reports suggest that about 22% of girls aged 15-19 years, about 13 million people, did not receive any education or training, compared to 12% of boys of the same age (UNICEF, 2021). As an example – in the number of schooling years for the age group 20–24 years in Afghanistan in 2015, females had 2.69 years' worth of education, compared to males' 6.40 years, which is a vast difference in access to education.

The occupational segregation examination includes analyzing the number of employees in the country, the number of men versus women working in different fields, their average salary, the wage gap, and legal barriers for women in various economies. Globally, over 2.7 billion females face legal restrictions and do not have the same selection of careers as men (World Bank Group, 2021). World Bank Group (2021) specifies that most CIS countries, 15 in Francophone Africa, and 12 Spanish-speaking countries have job restrictions exclusively for women. Interestingly, overall restrictions include jobs with high physical load, like mining. Policies where women are not allowed to work without their husbands' permission, exist in 18 countries (World Bank Group, 2021). So many jobs are not available for women, even if they want to start a carrier in the field.

Gender differences in wages are among the most debated topics of socioeconomic research, proved by numerous scientific studies, publications, and reports of well-known research organizations (IMF, UN, OECD, World Bank). The Gender Gap Report (2020) reports that the wage gap is still roughly 37% worldwide. The income gap (the ratio

between the bottom quantile of women's income to that of the top quintile of men) remains close to 51%. Even though women's labor is much in demand as the female labor force, 15-64 years old represent about 39% of the total of 3.38 billion worldwide (World Bank, 2022).

2.2.2 Bias and social expectations

Women in progressive nations have equal opportunities as men, the same education, job offerings, skills, and competence (Ridgeway, 2011). Excluding external and legal barriers, like lack of quality education or job restrictions, internet access in developed countries gives women more opportunities to obtain skills, qualifications, or degrees. So, the beginning of a professional career path in the enterprise may be the same for men and women in advanced economies. Both can acquire a job and get promoted steadily in their first years.

Nevertheless, in contrast with men, women can face several struggles throughout their careers, including a glass ceiling, a sticky floor, and a glass cliff. Women also encounter many more problems, like salary differences, job segregation, prejudice against working women, and the different evaluation of women's behavior. Plus, women worldwide are expected to perform a "double day," where they do their job and have to take care of their families.

2.2.2.1 Stereotypes and biases

The term "stereotype" was mentioned for the first time by Walter Lipmann in his book "Public Opinion" (1922). He described stereotypes as prejudgments that maintain the whole acknowledgment process and mark certain things as familiar or unfamiliar. That prejudgment influences our reason, so barely known appears expected. At the same time, the unknown seems extremely foreign (Lippman, 1922). It is challenging to measure biases in detail as it is a social factor that is not easy to rationalize. However, it can significantly affect women's careers.

For example, studies proved that bias influences women's success interpretations.

Scientific investigations on gender stereotyping of the credentials of men and women have found that due to gender stereotypes, career and success accomplished by men is primarily

considered the logical conclusion of their stable job performance and natural need to achieve (Kiesler, 1975, Goldberg, 1983, Kunda and Thagard, 1996). In comparison, women's same success is considered as extra-effort performance or linked to an external source, like luck (Pheterson, Kiesler, and Goldberg, 1971). One study notes that in cases where a woman performs so-called "men's work" excellently, others believe she deserves more admiration than men (Goldberg, 1983).

Stereotypes and biases proved to influence the glass ceiling effect significantly as well. Several studies have concluded that there are two main ideas regarding the source of the glass ceiling's existence (Grout, Park and Sonderegger, 2009, Choi and Park, 2014, Ganiyu and Oluwafemi, 2018). Short explanations of both ideas are: first, women are different from men, and "typically women" behaviour is not efficient for work, and second, women cannot be on the same level as men leadership-wise.

The first reason for the glass ceiling's existence is men's and women's differences in physiology, personality, and other traits. Old studies portray classic male images as bold, self-reliant, confident, and decisive (Mckee and Sheriffs, 1957). And typical women's traits as communicative, emotionally invested, supportive, and warm (Goffman, 1979). Males' negative markers are arrogance, authoritativeness, and excessive rationality. At the same time, females' negative traits include being submissive and dependent (Kinnaird and Hall, 1994, Kite, Deaux, and Haines, 2008). As a result, the authors have concluded that more positive qualities belong to men than women (Kinnaird and Hall, 1994). The second explanation for the lack of women in higher positions is the gender-biased image of women being caregivers rather than money-makers. Therefore, the assumption is that women lack the specific character to fulfil traditionally male roles (Feuer, 1988). The views on how women are not suited to be leaders tend to resist change (Dodge, Gilroy and Fenzel, 1995). Enterprises' leadership positions tend to allow gendered professional work ethics. Hence the 'think manager - think male' phrase (Britton, 2000, Schein, 2001).

The "Glass Ceiling Conundrum" study from the Journal of Evolutionary Studies in Business (2018) notes that the two concepts are not mutually exclusive. Women may not be the same as men in personality, but it does not mean they are poorer managers or lack competence. They might have different management techniques and stress responses from those traditionally initiated by male executives. However, other studies have proved no

fundamental difference in characteristics between men and women working in multiple occupations (Sigel and Sapiro, 1983, Sigel, 1996).

2.2.2.2 Social norms

Most women have traditionally formed obligations of taking care of their family, meaning they must do two jobs simultaneously throughout their careers and turn down opportunities, which is a whole other struggle for women's work and family balance (Ridgeway, 2011). Many women sacrifice and struggle more than their male colleagues because they must perform the dual roles of care provider at home and professional employees (Luke, 2001, Beddoes and Pawley, 2014). Work shifts are only sometimes flexible, so some women must turn down higher positions that require a more extensive workload. The maternity leave takes years out of their professional growth. Moreover, even if daddy quotas exist, conditions are better for dads, and families will lose more income if women go on maternity leave; women, as dictated by most of the social expectations, will be the ones to go on maternity leave. The International Labour Organization (ILO) establishes a minimum of 98 weeks to be offered to employees on maternity leave. The suggested compensation proposal from ILO is a minimum of 67% of earnings. Still, the number varies from 25% to 100% worldwide (World Bank Group, 2018). However, many economies do not ensure the same position, and at least seven countries do not offer paid maternity leave.

The social expectation of being the primary caregiver hit women especially hard during the pandemic. Women have lost out more than men economically and socially, from job and income losses to the increased danger of poor mental health and violence at home. More women than men lost their jobs during the early stages of the COVID-19 pandemic (World Bank, 2021), including women-led micro-businesses (Torres et al., 2021). Moreover, the pandemic shifted women's work-family balance by burdening their housework and working from home (Adisa, Aiyenitaju, and Adekoya, 2021). Women in many countries have given up their free time to a greater extent than men to care for others, including children and the elderly (World Bank, 2021).

Different social expectations of women's behavior at work can pressure and influence their performance. Cultural predispositions may affect the identity and behavior of female employees. Some cultures can welcome dominant individualities; others find women

acting dominantly too aggressively. The term "alpha female" is made to explain the dominant behavior of women leaders, which from a biased point of view, is seen as "men's behavior" (Sumra, 2019). The "alpha female" characteristics here are similar to ones expected from a "typical" male - rarely apologetic, confident, self-reliant, does not care about others' concessions, and favors independence (Maslow, 1939). Hence, there might be expectations of promoted women to behave dominantly, while their identities may differ. According to the "expectations," they might act authoritative and rational at work while being compassionate and gentle at home (Fuller, 2014). More modern studies have shown that promoted women should not face expectations to behave like the "old" generation of top managers. Instead, motivation should be encouraged, and efforts recognized. Non-dominant characteristics do not mean ineffective leadership (Emory, 2013).

