Who doesn’t take a risk, never gets to drink champagne: women, risk and economics

Magdalena Adamus, Institute of Experimental Psychology, Centre of Social and Psychological Sciences of SAS, Bratislava, jena.adamus@gmail.com

ADAMUS, Magdalena. Who doesn’t take a risk, never gets to drink champagne: women, risk and economics. Človek a spoločnosť, 2018, roč. 21, č. 2, s. 16-30. doi: https://doi.org/10.31577/cas.2018.02.524

Abstract:
Because differences in risk attitudes are often quoted as one of the causes of lower earnings of women and their absence in senior positions, understanding whether risk aversion is an intrinsic, biological feature or is linked with some socio-cultural and contextual factors is of great importance for policy and education. This paper provides an overview of studies, mainly experimental, on risk aversion of women and men. First, it discusses results indicating greater risk aversion among women and linking it with biological characteristics. Then it lists studies refuting these differences or pointing to sources other than biological. The entire discussion will be framed in the context of Identity Economics (IE) suggesting that women’s risk preferences may be linked with identity and thus also with normative requirements placed on them. The main aim of the study is to examine whether commonly accepted claims are not persistent stereotypes and whether differences arise out of social, cultural or contextual rather biological causes. It presents arguments supporting the hypothesis that women are a varied group and their risk attitudes are sensitive to even slight contextual alterations.

According to the OECD, women on average earn less (e.g. in Slovakia 13.9%, 2017), are under-represented in boards (OECD average 20%, Slovakia 14%), spend twice as much time as men on unpaid household work (OECD average 271:137 min.), and in most countries there is less than 30% representation of women in parliaments (Slovakia 19%, 2014), although according to the World Bank they account for 49.5% of the global population. These are only a few selected examples of imbalances important from the perspective of both social and economic life. The answer to the question about the sources of these inequalities is a starting point for action that should provide both genders with equal chances. The main subject of the paper is risk aversion – one of the most important factors believed to differentiate women from men and affecting their incomes, social status and generally professional success. The main aim of the study is to demonstrate that risk aversion is not absolute and immune to manipulations. According to lexical definitions, risk is “a situation involving exposure to danger, a possibility that something unpleasant will happen” (Oxford Dictionaries) or “a possibility of loss or injury” (Merriam Webster). Economics defines risk aversion in narrower terms, as a feature of a person who presented with two options with the same expected utility chooses the certain or more probable one. Although economic men should be indifferent to risk, actual people of both sexes, are rather risk averse. The definition of risk, however, affects choices of measures. Most commonly used are hypothetical or real-stake lotteries (Holt, Laury 2002), less frequently questionnaires covering issues such as smoking, extreme sports, driving (Weber et al. 2002) and only occasionally field studies analysing actual risky behaviour (such as behaviour in bridge tournaments – Dreber, von Essen, Ranehill 2011; betting in dog and horse racing – Johnson, Powell 1994).

The paper shows that women are a much more diverse group than many papers claim and risk attitudes are sensitive to slight modifications, including used measures, and is strongly affected by social and cultural factors. Causes of gender differences range from biological (testosterone level, finger ratio), through socialisation, motivation and preferences, to situational factors such as the context of the study or used tools. The background of this overview is provided by Identity Economics (Akerlof, Kranton 2000; 2010) according to which identity as well as social roles and stereotypes are crucial for choices, because violating social prescriptions lead to anxiety, discomfort and ostracism, particularly when an activity (in this case risk taking) is stereotyped as a male domain. Their theory suggests that utility of a given behaviour increases when it is consistent with social
prescriptions applicable to a person and decreases when behaviour violates social norms and runs counter to social stereotypes and expectations.

The history of economic studies on risk-aversion dates back to the 1950s and covers many issues including lotteries (e.g. Allais’ paradox or an older Petersburg paradox), investment experiments (e.g. Charness, Gneezy 2012) or even analysis of the “capitalistic structure of economy” (Arrow 1951: 404). Because risk is present in nearly every decision, not only economic, a possible greater risk aversion of women would adversely affect many important areas, such as investing in stocks, education, health, possession of real estate and finally choices related to employment or starting a business (Dohmen et al. 2012; Barsky et al. 1997; Guiso, Paiella 2008; Bonin et al. 2007; Dohmen et al. 2011; Schlaegel, Koenig 2014). Additionally, because it is assumed that lower risk aversion is a desirable feature, particularly among managers, women can fall victim to negative selection or even statistical discrimination.

Of course women and men are not identical, but because many of the differences important from the perspective of economics or labour market gradually disappear – particularly in countries with greater equality – we can safely assume that their sources should not be (or at least not completely) sought in biology. And since we have observed many significant changes in areas such as mathematical, intelligence or education, it seems likely that these trends will continue. Furthermore, following Hyde (2005) or Nelson (2012; 2013; 2018) examining differences between both groups, we will likely find similarities rather than unbridgeable gaps. Additionally, unobservable characteristics such as masculinity score or testosterone level prove to be better predictors of risky behaviour than sex. Finally, as we have seen there is even no universal measure of risk aversion providing consistent results across all contexts. Therefore, using biological sex as a forecast of competence in dealing with risk, as well as in many other cases, is, at best, inefficient. Believing that risk is a guarantee of success, that women are conservative when it comes to taking risk and that taking risk is a male domain, places women in an unfair situation, where whatever they do, they will lose – they will face either statistical discrimination or ostracism. Therefore, if the evidence is mixed, it is always better to judge people of both sexes based on their actual competences not on assumptions, prejudices, or stereotypes we have about them because of the evidence. And above all, not to demand more because we expect a woman to behave according to prescriptions that are irrelevant when hiring a man.

