

# Family Transitions and Risk Attitude

We use the German Socio Economic Panel to analyze the impact of life changing events on individuals' risk tolerance levels over time, which is reported in response to a question on individuals' willingness to take risks. The dataset follows a representative sample of the German population. We find substantial changes in risk attitudes over time with respect to getting married or separating from a partner, giving birth to a child for the first time, and providing care to a family member. Furthermore, we find that these effects are associated with household structure. In particular, we observe that the risk tolerance of individuals that are referred as the head of household demonstrates more extreme changes associated with life events while having children moderates the changes associated with the dissolution of households.

**Keywords:** Variable risk attitudes, self-reported risk attitude, life changing events, marital-status transitions, family structure, marriage

**JEL classification:** D14, D81, G11, J12, J13

*Very preliminary draft – do not cite without authors' permission.*

## 1 Motivation

Family status and composition have been shown to have a relevant impact on risk attitude, see, e.g., Halek and Eisenhauer (2001). Yet, relatively little is known about how changes affect risk attitude immediately after transitions. Particularly, causalities are often not clear. For example, it has been repeatedly shown that married individuals are more risk averse, see, e.g. Cohn et al. (1975), Riley and Chow (1992), and Lin (2009) among others. Yet, it remains unclear whether individuals who get married become more risk averse or are risk averse individuals more likely to marry (earlier). Given the extensive information in our dataset, our paper aims at closing this gap by following a representative panel of the German population over several years. This enables us to observe immediate reactions separately from the overall aggregate effect. We are particularly interested in life events such as marriage, having children, and separation from a partner through divorce or widowhood. All these events can be

expected to have a major impact on life style and particularly the financial wellbeing of individuals. Wealth may increase or divide and spending may need changes particularly with respect to housing. Also, these events can change planning horizons and introduce (increase) altruism in own utility considerations. Although these events are not strictly exogenous, transitions in family composition and marital status pose an important source of risk. As a consequence, we expect individuals to significantly adjust their willingness to take risks once their experience dramatic changes in their life circumstances. As individuals' attitudes towards risks have a significant impact on their decision making under risk<sup>1</sup> and to better understand individual decision making, investigating the impact of changing life conditions on risk attitudes appears a crucial point of investigation.

We use the German Socio Demographic Panel (SOEP), a representative panel dataset of private households in Germany, and track changes in family composition and marital status over time and relate them to individuals' self-reported risk attitude. Our findings indicate that events that are associated with the formation of a family or a household, such as marriage or having a child, decrease risk tolerance levels. We find significant differences between the first child born and subsequent children which may explain mixed findings in previous literature. In addition, we specifically investigate whether these effects are different for individuals who consider themselves as head of households and find that household heads show stronger reactions in terms of adjusting their risk attitudes. Furthermore, we find that events that are associated with the dissolution of a family or a household, such as separation from partner, increase risk tolerance levels.

After the introduction our paper is structured as follows. Section 2 discusses related literature and section 3 explains our dataset and methodology. In the fourth section, we will discuss our results and section 5 concludes.

## **2 Family Economics and Risk Attitudes**

### *2.1 Formation and dissolution of household units*

There are several reasons to expect changes in the composition of a household to affect risk attitudes. One theory can be derived from economies of scale in combination with the theory of reference points. Once a family member or loved one joins economic forces with someone

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<sup>1</sup> See, e.g., Friedman and Savage (1948) and Arrow (1971) and including decisions on purchasing insurance (see, Mossin (1968), Cohen and Einav (2007), or Drèze (1981)) and allocating funds (Markowitz 1952)).

else, there are usually economies of scale effects implying a higher joint life style. This will ideally put both individuals in a better economic situation than before which can also impact their attitude towards risk.

In their seminal work on behavioral decision making, Kahneman and Tversky (1979) propose that individuals have a reference point in terms of consumption habits and are risk averse when acquiring additional resources as this puts individuals on a level above the reference point. Accordingly, individuals can be expected to be set above their reference point the increase by e.g. marriage when economies of scale can be achieved. Therefore, we would expect a decrease in risk tolerance. Similarly, if an individual is at his or her reference point at the point in time when a household suffers a loss of a financial contributor, we predict the loss would result in a higher level of risk tolerance. Contrary to the previous argument, Kotlikoff and Spivak (1981) investigate the sharing of longevity risk within families and show that even small families can replace a significant share of longevity protection through annuities. Their argument is that households with more members are able to take on more risks by themselves as they can pool these risks within the household. Although Hayashi et al. (1996) reject the hypothesis of risk sharing within families. If there is no or only very little intra-family risk sharing, we would expect that the formation of a household unit will lead to less risk taking as individuals are set above their reference points.

Previous literature has found mixed evidence whether marriage and family size increase or decrease risk taking. Outreville (2014) provides an extensive review of the findings in the literature. Cohn et al. (1975), Riley and Chow (1992), Halek and Eisenhauer (2001), and Lin (2009) find that married individuals are more risk averse. Other studies find mixed evidence and point to the fact that gender and wealth differences also play an important role in this regard (see, e.g., Sundén and Surette (1998) and Jianakoplos and Bernasek (2006)). At the same time, there are many studies showing that married investors hold riskier assets than single investors (see, e.g., Schooley and Worden (1996), Love (2010), and Bertocci et al. (2011)). This finding seems to be counterintuitive to a higher level of risk aversion in married couples. Hanewald and Kluge (2014) argue that this may not be counter-intuitive as married individuals benefit from mutual risk sharing and can therefore take on more risk. Christiansen et al. (2015) discuss two effects of joining or leaving a family union, economies of scale as well as preferences updating. Halek and Eisenhauer (2001) who also find that being married is related to a higher degree of risk aversion specifically highlight that the causality is not clear. They pose the question whether being married makes you more risk averse or being risk averse makes one more likely to marry. Dohmen et al. (2011) argue similarly and there is some evidence that less risk averse individuals tend to marry later (see Light and Ahn (2010)). Our dataset enables us to

look into transitions of marital state rather than absolute levels which will help us to single out the actual effect of getting married.

