Fairness Dominating Human Behavior in International Ultimatum Bargaining Game
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Especially in South Africa

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ABSTRACT

In 2013, we conducted an international field experiment on human behavior in South Africa and Germany with more than 1,100 participants. For this Ultimatum Bargaining Game, an inheritance of 12,000 ZAR (1,000 EUR) had to be split up between three beneficiaries. The beneficiaries inherited different roles: Andy had the right to propose the distribution of the inheritance. Berta could either accept or reject the proposal. Carlos had no rights at all. The role as proposer was auctioned off. As proposer, a large majority opted for an equal split. This was followed by the two Power Coalitions with 19 % of the votes. Less than 4 % opted for the proposal of Homo Oeconomicus (10,000 | 1,000 | 1,000 ZAR). Statistically significant differences in behavior exist between Germans and South Africans. In general, inequality aversion is much stronger among South Africans. While two thirds of South Africans propose an equal split, less than half of the Germans do. Various characteristics of the participants, like cultural background, rationality, income, gender as well as economic education are found to significantly determine the behavior as proposer.

Ultimatum bargaining game, experimental economics, fairness and economic rationality
JEL D01, D63, C99

INTRODUCTION

In December 2013, we conducted an international research project on human behavior and decision making. We invited all students and employees of Stellenbosch University (South Africa) and the University of Applied Sciences Kaiserslautern (Germany) through the internet as well as the general public via social networks and two regional newspapers in Germany to participate in a so-called Ultimatum Bargaining Game (UBG).[2] For a better reflection of the diversity of the South African population, we also conducted field experiments in the township of Kayamandi as well as in the Coloured neighborhood of Idasvallei - both belongin to the municipality of Stellenbosch.[3]

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[2] In addition to students & employees of Stellenbosch University (30,000) and the University of Applied Sciences Kaiserslautern (6,000), individual classes at the University of Western Cape (South Africa), University of Cape Town (South Africa) and the University of the Incarnate Word (Texas, United States) had been invited. The German regional newspapers were Rheinpfalz and Pfälzischer Merkur (both Rhineland-Palatinate) with circulations of app. 5,000 each.

[3] Two field workers were trained to conduct the survey in their neighborhood. For Kayamandi, the questionnaire had been translated into Xhosa. The project has been approved by two ethic committees of Stellenbosch University, South Africa. Currencies used in the paper: DM - (previous) German Mark; EUR - Euro, USD - US Dollar, and ZAR - South African Rand.

Three randomly selected participants slipped into the roles of the beneficiaries – **A**ndy, **B**erta and **C**arlos. Due to the will of aunt Louise, the inheritance is to be divided up according to the following rules: **A**ndy has the right to propose the distribution of the 12,000 ZAR. **B**erta can accept or reject this proposal. She therefore has the right to veto **A**ndy's proposal. If **B**erta accepts **A**ndy's proposal, the total amount will be split according to the proposed distribution. If **B**erta rejects **A**ndy's proposal, none of the three will receive any money. It will all go to charity, or like in our experiment, three other beneficiaries are to be selected randomly. **C**arlos can neither influence the proposal of distribution nor its acceptance or rejection.[4] By introducing a third player, the responder (**B**erta) reveals how she cares not only for her own well-being, but also for the well-being of our dummy player (**C**arlos).[5] In our basic version of the experiment, **A**ndy's role as proposer is auctioned off.[6] All participants were asked to place a bid for their right of proposing.[7]

This basic structure of the experiment is extended by including a second version, in which the role of the proposer is to be selected randomly – only after – the proposer decided on his proposal. The division of the actual funds is based on the basic version of our three-person *Ultimatum Bargaining Game*.

We were hoping that our research would provide answers to the following questions: (1.) What role does fairness and rationality play, when people got to make a decision on splitting up a considerable amount of real funds? (2.) How do participants evaluate different kind of proposals – again taking fairness and rationality into account? (3.) Are there significant differences in human behavior between South Africans and (predominantly) Germans?

Basic microeconomic theory in decision making usually assumes that economic agents behave rationally – no matter if they are employees, managers, politicians or students. The concept of a rational decision maker is called *Homo Oeconomicus*. The decision maker aims to maximize his financial wealth or personal utility.[8] Though, past economic experiments – in

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[4] The general set-up of the experiment is based on Güth et al. (2003). Additional variations of the Ultimatum Bargaining Games can be found in Holt (2007).

[5] See Güth et al. (2007:464) for a short discussion on confirming the theory of inequality aversion in the case of high rejection rates by **B**erta through the introduction of a dummy player. Though, the personal presence of a third party seems to exert only a limited influence on the monetary allocation that the proposer **A**ndy suggests for this third party (Sääksvuori/Ramalingam 2015: 23).

[6] Andreoni/Blanchard (2006) employed a tournament-style variation of a basic ultimatum game instead of an auction.

[7] In *Appendix I*, we show how the inheritance of 12,000 ZAR was actually split up.

[8] The closest living "relatives" to humans - chimpanzees - seem to be a good example for self-interested rational maximizers. When it comes to food neither are they sensitive to fairness nor do they hardly reject very low offers (Jensen et al. 2007).

the field and in the laboratory – have shown that many participants behave in a reciprocal way (*Homo Reciprocans*). They honor friendly behavior and punish non-cooperative behavior. Often, they are even willing to accept financial losses when punishing non-cooperative behavior.[9] In our experiment, punishment is reflected by the loss of their proposed share of inheritance.

After an introduction on *Ultimatum Bargaining Games* with their theoretical and empirical background, we derive a set of hypothesis from previous findings. Chapter 2 sums up the characteristics of our participants. This is followed by basic results on the choice of proposals and their acceptances ratios, which are presented in Chapter 3. In Chapter 4, we discuss the different perceptions of our South African versus German participants. These perceptions seem to level off, the moment the proposer is randomly selected (Chapter 5). By estimating maximum likelihood probit regression models, we filter out the determinants of proposing and accepting the **Homo Oeconomicus** proposal (Chapter 6). Our main findings are summarized and discussed afterwards.

1. ULTIMATUM BARGAINING – INTRODUCTION AND SOME EMPIRICAL RESULTS

The *original Ultimatum Bargaining Game* consists of two subjects that are assigned the role of proposer and receiver. Both of them bargain over a certain sum of money (e.g. 10 USD). The proposer offers a division of this amount of money the responder can either accept the proposal or reject it. If the responder rejects it, then both subjects are left with a payoff of zero. Assuming that both decision makers are self-interested in the sense that they prefer more money to less or any amount to nothing at all, one would expect the following behavior:

> The responder should accept all positive offers – no matter how small they are.
> The proposer – keeping the behavior of the responder in mind – is going to
> propose the smallest monetary offer possible.

In the case of the above example of 10 USD and discrete sizes of US-Dollar offers, the proposer should offer a split of 9:1 USD (proposer : responder), which the responder would accept willingly. Generally, in almost all kind of experiments – in the field, the laboratory and the classroom[10] – as well as in different cultural and economic environments, the

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[9] In a study on 17 small-scale societies in 12 countries with a wide variety of economic and cultural conditions Henrich et al. (2001: Table 1) showed that this behavior is even true for half of these economically poor societies. Rejection rates in industrial countries are usually higher.
[10] Holt (2007: CE-27) proposes a simple classroom ultimatum game.

proposer offers significantly higher monetary awards. The bulk of proposers in industrial countries offer 40-50 percent of stake size. In field experiments in 17 small-scale societies, all mean offers were within a range of 26 to 58 percent (Henrich et al. 2001: 74).[11] While the responder in industrial societies rejects offers below 20-30 percent with a probability of around 0.5. The rejection of positive minor offers indicates that subjects view them as unfair (Fehr/Gächter 2000: 161). Interestingly, in some of the small-scale societies rejection rates were "extremely rare".[12] The 70 % haircut on Greek government debt for private investors had been a prerequisite for the 2nd financial aid package in 2012. According to Erber (2012) it resembles a macroeconomic ultimatum bargaining game almost perfectly.

One simple variation of the ultimatum bargaining game is the *dictator game*. As the responder has no say at all, the proposer (= dictator) should keep all the money at stake. Experiments show that the offers by the proposer are heterogeneous and usually positive in value (on average 2.4 USD, for a stake of 10 USD). Though, offers in dictator games are considerably less than in ultimatum games (average of 4.7 USD). Proposers seem to care - a bit at least - about equity. Since offers are higher in ultimatum experiments, the responders' concern for equity seems to drive the larger offers in UBGs.[13] As proposers have strong expectations in the responders' beliefs of fairness, they are tilted towards proposing (near) equal splits (Bahry/Wilson 2006: 51).

Fehr et al. (2006: 1913) extended the dictator game by introducing a third party with no rights attached. The proposer (dictator) can choose three alternative options for payoffs. While his payoff remains fixed, the payoffs for the two other parties vary. The dictator can redistribute income from the richer party to the poorer one, thereby reducing (but not eliminating!) inequality. The redistribution comes with a loss of efficiency, as total payoff drops when reallocation is enforced. They implement two different treatments, first one in which the proposer receives a middle income, and a second one in which he is the poorest of the three parties. The authors find that dictators studying economics and management were significantly less inequality averse than non-economists. On the other hand, female proposers

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[11] E.g. in two multi-ethnic Russian republics the offers were on average 47 percent of total. The total at stake is roughly equal to a day's wage (Bahry/Wilson 2006: 44).