**Keywords:**
Gender differences. Risk aversion. Stereotypes. Identity economics.

1. Introduction

According to the OECD, women on average earn less (e.g. in Slovakia 13.9%, 2017), are underrepresented in boards (OECD average 20%, Slovakia 14%), spend twice as much time as men on unpaid household work (OECD average 271:137 min.) and in most countries hold less than 30% of seats in parliaments (Slovakia 19%, 2014), although according to the World Bank they account for 49.5% of the global population. These are only a few selected examples important from the perspective of both social and economic life. The answer to the question about sources of these inequalities is a starting point for actions that should provide both genders with equal chances. The main subject of the paper is risk aversion – one of the most important factors believed to differentiate women from men and affecting their incomes, social status and generally professional success. The main aim of the study is to demonstrate that risk aversion is not absolute and immune to manipulations. However, before we proceed with the detailed analysis, we should clarify meaning of the concept. According to lexical definitions it is “a situation involving exposure to danger, a possibility that something unpleasant will happen” (Oxford Dictionaries) or “a possibility of loss or injury” (Merriam Webster). Economics defines risk aversion in narrower terms, as a feature of a person, who presented with two options with the same expected utility chooses the certain or more probable one. Although economic men should be indifferent to risk, actual people of both sexes are rather risk-averse. The definition affects the choice of measure: most commonly used are hypothetical or real-stake lotteries (Holt, Laury 2002), less frequent are questionnaires covering behaviour such as smoking, extreme sports, driving (Weber et al. 2002) and only occasionally studies analysing actual risky behaviour (such as behaviour in bridge tournaments – Dreber, von Essen, Ranehill 2011; betting in dog and horse racing –
Who doesn’t take a risk, never gets to drink champagne: women, risk and economics

Johnson, Powell 1994). Another consequence of the complex nature of risk is the interdisciplinary character of studies dedicated to it. The research on risk combines insights mainly from economics and psychology, but incorporates also contributions from sociology, evolutionary theory, biology, neurosciences and anthropology. The present analysis implies that it is difficult to separate these traditions of scientific inquiries; although a pivot of the studies is formed by economic considerations, behavioural economists are willing to absorb the best practices from other disciplines and thus enrich their own results.

In further sections the paper shows that women form a much more diverse group than many papers claim and risk attitudes are sensitive to slight modifications, including used measures, and is strongly affected by social and cultural factors. Although usually studies concerning gender differences in risk-aversion come from Western countries, there is growing evidence from culturally diverse countries, including also the Czech and Slovak milieu. Previous studies in Slovakia showed that female students were more risk-averse than their male peers particularly when they felt less competent (Balaz et al. 2009). Furthermore, Varcholova and Rimarcik (2004) found that not only were Slovak men more willing to take risks than women, but they also identified two significant factors correlating with the willingness to take risk – namely being overweight and entrepreneurial intentions. Although intentions to start a company are believed to be directly linked with attitudes toward risk (cf. Kolvereid, Isaksen 2006; Zhao et al. 2005), it would require further analysis to identify sources of the correlation with obesity. Kolouchova and Machek (2016) observed that Czech female managers working at family firms were less risk-prone than men, their decisions being generally more prudent and careful. The causes of gender differences range from biological (testosterone level, finger ratio), through socialisation, motivation and preferences, to situational factors such as context of the study or used risk elicitation methods. The background of this overview is provided by Identity Economics (Akerlof, Kranton 2000; 2010). According to this theory, identity, as well as social roles and stereotypes, are crucial for choices, because violating social prescriptions leads to anxiety, discomfort and ostracism, particularly when an activity (in this case risk-taking) is stereotyped as a male domain. Their theory suggests that the utility of a given behaviour increases when it is consistent with social prescriptions applicable to a person and decreases when behaviour violates social norms and runs counter to social stereotypes and expectations.

The rest of the paper is organised as follows: section two provides a review of the studies on gender differences, then refers to studies pointing to biological factors and finally, it discusses a turn caused by a meta-analysis performed by Nelson (2012). The third section describes social and cultural factors affecting attitudes toward risk and refers to anthropology, studies on contextual factors (risk elicitation methods and stereotype threat) and specific sub-samples (other than university students). The fourth section summarises the results and sets them in the context of Identity Economics.

2. Gendered attitudes toward risk

The history of economic studies regarding risk-aversion dates back to the 1950s and covers many issues, including lotteries (e.g. Allais’ paradox or an older Petersburg paradox), investment experiments (e.g. Charness, Gneezy 2012) or even analysis of the “capitalistic structure of economy” (Arrow 1951: 404). Because risk is present in nearly every decision, and not only economic ones, the possible greater risk aversion of women would adversely affect many important areas; such as investing in stocks, education, health, possession of real estate and choices related to employment or starting a business (Dohmen et al. 2012; Barsky et al. 1997; Guiso, Paiella 2008; Bonin et al. 2007; Dohmen et al. 2011; Schlaegel, Koenig 2014). Additionally, because it is assumed that lower risk aversion is a desirable feature,
particularly among managers, women can fall victims to negative selection or even statistical discrimination.