2.3 Gender inequality indexes worldwide.

2.3.1 Gender gaps

The World Economic Forum examines data from 146 countries and reports national gender gaps on economic, political, schooling, and healthcare criteria. The equality gap combines four key dimensions – "Economic Participation and Opportunity, Education Attainment, Health and Survival, and Political Empowerment" - equal to 68%, lower than in 2020 (WEF, 2022). It is the same as the European Institute for Gender Equality (EIGE) index, but in that case, the index has risen by 0,6 since 2020. The 2021 WEF Report states that Iceland, 89% of gender equality score, ranked number one, and the Czech Republic is precisely in the middle with 71%. Afghanistan is the last with 44% (World Economic Forum, 2021). WEF also states that with the current data, it seems that it will take about 135 years to close the gender gap. The pay gap Top-10 countries list (Image 1) and other data show that Western European countries have the best scores and higher chances of gender parity. However, European Institute for Gender Equality (EIGE) published that women in the Political field represent only 26.1% of all parliament seats and only 22% of ministers in the 156 countries globally. The situation seems to improve as more women are in parliament, and two countries chose their first female prime ministers in 2020. At the same time, gender-based gaps in economic participation, education, health, and survival are smaller than last year.

Picture 1. Gender gap, Top-10 countries

| Rank | Country | Gender gap closed to date |
|------|-------------|---------------------------|
| 1 | Iceland | 89.2% |
| 2 | Finland | 86.1% |
| 3 | Norway | 84.9% |
| 4 | New Zealand | 84.0% |
| 5 | Sweden | 82.3% |
| 6 | Namibia | 80.9% |
| 7 | Rwanda | 80.5% |
| 8 | Lithuania | 80.4% |
| 9 | Ireland | 80.0% |
| 10 | Switzerland | 79.8% |

Source: WEF, 2021

2.3.2.1 Segregation and wage gap

According to Image 2, 5% of women have lost their jobs since the beginning of the pandemic, compared to 3,9% of men worldwide (World Economic Forum, 2021). Europe's decline in employment was 2.4% for both sexes (European Commission, 2021). However, labor rates rose more for men than for women. Multiple sources suggest that although both men and women suffered from COVID-19 financially, the impact is more significant on women on numerous levels. The inequality gap should increase, affecting wage and job segregation (EC, WEF, ILO, World Bank). Worldwide, change in employment significantly declined by -4.2% (Image 2), which is almost 54 million jobs in 2019-2020. During the first pandemic years, in the US, employment numbers declined -by 9.4%, by -4.1% in the Arab States, 3.8% in Asia and the Pacific, and Europe and Central Asia by 2.5%.

Picture 2. Percentage change in employment by sex



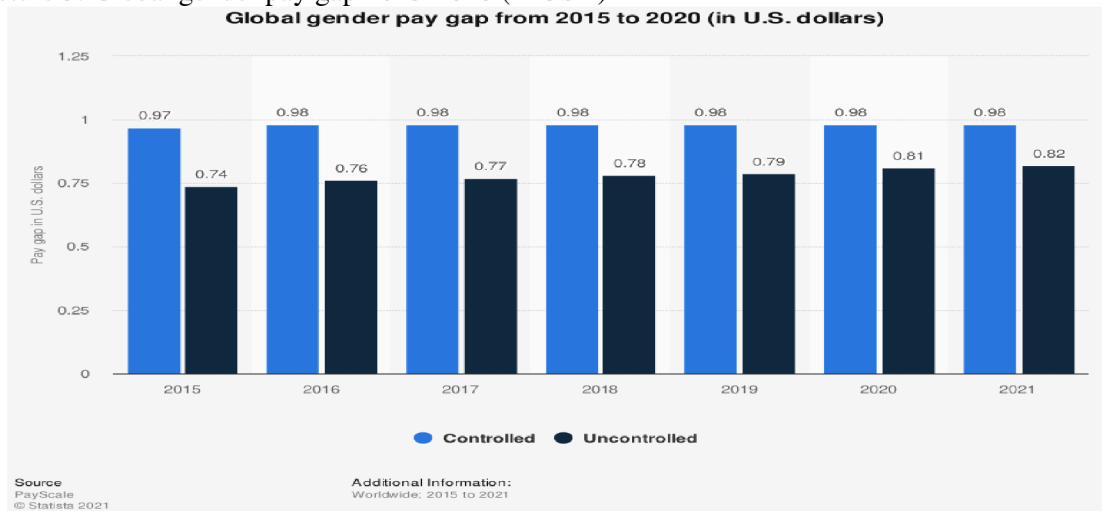
Source: WEF, 2021

Reports also suggest a higher risk of women being unemployed or not hired than men worldwide because most women work in fields that were hit by pandemics the most, e.g., healthcare and social assistance - 75% share of women employees, education 65.4%, accommodation and food 48,8% (World Economic Forum, 2021). The fields where women work the least are transportation, mining, and construction (ILO, 2021).

Evidence suggests that significant job segregation persists in technological field positions. The percentage of women employed remains low, and progress changes remain minimal. For example, the share of women working in Data and AI is equal to 32%, and over 2018 the figure declined by less than 1%.

The pay gap (Image 3) remains the most discussed topic as it has always existed worldwide and is examined yearly. In 2020 the average worldwide wage gender gap was equal to 0.98 in developed countries and 0.82 in uncontrolled countries.

Picture 3. Global gender pay gap 2015-2020 (in USD)



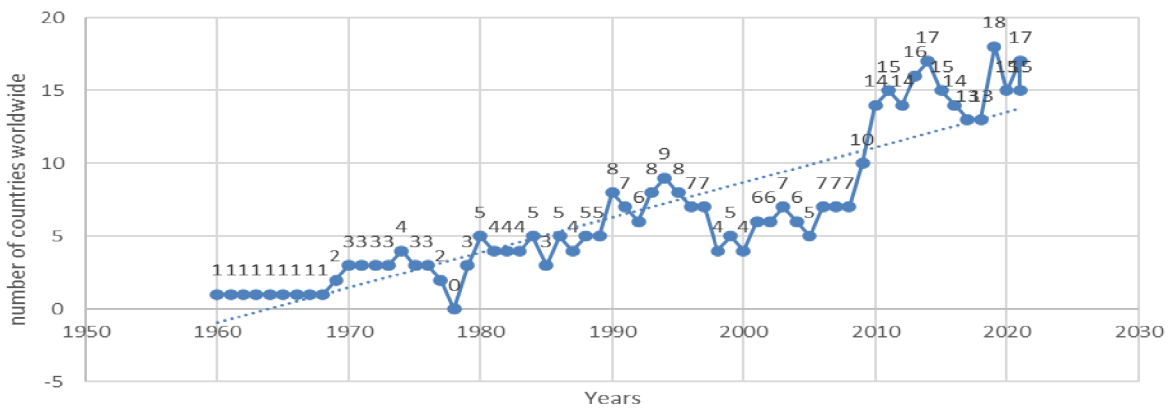
Source: Szmigiera, 2021

2.3.2.2 Glass ceiling

Overall, the number of countries that promote women to executive positions increased worldwide to 63 countries from 1960 to 2022 (Image 3), where the first elected female Prime Minister in Sri Lanka was in 1959. Since then, the number of women in power has developed slowly, with the most rapid growth happening in the past 12 years. Altogether, 76 women have held the most influential positions of executive power in their countries.

Picture 4. Countries with women in the highest position of executive power over the years

Number of countries with women executives 1960-2022



Source: O’Neill, 2022

World Economic Forum and LinkedIn studies in 2021 suggest that the fields with the most significant share of employed women are IT and Software services, Finance, Healthcare, and Manufacturing. Opposite to that, there is more severe destruction among all positions in other industries with high women participation, for example, the Consumer sector, Non-profits, and Media and Communication. Longer shifts of paid and unpaid work in quarantine, school closures, and limited availability of mental care services have contributed to overall growth in stress, anxiety about job insecurity, and difficulty sustaining work-life balance among women with kids.