[12] Henrich et al. (2001: 75) as well as for industrial countries: Forsythe et al. (1994) in Bolten/Ockenfels (2000: 169). A thorough discussion on the driving forces of generous behavior like altruism, concern for fairness or fear of reciprocity is provided by Dixit/Nalebuff (2010: 49ff).

[13] Bolten/Ockenfels (2000: 169) refer to numerical results of a previous study by Forsythe et al. (1994); the median offers in the cited experiment were 2 USD (dictator) and 5 USD (ultimatum bargaining).

rather redistribute payoffs towards a more equal allocation; political alignment had no influence at all.[14]

Similarly, one can also extend the two-person ultimatum game by integrating a third party that is truly powerless. In our case, it is **C**arlos that forces the proposer as well as the responder to consider additional social motives when formulating their decision. The *three-person ultimatum game* helps us to analyze how the responder's decision - accepting vs. rejecting a proposal - depends on his own share and on the share allocated to the "hostage" **C**arlos.[15] In this case the relative payoffs are focused on. A participant's utility declines significantly as monetary payoffs become sufficiently inequitable. Though, the distaste is larger for disadvantageous inequality than advantageous inequality (Fehr/Schmidt 1999). As inequality rises utility declines, but it drops faster when the responder receives a smaller portion of the pie. In a small scale UBG experiment with a third party receiving separate payoffs, responders were concerned with disadvantageous inequality. Their rejection rate to an offer of 44 % of total pie rose up to 20 % when the "hostage" was to be rewarded more than twice the amount the responder received from the proposer.[16]

At the same time the proposer is also influenced by the relative payoff share. In their Equity Reciprocity Competition (ERC) model Bolton/Ockenfels (2000) suggest that the proposer will offer one third of the pie to the responder, and a significantly smaller amount to the powerless third party. Besides his own payoff, the proposer cares for his relative share compared to the two other parties combined. And he does not expect a rejection by the responder when he only offers a small share to the powerless third party (Güth et al. 2007: 451).

Kagel/Wolfe (2001) extended the experiment by offering different positive as well as negative consolation prizes to the powerless third party, if the responder rejects the payoff proposal. Even considerable positive consolation prizes, which thereby lead to a disadvantageous inequality for the responder, tend not to influence his or her rejection rate. Negative consolation prizes also had no significant impact on rejection rates. Overall, inequality resulting from an intentional action by a proposer's low offer is treated differently

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[14] For the treatment in which the proposer remains the poorest person of the three, economists strive even harder for efficiency (Fehr et al. 2006: 1915).

[15] Güth et al. 2007: 450. The powerless third party is hostage to the decisions taken by the proposer as well as the responder (Shupp et al. 2006: 400).

[16] Introducing a powerless third party reduced rejection rates to 3-7 % as long as the extra payoffs to the "hostage" were approximately in line with the payoffs for the respondent. Shupp et al. (2006: 404, 406).

from unintentional income inequality between the responder and the "hostage" as a result of rejecting the offer.[17]

In their national newspaper experiment (Germany) on a three-person *ultimatum bargaining game* Güth et al. (2007: 453) limited the number of possible proposals for their total amount of 1,200 DM to eighteen, where

> $a \in \{0, 200 \text{ DM}, 400 \text{ DM}, 600 \text{ DM}, 800 \text{ DM}, 1,000 \text{ DM}\}$,
>
> $b, c \in \{100 \text{ DM}, 200 \text{ DM}, 300 \text{ DM}, 500 \text{ DM}, 600 \text{ DM}\}$, and
>
> A proposes a vector (a, b, c) with $a + b + c = 1,200 \text{ DM}$.

They received 4,869 valid submissions, which was about 5/1,000 % of total readers. **Equal Split** was the modal offer, with 57 % of all offers. The second and third most frequent proposals were the **Power Coalition** (600 DM, 500 DM, 100 DM) with 16 % and the **Homo Oeconomicus** (1,000 DM, 100 DM, 100 DM) with 8 % respectively. At the same time, almost all responders accepted the **Equal Split**, dropping to 2/3 for the **Power Coalition** and slightly more than 1/5 for **Homo Oeconomicus**. In their econometric analysis, Güth et al. (2007: 459f) showed that female participants chose the **Equal Split** significantly more often than males, older subjects accepted fewer proposals, whereas academic professionals as well as participants using the internet had higher acceptance probabilities.[18]

In 2006, we conducted a newspaper & internet experiment for 12 (hypothetical) tickets to one of the football matches of the FIFA-World Cup in Germany. It resembled the set-up of the three-person UBG by Güth et al. (2007).[19] In addition to the previous study, we asked our participants questions capturing their cognitive skills ("intelligence"). Only as proposers, did economists and male participants behave differently than non-economists and women. Men, economists and more intelligent participants offered more selfish proposals. On the other hand, female responders accepted the most self-centered payoff structure (**Homo Oeconomicus**) more often than men (Piazolo 2007: Tab. 5, 6).

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[17] In their experiment, Equal Split was the modal offer - with slightly less than a third of all 680 offers proposed (Kagel/Wolfe 2001: 210, 216).

[18] 61 % of all valid submissions of the 2001 newspaper experiment were provided through the internet (Güth et al. 2007: 454).

[19] One ticket had a monetary value of EUR 10 - adding up to a total of EUR 120. Out of 381 participants, we randomly selected nine to actually play the game in three separate groups (Piazolo 2007).

Based on the findings of previous empirical studies as well as on the Equity Reciprocity Competition (ERC) model of Bolton/Ockenfels (2000), we derive the following hypotheses for our three-person *Ultimatum Bargaining Game*.

Hypothesis # 1

Due to inequality aversion, we expect most of the proposers to go for an **Equal Split**. This inequality aversion might stem from their personal views.[20] But, it might also be based on their expectation of reciprocal behavior by equality prone responders. The latter will lead to relative low acceptance ratios for the self-interested, but rational **Homo Oeconomicus** split up - in our case: ZAR 10,000 (**A**ndy) | ZAR 1,000 (**B**erta) | ZAR 1.000 (**C**arlos). Essentially, every responder will accept the **Equal Split**.

Hypothesis # 2

On average, we expect our proposers to take the largest share of the total payoffs for themselves, while the responder is offered significantly more than the powerless third party. By increasing the offer to the respondent, while reducing the payoff to the "hostage", the proposer is expected to successfully lure the respondent in accepting a non-equal distribution - like the **Power Coalition** of ZAR 6,000 (**A**ndy) | ZAR 5,000 (**B**erta) | ZAR 1,000 (**C**arlos).

Hypothesis # 3a & b

The responder on the other hand is expected to generally accept offer of a third of the pie or more - in our case this is a payoff of "≥ ZAR 4,000" to **B**erta.[21] As the offer drops to half of the social norm (1/6) or below, almost all responders will reject the offer.[22]

Hypothesis # 4

Economists or Business majors are different in their behavior than the general population. They behave more in line with the concept of a rational decision maker (**Homo Oeconomicus**) trying to maximize financial wealth. As the proposer (**A**ndy), they would keep more for themselves - while as the responder (**B**erta), they would accept lower offers.[23]

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[20] In Bolton/Ockenfels (2006: 1909), German students showed a much greater demand for equity than social efficiency in a three person distribution experiment.

[21] 1/3 is based on the model by Bolten/Ockenfels (1998) in: Kagel/Wolfe (2001: 206).

[22] Kagel/Wolfe (2001: 210). In general, offers below 30 % of the pie, tend to be rejected by a majority of responders time in developed countries. In our experiment this translates to payoffs of 1,000 to 3,000 ZAR for **B**erta.

[23] See Carter/Irons (1991: 173f.). In their study on college students, they showed that "economists are born, not made".

Hypothesis # 5

The German economic system is based on the so-called "Soziale Marktwirtschaft" (social market economy). It is a rule-based market economy with a strong state or government that intentionally manages the economy in accordance to open and competitive markets as well as with social priorities. When there is market failure, there is social compensation.[24] In addition, the tax system is favoring the redistribution of income. In South Africa the economic system seems to be even more state-oriented in nature - with severe government interference. Due to the legacy of apartheid, redistribution of income between & within groups of population is in itself a primary goal of economic policy. Keeping this in mind, we expect South African participants to be less self-interested than their German counterparts. In a European setting with Sweden (more equality-oriented) as a counterpart, just as expected - the Swedish students were more inequality averse or fairness prone than German students.[25] Since we asked for population characteristics in the South African context (Afrikaaner, Black, Coloured and Europeans), we expect that these reflect cultural differences and influence economic decisions as well.

Hypothesis # 6a-e

We expect some of the socio-demographic factors to influence the decision taken - either as proposer or as responder.