Van de Venter et al. (2012) utilize a similar approach and aim to investigate this further by analyzing changes in financial risk attitude depending on changes in family structures. They use the FINCA metric of the SMART Investor magazine as measure of risk attitude. They find no statistically significant impact of getting married or getting a divorce on their risk measure. Yet, they overall find relatively few significant estimates and have a very small measure of fit which they partially contribute to their small sample size. In our dataset, we can observe whether an individual married within the previous observation year and how this interacts with his or her risk attitude, his or her subsequent changes in risk attitudes levels, and the likelihood of the individual's risk attitude changing. We, therefore, are able to contribute to a better understanding and shed empirical light on the relationship between risk attitude and marriage.

In addition to marriage, the dataset allows us to consider other events that change the formation of families, households, and their financial positions. Several of these indicate an increasing number of individuals to a household unit where economies of scale are usually expected.<sup>2</sup> In this respect, we use a variable that indicates whether a couple moves together and forms a household for the first time. There is little previous research on how household formation other than marriage impacts risk attitude.

We also investigate events that reduce the number of family members within a household unit. Our dataset includes information on when individuals separate from a life partner, get divorced, and if their life partner dies. In addition, we also consider the death of a parent which has been shown to impact risk attitude by Dohmen et al (2011).

With respect to divorce and widowhood, Love (2010) provides empirical insights into stock market participation and observes that divorce and widowhood are associated with lower stock shares in risky assets (as compared to married households). Likewise, Dohmen et al. (2011) observe that widows are less willing to take risks than singles. Christiansen et al. (2015) find that divorce has a gender specific impact on stock holdings. Women decrease their share in risky assets while men increased their risky shares. In accordance with our predictions with respects to a formation of a household, we expect that the dissolution of a household increases risk taking as individuals will be below their reference point

## *2.2 Addition of dependents*

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<sup>2</sup> See Becker (1974) for a detailed discussion on the economies of scales in human relationships and marriage.

With respect to the addition of dependents, we expect two ways how this affects risk attitude. First of all, we assume that the additional dependent will be considered in utility considerations. When it comes to additional risk taking, we suspect that individuals may shy away more from additional risks. Negative consequence may not only be borne by them, but also by their dependents depending on the level of altruism. At the same time, we suppose that additional dependents tie up resources which could be used otherwise to increase family's income. According to the theory of Kahneman and Tversky, this can expect individuals to be set below their references point and therefore increase risk taking.

In our dataset, we observe whether a child was born within the household which may not, however, be regarded as an additional contributing member to the household from an economic perspective. Chaulk et al. (2003) find that the presence of a child reduces individuals' willingness to take investment risks and observe that this is even more prevalent for males than for females. Overall, the negative correlation between children and investment risk taking is moderated by income, indicating that investment risk tolerance of more affluent segments of the society is comparatively less contingent on having children. Görlitz and Tamm (2015) find that becoming parents makes individuals more risk averse but do not observe gender-specific differences. Bellante and Green (2004) find no significant impact of having children on relative risk aversion, yet their dataset focuses on the elderly where it is more likely that children are not financially dependent anymore. Cohn et al. (1975), Siegel and Hoban (1991), Hersch (1996), and Lin (2009) find that risk aversion decrease in family size. The mixed evidence may be attributed to different aspects of family additions. The decision for the first child may be different than for subsequent children as it changes the perspective of the parent by suddenly becoming responsible for a dependent, i.e. may have a huge impact on the level of altruism in the parents' utility. The decision to have subsequent children may be different as an altruistic element in the parents' utility can already be expected. In some sense, the decision for additional children may also seem less risky as the parent may know better what to expect. At the other, subsequent children also tie up resources as parents also need to care and provide for them. In order to account for such potential non-linearities, we distinguish between the first and subsequent child(ren) in our analysis. We expect the birth of the first child to have a greater impact as this can be expected to induce a greater change in living conditions. In addition, we also investigate whether being the household head makes the impact of having a child more and whether the dissolution of a household unit has a different impact if there are children in that household as suggested by Love (2010).

In addition, we also investigate how starting to provide informal long term care for a loved affects risk attitude. To some extent, we expect to see similar impact on risk taking as, again,

family resources are been tied up. Yet, motives for providing long term care may be different as long term care needs tend to arise more suddenly while the decision for children is often a more conscious one. We expect that providing long term will also add an element of altruism to an individual's utility function but may not be as prominent as when having your first child as the decision to provide long term care can be more random. Therefore, we assume that tying up resources may therefore have the stronger impact which can be expected to increase the willingness to take risks.

### **3 Data and Methodology**

To investigate the impact of changing family structure and marital status transitions on risk attitudes, we use German Socio Demographic Panel (SOEP). The SOEP is a representative panel data set of the resident adult population in Germany. Since 1984, the survey has been conducted on an annual basis and there are about 30,000 individuals in the dataset, who live in about 11,000 households. Each year between January and Mai, the SOEP surveys the head of each household in the sample, but also gives the survey to all other household members over the age of 18 (or turning 18 in the year when they are added to the survey sample). The SOEP asks individuals for a wide range of personal and household information. This includes financials and income as well as lifestyle and health-related variables. In addition, the survey contains a variety of socio-demographic indicators, such as gender, age, marital status, and information on education and occupation. Along these lines, individuals are also asked for their attitudes on assorted topics, including political views or their satisfaction with professional and private life.

As part of investigating individuals' attitudes, the SOEP asks individuals to self-assess their willingness to take risks. People are asked to indicate on a scale from 0 to 10 how they see themselves in terms of their willingness to take risks, with 0 representing no tolerance for risks and 10 representing the greatest willingness to be exposed to risk. This self-reported risk attitude was first surveyed in 2004 and 2006 and starting 2008 willingness to take risks has been available on an annual basis. For our analysis, we use the 2004, 2006 and 2008-2012 waves of the SOEP.

Generally, there are several ways risk attitude can be elicited and reported in datasets.<sup>3</sup> The SOEP relies on self-reported measures while other studies use hypothetical choice questions

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<sup>3</sup> See, e.g., Browne et al. (2015) for a more detailed overview and discussion of elicitation and measurement methods.

(see, e.g., Donkers et al. (2001) or Hartog et al. (2002)) or real life choices such as portfolio choices (see, e.g., Hansen and Singleton (1983), or Jackwerth (2000)) or insurance purchasing decisions (see, e.g., Cohen and Einav (2007) or Sydnor (2010)). Eliciting risk attitudes with self-reported variables may raise some concern whether this is a meaningful measure for actual risk-taking behavior. Dohmen et al. (2011) address this question and confirm the behavioral validity of the self-reported risk attitudes in the SOEP with paid lottery choices. We are therefore confident that our results will provide meaningful contributions to the study of risk attitudes.

