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BEHAVIOUR AND GENDER SAVINGS GAP ACROSS THE WORLD

Bachelor's thesis

Programme International Business Administration, specialisation Finance and Accounting

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Tallinn 2021

I hereby declare that I have compiled the paper independently
and all works, important standpoints and data by other authors
have been properly referenced and the same paper
has not been previously presented for grading.
The document length is 8638 words from the introduction to the end of conclusion.

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ABSTRACT

Gender inequality persists in many countries. However, the existing literature on the determinants of gender gaps in financial outcomes besides pay gap is rather scarce. This is especially true in the cross-county context. The present study contributes to the literature on gender equality in two ways. First, using the data from Global Findex database I run a logistic regression to estimate the gender effect on the likelihood of making financial savings in more than 140 countries. The results suggest that gender savings gap exists in 55 out of 144 countries Secondly, I utilise the data from the previous step to explore the predictors of the gender savings gap at the country level. The estimated dependent variable from step one is converted into categorical variable ranging from 0 (gender saving gap at the country level is not statistically significant) to 3 (highest value of the gender savings gap). I use ordered logit regression to test three hypotheses that link country's economic performance and dimensions of national culture to the gender gap in savings. The results suggest that countries high on indulgence versus restraint dimension of national culture have higher gender gap in savings while economic recession is associated with a lower gender gap in savings.

Keywords: Savings, Gender Gap, Behaviour, Estimated Dependent Variable Regression, Ordered Logit

INTRODUCTION

Gender savings gap is an extension of gender income gap and has its evidence. They range from differences in expectations about savings, macro-economic climate, personal factors (Bróna Ní Chobhthaigh 2019). To help governments and financial institutions take better strategical decisions, it is important to address this problem from cross-countries perspective, to determine what factors increase gender differences in savings in one country and reduce them in another. Moreover, gender savings gap has widened as a result of the COVID-19 pandemic (Voucher Codes 2020), despite the fact that women tend to reduce their current consumption and increase savings during the crisis (Dang, Nguyen 2020).

This thesis is focusing on investigation of economic, social, cultural, behavioural aspects of countries worldwide that might widen or reduce the savings gap. The savings gap was already investigated as in perspective of attitude towards risk by genders in previous research studies, where it has been stated that both genders react differently to personal changes or changes in macroeconomic environment. Nevertheless, there are scientific evidence that certain social groups do not experience gender differences in savings at all, for example, students (Qiao 2012; Likitapivat 2019). Therefore, this research will address the problem from a broader perspective, investigating what factors reduce the gap or reinforce it.

The thesis will primarily be based on secondary data from Global Financial Inclusion (Global Findex) database 2017 collected by Gallup. Inc. in 2017. This is a survey of a particular research value because it represents 97% of the global population. It contains information on how people borrow, make payments and, most importantly, save. The information permits to connect the data with country, cultural and personal factors in order to investigate cause and effect, which is in coherence with the aims of my research.

Global Findex database is used to estimate the gender effect on likelihood of financial savings in 144 countries. According to the logistic regression results, the gender savings gap finds its presence in 55 out of 144 countries. These countries are from all over the world, they are categorized in different wealth regions groups, that is to say, in general, they do not necessarily have a lot on common. This evidence underlines the significance of the study matter. Moreover, the number 55 suggest the suitability of results for further investigation.

To obtain valid results, I will apply logistic regression analysis and test following hypotheses:

H1: Economies in late and recession phases positively affect gender savings gap.

H2: Uncertainty avoidance contributes to gender savings gap.

H3: Long-term orientation societies negatively affect gender gap in savings.

To test the hypotheses and to find the determinants of savings, the ordered logit model is created. The categorical dependent variable is derived from an estimated variable and ranges ranged from 0 (gender savings gap at country level is not statistically significant and, therefore, regarded as the absence of gender savings gap) to 3 (high level of inequality regarding savings). Thus, the categorical variable is a coefficient that reflects the potential of women's savings in a country while controlling for other independent variables. The independent variables represent a series of socio-economic and cultural variables, where some of the variables can explain to a certain degree the behavioural differences of the populations and individuals, which has been proven in many literatures. The ordered logit model has also been tested for robustness.

The thesis starts with existing literature evidence, where I discuss the main determinants of differences in savings. These are the existing gender gap, in particular, income gap, and psychological and cultural biases. The income gap stands for differences in economic opportunities for genders and behavioural difference appear usually not due to the gender itself but as a consequence of the society construct. Then, I explain the data used in research and methodology, following by empirical results of the study. After come discussion part and, finally, conclusion with recommendations and proposals. All sources can be found in the list of references, and additional numerical and visual data can be observed in appendixes.

1 LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

In this section, I discuss previous studies that are relevant for my research. First of all, I discuss the role of gender gap for the appearance of the gender savings gap, I thoroughly analyse the determinants of gender differences in savings. Then, I review the behaviour patterns of genders and its effects on the savings determinants. Finally, I develop three hypotheses based on the review of literature.

1.1. The Gender Gap

The gender gap is measured with The Global Gender Gap Index and represents the progress over time of different gender-based disparities. It allows for an effective comparison of countries and regions taking into account either economic, education, health or political criteria (World Economic Forum 2020). In general, the biggest objectives of reducing the gender gap as for 2020 are: increasing female labour force participation, number of women in leadership positions, closing wage and remuneration gaps and building parity in emerging high-demand skills and jobs. Indeed, all objectives are a similar to a loop, where the income gap (not to be confused with the wage gap that is considerably lower) mostly arises from the fact that less women engage in entrepreneurial or investing activities.

The savings gap is an extension of the income gap. However, a lot more factors affect our savings decisions than simply the ability to earn an income. Even though savings are directly associated with wealth accumulation, the determinants of savings might also include macroeconomic, demographic and psychological variables (Lunt, Livingstone 1991). In further paragraphs, I will discuss evidence that directly arise from income gap and affect savings gap, and then I continue with a review of psychological aspects affecting savings decisions. These are the two primary determinants of the gender savings gap.

1.1.1. Income gap affecting savings gap

Of course, the most evident reason for smaller savings is the fact that less women are globally presented in the labour market (55% vs. 78% of men). The ratio of the total income of women to that of men is 50%. The global average woman's income is about $11 000 in PPPs, in contrast the of a man is $21 000 in PPPs (WEF 2020). In many countries women are disadvantaged to access credit, land and financial products, which prevents them from any entrepreneurial, managerial activities and financial investments, hence, the accumulation of savings.

Another obstacle is that women have more challenges to access into high-reward segments of economy and they have challenges to get senior roles (World Economic Forum 2020). The segregation is clear on the vertical level and the occupations where women tend to be overrepresented are those where the proportion of women with supervisory roles are smaller (Dolado, Felgueroso 2003). The female pool of talent is underutilized there is a need to expand the share of women employed in many positions (Figure 1).