2.1. Plain differences
The wave of studies stressing economic differences between men and women started together with behavioural economics and reached its peak at the turn of 21st century. From this period, there have been many papers claiming that women are more risk averse in investment, financial or insurance decisions or even that women and men fundamentally differ in these matters. This does not mean that this question had not aroused interest among researchers earlier. One of the first meta-analyses of studies on risk aversion (Byrnes et al. 1999) covers 150 papers, the earliest of which comes from the 1960s and as much as 60% of them support the hypothesis about the greater risk aversion of women. At the same time in 40% of cases, effects were either insignificant or women proved to be more risk-prone. The authors noticed that differences fluctuate depending on the measure used and the context of the study. Croson and Gneezy (2009) using experimental lotteries concluded that there are "fundamental differences between men and women" in risk attitudes. In their study, they relied on a series of earlier economic and psychological papers supporting their hypothesis, although they noticed that there are also studies reporting no differences or whose results were mixed. They refrained from indicating clear causes of the differences (nature or nurture) and noticed that one of the reasons could be the so-called publication bias. A similar overview of previous studies was provided by Charness and Gneezy (2012) who focused mainly on investment games (both real-stake and hypothetical). All of the studies they mentioned (including two by the authors themselves) concluded that women are systematically and consistently less risk taking. Eckel and Grossman (2002; 2008) examined risk aversion in real stake lotteries and stated that in all variants women on average were "consistently more risk-averse than men", although when they asked participants to evaluate expected risk aversion of other participants, they significantly over-estimated women’s risk aversion; that is they believed that women are even more risk averse than they actually were. It is noteworthy, however, that although the authors referred to evolutionary theories, they did not claim that biological factors are the sole or even main cause of the differences. They recognise that women are often treated differently by banks or investment advisors who offer them less risky options, which is consistent with the finding that (particularly male) participants of the study had biased assumptions about women’s risk attitudes. This, in turn, may lead to statistical discrimination and negative self-selection when they make investment and professional choices.

2.2. Biological determinants
A separate category of studies on gender differences are those correlating results with biological factors such as genes or hormones. Dreber and Hoffman (2007) studied the relationship between risk propensity (measured with investment game) and digit ratio (index to ring finger) which is believed to reflect exposure to prenatal testosterone and oestrogen, and determined that the influence of biological sex decreases when controlling for this ratio. Unfortunately, although in the Swedish sample the effect was prominent, it disappeared in a more culturally diverse sample of American students. Coates and Herbert (2008) who studied risk attitudes among male traders in the City of London go a step further and claim that testosterone level is responsible not only for risk propensity but also for the profitability of managed funds; on days when their testosterone levels were higher than the 8-day average, they obtained higher returns. On the other hand, they notice that elevated levels of testosterone and cortisol could interfere with the rationality of decisions. We should also note that their definition of risk is as a threat, and that they did not measure propensity to risk directly but only as a variance of a trader’s return, making it difficult to compare their results.
with those known from behavioural economics. A similar attempt was made by Apicella et al. (2008) who correlated risk aversion not only with digit ratio but also with salivary testosterone and facial masculinity. Their study covered only male participants (98) and thus it would be difficult to draw any conclusions about women. However, both their definition of risk and the measure (investment game) were consistent with those adopted in standard economic studies. They used a convenience sample of American students (Harvard University) and similarly as Dreber and Hoffman (2007) found no correlation between digit ratio and risk aversion; although men with higher actual levels of salivary testosterone and more male faces proved to be more risk-prone. Again, Schipper (2011) found no link between digit ratio and risk aversion measured with standard lotteries (Holt, Laury 2002). Sapienza et al. (2009) examined over 500 MBA students (169 females) and found that higher levels of salivary testosterone positively affect women’s propensity to risk (measured with lotteries). The effect is stronger for relatively low concentrations of testosterone proving that the influence of this hormone is non-linear. Interestingly, at low levels, sex differences disappear indicating that biological sex is a worse predictor of risky behaviour than an actual testosterone concentration. It would seem that linking risk aversion with the testosterone level solves the issue, but according to the results, it seems to become even more complex. We should also remember that as Eckel and Grossman (2008) observed in studies on risk attitudes there is a low correlation between tasks, measures and contexts, and this provides a good starting point for further research on the actual extent of the differences.

2.3. An unexpected twist

Nelson (2012; 2013; 2018), who published results of her meta-analysis first of 28 and later of 35 studies, showed that in only 14 cases differences between men and women were statistically significant (in 5 cases they were larger than half standard deviation and in 2 more than one standard deviation). In 3 cases statistically significant differences spoke in favour of greater male risk aversion. Using an Index of Similarity (IS) she developed, she claimed that distribution of this feature among women and men overlap in 60 and even 80%. This means that over 60% of women (usually about 80%) can be paired with a man with an identical attitude towards risk. Particularly, in the study by Eckel and Grossman (2008) IS ranged between 0.6 and 0.8 depending on the condition and thus similarities are greater than differences. This undermines the widespread interpretation of differences as very large and shows that understanding the results as suggesting that each woman is less risk-prone than any man is a too hasty assumption.