- *Gender* - female participants tend to be more inequality averse - thereby, offering more and rejecting smaller amounts more easily.

- *Age* - older participants also seem to be more inequality averse. The older, sometimes post-war generation might have a stronger moral obligation to share equally. In addition, wealth increases with age, therefore the stakes at hand are relatively minor. Therefore, rejecting a seemingly unfair payoff structure financially does not hurt them much (Güth et al. 2007: 465).[26]

- *Students* - there is some empirical indication by Güth et al. (2007: 463) that the acceptances rates for the **Power Coalition** as well as **Homo Oeconomicus** are higher for students than non-students.

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[24] Underprivileged are supported by state institutions through welfare and education policy. For a more in depth discussion of the German Social Market Economy see Konrad-Adenauer-Stiftung (2009) and Goldschmid/Wohlgemut (2008).

[25] Braun/Kohlmorgen (2010) in: Braun et al. (2011: 511).

[26] Though, the size of the pie (stake) often does not influence the experimental results of UBGs (in Fehr/Gächter 2000: 162).

- *Intelligence* - we expect participants with more pronounced cognitive skills, based on the simple Cognitive Reflection Test (Shane 2005),[27] to better understand the concept of rationality and therefore vote more often as proposers for the self-interested **Homo Oeconomicus**.

- *Religious affiliation* - Christian values on equality - especially strong for a catholic background - could lead to a more pronounced inequality aversion. Empirical results of our previous study in a US, though predominantly Hispanic setting seems to indicate this (Piazolo 2010: 322).

In our recent experiment we asked the participants on assessing their *risk proneness* as well as their willingness to pay for the role of the proposer **A**ndy. We assume that participants willing to take more risks would go for the **Homo Oeconomicus** - thereby, gambling for the highest stake at hand (ZAR10,000). Since the role of the proposer was auctioned off, higher *bids* - half of which were deducted from the payoff for **A**ndy only - should be submitted by self-interested participants. In addition, the participants had to make their decisions without knowing the roles they were deciding for in advance. Due to the *random assignment of roles*, we expected the likelihood of **Equal Split** as proposed by **A**ndy to rise significantly. At same instance, acceptance ratios for all proposals should increase as the proposer did not know in advance that he or she is making a proposal (ex post random selection process).

Similar to Güth et al. (2007), our own experiment is set outside the laboratory and classroom. The appealing feature of an experiment run in public via newspaper and the internet is that one can gather a more diverse and larger subject pool. The participants vary by several socio-demographic factors like age, gender, profession and occupation - all of which might influence the distribution of inequality aversion. There are costs attached to a public experiment - the most obvious is the selection bias depending on who we were able to address through the newspaper articles in two German regional outlets (readership of app. 10,000) and the internet - mainly university associates (staff, students as well as their friends and relatives) of app. 38,000. Though, one can anticipate self-selection also for lab experiments, as students are asked to participate on a voluntary base. There might be a critical notion that with lab experiments, the experiment is not known in advance, while our experiment is published in detail beforehand. Since we expected participation to be greatly discouraged, if no one knew what we (they) were up to, we accepted the drawback on the

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[27] Three questions concerning logic and mathematical thinking. If all questions are answered correctly, the participant scores 3. For no correct answer the score is 0.

control of the experiment.[28] For reasons of comparison, we used exactly the same vector of possible payoff variations as Güth et al. (2007). Also, as stakes seem to matter (Andersen et al. 2011: 3428), we stuck with relatively high payoffs for a lucky few ones by introducing a lottery for determining three beneficiaries. For South Africans, the maximum payoff of ZAR 10,000 represents almost half of annual income for the lowest income quintile.[29]

2. CHARACTERISTICS OF OUR PARTICIPANTS

A total of 1,138 individuals participated in the 2013 Ultimatum Bargaining Game. This is the highest rate of participation for our internet experiments so far. The majority of participants (69 %) are South Africans - most of them members of Stellenbosch University, more than a quarter are Germans (*Figure 1*). The remaining five percent are mainly from Austria, Switzerland and the United States.

Figure 1
Regional distribution of participants (n = 1,138)

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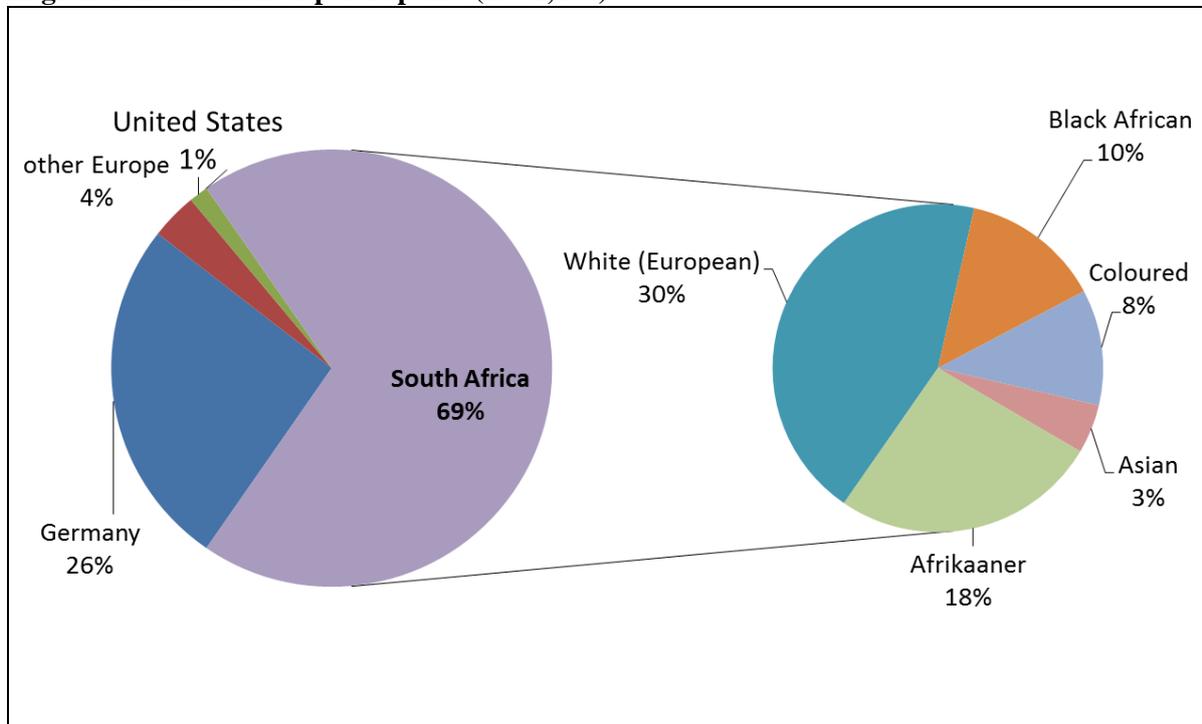
[28] In addition, Güth et al. (2007: 452) mentioned the inviting - non-neutral - way the experiment is presented in the newspaper. List (2011) presents the spectrum of experiments in economics from laboratory to artefactual and natural field experiments. He discusses the drawbacks as well as the strengths of field experiments.
[29] The highest possible payoff for **A**ndy was ZAR 10,000. This represents app. the equivalent to almost three weeks of income at the minimum wage level in Germany (EUR 8.50 per hour, depending on the branch of industry). In 2006, in total EUR 120 were at stake (Piazolo 2007) - therefore, we expect a higher participation in the 2013 experiment.

On average, the participants are 28 years of age – the youngest being 8, the oldest 73. Due to the fact that roughly 60 percent of our participants are still studying at a university, median age is in the mid-twenties. One third of all participants have a background in business or economics (*Table 1*). Compared with previous studies, the share of female participants is relatively high (42 %).

Table 1
Characteristics of participants

n = 1,138						Percentage
Age	Mode	21	**Education**	Ph.D.		5.2
	Median	**24**		University Master		16.2
	Mean	28.3		University of Applied Sciences degree		3.6
	Range (73 - 8)	65 years		Bachelor		26.4
	Standard deviation	10.6 years		Community College		3.2
		Percentage		**High School Diploma**		**39.9**
Gender	Female	42.2		Middle School		4.4
	Male	**57.8**		No degree		1.2
Occupation	Self-employed	3.3	**Field of Study**	**Management/Economics**		**34.3**
	Government	4.0		Engineering		15.7
	White collar worker	22.1		Natural Sciences		16.3
	Blue collar worker	3.9		Other		24.5
	University student	**60.9**		Non-University		9.2
	Ín school	3.3				
	No employment	2.6				

Coding: Occupation - Self-employed (6) to not employed (0.5); Education - Ph.D. (7) to No degree (0.5); Field of Study - Management/Economics (4) to Non-University (0.5).