Picture 5. Change in Hiring

| Industry | Share of women hired into senior management roles | | | | | | Share of women in all roles (2020) | Senior management roles, percentage point change | |
|--|---|-------|-------|-------|-------|-------|------------------------------------|--|--------------|
| | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | | 2015 to 2019 | 2019 to 2020 |
| Information Technology, Software and IT Services | 24.2% | 24.5% | 25.2% | 26.0% | 27.1% | 27.8% | 31% | 2.9% | 0.7% |
| Financial Services | 28.9% | 29.0% | 29.4% | 30.6% | 31.3% | 31.5% | 40% | 2.4% | 0.2% |
| Health and Healthcare | 43.5% | 43.5% | 43.6% | 44.5% | 45.2% | 45.4% | 61% | 1.8% | 0.1% |
| Manufacturing | 19.8% | 20.0% | 20.6% | 21.1% | 21.7% | 21.8% | 28% | 1.9% | 0.1% |
| Consumer, Consumer Goods | 36.2% | 36.0% | 36.4% | 37.1% | 37.6% | 37.3% | 53% | 1.4% | -0.3% |
| Media and Communications | 42.8% | 43.5% | 43.8% | 45.0% | 45.0% | 44.5% | 54% | 2.2% | -0.4% |
| Non-profits | 54.0% | 54.1% | 54.1% | 54.7% | 55.2% | 54.8% | 68% | 1.2% | -0.4% |
| Professional Services | 33.7% | 34.1% | 34.4% | 35.6% | 35.7% | 35.3% | 47% | 2.0% | -0.5% |
| Education | 47.7% | 48.4% | 48.3% | 49.5% | 50.0% | 49.4% | 57% | 2.2% | -0.6% |
| Consumer, Retail | 34.8% | 34.9% | 35.3% | 35.0% | 36.2% | 35.3% | 53% | 1.4% | -0.8% |
| Consumer, Recreation and Travel | 33.2% | 33.6% | 33.6% | 34.1% | 35.0% | 33.9% | 43% | 1.6% | -1.0% |

Source: WEF, 2021

The WEF points out four industries that have progressed in hiring women for senior roles and expanding the number of women employed. These fields (Image 5) are IT, Finance, Healthcare, and Manufacturing, each having a raise of about 1%. From 2015 to 2019, the most progress globally was in IT, Finance, Media, and Education, increasing by about 2% in all four (World Economic Forum, 2021). Still, there is a persistent decline in hiring women into executive positions, which reverses all the progress made in 2018-2019, according to WEF.

2.4 Gender inequality in Kazakhstan.

2.4.1 General Overview

At the beginning of 2021, Kazakhstan had 18.8 million people, a 1% growth from 2020. Of those 18.8 mln, 65% (8,7 million) are the working population aged 15-64, including 4.2 million active women (ASPR RK, 2022). So it is evident that women represent almost half of the current labor force and are very much in demand.

According to the Association of Business Women of Kazakhstan, women are mainly employed in low-paid areas of activity - education, and healthcare, where more than 70% work. According to the Asian Development Bank Gender Assessment Report in Kazakhstan (2013), these education and health sectors, together with food, finance, and insurance, which women employees also dominate, are low-wage sectors that account for only 2% of the GDP of Kazakhstan. Related literature also suggests that the average difference in salaries between men and women made up 40-50% in favor of men.

According to Kireyeva and Satybaldin, 2019 and WEF, 2021, the most significant gender pay gaps in Kazakhstan remain in four sectors:

- Art, entertainment, and leisure
- Finance and insurance sectors
- Professional, scientific, and technical sectors
- Accommodation and food services

While the smallest gap was recorded in the following sectors:

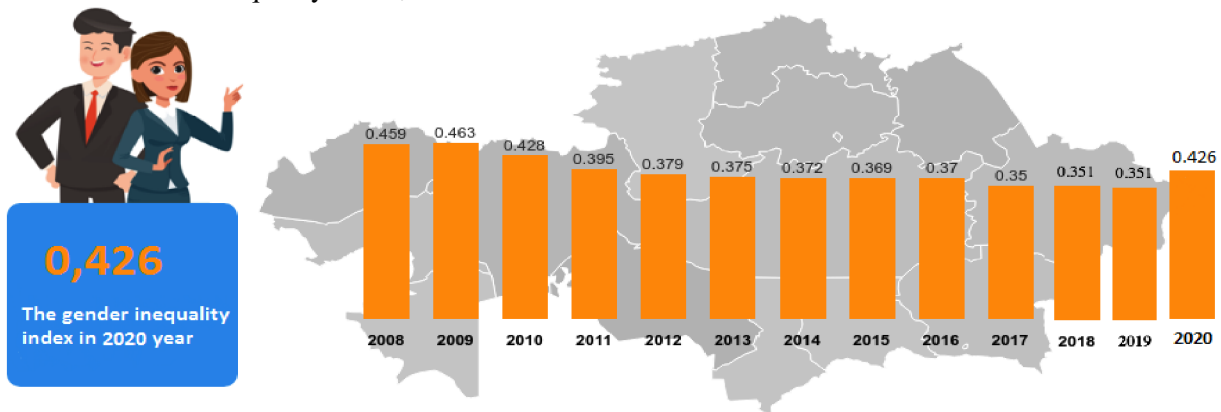
- Education
- Administrative and support services
- Health and social services

- Information and communication

The fields mentioned above with the smallest gap can indicate Kazakh women's success in occupations historically predisposed for them - education and nursing.

On the worldwide scale, the gender gap reports suggest that since 2020 Kazakhstan's equality rank dropped eight places and is now number 80 with a gender parity of 71%, right between Russia and Thailand (World Economic Forum, 2021). However, Kazakhstan's Gender Index evaluation (Image 6), conducted by the Bureaus of statistics, shows that gender parity went up in 2020 (ASPR RK, 2022).

Picture 6. Gender Inequality Index, Kazakhstan



Source: ASPR RK, 2022

The WEF also informs that while evaluating four primary sectors, researchers found education to be the highest, with a 99% gender parity. It indicates that Kazakhstan has almost no gender inequality in education and is marked 47th globally. Statistical Bureau of Kazakhstan (2020) reports that 94% of Kazakhstani adults aged 25-64 have completed upper secondary education. The health and survival sector equals 97%, slightly declining from 2006. The situation is not much worse with Economic participation, with 71% gender parity and 65th rank. Regardless, a sector that brings down the overall score in Kazakhstan is Political empowerment. Kazakhstan held political gender equality of 8% in 2006; since then, the number has grown to 14% in 2021 (WEF, 2021).

Kazakhstan is close to gender parity regarding primary, secondary, and higher education access. Hence, the explanation for such a small number of women's access to senior management positions and wage levels is not a lower qualification. The reason might be cultural barriers. Kazakhstan's women also suffer due to stereotypes, social expectations, and dual responsibility, just like in any other country. Females are stereotypically viewed

as helpful, kind, sympathetic, and sensitive (Eagly and Carli, 2007) and face a 'psychological barrier to women's choice, performance, and persistence in career decision-making (Sullivan and Mahalik, 2000). In Kazakh society, traditional views on the role of a woman, "keeper of the warmth," are designed to create comfort for her husband and children, which meshes with modern perspectives, where the woman is an important economic player—the "breadwinner" of the family, along with a man. Kazakhstan's women must work both at work and home; they are assigned to cook, clean, and look after children relentlessly. Career-oriented women are often perceived negatively by both women and male colleagues.

In contrast, men's career aspirations are viewed positively in society. Promotion possibilities often connect to a woman's marital status or situation with kids (Zhumagali, 2018). Thus, face an impossible conflict between traditional society's expectations of their role as mother and wife and Western values regarding women's professional fulfillment. It is not enough to adopt state programs and laws to support women's leadership; close interaction between the government and public institutions and measures to change stereotypical thinking about the role of women are necessary.