After 2012 the tendency to overstate differences gradually reverse and more and more publications conclude that women and men are similar in terms of risk attitudes or that in a given sample no statistically significant differences were recorded. There are also first studies analysing risk aversion in a more systematic way, indicating possible sources of some observed variations. For example in comparing the stability of various risk elicitation methods, Csermely and Rabas (2016) found no statistically significant differences between women and men, while Filippin, Crosetto and Heider (2014; and also Filippin, Crosetto 2016) concluded that although there are some differences, their scope and size depend on used measures – the greatest being in investment games (e.g. Gneezy, Potters 1997) and lotteries (e.g. Eckel, Grossman 2002, 2008), while in the Bomb Risk Elicitation Task in which participants decide how many boxes out of 100 to collect, while remembering that one of them contains a bomb which would destroy all previous earnings (Crosetto, Filipin 2013) and in the most popular method – multiple price list (Holt, Laury 2002) differences are rather an exception than a rule. This is not surprising since the authors of the method themselves stated that sex (similarly as age or income) does not explain a significant proportion of variance in high-stake lotteries.
3. Socio-cultural and contextual predictors of risk taking

Despite all these, we cannot deny that in many areas there are differences between women and men and that it is much easier to publish a study highlighting than denying them. Some explanation of this fact may be confirmation and publication biases: a tendency to look for confirmation of one’s hypotheses and to publish papers consistent with currently accepted theories. These tendencies are additionally strengthened by such popular, easily accessible but far from reliable publications such as *Men are from Mars, Women are from Venus* (Grey 1992). Authors of such books often present arguments selectively and attribute differences to biological or evolutionary mechanisms, even if evidence is weak. For example, Baron-Cohen (2004:12) claims that “The female brain is predominantly hard-wired for empathy. The male brain is predominantly hard-wired for understanding and building systems”. Pinker (2002:342; 353) argues that “neuroscience, genetics, psychology and ethnography are documenting sex differences that almost certainly originate in human biology” and that women do not pursue their careers, “because they don’t want to”. Finally, Ridley (2003:248) believes that “Men and women have different minds: The differences are the direct result of evolution” and that women “sought to serve society above all”. Other authors claim that there are also differences in personality, cognitive skills, intelligence and mathematic skills, making women either insufficiently competent or uninterested in pursuing a career in stereotypically male professions and attribute these differences to causes such as investments in rearing offspring, testosterone level or genetic differences. More recent studies show that there are no statistically significant differences in average intelligence (Flynn 2012). Tests of mathematical competence show that differences disappear and the greater gender equality in a given country, the better girls’ results are with girls even starting to dominate (Guiso et al. 2008; Nosek et al. 2002; 2009). Personality differences are so small that they have no diagnostic meaning for potential employers (Hyde 2005). A final argument against the nature argumentation comes from studies performed in several non-western cultures showing that western behavioural patterns (risk attitudes, competitiveness, altruism) believed to be universal, might be the most unusual in the world (Henrich, Heine, Norenzayan 2010).

3.1. Anthropological studies

Although the series of abovementioned studies concerned mainly altruistic behaviour, in some cases it covered also risk aversion measured with real-stake lotteries with a certain, safe option (Henrich, McElrath 2002). In two cases, Mapuche (Chile) and Sangu (Tanzania) participants preferred risky options more often than American students (University of California). No gender differences were observed in any of the samples. Gneezy, Leonard, List (2009; see also Gong; Yang 2012) compared two cultures, one patriarchal (Maasai, Tanzania) and one matrilineal (Khasi, India). Using a simple real-stake lottery (that could either triple endowed money or lose everything), they found that there were no differences between women and men in either of the cultures, although generally, Khasi were more risk-prone than Maasai (they invested 85% and 60% of the endowment respectively). The authors explain these results by co-evolution; namely a theory according to which genetic traits in a favourable environment could mutually enforce one another. We cannot forget that socialisation starts already during childhood including influences of parents, family, school, teachers and peers. Social learning (implicit) and thus oblique transmission are important elements in the process of imitation of when an individual is perceived as successful. Similar findings are provided by the already mentioned study by Finucane et al. (2000) who claimed that there are no universal gender differences, there is only a “white male effect”. Furthermore, Dohmen et al. (2012), using data from 2003 and 2004 SOEP data, studied the impact of socialisation on attitudes towards risk (hypothetical investment game). According to the authors, this propensity is moderated not only directly by the parents’ willingness to take
risk, but also by the so-called regional level of risk aversion. Therefore, we deal here with two lines of socialisation and learning: a direct (parents) and an indirect (observation of others) one.

3.2. Contextual factors
The results of “anthropological” studies are consistent with a study by Booth and Nolen (2009) who examined (with a real-stake gamble) risk attitudes of students in coeducational and single-sex schools. Although in co-ed-schoools, girls were more risk-averse than boys from the same school, in single-sex environments their risk attitudes did not differ from those of boys (both single-sex and co-ed). Interestingly, the propensity to take risk increased in all-girls groups. Similar results were provided by a controlled experiment (Booth, Cardona-Sosa, Nolen 2014) in which first-year university students were randomly assigned to either co-ed or single-sex groups. Their risk attitudes were measured twice at the beginning and after 8 weeks with multiple-choice list method (Holt, Laury 2002). Although generally women were less risk-prone, after 8 weeks in a single-sex group they were willing to risk more than their counterparts from mixed groups suggesting that risk attitudes are effects of “social learning rather than inherent gender traits” (Booth, Cardona-Sosa, Nolen 2014:126). Of course, it is impossible to claim that the effects of school or experimental manipulation will continue throughout the adult life, but similar results were obtained by Lindquist and Save-Soderbergh (2011), who found out that strategies chosen by women in Jeopardy are less risky when they play against men.