In addition to risk attitudes, the SOEP includes rich information on family structure and household size. We use this information to investigate the association between changing family and household structures and individuals' risk attitudes. In contrast to many other studies, our panel data set allows us to analyze changes as opposed to one point in time observations. In this respect, we are particularly interested in the impact of life changing events, such as marriage, separation from one's life partner, divorce, childbirth, providing care to family member and employment changes. The SOEP asks individuals if (and how) their family situation changed during the last calendar year. For example, respondents are asked to indicate whether they married, whether they moved in with a partner, whether they lost their job, or whether they had a child during the last year. In addition, individuals are asked if they provide care to a disabled or elderly family member. To include this information, we create a dummy variable to capture if individuals become a care provider for family members. We use all this information on family structure and household size as independent variables in our analyses and test their impact on risk attitudes. Table 1 reports summary statistics for these events during our observation period.

Variable	Definition	Mean	Std. Dev.	Min	Max
<b>Marriage*</b>	(1): individual got married	0.01	0.11	0	1
<b>Moved_together*</b>	(1): individual moved together with partner	0.02	0.12	0	1
<b>Separated_partner*</b>	(1): individual (got) separated from partner	0.02	0.12	0	1
<b>Divorce*</b>	(1): individual had a divorce	0.01	0.07	0	1
<b>Death_partner*</b>	(1): individual's partner died	0.01	0.07	0	1
<b>Death_parent*</b>	(1): individual's mother or father died	0.02	0.15	0	1
<b>Child_birth*</b>	(1): individual became a parent	0.02	0.14	0	1
<b>First_child_birth*</b>	(1): individual became parent for the first time	0.01	0.09	0	1
<b>Subsequent_child_birth*</b>	(1): individual became parent for the (at least) second time	0.01	0.10	0	1
<b>Start_supportpersoncare*</b>	(1): individual provides care for a family member	0.02	0.12	0	1

<b>Job_loss*</b>	(1): individual lost his or her job	0.07	0.27	0	1
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**Table 1:** Summary statistics for life changing events on an annual basis during observation period of 2004-2012 (\*Denotes dummy variables).

We also include control variables for those factors that have been found to be associated with risk attitudes in previous studies. These include information on income and wealth, gender, age, education level attained, type of employment, federal state (Bundesland), home ownership, and self-rated health.<sup>4</sup> We capture wealth by including individuals' monthly, real after tax income on household level. In addition, we include (real) income they receive from interest and dividend payments on an individual level.<sup>5</sup> In order to account for individual savings behavior, we include a dummy variable indicating whether or not individuals have a savings account. Lastly, we create a dummy variable indicating homeownership.

We also control for individuals' occupational level.<sup>6</sup> In this respect, we differentiate between blue-collar employees, white-collar employees, civil servants, trainees, and self-employed individuals. In addition, we control for individuals that have no job either because they are currently seeking work (unemployed individuals) or because they deliberately choose to not work, i.e. housewives. We refer the latter to as individuals with 'no job' and we use blue-collar workers as the omitted category.

Similar to risk attitude, health status is available as self-reported variable. Despite some discussion about potential biases in self-rated health measures<sup>7</sup>, Dohmen et al. (2011) show the significance of self-reported health for risk attitudes. In the SOEP, self-rated health state is measured by an integer variable taking values between '1' (very good health status) and '5' (poor health status).

To control for geographical region, we create dummy variables for all 16 Federal States of Germany. We use the Federal State of Bavaria as omitted category.

In some of our analyses, e.g., when investigating the effect of a child birth, we also control for family structure. In this respect, we include individuals' marital status and differentiate between married, widowed, and divorced individuals as well as singles. The omitted category in our

<sup>4</sup> See Barsky et al. (1997), Donkers et al. (2001), Hartog et al. (2002), Kimball et al. (2008), Outreville (2014), or Dohmen et al. (2011).

<sup>5</sup> We use 2012 numbers in our analysis and account for inflation by referring to <http://de.inflation.eu/inflationsraten/hvpi-inflation.aspx>

<sup>6</sup> See, e.g., Cohn et al. (1975), Siegel and Hoban (1991), and Halek and Eisenhauer (2001).

<sup>7</sup> See, e.g., Miilunpalo et al. (1997) for an overview.



analyses is single. With respect to family size, we include the number of children the household receives child allowances for.<sup>8</sup> In addition, we differentiate between individuals who indicate to be the head of household and other household members. Previous studies, e.g., Görlitz and Tamm (2015) or Browne et al. (2015), find that women are on average more risk averse, but changes in risk attitude do not significantly vary by gender. However, we posit that there may be differences between the head of household, which we believe to be the major breadwinner of the family, and other household members. On our sample, about 57% of all households with children indicated to have a male head of household whereas the other 43% have a female household head. As the head of household is most likely responsible for financial planning and financial decisions, we posit that analyzing differences between household heads and other household members is an interesting point of investigation.

Table 2 reports summary statistics for all control variables used in our analyses.

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<sup>8</sup> The German Government pays financial support, i.e., child allowances, to a primary caregiver, who is financially responsible, for each child they are providing care for. Monthly allowances are currently 188 Euros for the first two children and up to 219 Euros for further children. We prefer using this measure over the actual number of children living in the household as it better reflects the financial responsibility for the children.