2.4.2 Approaches toward Equality in Kazakhstan

The Republic of Kazakhstan implemented a discrimination elimination law on June 29, 1998 (CEDAW, 2000). Since then, the highest political level has demonstrated the steps to acquire gender equality by creating gender projects and a special statistical bureau. The gender statistics added to the statistical website contain information on maternal mortality, abuse, unemployed population, number of marriages, and more (Gender Statistics of Kazakhstan, 2022). Moreover, the Gender Equality Strategy project (2006 to 2016) goals included developing gender-sensitive public consciousness, equality in rights, opportunities, education, social and political life, and gender equality economically, legally, and in households. It also included goals related to the image of the family altogether, which might be an indicator of the nation's vision of the role of women in society. Family-related goals include strengthening the reproductive health of men and women, sustaining the idea of the family, and increasing the part of education in households. Since the beginning of 2017, the new Concept of Family and Gender Policy implementation in the Republic of Kazakhstan until 2030 has begun, so gender equality

projects in Kazakhstan exist. Still, their power and value are doubted by many local and international organizations, including EEAS (Dubok and Turakhanova, 2017). They agree that even though the projects implemented so far have "Equality" in name, they have no real power. The department created to achieve the set goals cannot influence other ministries and departments or develop projects, quotas, or programs to support women, nor can they guide other governmental departments.

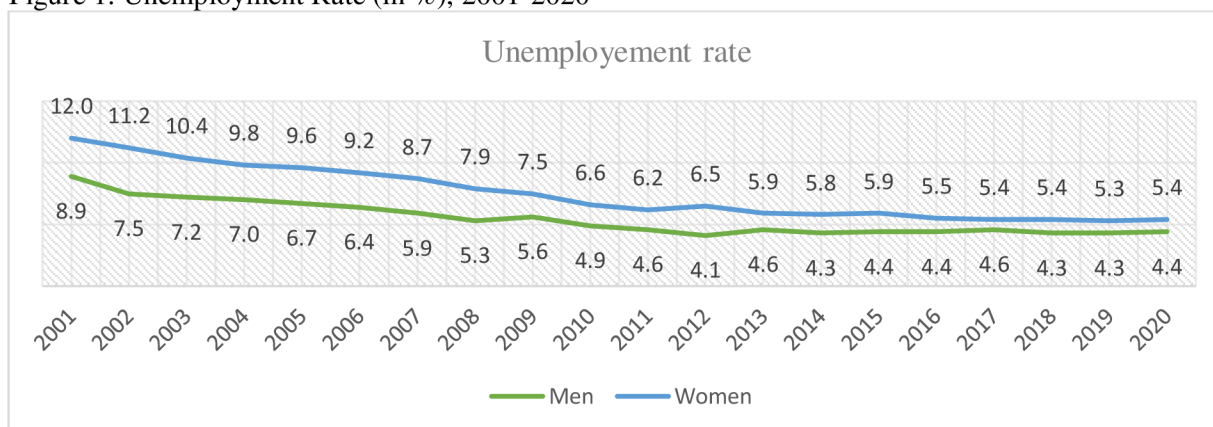
Overall, no in-depth reports or statistics, diversity quotas, or paternity leave projects have been enforced despite the Republic of Kazakhstan's changing scenario, including the growing importance of women in the workforce (Buckley, 1997) and the further modernization and arrival of foreign companies and professionals into the country. Projects that can support women juridically have yet to be discussed in the parliament or other political meetings, suggesting that the country's government is not as interested in the topic. Also, the reports from worldwide organizations are usually unavailable in the national language, which creates an even wider gap of unawareness, and Bias persists in influencing women's careers. On the bright side of the parity policies, on October 12, 2021, Kazakhstan canceled the "prohibited jobs" list for women. The jobs described as "unhealthy" and "dangerous" for females' reproductive capabilities included jobs like Bulldozer driver and Digger (PwC, 2021) might open new work possibilities for Kazakh women.

3 Practical Part

3.1 Discussion of the Glass ceiling factors

The goal of the Practical part of the thesis is to describe and compare the Glass ceiling effect's factors using graphs and charts as well as descriptive statistics. As was discussed in the First section of this thesis, five main factors influence the glass ceiling phenomenon. Education access, Job segregation, Pay gap, and Bias and cultural predisposition. For comparison purposes, this section's last part will describe the number of women who reached managerial positions and the Unemployment in the Republic of Kazakhstan. Before thoroughly examining the Glass ceiling for a better understanding of the overall situation in Kazakhstan: the population is 19,6 million people, where 9,7 million are women. Inflation is 17.7%, GDP is 103.6%, and the unemployment rate is 4.9% in 2022 (ASPR RK, 2022). Women's unemployment rate (Figure 1) is higher than men's on average, and even though the number of employed women increased significantly over the years (which might be related to a shift in the country's view on working women), there are always more employed men. In 2020, 72.1% -of employed men, 60.3% of employed women (ASPR RK, 2022).

Figure 1. Unemployment Rate (in %), 2001-2020



Source: stat.gov.kz

3.1.1 Access to quality education

As mentioned in the Literature review, Kazakhstan has almost achieved full parity in Access to education (WEF, 2021). The Gender parity index presented is a ratio of the gross enrollment rate in primary, secondary, and higher education institutions to the total

population of corresponding age groups. Kazakhstan's education system is 12 years long. Primary school enrollment is at 6-7 years old, and secondary at 10-11 years old. In 9th grade, there is a choice of either going to college or continuing studying in grades 10 and 11. Enrollment in university starts at 17 years. Before university, passing the Unified National Testing (UNT) is compulsory:

Figure 2. Gender parity index in primary, secondary, and higher education, 2001-2020

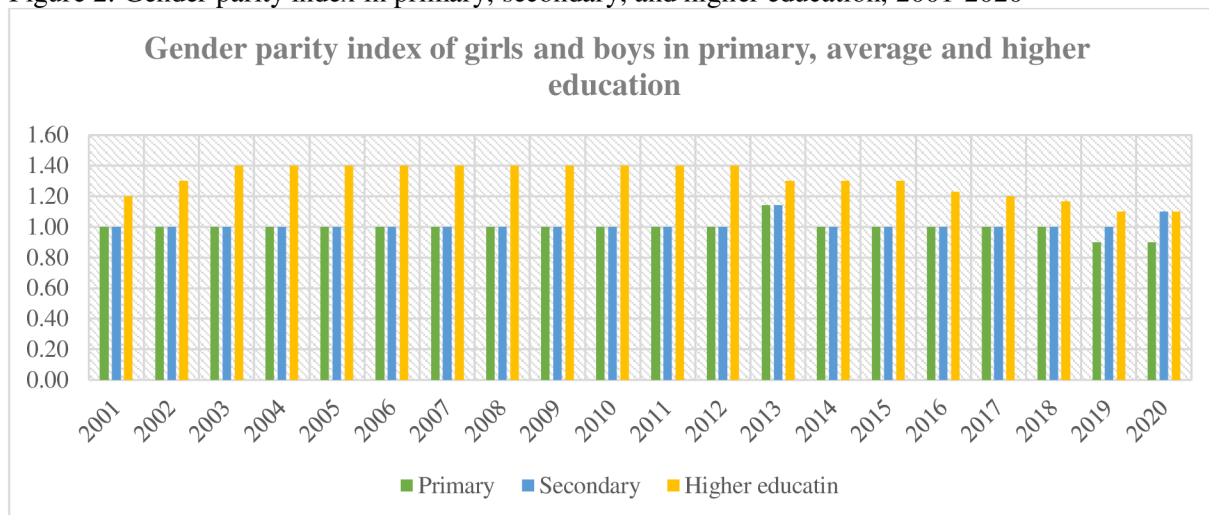
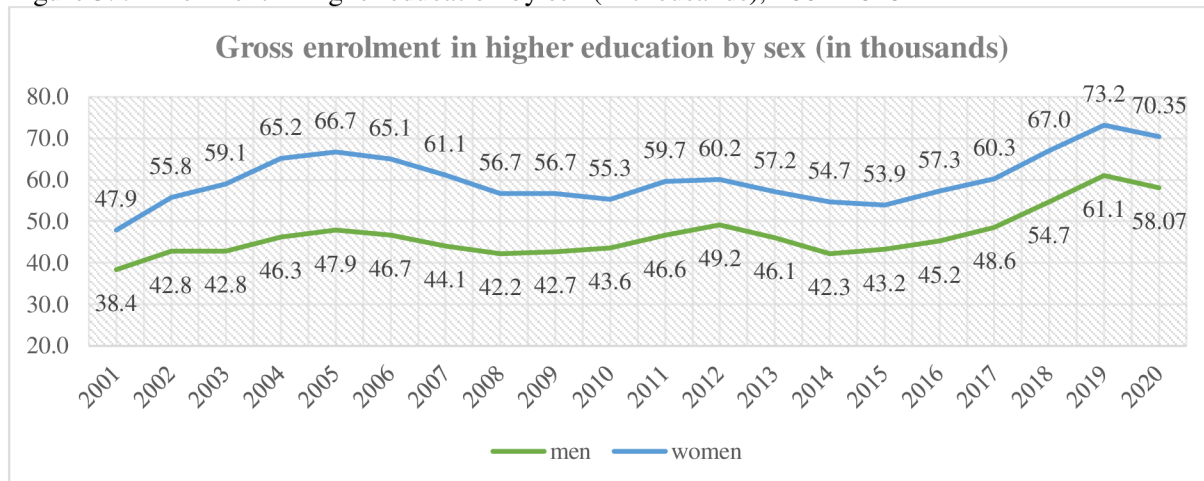


