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ABSTRACT

Gender Differences in the Link between Income and Trust Levels: Evidence from Longitudinal Data

We investigate the effect of individual income on interpersonal trust levels, using longitudinal survey data for 22,219 Australians over the 2005-2014 period. Our results produce two key insights. First, we demonstrate the importance of accounting for individual-level fixed effects, as the income coefficient goes from positive and statistically significant in a pooled regression to negative and statistically significant in a fixed effects panel model. Second, this negative effect of income on trust holds only for men, and not for women. This result appears to be concentrated among males who are young and moving from no income to positive income, but employment status is not the driving factor. Further, we explore a potential channel via psychological characteristics and find evidence of men reporting greater levels of neuroticism and fretfulness following an increase in income but, again, women do not. In turn, neuroticism and fretfulness are robust predictors of decreased trust levels; these additional findings are based on cross-sectional variation only, since both these variables are available in only one of the survey waves to date.

JEL Classification: D01, D31, J16, Z10

Keywords: gender differences, income levels and trust, interpersonal trust, neuroticism

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1 Introduction

Interpersonal trust has been identified as an important factor for countries' economic development and growth, as well as social integration, physical health, and life satisfaction at the individual level.[1] For example, Hamamura (2012) points out that "[g]eneralized trust is integral to individual well-being and to the economic and political fabrics of a society." However, although the importance of trust for a society is well established, the determinants of trust remain difficult to assess. This is particularly the case for the role of an individual's income. While some studies report a positive association between economic welfare and trust, these results are either based on comparison across individuals or on aggregate analyses at the macroeconomic level.[2] By contrast, a number of experimental studies have reported that access to more resources (in the form of income or status) is associated with increased unethical behaviour (Piff et al., 2010; Piff et al., 2012; Kouchaki et al., 2013; Brandt et al., 2015).

The focus of this paper is twofold. First, we use longitudinal survey data to estimate the association between income and trust both across individuals, using pooled data, and within individuals, using fixed-effects regressions. This enables us to determine the importance of accounting for unobservable individual characteristics in analyses of trust at the individual level. The corresponding results reveal sharp differences, as the respective

[1] See Granovetter (1973) for the role of trust in social integration and relationships; see Jen et al. (2010), Schneider et al. (2011), and Rocco et al. (2014) for physical health; Giordano and Lindström (2011) focus on mental health; Delhey and Newton (2003) and Uslaner (2016) connect trust to happiness and life satisfaction. On the macroeconomic level, several papers have highlighted trust as an important driver of economic growth and development (Putnam et al., 1994; Fukuyama, 1995; Knack and Keefer, 1997; Zak and Knack, 2001; Fafchamps, 2006; Guiso et al., 2006; Algan and Cahuc, 2010, 2014; Dincer and Uslaner, 2010), financial development (Guiso et al., 2004), industrialization (Miguel et al., 2005), government performance (Knack, 2002), and the absence of corruption (La Porta et al., 1997).

[2] For findings about a positive link, see Alesina and La Ferrara (2002) Leigh (2006), Wang and Gordon (2011), Hamamura (2012), Hermes and Poulsen (2013), or Korndörfer et al. (2015). For results suggesting a negative link, we refer to Kraus et al. (2010), Piff et al. (2012), Kraus and Keltner (2013), and Piff et al. (2010). In the associated studies, socioeconomic status corresponds to income, educational attainment, and the most 'respected' occupations.

sign is reversed from positive to negative when moving from a pooled to a fixed-effects model, yet remains highly statistically significant.

Second, we present evidence that the income-trust relationship differs systematically by gender. A priori, there exist ample grounds for suspecting women and men may differ in how their trust levels are affected by changes in income. For example, gender differences have been reported in closely related behavioral attitudes with respect to preferences and non-cognitive skills; women tend to be more risk-averse, more sensitive to others, and place more importance on family, relationships, and the general good of society (Dollar et al., 2001; Fortin, 2008; Croson and Gneezy, 2009; Grove et al., 2011). By contrast, men tend to be more confident and assertive, placing greater importance on income and financial success. Women and men have also been found to differ markedly in their attitudes toward, and behavior within, competitive situations (see Croson and Gneezy, 2009, for a survey of such studies).[3]

Our study uses longitudinal data from the *Household, Income and Labour Dynamics in Australia* (*HILDA*) survey. These data allow us to follow 22,219 individuals over up to six survey waves between 2005 and 2014 for which self-reported trust levels are reported, totalling 76,524 observations. This permits us to control for unobservable, time-invariant (and slow-changing) variation at the individual level, thereby substantially alleviating concerns about endogeneity from measurement error and omitted variables in our estimation results. Our findings suggest that, at the individual level, an increase in

[3]On average, competitive situations tend to appeal to men more so than to women, who tend to be competition-averse (Niederle and Vesterlund, 2007; Gneezy and Rustichini, 2004*a*; Datta Gupta et al., 2005; Vandegrift and Brown, 2005). Similarly, women and men have been found to behave differently in competitive situations, with men tending to increase their effort in response to competition more so than women (Gneezy et al., 2003; Gneezy and Rustichini, 2004*a*; Croson and Gneezy (2009); Azmat et al., 2016). Finally, gender gaps in attitudes to risk have been reported throughout a number of settings, e.g., related to smoking or seat belt usage (Hersch, 1996), as well as financial investment (Jianakoplos and Bernasek, 1998; Eckel and Füllbrunn, 2015) and betting in game shows (Jetter and Walker, 2016). Eckel and Grossman (2008) provide a summary of the experimental evidence on gender differences in risk preferences.

personal income is associated with *decreased* trust levels for men, but not for women. This result is robust to including a number of potentially confounding factors, such as time-varying demographic variables and wave-fixed effects. Subsequently, we investigate whether this pattern manifests at a particular point of the income distribution. We find the negative income-trust relationship to be particularly prominent for younger males who move from reporting zero to a positive personal income, although the latter appears to be the dominant feature and the relevance of age becomes weaker once we control for both. Interestingly, movement into or out of employment does not seem to be the crucial driver.

Finally, informed by prior research in psychology, we propose a potential channel through which changes in income may affect trust levels, focusing on emotional stability characteristics. Indeed, we find men to report higher scores on neuroticism and fretfulness following a rise in income and, alternatively, a binary move from earning no income to any non-negative income. In turn, using information from over 11,000 respondents in wave 5 of the *HILDA* survey (where both information on trust levels and emotional stability are asked), we find neuroticism and fretfulness to be associated with lower trust levels. In combination, these results are consistent with an explanation where emotional characteristics act as an important mediating channel through which income can affect trust levels. Nevertheless, our study does not allow us to draw firm conclusions in this regard and other explanations that we are not able to test here are, of course, possible.

The paper proceeds with an overview of the associated literature, followed by a description of our data and methodology in Section 3. Section 4 presents our main findings and robustness checks, whereas Section 5 explores a potential mechanism which may explain our findings. Finally, Section 6 concludes.

2 Background

2.1 The Income-Trust Relationship

A growing literature studies the relationship between socioeconomic status and trust, in which, *a priori*, one could intuitively argue for either a positive or a negative relationship. Thus far, the evidence is inconclusive, as researchers have produced support for both.

Several studies report evidence for a positive association and Hamamura (2012) suggests two explanations.[4] First, a wealthy individual might be more able to afford the risk of loss from betrayal compared to a poor individual. Second, individuals tend to surround themselves with people of similar social status. As crime rates are generally higher in low socioeconomic areas, those of low socioeconomic status are more regularly exposed to betrayal, thereby reinforcing an untrusting belief toward others. Further, one's trusting or distrusting belief is reinforced through interactions with someone of the same type of belief. This may, therefore, feed a self-fulfilling prophecy. Brandt et al. (2015) also argue that low-income individuals expect to face judgement and rejection from society causing them to be "more psychologically defensive, which can manifest in social distrust."

Other studies suggest a negative income-trust relationship. In a cross-country analysis, Wang and Gordon (2011) find evidence of a negative relationship in some countries. Korndörfer et al. (2015) suggest that individuals of lower socioeconomic status are more dependent on others due to their limited economic resources and, consequently, trust in others becomes more important. As a result, these individuals tend to prioritize contextual explanations of their circumstances, compared with higher socioeconomic status

[4]For instance, Leigh (2006) finds evidence of a positive income-trust relationship at the neighbourhood level, as affluent Australian suburbs display a higher level of generalized trust than less affluent areas. Evidence of this relationship has also been found in the United States where individuals with higher personal incomes report higher levels of generalized trust (Alesina and La Ferrara, 2002). Additional evidence for a positive association between income and trust are provided by Hamamura (2012), Hermes and Poulsen (2013), and Korndörfer et al. (2015).

individuals who attribute their success to their own genetics and identity (Kraus et al., 2010). In a related context, Dietze and Knowles (2016) report that high-status individuals spend less time and effort focusing on other people's faces, and interpret this as evidence that social class affects (negatively) the extent to which people see others as potentially rewarding, threatening, or otherwise worthy of their attention. Consequently, individuals of lower socioeconomic status may be more aware of their environment and people around them, therefore demonstrating higher levels of trust and more pro-social behavior.