There are several differences in characteristics of participants from **Europe (Germany)**[30] and **South Africa**: less females in Europe (33 % vs. 46 %), a larger share of highly educated participants in Europe (26 % with Master degrees & Ph.D.s vs. 19 % for South Africa) as well as a larger share of participants with a background in business & economics in Europe (47 % vs. 29 %). On the other hand, two thirds of our South African participants were students, while this was only the case for 47 % of the Europeans. The participants were also asked to describe their personal risk preference as well as their religious affiliation. Average South Africans are more religious, while there are no obvious differences in risk proneness or aversion. [31] Though, Europeans out-performed in the cognitive reflection test. They answered two out of three questions correctly, while South Africans were able to answer 1.4 questions on average.

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[30] 90 % of the 334 European participants are German residents; 8.8 % are from Austria and Switzerland - also German speaking.

[31] Shane (2005). All participants should describe their risk proneness on a scale of 1 (risk averse) to 5 (risk prone) as well as for their religious affiliation (from 1 = atheist to 5 = active member of a denomination). On average, South Africans were statistically significant more religious than Europeans (3.7 vs. 2.4).

More than two thirds of the South African participants classified themselves as White (European & Afrikaaner), whereas Coloureds and Black Africans (Xhosa, Zulu) were almost evenly represented. The distribution in population groups closely resembles the current membership structure of Stellenbosch University (students & employees). Due to persistent differences in educational attainment and the household's unequal income distribution, studying at Stellenbosch University with annual tuition fees of on average 36,000 ZAR (2,800 EUR) is often inaccessible for the large majority of South African High School graduates. As Afrikaans is still the major mode of lecturing in most of the Bachelor programs, the language proficiency provides another stepping stone into Stellenbosch University. Based on the population characteristics of our South African participants their self-reporting on income levels is strongly skewed towards the highest quintile (see *Appendix II*).

Compared to our previous study (Piazolo 2007 & Piazolo 2010) for our European (German) participants there are no major difference in the characteristics of participants. There were just slightly less student (47 %) participants. Half of the subjects were economics or management majors. In Güth et al. (2007) the participants were significantly older (mean age 40.6), with a substantial share of non-academics (24.2 %) and only 18.5 % being university students. Almost all public newspaper and internet experiments attract men more often than women - usually around and above 2/3 of all participants are male.[32] Compared to previous studies, the distinct feature of our study is its focus on South African and German participants as well as on the population background of South Africans.

3. LIST OF PROPOSALS AND DECISION MAKING

Andy and **B**erta had to choose from 18 individual proposals presented in *Table 2*. First, each participant had to select one proposal in his or her role as **A**ndy. Afterwards, they slipped into the role of **B**erta. Here, they had to decide to either accept or reject each of the different 18 proposals - columns 9 & 10. In the last column to the right, we used the acceptance rates for each proposal to calculate the expected payoff for **A**ndy. For putting our results into perspective, we added the information on the main findings of three previous studies on the left hand side of *Table 2*.

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[32] In Güth et al. (2007) 68.4 % as well as in Piazolo (2007, 2009) these came up to 71.9 % and 67.2 % respectively.

Table 2
Choice of proposals and acceptance ratios (role known)

| Güth et al. (2007) n = 4,849	Piazolo (2007) n = 381	Piazolo (2010) n = 509	International Internet Experiment on 12,000 ZAR		proposals for split up			Berta's reaction		expected Payoff for
			n = 1,139	Andy's Choice	Andy	Berta	Carlos	accept	reject	Andy (ZAR)
				0.26%	0	6,000	6,000	63%	37%	0
				0	2,000	4,000	6,000	50%	50%	1,000
				0.53%	2,000	5,000	5,000	67%	33%	1,340
				0.18%	2,000	6,000	4,000	66%	34%	1,320
				0	4,000	2,000	6,000	23%	77%	920
				0.09%	4,000	3,000	5,000	34%	66%	1,360
56.8% (97%)	42% (97%)	42% (95%)	**Equal Split**	61.25%	4,000	4,000	4,000	96%	4%	3,840
				5.01%	4,000	5,000	3,000	72%	28%	2,880
				2.55%	4,000	6,000	2,000	64%	36%	2,560
				0	6,000	1,000	5,000	16%	84%	960
				0.26%	6,000	2,000	4,000	19%	81%	1,140
				3.51%	6,000	3,000	3,000	34%	66%	2,040
				8.52%	6,000	4,000	2,000	48%	52%	2,880
15.9% (64%)	12% (92%)	17.9% (69%)	**Power coalition**	10.90%	6,000	5,000	1,000	50%	50%	3,000
				0	8,000	1,000	3,000	14%	86%	1,120
				0.35%	8,000	2,000	2,000	19%	81%	1,520
				2.99%	8,000	3,000	1,000	23%	77%	1,840
8.3% (22%)	14% (39%)	8.7% (25%)	**Homo Oeconomicus**	3.60%	10,000	1,000	1,000	14%	86%	1,400
(Acceptance ratios of Berta)										
			Average inheritance per person in ZAR		4,278	4,037	3,685			
Participants mainly from GER | GER | GER & US			*Average Bid for Andy*		2,750					
			Median Bid for Andy		1,870					

Andy – the proposer (all participants)

Most of our participants (61 %, fourth column in *Table 2*) propose a fair and **Equal Split** of 4,000 ZAR for each of the beneficiaries. The second most important proposals are the so-called **P**ower **C**oalition(**s**) with 11 % and 9 % of the votes: **A**ndy and **B**erta both profit from agreeing bilaterally on a reduced inheritance of **C**arlos, as the latter has no rights at all. Only 3.6 % of our participants propose a split up that leaves **A**ndy with the highest payoff possible (10,000 ZAR), while **B**erta and **C**arolos only get 1,000 ZAR each. This is the proposal that reflects a profit maximizing **Homo Oeconomicus** the closest. More than half of all proposals were either not chosen at all or by less than 1 % of the participants, which was also true for the studies by Güth et al. (2007) and Piazolo (2007, 2010). In the newspaper experiment by Güth et al. (2007) as well as in our recent study (Piazolo 2015), the majority of participants proposed the **Equal Split** (57 % and 61 % respectively). Compared to previous studies, the share of proposals for the self-interested **Homo Oeconomicus** split-up was especially meagre (3.6 %) in the South African-European context.

Based on the roles with the various rights attached, it is not very surprising that the average financial sum proposed for **A**ndy is quite a bit higher than the amount for the powerless **C**arlos (4,278 ZAR vs. 3,685 ZAR). Though, the difference in payoffs is substantially less than in previous experiments.[33] In Kagel/Wolfe (2001: 213), the proposer reserved 44 % to 48 % of total payoff to himself. Our own empirical findings fits Bolton/Ockenfels's (2000) Equity Reciprocity Competition model only moderately: while 1/3 of the stake goes to the responder, the hostage still receives 31 % of the total amount and the largest stake remains with the proposer (36 %).[34]

Summarizing, we find empirical support for a strong inequality aversion (*hypothesis #1√*) as a large majority proposes the **Equal Split**. While the responder is offered substantially more than the powerless third party, the proposer - on average - allocates the largest share to himself (*hypothesis #2√*); though less than one could have expected based on the ERC model (Bolton/Ockenfels 2000).

Figure 1
Average acceptance ratios of Berta for different payoffs for Berta (percentage, all participants)
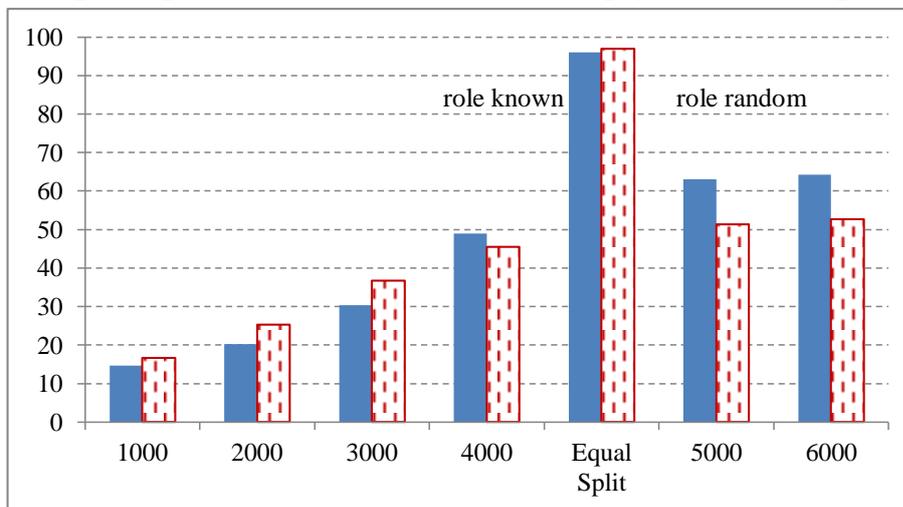
Participants know their role in advance (role known). Participants decide first as **A**ndy and as **B**erta, afterwards these roles are randomly assigned to (role random).

Berta – with veto power (all participants)

As responder **B**erta, the acceptance ratio for an **Equal Split** is almost unanimous (*Figure 1*). Only 4 % of all participants rejected the **Equal Split**. On this account, our results are in line with previous studies[35] as well as in accordance to expectations (*hypothesis #1√*). For the

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[33] The amounts for the proposer **A**ndy are similar to the ones in Güth et al. (2007) with 516 EUR and in Piazolo (2007) with 552 EUR. In Piazolo (2010), the expected payoff for **A**ndy was twice as much as the one for **C**arlos: 543 EUR vs. 266 EUR.