Variable	Definition	Mean	Std. Dev.	Min	Max
<b>Dependent variables</b>					
<b>Riskattitude</b>	scale from 0 to 10 (0): no risk tolerance and (10): high willingness to take risks	4.35	2.25	0	10
<b>Delta_riskattitude</b>	absolute change in risk attitude from one year of observation to the next	0.01	2.20	-10	10
<b>Control variables</b>					
<b>Marriage*</b>	(1): individual got married	0.01	0.11	0	1
<b>Moved_together*</b>	(1): individual moved together with partner	0.02	0.12	0	1
<b>Separated_partner*</b>	(1): individual (got) separated from partner	0.02	0.12	0	1
<b>Divorce*</b>	(1): individual had a divorce	0.01	0.07	0	1
<b>Death_partner*</b>	(1): individual's partner died	0.01	0.07	0	1
<b>Death_parent*</b>	(1): individual's mother or father died	0.02	0.15	0	1
<b>Child_birth*</b>	(1): individual became a parent	0.02	0.14	0	1
<b>First_child_birth*</b>	(1): individual became parent for the first time	0.01	0.09	0	1
<b>Subsequent_child_birth*</b>	(1): individual became parent for the (at least) second time	0.01	0.10	0	1
<b>Start_supportpersoncare*</b>	(1): individual provides care for a family member	0.02	0.12	0	1
<b>Job_loss*</b>	(1): individual lost his or her job	0.07	0.27	0	1
<b>Ln_real_aftertaxincome</b>	natural logarithm of individual's real monthly household after tax income	7.90	0.58	0	12.23
<b>Ln_real_interestdividendincome</b>	Income received income from interest and dividends	5.16	2.46	0	14.21
<b>Propertyownership*</b>	(1): individual owns house or flat	0.58	0.49	0	1
<b>Savingsaccount*</b>	(1): individual has a savings account	0.76	0.43	0	1
<b>Civilservant*</b>	(1): civil servant	0.05	0.22	0	1
<b>Nojob*</b>	(1): individual has no job	0.06	0.24	0	1
<b>Trainee*</b>	(1): individual is trainee	0.03	0.16	0	1
<b>Whit-collar*</b>	(1): individual is white-collar worker	0.31	0.47	0	1
<b>Blue-collar*</b>	(1): individual is blue-collar worker	0.15	0.37	0	1
<b>Unemployed*</b>	(1): individual is registered as unemployed	0.05	0.21	0	1
<b>Retired*</b>	(1): individual is retired	0.28	0.45	0	1
<b>Selfemployed*</b>	(1): individual is self-employed	0.07	0.25	0	1
<b>Age</b>	age of individual	52.22	15.51	17	102
<b>Male*</b>	(1): individual is male	0.47	0.50	0	1
<b>Height</b>	body height in cm	171.2	9.34	80	207
<b>Highlevelschool*</b>	(1): individual has high level school leaving certificate	0.28	0.45	0	1
<b>Health*</b>	scale from 1 to 5 with (1): very good health status and (5): poor health status	2.69	0.91	1	5
<b>Single*</b>	(1): individual is single	0.17	0.38	0	1
<b>Married*</b>	(1): individual is married	0.68	0.47	0	1
<b>Widowed*</b>	(1): individual is widowed	0.07	0.25	0	1
<b>Divorced*</b>	(1): individual divorced	0.08	0.27	0	1

**Table 2:** Summary statistics for variables in our analyses during observation period 2004-2012 (\* denotes dummy variables and summary statistics for Federal State variables are reported in the Appendix).

For our analyses, we use the 2004, 2006, 2008, 2009, 2010, 2011 and 2012 waves of the SOEP as individuals' risk attitude is not surveyed in 2005 and 2007. Since 2008, however, risk

attitudes have been surveyed on an annual basis. Our dataset is a balanced dataset and consists of 9,293 individuals older than 18 years (or turning 18 in the year they were included to the dataset). After dropping individuals with missing data we are left with a balanced panel dataset of 7,339 individuals and 51,373 observations.

We estimate several different statistical models to analyze the impact of changing family and household conditions on risk attitude. First of all, we run a year- and individual-fixed effects OLS model, which we refer to as Model 1. In this model, we include clustered standard errors on the individual level<sup>9</sup> and regress all the previously mentioned life changing events and control variables on risk attitude. Our empirical model is supported by the Breusch-Pagan Lagrangean multiplier test that rejects the null hypothesis of no individual- and time-specific effects. In addition, the Hausman test supports the choice of a fixed-effects model. Model 1 is specified as follows.

$$\begin{aligned} riskattitude_{i,t} = & \beta_0 + \beta_1 Life\ Event_{1,i,t} + \dots + \beta_n Life\ Event_{n,i,t} \\ & + \gamma \cdot X_{controls_{i,t}} + \delta \cdot Year\ Dummies + \varepsilon_{i,t} \end{aligned} \quad (1)$$

with  $i=1, \dots, N$  and  $t=1, \dots, T$  where  $N = number\ of\ individuals$  and  $T = number\ of\ years$ .

Our set of control variables is denoted by  $X_{controls}$ . Since we use a model with individual fixed effects, we do not include variables that do not change over time, such as gender and height.

Next, we are interested in investigating the magnitude of changes. In this respect, we analyze changes in risk attitude as opposed to absolute levels. We calculate changes in risk attitude, by determining the absolute shift on the 0-to-10 scale from one year of observation to the other. Consequently, a positive change indicates an increased willingness to take risks. According to the above-mentioned model specification, we fit an individual- and year- fixed effects OLS model with clustered standard errors on the level of individuals (Model 2). We use changes in risk attitudes as dependent variable and include the previously described life changing events and the set of control variables as independent variables. Model 2 is specified as follows.

$$\Delta riskattitude_{i,t} = \beta_0 + \beta_1 Life\ Event_{1,i,t} + \dots + \beta_n Life\ Event_{n,i,t}$$

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<sup>9</sup> Clustered standard errors account for possible correlations within a cluster and asymptotically equal unclustered standard errors. Since we cannot rule out that clustered standard errors are necessary, we include them to err on the side of caution.

$$+\gamma \cdot X'_{controls_{i,t}} + \delta \cdot Year\ Dummies + \varepsilon_{i,t}$$

(2)

with  $i=1, \dots, N$  and  $t=1, \dots, T$  where  $N = \text{number of individuals}$  and  $T = \text{number of years}$ .

## 4 Results

In this section we report and discuss our empirical findings. As mentioned above, we are interested in investigating the association between changing family or household composition and risk attitudes. We analyze multiple of these life changing events, several of which we find to have highly significant impact on individuals' willingness to take risks.

Table 3 reports the regression results of Model 1 and Model 2 for our observation period of 2004 to 2012.