Another type of contextual factor is stereotype threat. Carr and Steele (2010) determined that triggering stereotype threat (by presenting the task as measuring mathematical, logical or rational ability) affects attitudes towards risk in a coin-toss lottery. Although in a condition without stereotype, differences between women and men were insignificant, after activating the stereotype, women were significantly less willing to risk than men in the same condition and both men and women in the stereotype-irrelevant condition. Similar conclusions were drawn by Meier-Pesti and Penz (2008), who examined how stereotypes affect financial decisions of the general population and university students. Additionally, they correlated their results with a measure of masculinity (BSRI-M). Similarly as in the case of testosterone studies discussed above, they concluded that masculinity is a better predictor of risk attitude than sex in all four measures of risk aversion. Surprisingly, activation of stereotype (through describing pictures presenting male businessman, women holding a baby) affected only men; after watching a "mother" picture they assigned themselves lower masculinity scores and were more risk-averse than men primed with male roles and those in the control group (neutral picture). In their second study (with students) women described themselves as equally masculine as men and consequently the authors detected no differences in risk aversion. We should also remember that in real life situations women usually earn less and thus have lower investment budgets, which, in additional to all the already discussed factors, may explain their more conservative investment choices.

3.3. Specific subsamples
One of the main objections against studies analysed here (both those indicating and denying differences) is the fact that they often use convenience samples consisting of students. Because with experience risk aversion decreases, it is important to study not only the general population but its specific sub-sample, namely managers. Beckmann and Menkhoff (2008) studied the behaviour of over 600 fund managers (125 women) in four countries: the United States, Germany, Italy and Thailand, asking them whether “in respect of professional investment decision they mostly act” risk-averse or not. Controlling for such factors as a post, size and type of managed fund and also age, marital status and number of hours worked per
week, they determined that women reported higher levels of self-stated risk aversion in investment decisions. However, statistically significant differences in average risk propensity were present only in the Italian sample (in Germany average values were equal and in the USA women were more risk-loving). A slightly older study by Johnson and Powell (1994) on a sample of management students, whose task was to assess a potential investment and either recommend it or not. Because the same percentage of women rejected the investment (assumed as a measure of risk aversion), the authors concluded that in the group of future managers there are no gender differences both in quality of taken decisions and in risk attitudes. They indicated that this may be caused by education and experience (students get used to dealing with risks) or by self-selection (more risk-prone women are also more inclined to study management). Similar conclusions were drawn by Atkinson, Baird, Frye (2003) who asked whether mutual fund managers manage differently. They found no significant differences in terms of performance, risk or other important features. Despite this, funds managed by women obtained fewer funds, particularly during the first year of their work, which may reflect the stereotype that women are less competent and efficient. Adams and Funk (2012) examined a large sample of Swedish managers using the method introduced by Dohmen et al. (2012) and stated that women and men in this sub-population differ systematically. Surprisingly, female managers proved to be more risk-prone. They noticed also that in Sweden costs of choosing professional career are for women lower than in other, less equality-oriented countries and thus, as a consequence of self-selection by women determined to pursue their careers, in other countries female managers could prove to be even more risk-oriented (compared to the general population) than in Sweden.

4. Persistent stereotypes and identity
As we have seen from this brief review, the greater risk aversion of women, although not a myth, is some kind of a stereotype. The evidence is mixed; women can be more risk-averse than men in some situations and less (or equally) risk-averse in others. It depends on culture, used measure, studied sample or even subtle situational cues such as a description of the task. Usually, women are more similar to men than different (cf. Index of Similarity, Nelson 2012). As Wojciszke and Szlendak (2010) observed, differences between women and men can be present at 4 different levels: objective or subjective differences and differences of descriptive or prescriptive stereotypes. And although the most important, objective differences are so small that Hyde (2005) put forward the “gender similarity hypothesis”, we cannot forget that descriptive stereotypes easily mutate into prescriptive ones. While descriptive stereotypes are responsible for statistical discrimination (e.g. associating femininity with incompetence in stereotypically male domains), prescriptive ones lead to prejudice against those individuals, who seem to be “non-standard”. If such stereotypes additionally link with norms indicating desirable features and behaviour, they can prove to be a significant obstacle on the way to equality of chances. The adverse impact of stereotypes on behaviour is not one-dimensional; they distort perception and preferences of both potential employers (statistical discrimination) and social groups affected by them (stereotype threat, negative self-selection). In the sections below, we shall see how stereotypes affect choices of stereotyped groups and answer the question whether all stereotypes have already disappeared.

4.1. Impact of identity on preferences
Those who claim that women and men differ drastically in terms of characteristics important from the perspective of the labour market, often refer to differences not in competences, but in motivations and preferences. But both motivations and particularly preferences, as understood in economics, are shaped in a broader, social context of family, school, peers, media and perhaps above all by stereotypes penetrating all spheres of social life. If it is widely accepted
that a group (in this case women) is less competent (e.g. in dealing with risk), then, as we have seen, the mere activation of such stereotype can affect their performance. According to Akerlof and Kranton (2000; 2010), the role of identity starts with differentiating two groups, which are linked with different norms, prescriptions and ideals. They noticed also that violating norms “evokes anxiety and discomfort in oneself and in others” (Akerlof, Kranton 2000:716). As a consequence, this anxiety (actual or anticipated) reduces expected utility of a given action and thus distorts preferences. Since a rational individual should be a maximiser, she will not choose an action that brings zero or low utility that is an action that is inconsistent with internalised norms. Identity Economics (IE) predicts thus that women will dominate in professions with feminine descriptions and the more they internalised social norms, the more they will manifest behaviour that is prescribed to their group (e.g. preferring non-pecuniary outcomes over higher earnings). Interestingly, in this theory, identity is treated as a specific type of externality that is an action whose consequences “spill over” into a broader context and reduces the wellbeing of other individuals seemingly unaffected by the choice, but actually threatened in their own identity by an out-grouper. Does IE provide a reliable explanation of differences in risk aversion? A good theory of risky behaviour should explain why women and men differ and why these differences are not consistent across various contexts. It seems that IE is well-suited for this purpose. It starts with norms and stereotypes; if a society is stereotype-free or if norms accepted there are different than those known from western societies, then it seems obvious that observed behavioural patterns also differ (Henrich, McElrath 2002; Gneezy, Leonard, List 2009). Additionally, women who identify themselves with masculine traits (Meier-Pesti and Penz 2008) or who actually have “masculine” traits (Apicella et al. 2008; Sapienza et al. 2009) will behave more like men. Finally, even a subtle activation of a stereotype can remind them of being women and therefore distort their performance (Meier-Pesti and Penz 2008; Carr, Steele 2010).

