Competition and well-being:

does market competition make people unhappy ?

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Abstract

Empirical research on the role of economic institutions for subjective well-being is still widely lacking, while recent economic-experimental outcomes suggest that experienced utility may depend on the intensity of market competition. This paper is the first to empirically analyze the implication of market competition for subjective well-being using real-life survey data on 80,000 individuals in more than 60 countries from the World Values Survey 1997-2001. In support of our hypothesis, we find that market competition aggravates the impact of individual's bargaining position in economic transactions on her subjective well-being – compared to the least powerful in society. Put differently, we find that market competition enlarges the happiness differences caused by cleavages in socio-economic position. Our results also suggest that competition-induced welfare changes are not gender-specific, while a stronger rule of law appears to prevent the generation of such additional benefits or losses. Particularly the latter results call for further economic-experimental corroboration in the laboratory, but also bear important policy implications.

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Introduction

"*It is not from the benevolence of the butcher, the brewer or the baker that we expect our dinner, but from their regard to their own interest. We address ourselves not to their humanity but to their self-love, and never talk to them of our necessities but of their advantages. Nobody but a beggar chooses to depend chiefly upon the benevolence of their fellow-citizens*."
(Adam Smith, *Wealth of Nation*s, 1776)

Adam Smith (1776) once used the metaphor of the 'invisible hand' to illustrate the importance of well-functioning free markets for mutually beneficial economic exchange and, finally, individual well-being. More specifically, A. Smith viewed intentionally, rational self-interested behavior in a competitive market setting as the driving force for unintentional welfare gains. With these thoughts having been developed further by Leon Walras (1874), also modern economic textbooks praise market competition for its welfare-improving impacts that are usually associated with, on the sellers' side, the pressure to innovate and to lower production costs, and, on the buyers' side, maximal consumer surplus through range of choice, high quality of goods and 'just' prices that reflect (only) the marginal costs of production. In contrast, the absence of competition on either side of the market is demonstrated to allow for monopoly or monopsony mark-ups that redistribute rents from the less influential to the more powerful market participants, and, in consequence, causes a shift in welfare from one market side to the other.[2]

Although happiness research has its origins in psychology, it is now also blossoming in the fields of economics; however, the empirical analysis of economic, political or social institutions on individual well-being is still in its infancy. While the influence of political institutions such as democracy or federalism have been quite well documented (e.g. Frey

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[2] As known, a part of societal welfare (deadweight loss) is lost in this process.

and Stutzer 2000, Bjørnskov et al 2008a, Dorn et al. 2007, 2008,), there is still a substantial research void when it comes to assessing the effects of market institutions, defined as formal and informal institutions that govern economic transactions between selling and buying individuals or firms over markets, such as market competition. In addition, most of these studies do not take into account that institutions might exert differential impacts on well-being depending on individuals' socio-economic position and socio-demographic characteristics such as gender or income.[3]

To fill this gap, this paper aims to test implications of market competition for individual well-being, taking into account that its effects may interplay with one's bargaining position in economic transactions, using individual-level 'field' data on subjective well-being of about 80,000 persons in more than 60 countries obtained from the World Values Survey (1997 – 2001). According to neoclassical economic theory, the degree of market competition rises with the number of agents on either side of the market, and maximum market competition is achieved when market power on either side is absent. Moreover, this paper also tests to what extent the effects of market competition differ (a) between genders and (b) by a country's quality of the legal and judicial systems which constitute an important component of the institutional framework for market transactions. To our best knowledge, we do not know of any other empirical contribution in economics that analyzes the impact of market competition on well-being.

In principle, the hypotheses on the impact of market competition on well-being and its interplay with individual bargaining power, gender, and the rule of law are drawn from previous research in experimental economics. As many economic experiments still focus on players' performance and thus on pay-off distribution as outcome, the novelty of this paper lies equally in developing analogous hypotheses for subjective well-being, besides testing them against cross-country micro-level field data.

In support of our hypothesis, our results show that market competition (on the other side) appears to benefit the 'winners' by reinforcing the well-being raising impact of having a

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[3] A comprehensive robustness test of the impact of a wide range of political, cultural, economic and human development factors for subjective well-being can be found in Bjørnskov et al 2008.

better bargaining position in transactions – compared to the least powerful economic agent. In other words, compared to a median bargaining position, persons with lesser market power experience additional welfare losses as market competition intensifies, while persons above the median appear significantly better off. Thus, market competition appears to enlarge happiness differences caused by socio-economic cleavages. However, estimations for gender subsamples suggest that there are no additional gender-specific welfare gains as market competition increases, while a stronger rule of law appears to prevent the generation of such additional benefits or losses. In the remaining part of the paper, section 2 presents experimental economics evidence and derives the hypotheses, while section 3 describes the data and introduces the model. The empirical results are presented in section 4, while section 5 concludes.

2 Experimental economics evidence and derivation of hypotheses

Although experimental economics literature has almost exploded during the last years, there appear to be only very few experiments that deal with the question how the introduction of market competition, defined as absence of any market power in the tradition of neoclassical economics theory, affects players' experienced utilities.[4] To our knowledge, the sole relevant contribution is the study by Brandts, Riedl and van Winden (2006), that explicitly tests the impact of market competition on players' happiness in a repeated[5] social dilemma game.[6] They observe the effects of market competition for "subjects' subjective (experienced) well-being" (Brandts et al., 2006, p.20) by surveying the participants' emotions at the end of the experiment and comparing the participants'

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[4] In this paper, we use the notions 'happiness', 'life satisfaction', '(subjective) well-being' and '(experienced) utility' interchangeably.

[5] Games are repeated over 30 rounds with identical interacting players (fixed players with fixed roles).

[6] We are not aware of any other economic experiment that tried to measure the impact of (market) competition on players' *well-being*. The financial (pay-off-related) effects of competition have been tested with ultimatum games and Bertrand bidding games in e.g. Fischbacher et al. (2003), Dufwenberg and Gneezy (2000), Fauraker and Siegel (1963). For evidence of the rank dependence of the effects of competition among mammals, see Van Loo et al., (2001).

answers across the two different treatments.[7] The first treatment reflects the presence of market competition by setting up a 'triad' game structure in which one player chooses in each round *among two potential* trade partners prior to any transaction.[8] In the alternative setting, market competition is absent as only two fixed trade partners are present (dyad structure).

Brandts et al. (2006) find that with competition on the other side of the market, monopoly player A, having the 'power to choose' among two potential trade partners, is the happiest player among all games and players, being significantly happier than (1) any of her trade partners B and C or (2) any of the two players in a game with no competition (dyad game), who both experience equal levels of happiness. On the long side of the market in the triad game, the less often chosen player (let's call him C) is shown to be significantly unhappier than the more frequently chosen trade partner (player B), although both have identical market power. Thus, as relation (1) illustrates, there is a clear-cut hierarchy of experienced well-being across players and treatments.[9]

$$A \ (triad) > A/B \ (dyad) = B \ (triad) > C \ (triad) \qquad \qquad (1)$$

In our view, players' experienced utilities can possibly be broken down into the following components: (1) the realized financial gain (pay-off) as part of outcome utility, (2) frequency of trade contacts as means of social interaction (procedural utility), (3) the enjoyment of bargaining or market power (procedural utility), which we relate to the emotional benefit experienced when excluding potential trade partners. Arguably, the well-being effects of 'the power to choose' may well depend on the degree of competition on one's own side, but equally on that on the other side of the market. Most

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[7] Subjective well-being was assessed by asking about participants' general mood using pictures with abstract facial expressions mirroring a 9-point scale developed by psychologists of which one had to be chosen by the subject. Using these so-called 'Self-Assessment Manikins' mitigates the impact of potential framing.

[8] The excluded player received a small remuneration that was lower by construction than the symmetric payoffs in the Nash equilibrium or the cooperative equilibrium, but higher than in a situation of (cooperate, defect) for the cooperating player.

[9] See also the summary in 'Result 4' in Brandts et al. (2006, p.21).

probably, this procedural utility effect is independent of the achieved financial gain (outcome utility). Note also that competition seems to trigger higher insecurity of earnings on either side of the market (cf. Brandts et al., 2006, p.16). In order to determine the impact of market competition on players' well-being, these partly overlapping effects have to be disentangled.