VARIABLES	(1)	(2)
	Fixed Effects OLS - dependent variable: riskatt	Fixed Effects OLS - dependent variable: change in riskatt
marriage	-0.1404** [0.0624]	-0.2392** [0.1030]
movedtogether	0.0745 [0.0647]	-0.1773 [0.1126]
separatedpartner	0.2061*** [0.0650]	0.2294** [0.1060]
divorce	0.1152 [0.1068]	-0.2496 [0.1772]
deathpartner	-0.0195 [0.1173]	0.1559 [0.1703]
deathparent	-0.0719 [0.0499]	-0.0567 [0.0762]
first_child	-0.2113** [0.0905]	-0.0922 [0.1357]
subsequent_child	0.0181 [0.0724]	0.0718 [0.1279]
start_supportpersoncare	0.1268** [0.0597]	0.2328** [0.0920]
jobloss	0.0576* [0.0326]	0.1064** [0.0533]
age2	0.0003*** [0.0001]	-0.0004*** [0.0001]
health	-0.0885*** [0.0137]	-0.0640*** [0.0216]
ln_real_aftertaxincome	0.0016 [0.0338]	-0.0036 [0.0504]
ln_real_interestdividendincome	0.0008 [0.0059]	0.0107 [0.0093]
propertyownership	-0.0012 [0.0442]	-0.0657 [0.0697]
savingsaccount	-0.0363 [0.0268]	-0.0552 [0.0426]
nojob	0.0573 [0.0652]	0.0217 [0.1031]
trainee	0.1356* [0.0729]	0.1578 [0.1142]
unemployed	0.0192 [0.0601]	-0.0322 [0.0925]
retired	-0.0354 [0.0646]	0.0096 [0.0988]
whitecollar	0.0128 [0.0482]	-0.0599 [0.0781]
selfemployed	0.1761** [0.0792]	-0.1653 [0.1213]
civilservant	-0.0318 [0.1049]	0.0962 [0.1478]
year2006	0.2080*** [0.0332]	-0.1752* [0.0945]
year2008	-0.2513*** [0.0491]	-0.7497*** [0.0692]
year2009	-1.0088*** [0.0580]	-1.0386*** [0.0568]
year2010	-0.4778*** [0.0674]	0.3005*** [0.0455]
year2011	-0.3208*** [0.0774]	-0.0303 [0.0420]
year2012	-0.1854** [0.0886]	-0.0911*** [0.0348]
Constant	3.8872*** [0.4238]	2.4847*** [0.6858]
Federal States controls	YES	YES
Individual fixed effects	YES	YES
Observations	51,373	51,373
Adjusted R-squared	0.5060	0.0394
Number of individuals	7,339	7,339

Robust standard errors in brackets \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 3.** Regression results. Reference categories are: blue-collar workers, year 2004 and Federal State Bavaria (Regression results for Federal State variables are reported in the Appendix)

First of all, we find that getting married decreases individuals' willingness to take risks. The coefficient estimate for getting married in Model 1 is about -0.14 statistically significant at the

5% level. In addition, our model on changes in risk attitudes (Model 2) indicates that individuals who married decrease their risk tolerance more than individuals who are not newly married. This is consistent with, e.g., Halek and Eisenhauer (2001) who find that being married is related to a higher degree of risk aversion. As argued before, economies of scale can lead to higher financial wellbeing after marriage. Referring to Kahneman and Tversky (1979) and assuming that they are at their reference level at the time of marriage, we posit that individuals are risk averse because they are above their reference point (or aspiration level) after marriage. The intuition of this is that individuals, once they are above their reference point, do not want to fall back to their previous level and become less willing to take risks in order to maintain their position. In addition, we are interested in the event of household formation. Our coefficient estimate for moving together for the first time is positive but statistically insignificant. Consulting our model on changes in risk attitude we find a negative coefficient estimate that is also statistically insignificant. We posit that forming a joint household should generally lead to scale effects, but these may not immediately materialize.

Next, we identify several life events that result in a decrease of contributing household members, such as getting separated from your partner, getting divorced, or the death of a parent or the life partner. Following Kahneman and Tversky (1979), we expect these events to be associated with increasing levels of risk tolerance. We find some evidence for this theory. Getting separated from a life partner is strongly associated with individuals' attitudes towards risks. As reported in Table 3, the coefficient estimate for separation from partner in Model 1 is about 0.21 and statistically significant at the 1% level indicating that individuals, who split up with their partners, are more willing to take risks. In the model on changes in risk attitudes (Model 2), we find support for this finding and the coefficient estimate is 0.23 and significant at the 5% level. The divorce variable has less explanatory power. We contribute this to the fact that the process of a divorce tends to be time consuming in Germany. It usually requires spouses to live in separate households at least a year before the divorce can be initiated unless in hardship cases. Only after that, the court process can be initiated which takes another couple of months. Accordingly, we argue that the separation from a partner is usually the most important step to become single again and can therefore be expected to have more explanatory power. For the life events death of life partner and death of a parent we do not observe any significant coefficients. For the death of a life partner, we cannot control for age when the partner dies. A premature death has a much higher impact on a family's financial situation than the death of a retired individual where the spouse may be entitled to social security survivor benefits. This may partially explain the non-significant impact. Likewise, we argue that the death of a parent could, but does not necessarily have to be a sudden event. In fact, the death of a parent could be preceded by a severe illness. In addition, our dataset contains only adolescents and the

extent to which the death of a parent impacts the family's financial situation can widely vary. This may also explain the insignificant results.

With respect to the birth of a child, we find a substantial difference between the first child and subsequent children. In Model 1, our coefficient estimate for the birth of the first child is -0.21 and significant at the 5% level. This is consistent with, among others, Chaulk et al. (2003), who find that having children reduces individuals' willingness to take financial risks. In contrast to this, the coefficient estimate for subsequent children is positive, yet statistically insignificant. We attribute our different findings for the first and the subsequent child(ren) to the fact that the major change in future expectations happens once the first child is born as argued in section 2. When consulting the model on changes in risk attitude (Model 2), we observe the same signs for the coefficient estimates but no statistical significance. Likewise, we find that providing care to a sick, disabled, or elderly family member increases individuals' willingness to take risks, too. The reported coefficient estimate in Model 1 is 0.09 and significant at the 5% level, whereas the result in Model 2 is statistically insignificant but also positive. Veltman et al. (2002) highlight that family caregivers report positive as well as negative personal experiences with care giving to a relative. Providing long term care is often accompanied with tying up resources and we find that this effect seems to outweigh the fact that negative consequences of risk taking may also harm the sick or elderly person that care is provided for.

In addition to the above-mentioned events, we also control for job losses. Each year, the SOEP asks individuals whether and why they lost their job. We exclude those cases where the individual deliberately resigned but consider all job losses that were due to company shut-downs, suspensions, or dismissals. We find that individuals who unintentionally lost their job report to be more willing to take risks. Our coefficient estimate in Model 1 is 0.06 and significant at the 10% level. This is also supported by Model 2. The coefficient estimate for job loss is 0.11 and significant at the 5% level indicating that individuals who lost their job increase their willingness to take risks more than the control group. Consistent with Kahneman and Tversky (1979), we argue that losing his or her job puts an individual below the reference point. As a consequence, risk tolerance levels increase.