Corresponding evidence has been found in empirical studies where those of higher socioeconomic status are reported to be more egotistic and self-centered, placing more value on their own welfare than the welfare of others (Piff et al., 2010; Kraus and Keltner, 2013). This may not foster pro-social behavior or a trusting attitude toward society. Conversely, individuals of lower socioeconomic status are more empathetic and emotionally aware of others (Kraus et al., 2010) and display more trustworthy behavior, engaging in less unethical activities, such as breaking the law, stealing, lying, cheating, and endorsing others' unethical behavior (Piff et al., 2012; Kouchaki et al., 2013). As suggested by Piff et al. (2010), exhibiting greater concern for others and valuing cooperation and egalitarianism leads the individual to engage in more pro-social behavior themselves. Thus, the income-trust relationship may be negative. In summary, higher incomes may be positively or negatively associated with people's trust levels.

2.2 Reverse Casuality Concerns

Before presenting the motivation for considering gender differences in that relationship, we want to briefly discuss potential endogeneity concerns from reverse causality. We are ultimately interested in measuring the effect of income on trust. However, intuitively, it is possible that trust also affects income levels. We argue that this reverse effect is more

likely to be relevant in the long run and at the macroeconomic level, rather than in the short run and at the individual level. The corresponding stream of research has largely focused on long-term developments at the country-level. As a greater level of social trust improves the efficiency of interactions between people, higher levels of trust have been associated with higher levels of economic development (Fafchamps, 2006; Guiso et al., 2006; Algan and Cahuc, 2010).[5]

Overall, Brandt et al. (2015) argue that, at the individual level, socioeconomic status is far more likely to drive trust than vice versa. Nonetheless, reverse causality clearly remains a possibility we must accept as a potential limitation. As the following pages will show, our key finding states that men trust *less* as their income rises. Thus, even if the type of reverse causality discussed above was present in our study, this would, if anything, introduce a downward bias for our findings. If trust does lead to larger incomes, as suggested by the majority of the literature, then our estimates provide a lower bound (in absolute terms) of the income-trust relationship.

Finally, it is worth noting that our study focuses on ten years of annual survey responses (2005 – 2014) by individuals living in Australia, which is one of the richest and most stable economies worldwide with a strong prevalence of law and order. In this timeframe, respondents have by and large been shielded from the types of large-scale events shown to systematically influence trust levels, such as the slave trade (e.g., see Nunn and Wantchekon, 2011) or armed conflicts (e.g., see Rohner et al., 2013). Thus, the macroeconomic intuition of a potential causality from trust to income levels appears less applicable in our individual-level setting. Beyond that, wave-fixed effects ensure that common national or global events (such as the global financial crisis) are not affecting our estimates. In addition, our empirical analysis controls for an array of potentially confounding factors

[5]In addition, trust may influence the development of political and economic institutions which in turn determine economic growth (Tabellini, 2010).

that are aimed at capturing other dynamics between trust and income levels.

Overall, we believe that reverse causality is unlikely to be driving our findings. If they do, our results are likely to underestimate (in absolute terms), rather than exaggerate, the true effect of income on trust. Nevertheless, ultimately we cannot exclude reverse causality concerns completely and interpretations should be inferred carefully with this in mind.

2.3 Gender Differences in Trust

Gender differences in preferences and behavioral attitudes have been documented across a range of studies. In a comprehensive summary of that literature, Croson and Gneezy (2009) list a number of studies demonstrating that women tend to be less trusting than men. Chaudhuri et al. (2013) find marginal differences in women's and men's trust levels in a laboratory experiment, both within a group and individually. Employing three experimental studies, Haselhuhn et al. (2015) find that women are more forgiving in terms of trust following a trust violation. In turn, Buchan et al. (2008) represents one of the few studies finding men trust more than women. Rau (2011) provides a recent summary of the associated (short) literature on gender differences in trust.

Of key interest in this context are studies reporting that women and men differ in their attitudes toward others and toward money. In reality, attitudes related to trust and financial characteristics are often interlinked. For example, Dollar et al. (2001) and Swamy et al. (2001) find that women are less willing to forgo gains to the common good in return for personal gain, compared to males. In general, women tend to be more 'other-orientated' (Croson and Gneezy, 2009) and to choose jobs where they can work with people and "help others or be useful to society", whereas men tend to choose jobs based on the opportunity to earn money and be successful (Fortin, 2008). This evidence

provides a basis for why one might suspect gender differences in the association between income and trust.

One of the most striking findings reported in the literature on gender differences in preference are the strong patterns observed in attitudes toward and behavior in competitive situations (Croson and Gneezy, 2009). Specifically, competition tends to be perceived as threatening for women but motivating for men (Niederle and Vesterlund, 2007; Gneezy and Rustichini, 2004*a*; Vandegrift and Brown, 2005; Datta Gupta et al., 2005). Correspondingly, men tend to perform better in response to competition while women do not (Gneezy et al., 2003; Gneezy and Rustichini, 2004*b*), and this gender difference appears to increase when stakes are increased (Azmat et al., 2016). This may be directly relevant to how changes in income affect interpersonal trust. Specifically, gender differences may arise depending on whether men and women regard income generation as a cooperative or a competitive game in which they participate. Trust may increase when income increases if the individual considers this to be the result of cooperation, but may decrease if it is considered to be the result of competition (that is, where my win is your loss). In accordance with the evidence discussed here, women may be more likely to work in jobs where success is linked to cooperation, while men work in jobs where success is linked to competition. If so, one might observe success, and higher income, to be linked to increased trust in women and decreased trust in men.

3 Data and Methodology

3.1 Data

All our data are derived from the annual *Household, Income and Labour Dynamics in Australia* (*HILDA*) survey which collects information on "economic and subjective wellbeing,

labour market dynamics and family dynamics" (Watson et al., 2004). A questionnaire is completed for all individuals aged 15 and above, probing various information about personal circumstances and subjective evaluations on various aspects of their lives. Questions about interpersonal trust are included in six survey waves to date, specifically in waves 5, 6, 8, 10, 11, and 14 (collected in 2005, 2006, 2008, 2010, 2011, and 2014).

We use a measure of interpersonal trust which is represented by responses to the question: "To what extent do you agree with the following statement: Generally speaking, most people can be trusted." Respondents can answer on a scale of one to seven, where one corresponds to "Strongly Disagree" and seven to "Strongly Agree." This measure of interpersonal trust is consistent with comparable studies, both those which use the *HILDA* survey (Hermes and Poulsen, 2013) and other surveys around the world (Alesina and La Ferrara, 2002; Wang and Gordon, 2011). Our sample from these six waves consists of 76,524 observations for 22,219 individuals. This represents an unbalanced panel with the average number of responses being 3.4 waves out of six.

The second key variable of our analysis is individual income, which is measured as the respondent's annual disposable income. This variable includes wages and salaries, business income, investment income, superannuation (i.e., retirement benefits), regular scholarship payments, pensions from overseas, insurance (e.g., worker's compensation or income insurance), and any benefits from the Australian Government, including welfare and pensions.[6] It does not include what *HILDA* calls 'irregular income' (e.g., one-off payments, such as redundancy or severance packages). This measure for income is consistent with other studies in the literature (Alesina and La Ferrara, 2002; Wang and Gordon,

[6]These incomes are measured for the last financial year, which in Australia runs from July to June. The survey is administered between August and November of each year, which means trust levels at these times are compared with income in the preceding financial year. Consequently, an association between changes in income and trust reflects an association between a change in income over the preceding financial year and subsequent trust levels. This may further lessen concerns that such an association reflects any causal effects of trust on income.

2011; Brandt et al., 2015).

Figure 1 illustrates income and trust levels by gender across all six waves. The 95 percent confidence intervals for these means are relatively narrow, reflecting the large sample size that allows us to estimate relationships quite accurately. The data presents an interesting peculiarity in the sense that trust levels are exceptionally low in wave 5, collected in 2005. To ensure that such heterogeneity across waves is not driving any of our results, we include wave-fixed effects into our analysis. Overall, Figure 1 shows that income levels have consistently been rising since 2005 with the average men earning more than the average women. In turn, women report higher trust levels throughout all waves. Table 1 displays summary statistics of the main variables of interest, showing an average reported trust level of 4.79 and an average income level of A$36,056. As is common in the associated literature, we use natural log transformations of income in our estimations.[7] To preserve observations in which a respondent reports no income, we follow the conventional conversion of adding one dollar, i.e., taking $Ln(1 + income)$.

Table 1 also reports summary statistics for the number of children, which forms one of our control variables that can vary for an individual over time. Other control variables included in the core analysis are civil status (eight categories) and educational attainment (eight categories). Previous cross-sectional studies have consistently identified education as a positive predictor of trust (Alesina and La Ferrara, 2002; Leigh, 2006; Wang and Gordon, 2011; Hermes and Poulsen, 2013; Viitanen et al., 2014). These binary variables are omitted from Table 1 to save space (see the footnote for a list). The inclusion of these variables ensures that our findings for the income-trust relationship are not driven by potentially confounding effects related to educational attainment, relationship status, or the number of children in the household.

[7]Note that since our analysis incorporates wave-fixed effects, it does not matter whether we convert nominal income to real income.

