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RISK TAKING AND ECONOMIC OUTCOMES:  
THE ROLE OF SOCIAL CONTEXT

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Katharina Lima de Miranda  
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## OVERVIEW OF PAPERS AND CO-AUTHORSHIP

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This thesis includes the following papers:

Lima de Miranda, K., Maschke, M., & Schmidt, U. (2012). Der Glücksspielstaatsvertrag aus ökonomischer Perspektive. In Höfling, W., Horst, J., & Nolte, M. (Eds.), *Sportwetten in Deutschland* (pp. 9-24), Tübingen: Mohr Siebeck.

Schmidt, U., & Lima de Miranda, K. (2013). Regulierung des Glücksspiels in Deutschland: Das Glücksspielgesetz Schleswig-Holsteins und der Glücksspieländerungsstaatsvertrag aus ökonomischer Perspektive. *Zeitschrift für Wirtschaftspolitik*, 62(1), 82-94.

Friedl, A., Lima de Miranda, K., & Schmidt, U. (2014). Insurance demand and social comparison: An experimental analysis. *Journal of Risk and Uncertainty*, 48(2), 97-109.

Lima de Miranda, K., Detlefsen, L., & Schmidt, U. (2016). The Risky Shift Phenomenon in Group Decisions: Does Gender Matter?. *mimeo*.

Lima de Miranda, K. (2016). Mindfulness, Preferences and Well-Being: Mindfulness predicts adolescents' field behavior. *mimeo*.

Each co-author contributed significantly to the concept, design and content of the articles.

The following paper is not part of this thesis:

Schmidt, U., Friedl, A., Eichenseer, M., & Lima de Miranda, K. (2016). Social Comparison and Gender Differences in Risk Taking. *mimeo*.

## INTRODUCTION

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Nearly all important economic decisions in real life like investments or educational decisions involve various risks. Therefore, risky choice behavior is a major determinant of economic outcomes and ultimately well-being. Standard economic theory relies on expected utility where risky decisions are solely determined by the own state-dependent payoffs of the decision maker and their corresponding probabilities. Empirical research has, however, shown that risk preferences are heavily influenced by the context inherent to the choice problem, for example framing effects, the presence of irrelevant alternatives or past experiences. This leads to systematic deviations from the choices that would be consistent with the conventional definition of rationality (Kahneman & Tversky, 2000). Factors that have been shown to influence risk taking are for example sleep deprivation (e.g. Venkatraman et al., 2011), mood and emotional state, like fear or anger (e.g. Raghunathan & Pham, 1999; Lerner & Keltner, 2001) or the level of stress (e.g. Bault et al., 2008; Porcelli & Delgado, 2009). In addition, many individual decisions under risk are taken in a social environment, therefore, the social context may be an important factor when evaluating choices. However, only in recent years the interest to study the influence of the social context on decisions under risk has been growing among economists. In this regard, for example the mere presence of peers has been shown to affect time and risk preferences (Wilson & Daly, 2004; Ermer et al., 2008; Hill & Buss, 2010; Linde & Sonnemans, 2012).

In my thesis I analyze risk taking and resulting economic outcomes in different settings with a particular focus on the social context. Thereby, I contribute to answering the question whether and how the social context influences preferences and thereby economic outcomes. My thesis consists of two parts. The first part, composed of two papers (papers one and two), addresses economic consequences in an environment where risk taking is inherent – the gambling market. Existing regulations are discussed from an economic perspective and possible new regulations are proposed. It, therefore, provides new insights and arguments on the debate on the optimal regulation of gambling, which directly affects economic outcomes. On the aggregate level it has implications in form of tax revenues and on the individual level for example in the context of problem gambling.