As regards the financial gains and the frequency of trade, these are (separately) conducive to well-being, ceteris paribus, as various regression analyses by Brandts et al. (2006) suggest. In particular, the authors find that negative emotions are triggered by experiencing a lower trade frequency, for a given level of earnings. Arguably, that higher pay-offs or income are conducive to happiness is a finding that is well known (e.g. Ferrer-i-Carbonell, 2005).[10]

The effects of market competition for well-being are most easily assessed by analyzing its impact on player A's happiness. For monopoly player A, a well-being gain between the non-competition and the competition settings is observable. At first sight, an increase in either pay-off or trade frequency might serve as explanation. However, we can rule out these explanations as, on average, player A's earnings do not significantly differ between the dyad and the triad games and trade frequencies are fairly identical across the two settings.[11] Moreover, given that competition is introduced on the opposing side of the market, a change in her own market power cannot be related to the increase in her well-being. In other words, with her income, trade frequency, and market power staying unchanged, Brandts et al. (2006) still find that intensifying competition on the *other* side of the market is conducive to monopoly player A's well-being, obviously dominating the potentially utility lowering effect of increasing income insecurity. In this paper, we conjecture that such non-financial benefits of market competition on the other side can be explained by positive emotions player A experiences when exerting her 'power to choose'. Most possibly, this 'joy of choosing' rises with the number of potential trade partners (and thus with competition), as the findings by Brandts et al. (2006) suggest.

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[10] For the impact of national income, that might equally represent the number of transactions aggregated to the country level, on individual well-being, see e.g. Bjørnskov et al. (2008).

[11] Similarly, cooperation levels were fairly identical across the dyad and the triad games.

Figure 1 illustrates the well-being comparisons for player A under the two different environmental settings - the dyad and the triad games – suggesting not only that exerting monopoly power per se is conducive to happiness (cf. A(dyad) > C(triad) in relation (1)), but even more that market competition exerts an aggravating impact on this positive market power effect (cf. A(triad) > A (dyad) in relation (1)) (see Figure 1).

Figure 1: Well-being of monopoly player A

	Player A	
	No market power	market power
Low competition (dyad game)	Not observed	+ (A(dyad) > C (triad))
Strong competition (triad game)	Not observed	+ + (A(triad) > A(dyad))

Notes: '+' indicates "some welfare gains", '+ +' "substantial welfare gains".

While a well-being increasing impact of competition on the other market side on monopolist player A can easily be concluded from the experiment, due to the complex tangle of influences, the welfare effects of market competition on the (long) market side in which it is introduced (players B and C) cannot be unambiguously identified. In general, when moving from the dyad to the triad game structure, the introduction of competition on the long side of the market leads not only to a decrease in the incumbent's market power, but also, due to a locked-in effect, to substantial differences in trade

frequencies and, thus, financial gains between these two players.[12] Overlapping effects are also observable when comparing the utility level of player B with that of player C within the triad game: as both players enjoy identical market power, the experienced utility gap may be caused simultaneously by differences in both trade frequency and earnings. In all these comparisons on the long side of the market, the well-being effects of competition per se remain disguised. On the other hand, these observations on the long side do not contradict an analogous application of an assumed interaction effect of market competition with market power for players B and C. These considerations lead to the following hypothesis:

Hypothesis 1
In economic transactions, market competition re-enforces the bargaining power effect for participants' subjective well-being.

Impact by gender

Experimental research on gender-specific well-being effects of market competition is missing. However, we might develop preliminary hypothesis based on related economic laboratory and field experiments that investigate the impact of competition among participants (tournaments) and competitive environments on individual performance. This experimental research suggests men and women not only to exhibit differences in their risk-taking behavior and their attitude towards competition, but also to differ in their willingness to adapt to such an environment (e.g. Gneezy and Rustichini, 2004). For example, Gneezy et al. (2003) use experiments with mace-solving exercises to show that, when players are being rewarded based on their performance relative to that of their competitors ('the winner takes all'), male participants, on average, increase their number of solved maces and, thus, perform significantly better than female players. In contrast,

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[12] Indeed, Brandts et al. (2006) report that having been the trade partner in round t-1 increases the likelihood of becoming a trade partner in the following rounds. In explanation, repeated interaction with the identical trading partner across rounds is favorable for monopoly player A as it facilitates reaching the cooperative equilibrium. That longer trade relations tend to generate larger rents was also observed by Brown et al. (2004) in an incomplete contract setting.

male and female performances are similar in the non-competitive setting, namely when players are remunerated individually and irrespective of the others' performance. In another experiment reported in Gneezy and Rustichini (2004) nine and ten years old boys and girls, who at that age have identical physical strength, were asked to race first by themselves and then in competitive pairs of two with a similar first round performance. While no gender gap in running speed was observable in the first round, in the second race boys showed improvements in their speed, while girls ran even slowlier than before.[13] Again, the main finding of this experiment is that "competition improves performance relative to a non-competitive environment for boys, but not for girls" (ibid., p.379).[14]

That women are less competition-liking per se, even though no gender difference in abilities is eminent, is also the conclusion drawn by Niederle and Vesterlund (2007). They find that women, in general, including high-performing women, tend to avoid competitive situations compared to alike men, even if the competitive scheme is the pay-off maximizing earning scheme in the games played. Explanations offered are not only gender-specific heterogeneity of preferences over remuneration schemes, but also gender differences in receiving feedback as well as relative overconfidence of men regarding their own future performance. Indeed, the trust game experiments by Fershtman and Gneezy (2001) suggest that women have a preference for an equal distribution of pay-offs. Theories of evolutionary biology and sociobiology suggest that these gender differences in attitudes and behavior might well be grounded in the differential costs of reproduction and thus be genetically determined (e.g. Knight, 2002).

Overall, these economic experiments suggest for societal reality that a competitive environment may exert differential impacts on performance by gender, and that men are more likely to successfully adapt to such an environment. Indeed, Niederle and Vesterlund (2007) report evidence that the female population gains economically

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[13] More specifically, boys' improvements were largest in equal-gender pairs, while girls' performances were worst in homogenous pairs. In mixed-gender pairs, boys substantially improved, what was not observed for girls.

[14] These gender-specific differences in behavior occur irrespective of the type of reward for the winner – with both intrinsic and extrinsic (namely financial) motivation.

relatively less compared to the male from competition at college or competition for top jobs. The latter observation already mixes effects of tournament-type competition with that of market competition (that might well entail a tournament component on the long side), allowing us to attempt to predict gender-specific welfare effects of market competition. Thus, we may tentatively draw the general conclusion that in real life there are gender-specific advantages or disadvantages in profiting from market competition, such that men should be relatively more able to turn market power into successful rent extraction compared to women and, thus, possibly, experience higher utility levels. As competition rises, this gender gap in well-being should increase. The following figure (Figure 2) and hypothesis 2 summarize our predictions:

Figure 2: Gender-specific welfare gains

	Strong bargaining position		Weak bargaining position	
	Comp. low	Comp. high	Comp. low	Comp. high
Men	+	+ +	–	–
Women	+	+	–	– –

Notes: '+' indicates "some gains", '+ +' "substantial gains", and '-', '- -' analogously for losses.

Hypothesis 2:
In economic transactions, market competition exerts a gender-specific impact on the ability to turn market power into welfare gains, in favor of men.

Completeness of contracts

The social dilemma experiments conducted by Brandts et al. (2006) were all in a setting with incomplete contracts, implying that the action of the responding side could not be enforced. We will now consider the welfare effects of market competition when contracts are complete, on both sides of the market likewise. Given that suitable economic-experimental evidence is widely lacking, we will resort to speculating on the welfare implications of market competition. A complete contract is defined as a situation in which each player's responsibilities for all foreseeable situations are fixed ex ante, and an enforceable and enforced sanction for defecting is set.

Since we are not aware of social dilemma experiments with complete contracts, we may draw analogous conclusions from market experiment outcomes. In a market experiment buyers offer prices to sellers for a specific indivisible consumption good; these offers can be either rejected or accepted. If a seller accepts, the good is produced with a quality at the seller's discretion, then the exchange takes place and the gains from trade manifest. Otherwise, in case of no acceptance, no trade takes place and no party wins anything. In these market games, the complete contract setting is reflected in an exogenously (contractually) fixed quality of the good, and only the price can be negotiated on.

These market experiments have shown that completeness of contracts allows the monopolist trader to extract the *maximum* rent, being able to fully exploit her bargaining position. This phenomenon occurs independently of which side of the market is monopolized as long as the number of competitors on the other side is sufficiently large (Cason and Williams 1990, Kachelmaier and Shehata 1992).[15] Obviously, the completeness of contracts eradicates the inequality diminishing effect of mutual reciprocity, altering the effects of the bargaining power for players' pay-off distribution. In contrast, under an incomplete contract setting, there is a strong monetary incentive for buyers to signal trust to sellers and induce reciprocal behavior by paying higher prices,

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[15] In the presence of market competition and complete contracts, theoretical models predict and experiments show that the reservation Nash-price is paid by the buyer while the seller chooses the Nash-minimum quality (see Fehr et al., 1998, for more literature).

for the cooperative equilibrium outcome with a higher good's quality to realize.[16] In other words, the completeness of contracts leaves no room for fairness motives or reciprocation to influence the experimental game outcome (Fehr and Schmidt, 1999).