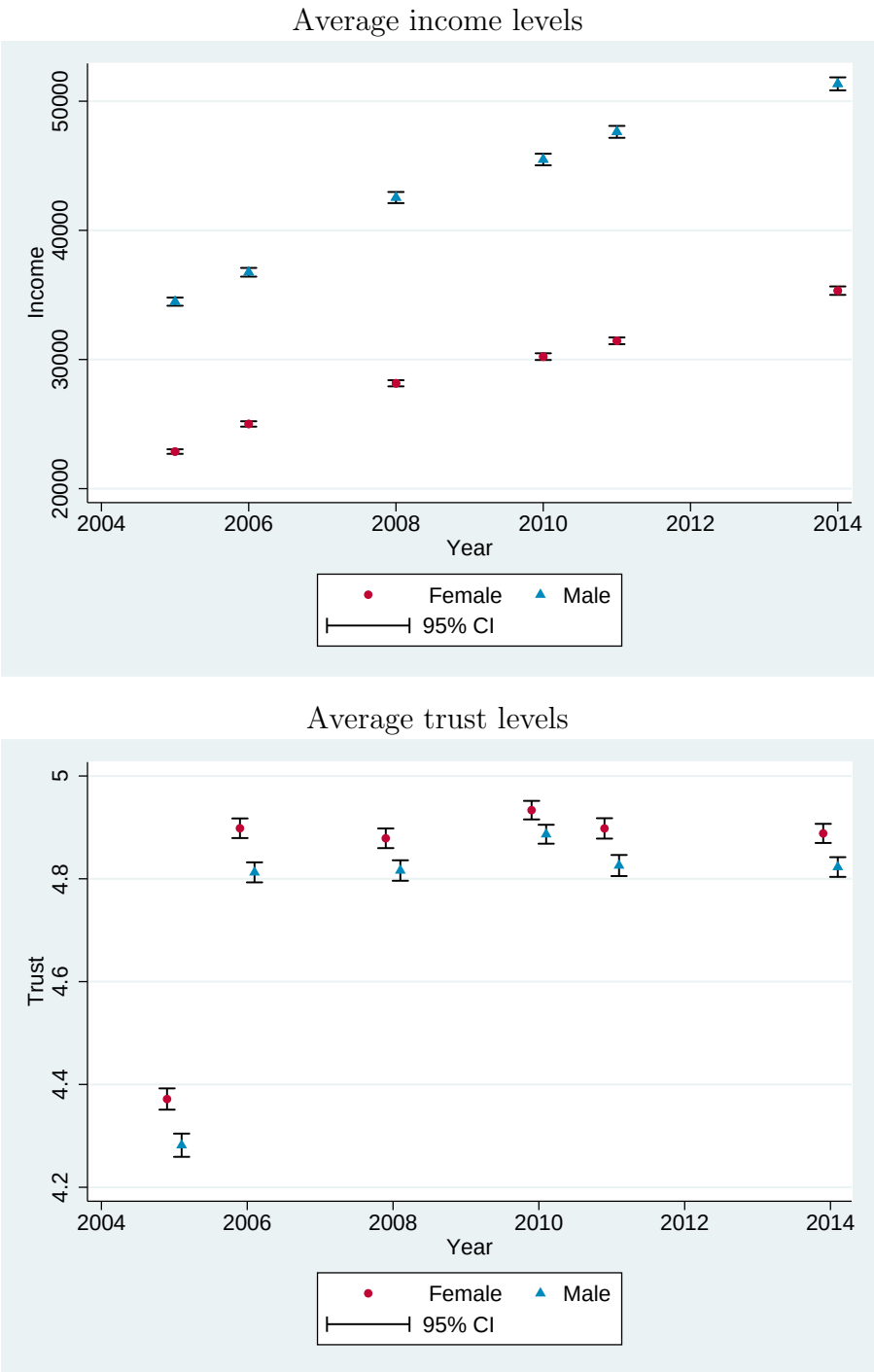

Figure 1: Income (top) and trust levels (bottom) by gender over waves 5, 6, 8, 10, 11, and 14.

Table 1: Summary statistics of the main variables for all 76,524 observations.

Variable	Mean (Std. Dev.)	Min. (Max.)	Variable description
Trust	4.79 (1.36)	1 (7)	"Generally speaking, most people can be trusted" (1 = strongly disagree; 7 = strongly agree)
Income	36,056 (35,261)	0 (774,346)	Financial year disposable personal income (A$); $[Ln(1 + income)]$
Female	0.53 (0.50)	0 (1)	= 1 if respondent female
Children	0.61 (1.03)	0 (10)	# of children in household
Employed	0.64 (0.48)	0 (1)	= 1 if employed; = 0 if unemployed or not in the labor force
Non-zero income	0.96 (0.19)	0 (1)	= 1 if respondent reports non-zero income

Notes: Summary statistics for 8 binary indicators of educational attainment (postgraduate degree, graduate diploma, bachelor or honors, advanced diploma, certificate III or IV, completed year 12, year 11 and below, and undetermined) and 8 binary variables for civil status (refused/not stated, don't know, legally married, de facto, separated, divorced, widowed, and never married and not de facto) are omitted.

3.2 Methodology

Our empirical approach employs a conventional regression framework for individual i and their response in wave t:

$$Trust_{it} = \alpha_0 + \alpha_1 Income_{it} + \alpha_2 (Income_{it}) \times (Female_i) + \lambda_t + \gamma_i + \alpha_3 \boldsymbol{X_{it}} + \epsilon_{it}. \quad (1)$$

In order to properly account for individual-fixed effects, we follow the conventions of the literature and employ a standard linear regression approach, as opposed to a logit or ordered logit approach (see Greene, 2004). Our main coefficients of interest are represented by α_1 and α_2. For males, the relationship between income and trust is captured by α_1, whereas for females that link is described by $\alpha_1 + \alpha_2$, thereby including the interaction term between income and *Female*. Naturally, if there were no gender differences in the income-trust link we would expect α_2 to be statistically irrelevant and indistinguishable from zero.[8]

Further, equation 1 controls for wave-fixed effects via λ_t and individual-fixed effects (γ_i). Both of these vectors are aimed at isolating the income-trust model from unobservable influences that are specific to time or the individual. In particular, individual-fixed effects allow us to control for unobserved time-invariant characteristics at the individual level, therefore lessening concerns of endogeneity bias caused by measurement error and time-invariant omitted variables. This is likely to be of particular importance when analyzing highly subjective variables like trust. For example, a naturally optimistic person, who perceives the world in a positive light, may report higher levels of trust and potentially also income than someone who is naturally more pessimistic (Uslaner, 2016).

Following the associated literature, other individual characteristics that could influence

[8]Note that including a binary indicator for *Female* becomes obsolete when controlling for individual-fixed effects since gender is time-invariant for an individual.

income and trust simultaneously might include ethnicity, country of origin, upbringing, parental background, and religion. Alesina and La Ferrara (2002) find ethnicity to be important arguing that blacks report lower levels of trust than other ethnicities due to their minority status and being historically discriminated against. Country of origin (and parental country of origin) measures cultural influences which can affect an individual's trust level (Hermes and Poulsen, 2013; Viitanen et al., 2014; Dieckmann et al., 2016). Research using Australian data has identified parental education as an important determinant of an individual's trust levels (Viitanen et al., 2014). Wang and Gordon (2011) and Hermes and Poulsen (2013) find evidence that religion is significantly related to trust, and Berggren and Bjørnskov (2011) find a negative and statistically meaningful link between religiosity and social trust levels, both internationally for 109 countries and within the United States.[9] Chuah et al. (2016) analyze trust levels and find substantial heterogeneity for trusting others within our outside one's religion. Finally, a large body of the psychology literature from the 1950s and 1960s finds interpersonal trust and personality to be correlated (see Delhey and Newton, 2003, for a summary). More recently, Uslaner (2016) argues that "generalized trust rests upon a micro-foundation of optimism." Because these individual features are inherently time-invariant they are captured by individual-level fixed effects, thus substantially reducing concerns of an omitted variable bias.

In addition, fixed effects at the individual level lessen concerns of measurement error. This is an issue which applies particularly to survey responses of an evaluative (subjective) nature, as each individual may interpret a question differently and to their own scale (see Blanton and Jaccard, 2006, for a comprehensive discussion). For example, a trust level of three for one individual may be the equivalent of a five for another individual. Such bias can arise also for less subjective variables, and can apply to reported income data

[9]In additional estimations (not displayed), we have also checked whether our findings are particularly prevalent for respondents from a specific religion (Catholics, Protestants, non-religious individuals, Buddhists, or Muslims) but no discernible heterogeneity emerges.

if an individual consistently over- or under-reports their income. Such systematic biases are automatically captured by fixed effects at the individual level.

$\boldsymbol{X_{it}}$ represents the vector of time-variant control variables, including the respondent's number of children, as well as binary indicators for educational attainment levels and civil status. Finally, ϵ_{it} represents the usual error term and throughout our estimations we cluster error terms at the individual level.

Beyond equation 1, we also estimate trust equations for females and males separately. Further, we introduce alternative measures of income, including binary indicators for those in employment and those earning a non-zero income, in order to determine whether our core results can be attributed to such important distinctions. We also form various subsamples based on respondents' religious and parental background. Finally, we consider alternative outcomes which capture psychological traits potentially related to trust, including indicators for emotional stability, envy, jealousy, fretfulness, and agreeableness.

4 Main Empirical Findings

4.1 Main Results

Table 2 displays our core results, where we subsequently incorporate control variables, following the concept laid out in equation 1. Column (1) presents estimates for a simple univariate model, using pooled data. Income and trust are positively related when the data are pooled, indicating that people with larger incomes are more trusting. This result would confirm a bulk of the literature proposing a positive relationship between individual income and trust when considering a cross-sectional model (e.g., see Leigh, 2006, for Australian data and Alesina and La Ferrara, 2002, Wang and Gordon, 2011, and Brandt et al., 2015 for global data).

Table 2: Displaying regression results from estimating trust levels (increasing from 1 to 7).