We do not include age in our analysis as we utilize individual fixed effects. However, we include a squared term for age as Cohen and Einav (2007) find a u-shaped relationship between age and risk aversion. Such a relationship has not, however, been confirmed by other studies. Model 1 confirms the u-shaped relationship as suspected by Cohen and Einav (2007). Yet,

Model 2 shows a negative sign implying that individuals change their risk attitude less and less the more they age. Yet, estimates are relatively small.

With respect to self-assessed health, we find that a lower health state is associated with a lower willingness to take risks. This is in line with the findings of Dohmen et al. (2011) and Browne et al. (2015) who utilize the same dataset. Meanwhile Bellante and Green (2004) find no significant impact of health status on risk attitude, yet their sample only examines elderly and uses a different risk metric, too.

We find no significant impact of our income variables (after tax earnings and investment earnings) while Hartog et al. (2002) find that higher income levels decrease risk aversion. Dohmen et al. (2011) confirm this relationship on the SOEP data. We believe that the insignificant estimates of our sample are due to the fact that we already include individual fixed effects. Our wealth controls (holding a savings account and owning property) are insignificant as well which we attribute to the same reasons.

Similar to previous research<sup>10</sup>, we control for occupation. We only find that being a trainee and being self-employed have a significant impact on the absolute level of the willingness to take risk and both increase the willingness to take risks. This is line with previous findings as self-employed individuals naturally take on more risks as do trainees while they are still investing in their education.

In addition, we include year fixed effects as our sample observation period coincides with the 2008 Global Financial Crisis as well as the European Sovereign debt crisis. Our data shows support for the theory of counter cyclical risk aversion, see, e.g., Guiso et al. (2014), Browne et al (2015), and Cohn et al. (2015).

As mentioned above, we find that the birth of the first child significantly reduces individuals' willingness to take risks. A recent study by Görlitz and Tamm (2015) analyzes parenthood and risk attitudes and find that the relationship between childbirth and risk attitudes does not significantly differ by gender. We enhance the scope of their paper and test if changes in risk attitudes are more prevalent among who refer themselves to as the head of household. As discussed above, the SOEP annually asks individuals to self-asses their position in the household. We believe that individuals, who indicate to be the head of household, are most likely to be the (major) breadwinner of the family. Since the presence of children changes financial positions and expectations about future spending, we posit that the decrease in risk tolerance is more prevalent among household heads. To investigate the effect of being the head of a

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<sup>10</sup> See, e.g., Halek and Eisenhauer (2001), Hartog et al. (2002), Lin (2009), and Dohmen et al. (2011).



household, we repeat our analysis and include a dummy variable to indicate whether the individual is the head of household. This dummy variable is also included as interaction term with the birth of the first child. We report our results in Table 4.

VARIABLES	(1) Fixed Effects OLS - dependent variable: riskatt
first_child	0.0967 [0.1739]
first_child_householdhead	-0.4335** [0.1976]
householdhead	-0.1067 [0.0751]
married	-0.1613** [0.0663]
divorced	-0.0251 [0.0966]
widowed	-0.1849 [0.1200]
age2	0.0003*** [0.0001]
health	-0.0903*** [0.0141]
year2006	0.1918*** [0.0348]
year2008	-0.2607*** [0.0519]
year2009	-1.0147*** [0.0618]
year2010	-0.4747*** [0.0720]
year2011	-0.3154*** [0.0827]
year2012	-0.1728* [0.0944]
ln_real_aftertaxincome	-0.0042 [0.0351]
ln_real_interestdividendincome	0.0012 [0.0061]
propertyownership	-0.0113 [0.0458]
savingsaccount	-0.0308 [0.0274]
nojob	0.0821 [0.0661]
trainee	0.1110 [0.0763]
unemployed	0.0494 [0.0600]
retired	-0.0338 [0.0653]
whitecollar	0.0070 [0.0495]
selfemployed	0.1552* [0.0836]
civilservant	-0.0317 [0.1075]
Constant	4.0566*** [0.4463]
Federal States controls	YES
Individual fixed effects	YES
Observations	51,373
Adjusted R-squared	0.5079
Number of individuals	7,339

Robust standard errors in brackets \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 4:** Regression results household position and birth of first child. Reference categories are: blue-collar workers, singles, year 2004, and Federal State Bavaria (Regression results for Federal State variables are reported in the Appendix).

Our results show that individuals, who indicated to be the head of household, are on average less willing to take risks. As reported in Table 4, the coefficient estimate for being household head is -0.11 but statistically insignificant. The main effect of the birth of the first child is positive but also statistically insignificant. Yet, we find the interaction term between household head and the birth of the first child to be statistically significant at the 5% level. The reported coefficient estimate is -0.43. This implies that household heads decrease their willingness to take risks more after the birth of the first child (compared to individuals that are not considered as head of household). To control for the effect that the household head is the only parent in single parent families, we run a robustness test where we repeat our previous analysis but restrict ourselves to the group of married parents. Our results are reported in Table 5.

VARIABLES	(1) Fixed Effects OLS - dependent variable: riskatt
first_child	0.2546 [0.2052]
first_child_householdhead	-0.4427* [0.2421]
householdhead	0.0573 [0.1444]
age2	0.0002 [0.0002]
health	-0.0951*** [0.0177]
ln_real_aftertaxincome	-0.0295 [0.0530]
ln_real_interestdividendincome	0.0099 [0.0077]
propertyownership	0.0043 [0.0662]
savingsaccount	-0.0319 [0.0346]
nojob	0.0295 [0.0805]
trainee	0.3328 [0.2212]
unemployed	0.0457 [0.0814]
retired	-0.0189 [0.0774]
whitecollar	0.0080 [0.0666]
selfemployed	0.1735 [0.1133]
civilservant	0.0269 [0.1365]
year2006	0.2538*** [0.0470]
year2008	-0.1739** [0.0755]
year2009	-0.9537*** [0.0906]
year2010	-0.3702*** [0.1061]
year2011	-0.1760 [0.1229]
year2012	-0.0175 [0.1405]
Constant	4.4319*** [0.6916]
Federal States controls	YES
Individual fixed effects	YES
Observations	34,930
Adjusted R-squared	0.5032
Number of individuals	4,990

**Table 5.** Regression results. Effect of household position and birth of first child for married parents. Reference categories are: blue-collar workers, year 2004, and Federal State Bavaria (Regression results for Federal State variables are reported in the Appendix).