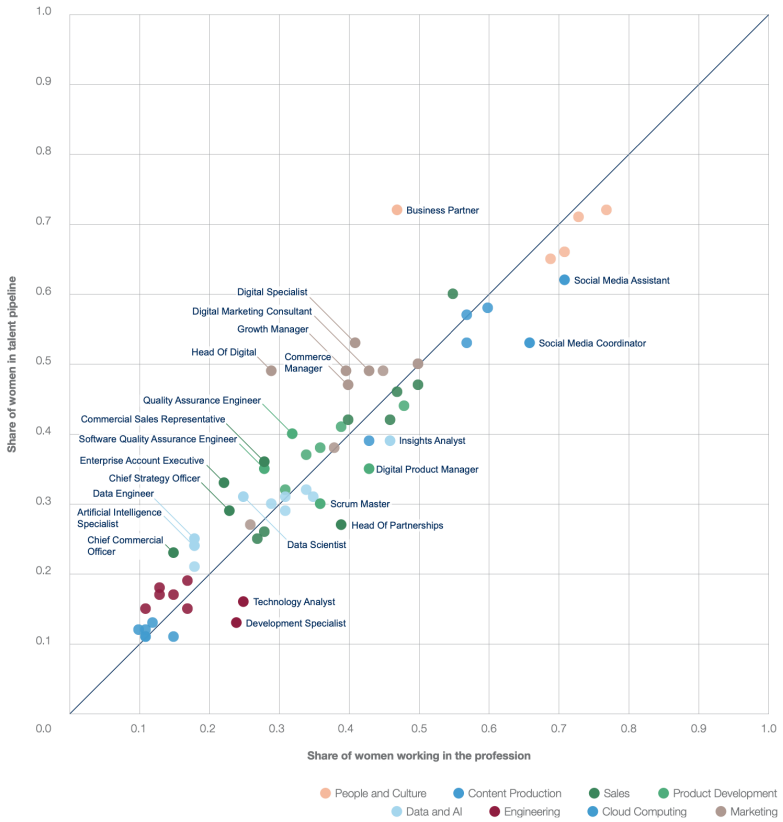

Figure 1. Share of women in occupations by professional cluster contrasted with share of women in the talent pipeline
Source: World economic forum (2020)

Fisher (2017) stated that women have lower incomes, on average, and a higher percentage have uncertain incomes from year to year. Uncertain incomes can be partially justified with the fact that, for example, employers are more likely to layoff women than men when downsizing without consideration of their performance (Kalev 2014). In addition to this, during the time of crisis and specifically coronavirus pandemic outbreak, women were economically affected much more than men and the gender income gap increased (Kristal et al. 2020). One of the causes for that is that women occupy most of the part-time jobs in the economy, they might not get stable contracts (Dolado et al. 2003). In addition to this, the professional clusters where women are mostly presented are the ones with less stability as, for example, services (Dang et al. 2020). Moreover, the share of women in the emerging high-growth roles including high-volume roles and leadership roles is considerably lower (World Economic Forum 2020) (Figure 2).

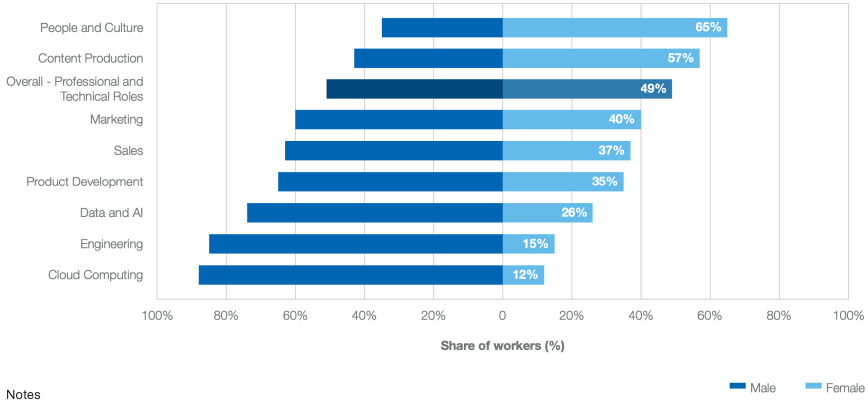

Figure 2. Share of male and female workers across professional clusters
Source: World economic forum (2020)

1.1.2. Gender savings gap and its psychological reasons

The gender gap in G20 countries for formal savings exists and is the largest in Italy, followed by France and Saudi Arabia (Hasler, Lusardi 2017). Also, women save less for retirement than men do. According to the study, financial literacy is positively correlated with formal and retirement savings for both women and men, but, in general, the financial literacy of the population that is needed for savings overall is low.

Fisher (2010), found out that low risk tolerance results in lower likelihood to save for women, but not for men. In fact, several studies have proven that women have lower risk tolerance related to finance and invest their money more conservatively than men do (Bajtelsmit et al. 1996; Hallahan et al. 2004). From this it can be stated that gender savings gap is also related to female risk aversion.

The wealth inequality arises from differences in portfolio allocation, and so women with low levels of risk tolerance might not be prepared for retirement due to outcomes of individual responsibility for retirement savings, and a longer life expectancy (Yao et al. 2005). Nevertheless, it is important to take into account that gender differences in risk tolerance accounted for approximately 10% of the gender difference in accumulated wealth (Neelakantan 2010).

Gap in savings comes mainly from lower expectations about potential future savings by women (European Commission 2019). The reasons for that might be financial well-being, security and personal pessimism or optimism about future economic ability. Fisher (2017) extended her research from savings to financial risk tolerance and found out that women are less risk tolerant than men not due to gender itself, but because of the gender difference in other factors that are related to risk tolerance. And these are in particular economic characteristics and expectations. Income uncertainty is negatively related to women's risk tolerance and positively to men's, and this is because the types of uncertainty for men and women are different. Also, net worth increases the high-risk tolerance for men but to a lesser degree for women. That is why for the reason of lower net worth and more years of retirement women are recommended to hold riskier portfolios than they can tolerate (Ho, et al.'s 1994).

At the same time, such demographic parameters like more education and younger age can serve as a mediator to reduce the gender differences in risk tolerance (Cupples et al. 2013; Ginson et al. 2013). There have also been evidences that there is no difference in savings decisions for female and male Finnish and Thai students (Qiao 2012; Likitapivat 2019).

1.2. Gender financial behaviour

Financial behaviour of men and women differ significantly (Walczak, Pieńkowska-Kamieniecka 2018). Men use more financial goods and services such as debit card, they also buy shares more frequently and men are more willing to take risks. Women tend to perceive money as basis for comparison with others, as security, they more often have the feeling of lack of money and associate money directly with work. At the same time, men tend to perceive money as an expression of power and as security (Herdjiono 2018). Women tend to be more efficient in cash flow management and men show a better credit and savings management ability. Nevertheless, despite the said above there are no abnormally significant differences in attitude towards personal

finance between men and women (Herdjiono 2018). In the next paragraphs, I will discuss potential economic and cultural aspects that might have an effect on the gender savings gap based on its determinants.

1.2.1. Economic cycle and its effects on behaviour

Economic cycle, also called the business cycle, is representing different phases of economic activity, from expansions (rebounds and peaks) to contractions (moderates and contracts). There is evidence of research studies identifying ideal strategies for portfolio creation based on the economic cycle. Equity and shares are best for the expansion period, and commodities, bonds and deposits in the bank for contraction periods (Adamauskas, Krusinskas 2012). Nevertheless, people rarely act in their best interests due to a range of behavioural biases.

A study from Spain demostrated non evident results: since men are more employed in occupations that are more affected by cyclical fluctuations, they are more sensitive to the business cycle (García 2017). The author states that during the expansions, unemployment duration is higher for women and wages are higher for men. In contrast, during recession, job finding rates and their stability decrease for men, while do not change significantly for women, and the gender gap narrows slightly. The reason for that men are more likely to be employed in high-emerging industries with a higher level of mobility. This does not contradict that has been discussed by me above, because COVID-19 outbreak is not a “regular” recession, and it, indeed, affects women more severely than men, also because of the closure of schools, its related additional childcare, and because of a larger female presence in service, healthcare etc. industries (Alon, et al.’s 2020). Also, due to the pandemic, women tend to reduce their current consumption and increase savings (Dang, Nguyen 2020).