Estimation:	Pooled Model		Fixed Effects Model			
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable: Trust (mean = 4.788)						
Ln(income+1) (α_1)	0.024***	0.021***	-0.011***	-0.018***	-0.015***	-0.016***
	(0.003)	(0.003)	(0.003)	(0.004)	(0.005)	(0.005)
Ln(income+1) × Female (α_2)				0.013**	0.012**	0.013**
				(0.006)	(0.006)	(0.006)
Wave-fixed effects		yes	yes	yes	yes	yes
Educational categories					yes	yes
Control variables[a]						yes
$\alpha_1 + \alpha_2 = 0$ (p-value)[a]				0.229	0.432	0.442
# of respondents	22,219	22,219	22,219	22,219	22,219	22,219
# of waves	6	6	6	6	6	6
N	76,524	76,524	76,524	76,524	76,524	76,524

Notes: Standard errors clustered on the individual level are displayed in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. [a]Includes a measure for the number of children and 8 binary indicators for civil status. [a]Results from a post-estimation test, where statistical significance would indicate that the effect of income on trust is meaningfully different from zero for women.

Column (2) presents estimates from a pooled regression with wave-fixed effects, acknowledging that unobservable parameters may have changed over time (e.g., via the global financial crisis in 2007). This particularly aims to control for the unusually low levels of trust reported in wave 5. However, the coefficient of interest only changes marginally from 0.024 to 0.021 and remains statistically significant at the one percent level.

Columns (3) to (6) present fixed-effects panel model estimates, based on variation observed within individuals across survey waves. These reveal a marked change in the coefficient associated with income from a positive and statistically meaningful predictor in the pooled model to a negative and statistically meaningful coefficient. This result stands in contrast to other studies which report specifically on the association between income and trust, though it is consistent with many studies investigating the association between socioeconomic status and pro-social behavior at the individual level, and particularly in experimental settings (Kraus et al., 2010; Piff et al., 2012; Kraus and Keltner, 2013). Our results suggest that, when comparing broadly across people, those with better circumstances tend to exhibit greater levels of trust. However, once we look more closely within smaller groups of individuals, and particularly when we look at changes over time, an improvement in economic circumstances or status appears to be associated with a decline in trust levels.

The magnitude of the implied relationship remains small: A one standard deviation increase in the logarithm of income (2.19) is associated with a -0.024 change in the trust index. However, the sign and statistical significance of the link are likely more relevant. As these results are derived from annual surveys and cultural attitudes such as trust are known to only change slowly over time (e.g., see Alesina and Fuchs-Schündeln, 2007, Brosig-Koch et al., 2011, Nunn and Wantchekon, 2011), it is remarkable that we can identify a significant link between income and trust in an estimation with individual-level fixed effects.

In column (4), we introduce the interaction term between $Income$ and $Female$, testing whether the income-trust link varies by gender. Indeed, we find this association strengthens for men (i.e., becomes more negative with a coefficient of -0.018), while the net effect for women remains indistinguishable from zero ($-0.018+0.013 = -0.005$; standard errors indicate this effect is not statistically significant on conventional levels). Thus, if we do not control for gender differences in such estimations, the average effect may be biased toward zero, grouping negative effects from the average man together with insignificant effects for the average woman.

In columns (5) and (6), we further introduce control variables, including educational attainment indicators, a measure for the number of children in the household, and binary variables for civil status. The corresponding results demonstrate that the link between income and trust remains remarkably robust in terms of sign, magnitude, and statistical significance. Our results therefore suggest that men become significantly less trusting of others when earning more, whereas no discernible effect emerges for women.

Investigating this relationship further, Table 3 presents alternative estimates using gender-specific subsamples. This carries the advantage of allowing other covariates to also vary across gender. However, we observe the same outcome, as once all control variables and fixed effects are accounted for women do not exhibit different trust levels when their income changes (see column 2). However, column (4) shows that this is the case for men.

Throughout the rest of the paper, the results from fixed-effects panel regressions (column 6 of Table 2 and columns 2 and 4 of Table 3) will form our benchmark regressions against which subsequent estimates are compared.

Table 3: Displaying regression results from estimating trust levels separately by gender (increasing from 1 to 7).

	Females		Males	
	(1)	(2)	(3)	(4)
Estimation:	Pooled	Fixed effects	Pooled	Fixed effects
Dependent variable: Trust (mean = 4.788)				
Ln(1+income)	0.030***	-0.004	0.020***	-0.015***
	(0.004)	(0.004)	(0.004)	(0.005)
Wave-fixed effects		yes		yes
Control variables[a]		yes		yes
# of respondents	11,629	11,629	10,590	10,590
# of waves	6	6	6	6
N	40,741	40,741	35,783	35,783

Notes: Standard errors clustered on the individual level are displayed in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. [a]Includes a measure for the number of children, binary indicators for 8 education statuses, and 8 binary indicators for civil status.

4.2 Robustness Checks

To test the robustness of this finding, Table 4 displays results from including several additional control variables. Although we display estimates based on gender-specific samples here, the corresponding findings for the complete sample are consistent with these results. We first test for potential non-linearity in the income-trust link by adding a squared term of our income measure. Since women earn less than men, on average, it is possible that our benchmark findings are driven by individuals in particular income ranges. However, columns (1) and (4) indicate that this is not the case.

Second, we acknowledge the role of age in explaining trust levels by adding an interaction term between age and income.[10] Although column (2) shows that income continues to be irrelevant when explaining trust levels for women even at different ages, column (5) produces an interesting non-linearity for men. The negative income-trust relationship emerges particularly for *young* men, since the interaction term with age turns positive. The net effect remains negative until approximately 58 years of age. In fact, the baseline magnitude of -0.015 (see column 4 of Table 3) is reached at the age of approximately 34.4.[11] Younger males show a stronger negative link between income and trust, whereas for older male respondents the link approaches zero. The following sections will consider further specifications trying to pin down the origins for the negative income coefficient for men.

Third, columns (3) and (6) include seven state-fixed effects to account for the possibility that individuals have been moving within Australia over our ten year timespan.[12]

[10] Notice that including age by itself becomes obsolete because of individual- and wave-fixed effects. In alternative estimations, we also employ a squared term of age (following results from Sutter and Kocher, 2007, Clark and Eisenstein, 2013, or Dittrich, 2015, for example), but the corresponding results are virtually identical.

[11] Calculation: $-0.03692 + age \times 0.00064 = -0.015$, where age indicates the age at which the initial effect of -0.015 is reached.

[12] Australian states are the Australian Capital Territory, New South Wales, the Northern Territory, Queensland, South Australia, Tasmania, Victoria, and Western Australia. One of these is automatically

Table 4: Displaying regression results from several robustness checks, estimating trust levels (increasing from 1 to 7). FE indicates fixed effects for individuals are accounted for.

	Females			Males		
	(1)	(2)	(3)	(4)	(5)	(6)
Estimation:	FE	FE	FE	FE	FE	FE
Dependent variable: Trust (mean = 4.788)						
Ln(1+income)	0.013	-0.012	-0.004	-0.026*	-0.03692***	-0.015***
	(0.014)	(0.009)	(0.004)	(0.016)	(0.010)	(0.005)
$[\text{Ln}(1+\text{income})]^2$	-0.002			0.001		
	(0.001)			(0.001)		
Ln(1+income) × Age		0.000			0.00064***	
		(0.000)			(0.000)	
State-fixed effects			yes			yes
Wave-fixed effects	yes	yes	yes	yes	yes	yes
Control variables[a]	yes	yes	yes	yes	yes	yes
# of respondents	11,629	11,629	11,629	10,590	10,590	10,590
# of waves	6	6	6	6	6	6
N	40,741	40,741	40,741	35,783	35,783	35,783

Notes: Standard errors clustered on the individual level are displayed in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. [a]Includes a measure for the number of children, binary indicators for 8 education statuses, and 8 binary indicators for civil status.

The corresponding results show that this is not the case, as the benchmark findings are virtually unaffected.

4.3 Employment and Non-Zero Income

After establishing a negative income-trust link for (especially young) males, but not for females, we now evaluate at which point of the income distribution this result emerges. In particular, we consider whether movements into and out of employment, as well as from zero to positive income, might explain our results.

4.3.1 Employment

Following the fact that particularly young males appear to exhibit a negative income-trust link, Table 5 focuses on employment status. Is it possible that entry into the labor market comes with a systematic decrease in trust levels (e.g., see de Jong et al., 2009, for a study on the link between trust and specific employment situations)?

Column (1) presents estimates based on the complete sample, this time using a binary indicator for employment status (= 1 if employed; = 0 if unemployed or not in the labor force) in place of income. As in our benchmark estimations, we include an interaction term with *Female*. Interestingly, no significant patterns emerge in the fixed-effects models. Thus, employment does not appear to be driving our baseline findings.

4.3.2 Non-Zero Income

Next, we consider whether our core results may relate specifically to people moving from earning no income to earning some positive income. Throughout our sample, approximately four percent of the responses report earning zero personal income whatsoever

excluded in each regression and forms the reference point.

Table 5: Considering employment status, displaying regression results from estimating trust levels (increasing from 1 to 7). FE indicates fixed effects for individuals are accounted for.

	All	Females	Males
	(1)	(2)	(3)
Estimation:	FE	FE	FE
Dependent variable: Trust (mean = 4.788)			
Employed (α_1)	-0.005	-0.025	0.004
	(0.025)	(0.021)	(0.026)
Employed × Female (α_2)	-0.016		
	(0.032)		
Wave-fixed effects	yes	yes	yes
Control variables[a]	yes	yes	yes
$\alpha_1 + \alpha_2 = 0$ (p-value)[b]	0.311		
# of respondents	22,219	11,629	10,590
# of waves	6	6	6
N	76,524	40,741	35,783

Notes: Standard errors clustered on the individual level are displayed in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. [a]Includes a measure for the number of children, binary indicators for 8 education statuses, and 8 binary indicators for civil status. [b]Results from a post-estimation test, where statistical significance would indicate that the effect of income on trust is meaningfully different from zero for women.