Figure 3. Enrollment in higher education by sex (in thousands), 2001-2020



Source: stat.gov.kz

The charts show that Kazakhstan has parity in primary and secondary education (Figure 2). Moreover, more women than men enrolled in universities throughout the 20 years of data, so it is evident that Kazakh women have the same education opportunities as men (Figure 3).

3.1.2 Job segregation

Job segregation is more challenging to analyze as there are multiple occupational areas. For comparison purposes, fields where women typically succeed, like the Service sector, and the sectors with typically low women representation, the Agricultural and Construction sectors, are included (Figure 4). The political sector of Kazakhstan's women representation among Politicians is most deficient compared to others. It brings down the country's rank in the Global Gender report by WEF every year. In 2021 Kazakhstan held political gender equality of 14% (WEF, 2021).

The diagram shows that women in Service-related work represent more than half of the staff. There was a significant drop in 2012 (47.6%), but the sector's mean is 55.6%. The second-highest share belongs to the Agricultural sector, with a mean of 45.8% minimum of 42.4% in 2019. Construction is in third place, with a mean of 29.1%, a minimum of 27.1% in 2015, and a maximum of 30.8% in 2007. The Political field has extreme women underrepresentation, with a mean of 9.7%, minimum of 7% in 2019, and maximum of 11.7% in 2018.

Figure 4. Share of employed women by groups of types of economic activities (%), 2001-2019



Source: stat.gov.kz

3.1.3 Pay gap

It is evident that the wage gap significantly went down since 2001 by over 16% (Figure 5). The wage gap's mean equals 34.62%, minimum being 25% in 2020 and maximum of

41.3% in 2001. Women's salary was 12,635 Kazakhstani tenge compared to 21,511 tenge men's average monthly salary in 2011. And 182,679 tenge women's and 243,524 tenge men's salaries in 2020. Overall the average pay gap is going down. However, Kireyeva and Satybaldin, 2019 researched Kazakhstan's pay gaps in various jobs and confirmed that gender discrimination in employment is the most crucial factor in the existing gender wage differences. They theorized it might connect to cultural predisposition and the stereotypes about "male professions" and employers' belief that women's productivity stands lower than men's, which diminishes salaries and reduces hiring bias.

Figure 5. Wage gap (in %), 2001-2020



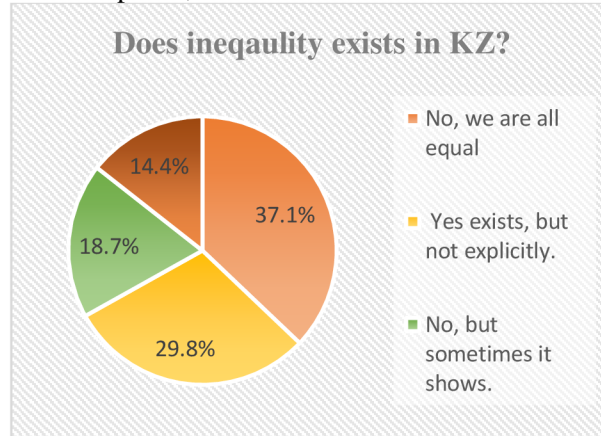
Source: stat.gov.kz

3.1.4 Bias and cultural predisposition

To understand Kazakhstan's Bias and social norms, a sociological survey conducted with a sample of 1500 respondents aged 18 to 60 years in 2016 by Kazakhstan researchers will be analyzed (Uzkembayeva, M.A. et al., 2016). The question of the inequality among men and women's existence (Figure 6) received a majority response of "No, we are all equal" (37.1%) and "Yes, but not explicitly "(29.8%). A further-related question, "If it does exist, how is it expressed?" had replies of Distribution of housework (31.4%), Care for children and elderly (23.3%), Lack of women in politics, and Unequal pay, both around 14%. On the contrary, those who disregarded the existence of inequality replied: It is my opinion (26%), Traditions and customs of our culture (18.5%), Historical development of our society (18.4%), Religion (9.4%). Almost 37% of respondents also mentioned that they are aware of the concept of Gender policy, and 45.8% of replies are from women.

Interestingly, the most common problems for women, by respondents' opinions, are Early pregnancy (75.8%), Unpaid housework (71.4%), and Double load at work and home (68.6%).

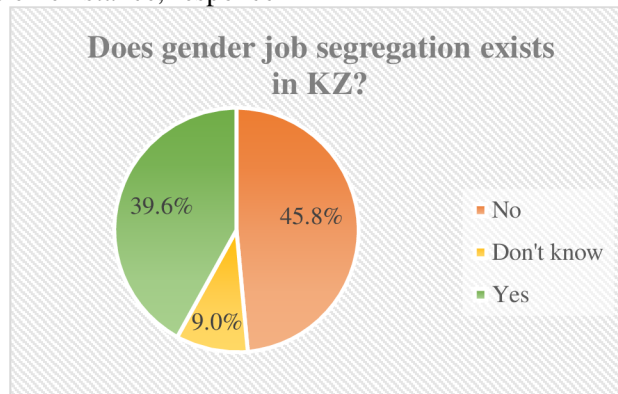
Figure 6. Inequality existence response, 2016



Source: Uzkembayeva, M.A. et al., 2016

Job-related questions, like "Do you think job segregation exists" (Figure 7), mainly had unfavorable responses – No (45.8%) and Yes (39.6%). In respondents' opinions, typical female jobs are Secretary, Librarian, and Make-up artist. Options like Lifeguard, Miner, and Driver for women occupation received zero positive responses, and instead, these occupations were called "typically male." A typical job for both sexes: Doctor, Manager, and Teacher.

Figure 7. Job segregation existence, response

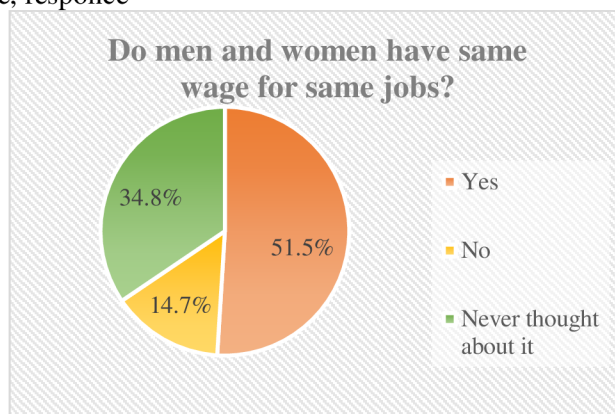


Source: Uzkembayeva, M.A. et al., 2016

51.5% of people denied the existence of the pay gap (Figure 8), while 34.8% said they never thought about it, and only 14.7% replied that men and women do not have the same wages for the same jobs. Replies to "Do you think men and women have the same hiring conditions?" were: Yes (32.3%), No (27.7%), Do not know (24%) and Never thought

about it (16%). Most of those who confirmed the same hiring conditions were women - 36.2%, and 25.9% were men.