In sum, these market experiments suggest for the social dilemma games as played by Brandts et al. (2006) that, when allowing for 'contracting away' players' discretion (e.g. over effort levels in labor markets or quality choice as producer), completeness of contracts may affect the financial and potentially the non-financial outcomes of the games. In consequence, conclusions for the expected interaction of market competition with market power with respect to individual well-being might be drawn.

First, in the social dilemma game, completeness of contracts may trigger an increase in monopoly player A's financial gains from trade due to additional rent-extraction. The size of these additional gains should be unaffected by small changes in the number of competitors on the other side of the market. The reason is that her pay-offs are independent from whom she selects as potential trade partner and how many of them are available, as she can always enforce a contract that extracts the maximum rent.[17] In other words, we expect no interplay between the degree of market competition and market power with respect to player A's pay-offs. Second, an analogous argument applies to trade frequency, which may equally stay unaffected by moderate variations in the intensity of market competition, due to perfect enforceability of contracts and players' profit-maximizing behavior. Furthermore and third, the reduction in income insecurity under complete contracts will be independent of the degree of competition as it is triggered by the completeness of contracts itself. In sum, we have reasons to expect no interplay between market competition and bargaining power with respect to income, trade frequency, or income insecurity, economic outcomes that might serve as mediating variables of the effects of competition for experienced utility.

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[16] Indeed, Fehr et al (1993) show that under incomplete contracts buyers offer a price substantially above their reservation price, while the quality of the delivered good increases linearly in buyers' prices.

[17] Please note that this argument assumes some minimum level of competition on the other side of the market. Predictions might be different with two monopoly/monopsony players interacting.

However, based on Brandts et al. (2006) under incomplete contracts we related the observed well-being increase for player A due to market competition to the 'joy of rejecting other players', as her pay-offs or trade frequency were not affected. The question is whether such positive emotions are still present when contracts are complete. Again, due to missing evidence from economic laboratory experiments, we can only make preliminary conjectures.

In this paper, we postulate that under completeness of contracts the introduction of market competition on the other side does not evoke such positive emotions of choosing or rejecting potential trade partners. In consequence, we do not expect an interaction between market power and market competition with respect to well-being. We offer two plausible explanations for our conjecture. The first reason is that, economically, the well-being effects of the 'power to choose' may be too small to merit its deliberate exertion under complete contracts. More specifically, the psychic costs of selecting one among several trade partners may exceed the emotional benefit from having rejected the other players. Consequently, a rational player will avoid these costs of decision-making by selecting trade partners at random, and, thus, not exerting her power intentionally. In contrast, under the incomplete contract setting player A's well-being gains from deliberate choice constitute a byproduct of her rational and intentional pay-off maximization that builds on triggering opponent's reciprocal behavior.

However, even if psychic and time costs of non-random choice were sufficiently low, the question arises whether positive feelings of 'rejecting others' are induced at all. More specifically, we believe that allowing for complete contracts leads to an impersonalization of the negative emotions experienced by those not having been chosen, so that the monopoly player A cannot draw additional emotional benefits from her position as market competition intensifies. In other words, we conjecture that completeness of contracts disentangles the (otherwise interdependent) utility functions of players A from those of B and C. In detail, we believe that - from the viewpoint of players B and C - the completeness of contract provides player A with some 'absolute power', so that rejected players will hold the institutional setting rather than player A's choice responsible for their rejection. In consequence, a rejection may not cause the

development of any 'personalized' negative feelings (against player A). Player A, in turn, anticipating only 'impersonalized' emotional reactions, thus, is not able to draw positive feelings from having rejected a trade partner. In sum, under complete contracts, 'exerting the power to choose' is not likely to affect monopoly player A's well-being, which, consequently, is then independent of the degree of market competition (the number of players) on the other side.

In sum, when contracts are complete, from the viewpoint of monopoly player A, we hypothesize the intensity of market competition *not to aggravate* the market power effects for her well-being, in contrast to the incomplete contract setting. Again, analogous conclusions may be drawn for the players on the other side of the market, as they may hold the institutional setting responsible for the outcome. Based on these thoughts, we formulate the following hypothesis:

Hypothesis 3:

Under complete contracts, there should be no interplay between market competition and bargaining power in economic transactions with respect to subjective well-being.

3 Data and model

Data

For analyzing our research question we employ the 3rd and 4th waves of the World Values Survey (WVS) that contains socio-demographic information on about 80'000 individuals in more than 60 countries. As dependent variable we employ the WVS measure of life satisfaction that gives information on the interviewee's response to the question: "All things considered, how satisfied are you with your life as a whole these days?" This categorical measure of subjective well-being takes on values between 1 (very

dissatisfied) and 10 (very satisfied). The individual-level control variables are equally obtained from the WVS dataset. For descriptive statistics, see Table 1.

Market competition in individual i's economy, in which trade, economic exchange and public goods creation take place, is approximated by the degree of her country's exposure to the forces of economic globalization. The KOF index of economic globalization measures the integration of a national economy in the world market through international trade linkages and financial transfers (Dreher, 2006). This index proxies domestic market competition in two ways: First, it accounts for the pressure of global market competition through the credible threat of market entry by foreign competitors into domestic markets. Consequently, domestic suppliers are then forced to stay competitive and set their prices as if they had no market power. Pressure on domestic firms to produce efficiently and innovate might also be exerted by competition in foreign markets to which domestic firms intend to export to. Second, the KOF index of economic globalization also measures actual competition in domestic markets that is exerted through actually present numerous foreign competitors that sell their imported goods in these domestic markets.

However, the degree of market competition and economic globalization might well be correlated with economic development or income inequality (or, alternatively, the size of the welfare state), confounding the interpretation of our results.[18] Economic liberalization and market competition may trigger higher economic growth, so that wealthier countries tend to be not only the most open ones but also those with the most competitive national markets. In addition, richer countries might also have larger domestic markets, potentially lowering the exposure to economic globalization. To purify our measure of market competition from its implicit wealth component we employ the predicted residuals of a regression of the competition measure on the log of GDP per capita in 2000, assuming the most flexible functional form.[19] These residuals reflect then *pure* market competition

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[18] However, in a sample of economically most globalized countries the variation in income inequality suggests that there is no connection with our measure of market competition. Our regression analysis (see next footnote) supports this conjecture.

[19] This regression was performed with a sample of 80 countries. Pakistan had to be excluded as an influential outlier. Log of GDP was employed assuming a polynomial functional form. All estimated coefficients were significant at the 5 percent level with an adjusted R2 of 0.655. The Jarque-Bera test did not reject the null hypothesis of normally distributed residuals. A measure of income inequality turned out

which abstracts from national wealth (or domestic market size). By choosing this measure, we view the degree of competition as pertaining particularly to the 'other side' of the market, namely approximating the number of potential trading partners in the economic environment an individual can choose among, that is independent of the market competition's impact on national income.

On the other hand, as the experiments by Brandts et al. (2006) suggest, we have to distinguish market competition in individual's *i*'s economic environment from her own *bargaining position* in the market. Although the economy as a whole might be subject to fierce competition, a single agent might still extract (additional) rents by exploiting her market power during a single economic transaction. We approximate individual *i*'s bargaining position by a measure of her (absolute) income position, provided by the World Values Survey. The WVS offers information on individuals' income based on ten country-specific income brackets that can also be interpreted as a 10-scale ranking. Cross-country comparability of these ranks is ensured by them roughly representing the ten income deciles of each national income distribution. As common, we measure bargaining position relative to the weakest position as reference point.

By employing income as measure of bargaining power, we also follow the tradition in political science that uses GDP as measure of a country's capabilities and proxy for a country's representative's weight in international negotiations (e.g. Schneider, 2005). However, individual income might not only approximate bargaining position but equally other persons' characteristics such as resources, skill, education, or simply, income. In principle, these correlations do not pose a problem as long as they are strong and highly positive. Indeed, by employing individual *i*'s income position to measure her bargaining position we implicitly assume that income is highly correlated with and thus linked to having financial resources to search for alternative trading partners, lobby for her interests, or afford the costly enforcement of her contracts. Moreover, higher income ranks may well be the result of previous advantageous trade/exchange outcomes and, as such, proxy dominant bargaining positions in past transactions, predicting bargaining

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insignificant, also jointly, even when testing several functional forms and was therefore omitted from the final specification. See Table A1 for detailed results.

position in present transactions. Similarly, higher skill and better education may equally be advantageous in economic transactions as, e.g. they might imply more calculating and better informed decision-making. Clearly, as bargaining power is only approximated, we are not able to completely exclude alternative explanations for our empirical findings, which we address in the conclusion.[20]

For assessing hypothesis 3, *completeness of contracts* is approximated by measures of legal quality, as better working and more impartial legal systems set an institutional framework that fills gaps in business/trade/exchange contracts through regulating the parties' rights and obligations in case of unforeseeable events. In this study, three alternative measures account for the quality of the legal system: first, we employ two sub-indices of the Fraser Institute's economic freedom's index that pertain (1) to the 'judicial independence' and (2) to the 'integrity of the legal system', both measured in 1995 (Gwartney and Lawson, 2006). According to the Fraser Institute's Appendix to its Annual Report in 2001, the first index component is based on various issues of the 'Global Competitiveness Reports', a survey of leading CEO's conducted by the World Economic Forum, and reflects the independence of the judiciary from interference by the government and, most importantly to our question, by any of the parties in dispute. Instead, the second measure is related to legal corruption, namely the absence of "irregular payments to judges, court personnel, or other officials" (Gwartney and Lawson, 2001, p.26), reflecting facets of the strength and impartiality of the legal system, mostly based on Political Risk Component I (Law and Order) from the International Country Risk Guide (PRS Group).