(2,896 observations; 55 percent of these are male). Table 6 introduces a binary indicator for earning some positive income instead of the standard income variable, along with the usual gender interaction term.

Table 6: Considering the jump from no income to some income, displaying regression results from estimating trust levels (increasing from 1 to 7). *FE* indicates fixed effects for individuals are accounted for.

	All		Females		Males		
Estimation:	(1) FE	(2) FE	(3) FE	(4) FE	(5) FE Excluding zero income	(6) FE	(7) FE
Dependent variable: Trust (mean = 4.788)							
Non-zero income (α_1)	-0.157***	-0.240***	-0.006	-0.051	-0.149***	-0.293***	
	(0.047)	(0.070)	(0.043)	(0.087)	(0.049)	(0.092)	
Non-zero income × Female (α_2)	0.157**	0.147**					
	(0.062)	(0.062)					
Non-zero income × Age		0.003*		0.001		0.005**	
		(0.002)		(0.002)		(0.002)	
Ln(1+income)							-0.039
							(0.029)
Ln(1+income) × Age							0.001
							(0.001)
Wave-fixed effects	yes	yes	yes	yes	yes	yes	yes
Control variables[a]	yes	yes	yes	yes	yes	yes	yes
$\alpha_1 + \alpha_2 = 0$ (p-value)[b]	0.994	0.184					
# of respondents	22,219	22,219	11,629	11,629	10,590	10,590	10,274
# of waves	6	6	6	6	6	6	6
N	76,524	76,524	40,741	40,741	35,783	35,783	34,468

Notes: Standard errors clustered on the individual level are displayed in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. [a]Includes a measure for the number of children, binary indicators for 8 education statuses, and 8 binary indicators for civil status. [b]Results from a post-estimation test, where statistical significance would indicate that the effect of income on trust is meaningfully different from zero for women.

Contrary to employment status, this distinction appears to unveil the detailed dynamics under which we observe gender differences. Column (1) reports estimates for the fixed-effects estimation with the familiar control variables, revealing strong gender differ-

ences. Moving from no income to some income is associated with a precisely estimated negative development in trust levels for males. This effect is relatively sizeable, especially when bearing in mind the rather short intervals between waves: A binary move from earning zero to some income yields a 0.157 point decrease in the trust index. This corresponds to more than 18 percent of a within-individual standard deviation (equivalent to 0.86). Interestingly, the effect for women equals exactly zero ($-0.157 + 0.157$).

Column (2) then includes an interaction term with age in order to further distinguish which factor matters more: Moving from zero to some income or age. Since most people move from earning no income to some income earlier in life, rather than in their 50s or 60s, both characteristics many times occur at the same time and it is particularly young people who experience the switch to earning positive income. Column (2) provides statistical evidence for both, yet the interaction term with age is only marginally different from zero with a statistical significance level of ten percent. In fact, only at the age of 80 would we derive a zero effect for earning an income on trust levels (calculation: $-0.240 + age_{threshold} \times 0.003 = 0$, which produces $age_{threshold} = 80$). Columns (3) and (4) then show that, again, no discernible dynamics emerge for women and moving from no income to earning some income is virtually unrelated to trust levels. However, columns (5) and (6) show that both the switch to earning income and age seem to matter for men.

Finally, column (7) presents results from estimating the benchmark regression for males, where we return to the continuous measure for income. However, we exclude those earning no income from the equation to evaluate whether the familiar age dynamics are still present. Interestingly, we find no evidence for age to matter, which indicates that moving from zero to any non-negative income is where men appear to experience a decrease in trust levels. With these results in mind, we now consider whether our core results can be explained by changes in psychological characteristics.

5 Psychological Characteristics

5.1 A Potential Mechanism

Having established that men systematically report lower interpersonal trust levels in response to an increase in income, we now consider one possible explanation. Specifically, we investigate whether our core findings might be explainable by psychological factors related to emotional stability, which have been suggested to be closely interlinked with trust levels. We sketch this possible channel in Figure 2 and discuss the relevant literature and the accompanying intuition along with our corresponding empirical findings.

Figure 2: The link between income and trust, mediated by emotional stability.

5.2 Income and Emotional Stability

In terms of the first link sketched in Figure 2, a sizeable stream of research analyzes the effects of money, social status, and power on a variety of behavioral attitudes. For instance, Clingingsmith (2016) and Yu and Chen (2016) find evidence that higher income is associated with less negative emotions and Kahneman and Deaton (2010) conclude that this is mostly true at the lower end of the income distribution. On the other hand, money and social class have recently been connected to concepts like narcissism and a decreased sense of empathy (Ricciardi, 2013; Piff, 2014).

To test whether income is indeed systematically connected to emotional characteristics that matter for trust levels, we access information on several variables on emotional stability reported in *HILDA*. In particular, we consider an aggregated index of emotional stability (the opposite of neuroticism and one of the Big Five personality traits; see McCrae

and John, 1992) and several of its components. This index is constructed from responses to questions about the degree to which respondents consider themselves to be envious, moody, touchy, jealous, temperamental, and fretful. Responses range from 1 ('does not describe me at all') to 7 ('describes me very well').[13] These variables are included in waves 5, 9, and 13. In addition, we include aggregate scores for 'agreeableness', which comprises aggregated scores based on responses to question about whether respondents consider themselves sympathetic, kind, cooperative and warm. The respective summary statistics of these additional survey responses are referred to the appendix Table A1. In the next subsection, we describe why these particular emotional characteristics may be especially relevant for trust levels.

The corresponding results are reported in Table 7. Column (1) replicates our benchmark result related to trust levels, providing a comparison throughout Table 7. As before, we begin with an analysis of the continuous income variable in Panel A, whereas Panel B turns to the binary indicator for earning any income. In column (2), we show results from estimating a respondent's aggregated answer regarding neuroticism (the reversed emotional stability index), ranging from one to seven. These results show that men become marginally *more* neurotic (i.e., less emotionally stable) when their income increases (Panel A) or when they begin drawing any income (Panel B). Women, however, exhibit no relationship between income and neurotic tendencies, as indicated by the net effect from income and the interaction term with $Female$.

Columns (3) to (5) then display results for selected individual components of the emotional stability index, considering respondents' self assessments regarding envy, jealousy, and fretfulness. Indeed, men seem to become marginally more fretful as their income increases. This result emerges both for our continuous measure of income and when con-

[13]The aggregate indicator for emotional stability initially displays the inverse, i.e., larger values indicate better emotional stability. To be consistent with the remaining indicators, we reverse these, so larger values indicate more neuroticism, i.e., less emotional stability.

Table 7: Displaying results from estimations including individual fixed-effects, exploring psychological traits as alternative outcome variables. All regressions are estimated in a fixed effects model on the individual level.

Dependent variable:	(1) *Trust*	(2) *Neurotic*	(3) *Envious*	(4) *Jealous*	(5) *Fretful*	(6) *Agreeable*
Panel A: Considering income						
Ln(1+income) (α_1)	-0.016***	0.010*	0.007	0.001	0.015*	0.005
	(0.005)	(0.006)	(0.008)	(0.008)	(0.009)	(0.005)
Ln(1+income) × Female (α_2)	0.013**	-0.008	-0.005	0.002	-0.006	-0.004
	(0.006)	(0.007)	(0.010)	(0.010)	(0.011)	(0.006)
Wave-fixed effects & control variables[a]	yes	yes	yes	yes	yes	yes
$\alpha_1 + \alpha_2 = 0$ (p-value)[b]	0.442	0.640	0.709	0.637	0.264	0.843
Panel B: Considering non-zero income						
Non-zero income (α_1)	-0.157***	0.123**	0.117	-0.001	0.179*	0.042
	(0.047)	(0.063)	(0.089)	(0.090)	(0.096)	(0.055)
Non-zero income × Female (α_2)	0.157**	-0.100	-0.121	0.055	-0.073	-0.044
	(0.062)	(0.077)	(0.110)	(0.111)	(0.123)	(0.066)
Wave-fixed effects & control variables[a]	yes	yes	yes	yes	yes	yes
$\alpha_1 + \alpha_2 = 0$ (p-value)[b]	0.994	0.628	0.947	0.433	0.200	0.972
# of respondents	22,219	19,692	19,612	19,632	19,525	19,709
# of waves	6	3	3	3	3	3
N	76,524	37,988	37,781	37,745	37,466	38,052

Notes: Standard errors clustered on the individual level are displayed in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. [a]Includes a measure for the number of children, binary indicators for 8 education statuses, and 8 binary indicators for civil status. [b]Results from a post-estimation test, where statistical significance would indicate that the effect of income on trust is meaningfully different from zero for women.

sidering the binary move from earning no income to any income (Panel B). This could be one explanation why trust levels suffer as income increases: Being more concerned and fretful may lead one to trust others less, everything else equal. Finally, agreeableness does not seem to be significantly affected by changes in income levels.

Figure 3 visualizes the corresponding results from estimating each behavioral characteristic in gender-specific regressions. The vertical lines display two-sided 90 percent confidence intervals. The top panel reveals no discernible changes for women in any of these behavioral traits. In the bottom panel, we confirm that men become marginally more neurotic and fretful. It is important to keep in mind that these results are derived from three waves only (with the exception of trust which relies on six waves), meaning that we have at best three observations per individual. Naturally, this leaves less statistical variation to be explained in a fixed effects model, which is likely one reason for larger standard errors (represented by longer vertical lines in Figure 3). Figure A1 in the appendix displays the corresponding findings when analyzing the binary distinction between earning no income or a positive income, producing a conclusion that is consistent with Figure 3.