Our results as reported in Table 5 show a robust result for the interaction term between household head and the birth of the first child. This indicates that the additional decrease in risk tolerance for household heads is still negative and statistically significant when we reduce our sample to the subgroup of married individuals. The main effects of child birth and household heads are still statistically insignificant in model on the subsample of married individuals but the sign of being the household head changes from negative to positive. This implies that the head of married households seems to be more willing to take risks than spouses. However, since the main effects for being the household head are statistically insignificant in both models, we do not further interpret the main effects.

Next, we argue that the presence of children may play an important role when partners separate. Even if we find that getting separated increases willingness to take risks, we argue that this effect may be moderated if the couple has children. Since having children increases the need for future spending on, e.g., the children's education, we posit that separation from a life partner may have different effects for couples with children as compared to couples who do not have children. To investigate the relationship between separation from a partner and willingness to take risks for different family compositions, we repeat our analysis and interact the event of getting separated with a variable that indicates the number of children. We report our regression results in Table 6.

VARIABLES	(1) Fixed Effects OLS - dependent variable: riskatt
separatedpartner	0.3548*** [0.1041]
separatedpartner_children	-0.1404* [0.0753]
number_children	-0.0021 [0.0202]
age2	0.0003*** [0.0001]
health	-0.0887*** [0.0137]
ln_real_aftertaxincome	0.0040 [0.0340]
ln_real_interestdividendincome	0.0005 [0.0059]
propertyownership	-0.0018 [0.0446]
savingsaccount	-0.0373 [0.0268]
nojob	0.0563 [0.0630]
trainee	0.1443** [0.0730]
unemployed	0.0419 [0.0582]
retired	-0.0270 [0.0643]
whitecollar	0.0119 [0.0482]
selfemployed	0.1692** [0.0794]
civilservant	-0.0366 [0.1049]
year2006	0.2080*** [0.0332]
year2008	-0.2474*** [0.0490]
year2009	-1.0049*** [0.0580]
year2010	-0.4718*** [0.0674]
year2011	-0.3142*** [0.0774]
year2012	-0.1771** [0.0885]
Constant	3.8977*** [0.4258]
Federal States controls	YES
Individual fixed effects	YES
Observations	51,373
Adjusted R-squared	0.5059
Number of individuals	7,339

Robust standard errors in brackets \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 6.** Regression results. Reference categories are: blue-collar workers, year 2004, and Federal State Bavaria (Regression results for Federal State variables are reported in the Appendix).

Consistent with our first model, we observe that separation from partner increases individuals' willingness to take risks. The coefficient estimate is 0.35 and significant at the 1% level. However, this increase in risk tolerance less prevalent in case there are children in the household. As reported in Table 6, the interaction between getting separated and having children is negative, i.e., -0.14 and significant at the 10% level. This implies that the increase in willingness to take risks is less positive if there are children in the household.

## 5 Conclusion

Understanding how individuals make risky decisions is of utmost importance to modern economics. Risk attitude influences critical decision making such as on consumption, job search and financial planning, just to name a few. From a welfare perspective, the design of any well-functioning safety net should carefully consider individual preferences when designing benefits. Unsurprisingly, risk attitudes have been studied widely in the economic and psychological literature. Yet, many studies follow the paradigm of the homo oeconomicus without any strings attached. Family status and ties, however, have been shown to have a considerable impact on risk attitude. Most studies investigating this, however, are point in time observations and can therefore only observe absolute levels. Much less attention has been paid to how risk attitude immediately reacts to certain critical changes in an individual's life situation which is the focus of our paper.

In our paper, we analyse whether transitions in families are associated with changes in risk attitude on a nationally representative panel dataset of the German population. The panel structure of our dataset allows us to extract individual specific effects. This is particularly interesting as often causalities are not clear and this enables us to disentangle immediate reaction from long term effects. Our main findings are that getting married and forming a household unit reduces the willingness to take risks. We find the reverse impact with the dissolution of households, i.e. when individuals separate from their partners. We find that the existence of children in the household moderates this effect, yet it is still significant. Regarding the birth of children we find that only the birth of the first child significantly reduces the willingness to take risks while subsequent children do not have a significant impact. This can explain the mixed evidence of family size on risk attitude so far. Another focus of our work is to specifically look into differences between individuals who consider themselves head of household. We find that household heads show stronger reactions to the investigated events which we partially attribute to the higher financial responsibility of the household head.

## Appendix

### A.1 Summary Statistics Federal State Variables

Variable	Definition	Mean	Std. Dev.	Min	Max
Federal State Baden-Wuerttemberg*	(1): individual lives in Baden-Wuerttemberg	0.12	0.33	0	1
Federal State Bayern*	(1): individual lives in Bayern	0.15	0.35	0	1
Federal State Berlin*	(1): individual lives in Berlin	0.04	0.20	0	1
Federal State Brandenburg*	(1): individual lives in Brandenburg	0.05	0.21	0	1
Federal State Bremen*	(1): individual lives in Bremen	0.01	0.08	0	1
Federal State Hamburg*	(1): individual lives in Hamburg	0.01	0.12	0	1
Federal State Hessen*	(1): individual lives in Hessen	0.07	0.27	0	1
Federal State Mecklenburg-Vorpommern*	(1): individual lives in Mecklenburg-Vorpommern	0.02	0.13	0	1
Federal State Niedersachsen*	(1): individual lives in Niedersachsen	0.07	0.26	0	1
Federal State Nordrhein-Westfalen*	(1): individual lives in Nordrhein-Westfalen	0.21	0.40	0	1
Federal State Rheinland-Pfalz*	(1): individual lives in Rheinland-Pfalz	0.05	0.22	0	1
Federal State Saarland*	(1): individual lives in Saarland	0.01	0.08	0	1
Federal State Sachsen*	(1): individual lives in Sachsen	0.08	0.27	0	1
Federal State Sachsen-Anhalt*	(1): individual lives in Sachsen-Anhalt	0.05	0.21	0	1
Federal State Schleswig-Holstein*	(1): individual lives in Schleswig-Holstein	0.02	0.16	0	1
Federal State Thuringen*	(1): individual lives in Thuringen	0.04	0.21	0	1

**Table A.1:** Summary statistics of Federal State variables during the observation period of 2008-2012 (\* denotes dummy variables).