[34] In Piazolo (2010), the proposer received 45 % of payoff, the hostage 22 % and the respondent 33 %. These results were much more in line with ERC model.

[35] E.g. Bahry/Wilson 2006: 45; Güth et al. 2007: 457; Piazolo 2007 and 2010.

Power Coalition the rate of acceptance drops to 50 % (*Table 2*), while the proposal linked to the concept of **Homo Oeconomicus** is rejected by six out of seven participants. This reaction is quite irrational, as **B**erta relinquishes an inheritance worth 1,000 ZAR – for the sake of rebuffing **A**ndy's extremely non-equal proposal. Our recent results are more to the extreme than findings of previous studies for industrial countries (e.g. Güth et al. 2007, Piazolo 2007 and 2010). *Figure 1* shows that just for Equal Split do the acceptance rates of Berta actually peak. Even higher payoffs (5,000-6,000 ZAR) for the respondent are rejected by a large share of participants.

Matching proposals with acceptance ratios, we calculate the payoffs for **A**ndy assuming that he correctly expected the level of acceptance by **B**erta. These expected payoffs are presented in *Table 2* (far right hand column). Due to the meagre acceptance ratios for the **Power Coalition(s)**, the expected payoff for **A**ndy remained the highest of all proposals for **Equal Split** (3,840 ZAR).[36] So, a super-rational proposer - taking the rejection rates of **B**erta into account - should not have opted for the selfish version of **Homo Oeconomicus** or should not have tried to lure **B**erta into accepting a non-equal distribution concerning the "hostage" only (**Power Coalition**). Instead, one should have distributed the payoff between the three beneficiaries evenly.

For each payoff for **B**erta (1,000 - 6,000 ZAR) there are three variations in payoffs for the proposer and the powerless party. *Figure 1* presents the average acceptance ratios of **B**erta. Besides the special case of a fully fair distribution of the inheritance - **Equal Split**, the acceptance ratio increases step-by-step as the amount allocated to herself rises. All of the proposals for which **B**erta receives only 1,000 - 3,000 ZAR are rejected by (more than) two thirds of all participants. Almost a third of all participants seem to value a fair distribution above their personal rise in financial wealth, as the drop in acceptance for 5,000 - 6,000 ZAR shows. One could call them the super-equality-prone respondents. In Güth et al. 2007 and in Piazolo (2010), the decline in acceptance ratios of the respondent with rising payoffs - past Equal Split - was much less pronounced.[37]

Summarizing, almost all participants accept the **Equal Split** - the fully fair distribution - just as expected (*hypothesis #1√*). Low payoffs - up to a share of 25 % - for the respondent are rejected by a large majority of participants, while payoffs of 1/3 of the total or more are

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[36] In our field experiment of 2006, 92 % of all 381 participants accepted the Power Coalition as **B**erta. Thus, the expected payoff for **A**ndy was significantly higher: 552 EUR (Piazolo 2007). Also in the US-German field experiment of 2009, the highest payoff remained with the Power Coalition: 414 EUR (Piazolo 2010).
[37] E.g. in Piazolo (2010), the acceptance ratios dropped by 10 to 15 %.

accepted by more than half of the respondents. Both findings therefore give (weak) support to the expectations based on the ERC model (*hypothesis #3√*).[38]

4. DIFFERENT INTERNATIONAL PERCEPTIONS - SOUTH AFRICANS VS. EUROPEANS

More than two-third of participants are residents of South Africa, the remaining being Europeans (predominantly German). In their role as proposers in *Figure 2*, the South Africans selected the **Equal Split** at a significantly higher rate than their European counterparts (67 % vs. 48 %). Women also prefer the **Equal Split** and a higher share of South Africans is female; this might explain a major part of the international differences.[39] Almost a third of Europeans propose the two kinds of **Power Coalition(s)**, and 6 % of them suggested the wealth maximizing version of **Homo Oeconomicus**. For the South Africa, this rate is a meagre 2.5 %.

Figure 2
Andy's proposals for 12,000 ZAR (percentage, role known)
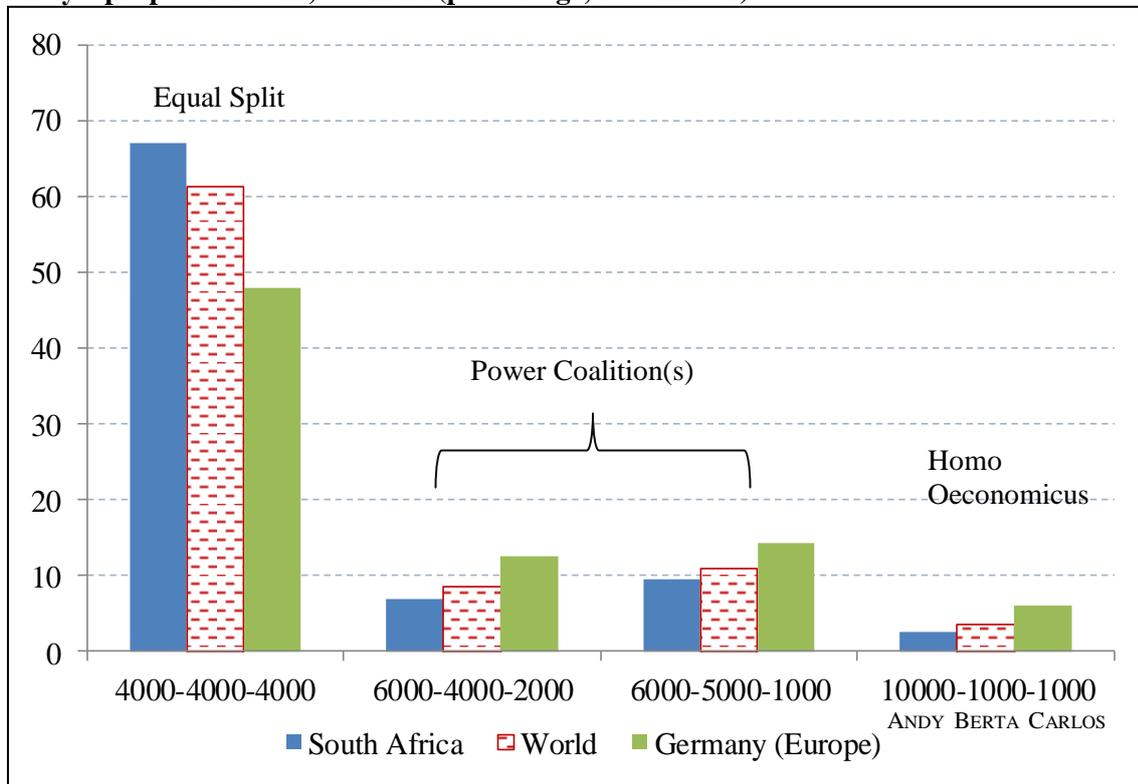
These four proposals were selected by 81 % of Europeans and 86 % of South Africans.
Number of Participants: South Africa 788, Europe 334 (295 Germans); World 1,138.

Due to the profound difference in proposals made by South Africans, the average amount of Rand being allocated to **A**ndy himself is less than the one by Europeans (4,586 ZAR vs.

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[38] See Kagel/Wolfe (2001: 206, 210).
[39] 67.7 % of all women vote in their role as proposer for an Equal Split – men only at a rate of 56.5 %. Therefore, the female proposal rate is slightly higher than that of all South Africans (67 %).

5,244 ZAR).[40] For the additional characteristics of our participant, it is does not come as a surprise that business and economics majors - one third of all - vote the "most" for **Homo Oeconomicus** (8 %). Though, economists also suggest **Equal Split** and **the Power Coalition(s)** to a much higher extent (48 % and 28 % respectively) than the purely rational proposal.

High aversion of South Africans towards inequality

In their role as respondent (**B**erta), only 160 of all participants (14 %) do accept each of the 18 different proposals. This would give them at least 1,000 ZAR – instead of relinquishing these funds and receiving nothing at all. Consequently, for participants offering the **Homo Oeconomicus** distribution to the respondent, the acceptance rate stands at 90 % for each of the options. Almost one fifth of Europeans decide rationally in accepting all proposals; for South Africans it is one tenth. Therefore, just 12 % of *South Africans* accept the proposal of **Homo Oeconomicus**. Even for the **Power Coalition(s)** there is no majority among South African participants (*Figure 3*). Due to the low South African acceptance rates, the expected payoff for the **Equal Split** (3,840 ZAR) is substantially above the one for the **Power Coalition** (2,700 ZAR).