Figure 8. Pay gap existence, response



Source: Uzkembayeva, M.A. et al., 2016

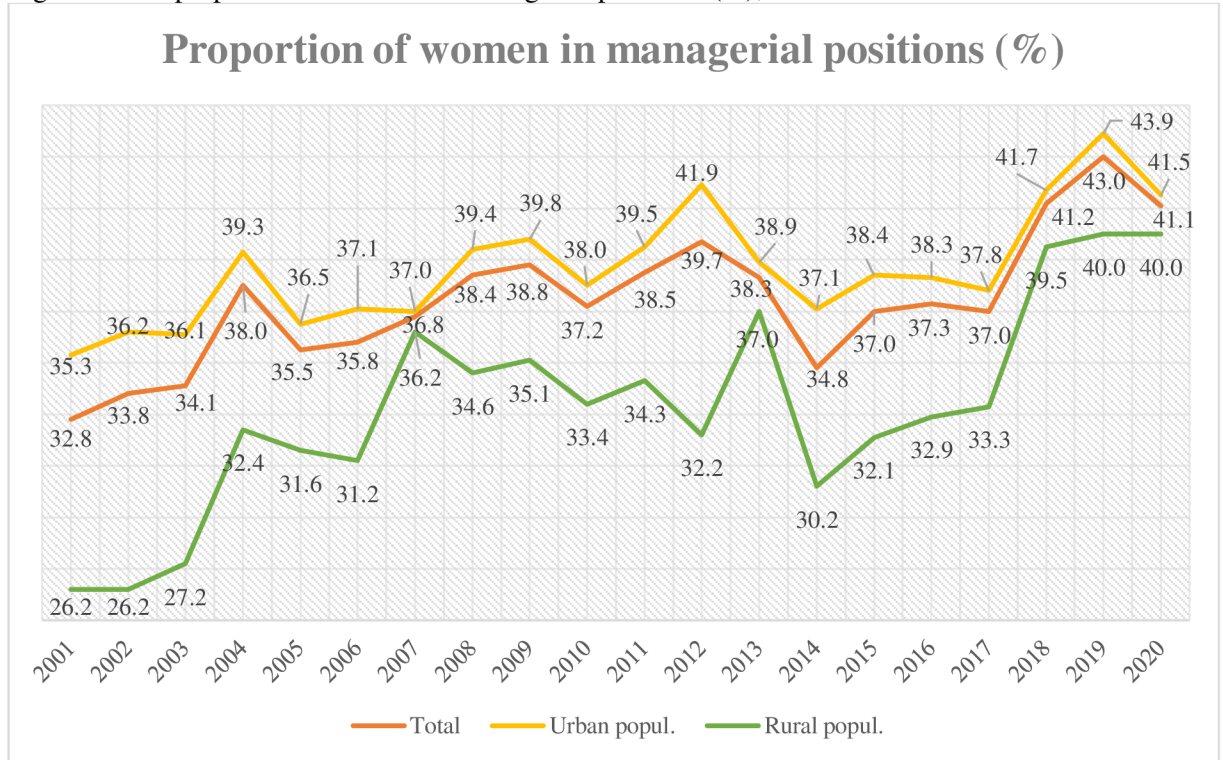
As to whether women are the ones who should go on maternity leave, 85.1% said yes. Contrarily, the reply to "Who is responsible for child-rearing in the family?" was "Both parents" (90.5%), and less than one percent voted that only the mother should be responsible for raising children. In addition, 71.1% of respondents said that Women do most of the housework in a Kazakh family, and only around 3% voted that Both men and women and Men take Care of the household. To question, "Is it necessary to teach Kazakhstan's people knowledge that helps to overcome stereotypes about men and women?", 44.4% of respondents said Yes, it is necessary, 43% said they Do not know, and only 12.7% replied it is unnecessary. Among those who agreed, 48.9% were women.

3.1.5 Glass ceiling

Figure 9 shows that the proportion of women in managerial positions does not have a constant upward or downward direction throughout the years. In total mean of women proportion is equal to 37.53, minimum being 32.80% and a maximum of 43% in 2019. Rural mean is 33.28% and urban mean - 38.68%. Which indicates that the rural population has a less women managers on average, but the latest indicators are not too bad, with only 1.5% difference. Also, the rural population has the most significant change – throughout the 20 years the proportion grew by 13.8%. Total proportion of women managers has

increased by 8.3%., since 2001, the In urban areas, it increased by 6.3%, and the most significant change was among the rural population, where women's representation among managers rose by 13.8% since 2001.

Figure 9. The proportion of women in managerial positions (%), 2001-2020



Source: stat.gov.kz

3.2 Hypothesis testing

3.2.1 Preliminary data

The preliminary data from 2001 to 2020 from Kazakhstan's statistical office (ASPR RK 2022). for the Regression analysis is presented in Figure 10. It contains the Glass ceiling, Education access, Pay gap, and Job segregation variables.

And to summarize the descriptive statistics in Figure 11 - the mean of Access to Education is 60.17%, the Pay gap is 34.42%, Job segregation is 35.07%, and the mean of the Glass ceiling is 37.45% throughout 20 years of data (2001-2020).

Figure 10. Preliminary data, Glass ceiling

| Obs | Glass_Ceiling | Education_Access | Pay_Gap | Job_Segregation |
|-----|---------------|------------------|---------|-----------------|
| 1 | 32.8 | 47.9 | 41.3 | 35.2 |
| 2 | 33.8 | 55.8 | 38.3 | 35.3 |
| 3 | 34.1 | 59.1 | 39.2 | 35.7 |
| 4 | 38.0 | 65.2 | 38.1 | 35.5 |
| 5 | 35.5 | 66.7 | 38.9 | 35.6 |
| 6 | 35.8 | 65.1 | 37.7 | 36.0 |
| 7 | 36.8 | 61.1 | 34.2 | 35.9 |
| 8 | 38.4 | 56.7 | 36.2 | 36.0 |
| 9 | 38.8 | 56.7 | 33.8 | 35.9 |
| 10 | 37.2 | 55.3 | 34.0 | 35.7 |
| 11 | 38.5 | 59.7 | 32.0 | 35.8 |
| 12 | 39.7 | 60.2 | 30.5 | 33.6 |
| 13 | 38.3 | 57.2 | 32.2 | 35.6 |
| 14 | 34.8 | 54.7 | 33.0 | 34.7 |
| 15 | 37.0 | 53.9 | 34.1 | 34.3 |
| 16 | 37.3 | 57.3 | 31.4 | 34.6 |
| 17 | 37.0 | 60.3 | 32.2 | 34.1 |
| 18 | 41.2 | 67.0 | 34.2 | 34.8 |
| 19 | 43.0 | 73.2 | 32.2 | 33.3 |
| 20 | 41.1 | 70.4 | 25.0 | 33.8 |

Figure 11. SAS output for the Glass ceiling. Descriptive statistics.

| Variable | Mean | Std Dev | Minimum | Maximum | Median | N | Coeff of Variation | Lower Quartile | Upper Quartile |
|------------------|------------|-----------|------------|------------|------------|----|--------------------|----------------|----------------|
| Glass_Ceiling | 37.4550000 | 2.6029285 | 32.8000000 | 43.0000000 | 37.2500000 | 20 | 6.9494821 | 35.6500000 | 38.6500000 |
| Education_Access | 60.1750000 | 6.1529518 | 47.9000000 | 73.2000000 | 59.4000000 | 20 | 10.2250965 | 56.2500000 | 65.1500000 |
| Pay_Gap | 34.4250000 | 3.7656166 | 25.0000000 | 41.3000000 | 34.0500000 | 20 | 10.9386103 | 32.2000000 | 37.9000000 |
| Job_Segregation | 35.0700000 | 0.8621271 | 33.3000000 | 36.0000000 | 35.4000000 | 20 | 2.4583037 | 34.4500000 | 35.7500000 |

Source: my own calculations

3.2.2 Multiple linear regression

This part of the thesis includes testing the relationship among the variables – factors of the Glass ceiling. The target variable (Y) is the Glass ceiling, and the explanatory variables – Access to education (X1), Pay gap (X2), and Job segregation (X3). The linear regression model will be constructed using the SAS program. The decision to reject or accept the null hypothesis of no overall significance will be made using F-test. Then, suppose the Null hypothesis rejection; it gives us enough statistical evidence to assume at least one significant relationship between dependent and independent variables. In that case, the t-test will be conducted to analyse the individual significance between each explanatory variable and the target variable.