5.3 Emotional Stability and Trust

Turning to the second link from Figure 2, trust has been found to be positively associated with the ability to cope with stress, both for women and men (Schill et al., 1980). Similarly, happiness and gratitude have been found to increase trust, while anger and negative emotions may decrease trust (Dunn and Schweitzer, 2005; Myers and Tingley, 2016). Table 8 presents results from using neuroticism and fretfulness – the meaningful variables from Table 7 – to predict trust levels. Unfortunately, the questions on emotional stability characteristics and trust are only jointly available in wave 5. Thus, we need to

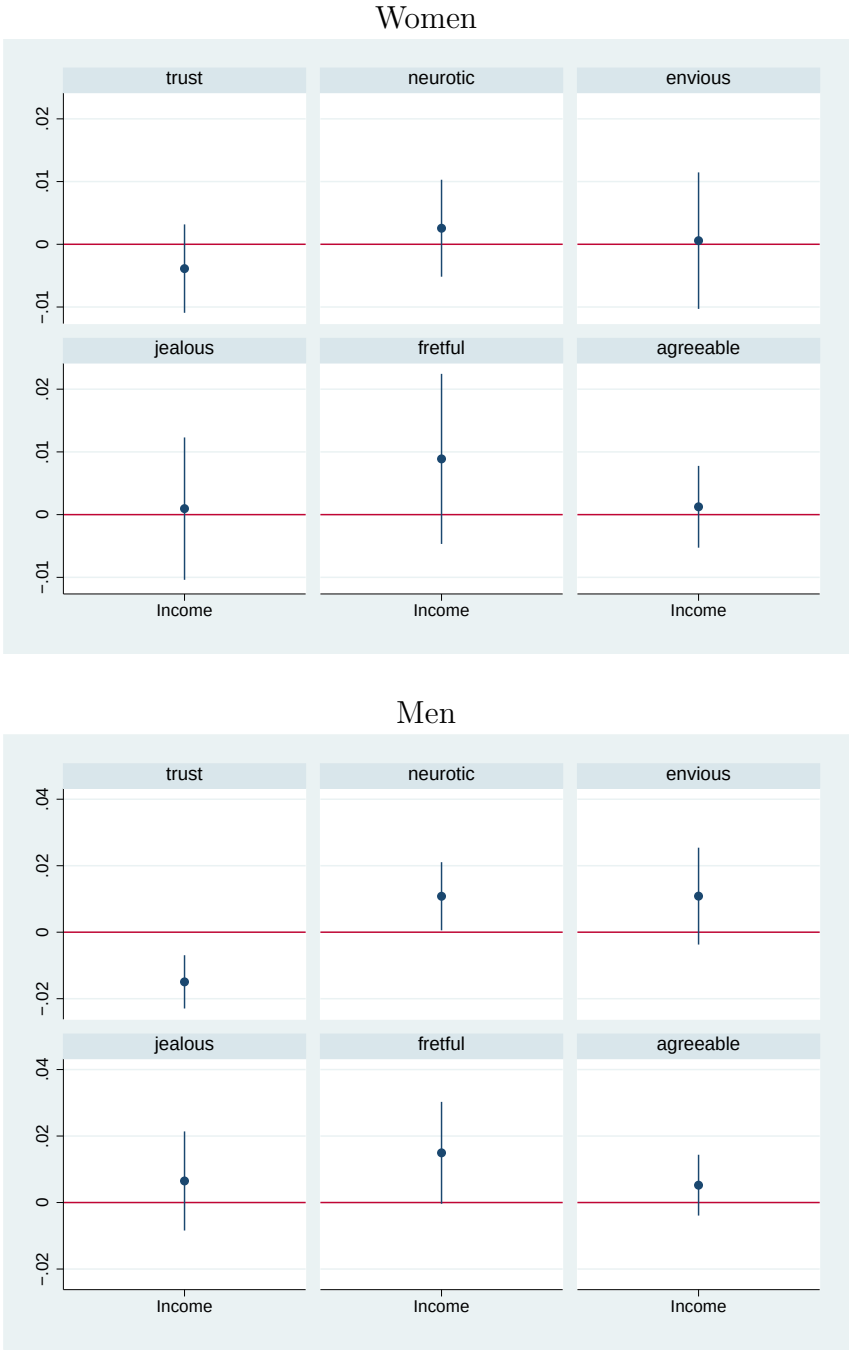

Figure 3: Respective coefficient of the income variable derived from estimating behavioral attitudes in gender-specific subsamples. All control variables are included in a fixed effects model on the individual level (a measure for the number of children, binary indicators for education statuses and civil status, as well as wave-fixed effects).

resort to a pure cross-sectional analysis, controlling for the number of children, in addition to the familiar binary indicators for educational attainment and civil status. Overall, this still produces a sizeable sample of over 11,000 respondents, but one should bear in mind we cannot control for individual-level fixed effects in these estimations.

Table 8: Considering the link between emotional stability and trust levels (increasing from 1 to 7).

	All (1)	All (2)	Females (3)	Males (4)	All (5)	All (6)	Females (7)	Males (8)
Dependent variable: Trust (mean = 4.327)								
Neurotic	-0.193***	-0.200***	-0.193***	-0.192***				
	(0.013)	(0.014)	(0.017)	(0.020)				
Neurotic × Female		0.014						
		(0.009)						
Fretful					-0.092***	-0.103***	-0.086***	-0.100***
					(0.009)	(0.011)	(0.012)	(0.015)
Fretful × Female						0.019**		
						(0.009)		
Control variables[a]	yes	yes	yes	yes	yes	yes	yes	yes
$\alpha_1 + \alpha_2 = 0$ (p-value)[b]		0.000***				0.000***		
# of respondents	11,238	11,238	5,993	5,245	11,054	11,054	5,897	5,5157
# of waves	1	1	1	1	1	1	1	1
N	11,238	11,238	5,993	5,245	11,054	11,054	5,897	5,157

Notes: Standard errors clustered on the individual level are displayed in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. [a]Includes a measure for the number of children, binary indicators for 8 education statuses, and 8 binary indicators for civil status. [b]Results from a post-estimation test, where statistical significance would indicate that the effect of income on trust is meaningfully different from zero for women.

Column (1) introduces neuroticism as a predictor for trust and we find a negative relationship that is statistically significant on the one percent level. In the spirit of our main findings along the lines of gender differences, column (2) includes an interaction term between neuroticism and *Female*. However, in this case the results reveal no noticeable anomaly and the link prevails for respondents from either gender. Confirming these

findings, columns (3) and (4) show results from focusing on gender-specific subsamples and the link between neuroticism and trust is virtually identical for female and male respondents.

Columns (5) to (8) follow the same sequence as the first half of Table 8, but focus on fretfulness instead of neuroticism. The corresponding results are similar, and although we uncover a marginal gender difference in that women show a less pronounced link between fretfulness and trust, the respective coefficient remains negative and comfortably different from zero in all estimations.

Overall, analyzing the link between income, emotional stability, and trust levels produces conclusions that are consistent with the hypothesis laid out in Figure 2. We do find evidence that an increase in income is associated with men reporting to be more neurotic and fretful, but not women. In turn, the link between these emotional stability characteristics and trust levels emerges with force, i.e., more neuroticism and fretfulness are associated with decreased trust levels, everything else equal. Taken together, this suggests one potential channel through which income affects trust levels, but other mechanisms are, of course, possible.

6 Conclusion

This paper exploits the longitudinal structure of the *HILDA* dataset to evaluate the association between an individual's income and their interpersonal trust levels. Our main analysis includes detailed information for 22,219 individuals over a maximum of six survey waves, taken between 2005 and 2014.

We derive two novel insights. First, estimates from analyzing a pooled sample differ substantially from those derived from a fixed effects model. A pooled estimation produces a positive effect of income on trust, whereas a fixed-effects framework generates a

firmly *negative* coefficient. Thus, once time-invariant individual characteristics that are unobservable to the researcher are accounted for (e.g., inherent behavioral attitudes, beliefs, and experiences), results are markedly different. In a broader context, these results confirm earlier studies that suggest income can sometimes have socially undesirable consequences for behavior (e.g., see studies on people's behavior when winning in the game monopoly, summarized by Ricciardi, 2013). Throughout both types of specification, income levels emerge as a statistically powerful predictor of trust levels, reiterating the importance of financial attributes for trust levels.

Second, we uncover systematic gender differences in this pattern. The negative association between income and trust is driven entirely by males, whereas no discernible link emerges for females in any of our estimations. We particularly find men who move from earning no income to some positive income to be the driving force behind our findings. This result remains robust to a number of alternative specifications, but is not driven by employment status.

We then investigate one potential channel through which income may affect trust in considering self-reported psychological characteristics, and particularly emotional stability. Indeed, the corresponding results are consistent with the hypothesis that income can lead to more neuroticism and, specifically, fretfulness for men, but not for women. In turn, both of these features emerge as strong negative predictors of trust levels, although the results from estimating this final relationship are based on a pure cross-sectional sample of over 11,000 respondents and should be interpreted with caution.

Overall, we aim to contribute to two closely related streams of research. First, we show that analyzing the income-trust connection in a cross-sectional setting may be subject to substantial endogeneity problems in the form of unobservable individual-level characteristics. In fact, the corresponding coefficient on income levels switches sign completely once individual-level fixed effects are accounted for in a panel setting. These results advise

caution when interpreting results connecting income to trust in a cross-sectional setting.