4.2. Between Scylla (of stereotypes) and Charybdis (of prejudice)
The above argument is correct only if stereotypes are still valid and if women are actually punished for choosing non-standard behaviour. There are some that claim they are not; years of gender mainstreaming and implementation of anti-discrimination laws should have secured a level playing field for everyone. If therefore, equality is not yet obtained the reason is in the women themselves. As we have seen, stereotypes can affect women’s performance either by inclining them to choose occupations consistent with prescribed norms (appropriate for women) or by seeing them as incompetent (the more, the more feminine they seem). Of course, the situation changes – possibly at an uneven pace and certainly not fast enough. No country has yet reached the value “1” meaning perfect equality in the Global Gender Gap Index. In a study designed to measure persistence of stereotypes, Haines et al. (2016) asked participants (workers at Amazon Mechanical Turk) about the likelihood that a set of certain gendered characteristics (such as being a politician, postal worker, head of a household, being well-built, etc.) describes a typical man or a typical woman and then compared their data with those from 1983 (Deaux, Lewis 1984). They found out that women were still perceived as more communal, while men as more agentic with no significant change across time. Stereotypes in other areas (occupation and physical characteristics) also did not change. But that is not all. In a study by Rudman and Glick (1999, 2001; Rudman et al. 2012) participants rated candidates (either male or female) for a post of a computer lab. manager (described as either feminised (helpful, sensitive to others’ needs) or masculinised (technically skilled, ambitious)) in terms of their competence (e.g. competent, independent, analytical) and personal traits (e.g. kind, supportive, friendly). They established that women displaying masculine traits are seen as violating norms of being nice and friendly. Job descriptions often contain stereotypically male traits associated with being seen as competent. Women, who
want to be seen as competent must, therefore, present themselves as agentic, risking at the same time that they will be seen as less socially skilled and less likeable (although equally competent as men). The results suggest that the “backlash effect” activates when women violate norms of being sensitive or supportive, not because they are competent, but it is extremely difficult to present oneself as both “nice and able” (Rudman and Glick 2001:746). To this set of male characteristics, we can easily add another one: risk-taking. Therefore, as some in this context have already observed (e.g. Rudman Glick 2001; Akerlof, Kranton 2010) women are put in a situation resembling Catch 22; punished for being incompetent when seen as feminine and punished for being unfriendly or aggressive when seen as insufficiently feminine and excessively agentic (cf. Akerlof, Kranton 2010: Price Waterhouse vs. Ann Hopkins). In both cases, however, they are seen as unfit for higher posts.

5. Conclusion
Are women and men identical? Of course, they are not. But because many of the differences important from the perspective of economics or labour market gradually disappear – particularly in countries with greater equality – we can safely assume that their sources should not be (or at least not completely) sought in biology. And since we have observed many significant changes in areas such as mathematics, intelligence or education, it seems that these trends will continue and following Hyde (2005) or Nelson (2012; 2013; 2018) examining differences between both groups, we will likely find similarities rather than unbridgeable gaps. Furthermore, unobservable characteristics such as masculinity scores or a salivary testosterone level prove to be better predictors of risky behaviour than sex. Finally, as we have seen there is even no universal measure of risk aversion providing consistent results across all contexts. Therefore, using biological sex as a forecast of competence in dealing with risk, as well as in many other cases, is, at best, inefficient. Believing that risk is a guarantee of success, that women are conservative when it comes to taking the risk and that taking risk is a male domain, places women in an unfair situation where whatever they do, they will lose – they will face either statistical discrimination or ostracism. Therefore, if the evidence is mixed, it is always better to judge people of both sexes based on their actual competences not on assumptions, prejudices, or stereotypes we have about them because of their affiliation to a certain group. And above all, not to demand more because we expect a woman to behave according to prescriptions that are irrelevant when hiring a man.
References

Adams, R., Funk, P. (2012). Beyond the Glass Ceiling: Does Gender Matter? *Management Science*, 58(2), 219-235.

Akerlof, G., Kranton, R. (2000). Economics and Identity. *The Quarterly Journal of Economics*, 115(3), 715-753.

Akerlof, G., Kranton, R. (2010). *Identity Economics. How Our Identities Shape Our Work, Wages, and Well-Being*. New Jersey: Princeton University Press.

Arrow, K. (1951). Alternative Approaches to the Theory of Choice in Risk-Taking Situations. *Econometrica*, 19(4), 404-437.

Atkinson, S., Baird, S., Frye, M. (2003). Do Female Mutual Fund Managers Manage Differently? *The Journal of Financial Research*, 26(1), 1-18.

Apicella, C., Dreber, A., Campbell, B., Gray, P., Hoffman, M., Little, A. (2008). Testosterone and financial risk preferences. *Evolution and Human Behavior*, 29, 384-390.

Balaz, V., Nemcova, E., Fifekova, E. (2009). Ellsbergov paradox: rozhodovanie za podmienok rizika a neistoty. *Ekocnomicky Casopis*, 57(3), 213-229.