3.2.2.1 Multicollinearity

Before conducting the final regression analysis, the correlation among the Education access, Pay gap, and Job segregation independent variables, referred to as multicollinearity, will be checked using the SAS studio program (Figure 12).

Figure 12. SAS output for correlation analysis

| Pearson Correlation Coefficients, N = 20 | | | |
|--|------------------|----------|-----------------|
| | Education_Access | Pay_Gap | Job_Segregation |
| Education_Access | 1.00000 | -0.33112 | -0.32995 |
| Pay_Gap | -0.33112 | 1.00000 | 0.57739 |
| Job_Segregation | -0.32995 | 0.57739 | 1.00000 |

Source: my own calculations

The correlation of Education access to the Pay gap, $R_{x1x2} = -0.33$, is very weak. The correlation of Education access to Job segregation is $R_{x1x3} = -0.32$, also very weak. And the correlation of Pay gap to Job segregation, $R_{x2x3} = 0.5$ medium correlation. It is conclusive that no multicollinearity is present in this Regression model, and no adjustments need to be made.

3.2.2.2 Estimated Regression equation

The SAS output for the estimated regression equation in Figure 13 is

$$y' = 39.237 + 0.204x_1 - 0.360x_2 - 0.047x_3.$$

Where Access to Education, parameter B1 equals 0.204, Pay gap parameter B2 = -0.360, and Job segregation B3 = -0.047. Thus, if Access to education rises by 1%, women's representation in a managerial position (Glass ceiling) estimated growth is 0.204%, assuming two other factors are constant. By this logic, if Pay gap grows by 1%, the Glass ceiling goes down by -0.360%, and if Job segregation rises by one unit - women's representation becomes lower by -0,047%.

The quality of the model can be calculated as such: SST = 128.729, SSE = 40.299, and SSR = 88.430 (Figure 13), which means $R^2 = (SSR/SST) = (88.420/128.729) = 0.6869$. Same as in SAS output. 68.69% of the Glass ceiling target variable is explained by the estimated multiple regression equation with Access to Education, Job segregation, and Pay gap as the explanatory variables.

3.2.2.3 F-test

Figure 13. SAS output for the Glass ceiling. F-test

| Model: MODEL1 | |
|-----------------------------------|----|
| Dependent Variable: Glass_Ceiling | |
| Number of Observations Read | 20 |
| Number of Observations Used | 20 |

| Analysis of Variance | | | | | |
|----------------------|----|----------------|-------------|---------|--------|
| Source | DF | Sum of Squares | Mean Square | F Value | Pr > F |
| Model | 3 | 88.43047 | 29.47682 | 11.70 | 0.0003 |
| Error | 16 | 40.29903 | 2.51869 | | |
| Corrected Total | 19 | 128.72950 | | | |

| | | | |
|----------------|----------|----------|--------|
| Root MSE | 1.58704 | R-Square | 0.6869 |
| Dependent Mean | 37.45500 | Adj R-Sq | 0.6283 |
| Coeff Var | 4.23719 | | |

| Parameter Estimates | | | | | |
|---------------------|----|--------------------|----------------|---------|---------|
| Variable | DF | Parameter Estimate | Standard Error | t Value | Pr > t |
| Intercept | 1 | 39.23704 | 17.97344 | 2.18 | 0.0443 |
| Education_Access | 1 | 0.20435 | 0.06375 | 3.21 | 0.0055 |
| Pay_Gap | 1 | -0.36050 | 0.12044 | -2.99 | 0.0086 |
| Job_Segregation | 1 | -0.04759 | 0.52585 | -0.09 | 0.9290 |

Source: my own calculations

The hypothesis for the F test is as follows:

- $H_0: B_1 = B_2 = B_3 = 0$
- $H_1: B_1$ and/or B_2 and/or $B_3 \neq 0$

The Null hypothesis is that there is no relationship between the target and explanatory variables, and the Alternative hypothesis – at least one of the explanatory variables has a significant relationship with the target variable (Glass ceiling).

The decision will be based on the probability value approach; if p-value < α (alpha), then the H_0 can be rejected. Figure __ above shows that the p-value of the Regression model (F-test) is equal to 0.0003. With a significance level of 5%, $\alpha = 0,05$. Based on the p-value and alpha, the conclusion is that the H_0 can be rejected as p-value is less than the alpha (0.0003<0,05).

3.2.2.4 T-test

To individually establish which explanatory variables have a relationship with dependent variables and which do not, the t-test will be applied (Figure 14). New hypotheses will be constructed for that matter.

For X₁) H₀: B₁ = 0 H₁: B₁ ≠ 0

For X₂) H₀: B₂ = 0 H₁: B₂ ≠ 0

For X₃) H₀: B₃ = 0 H₁: B₃ ≠ 0

The p-value (Figure 14) comparison to the alpha = 0.05:

The p-value for X₁ = 0.0055, (< 0.05), the null hypothesis can be rejected; there is a relationship between Access to Education and Glass ceiling.

For X₂ = 0.0086 (< 0.05). Null hypothesis rejected; the relationship between Pay gap and Glass ceiling is significant.

X₃ = 0.929 (>0.05). Therefore, there is no rejection of the null hypothesis - the relationship between the Glass ceiling and Job segregation is insignificant

Figure 14.SAS output for Glass ceiling, t-test

| Parameter Estimates | | | | | |
|---------------------|----|--------------------|----------------|---------|---------|
| Variable | DF | Parameter Estimate | Standard Error | t Value | Pr > t |
| Intercept | 1 | 39.23704 | 17.97344 | 2.18 | 0.0443 |
| Education_Access | 1 | 0.20435 | 0.06375 | 3.21 | 0.0055 |
| Pay_Gap | 1 | -0.36050 | 0.12044 | -2.99 | 0.0086 |
| Job_Segregation | 1 | -0.04759 | 0.52585 | -0.09 | 0.9290 |

Source: my own calculations

4 Results and Discussion

While analysing the factors of the Glass ceiling – Access to education, Pay gap, and Job segregation data from 2001-2020 and the SAS output, the overall significance of the Regression model using the F-test was confirmed. The Null hypothesis of no overall significance was rejected -there is at least one dependency between the target and explanatory variables. The Glass ceiling's strongest correlation is with Access to education, $R=0.66$, which makes sense as Education is one of the essential criteria when considered for a job position or a promotion. Women representation among managers negatively correlated with the Pay gap and Job segregation ($R= -0.69$ and $R=-0.47$ accordingly). Meaning if Pay gap or Job segregation rises, the numbers of women managers become smaller.

Further investigation of individual significance using a t-test shows that Job segregation independent variable X_3 had no significant relationship with the women-managers representation (the H_0 not rejected). The insignificance of the data might be because the statistical office's numbers available did not include all the Job fields, and the total average ratio is yet to be reached. Considering the survey, when 1500 respondents aged 18-60 voted on whether job segregation exists - 45.8% said it does not exist. However, when asked for most typical jobs for women, the standard answer was Secretary, Librarian, and Make-up artist, while typically male jobs were Miner, Security guard, and Lifeguard. Interestingly, when asked what the most common job for both sexes is, replies were: Doctor, Manager, and Teacher. So, it is evident that people differentiate jobs by sex and do not recognize the power of job segregation.