As third measure, (3) the rule of law component of the Kaufman governance quality indicator of 1998 complements the set of quality of legal system variables. According to Kaufman et al. (2003), the "rule of law" indicator is based on a regression with data from various distinct sources and reflects, among others, general public safety, average norm compliance, crime as a threat to business, enforceability of private and government

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[20] As education might equally proxy bargaining power, it has been excluded from the model. See also next section and footnote 22.

contracts, protection of property rights, fairness of judicial process and judicial independence, as well as quickness and enforceability of court decisions.

Overall, the Fraser indices appear to measure specific and narrow aspects of the quality of a country's legal system, while the Kaufman index mirrors a broader definition, giving rise to the well-known 'kitchen sink'-nature-criticism. For their descriptive statistics, see Table 1.

Insert Table 1 about here

Model

In our model, we view life satisfaction of individual i in country s (SWB_{is}) as a function of her bargaining position under specific market environments ($POS_{is}*COMP_{s}$,), measured by the variables introduced above. Thus, by interacting the individuals' income ranks with the degree of national competition (due to globalization) we explicitly model how the well-being effects of market power change with the degree of market competition (coefficient γ). In addition, through inclusion of POS_{is} itself, that is not interacted, we allow also for well-being effects of bargaining position that are rather independent of market environment (coefficient β).[21] This relation can be expressed as follows:

$$SWB_{is} = \quad \beta\, POS_{is} + \gamma\, POS_{is}*COMP_{s} + \delta'X_{is} + \varepsilon_{is} \qquad (1)$$

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[21] Note that in the experiments by Brandts et al. (2006) the size of the monopoly player's pay-off is independent of the degree of competition on the other side of the market.

Vector X_{is} contains the remaining control variables, including individual-level socio-demographic determinants as well as country fixed effects, while ε_{is} denotes the individual-specific error term. The selection of most of these individual-level variables is based on previous life satisfaction studies (e.g. Bjørnskov et al., 2008, 2008a; Ferrer-i-Carbonell, 2005). In order to ease the interpretation of income rank as market power, we exclude those individual-specific determinants that are highly correlated with income and might equally reflect facets of a bargaining position in (market) transactions, e.g. education, occupational status, and political orientation.[22] In consequence, we employ mainly gender, age, family type, generalized trust, religious denomination, service participation, and belief in a superior being as controlling factors of well-being. The country fixed effects absorb any impact of country-specific characteristics such as institutions, culture, and macro-economic conditions as well as consumption possibilities at the country level (GDP). Thus, they also capture effects exerted by the degree of market competition *per se*.

Given the categorical nature of the dependent variable, we apply an ordered probit estimation technique. For simplicity, only the results for the variables of interest (POS_{is} and $POS_{is}*COMP_{s}$) are reported in the main text of the paper, while the estimation outcomes for the X_{is} variables for the whole population can be found in the Appendix (Table A2). Focusing on these interplays between individual-specific and macro-level determinants of well-being may also have the methodological advantage that identification of the effect of macro-level market competition is facilitated in a micro-level cross-section with no variation over time. Following the empirical happiness literature, as reference group we chose the persons with the weakest bargaining position.[23]

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[22] In general, persons with higher education or those who are active in the labor market are likely to have more bargaining power compared to those with little education or without employment. In addition, persons with more market power are more likely to oppose income redistribution and, thus, be found among those with a conservative ideology.

[23] For a life satisfaction model comprising individual-level factors combined with explicitly modeled macro-level determinants, see Bjørnskov, Dreher, and Fischer (2008). Since we are mainly interested in the interaction between competition and market power, a country fixed effects specification seemed more appropriate. Moreover, macro-level competition is multicollinear with country fixed effects, so that its pure impact remains unobservable in cross-sectional data.

4 Results

The estimation results for the bargaining position, measured by the ten income ranks, and their interactions with market competition are presented in Table 2. For reasons of comparison, column (1) excludes the interaction terms and report only the *per se* effects of income. Columns (1) and (2) display the results for the whole population, while column (3) and (4) report the outcomes for the two subpopulations by gender. In all estimations, the reference group is formed by those persons in the lowest income rank.

In model (1), which excludes the interaction terms, we observe for the whole population that persons with an income higher than those in the reference group tend to report higher levels of life satisfaction. Moving from one income rank to the next higher, we observe increases in coefficient sizes as well as in magnitudes of marginal effects (from 0.019 for rank 2 up to 0.157 for rank 10, for a complete list see the appending table to Table 2). Most of these differences are statistically significant.[24] These findings suggest that life satisfaction rises with absolute income (rank) relative to the reference group, being in line with the previous happiness literature (e.g. Ferrer-i-Carbonell, 2005). The welfare effects of absolute income are supportive of the experimental outcomes by Brandts et al. (2006) that found happiness to be positively correlated with financial gains, the number of successful transactions, and trade frequency. The reader should note that if we had chosen the median income rank as reference point, we would have observed that life satisfaction declines (increases) with growing negative (positive) distance from the comparison group, being in line with the literature on positional concerns (e.g. Clark, Frijters and Shields, 2007, Fischer and Torgler, 2007).[25]

Model 2 (column 2) includes now the interaction terms between market competition and income rank. Comparing the estimates of the (non-interacted) absolute income ranks for

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[24] However, an exception pertains to the insignificant difference between the 7th and the 8th income ranks. In this paper, all cross-model and within-model comparisons of marginal effects are based on weighted OLS regressions. Given that the dependent variable has 10 categories, using OLS yields reliable results (see Ferrer-i-Carbonell and Frijters, 2004).

[25] Econometrically, the choice of the comparison income group does not affect the estimates of the remaining non-financial covariates.

model 1 with those obtained for model 2, we find a striking cross-model similarity of point estimates and marginal effects, an observation that is supported by appropriate statistical tests.[26] The fact that models 1 and 2 differ only with respect to the interaction terms lets us draw the following conclusion: Obviously, the total well-being effect of income consists of two rather distinct and independent components: on the one hand, a 'per se' effect that is quite unaffected by and independent of market competition, and an additional effect that varies under different degrees of market competition. (Notably, the size of the *total* effect of income is then equally dependent on the intensity of market competition). This finding of two independent effects is analogous to the observation in Brandts et al. (2006) of monopoly player A experiencing increases in well-being as competition rose that were unrelated to her financial gains from trade, which stayed the same in the two treatments.

Our focal variables are, however, the interaction terms that relate to competition-dependent effects of bargaining power. In general, we observe in column (2) for all persons a significant and positive interaction between intensity of market competition and income rank, suggesting that in a more globalized economy the positive contribution of one's bargaining power to individual well-being is enlarged, compared to the group with the weakest bargaining power. This finding is in support of hypothesis 1. Again, the choice of the comparison group affects the sign of the estimates, and these empirical results are identical to observing a well-being lowering effect for persons below and an increasing effect for persons above the median income rank.

The sizes of the marginal effects of the interaction terms do not show a strong variation across income ranks, an impression that is statistically corroborated. In other words, for a given level of competition, it appears that the aggravating effect of competition is of equal magnitude for all income ranks (namely $\gamma_2 = \gamma_3 = \gamma_4$ etc.).[27] However, these

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[26] Indeed, only the difference in the coefficients and marginal effects of the interaction terms between the 5th and the 8th income ranks is significant (at the 5 percent level).

[27] It should be noted that our results do not suggest that the total effect of marginal income on well-being ($\delta SWB_{is}/\delta\, POS_{is} = \beta + \gamma\, COMP_s$) is identical across all income groups. Indeed, it is composed of two terms: an independent absolute income part (β) and a part that depends on competition ($\gamma\, COMP_s$), with the first varying across income ranks (namely $\beta_2 < \beta_3 < \beta_4$ etc.).

marginal effects are to be interpreted with respect to the lowest income group only – when switching from the reference group's income to the income rank in question. In other words, these estimation results are not suitable for gauging marginal effects of income between two consecutive ranks (with rank > 1) that assume cardinality.