Second, to our knowledge we are among the first to find systematic gender differences in the income-trust link. On average, men may react with decreased trust levels once their income increases and particularly when they move from earning no income to some income. We observe none of these dynamics for women. These findings may eventually have implications for policy discussions related to transfer payments, for example. Since interpersonal trust has been identified as an important positive feature in society, a strong interpretation of our findings might suggest policies should opt for allocating resources to women instead of men, when faced with the choice. Nevertheless, the results presented here remain too preliminary to infer strong policy conclusions and further research is needed to better identify underlying dynamics and to confirm our findings in related settings.

References

Alesina, A. and Fuchs-Schündeln, N. (2007), 'Good-bye Lenin (or not?): The effect of communism on people's preferences', *The American Economic Review* **97**(4), 1507–1528.

Alesina, A. and La Ferrara, E. (2002), 'Who trusts others?', *Journal of Public Economics* **85**(2), 207–234.

Algan, Y. and Cahuc, P. (2010), 'Inherited trust and growth', *The American Economic Review* **100**(5), 2060–2092.

Algan, Y. and Cahuc, P. (2014), 'Trust, well-being and growth: New evidence and policy implications', *Handbook of Economic Growth* pp. 49–120.

Azmat, G., Calsamiglia, C. and Iriberri, N. (2016), 'Gender differences in response to big stakes', *Journal of the European Economic Association* **14**(6), 1372–1400.

Berggren, N. and Bjørnskov, C. (2011), 'Is the importance of religion in daily life related to social trust? Cross-country and cross-state comparisons', *Journal of Economic Behavior & Organization* **80**(3), 459–480.

Blanton, H. and Jaccard, J. (2006), 'Arbitrary metrics in psychology', *American Psychologist* **61**(1), 27.

Brandt, M. J., Wetherell, G. and Henry, P. (2015), 'Changes in income predict change in social trust: A longitudinal analysis', *Political Psychology* **36**(6), 761–768.

Brosig-Koch, J., Helbach, C., Ockenfels, A. and Weimann, J. (2011), 'Still different after all these years: Solidarity behavior in East and West Germany', *Journal of Public Economics* **95**(11), 1373–1376.

Buchan, N. R., Croson, R. T. and Solnick, S. (2008), 'Trust and gender: An examination of behavior and beliefs in the investment game', *Journal of Economic Behavior & Organization* **68**(3), 466–476.

Chaudhuri, A., Paichayontvijit, T. and Shen, L. (2013), 'Gender differences in trust and trustworthiness: Individuals, single sex and mixed sex groups', *Journal of Economic Psychology* **34**, 181–194.

Chuah, S. H., Gächter, S., Hoffmann, R. and Tan, J. H. (2016), 'Religion, discrimination and trust across three cultures', *European Economic Review* **90**, 280–301.

Clark, A. K. and Eisenstein, M. A. (2013), 'Interpersonal trust: An age-period-cohort analysis revisited', *Social Science Research* **42**(2), 361–375.

Clingingsmith, D. (2016), 'Negative emotions, income, and welfare: Causal estimates from the PSID', *Journal of Economic Behavior & Organization* **130**, 1–19.

Croson, R. and Gneezy, U. (2009), 'Gender differences in preferences', *Journal of Economic Literature* **47**(2), 448–474.

Datta Gupta, N., Poulsen, A. and Villeval, M. C. (2005), 'Male and female competitive behavior-experimental evidence', *GATE Working Paper No. WP 05-12* .

de Jong, J., Schalk, R. and Croon, M. (2009), 'The role of trust in secure and insecure employment situations: A multiple-group analysis', *Economic and Industrial Democracy* **30**(4), 510–538.

Delhey, J. and Newton, K. (2003), 'Who trusts?: The origins of social trust in seven societies', *European Societies* **5**(2), 93–137.

Dieckmann, A., Grimm, V., Unfried, M., Utikal, V. and Valmasoni, L. (2016), 'On trust in honesty and volunteering among Europeans: Cross-country evidence on perceptions and behavior', *European Economic Review* **90**, 225–253.

Dietze, P. and Knowles, E. D. (2016), 'Social class and the motivational relevance of other human beings evidence from visual attention', *Psychological Science* **27**(11), 1517–1527.

Dincer, O. C. and Uslaner, E. M. (2010), 'Trust and growth', *Public Choice* **142**(1-2), 59–67.

Dittrich, M. (2015), 'Gender differences in trust and reciprocity: Evidence from a large-scale experiment with heterogeneous subjects', *Applied Economics* **47**(36), 3825–3838.

Dollar, D., Fisman, R. and Gatti, R. (2001), 'Are women really the "fairer" sex? Corruption and women in government', *Journal of Economic Behavior & Organization* **46**(4), 423–429.

Dunn, J. R. and Schweitzer, M. E. (2005), 'Feeling and believing: The influence of emotion on trust', *Journal of Personality and Social Psychology* **88**(5), 736–748.

Eckel, C. C. and Füllbrunn, S. (2015), 'Thar she blows? Gender, competition, and bubbles in experimental asset markets', *The American Economic Review* **105**(2), 906–20.

Eckel, C. C. and Grossman, P. J. (2008), 'Men, women and risk aversion: Experimental evidence', *Handbook of Experimental Economics Results* **1**, 1061–1073.

Fafchamps, M. (2006), 'Development and social capital', *The Journal of Development Studies* **42**(7), 1180–1198.

Fortin, N. M. (2008), 'The gender wage gap among young adults in the United States: The importance of money versus people', *Journal of Human Resources* **43**(4), 884–918.

Fukuyama, F. (1995), *Trust: The social virtues and the creation of prosperity*, Free press New York.

Giordano, G. N. and Lindström, M. (2011), 'Social capital and change in psychological health over time', *Social Science & Medicine* **72**(8), 1219–1227.

Gneezy, U., Niederle, M. and Rustichini, A. (2003), 'Performance in competitive environments: Gender differences', *The Quarterly Journal of Economics* **118**(3), 1049–1074.

Gneezy, U. and Rustichini, A. (2004*a*), 'Gender and competition at a young age', *American Economic Review Papers & Proceedings* **94**(2), 377–381.

Gneezy, U. and Rustichini, A. (2004*b*), 'Incentives, punishment and behavior', *Advances in Behavioral Economics* pp. 572–89.

Granovetter, M. S. (1973), 'The strength of weak ties', *American Journal of Sociology* **78**(6), 1360–1380.

Greene, W. (2004), 'The behaviour of the maximum likelihood estimator of limited dependent variable models in the presence of fixed effects', *The Econometrics Journal* **7**(1), 98–119.

Grove, W. A., Hussey, A. and Jetter, M. (2011), 'The gender pay gap beyond human capital: Heterogeneity in noncognitive skills and in labor market tastes', *Journal of Human Resources* **46**(4), 827–874.

Guiso, L., Sapienza, P. and Zingales, L. (2004), 'The role of social capital in financial development', *The American Economic Review* **94**(3), 526–556.

Guiso, L., Sapienza, P. and Zingales, L. (2006), 'Does culture affect economic outcomes?', *The Journal of Economic Perspectives* **20**(2), 23–48.

Hamamura, T. (2012), 'Social class predicts generalized trust but only in wealthy societies', *Journal of Cross-Cultural Psychology* **43**(3), 498–509.

Haselhuhn, M. P., Kennedy, J. A., Kray, L. J., Van Zant, A. B. and Schweitzer, M. E. (2015), 'Gender differences in trust dynamics: Women trust more than men following a trust violation', *Journal of Experimental Social Psychology* **56**, 104–109.

Hermes, K. and Poulsen, M. (2013), 'The intraurban geography of generalised trust in Sydney', *Environment and Planning A* **45**(2), 276–294.

Hersch, J. (1996), 'Smoking, seat belts, and other risky consumer decisions: Differences by gender and race', *Managerial and Decision Economics* **17**(5), 471–481.

Jen, M. H., Sund, E. R., Johnston, R. and Jones, K. (2010), 'Trustful societies, trustful individuals, and health: An analysis of self-rated health and social trust using the World Value Survey', *Health & Place* **16**(5), 1022–1029.

Jetter, M. and Walker, J. K. (2016), 'Gender in *Jeopardy!*: The role of opponent gender in high-stakes competition', *IZA Discussion Paper No. 9669* .

Jianakoplos, N. A. and Bernasek, A. (1998), 'Are women more risk averse?', *Economic Inquiry* **36**(4), 620–630.

Kahneman, D. and Deaton, A. (2010), 'High income improves evaluation of life but not emotional well-being', *Proceedings of the National Academy of Sciences* **107**(38), 16489–16493.

Knack, S. (2002), 'Social capital and the quality of government: Evidence from the States', *American Journal of Political Science* pp. 772–785.

Knack, S. and Keefer, P. (1997), 'Does social capital have an economic payoff? A cross-country investigation', *The Quarterly Journal of Economics* **112**(4), 1251–1288.

Korndörfer, M., Egloff, B. and Schmukle, S. C. (2015), 'A large scale test of the effect of social class on prosocial behavior', *PLoS One* **10**(7).

Kouchaki, M., Smith-Crowe, K., Brief, A. P. and Sousa, C. (2013), 'Seeing green: Mere exposure to money triggers a business decision frame and unethical outcomes', *Organizational Behavior and Human Decision Processes* **121**(1), 53–61.

Kraus, M., Côté, S. and Keltner, D. (2010), 'Social class, contextualism, and empathic accuracy.', *Psychological Science* **21**(11), 1716.