The second part of my thesis is composed of three papers that address risk taking in experimental settings with a focus on the social context. In these three papers I use economic experiments to examine individual risk preferences in the presence of social comparison (third paper), risk preferences of groups compared to individuals (fourth paper) and the predictive

power of risk and time preferences as well as mindfulness for adolescents' field behavior (fifth paper). Studies three and four focus on decision making processes explicitly taking the social context into account and demonstrate that the social context has a significant influence on preferences. The fifth study examines the relation between preferences and personality traits and analyzes their influence on economic outcomes, including health and economic related behavior, such as smoking or saving, as well as subjective well-being.

## **Part I of the thesis**

The first part of my thesis deals with the regulation of gambling in Germany. The motivation for the two papers included in this part was an intense debate about the re-regulation of the German gambling market. The background of this debate was the fact that the existing regulations had been declared incompatible with the European law by the EU court and were running out in 2011. The focus of the analysis lies on the economic consequences of the regulation, in particular the economic inefficiencies caused by the monopoly in place and the decreasing revenues in the gambling market due to major market changes as a result of increasing online-betting, a sector which was unregulated at that time.

In the first paper, *Der Glücksspielstaatsvertrag aus ökonomischer Perspektive*, my co-authors and I analyze the German sports betting market, as a branch of the gambling market, from an economic perspective and outline possible new regulations. The situation in Germany is described with regard to economic indicators, problem gambling and betting manipulation. In addition, the German betting market is compared to other European countries in light of the harmonization of the European market. A focus is drawn on online-betting, since it was not regulated at that time. Afterwards, possible regulation scenarios are compared and discussed, in particular different taxation schemes. One of the main conclusions of this first paper is that, in our view, a betting monopoly cannot be justified from an economic perspective. However, we acknowledge that there is a need for regulation, due to the negative effects of problem gambling and betting manipulation. A reasonable way for a new regulation would be a regulated opening of the market, which could, for example, be implemented by a licensing procedure. Future regulations should ensure that the share of wagers in the regulated market is as high as possible, which is particularly important for the relatively new and unregulated online-betting market. A tax on gross gaming revenues seems to be most suitable to achieve this goal. Finally, we suggest that, in order to minimize the negative impact of gambling, the regulation should be designed in a way that it can most effectively prevent betting manipulation and reduce problem gambling. This paper is joint work with Mario Maschke and Ulrich Schmidt and is published as: Lima de Miranda, K., Maschke, M., & Schmidt, U. (2012). *Der Glücksspielstaatsvertrag aus ökonomischer*

Perspektive. In Höfling, W., Horst, J., & Nolte, M. (Eds.), *Sportwetten in Deutschland* (pp. 9-24), Tübingen: Mohr Siebeck.

In 2012 the 16 German federal states eventually implemented new regulations on gambling. In January 2012 Schleswig-Holstein unilaterally implemented a new and relatively liberal regulation, the federal Gaming Amendment Act of Schleswig-Holstein (GAA), thereby deviating from the composite of the remaining 15 federal states. These passed new regulations called the German State Treaty on Gambling (GST), which entered into force in July 2012. These also liberalized the gambling market but to a lesser degree than Schleswig-Holstein.

This led to the second paper, ***Regulierung des Glücksspiels in Deutschland: Das Glücksspielgesetz Schleswig-Holsteins und der Glücksspieländerungsstaatsvertrag aus ökonomischer Perspektive***, in which my co-author and I compare the two new laws effective for the regulation of gambling in Germany at that time from an economic perspective. First, we derive two goals that should be pursued by the regulation of gambling – realization of tax revenues and the reduction of problem gambling. Channeling gambling into the regulated market is, in our view, a necessary condition to achieve both objectives. As the GAA can be expected to realize a higher degree of channeling due to more competitive tax rates as well as the inclusion of online poker and casinos, it appears to be overall superior to the GST. We note that it is in particular incomprehensible that online poker and online casinos are not included in the GST, since on one side they have a high potential for addiction and should thus be regulated and on the other side allow to generate higher tax revenues compared to sports betting for example. This paper is joint work with Ulrich Schmidt and is published as: Schmidt, U., & Lima de Miranda, K. (2013). Regulierung des Glücksspiels in Deutschland: Das Glücksspielgesetz Schleswig-Holsteins und der Glücksspieländerungsstaatsvertrag aus ökonomischer Perspektive. *Zeitschrift für Wirtschaftspolitik*, 62(1), 82-94.