1.2.2. Cultural characteristics affecting behaviour

Many models have been elaborated to describe cultural differences across countries. The study field started with Tönnies and his book Gemeinschaft and Gesellschaft (1887), that gives the distinction between community (traditional social rules) and civil society (modern future-oriented societies) (Tönnies 2001). New and more complex models appear with the progress, for example, the Model of Edward Hall (1976), who identified cultures as mono-chronic or poly-chronic, high or low context and past- or future-oriented (Hall 2001). Based on his concepts, Richard D. Lewis divided the world in either Linear-Active, Multi-Active or Reactive typologies that is based on

people's behaviour. After everything, in this thesis I have to draw attention to a model that would reflect the cultural attitudes towards risks or towards the future, because the differences in savings between men and women are primarily based on that.

The Hofstede's, G. (2011) model provides originally four cultural dimensions, such as power distance, uncertainty avoidance, the extent of individualism vs. collectivism, masculinity vs. femininity. Later on the model was supplemented by two other dimensions, namely long-term vs. short-term orientation, that reflects the choice of focus of people's acts: the present or the past (slow economic growth) or the future (fast economic growth); and indulgence vs. restraint, related to people's attitude towards basic human desires and enjoying life (Hofstede, Minkov 2010).

First of all, the validity of the introduced cultural model as in regard to finance has to be substantial. Beckman et al. (2008) have found that "asset managers' views and behaviour as well as the industry's structure differ between countries in a way that is clearly related to expectations derived from Hofstede's cultural dimensions". The study concludes that the cultural importance assigned to age, experience, gender, active asset management style and information research effort has a clear impact on investment behaviour. Another paper confirmed that bank risk-taking is higher in countries with high individualism, low uncertainty avoidance and low power distance (Ashraf 2016). On the opposite side, there was a more recent study that found a negative association between individualism and bank risk-taking (Illiashenko, Laidroo 2020). Thus, it can be undoubtably justified that there is influence of cultural dimensions on financial behaviour.

The uncertainty avoidance is not the same as risk avoidance as it might seem at first, it is more related to comfortable or uncomfortable feelings in unstructured situations (Hofstede 2011). Hofstede (2011) gave examples that the countries with high uncertainty avoidance have a belief in ultimate truths and grand theories, the life is perceived as a stress that must be fought and those cultures have a strong need for rules. Also, the subjective health and well-being evaluation is low, and Fisher (2010) found out that poor health negatively impacted the likelihood to save for females but not males. In contrast, people in countries with a weak uncertainty avoidance do not like rules, perceive the life as it is with its uncertainty and rely more on relativism and empirism.

Another dimension that might be interesting to consider in studies of savings is long-term versus short-term orientation (Table 1.). Behavioural biases are considered to be universal for all countries and all genders (Kahneman, Slovic, Tversky 1982) and that is why long-term orientation, which

is directly related to willingness to save and provides a more future-oriented orientation that might mean a more positive attitude towards the future, might affect the general savings level of a certain country.

Table 1. Ten differences between short- and long-term-oriented societies

Short-Term Orientation	Long-Term Orientation
Most important events in life occurred in the past or take place now	Most important events in life will occur in the future
Personal steadiness and stability: a good person is always the same	A good person adapts to the circumstances
There are universal guidelines about what is good and evil	What is good and evil depends upon the circumstances
Traditions are sacrosanct	Traditions are adaptable to changed circumstances
Family life guided by imperatives	Family life guided by shared tasks
Supposed to be proud of one's country	Trying to learn from other countries
Service to others is an important goal	Thrift and perseverance are important goals
Social spending and consumption	Large savings quote, funds available for investment
Students attribute success and failure to luck	Students attribute success to effort and failure to lack of effort
Slow or no economic growth of poor countries	Fast economic growth of countries up till a level of prosperity

Source: Hofstede (2011)

1.3. Hypotheses development

The paper aims to find reasons that lead to an increase or a decrease of gender savings gap. In previous studies it is clearly observable that the main determinants of gender savings gap are gender income gap and a different attitude towards risk and towards the future by genders. There is evidence that such demographic variables as age and level of education allow for a decrease in gender gap. Nevertheless, even most successful practices in gender equality achievements (Norway, Finland, Sweden etc.) still have at least 20% in wage or income gap or more (World Economic Forum 2020). Hence, this study aims to find variables that could potentially have an impact on the determinants of gender savings gap, that might find their presence worldwide.

Economic recession is expected to increase the gender savings gap. Even though during a normal recession (except coronavirus pandemic) women lose their jobs less and their incomes decrease less (García 2017), women base their savings decision on potential future income (European

Commission 2019), which might not necessarily be very optimistic during the recession. During economic downturn, women might become more risk averse that negatively affects their savings decisions (Fisher 2010). In contrast, men do not associate their savings decisions that much with their attitude towards risk, and sometimes income uncertainty might positively affect the choice for high-risk decisions for men (Fisher 2017).

Uncertainty avoidance is also expected to positively affect the gender savings gap. Strong uncertainty avoidance means higher stress, emotionality, anxiety and neuroticism (Hofstede 2011). Also, it means an underestimation of one's health that affects women savings decisions (Fisher 2010) and uncertainty is considered as a threat, so the perception of future uncertainty might be biased and perceived as negative.

Long-term orientation of cultures is meant to reduce the gender savings gap. This characteristic is directly influencing the savings quote, a lot of funds available for investments in such societies. A lot of importance is assigned to thrift and perseverance (Hofstede 2011). More adaptability and dynamics are present, women in such societies might feel less pressured and take own responsibility for implementation of desired future outcomes.

Having profoundly analysed prior studies, I formulate following hypotheses:

H1: Economies in late and recessions phases positively affect gender savings gap.

H2: Uncertainty avoidance contributes to gender savings gap.

H3: Long-term orientation societies negatively affect gender gap in savings.

2 DATA AND METHODOLOGY

2.1. Data

The gender savings gap is estimated using the data from Global Findex database, a survey on how adults save, borrow, and many other variables related to financial inclusion. The survey is administered by the World Bank and was carried out by Gallup, Inc. and it was conducted face to face in countries where telephone coverage represents less than 80% of the global population. The survey has three waves. In this study I use only data from 2017 (most recent wave of the survey). This database is the largest and the most comprehensive of its kind, for 2017 alone it it surveys more than 140 economies including over 150000 adults, i.e., more thant 1000 adults per country.

For independent variables, the dataset was composed of several variables from different sources. Creditors' and shareholders' rights, information sharing and legal origin (Djankov et al. 2007), deposit insurance (Barth et al. 2013). Then, rule of law comes from Country Risk Guide (ICRG) database and DMMSCI from MSCI Developed Markets Indexes database and GDP from IMF database. All cultural variables come from Greet Hofstede's website, Hofstede Insights, (Gelfand et al. 2011). To find out if the country experienced an economic slowdown or recession, GDP per capita, the World Economic Outlook Database has been utilised. Last, two gender inequality indexes have been extracted from the World Bank and World Economic Forum.

2.2. Gender savings gap

The estimated dependent variable models often arise in studies where countries are the units of analysis and they are thus a good approach to investigate sources of cross-national causal heterogeneity (Lewis et al. 2005). To create an estimated dependent variable, I derive relevant for this study data from Global Findex Database 2017 (Table 2). These are demographic variables, country – *economy* and *economy code,* gender – *female,* age – *age*, education – *education,* income – *income,* people who saved – *saved.* There are many evidences that income and education play a major role in increasing the likelihood of savings decisions (Joo et al. 2005; Swasdpeera 2012).

From the Table 2. It is observable that nearly half of the respondents were female, the youngest person was aged 15 and the oldest 99.