Kraus, M. W. and Keltner, D. (2013), 'Social class rank, essentialism, and punitive judgment', *Journal of Personality and Social Psychology* **105**(2), 247.

La Porta, R., Lopez-de Silanes, F., Shleifer, A. and Vishny, R. W. (1997), 'Trust in large organizations', *The American Economic Review* **87**(2), 333.

Leigh, A. (2006), 'Trust, inequality and ethnic heterogeneity', *Economic Record* **82**(258), 268–280.

McCrae, R. R. and John, O. P. (1992), 'An introduction to the five-factor model and its applications', *Journal of Personality* **60**(2), 175–215.

Miguel, E., Gertler, P. and Levine, D. I. (2005), 'Does social capital promote industrialization? Evidence from a rapid industrializer', *Review of Economics and Statistics* **87**(4), 754–762.

Myers, D. C. and Tingley, D. (2016), 'The influence of emotion on trust', *Political Analysis* **24**, 492–500.

Niederle, M. and Vesterlund, L. (2007), 'Do women shy away from competition? Do men compete too much?', *The Quarterly Journal of Economics* **122**(3), 1067–1101.

Nunn, N. and Wantchekon, L. (2011), 'The slave trade and the origins of mistrust in Africa', *The American Economic Review* **101**(7), 3221–3252.

Piff, P. K. (2014), 'Wealth and the inflated self: Class, entitlement, and narcissism', *Personality and Social Psychology Bulletin* **40**(1), 34–43.

Piff, P. K., Kraus, M. W., Côté, S., Cheng, B. H. and Keltner, D. (2010), 'Having less, giving more: The influence of social class on prosocial behavior', *Journal of Personality and Social Psychology* **99**(5), 771.

Piff, P. K., Stancato, D. M., Côté, S., Mendoza-Denton, R. and Keltner, D. (2012), 'Higher social class predicts increased unethical behavior', *Proceedings of the National Academy of Sciences* **109**(11), 4086–4091.

Putnam, R. D., Leonardi, R. and Nanetti, R. Y. (1994), *Making democracy work: Civic traditions in modern Italy*, Princeton University Press.

Rau, H. A. (2011), 'Trust and trustworthiness: A survey of gender differences', *Forthcoming in: Psychology of Gender Differences* .

Ricciardi, M. (2013), 'A 'rigged' game of Monopoly reveals how feeling wealthy changes our behavior', http://planetsave.com. Accessed: 2016-11-19.

Rocco, L., Fumagalli, E. and Suhrcke, M. (2014), 'From social capital to health–and back', *Health Economics* **23**(5), 586–605.

Rohner, D., Thoenig, M. and Zilibotti, F. (2013), 'War signals: A theory of trade, trust, and conflict', *The Review of Economic Studies* **80**(3), 1114–1147.

Schill, T., Toves, C. and Ramanaiah, N. V. (1980), 'Interpersonal trust and coping with stress', *Psychological Reports* .

Schneider, I. K., Konijn, E. A., Righetti, F. and Rusbult, C. E. (2011), 'A healthy dose of trust: The relationship between interpersonal trust and health', *Personal Relationships* **18**(4), 668–676.

Sutter, M. and Kocher, M. G. (2007), 'Trust and trustworthiness across different age groups', *Games and Economic Behavior* **59**(2), 364–382.

Swamy, A., Knack, S., Lee, Y. and Azfar, O. (2001), 'Gender and corruption', *Journal of Development Economics* **64**(1), 25.

Tabellini, G. (2010), 'Culture and institutions: Economic development in the regions of Europe', *Journal of the European Economic Association* **8**(4), 677–716.

Uslaner, E. M. (2016), Who do you trust?, *in* 'Interdisciplinary Perspectives on Trust', Springer, pp. 71–83.

Vandegrift, D. and Brown, P. (2005), 'Gender differences in the use of high-variance strategies in tournament competition', *The Journal of Socio-Economics* **34**(6), 834–849.

Viitanen, T. et al. (2014), 'Parental divorce and other determinants of interpersonal trust: Evidence from HILDA panel data', *Australian Journal of Labour Economics* **17**(1), 35.

Wang, L. and Gordon, P. (2011), 'Trust and institutions: A multilevel analysis', *The Journal of Socio-Economics* **40**(5), 583–593.

Watson, N., Wooden, M., Horn, S., Parr, N., Breusch, T., Gray, E., Wilkins, R., Headey, B., Cai, L. and Kalb, G. (2004), 'The Household, Income and Labour Dynamics in Australia (hilda) survey', *Australian Journal of Labour Economics* .

Yu, Z. and Chen, L. (2016), 'Income and well-being: Relative income and absolute income weaken negative emotion, but only relative income improves positive emotion', *Frontiers in Psychology* **7**.

Zak, P. and Knack, S. (2001), 'Trust and growth', *Economic Journal* **111**(470), 295–321.

Appendix

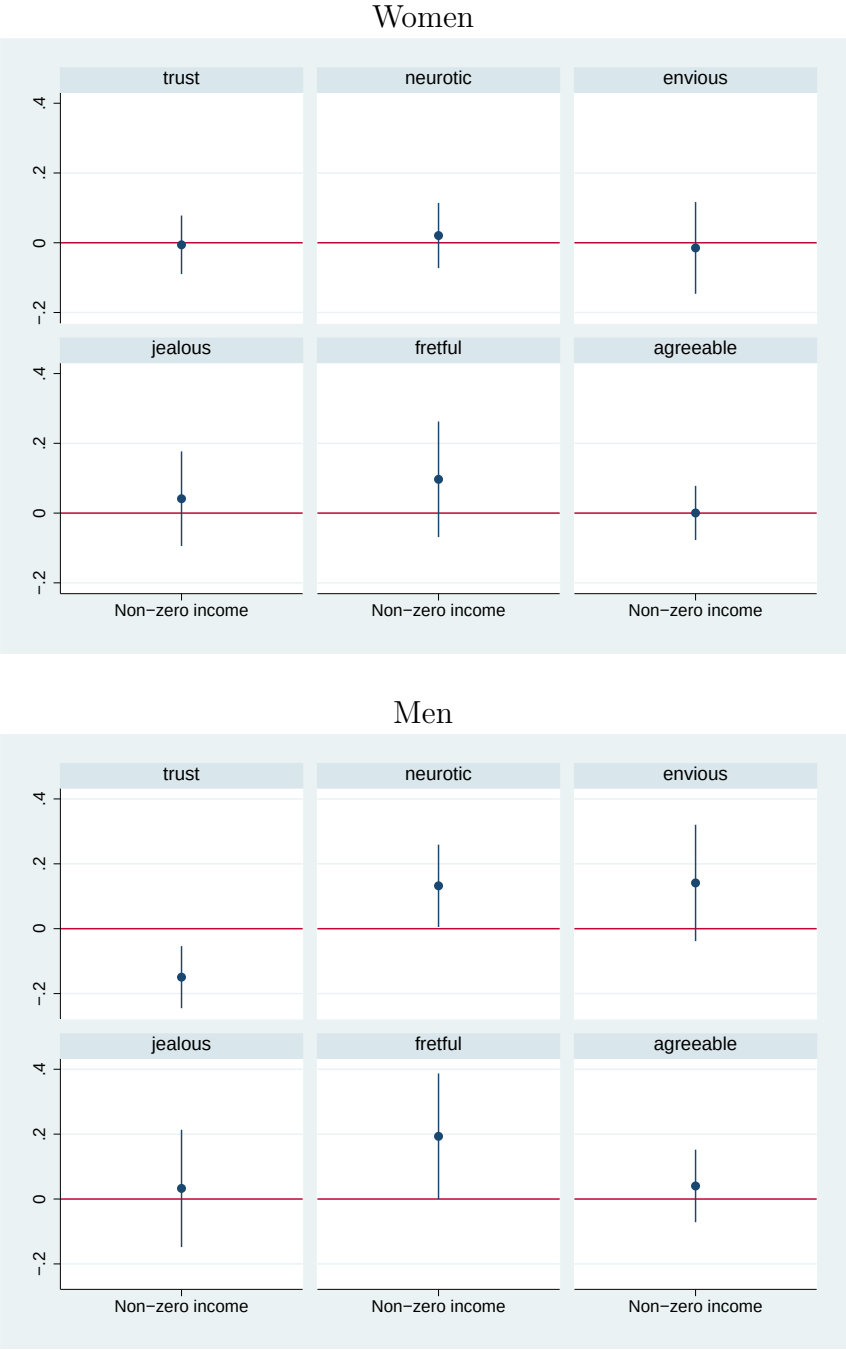

Figure A1: Respective coefficient of *non − zero income* derived from estimating behavioral attitudes in gender-specific subsamples. All control variables are included in a fixed effects model on the individual level (a measure for the number of children, binary indicators for education statuses and civil status, as well as wave-fixed effects).

Table A1: Summary statistics for additional variables.

Variable (N)	Mean (Std. Dev.)	Min. (Max.)	Variable description
Neuroticism (37,988)	2.81 (1.09)	1 (7)	Neuroticism (reverse of emotional stability), increasing from 1 to 7
Envy (37,781)	2.66 (1.43)	1 (7)	Envious, increasing from 1 to 7
Jealousy (37,745)	2.38 (1.47)	1 (7)	Jealous, increasing from 1 to 7
Fretfulness (37,466)	2.63 (1.50)	1 (7)	Fretful, increasing from 1 to 7
Agreeableness (38,052)	5.39 (0.94)	1 (7)	Agreeableness, increasing from 1 to 7