Assuming cardinality and continuously differentiability of the 10-category WVS income measure, we estimate a similar life satisfaction model with the interacted and non-interacted income rank dummies replaced by the original WVS income variable. In other words, the functional form of SWB with respect to cardinal income and market competition is assumed to be of the following form:[28]

$$\text{SWB}_{is} = \alpha \, INC_{is} + \beta \, INC_{is} * INC_{is} \; + \; \gamma \, INC_{is} * COMP_{s}$$

Estimating this model (including the usual covariates, X_{is}) as weighted ordered probit or OLS, the coefficients of both the interaction term and the income variable are all positive and significant ($\alpha, \gamma > 0$), at least at the 5 percent level, while a negative one for the squared income ($\beta < 0$) indicates decreasing marginal utility of income.[29]

For illustration of the observed effects, Graph 1 plots the experienced utility for all 10 income ranks and four different levels of competition (COMP = 0, 1, 5, and 10, respectively), setting all other covariates (including the constant) to zero. In addition, two utility difference curves depict the gap in well-being for three distinct degrees of competition, COMP = 5 versus COMP = 1, as well as 10 versus 1, respectively.

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[28] Preliminary estimation results with various model specifications suggest that the interaction between competition and income is of a linear nature (corroborated by appropriate Wald-tests), while income *per se* appears to exhibit decreasing marginal utility.

[29] The values are 0.287 for INC, -0.012 for INC^2, and 0.011 for the interaction term INC*COMP based on the weighted OLS regression.

Graph 1: SWB and Market Competition
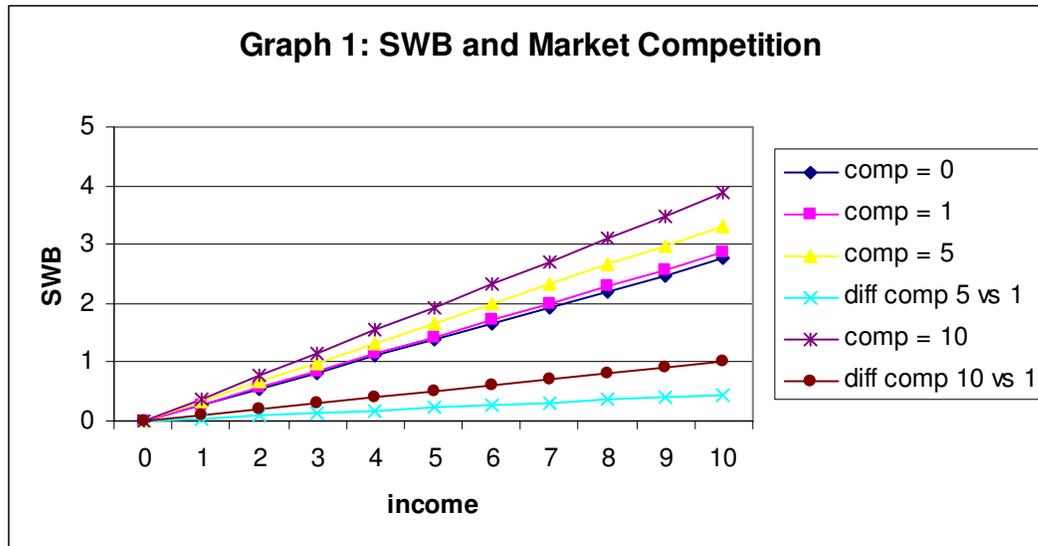
As can easily be seen from Graph 1, individual well-being rises with income, and thus with one's strength in bargaining position. Please note that the point estimates clearly indicate decreasing marginal utility from income, despite the rather linear appearance of the utility curves in the graph.

First of all, graph 1 illustrates that market competition contributes positively to well-being as utility curves with a higher degree of competition lie above those with a smaller degree. Thus, for a given (positive) income level / bargaining power, intensifying competition leads to an increase in experienced utility. The same interpretation applies to the utility differences curves, which lie all in the positive dimension.

Our main interest, however, is the question how the marginal impact of income for happiness is affected by changes in the degree of market competition. In graph 1, it is the slope of the utility curves that reflect the marginal utility of income. Clearly, as competition rises, the slopes of the utility curves become apparently steeper. Evidently, well-being rises faster in bargaining position as competition intensifies. In other words, market competition appears to tilt the well-being curve upwards. This tilt is also prominent when the slopes of the two curves calculated as the well-being difference for two different degrees of competition (10 and 5, respectively, versus 1). Depicted at the

bottom of graph 1, again, the slopes appear steeper as the difference in competition rises.[30] To sum up, Graph 1 illustrates how market competition re-enforces the bargaining power position effects for well-being.

Summing up, in support of hypothesis 1 and as demonstrated in the economic experiments by Brandts et al. (2006), column 2 of Table 1 shows that competition affects the impact of one's bargaining position on well-being, generating additional well-being gains, compared to the reference group. In our analysis, market competition appears as re-enforcing the bargaining effect on well-being, with the size of the additional gains increasing in income rank. Symmetrically interpreted, fiercer market competition triggers additional losses in well-being for individuals with less bargaining power than an average person – in contrast to persons with more bargaining power than the average.

Results by gender

Turning to the results by gender (columns 3 and 4 of Table 2), we first note that the similarity of the magnitudes of the estimated coefficients (and marginal effects) for the *absolute* income ranks across genders (see appending table to Table 2). This result suggests that utility gains due to increases in individuals' absolute income are of comparable size for both women and men, possibly through improved consumption possibilities.

However, when comparing the estimation results for the interaction terms across models, the competition effects previously observed for the whole population appear as almost entirely driven by the female subsample (except for the 3rd and 4th income ranks). More specifically, in contrast to the male population sample, in tendency, well-being of women depends positively on the intensity of market competition (for six out of nine income ranks), compared to the reference group. Consequently, one might conjecture that women

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[30] This procedure is equivalent to calculating the cross derivative of SWB w.r.t. to income and then to competition. As the first derivative of SWB w.r.t. income is $\delta SWB/\delta INC = \alpha + \beta * INC + \gamma\ COMP$, the estimates suggest that the marginal utility from income rises with competition ($\gamma > 0$).

gain relatively more in utility from competition than their male peers of equal income rank, strongly contradicting our hypothesis 2.

On the contrary, we are not able to statistically reject the hypothesis that, for all income ranks, the effect of competition is of equal size across the two gender-specific subsamples, which substantially weakens the reliability of the previous interpretation of a gender-specific differential impact.[31] To analyze this question further, we split the sample by bargaining position (low, middle, and high income) and interact the gender dummy with our measure of competition. The interaction term always turns out insignificant, suggesting that no gender-specific impact of competition exists. Equally, inclusion of an interaction term of 'being male' with the degree of competition in the original model yields no significant results. Finally, assuming cardinal and continuously differentiable income equally suggests, on the one hand, an advantage of the female population over the male in the respective subsample, but, on the other, again, a comparable impact of competition across genders when testing the hypothesis of equally sized marginal effects.[32]

Taken all together, Table 2 suggests that there may not be any gender-specific differences in turning market competition into additional welfare benefits.[33] Obviously, when it comes to real life, gender-specific advantages in coping with such competition do not appear to substantially matter to individual well-being. This finding contradicts our hypothesis 3 and contrasts previous experimental economics evidence, which, however, deals with, on the one hand, competitive environments (tournaments) and, on the other, gender differences in performance, that is pay-offs. Alternatively, an explanation for our empirical finding may equally build on aspiration theory that views well-being as the gap between aspired and achieved utility. It might well be that, despite of an existing gender-specific dis(advantage) for achieving under competition, internalization may also trigger gender-specific changes in aspiration levels, leaving the gap between both aspired and

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[31] Based on F-tests on equality of coefficient sizes across the two equations. See also footnote 24.

[32] Results are not reported but available on request.

[33] Significance levels of the coefficients on the interaction terms are higher in a subsample of countries with a low legal quality (see Table 3). However, even for this subsample no differential impact of competition by gender is observable.

achieved utility unaffected. In consequence, the impact of competition on well-being may not differ across genders, *ceteris paribus*. These empirical findings also suggest that outcomes observed in the experimental lab (for individuals' pay-offs) do not necessarily translate one to one into economic and social reality (of people's well-being).

Insert Table 2 about here

Quality of the legal system

Finally, we turn to the effects of well-working legal institutions and court systems for well-being (Table 3, columns (2) through (7)). For this purpose, the sample is divided into countries with either a higher or a lower rule of law index value than the median, for each of the Kaufman rule of law-index, the Fraser legal integrity and the Fraser judicial independence measures separately.[34] The results for the original, full sample of countries are reported in column (1) (equivalent to column (2) in Table 2).