Table 2. Descriptive statistics: variables used to estimate gender savings gap

Variables	Mean	S.D.	Min	Max
female	0,54	0,5	0	1
age	41,84	17,91	15	99
education	1,82	0,69	1	3
income	3,18	1,42	1	5
saved	0,5	0,5	0	1

Source: Compiled by the author using Global Findex Database

For the purpose to providing a better comprehension Table 3. is a representation of the results of a binary logistic regression, where the dependent dichotomous variable is *saved* (if people saved or not). As we can see, there is an evidence of the gender savings gap globally – the gender odds ratio is statistically significant and less than 1, meaning that females have a lower likelihood to save.

Table 3. Gender savings Gap globally

	Saved *logistic* Odds ratio
age	0,999*** (0,000)
female	0,859*** (0,011)
as.factor(education)2	1,814*** (0,012)
as.factor(education)3	3,161*** (0,017)
as.factor(income)2	1,290*** (0,018)
as.factor(income)3	1,537*** (0,018)
as.factor(income)4	1,870*** (0,017)
as.factor(income)5	2,475*** (0,017)
Constant	0,443*** (0,021)
Observations	153,621

Notes: asterisks refers to statistical significance. *p<0.1, **p<0.05; ***p<0.01.

Source: Compiled by the author using Global Findex Database

To estimate the gender savings gap at a country-level, I run separate models of the same specification as in Table 3 but for each country separately. In all models, dependent variable is a binary variable that takes the value of 1 is person saved money on the past 12 months, and 0 otherwise. Then, I take out the odds ratios for variable female (equals to 1 if respondent is female).

The exact regression specification that is repeated for each country separately is as follows:

$$Saved_i = f(age, female, education, income) + \varepsilon_i \quad (1)$$

The estimated dependent variable (further EDV) *estimate* is thus a coefficient that reflects the potential of women's savings in a country while controlling for other independent variables. The figure for the *estimate* from all countries can be found in Appendix 1. The first figure includes those coefficients that are statistically significant at 10% significance level, whereas the second includes all coefficients where the statistically significant are displayed in red. Interesting is that the *estimate* shows that in some countries women are way more likely to save than men are (e.g. South Korea, Nepal, Estonia). Nonetheless, this does not necessarily mean the absence of the economic gender gap i.e. gender equality. Sometimes, the external circumstances such as lack of social security make women spend less and save more, for example, during COVID-19 pandemic crisis (Dang et al. 2020).

South Korea has the largest *estimate* - 0,38, and it is, as a traditional society, far from achieving economic gender equality. Lee et al. (2007) found out that in South Korea, in couples where both partners work, the individual savings of women exceeded that of their spouses.[1] There is evidence of economies or diseconomies of scale from marriage, economies of scale mean the person will benefit from the spouse's money, and diseconomies means that the person will spend money for their spouse (Grossbard et al. 2010). This theoretical study shows that higher marriage rates and higher divorce rates are associated with higher savings rates in case of economies of marriage and with lower savings rates in case of diseconomies of marriage. In the example of South Korea, the study explains that in traditional societies women will save more likely than men if they are married, as they usually experience economies of marriage. On the contrary, married Canadian women do not save more, but less, than men. Based on the facts, the variable *estimate* and its'

[1] This and further explanations are based on heterosexual marriages examples

exponential *odds* can be transformed in absolute values. This means that negative gender savings gap as in the case of Nepal is treated as positive gender savings gap, i.e. existence of the gap.

The EDV *estimate* in the analysed sample has only 55 coefficients that are statistically significant (out of 144). As having a control for other variables than female, it is observable that in some countries education or income play a much more significant role in accumulation of savings. Even though there is evidence that in countries such as United Kingdom or France the gender savings gap exists, the likelihood to save for men and women is nearly equal. That is why, in this study I will consider the non-statistically significant estimates as zero, which would mean that there is no difference in savings potential for women and men, i.e. the absence of the gender savings gap. Then, as the results might have a too large dispersion (where 89 variables are 0), the OLS regression, or a linear model, might not produce efficient results. Therefore, I create an ordered logit model. The dependent variable is transformed to a factor from 0 to 3, where 0 - no difference (no gender savings gap), 1 – small difference, 2 – medium difference, 3 – large difference.

2.3. Independent variables

First of all, I record country-level variables that could have an effect on savings of individuals. Related to economy, these are the Gross Domestic Product (*GDP*) and *wealthReg* which classifies the economies by income (low income to high income). Another dummy variable similar to *wealthReg* is *DMMSCI* and it reflects if the country is classified as developed in accordance with MSCI Developed Market Indexes. Additionally, I took the data from World Economic Outlook database - a database on GDP, national accounts, inflation, unemployment rates etc., to control for recession (*recession*) in 2017. According to Jones (2016), the best and "healthy" economic growth is 2% to 3%. However, this percentage highly depends on countries, its' size and level of development. In this thesis, I consider for economic slowdown or recession in countries where the economic growth rate is less than 0%, and, additionally, I find the geometric mean for 10-year percentage growth of GPD (2007-2017) – *GROWTH10*. To be able to logically connect growth of GDP, the GDP per capita will also be controlled (*GDPCAP*), in current prices of U.S. dollars.

Then, a major role for savings, especially at financial institutions, play legal variables. In this paper, I include the trust in law (*ruleoflaw*), that shows to which extent the population trusts the legal system, is confident about it and is ready to follow the rules. The research has shown that

savings decisions are strongly correlated with the level of trust put in financial institutions (Agnew, et al. 2012). Another variable, *legal*, reflects the English legal origin. This variable might have a particular interest, because it has been found that legal system, that can be English (or common law), French, German, Scandinavian or Socialist, has a significant impact on financial development (Beck et al. 2002; La Porta et al. 2008). Related to savings, Demirgüç-Kunt (2016) found that "adults in countries with English legal origin are more likely to save for old age".

To test the models, I add creditors and shareholders variables. Creditors' rights mean legal rights in case of debtor's reorganization or liquidation. Shareholders' rights stand for legal protection of smaller shareholders against corporate insiders. Last, I control for the dummy variables deposit insurance (*depInsurance*), and information sharing (*infoSharing*). Deposit insurance specifies if a country has deposit insurance, which directly encourages savings at financial institutions. *InfoSharing* variable equals 1 when a country has either public or private registry, and otherwise 0. Registering credit history of persons is directly related to the level of development of the country.

Additionally, I include two gender equality indexes in the study. The gender equality index provided by World Bank is called Women's Workplace Equality Index. It is largely concentrated on women's workforce equality. It reports gender inequalities in legal treatment in seven categories: accessing institutions, building credit, getting a job, going to court, protecting women from violence, providing incentives to work, and using property. It gives an overall score from 0 to 100 (100 being the best). The World Economic Forum equality index has significant differences - it consists of four components: economic participation and opportunity, educational attainment, health and survival, and political empowerment. Its dimension ranges from 0 to 1 (1 is parity). The inclusion of such indexes is of particular value to this study, as controlling for them would allow for more comprehensive and less biased regression results.

Cultural variables are a representation of the extended Hofstede's National Culture model (Hofstede et al. 2010). *LTOR* stands for long-term orientation societies, and from the descriptive statistics table (Table 4.), it is visible than the mean for it is 45 (all cultural indexes have a dimension from 0 to 100), and that means that nearly half of the sample countries are long term oriented. The same is for indulgence (*INDUL*) and masculinity (*MAS*), where the distribution is almost equal. However, there is a majority of countries who tend to have higher levels of

uncertainty avoidance (*UAI*) and power distance (*PDI*), and most of the countries are collectivist rather than individualist (*IND*).