## **Part II of the thesis**

In the second part of my thesis I address risk taking and economic outcomes in experimental settings with a focus on the social context. For the papers included in this part me and my co-authors designed and conducted experiments with subjects from the University of Kiel and high-schools in Schleswig-Holstein. Using the data generated by the experiment I examine individual risk preferences in the presence of social comparison (third paper), risk preferences of groups compared to individuals (fourth paper) and the predictive power of risk and time preferences as well as mindfulness for adolescents' field behavior (fifth paper).

In the third paper, ***Insurance Demand and Social Comparison: An experimental Analysis***, me and my co-authors analyze a major puzzle in insurance economics - the fact that people underinsure low-probability events with high losses. It is well documented that many people do not take up disaster insurance even though premiums are often subsidized (Kunreuther et al., 1978; Kunreuther & Pauly, 2004). A very prominent example for this type of behavior is flood insurance in the USA. At the same time, many people insure modest risks at highly loaded premiums, e.g. extended warranties, cell phone insurance or low deductibles for home insurance. In the paper we develop and test a new explanation for the low take-up of disaster insurance by analyzing whether social comparison can explain the insurance decision. We argue that risks in the case of disasters are highly correlated between subjects whereas risks for which high insurance take-up can be observed (e.g. extended warranties or cell phone insurance) are typically idiosyncratic. We set up a simple model with social reference points which builds on the model of Fehr and Schmidt (1999) and show that in the presence of inequality aversion social comparison makes insurance indeed less attractive if risks are correlated. To test our theoretical predictions, we conducted an experiment designed to observe insurance take-up in situations where risks were either idiosyncratic or correlated. In a classroom experiment with 149 students from the University of Kiel, subjects received an initial endowment and had the possibility to buy full insurance at varying premiums for a potential loss (50% chance) under two correlation schemes – correlated and uncorrelated. We find that the average willingness to pay for insurance is significantly higher for uncorrelated than for correlated risks. The experiment therefore confirms our theoretical predictions. This paper is joint work with Andreas Friedl and Ulrich Schmidt and is published as: Friedl, A., Lima de Miranda, K., & Schmidt, U. (2014). Insurance demand and social comparison: An experimental analysis. *Journal of Risk and Uncertainty*, 48(2), 97-109.

Since the previous paper analyzes risk taking in the loss domain (possibility to buy insurance for a loss), my co-authors and I were intrigued to analyze how the risk correlation structure influences risk taking in the gain domain. We hypothesized that like in the loss domain risk taking is higher for positively correlated risks than for uncorrelated risks in the gain domain. In the resulting paper, ***Social Comparison and Gender Differences in Risk Taking***, (not part of this thesis due to regulation issues) we first develop a model of decision making under risk that depends both on the consumption value of outcomes as well as on a private and a social reference point. For this purpose, we build upon the model of Gamba and Manzoni (2014) and introduce a social reference point in the model of Köszegi and Rabin (2006, 2007) that depends on the payoffs of peers. Drawing on previous results from evolutionary biology, we hypothesize that men (women) focus more on relative (absolute) income, i.e., the relative weight of social gain-loss utility is higher for men than for women. Our model, therefore, predicts that risk taking

is higher (lower) for positively (negatively) correlated risks than for uncorrelated risks and that this effect is stronger for men than for women. We present two simple experiments that test the implications of our model. We use a two-step procedure: first we test the overall model with concurrent private and social reference points in a controlled lab environment. Afterwards, we enlarge the social context as we proceed to a classroom experiment. In both experiments, we compare individual risk taking for positively correlated risks with that of uncorrelated or negatively correlated ones. The predictions of our model are confirmed by the two experiments and we conclude that social comparison and the correlation of risks influence risk taking and may in particular play an important role in the discussion of gender differences in risk taking.