A comparison of the results across the two subsamples reveals that, in general, in countries with a high quality legal system the effect of the absolute income rank *per se* is more sizeable than in countries with a weak legal system, for two of three measures of legal quality and particularly for higher income ranks.[35] Overall, additional welfare gains of income appear to be induced by a well-functioning institutional framework. This

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[34] This procedure implies that countries in which the median value is present are excluded from the subsamples; however, inclusion of the median country in either subsample does not affect our results qualitatively. In general, as the three rule of law indices do not cover the full sample of countries, the number of observations of the two subsamples do not add up to that in the full sample.

[35] Significant differences between the two subsamples were observed for the 7th, 8th, 9th and 10th income ranks when the Kaufman rule of law index was used and the 6th, 7th, 8th, and 9th income ranks when the Fraser measure of legal integrity was employed. Only one significant difference for the 9th income rank was detected for the measure of judicial independence.

observation is in support of the argument that well-working legal institutions lower market transaction costs, facilitating economic exchange and thus improving consumption possibilities, ceteris paribus.

In stark contrast are the regression outcomes for the interaction terms. In the country sample with a strong rule of law, almost all interaction term coefficients are insignificant, indicating that the welfare effects of one's income rank are independent from the intensity of market competition.[36] In other words, a well-working, impartial and non-corrupt judicial system prevents the exploitation of having a stronger bargaining position to reap additional benefits as competition on the other side of the market intensifies. This observation holds true for all three alternative measures of the rule of law employed (columns (2), (4), and (6) of Table 3).

In contrast, in countries with a weak rule of law the significant coefficients on the interaction terms suggest that market competition interacts with individual market power, an observation mirroring the results for the full sample.[37] In general, the marginal effects in the low legal quality country sample, as statistical tests across equations reveal, are in most cases (often) significantly more sizeable than those observed in the high legal quality (full country) sample.[38] Assuming cardinality and continuously differentiable income shows, again, that the utility curve is tilted upwards as competition rises. In other words and in analogy of the previous findings (column 1), deficient legal institutions and inefficient court systems allow for additional welfare gains through a stronger bargaining position as competition in the economy gains momentum. Again, these estimation results

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[36] An exception, however, pertains to the 8th income rank when the Kaufman rule of law index of 1998 is used. Such significance, however, is not observable in the samples based on the two alternative measures from the Fraser Institute.

[37] In most of the cases the marginal effects appear equally sized across the nine absolute income ranks, a finding equally mirroring the full sample outcomes.

[38] Significant differences in marginal effects between the two subsamples by legal quality were detected for the interactions with the 3rd, 5th, 6th, 7th and 9th income ranks (weakly: 2nd, 4th, 8th) for the Kaufman rule of law and the (2nd, 3rd, 5th, 6th, 7th, 8th, 9th; weakly: 4th, 7th and 10th) income ranks for the Fraser legal integrity measure. Significant differences when the Fraser judicial independence measure was employed relate to the 3rd, 4th, 7th; and (weakly) 6th income deciles. Significant differences between the full and the low legal quality samples are observable when employing the Kaufman rule of law (3rd, 5th, 6th, 7th deciles; weakly: 2nd, 4th, 8th, 9th) or the Fraser legal integrity index (3rd, 5th, 8th, 9th deciles; weakly: 2nd, 6th), but when using the Fraser measure of judicial independence.

are insensitive to the choice of any of the three alternative measures of rule of law, as a comparison of columns (3), (5) and (7) reveals.

Overall, the results for sub-samples of countries split by the strength of the legal and judicial system in Table 3 suggest that the re-enforcing impact of competition on one's bargaining power becomes only evident when law enforcement is weak and courts are corrupt. This finding is in line with our hypothesis 3 that states that under completeness of contracts market competition does not affect the impact of bargaining position on well-being. However, alternatively, the differential impacts in these two country sub-samples may well be caused by more accurate and reliable data collection in countries with a high legal quality (= high GDP), while in the low legal quality country sample a measurement error manifests in the occurrence of significant interaction terms. In consequence, we cannot completely exclude the possibility that our findings for the rule of law constitute a statistical artifact.

Insert Table 3 about here

Robustness of results

The main findings presented in Tables 2 – 3 were robust to changes in model specification such as to the exclusion of generalized trust that might partly work as bargaining's power's transmission channel under different market environments (see Fischer 2008). Equally, inclusion of measures of political ideology, occupational status and education did not substantially alter our results, although in the latter case for the two lower income ranks the significance levels of the income estimates decreased, suggesting that particularly persons in these income groups are well approximated by education characteristics.

A major concern that applies to most cross-section analysis is that of reversed causality. It might well be that happier persons earn more (because they are more productive or positively discriminated), causing a positive correlation between income and life satisfaction that does not reflect a causal relation going from the first to the second. Our model, however, is based exactly on this assumption. Econometrically speaking, an endogeneity of income may bias the estimated coefficient vector, producing unreliable results. Using cross-section data such bias can me reduced by applying instrumental variable techniques to the endogenous variable.

As technical and theory-based requirements for choosing appropriate instruments, the variables in question should have sufficient explanatory power for the instrumented variable (income), while, at the same time, they should not constitute omitted variables in the main regression (happiness regression) (so-called 'exclusion restriction'). The WVS includes some questions that relate to interviewees' attitudes which have been, most possibly, formed during respondents' childhood. To justify their usage as instruments for income, we argue that these attitudes are determinants of current and past effort, and we expect more effort to lead to higher income. As proxy for effort, we first employ the question whether a child should be educated to be 'determined' and to exhibit 'perseverance'. Assuming that a parent's attitude towards child education may well reflect her own preferences, this variable may measure the respondent's own degree of 'ambition' that, arguably, should cause effort levels to be higher and earnings to increase. The other two instrumental variables pertain to two specific job characteristics that the respondent deems 'important', namely 'having a good job security' and 'having good working hours'. Assuming life-time utility maximizing individuals, we can, *ceteris paribus*, expect optimal effort (and thus wage) to decrease in the degree of risk aversion. Similarly, having a preference for highly regulated occupations with a fixed number of working hours might equally mirror, for example, a high personal discount factor that is adverse to long-term human capital investment decisions, lowering future earnings.

However, in order for the instruments to be valid, they should not affect interviewee's happiness. From an economic theory viewpoint, a neutral impact of effort on individual well-being has to be justified. According to aspiration theory, experienced utility is

defined as the distance between the actual (achieved) utility level and the aspired level. In such case, persons with certain attitudes not only exhibit higher effort levels and thus achieve higher income, but may equally develop higher income aspirations (as part of the adaption process), compared to persons with lower effort levels. In consequence, the gap between actual and aspired utility may well remain unaffected by cross-personal differences in exerted effort, and, *ceteris paribus*, not affect individual well-being as defined by aspiration theory. Thus, from a theoretical viewpoint, proxies for effort may well meet all requirements for being good and valid instruments for income in a happiness context.

Turning the econometric analysis, we report the results for the first stage (auxiliary) regression in Table A3 of the Appendix. Assuming cardinality of income, indeed, our instrumental variables show to be significant determinants of income with the predicted signs: while the proxy for 'ambition' exerts an income increasing impact (at the 1 percent level of significance), both 'job security' and 'good working hours' decrease respondents' earnings (both at the 1 percent level of significance). The F-test on the excluded instruments equally indicates that all three variables have (jointly) a strong predictive power, with an F-value beyond 35 for either auxiliary regression.[39]

As regards the validity of the instruments, the Hansen J-statistic (chi2(1) = 0.053, p-value = 0.81) suggests that the overidentifying restrictions are met, meaning that the proxies for effort have been correctly excluded from the happiness regression. This is also supported by the Anderson-Rubin Wald test (chi2 (3) = 5.89, p-value: 0.11), which is more reliable in the presence of weak instruments.[40] Moreover, the Kleibergen-Paap rk LM statistic indicates that no underidentification problem is present (rejection of H_0), meaning that the reduced form-equation is identified (chi2(2) = 24.18, p-val = 0.0000). A similar test (based on the related Kleibergen-Paap rk Wald statistic) shows that the bias in the IV estimate is less than 10% of the maximal IV size, meaning that the employed instruments

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[39] The instrumental variable regression was carried out using the user-written Stata command ivreg2 (Baum et al, 2007), that contains a wide array of validity tests which we report in our discussion.
[40] In principle, even a sufficiently strong F-statistic on the excluded instruments does not rule out the possibility that instruments are weak.

are not weak and yield reliable estimates for the endogenous variable in the main happiness regression.[41]

Employing cardinal income and its squared term, the estimates for both income variables are jointly significant at the 5 percent level, with income increasing in subjective well-being, but at a declining rate. Using the log of income instead, already assuming decreasing marginal utility, yields a positive coefficient significant at the 5 percent level. The important aspect of the IV estimation results is that, taking account of potential endogeneity, income still impacts individual well-being positively. Moreover, an endogeneity test based on the described IV models and estimations suggests that (log) income is, in fact, an exogenous determinant of well-being (Chi2 (2) = 0.382, p-val = 0.8680; for log of income: Chi2 (1) = 0.009, p-val = 0.9248).[42] Thus, our estimation results for happiness presented and discussed in this paper are not likely to be a product of model misspecification, at least as far as income is concerned.[43]

5 Summary and conclusion

This paper uses the World Values Survey data on more than 80,000 individuals of more than 60 countries to investigate the impact of market competition on subjective well-being (happiness). Although our analysis potentially suffers from irresolvable measurement problems and endogeneity issues due to the cross-sectional nature of the data, we nevertheless find support for two out of three predictions based on experimental outcomes, while one is rejected. Thus, this paper is the first to provide an econometric analysis of the impact of market competition on subjective well-being, successfully contributing to the empirical literature in happiness research. In addition, it also adds to

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[41] The reported test statistics relate to the model in which cardinal income and its squared term are (simultaneously) instrumented in the main regression. The test statistics are similar and qualitatively identical for the specification using the log of income.