Table 4. Descriptive statistics of independent variables

Variables	Mean	S.D.	Min	Max
estimate	-0,218	0,15	-0,89	-0,009
est	0,662	0,966	0	3
p.value	0,28	0,28	0	0,96
odds	0,89	0,2	0,41	1,47
LTOR	45,06	23.27	4	100
INDUL	44,32	21,93	0	100
PDI	63,94	20,72	11	100
IND	39	22,33	6	91
MAS	48,42	18,1	5	100
UAI	65,6	21,1	8	100
GDP	9,62	1,05	7	11,45
ruleoflaw	0,64	0,21	0,17	1
legal	0,28	0,45	0	1
shareholders	58	15,73	16,67	96,67
creditors	6,4	3,15	0	15
infoSharing	0,82	0,38	0	1
depInsurance	0,84	0,37	0	1
DMMSCI	0,21	0,41	0	1
recession	0,26	0,44	0	1
GROWTH10	0,031	0,025	-0,096	0,101
GDPCAP	18542	21382	325	108622
geWB	76,84	17,62	26,9	100
geWEF	70,06	5,49	54,6	83
estimante.abs	0,22	0,15	0,01	0,89

Source: Author's calculations
Table of variables and their definitions can be found in Appendix 2.

2.4. Methodology

To find out why some independent variables might have a different effect on the dependent variable in different countries, the EDV regression - the second stage of a two-stage estimation process, can be used (Lewis, Linzer 2005). Lewis and Linzer (2005) have tested the Ordinary Least Squares (OLS), Weighted Least Squares (WLS) and two Feasible Generalized Least Squares (FGLS) estimators, and found out that WLS is only efficient with a very large regression residual, and it leads to greater level of overconfidence. OLS standard errors are biased, whereas that of FGLS

produce more efficient estimates and standard errors are less biased. However, in my case none of these models are suitable and this finds its explanation.

Strictly speaking, since the gender coefficient *estimate* from 144 country regressions (each specification is described by equation 1) is statistically significant in only 55 cases, the use of OLS regression to fulfil this study research questions is problematic. If non-statistically significant estimates are excluded from further estimation, the sample size reduces to maximum of 55 observations and could be even smaller due to missing data at the country level. On the other hand, including non-statistically significant coefficients into estimation is also problematic. Therefore, as descried in section 2.2, I create an ordered categorical dependent variable that has 4 levels: where 0 - no difference (gender savings gap equal to zero), 1 – small difference, 2 – medium difference, 3 – large difference.

Given that dependent variable is categorical but has a clear ordered structure, I use ordered logit model for main estimation in this thesis. The regression specification is as follows:

$$Gender\ savings\ gap_j = f\left(Development_j;\ Law_j; Equality_{j,};\ Growth_j;\ Culture_j\right) \qquad (2),$$

where j subscript designate country. $Develoment_j$ refers to a set of controls that proxy economic and financial development (such as country's wealth region or GDP per capita). Law_j specify variables related to legal and government structure. $Equality_j$ is an index of country's gender equality. $Growth_j$ is a set of variables aimed to test the hypothesis about the role of country's economic performance. Whereas, $Culture_j$ include a set of national culture dimensions used to test culture-related hypotheses.

3 EMPIRICAL RESULTS

3.1. Main results

The results of this study are presented in Table 5. It is observable that a lot of variables are statistically significant at either 1%, 5% or 10% level. All models were compiled in accordance with a correlation matrix, to avoid the issue of multicollinearity. The models' Mcfadden R2 are more than 0,4 which is known to be sufficient (Domencich et al. 1975). The number of observations, ranged from 73 to 96, is in coherence with the number of variables.

From the models it is clear that different wealth regions nor MCSI developed market Index do not impact the likelihood of savings for women. The consistency with existing studies is nicely shown where studies suggest that it is not the GDP that improves the gender equality, but it is the consequence of gender equality that leads to economic improvements (Maceira 2017).

As *ruleoflaw* increases incrementally, the odds of *estimate* decrease by approximately 99%, which means that *ruleoflaw* positively affects women's savings. That is to say, the more women are likely to put trust in financial institution and the government, the more they are likely to save, which is in accordance with the existing studies that trust in banks increases the likelihood of formal savings (Beckman et al. 2017). This paper, however, suggests that trust decreases the likelihood of informal savings.

The significance of the variable *legal* means that in countries with English legal system the gender savings gap is smaller. According to legal origins theory, English legal origin, also known as common law, is known to have more secure investors rights, less strict regulation and more efficient governments and courts than those who inherited civil law (Beck et al. 2002). As a source of liberty in, for example, property rights, in combination with lack of structure and logic, common law might expose the citizens to a higher level of personal responsibility and risk taking, which might cause the decrease in Gender Savings Gap. However, this explanation rather lacks of conscious reasoning and needs further investigations to be confirmed.

Table 5. Determinants of women's savings

	Estimate *ordered logistic* Odds ratio				
	(1)	(2)	(3)	(4)	(5)
wealthRegLow income	0,360 (0,906)	0,305 (0,934)	0,215 (1,212)	0,539 (1,190)	0,802 (1,757)
wealthRegLower middle income	0,727 (0,797)	0,635 (0,814)	0,403 (0,998)	0,739 (1,010)	0,712 (1,229)
wealthRegUpper middle income	0,578 (0,694)	0,538 (0,709)	0,328 (0,845)	0,851 (0,803)	0,624 (1,014)
DMMSCI	2,140 (0,843)	2,206 (0,883)	3,176 (1,006)	2,101 (1,020)	2,760 (1,121)
ruleoflaw	**0,012** ** **(1,803)**	**0,010** ** **(1,822)**	**0,007** ** **(2,246)**	**0,008** ** **(2,164)**	**0,005** ** **(2,617)**
legal	**0,355** * **(0,601)**	**0,331** * **(0,616)**	**0,299** * **(0,702)**	0,477 (0,711)	0,463 (0,804)
geWEF	**0,898** ** **(0,046)**	**0,897** ** **(0,047)**	**0,895** * **(0,060)**	**0,841** *** **(0,057)**	**0,837** ** **(0,072)**
recession		0,307 (1,329)	0,257 (1,556)	**0,000** *** **(0,000)**	**0,000** *** **(0,000)**
GROWTH10		0,872 (0,621)	1,074 (0,769)	1,179 (0,722)	1,146 (0,890)
UAI			0,988 (0,016)		0,998 (0,018)
PDI			1,025 (0,017)		1,030 (0,020)
IND			0,998 (0,019)		1,017 (0,022)
MAS			0,991 (0,015)		0,993 (0,019)
LTOR				1,022 (0,015)	1,022 (0,017)
INDUL				**1,033** ** **(0,016)**	**1,033** * **(0,016)**
Observations	96	96	87	80	73
McFadden Pseudo R2	43%	45%	49%	58%	61%
McFadden Pseudo R2 Adj.	8%	6%	39%	22%	23%

Notes: asterisks refer to statistical significance. *p<0.1, **p<0.05; ***p<0.01. Robust standard errors can be found in parentheses

In the models, I additionally control for the gender equality index *geWEF*.[2] As mentioned before, this index is comprised out of four dimensions, namely Economic Participation and Opportunity, Educational Attainment, Health and Survival, and Political Empowerment. As controlling for *geWEF,* the majority of other variables become significant of increase in its confidence level. Such

[2] the variable *geWB* does not provide any information. In contrast to *geWEF,* this variable is concentrated on formal legal obstacles to women's economic participation around the globe. Many countries miss a lot of points on legally protecting women form violence, and that is why this index might be biased for actual economic measurements.

results suggest that control for gender equality index plays a huge role compared to simple economic development assessments. In the models, with an increase in *geWEF* the odds of *estimate* decreases by 10-15%, which means an increase in savings decisions for women.