These two studies contribute to the growing evidence that risk taking behavior of individuals is influenced by personal characteristics, such as gender, and by the decision context –for example whether a decision is taken individually or within a group. In addition, the second study contributes to the controversy regarding gender differences in risk taking by investigating the impact of social comparison. Gender differences in risk taking on the individual level have been intensively discussed in the economics literature. The predominant finding is that women are more risk averse than men (e.g. Charness & Gneezy, 2012), although others argue that gender differences are small and context-specific (Schubert et al., 1999; Fillipin & Crosetto, 2014). In contrast to individual decisions, relatively little evidence exists on how the gender composition of a group influences its' risk taking. This is striking as many important economic decisions are made by groups of individuals (e.g. committees, boards, working groups, teams), and with the introduction of women quotas in many European countries, it is a highly publicly debated and important topic.

Since the early sixties it has been shown that groups often take higher risks than individuals (risky shift phenomenon). This result has been challenged by recent studies which predominantly observed cautious shifts when experimental designs with real monetary incentives are employed. In the fourth paper of my thesis, *The Risky Shift Phenomenon in Group Decisions: Does Gender Matter?*, my co-authors and I analyze to which extent the direction of the group shift depends on the gender composition of groups. Based on the “risk as value” hypothesis of Brown (1965) we propose a gender-specific polarization hypothesis which states that, compared to individual preferences, male dominated groups will shift towards higher risk taking than female dominated ones. We test this proposition with an experiment in which we elicited risk preferences of groups of three people with varying gender composition. Our experimental tests show that on average risk taking of a group increases with the number of male group members and reveal a systematic impact of gender composition on group shifts which supports our hypothesis. This currently unpublished manuscript is joint work with Lena Detlefsen and Ulrich Schmidt.

While the previous papers in this part of my thesis analyze sources of differences in risk preferences among individuals and groups, the last paper investigates how differences in preferences and personality influence behavior and economic outcomes. In the fifth paper of my thesis, ***Mindfulness, Preferences and Well-Being: Mindfulness Predicts Adolescents' Field Behavior***, I assess the relationship between mindfulness and economic preferences, and consequently well-being, of adolescents. Mindfulness could influence economic and health related behavior by bringing about increased and unbiased attention to the present moment, for example to a decision making process. Comprehensive data of 525 German secondary school students were elicited and show no evidence for a strong linear or non-linear correlation between mindfulness and economic preferences. However, both mindfulness and preferences have explanatory power for adolescents' field behavior and thus contribute to explaining variation in behavior that may translate into serious health and economic consequences. In this regard, my findings indicate that the two concepts play rather complementary than substitutable roles. This implies that an integration of economic preferences and personality traits, such as mindfulness, may improve the analysis of potential sources of variation in life outcomes. As mindfulness reflects on a healthier lifestyle (less smoking and smaller BMI) and higher life satisfaction, the findings furthermore point into the direction that the development of mindfulness skills might help students to grow social-emotional capacities and increase physical and psychological well-being.

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## EIDESSTATTLICHE ERKLÄRUNG

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Erklärung zum selbständigen Verfassen der Arbeit:

Ich erkläre hiermit, dass ich meine Doktorarbeit „Risk taking and economic outcomes: The role of social context“ selbstständig und ohne fremde Hilfe angefertigt habe und dass ich als Koautor maßgeblich zu den weiteren Fachartikeln beigetragen habe. Alle von anderen Autoren wörtlich übernommenen Stellen, wie auch die sich an die Gedanken anderer Autoren eng anlehnenden Ausführungen der aufgeführten Beiträge wurden besonders gekennzeichnet und die Quellen nach den mir angegebenen Richtlinien zitiert.

Katharina Lima de Miranda  
Kiel, 2016