[42] Please note that the results of the test for endogeneity are only reliable when valid instruments are used.

[43] In principle, all of the more than 20 micro-level determinants employed in this study could be subject to reversed causality. Please note that it is almost a tradition in happiness research not to econometrically test the exogeneity assumption when working with cross section data.

the strand of literature that tests to what extent outcomes from the experimental laboratory may be suitable to explain real-world phenomena. However, this study also sheds light on research questions for which investigative economic experiments are still lacking.

In this study we find that market competition re-enforces the effect of an individual's bargaining position in transactions for her well-being (hypothesis 1): competition yields additional welfare gains from trade as it intensifies - compared to the weak position reference group. Assuming cardinality, we detect an upward tilt in the experienced utility curve suggesting that the beneficial effects of competition increase in income. Based on experimental outcomes of social dilemma games with altered numbers of competitors, as reported in Brandts et al. (2006), we conjecture these additional happiness gains to be caused by non-financial, emotional benefits of exerting market power, or, more explicitly, the 'joy of rejecting' potential trade partners. In principle, however, we are not able to rule out the interpretation that, in real life, a share of the observable additional well-being gains are linked to non-psychological factors such as earning opportunities or consumption possibilities effects. Moreover, it is also not completely possible to eliminate alternative interpretations of our bargaining power measure. In such case, however, even when assuming alternative interpretations of income rank as resources, skill, education or just income, the happiness gap enlarging effect of market competition, our focal finding, prevails.

Rejecting our prediction we are not able to identify a differential impact of competition by gender that would have suggested that men fare significantly better as competition rises, compared to the female population. At first sight, this finding appears to contradict experimental economic outcomes demonstrating that in competitive situations male participants were able to achieve substantially higher pay-offs compared to the female test takers (Gneezy et al, 2003). However, internalization of gender-specific (dis)advantages may well lead to gender-specific aspirations that, accordingly, cause the gender-specific gap between actual and aspired utility levels (or consumption levels) to remain unaffected as the degree of market competition changes, *ceteris paribus*. Up to

date, however, experimental evidence on the gender-specificity of well-being impacts of competition is still missing, particularly within a market economy context.

Finally, we find that well-working legal institutions and court systems do not allow for additional bargaining position-dependent welfare gains as market competition rises. Thus, well-protected property rights and enforceability of contracts appear to restrain exploitation possibilities that relate to the joy of rejection or, alternatively, to additional financial gains as competition on the other side gets fiercer, while a weak rule of law admits them. However, this positive welfare effect of the rule of law equally lacks corroboration by appropriate economic experiments allowing for complete and incomplete contracts under different degrees of market competition.

As policy conclusions, one could naively argue that weakening the rule of law combined with strong market competition might be a desirable state of society as welfare seems to be increased, as our econometric analysis suggests. However, such conclusion would be too short-sighted. First of all, the directions of the effects of market competition are, in fact, sensitive to the choice of comparison group - our econometric design takes the weakest bargaining power as reference point. Choosing the median position as reference point, we would have observed an aggravation of well-being differences due to existing social cleavages in terms of income position. In addition, the economic experiments by Brandts et al. (2006) suggest that under incomplete contracts negative emotions are experienced by the rejected players as competition on their own side rises, possibly due to experienced 'social stress'.[44] However, market competition might also exert positive effects that are of a rather long-run and indirect nature, which our empirical set-up does not capture. For these reasons, no final conclusion can be drawn with respect to the total impact of market competition on societal well-being in a Utilitarian tradition.

Arguably, our findings bear also important policy implications for underdeveloped nations that are in search for the optimal growth path. Our results suggest that the establishment of an impartial justice system and the protection of property rights are

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[44] For evidence of the stress-inducing effect of competition for rats and grassland plants, see e.g. Bohus et al. (1993) and Scebba et al. (2006).

likely to prevent welfare losses through intensified market competition. Thus, developing well-working legal institutions should preclude any economic liberalization. Indeed, a famous example for a misplaced liberalization policy that lead to such welfare losses due to dysfunctional government institutions is, most possibly, Russia in the 1990ies. Our finding of the importance of the rule of law is also in line with the critique formulated by Stiglitz (2002, 2006), who claims that recent development policies were naively based on economic textbook predictions that free and competitive markets lead to positive economic outcomes by themselves, not taking into account that in newly developing countries incomplete information, inadequate markets, and dysfunctional institutions would distort such development.

This policy conclusion of a priority of strengthening the 'rule of law' over the introduction of market competition is also in line with recent empirical cross-national happiness analyses on formal institutions and governance structure for more than 60 countries (Helliwell and Huang, 2008, Bjørnskov et al., 2008b). These studies reveal that for poor countries a well-working judicial system is beneficial to overall welfare, while competition in the political sphere (as reflected in the strength of democracy) does not contribute to it.[45] To sum up, these and my own results suggest that the benefits of institutions built on the principle of competition may become eminent not unconditionally, but rather after some basic economic needs and institutional conditions such as the 'rule of law' have been satisfied.

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[45] In contrast, in middle- and high-income countries democratic institutions were conducive to happiness – in addition to the positive effects of a strict rule of law.

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Appendix

Table A1: Derivation of competition measure

	1	2	3	4
GDP 2000	30.494*	-3.655*	29.143+	28.696+
	[2.10]	[2.17]	[1.95]	[1.96]
GDP 2000 ^2	-3.812*	0.263**	-3.649+	-3.604*
	[2.15]	[2.72]	[1.99]	[2.00]
GDP 2000 ^3	0.160*		0.154*	0.152*
	[2.24]		[2.08]	[2.10]
Gini coefficient			0.073	-0.275
			[0.93]	[0.48]
Gini coefficient ^2				0.042
				[0.62]
Constant	-78.353*	15.733*	-75.047+	-72.927+
	[2.01]	[2.16]	[1.87]	[1.86]
Observations	79	79	76	76
Adjusted R-squared	0.6549	0.6281	0.6548	0.6514
Jarque-Bera test	.1783	1.284	.1773	.1115
(p-value)	.9147	.5263	.9152	.9458
F-test (Gini vars.)				0.67

Notes: OLS estimation with Huber/White robust standard errors. '**', '*', '+' denote significances at the 1, 5 and 10 percent levels, respectively. Dependent variable is the economic dimension of the KOF globalization index of 2000 (Dreher, 2006).

Table A2: Baseline model (Table 2 column 2): controlling variables

Whole population		Whole population (cont.)	
Buddhist	-0.003	Has had 1 child	-0.022
	[0.09]		[1.34]
Muslim	-0.024	Has had 2 children	-0.011
	[0.83]		[0.70]
Catholic	-0.052**	Has had 3 or more children	0.003
	[3.01]		[0.19]
Protestant	-0.066	Believes in superior being	0.052**
	[1.31]		[3.92]
Orthodox	-0.128**	Service participation: once a week	-0.075**
	[4.04]		[4.32]
Other Christian denomination	-0.062	Service participation: one a month	-0.130**
	[1.25]		[6.70]
No denomination	-0.039*	Service participation: on common holy days	-0.141**
	[2.18]		[7.40]
Jewish	-0.061	Service participation: on specific holy days	-0.145**
	[0.90]		[4.97]
Hindu	0.037	Service participation: once a year	-0.185**
	[0.84]		[8.44]
Age	-0.033**	Service participation: less than once a year	-0.210**
	[18.61]		[9.85]
Age squared	0.000**	Service participation: never, practically never	-0.212**
	[18.72]		[11.15]
Male	-0.047**	Trusts most people	0.127**
	[5.25]		[13.24]
Single female	-0.008		
	[0.31]		
Single male	-0.086*		
	[2.08]		
Married	0.202**		
	[15.00]		
Cohabiting	0.097**		
	[3.40]		
Observations	79064		

Notes: Ordered probit estimation with country fixed effects. '**', '*' denote significances at the 1, and 5 percent levels, respectively. Dependent variable is subjective life satisfaction, measured on a 10-point scale.