Model (2), controls additionally for *recession* and *GROWTH10,* and, *ceteris paribus*, it leads to only minor changes in general results. *GROWTH10* – geometric mean of GDP growth for 10 years, does not affect women's likelihood to save. In a stable economic environment, women tend to become less risk-averse which positively affects their saving decisions, and rapid growth is not necessarily a factor of stability. This neutral result, however, does not allow to confirm that the belief in a higher future income is regarded as tendency in increase of women's willingness to save (European Commission 2019).

Then, the model (3) that considers also the original four Hofstede variables, lowers the significance of the *geWEF* variable. None of the cultural variables are significant. Power distance is neutral to women's savings in population. Power distance and its hierarchy mean existential inequality, the corruption level is frequent and autocratic governments are changed by revolution only. Hence, large power distance is a direct obstacle to close the gender gap.

IND – individualism also does not affect gender savings gap. Davis et al. (2019), researched individualism and gender equality, and reported that individualist values transcend gender identities, it is associated with gender equal attitudes in employment, income, education, and leadership, also with greater female employment and lower levels of fertility. The results of this study do not confirm the stated above, which implies that gender savings gap is not equally correlated with gender inequality and has other causes too. In addition to this, a study that reported negative associations with individualism and bank risk-taking (Illiashenko, Laidroo 2020).

The model (4) includes the extended Hofstede cultural variables, and it results in additional significance of the variables *recession* and *INDUL.* Increase in *INDUL* – indulgence level, stands for a potential increase in gender gap in savings. Enjoying life and having fun does not positively affect savings decision for women, which might be considered as a surprising result as indulgence in a culture also affects men that should potentially equilibrate the results. This could possibly be explained with the fact that men take more risks for pleasure, whereas risk for women is more often associated with instability (Herdjiono 2018). Additionally, this might be explained by the fact that countries have to put efforts to achieve gender equality, whereas countries with high level

of indulgence have higher birth-rates, lenient sexual norms, and maintaining order (police service) is not given a high priority (Hofstede 2011). Last, the *recession* variable, that stands for negative GDP growth, decreases the difference in savings for genders. Model (5) does not reveal new results, in both models (4) and (5), the variable *legal* loses its significance.

3.2. Robustness check

In addition to the robust standard errors, I run a second model, where the variables *wealthReg* and *DMMSCI* are replaced by *GDPCAP* – GDP per capita in 2017 in current prices of U.S. dollars (Appendix 3). *GDPCAP* highly correlates with the previous two variables, and as GDP per capita is also associated with wealth and development, it suits as a good substitution. Here, the *GDPCAP* does not show any significance. Based on the same pattern, *ruleoflaw, legal, geWEF, recession* and *INDUL* find their significance. All odds ratios are also very similar in both models. Therefore, as the conclusions do not significantly change when the assumptions change, it can be concluded that the results survive the robustness check and are thus valid.

4 DISCUSSION

In this section, I discuss the findings regarding the three hypotheses. In addition to this, I assess the contribution of this study in comparison with other studies and highlight the limitations and challenges of the methodology used. Finally, I contribute further suggestions for a further elaboration on this research field.

The study includes three hypotheses, in particular the first one being related to recession, second one to uncertainty avoidance and the third to one long-term orientation. Both long-term orientation and uncertainty avoidance did not show any statistical significance in the final model, therefore it is impossible to make any conclusion on these hypotheses within the thesis. That is why, The H2 and H3 are rejected. The reasons for that might be a too small sample, and the primary data, especially the one for long-term orientation, might experience a replication problem.

Nonetheless, the H1 - economies in late and recessions phases positively affect gender savings gap, has shown a certain consistency with the findings. The H1 was concluded based on three variables, namely *recession* – if a country experienced a negative GDP growth in 2017, while also controlling for *GDPCAP* – GDP per capita in 2017 (or wealth regions), and *GROWTH10* - geometric mean of the GDP during 2007-2017.

Recession negatively affects gender savings gap while *GROWTH10* and *GDPCAP* (nor wealth regions and development index) do not. Therefore, taking into account the significance of the variable *recession,* the H1 can also be rejected. This result has found its reasoning in several previous studies, such as that during recession phases women tend to save more and spend less (Dang, Nguyen 2020). Also, my findings justify previous studies that have shown that during recessions, job finding rates and their stability decrease for men, but do not change significantly for women, and the gender gap narrows slightly (García 2017). Sahin et al. (2010) stated that "women fared decidedly better than men during the most recent recession". Analogical studies with the same results have also been found in the US (Marshand et al. 2013). Therefore, it is possible to assume that the risk perception and the potential future income, i.e. cognitive biases, do not affect women to the same degree as the external economic circumstances. However, during the recessions, the gender gap narrows because the "male" industries suffer the most, so it implies worsening situation for men and none or slight changes for women.

Then, it is important to address the question why the rapid economic growth does not affect the gender savings gap. At first, the intuitive reason might be that the growth is the opposite of the recession, if recession reduces the gap, the growth does not it as the most promising industries are occupied by men. In addition to this, a rapid economic growth is not a sign of economic stability and development. A study on determinants on rapid Asian economic growth published their results that gender wage inequality has stimulated economic growth where low female wages have forced foreign investments and exports because of lower labour costs (Seguino 2000). However, to find more reasoning of the negative effect of growth on female savings, more investigation has to be done.

This paper implements ordered logistic regression analysis to investigate which variables affect women's savings decisions. An estimated dependent variable is used, and from that is it clear that age, gender, income and education determine savings decisions. However, the data and methods have a certain number of limitations. The cross-sectional nature of the data makes it hard to determine the cause and effect. In addition to this, the representativeness of results might be violated due to the absence of time-series analysis. The estimated dependent variable might provide a certain level of bias as, for example, the non-statistically significant variables were equalled to zero. It is also known that variation in the EDV models sampling variance from the dependent variable might induce heteroscedasticity (Lewis et al. 2005). The ordered logit models experience a number of limitations, the numerical categories are intuitively chosen, robustness is violated. Therefore, the independent variables throughout the models have to be chosen very carefully, with results taken with a grain of salt, highly relying on previous studies.

Nevertheless, the results of this study provide a considerable contribution, they are in consent with previous studies. As expected, age, gender, education and income determine savings. Then, it is observable that from the purely economic variables, only *recession* matters for female savings decisions. That finds its support in all the great amount of literature that discusses the non-economic causes of gender savings gap and gender inequality in general. The significance of *geWEF* variable confirms, that gender savings gap is actually an extension of the gender gap.

Ruleoflaw might be considered as a mix of economic and behavioural variable, where the trust in financial institutions that increases the risk be willing to take which plays a key role in closing the savings gap. Analogically with the variable *legal*, which reflects the structure of the society as a whole, both variables confirm the significance of risk-taking for women, where the higher

tolerance of risk negatively affects the gap and allows for more equality. The significance of indulgence has not yet found clear explanation in previous studies and is, therefore, a novel result.

The gender savings gap is a complex mix of gracefully combined economic, cultural, behavioural and social aspects of a certain country. Although my study contributes to a substantial degree to a better comprehension of the causes for the absence or presence of a gap, there is still a lot to explore. First, almost each variable used in this study might get a separate attention and investigation, e.g., the causes of the negative effect of indulgence on the savings gap. Then, the reasons why in some countries women tend to save much more than men (i.e., positive gender savings gap) remains unknown. Last, in further research studies, other methodology can be implemented, including time-series analysis and specific analysis of certain countries instead of cross-country.