Figure 3
Acceptance ratios as Berta (percentage, role known)
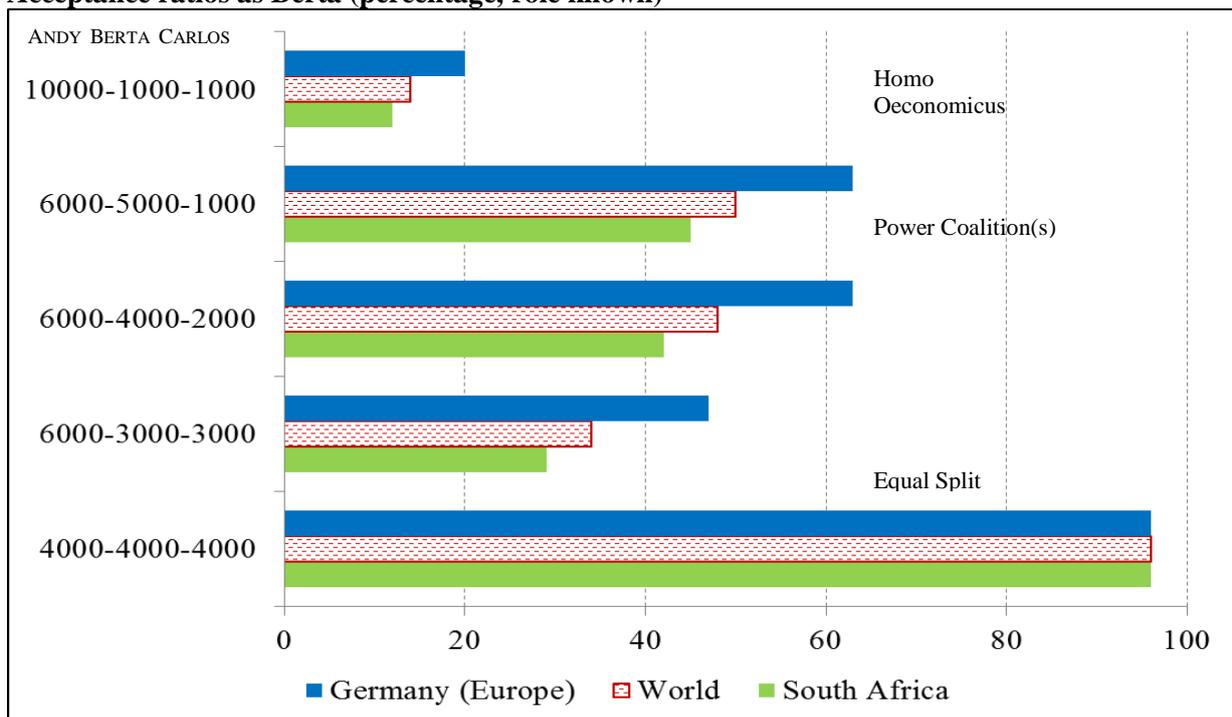
Number of Participants: South Africa 788, Europe 334 (295 Germans); World 1,138.

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[40] The expected payoff for **A**ndy (South Africans) closely resembles the one of US-Americans (461 EUR of an inheritance of 1,200 EUR) in our international 2009 study (Piazolo 2010).

Homo Oeconomicus is accepted by *Europeans* at a rate of 20 %. Still, the expected payoff as Andy is also higher for the **Equal Split** (3,840 ZAR) – though, closely followed by the **Power Coalion(s)** with 3,780 ZAR each. Overall, females accept a 10,000-1,000-1,000 ZAR split significantly less often (11 %) than business majors (19 %).

Summarizing the basic descriptive variation of our **South African** vs. **European** participants, we note that the cultural differences in splitting up an inheritance are remarkable. While South Africans are strongly inequality averse this seems "significantly" less so for the Europeans - thereby supporting *hypothesis #5*. If this first descriptive impression holds statistically, we will look into more depth by econometric modelling when taking the other characteristics of participants into account (Ch. 6).

5. RANDOM SELECTION OF THE PROPOSER – INTERNATIONAL GAP IS LEVELS OUT

In the second version of our experiment, the participants were asked to make the same decisions. Though, none of the three beneficiaries knew in advance, which role they play, when the inheritance is to be split up. So, the proposer – **A**ndy – does not know in advance, if he will actually benefit from his own proposal. He might end up as **B**erta or even **C**arlos. Due to this change in conduct, we expect the rates of proposal for an **Equal Split** to increase substantially. The empirical data in *Table 3* support our expectations. Now, almost six out of seven participants propose the **Equal Split**.[41] At same instance, the continental difference in proposal rates declines substantially from 19 to 11 percentage points. This is due to the marked difference in decision making by German or European participants.[42] Therefore, the average inheritance per person levels out further: the difference between **A**ndy and **C**arlos drops from 593 ZAR to just 459 ZAR (see bottom lines of *Table 2* and *Table 3*).

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[41] When bidding for their (known) role of **A**ndy, 61 % of all participants proposed the Equal Split (see *Table 2*).
[42] When bidding for their (known) role of **A**ndy 48 % of the Europeans proposed the Equal Split, under the new circumstances the rate went up to 77 %!

Table 3
Choice of proposals and international acceptance ratios (random proposer & respondent)

World (n = 1,139) South Africa (n = 788) Europe (n = 334)	Division of 12,000 ZAR			ALL (WORLD)		SOUTH AFRICA		EUROPE (GERMANY)		Expected Payoff
	Andy	Berta	Carlos	Proposer Andy	Berta Accepting	Proposer Andy	Berta Accepting	Proposer Andy	Berta Accepting	for Andy ZAR (all participants)
Equal Split	**4,000**	**4,000**	**4,000**	84.9 %	97 %	88.0 %	97 %	76.6 %	96 %	3,880
	4,000	**5,000**	**3,000**	1.9 %	62 %	1.5 %	57 %	3.0 %	74 %	2,480
	6,000	**3,000**	**3,000**	3.0 %	44 %	2.2 %	37 %	5.0 %	59 %	2,640
	6,000	**4,000**	**2,000**	2.6 %	37 %	1.9 %	32 %	3.8 %	49 %	2,220
Power Coalition	**6,000**	**5,000**	**1,000**	2.5 %	29 %	1.8 %	24 %	3.8 %	41 %	1,740
Homo Oeconomicus	**10,000**	**1,000**	**1,000**	1.4 %	15 %	1.0 %	12 %	2.1 %	22 %	1,500
ALL – average inheritance per person in ZAR	*4,258*	*3,943*	*3,799*							
Mean bid for Andy	*2,324*									
Median bid for Andy	*1,000*									

Overall, the acceptance rates of the respondent (**B**erta) do not change much. *Europeans* still accept non-equal distributions far more often than their South African counterparts. Though, their acceptance ratio for the true **Power Coalition** (6,000 | 5,000 | 1,000 ZAR) drops from 63 % to 41 %. The highest payoff for **A**ndy in the whole sample is reached with the **Equal Split** (3,880 ZAR). So, if expectations were anticipated correctly, proposing the fair distribution would again be a financially rational decision. For *Europeans* only, **Equal Split** with the highest expected payoff for **A**ndy is closely followed by 3,540 ZAR for the 6,000 | 3,000 | 3,000 ZAR proposal. Compared to our first version with predetermined roles, Europeans seem to punish an unfair treatment of (powerless) **C**arlos now.

Summarizing, as proposer (fixed assignment) we find significant differences in behavior based on the *cultural background*, *gender* and the *academic field of concentration on Economics or Management*. These differences level out when the participants do not know their specific role as proposer or respondent in advance (random assignment). The cultural background seems to determine significantly strong differences in behavior even when the role of proposer is randomly assigned to. Also, the respondents (fixed assignment) decide differently across the equatorial divide. All three findings give rise to support of *hypothesis #4, hypothesis #5* and *hypothesis #6a*. How these differences translate into positively or negatively influencing certain proposals, we'll check in the following part.

6. ECONOMETRIC ANALYSIS ON THE DETERMINANTS OF PROPOSING THE *TRUE* AND *GENERAL* HOMO OECONOMICUS

As the dependent variable is binary, we estimate *maximum likelihood binary probit regression models*. For a start, we are looking for the determinants of the choice of **Homo Oeconomicus** in single regression models - followed by multiple regression analysis. For our econometric studies we were able to use the data of 1,137 participants. As only 41 participants (3.6 %) of all voted for the 10,000 | 1,000 | 1,000 ZAR proposal, we extended the analysis to include a more *General* Homo Oeconomicus[43] as well. We used the data of choices, when the participants actually knew that they had to right to make a proposal as **A**ndy (= role known).

Table 4
Determinants for the choice of (True) Homo Oeconomicus (role of Andy known)

Single probit regression models	Dependant Variable - Proposal 10,000 | 1,000 | 1,000 ZAR (1) - n_1 = 41 All Other Proposals (0) - n_2 = 1,096		
Dependent variable	*Coefficient*	*Probability*	*McFadden R²*
Rationality (1-18)	0.231	0.000	0.398
Bids in Rand (for Andy)	0.0002	0.000	0.282
Economist (Yes = 390)	0.807	0.000	0.086
CRT-Test Score (0-3)	0.213	0.001	0.035
Non South African (Yes = 348)	0.377	0.009	0.020
Religiousness (1-5)	-0.105	0.032	0.013
Black African (Yes = 106)	-0.586	0.119	0.009

CRT – cognitive reflection test; Rationality is measured by the number of choices that a participant accepts as Berta – 18 is considered to be fully rational. Estimations with *Eviews 8*.
Non-significant variables: Afrikaaner, Coloured, Age, Education, (relative) Income, Risk Proneness, Student.