The t-test for other two explanatory variables, X_1 and X_2 , confirmed the significant relationship between the Glass ceiling and Education Access and Pay gap. The null hypotheses for them were rejected, confirming significant relationships.

Education access has almost full parity, confirmed by preliminary data and worldwide reports. Moreover, there are more women in higher education institutions than men (70.35% of female students in 2020). So, there is no doubt that women have the same chances education-wise.

The pay gap remains at 25% in 2020 but becomes smaller yearly. Still, most survey answers were that the Pay gap does not exist at all - 51.5% said men and women have the same salaries for the same jobs. Researchers have raised an opinion that its existence might be due

to employers' belief that women are less efficient than men and biases connected to "traditional" family image, pressuring some women to become stay-at-home moms after giving birth. Respondents did confirm that they believe caring for the house is primarily a female obligation - 71.1% said women are the ones who do most of the housework. And although 90.5% said both parents are responsible for raising children, when asked what the most common problem for women is, the second highest was unpaid housework (71.4%), and the third-highest double workload at work and home (68.6%). Furthermore, 85.1% agreed that women are the ones who should go on maternity leave. So, it is understandable that a double workload at work and home, which not everyone can uphold, restricts some Kazakhstani women's work opportunities.

Additional questions from the survey gave evidence that social norms and biases exist in Kazakhstan. Many significant questions about inequality, pay gap, and job segregation were turned down, even though those answers did not correlate with actual Gender statistics. 37.1% said inequality does not exist. In addition, when asked what the most common problems for women are, the top answer was early pregnancy (75.8%). Voters were familiar with the concept of Gender policy (37.2%), and 44.4% agreed with the necessity of teaching the knowledge that helps to overcome the stereotypes in the country.

5 Conclusion

The central objective of this work was to describe and evaluate the inequality in Kazakhstan, primarily by analysing the Glass ceiling phenomenon. The first part of the thesis introduced the Glass ceiling and close-related subjects like the Sticky floor and Glass cliff terms to demonstrate a continuous interest in the topic. The related studies and articles provided worldwide researchers' opinions and studies on why the Glass ceiling exists in the first place. Then each factor that powers the Glass ceiling was described separately with an in-depth investigation of the stereotypes, biases, and social norms. Reports and statistics from worldwide organizations described the global inequality gaps and compared them to Kazakhstan's worldwide ranking, with a short description of how the COVID-19 pandemic impacted women's employment. The literature review is concluded with Kazakhstan's inequality summary by analysing the Glass ceiling factors and evaluating Kazakhstan's attempt to achieve gender equality by enforcing the Gender Equality Strategy project.

The practical part tests the relationship significance between the Glass ceiling dependent variable and three independent variables: access to education, pay gap, and job segregation. Based on the results from SAS output, ASPR RK data from 2001-2020, and all the supporting literature presented in this thesis - the Glass ceiling exists in Kazakhstan just like in other parts of the world. It is influenced by some factors researchers define: the pay gap, education access, bias, and social norms. Kazakhstan's society's bias, stereotypes, and cultural predisposition influence women's career opportunities quite a lot. However, in most voters' opinion, inequality overall and at the work level does not exist or is not critical. Job segregation has proven not to influence the Glass ceiling phenomenon in Kazakhstan. However, it does impact the opportunities of women employees working in typically-male careers that require physical strength or give political authority, according to the statistical office (e.g., politics, police). Also, some stereotypically male jobs have yet to have female employees, as the "prohibited jobs list" was lifted recently. Meaning there is much to be added to the job segregation analysis. Education access parity is indeed practically reached, but the career prospects after at least Bachelor's degree are different. The average pay gap remains but seems to be shrinking.

The importance of reaching equality is unquestionable, and Kazakhstan's attempt to do so might strengthen in the future, but it requires more governmental and national involvement.

Some voters acknowledged the problems of inequality, unpaid housework, double load at work and home, lack of females among political figures, and the importance of women's involvement in public affairs. All voters did recognize the importance of learning to look through stereotypes.

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7.4 List of abbreviations

ASPR RK - Agency for Strategic planning and reforms of the Republic of Kazakhstan
 Bureau of National Statistics

8 Appendix

1. Do you think there is inequality between men and women in Kazakhstan?
 - a) No, we are all equal (37.1%)
 - b) Yes exists, but not explicitly. (29.8%)
 - c) No, but sometimes it shows. (18.7%)
 - d) Yes, very strong. (14.4%)

2. If the inequality exists, how does it express?
 - a) Distribution of housework (31.4%)
 - b) Care for children and the elderly (23.3%)
 - c) Lack of women in politics (14.4%)
 - d) Unequal pay (14.0%)
 - e) Division of professions into male and female (12.8%)
 - f) Life duration (9.5%)
 - g) Presentation of men and women in the media (3.6%)

3. If inequality doesn't exist, why?
 - a) It's my own opinion (26.0%)
 - b) Traditions and customs of our culture (18.5%)
 - c) It historically developed in our society (18.4%)
 - d) Religion (9.4%)

4. Are you familiar with the concept of gender policy?
 - a) Yes (37.2%)
 - b) No (35.3%)
 - c) Heard something about it (27.5%)

5. Which of these problems you would call most common for men?
 - a) High mortality (58.9%)
 - b) High chance of heart diseases (53.9%)
 - c) Unemployment (39.4%)

6. Q6: Which of these problems you would call most common for women?
- a) Early pregnancy (75.8%)
 - b) Unpaid housework (71.4%)
 - c) Double load at work and home (68.6%)
 - d) High mortality (9.6%)
 - e) Unemployment (18.3%)
7. Which problems you would call common for both sexes?
- a) Unemployment (24.9%)
 - b) High competition in the labour market (15.3%)
8. Do you think it is necessary to involve women in politics?
- a) Yes (58.3%)
 - b) No (22.7%)
 - c) I don't know (19.0%)
9. Do you think that in Kazakhstan, professions are divided into "male" and "female"?
- a) No (45.8%)
 - b) Don't know (9.0%)
 - c) Yes (39.6%)
10. If yes, which profession would you call "typically female"?
- a) Secretary (37.9%)
 - b) Librarian (36.0%)
 - c) Makeup artist (28.2%)
 - d) Lifeguard (0.0%)
 - e) Miner (0.0%)
 - f) Driver (0.0%)
11. If yes, which profession would you call "typically male"?

- a) Miner (45.1%)
- b) Security guard (38.2%)
- c) Lifeguard (37.7%)
- d) Teacher (0.6%)
- e) Librarian (0.2%)

12. If yes, which profession would you call typically for both sexes?

- a) Doctor (42.1%)
- b) Manager (39.3%)
- c) Teacher (36.5%)

13. Do you think men and women have the same wage for same jobs?

- a) Yes (51.5%)
- b) No (14.7%)
- c) Never thought about it (34.8%)

14. Do you think men and women have the same conditions when hired?

- a) Yes (32.3%)
- b) No (27.7%)
- c) Don't know (24.0%)
- d) Never thought about it (16.0%)

15. Do you think a woman should go on maternity leave and stay at home to take care of a child?

- a) Yes (85.1%)
- b) Not necessarily (7.6%)

16. Who do you think is responsible for raising children in a family?

- a) Both parents (90.5%)
- b) Mother (0.8%)

17. Who do you think does most of the housework in a Kazakhstani family?

- a) Women/wife (71.1%)
- b) Both (3.2%)
- c) Father/husband (3.4%)

18. In your opinion, is it necessary to teach Kazakhstanis the knowledge that helps to overcome stereotypes about men and women?

- a) Yes, it is necessary (44.3%)
- b) No, it's not necessary (12.7%)
- c) Don't know (43.0%)

Source: Uzkembayeva, M. A., Rezvuškina T.A., Bejsenova A.A. Policy towards Women and Men in Modern Kazakhstan. Friedrich Ebert Stiftung fund, Almaty, 2016. ISBN 978-601-80610-4-2