In general, this field of study, in particular related to women's savings, is not quite unambiguous, where some previous studies are in contradiction with each other, as, for example, the assumption about the late phases of economy and recession.

Based on this paper, I elaborate following suggestions: Since women can benefit from recession largely due to male job loss, more women have to enter contemporary highly competitive business and other industries (e.g., data science, cloud computing). Also, as women negatively experience risk, more trustworthy and confidence providing solutions associated with a certain degree of risk have to be elaborated and targeted for women by financial institutions. Also, as related to indulgence, women might find more economic freedom in countries where maintaining order in the nation is given a high priority. Therefore, the main focus areas for closing the gender savings gap are presented in the form of accurately chosen key words: legal rights, safety, stability, and trust.

CONCLUSION

Gender gap in savings remains an economic and social burden in a lot of countries. It is associated with both gender equality in general, as well as behavioural differences of men and women. Social, economic and cultural aspects reinforce certain behaviours that might lead to imbalance in strategic saving decisions for men and women. According to previous literature, women mostly save less due to a weaker risk tolerance, which find its cognitive explanations in prospect theory developed by Daniel Kahneman.

The aim of this paper is to determine the economic, social and cultural differences in most countries across the world that might widen or lessen the savings gap. The study should allow financial and other institutions to benefit from suggestions for a long-term strategy for the closure of the gender gap. To find the determinants, a ordered logistic regression was implemented, where the dependent variable is estimated and the independent variables represent a series of economic, cultural and other countries' variables.

The empirical results have shown that two out of three hypotheses are not significant, and one hypothesis has to be rejected. Therefore, it can be confirmed, that the recession phase of an economic cycle negatively affects gender savings gap, i.e., women savings become more equal to that of men. Additionally, the results allow to underline the importance of legal and political basis of countries, where secure rights, reasonable regulation, efficient governments and trust in institutions allow to reduce the gender savings gap. Specifically, this means that common law and trust in law reduce the gap, while indulgence increases.

In conclusion, gender differences in savings are, of course, highly dependent on gender gap, which in contemporary world finds its presence mostly through the economic gap (income gap and lack of women taking leadership positions) and political empowerment gap, where fewer women engage in high-level political activities. At the same time, there are other reasons why women tend to save significantly less or more than men do. Women save less because their experience of risk does not allow them to invest in riskier assets, often it is associated with different status of money for women. Women also save less if they do not put trust in institutions, if the government does not fulfil the function of providing security. Females might save significantly more in traditional societies because in case of a divorce the independent life would be harder for them. In a nutshell, the savings gap does not have to be neglected, because with better quality of savings, women will

be prepared for retirement, feel more secure which will stimulate their risk taking and, therefore, even entrepreneurial activities that will stimulate the economy as a whole.

Based on the results of this research, I line out following assessments and proposals:

1. The closing of gender gap will contribute to the closure of gender savings gap, however, not entirely.

2. To equilibrate the effect of the business cycle on both genders, more women from the talent pool have to occupy emerging, promising, future-oriented positions and, for that, the companies have to reconsider their policies. In fact, women are overpresented in people and culture or content creation spheres, but underrepresented in engineering, cloud computing and product development.

3. The increase in security provided by the institutions and governments reduces the likelihood of gender savings gap.

4. The free gratification of human's nature, having fun and enjoying life, widens the gender savings gap. Therefore, the societies with high level of indulgence according to Hofstede (e.g., Austria, Australia, United Kingdom) have to pay extra attention to elaborate additional programs for engaging more women in saving activities.

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APPENDICES

Appendix 1. Dependent variable *estimate*

Figure A1. Gender savings gap (female coefficient estimate from question 1), only statistically significant female coefficient estimate at 10% significance level

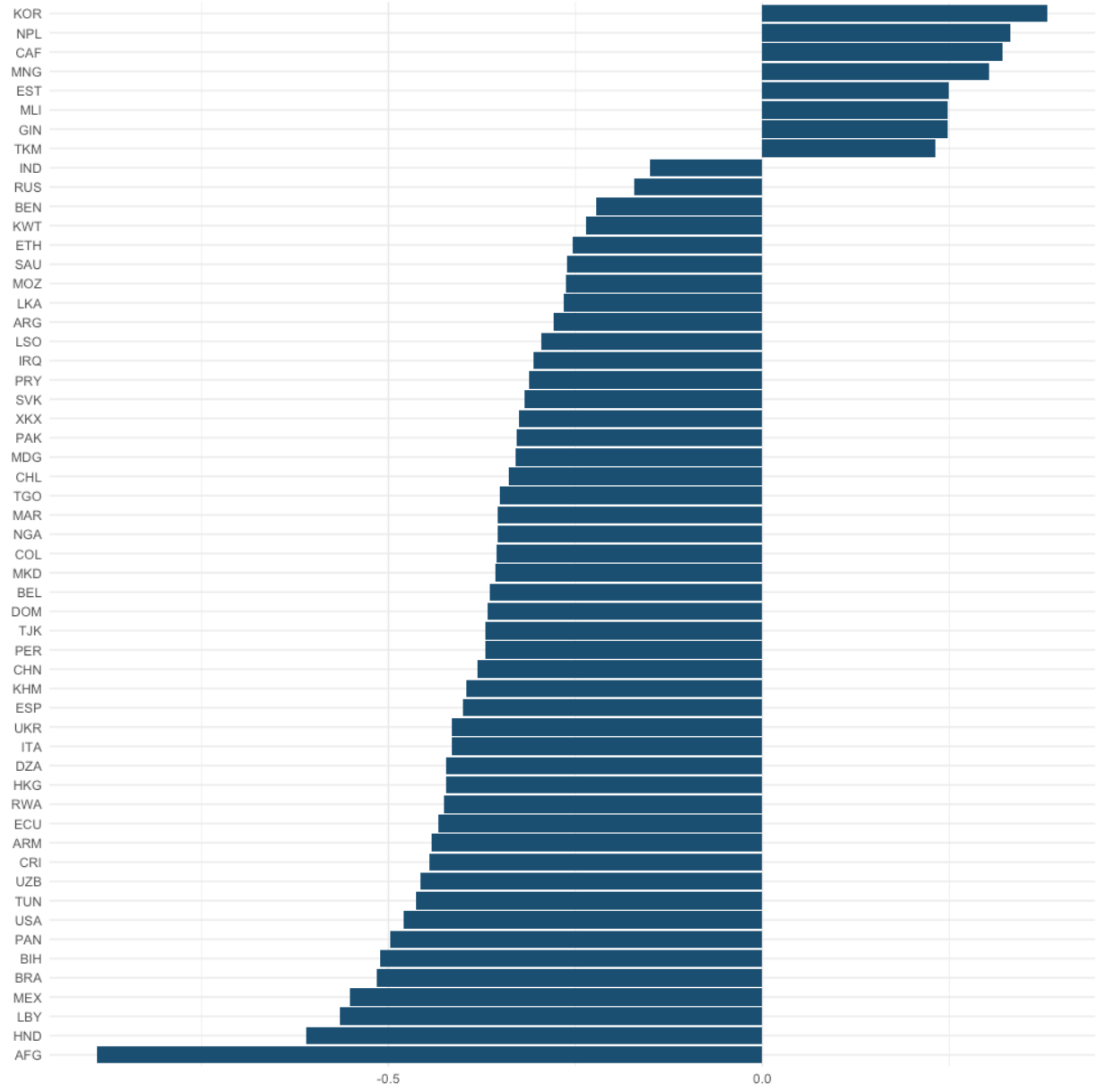
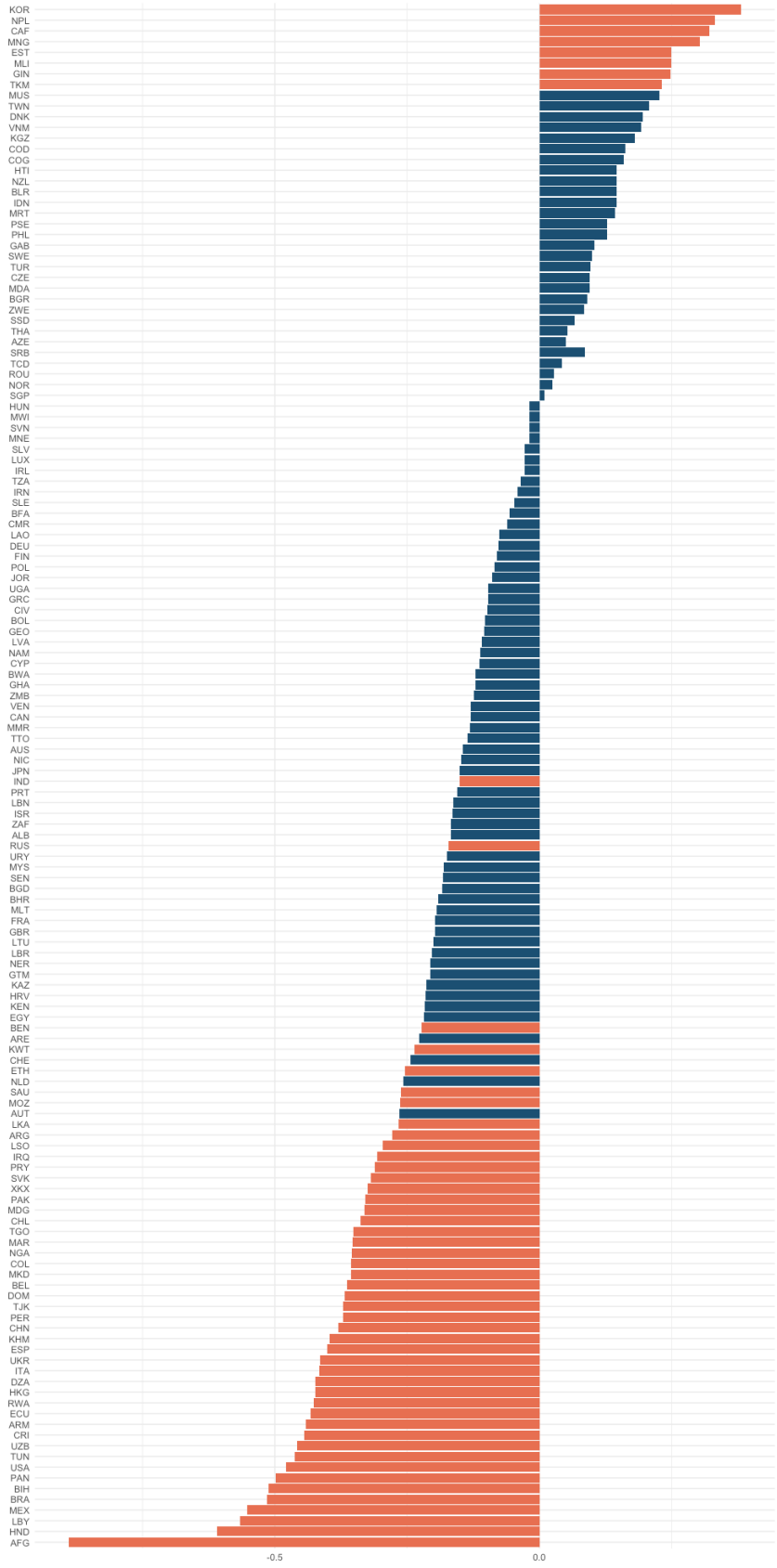