Of the 13 possible (independent) variables at hand, seven showed to be non-significant within a single probit regression model. Our significant models are presented in *Table 4*: A fully rational respondent would not relinquish a single Rand by rejecting one of the 18 different proposals. Thus, we define the level of rationality by the number of choices that a participant accepts as **B**erta. This measure of rationality exerts the strongest influence on the dependent variable. As the role of the proposer (**A**ndy) is auctioned off, high bids only make sense for those who plan to distribute an increasing share of the inheritance to themselves.[44] Studying management or economics - or having done so - leads to a more selfish proposal; the same is true for a higher score in a simple Cognitive Reflection Test. Being non-South African - 92 % of them German speaking - increases the probability of choosing **Homo Oeconomicus** too. On the other hand, being more religious as well as being black is working against the rational proposal. Though, Black African has a large negative coefficient, its' influence is hardly

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[43] The three proposals 10,000 | 1,000 | 1,000 ZAR, 8,000 | 3,000 | 1,000 ZAR and 8,000 | 2,000 | 2,000 ZAR are grouped together as *General* Homo Oeconomicus. A total of 79 participants opted for these proposals.
[44] The coefficient is comparatively small as the bids in South African Rand are up to 18,000 ZAR.

significant. In *Table 5* we present three multiple probit regression models explaining the choice for True Homo Oeconomicus in more depth. Overall, the explanatory power of our models is comparatively high - with a *McFadden R²* of 0.61 and above.

Table 5
Determinants for the choice of (True) Homo Oeconomicus (role of Andy known)

	Model I		Model II		Modell III	
	Dependant Variable - Proposal 10,000 | 1,000 | 1,000 ZAR (1); n_1 = 41 **All Other Proposals (0); n_2 = 1,096**
Constant	-6.89	(0.88) ***	-6.98	(0.95) ***	-6.98	(0.95) ***
Rationality (1-18)	0.25	(0.05) ***	0.27	(0.05) ***	0.27	(0.05) ***
Bids in Rand	0.0002	(3.4E-05) ***	0.0002	(3.5E.05) ***	0.0002	(3.5E.05) ***
Economist (Yes)	1.33	(0.29) **	1.37	(0.36) ***	1.37	(0.36) ***
Female (Yes)			0.47	(0.28) *		
CRT-Score (0-3)					-0.17	(0.12) °
McFadden R²	\multicolumn{2}{c}{*0.61*}	\multicolumn{2}{c}{*0.62*}	\multicolumn{2}{c}{*0.62*}

coefficient (standard error) °, *, **, *** level of significance 15 %, 10 %, 5 %, 1 %.
CRT – cognitive reflection test; Rationality is measured by the number of choices that a participant
accepts as Berta – 18 is considered to be fully rational.

Our basic *model I* picks up the three variables - Rationality, Bids in Rand and Economist (Yes) - that exerted the highest explanatory power in the previous single probit regression models of *Table 4*. Sign as well as size of the coefficients is also similar. Participants, who are more rational, who submitted higher bids to become the proposer, and who have a management or economics background are more likely to propose the fully rational **Homo Oeconomicus** 10,000 | 1,000 | 1,000 ZAR split-up. Adding a fourth variable does not increase the explanatory power by much, as both - gender and intelligence - are only significant at the 10-15 % level. The sign of their influence is rather counterintuitive: females opting more for the rational approach than male participants and the opposite being true for participants that scored high at the CRT. None of the other variables - like population groups - proofed to exert a significant influence. This might be due to little variations in the data of participants that proposed the (true) Homo Oeconomicus.

To increase the data variations, we took a closer look at the determinants of the more *General* Homo Oeconomicus by estimating multiple probit regression models. *Table 6* presents three - quite different - models in explaining the choice for a broader rational approach. *Model III* is based upon the basic model of the previous *Table 5* - including rationality, bids and field of study (economics or management). Additionally, being non-South Africans enhances proposing a rather unequal distribution of inheritance as well as being someone who is willing to take on more risk. Though, the latter factor is only mildly significant. Overall, *model III* exerts the highest explanatory power of the ones estimated (*McFadden R²* of 0.52).

Only when we delete one of the three major factors, are we able to take other variables into account. In *Model II* rationality, field of study as well as being non-South African remain highly significant. In addition, having a relative high income level (self-assessment for income quintiles, see *Appendix II*) leads participants to propose a stronger unequal payoff distribution. Economically, this is not surprising as the foregone payoff - if **B**erta rejects the proposal - does not hurt these financially better-off participants very much.

Table 6
Determinants for the choice of (General) Homo Oeconomicus (role of Andy known)

	Dependant Variable - three proposals:					
	10,000 | 1,000 | 1,000 ZAR; 8,000 | 3,000 | 1,000 ZAR; 8,000 | 2,000 | 2000 ZAR (1) - $n_1 = 79$;					
	All Other Proposals (0) - $n_2 = 1,058$					
	Model I		**Model II**		**Modell III**	
Constant	-1.59	(0.18) ***	-3.99	(0.44) ***	-4.99	(0.48) ***
Rationality (1-18)			0.17	(0.02) ***	0.16	(0.02) ***
Bids in Rand	0.0002	(2.2E-05) ***			0.0002	(3.5E.05) ***
Economist			0.42	(0.15) ***	0.70	(0.18) ***
Black African	-1.02	(0.50) **				
Coloured	-0.96	(0.50) *				
Religiousness	-0.10	(0.05) **				
Student	-0.35	(0.14) **				
Non-South African			0.50	(0.16) ***	0.36	(0.17) **
(relative) Income			0.14	(0.07) **		
Risk Proneness					0.14	(0.09) °
McFadden R²	*0.30*		*0.36*		*0.52*	

coefficient (standard error) °, *, **, *** level of significance 15 %, 10 %, 5 %, 1 %.
Rationality is measured by the number of choices that a participant accepts as Berta – 18 is considered to be fully rational.

Model I is based upon the bids for the role of proposer. Though, it includes four factors all exerting a negative influence on the choice for *General* Homo Oeconomicus. Hardly any Black African and Coloured participant proposed the strict as well as the broader versions of a rational decision maker. In addition, being more religious leads to a less one-sided (pro-proposer) payoff structure. The same is being true for participants still attending high school or university.

Table 7
Determinants for Andy's Net Payoff (role of Andy known)

	Dependant Variable - Net Payoff for Andy vs. Berta; n = 1,135			
	- 6,000 ZAR to + 9,000 ZAR			
OLS	**Model I**		**Model II**	
Constant	-852.6	(112.30) ***	50.0	(108.7)
Rationality (1-18)	123.5	(9.87) ***		
Bids in Rand	0.31	(0.02) ***	0.38	(0.02) ***
Non-South African	189.9	(115.0) *		
Economist (Yes)	461.1	(129.3) ***	758.1	(115.2) ***
Student	-257.9	(105.8) **	-309.0	(112.4) ***
Black African			-426.3	(188.9) **
Coloured			-489.4	(202.5) **
McFadden R²	*0.34*		*0.25*	

coefficient (standard error) *, **, *** level of significance 90 %, 95 %, 99 %.
Rationality is measured by the number of choices that a participant accepts as Berta –
18 is considered to be fully rational.

Hoping to deepen our understanding of cultural difference within the South African context as well as between South Africans and Europeans, we apply standard OLS procedures on the net payoff for **A**ndy versus **B**erta. The net payoffs are based on all 18 different proposals, which are then used as dependent variable. Net payoffs (see *Table 2*) vary between - 6,000 ZAR to + 9,000 ZAR.[45] The estimations for *model I* and *model II* confirm our previous results in general as well as concerning the cultural differences. Being more rational, bidding more excessively for the proposer and having a background in management or economics leads participants to propose higher positive spreads compared to the respondent. This also holds true for Europeans. On the other hand, participants who are a member of the Black African or Coloured community as well as ones, who are still studying would rather propose a less positive net payoff. The overall explanatory power of our two models is moderate.

7. FINAL REMARKS

More than 1,130 people took part in this international mixed newspaper and internet experiment of a multiple-person *Ultimatum Bargaining Game*. Three beneficiaries had to decide, how to split up an inheritance of 12,000 ZAR (or 1,000 EUR). More than two thirds of the participants were South Africans – most of them associated with Stellenbosch University. The remaining ones were almost all European (predominantly German).