Baron-Cohen, S. (2004). *The Essential Difference. Male and Female Brains and the Truth About Autism*, New York: Basic Books.

Barsky, R., Juster, T., Kimball, M., Shapiro, M. (1997). Preference Parameters and Behavioral Heterogeneity: An Experimental Approach in the Health and Retirement Study. *The Quarterly Journal of Economics*, 112(2), 537-579.

Beckmann, D., Menkhoff, L. (2008). Will Women Be Women? Analyzing the Gender Difference among Financial Experts. Discussion Paper No. 391, February 2008.

Bonin, H., Dohmen, T., Falk, A., Huffman, D., Sunde, U. (2007). Cross-sectional earnings risk and occupational sorting: The role of risk attitudes. *Labour Economics*, 14, 926-937.

Booth, A., Cardona-Sosa, L., Nolen, P. (2014). Gender differences in risk aversion: Do single-sex environments affect their development? *Journal of Economic Behavior and Organization*, 99, 126-154.

Booth, A., Nolen, P. (2009). Gender differences in risk behaviour: does nurture matter? *The Economic Journal*, 122(158), 56-78.

Byrnes, J., Miller, D., Schafer, W. (1999). Gender Differences in Risk Taking: A Meta-Analysis. *Psychological Bulletin*, 125(3), 367-383.

Carr, P., Steele, C. (2010). Stereotype Threat Affects Financial Decision Making. *Psychological Science*, 21(10), 1411-1416.

Charness, G., Gneezy, U. (2012). Strong Evidence for Gender Differences in Risk Taking. *Journal of Economic Behavior and Organization*, 83, 50-58.
Coates, J.M., Herbert, J. (2008). Endogenous steroids and financial risk taking on a London trading floor. *PNAS*, 105(16), 6167-6172.

Crosetto, P., Filippin, A., Heider, J. (2014). A Study of Outcome Reporting Bias Using Gender Differences in Risk Attitudes. *CESifo Economic Studies*, 61(1), 239-262.

Crosetto, P., Filippin, A. (2013). The “bomb” risk elicitation task. *Journal of Risk and Uncertainty*, 47, 31-65.

Croson, R., Gneezy, U. (2009). Gender Differences in Preferences. *Journal of Economic Literature*, 47(2), 1-27.

Csermely, T., Rabas, A. (2016). How to reveal people’s preferences: Comparing time consistency and predictive power of multiple price list risk elicitation methods. *Journal of Risk and Uncertainty*, 53(2-3), 107-136.

Deaux, K., Lewis, L. (1984). Structure of Gender Stereotypes: Interrelationships Among Components and Gender Label. *Journal of Personality and Social Psychology*, 46(5), 991-1004.

Dohmen, T., Falk, A., Huffman, D., Sunde, U. (2012). The Intergenerational Transmission of Risk and Trust Attitudes. *Review of Economic Studies*, 79, 645-677.

Dohmen, T., Falk, A., Huffman, D., Sunde, U., Schupp, J., Wagner, G. (2011). Individual Risk Attitudes: Measurement, Determinants, and Behavioral Consequences. *Journal of the European Economic Association*, 9(3), 522-550.

Dreber, A., von Essen, E., Ranehill, E. (2011). Outrunning the gender gap – boys and girls compete equally. *Experimental Economics*, 14(4), 567-582.

Dreber, A., Hoffman, M. (2007). 2D:4D and risk aversion: Evidence That The Gender Gap in Preferences is Partly Biological. Mimeo.

Eckel, C., Grossman, P. (2002). Sex differences and statistical stereotyping in attitudes toward financial risk. *Evolution and Human Behavior*, 23, 281-295.

Eckel, C., Grossman, P. (2008). Men, Women and Risk Aversion: Experimental Evidence. *Handbook Of Experimental Economics Results*, 1(113), 1061-1073.

Filippin, A., Crosetto, P. (2016). A Reconsideration of Gender Differences in Risk Attitudes. *Management Sciences*, Article in Advance, 1-23.

Finucane, M., Slovic, P., Mertz, C.K., Flynn, J., Satterfield, T. (2000). Gender, race, and perceived risk: the “white male” effect. *Health Risk & Society*, 2(2), 159-172.

Flynn, J. (2012). *Are We Getting Smarter? Rising IQ in the Twenty-First Century*. Cambridge: Cambridge University Press.

Gneezy, U., Leonard, K., List, J. (2009). Gender Differences in Competition: Evidence From A Matrilineal and Patriarchal Society. *Econometrica*, 77(5), 1637-1664.
Gneezy, U., Potters, J. (1997). An Experiment on Risk Taking an Evaluation Periods. *The Quarterly Journal of Economics*, 112(2), 631-645.

Gong, B., Yang, C. (2012). Gender differences in risk attitudes: Field experiments on the matrilineal Mosuo and the patriarchal Yi. *Journal of Economic Behavior and Organization*, 83, 59-65.

Grey, J. (1992). *Men Are From Mars, Women Are From Venus*. London: Harper.

Guiso, L., Monte, F., Sapienza, P., Zingales, L. (2008). Culture, Gender, and Math. *Science*, 320, 1164-1165.

Guiso, L., Paiella, M. (2008). Risk Aversion, Wealth, and Background Risk. *Journal of the European Economic Association*, 6(6), 1109-1150.

Haines, E., Deaux, K., Lofaro, N. (2016). The Times They Are a-Changing… or Are They Not? A Comparison of Gender Stereotypes, 1983-2014. *Psychology of Women Quarterly*, 1-11.