Figure A2. Gender savings gap (female coefficients from question 1), statistically significant female coefficient estimates at 10% significance level are highlighted in red



Appendix 2. Variables description

Variable	Definition	Data Source
Dependent variable determinants		
female	Female gender	Global Findex Database
age	Age	Global Findex Database
education	Higher education	Global Findex Database
income	Income from 2 (low) to 5 (high)	Global Findex Database
saved	If a person made savings during the past year	Global Findex Database
Dependent variables		
estimate	Results of a general linear model for *female* variable where dependent variable is *saved,* a categorical variable	Author's calculations
estimate.abs	Absolute value of the variable *estimate*	Author's calculations
Cultural variables		
LTOR	Measure of Long-Term orientation	Greet Hofstede's website, Hofstede Insights
INDUL	Measure of Indulgence	Greet Hofstede's website, Hofstede Insights
PDI	Power Distance Indicator	Greet Hofstede's website, Hofstede Insights
IND	Individualism	Greet Hofstede's website, Hofstede Insights
MAS	Level of Masculinity	Greet Hofstede's website, Hofstede Insights
UAI	Uncertainty avoidance	Greet Hofstede's website, Hofstede Insights

Socio-economic variables		
GDP	GDP	IMF
ruleoflaw	Extent to which population has confidence in and abides by the rules of society. Index from 0 (low) to 1 (high)	Country Risk Guide (ICRG) database
legal	Dummy variable equals 1 if legal origin of a country is British and 0 otherwise	Djankov et al. (2007)
DMMSCI	Country classified into category Developed Market by MSCI	MSCI
recession	Dummy variable equals 1 if a country experienced negative GDP growth, otherwise 0	World Economic Outlook Database
GROWTH10	Geometric mean of 10 years GDP growth (2007-2017)	Author's calculations
GDPCAP	GDP per capita in current prices of U.S. dollars	World Economic Outlook Database
geWB	Women's Workplace Equality Index. From 0 to 100 (100 being the best).	World Bank
geWEF	The World Economic Forum equality index. From 0 to 1 (1 is parity).	World Economic Forum

Appendix 3. Robustness check

	Estimate				
	ordered logistic				
	Odds ratio				
	(1)	(2)	(3)	(4)	(5)
GDPCAP	1,004 (0,017)	1,010 (0,017)	1,017 (0,020)	0,994 (0,024)	0,994 (0,029)
ruleoflaw	**0,047*** **(1,606)**	**0,024**** **(1,741)**	**0,027*** **(1,931)**	**0,029*** **(2,067)**	0,029 (2,313)
legal	**0,390*** **(0,550)**	**0,374*** **(0,563)**	0,406 (0,640)	0,502 (0,660)	0,539 (0,742)
geWEF	**0,919*** **(0,043)**	**0,910**** **(0,046)**	0,918 (0,055)	**0,851***** **(0,055)**	**0,857**** **(0,067)**
recession		0,253 (1,348)	0,341 (1,507)	**0,000***** **(0,000)**	**0,000***** **(0,000)**
GROWTH10		1,199 (0,568)	1,172 (0,693)	1,469 (0,671)	1,226 (0,800)
UAI			0,997 (0,014)		1,000 (0,015)
PDI			1,020 (0,017)		1,020 (0,020)
IND			1,005 (0,019)		1,019 (0,021)
MAS			0,997 (0,014)		0,999 (0,017)
LTOR				1,026 (0,016)	1,025 (0,018)
INDUL				**1,039**** **(0,017)**	**1,038**** **(0,018)**
Observations	96	96	87	80	73
McFadden Pseudo R2	43%	43%	43%	48%	58%
McFadden Pseudo R2 Adj.	1%	6%	40%	6%	8%

Notes: ***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.
Robust standard errors can be found in parentheses

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