When the participants are assigned to their roles beforehand, 61 % of all participants vote as proposer (**A**ndy) for an **Equal Split** (4,000 ZAR each), followed by 11 % for the **Power Coalition** (6,000 | 5,000 | 1,000 ZAR). Less than 4 % of all participants select the wealth maximizing alternative for the proposer of **Homo Oeconomicus** (10,000 | 1,000 | 1,000 ZAR). The (relative) majority of participants proposing **Equal Split** resemble empirical results of previous studies[46] as well as our own expectations (*hypothesis # 1√*). The responder is offered more than the powerless third party. The proposer - on average - allocates the largest share to himself. While this gives additional support to Bolten/Ockenfels's (2000) Equity Reciprocity Competition model and their expected payoff structure (*hypothesis # 2√*), the differences in expected payoffs for the three beneficiaries are less than the ERC would have predicted, and they are less than our previous 2009 experiment had shown.[47]

As respondent (**B**erta), the notions of *fairness* and *inequality aversion* dominate decision making. Every proposal, which results in "3,000 ZAR or less" for the respondent, is rejected

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[45] One third of the net-payoffs for **A**ndy is negative and one representing the Equal Split.

[46] In Güth et al. (2007), of 4,900 German participants 57 % proposed Equal Split.

[47] In 2009 with 509 participants from Germany and the US, the proposer allocated on average 266 EUR to the hostage, 391 EUR to the respondent and 543 EUR to himself (Piazolo 2010). In our recent experiment (*Table 2*), the average inheritance is 4,280 ZAR (proposer) - 4,040 ZAR (respondent) - 3,680 ZAR (hostage).

by two thirds and more of all participants. These individuals relinquish up to 3,000 ZAR, rather than accepting an unequal distribution of inheritance.[48] Just one seventh of all our economic agents behave fully rational by accepting each of the 18 different proposals. The average acceptance ratios increase with the amount allocated to the respondent (*Figure 1*), though the **Equal Split** is the only distribution that is accepted by essentially everyone. These results give empirical support to *hypothesis #1* and *hypothesis #3a&b*.

On the *cultural background*, there are statistically significant differences in behavior of South Africans and Europeans (*Table 4*). Based on *hypothesis # 5*, we expected the *South Africans* to be more equality oriented. They are: 67 % of them propose an **Equal Split**, while they reject in their role as **B**erta non-equal distributions of inheritance far more often than Europeans. Less than half of the *Europeans* go for an **Equal Split**, a third prefers one of the two **Power Coalition(s)**, while still 6 % of them suggest the wealth maximizing **Homo Oeconomicus** (*Figure 2*). In most of the maximum likelihood binary probit regression model of *Table 4 & 6*, being non-South African has a statistically significant positive influence on proposing *True* as well as *General* **Homo Oeconomicus**.

Aversion against inequality in splitting up an inheritance of 12,000 ZAR differs also distinctively within *South Africa*'s population setup: participants of the Black African and Coloured community are particularly less likely to propose *General* **Homo Oeconomicus** (model I in *Table 6*). Also, they opt for lower positive net payoffs between the proposer and the respondent (model II in *Table 7*). These results distinguish them from their Afrikaaner, Asian and White (European) national compatriots.

At the same time, there might be a tight link between the notion of fairness and reciprocity.[49] If South Africans in general expect the strong inequality aversion of their peers correctly, it is actually rational (or super-rational) to propose an **Equal Split** - since the expected payoff (3,840 ZAR) for the proposer is the highest for this fully egalitarian payoff structure![50] Though, in the non-South African context, the expected payoff for the **Power Coalition** does get close to the one for the **Equal Split**.[51] The moment the role of the beneficiaries is randomly assigned to each of the three – after placing their decisions - the proposal rate for

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[48] Bolten/Ockenfels (2000: 189) state evolutionary biology as a reason for this kind of behavior: "For a vast time, people lived in small groups. People may have a propensity to contribute because a successful group was necessary to individual success. A propensity to punish non-contributors might be the way evolution (partially) solves the free-riding problem inherent in such an arrangement." So, people care about relative standing, and they are willing to sacrifice a little to defend egalitarism.

[49] Bolton/Ockenfels (2006:1910) refer to this tight linkage.

[50] Güth (2009) mentioned this also.

[51] 3,840 ZAR (Equal Split) vs. 3,780 ZAR (for both Power Coalitions). In the 2009 US-German experiment, the expected payoff for the European participants was by far the highest for the Power Coalition: 474 EUR (Piazolo 2010).

the **Equal Split** rises substantially - overall as well as for the non-South Africans (> 77 %). At same instance, the equatorial divide diminishes to a large extent (*Table 3*).

Based on our econometric analysis, a higher level of *rationality* increases the probability of proposing the non-equal distribution of **Homo Oeconomicus** (*Tables 5-7*). While a higher *bid* (in ZAR) for the role of **A**ndy also increases the likelihood of opting for an unequal distribution. As expected, higher bids - half of which were deducted from the payoff for **A**ndy - should only be submitted by self-interested participants. This seems to the case.

Participants having a background in *Economics or Management* behave significantly more in line with the concept of a rational decision maker - either by being born that way, or having come across this concept during their educational process. The various models in *Table 4-7* provide strong empirical support to *hypothesis # 4√*. A higher *(relative) income* quintile also strengthens the drive towards proposing *General* **Homo Oeconomicus**. In addition, participants willing to take on higher *risk* are more likely to propose an unequal payoff structure - just as we have assumed beforehand.[52] In the opposite direction, increased *religious affiliation* leads to more pronounced inequality aversion (model I in *Table 6)* - thus underlining *hypothesis # 6e√*. Contrary to previous studies (Güth et al. 2007), high school and university *students - hypothesis # 6c -* are less likely to opt for a non-equal distribution of financial assets. This case is relatively strong as it holds for model I in *Table 6* as well as for the two OLS estimates of the proposer's net payoff (*Table 7*). Additional characteristics such as age, gender, levels of education and of intelligence (CRT) do not show to exert a stable or even moderate significant influence on the decisions taken by the proposer towards an uneven payoff structures between the three beneficiaries.

Due to this extensive data set, future research could take us to look at two additional dimensions: (i) checking the determinants of proposing the **Power Coalition(s)**, as well as (ii) trying to determine the various factors that influence the behavior of the respondent (**B**erta).

APPENDIX I

We randomly chose two South Africans and one non-South African (mainly German) as potential beneficiaries. The role of proposer and respondent are based on the individual bids for **A**ndy. Contrary to previous UBG experiments, in three rounds the selected **B**erta rejected

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[52] Though, the influence of risk proneness is not strongly significant - model III in *Table 6*.

Andy's proposal. Interestingly for the first set-up of candidates, a South African **B**erta actually rejected an **Equal Split**. We successfully distributed our financial assets only for the fourth set of randomly selected participants. With a bid of 2,000 ZAR Kevin O. (GER) became **A**ndy. He proposed an **Equal Split**. Mao W.-R. (ZA) accepted this proposal and Lauren d.T. (ZA) participated as **C**arlos. Both South Africans received the full amount of 4,000 ZAR, while Kevin's payoff was reduced by 50 % of his bid - as announced before - to 3,000 ZAR (230 EUR).

APPENDIX II

Figure 4
Self-Reporting on Participants Household Income (Quintiles)
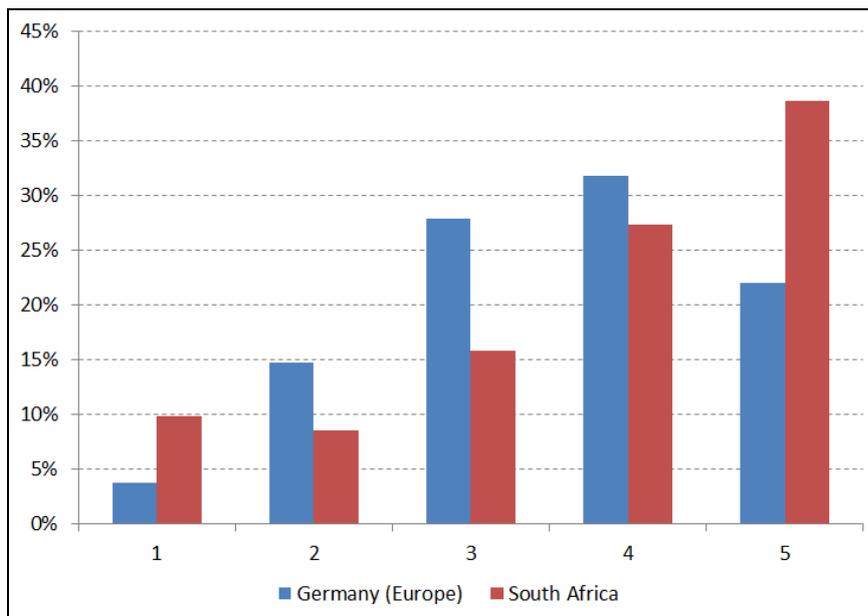
Lowest Income Quintile	21 % - 40 %	41 % - 60 %	61 % - 80 %	Highest Income Quintile
1	2	3	4	5
monthly (GER):				
up to €1,299	€1,300 - €1,999	€2,000 - €2,899	€2,900 - €4,199	€4,200 and above
annual (SA):				
up to R21,399	R21,000 - R35,750	R35,751-R61,624	R61,625-R142,083	R142,084 and above
[R13 app. €1]				

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