**A.2 Analysis on all Life Changing Events and Risk Attitude  
(Regression Results for Federal State Variables)**

VARIABLES	(1)	
	Fixed Effects OLS - dependent variable: riskatt	
federalstate_Thuringen	-0.0718 [0.5217]	-0.8454 [0.5305]
federalstate_Sachsen	0.3706 [0.3056]	-0.7231** [0.3346]
federalstate_SachsenAnhalt	0.1491 [0.3220]	-0.5403 [0.3838]
federalstate_Brandenburg	0.1889 [0.2713]	-0.8554*** [0.3062]
federalstate_MecklenburgVorp	0.1008 [0.3497]	-0.4761 [0.3998]
federalstate_BadenWuerttemberg	-0.2632 [0.2360]	-0.6195** [0.2899]
federalstate_Berlin	-0.2210 [0.2475]	-1.3249*** [0.3238]
federalstate_Bremen	0.0299 [0.6145]	-0.6716 [0.6177]
federalstate_Hamburg	-0.1198 [0.3013]	-1.1969*** [0.4101]
federalstate_Hessen	-0.0609 [0.2358]	-0.6695* [0.3761]
federalstate_Niedersachsen	0.0647 [0.3144]	-0.8906*** [0.3315]
federalstate_NordrheinWestfalen	-0.1049 [0.2667]	-1.0582*** [0.2919]
federalstate_RheinlandPfalz	-0.0596 [0.2958]	-1.6202*** [0.3955]
federalstate_Saarland	0.5255** [0.2319]	0.0367 [0.0532]
federalstate_SchleswigHolstein	-0.3338 [0.3047]	-1.0273** [0.4064]
Observations	51,373	51,373
Adjusted R-squared	0.5060	0.0394
Number of individuals	7,339	7,339

Robust standard errors in brackets \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table A.2** Regression results for Federal State variables. Reference categories are: blue-collar workers, year 2004 and Federal State Bavaria. (



### A.3 Analysis on Household Position and Birth of First Child (Regression Results for Federal State Variables)

VARIABLES	(1) Fixed Effects OLS - dependent variable: riskatt
federalstate_Thueringen	-0.0250 [0.5455]
federalstate_Sachsen	0.4324 [0.3095]
federalstate_SachsenAnhalt	0.1660 [0.3319]
federalstate_Brandenburg	0.2441 [0.2818]
federalstate_MecklenburgVorp	0.1493 [0.3510]
federalstate_BadenWuerttemberg	-0.1859 [0.2356]
federalstate_Berlin	-0.1631 [0.2575]
federalstate_Bremen	0.1986 [0.5153]
federalstate_Hamburg	-0.0444 [0.3009]
federalstate_Hessen	0.0650 [0.2552]
federalstate_Niedersachsen	0.1207 [0.3098]
federalstate_NordrheinWestfalen	-0.0570 [0.2716]
federalstate_RheinlandPfalz	0.0407 [0.2952]
federalstate_Saarland	0.0367 [0.0532]
federalstate_SchleswigHolstein	-0.2386 [0.3075]
Observations	51,373
Adjusted R-squared	0.5079
Number of individuals	7,339

Robust standard errors in brackets \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table A.3:** Regression results for Federal State Variables. Analysis household position and birth of first child. Reference categories are: blue-collar workers, singles, year 2004, and Federal State Bavaria.

#### A.4 Analysis on Household Position and Birth of First Child – Robustness Test on Married Parents (Regression Results for Federal State Variables)

VARIABLES	(1) Fixed Effects OLS - dependent variable: riskatt
federalstate_Thuringen	0.1197 [1.3601]
federalstate_Sachsen	1.0544** [0.4636]
federalstate_SachsenAnhalt	-1.0105*** [0.3383]
federalstate_Brandenburg	0.2032 [0.4136]
federalstate_MecklenburgVorp	-0.2043 [0.4721]
federalstate_BadenWuerttemberg	-0.3438 [0.4477]
federalstate_Berlin	-0.4419 [0.3529]
federalstate_Bremen	-0.1421 [0.7786]
federalstate_Hamburg	-0.1611 [0.5086]
federalstate_Hessen	-0.2560 [0.4259]
federalstate_Niedersachsen	-0.0214 [0.4144]
federalstate_NordrheinWestfalen	-0.5224 [0.3915]
federalstate_RheinlandPfalz	-0.4522 [0.4633]
federalstate_Saarland	0.2190 [0.2239]
federalstate_SchleswigHolstein	-0.7121 [0.4696]
Observations	34,930
Adjusted R-squared	0.5032
Number of individuals	4,990

Robust standard errors in brackets \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table A.4.** Regression results for Federal State variables. Effect of household position and birth of first child for single and married parents. Reference categories are: blue-collar workers, year 2004, and Federal State Bavaria.

## A.5 Analysis on Separation from Partner – Households with Children versus Households without children (Regression Results for Federal State Variables)

VARIABLES	(1) Fixed Effects OLS - dependent variable: riskatt
federalstate_Thueringen	-0.0183 [0.5328]
federalstate_Sachsen	0.3877 [0.3101]
federalstate_SachsenAnhalt	0.1672 [0.3247]
federalstate_Brandenburg	0.1941 [0.2738]
federalstate_MecklenburgVorp	0.1024 [0.3520]
federalstate_BadenWuerttemberg	-0.2637 [0.2412]
federalstate_Berlin	-0.2316 [0.2516]
federalstate_Bremen	0.0637 [0.6165]
federalstate_Hamburg	-0.1215 [0.3065]
federalstate_Hessen	-0.0545 [0.2374]
federalstate_Niedersachsen	0.0867 [0.3187]
federalstate_NordrheinWestfalen	-0.0872 [0.2697]
federalstate_RheinlandPfalz	-0.0615 [0.2974]
federalstate_Saarland	0.5351 [0.5286]
federalstate_SchleswigHolstein	-0.3412 [0.3089]
Observations	51,373
Adjusted R-squared	0.5059
Number of individuals	7,339

Robust standard errors in brackets \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table A.5.** Regression results. Reference categories are: blue-collar workers, year 2004, and Federal State Bavaria.

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