Henrich, J., Heine, S., Norenzayan, A. (2010). The weirdest people in the world? *Behavioural and Brain Sciences*, 33, 61-135.

Henrich, J., McElreath, R. (2002). Are peasants risk-averse decision makers? *Current Anthropology* 43(1), 172-181.

Holt, C., Laury, S. (2002). Risk Aversion and Incentives Effects. *The American Economic Review*, 92(5), 1644-1655.

Hyde, J. (2005). The Gender Similarity Hypothesis. *American Psychologist*, 60(6), 581-592.

Johnson, J.E.V., Powell, P.L. (1994). Decision Making, Risk and Gender: Are Managers Different? *British Journal of Management*, 5, 123-138.

Kolouchova, D., Machek, O. (2016). Zensky leadership v rodinnem podnikani: poznatky z kvalitativneho vyzkumu v Ceske republice. *Business Trends*, 2016(1), 33-41.

Kolvereid, L., Isaksen, E. (2006). New business start-up and subsequent entry into self-employment. *Journal of Business Venturing*, 21, 866-885.

Lindquist, G., Säve-Söderbergh, J. (2011). “Girls will be Girls”, especially among Boys: Risk-taking in the “Daily Double” on Jeopardy. *Economics Letters*, 112, 158-160.

Meier-Pesti, K., Penz, E. (2008). Sex or gender? Expanding the sex-based view by introducing masculinity and femininity as predictors of financial risk-taking. *Journal of Economic Psychology*, 29, 180-196.

Nelson, J. (2012). Are Women Really More Risk-Averse than Men? Research Note 12, Institute for New Economic Thinking.

Nelson, J. (2013). Are Women Really More Risk-Averse Than Men? A Re-Analysis of the Literature Using Expanded Methods. *Journal of Economic Surveys*, 00(0), 1-20.
Nelson, J. (2018). *Gender and Risk-Taking. Economics, Evidence, and Why the Answer Matters*. New York: Routledge.

Nosek, B., Banaji, M. (2002). Math=Male, Me=Female, Therefore Math≠Me. *Journal of Personality and Social Psychology*, 83(1), 44-59.

Nosek, B., et al. (2009). National differences in gender-science stereotypes predict national sex differences in science and math achievement. *PNAS*, 106(26), 10593-10597.

Pinker, S. (2002). *The Blank Slate. Sex and the Evolution of Human Nature*. London: Penguin Books.

Ridley, M. (2003). *The Red Queen*. London: Penguin Books.

Rudman, L., Glick, P. (1999). Feminized Management and Backlash Toward Agentic Women: The Hidden Costs to Women of a Kinder, Gentler Image of Middle Managers. *Journal of Personality and Social Psychology*, 77(5), 1004-1010.

Rudman, L., Glick, P. (2001). Prescriptive Gender Stereotypes and Backlash Toward Agentic Women. *Journal of Social Issues*, 57(4), 743-762.

Rudman, L., Moss-Racusin, C., Phelan, J., Nautus, S. (2012). Status incongruity and backlash effects: Defending the gender hierarchy motivates prejudice against female leaders. *Journal of Experimental Social Psychology*, 48, 165-179.

Sapienza, P., Zingales, L., Maestripieri, D. (2009). Gender differences in financial risk aversion and career choices are affected by testosterone. *PNAS*, 106(36), 15268-15273.

Schlaegel, C., Koenig, M. (2014). Determinants of Entrepreneurial Intent: A Meta-Analytic Test and Integration of Competing Models. *Entrepreneurial Theory and Practice*, 3, 291-332.

Schipper, B. (2011). Sex Hormones and Risk Preferences. *Mimeo*, University of California.

Varcholova, T., Rimarcik, M. (2004). Miera individualnej averzie k riziku a jej korelaty. *Ekonomicky casopis*, 52(5), 598-612.

Weber, E., Blais, A., Betz, N. (2002). A Domain-specific Risk-attitude Scale: Measuring Risk Perceptions and Risk Behaviors. *Journal of Behavioral Decision Making*, 15, 263-290.

Wojciszke, B., Szlendak, M. (2010). Skale do pomiaru orientacji sprawczej i wspólnotowej. *Psychologia Społeczna*, 5(1), 57-70.

Zhao, H., Seibert, S.E., Hills, G.E. (2005). The Mediating Role of Self-Efficacy in the Development of Entrepreneurial Intentions. *Journal of Applied Psychology*, 90(6), 1265-1272.
Electronic sources:
Merriam Webster, accessed 21.02.2018,
<https://www.merriam-webster.com/dictionary/risk>.

OECD Data, accessed 21.02.2018,
<https://data.oecd.org/earnwage/gender-wage-gap.htm>.

OECD Data, accessed 21.02.2018,
<https://stats.oecd.org/index.aspx?queryid=54757>.

OECD Data, accessed 21.02.2018,
<http://stats.oecd.org/index.aspx?queryid=54753>.

Oxford Dictionaries, accessed 21.02.2018,
<https://en.oxforddictionaries.com/definition/risk>.

World Bank, accessed 21.02.2018,
<https://data.worldbank.org/indicator/SP.POP.TOTL.FE.ZS>.

World Bank, accessed 21.02.2018,
<https://data.worldbank.org/indicator/SG.GEN.PARL.ZS>.

Acknowledgement:
This research was supported by a grant from Slovak Ministry of Education Science, Research and Sport of the Slovak Republic VEGA 2/0118/17: Risk assessment in decision making of individuals on the personal and company/business finances and business opportunities.