Table A3: Auxiliary regressions: instrumental variables

Dependent variable	1 Income	2 Income squared	3 Log of income
Teaching children 'perseverance' and 'determination'	0.356**	3.687**	0.088**
	[10.01]	[9.29]	[9.83]
Important: good job security	-0.197**	-2.646**	-0.030**
	[7.08]	[8.63]	[4.15]
Important: good working hours	-0.099**	-1.106**	-0.022*
	[3.01]	[3.25]	[2.64]
Constant	4.403**	23.931**	1.330**
	[15.46]	[8.44]	[18.16]
Individual controls	yes	yes	yes
Country fixed effects	yes	yes	yes
Observations	83794	83794	83794
R-squared	0.22	0.21	0.21

Notes: OLS regression. Standard errors adjusted for within-group correlation at the country level and heteroscedasticity. Individual-level and macro-level controlling variables (remaining instruments) are as in the baseline model. Relevant test statistics for the predictive power and validity of the instruments are reported in the main text.

Tables

Table 1: Descriptive statistics for variables

Variable	Obs.	Mean	Std. Dev.	Min	Max
Life satisfaction	79064	6.675	2.574	1	10
Residuals economic globalization	79064	-0.113	0.619	-1.620	1.681
Kaufman Rule of Law 1998	77893	0.400	1.024	-1.34	2.27
Fraser Judicial Independence 1995	62066	6.300	2.087	2.33	9.82
Fraser Integrity 1995	72310	7.025	3.118	0	10
Income level 2	79064	0.140	0.347	0	1
Income level 3	79064	0.143	0.350	0	1
Income level 4	79064	0.151	0.358	0	1
Income level 5	79064	0.125	0.331	0	1
Income level 6	79064	0.104	0.305	0	1
Income level 7	79064	0.085	0.279	0	1
Income level 8	79064	0.066	0.248	0	1
Income level 9	79064	0.047	0.211	0	1
Income level 10	79064	0.045	0.207	0	1
Buddhist	79064	0.013	0.113	0	1
Muslim	79064	0.160	0.366	0	1
Catholic	79064	0.350	0.477	0	1
Protestant	79064	0.016	0.125	0	1
Orthodox	79064	0.057	0.232	0	1
Other Christian religion	79064	0.015	0.121	0	1
No religious denomination	79064	0.179	0.383	0	1
Jewish	79064	0.003	0.057	0	1
Hindu	79064	0.023	0.150	0	1
Age	79064	41.113	16.090	15	98
Age squared	79064	1949.197	1494.701	225	9604
Male	79064	0.487	0.500	0	1
Single female	79064	0.050	0.218	0	1
Single male	79064	0.013	0.113	0	1
Married	79064	0.551	0.497	0	1
Cohabiting	79064	0.045	0.207	0	1
Has had one child	79064	0.145	0.352	0	1
Has had two children	79064	0.250	0.433	0	1
Has had 3 children or more	79064	0.292	0.455	0	1
Belief in superior being	79064	0.772	0.420	0	1
Service participation: once a week	79064	0.207	0.405	0	1
Service participation: once a month	79064	0.115	0.319	0	1
Service participation: on common holy days	79064	0.135	0.342	0	1
Service participation: on specific holy days	79064	0.026	0.158	0	1
Service participation: once a year	79064	0.067	0.250	0	1
Service participation: less than once a year	79064	0.085	0.279	0	1
Service participation: never/practically never	79064	0.234	0.423	0	1
Trust in others	79064	0.258	0.438	0	1

Notes: reference group are those with low income (rank1), other religion (no atheists), female, widowed, divorced or separated, no previous children, not believing in a superior being, service participation more than once a week, not trusting peer residents.

Table 2: Competition and subjective well-being

	1 whole pop	2 whole pop	3 male	4 female
Income level 2	0.097**	0.096**	0.095**	0.102**
	[4.71]	[4.65]	[2.93]	[3.80]
Income level 3	0.170**	0.168**	0.177**	0.162**
	[8.36]	[8.16]	[5.63]	[5.94]
Income level 4	0.291**	0.284**	0.292**	0.282**
	[14.39]	[13.90]	[9.32]	[10.42]
Income level 5	0.359**	0.352**	0.377**	0.331**
	[16.85]	[16.25]	[11.87]	[11.23]
Income level 6	0.441**	0.437**	0.445**	0.431**
	[20.50]	[20.05]	[13.34]	[14.94]
Income level 7	0.499**	0.497**	0.520**	0.477**
	[22.99]	[22.58]	[15.52]	[16.25]
Income level 8	0.513**	0.512**	0.530**	0.495**
	[22.02]	[21.69]	[14.89]	[15.71]
Income level 9	0.559**	0.557**	0.568**	0.549**
	[22.69]	[22.07]	[15.42]	[15.67]
Income level 10	0.618**	0.611**	0.625**	0.599**
	[24.93]	[24.14]	[17.10]	[16.72]
Competition * inc. level 2		0.080*	0.072	0.083*
		[2.51]	[1.38]	[2.08]
Competition * inc. level 3		0.096**	0.111*	0.082*
		[3.11]	[2.24]	[2.06]
Competition * inc. level 4		0.081**	0.099*	0.069
		[2.60]	[1.97]	[1.73]
Competition * inc. level 5		0.064*	0.076	0.056
		[2.01]	[1.50]	[1.37]
Competition * inc. level 6		0.083*	0.085	0.081*
		[2.57]	[1.64]	[1.96]
Competition * inc. level 7		0.103**	0.087	0.117**
		[3.12]	[1.66]	[2.72]
Competition * inc. level 8		0.121**	0.106	0.132**
		[3.39]	[1.87]	[2.89]
Competition * inc. level 9		0.082*	0.068	0.089*
		[2.35]	[1.24]	[1.97]
Competition * inc. level 10		0.072*	0.07	0.075
		[2.01]	[1.26]	[1.56]
Observations	81916	79064	38517	40547
Pseudo R2	0.0596	0.079	0.0629	0.0595
Number of countries	62	62	62	62

Notes: Weighted ordered probit estimation with country fixed effects. Individual-level baseline variables and country fixed effects are included but not reported. '**', '*' denote significances at the 1, and 5 percent levels, respectively. Dependent variable is subjective life satisfaction, measured on a 10-point scale.

Marginal effects to Table 2

	2	3	4	5
	whole pop	whole pop	male	female
Income level 2	0.019	0.019	0.018	0.021
Income level 3	0.034	0.035	0.035	0.035
Income level 4	0.062	0.061	0.060	0.063
Income level 5	0.079	0.078	0.081	0.076
Income level 6	0.101	0.102	0.099	0.104
Income level 7	0.118	0.119	0.120	0.118
Income level 8	0.124	0.125	0.125	0.125
Income level 9	0.139	0.140	0.137	0.143
Income level 10	0.157	0.157	0.155	0.159
Competition * inc. level 2		0.015	0.013	0.017
Competition * inc. level 3		0.018	0.020	0.016
Competition * inc. level 4		0.016	0.018	0.014
Competition * inc. level 5		0.012	0.014	0.011
Competition * inc. level 6		0.016	0.015	0.016
Competition * inc. level 7		0.020	0.016	0.023
Competition * inc. level 8		0.023	0.019	0.026
Competition * inc. level 9		0.016	0.012	0.018
Competition * inc. level 10		0.014	0.013	0.015
Observations	81916	79064	38517	40547

Table 3: Completeness of contracts - rule of law

	Full sample	Kaufman Rule of Law 1998		Fraser Judicial Independence 1995		Fraser Integrity of Legal System 1995	
	1	2	3	4	5	6	7
	full sample	strict	weak	strict	weak	strict	weak
Income level 2	0.096**	0.083**	0.096**	0.066	0.079*	0.073*	0.096*
	[4.65]	[2.67]	[3.42]	[1.84]	[2.48]	[1.97]	[2.25]
Income level 3	0.168**	0.177**	0.155**	0.142**	0.205**	0.191**	0.139**
	[8.16]	[5.75]	[5.53]	[3.94]	[6.34]	[5.30]	[3.24]
Income level 4	0.284**	0.311**	0.248**	0.288**	0.290**	0.299**	0.232**
	[13.90]	[10.13]	[8.98]	[8.08]	[9.35]	[8.34]	[5.51]
Income level 5	0.352**	0.394**	0.299**	0.398**	0.332**	0.371**	0.331**
	[16.25]	[11.93]	[10.39]	[10.16]	[10.04]	[10.24]	[6.48]
Income level 6	0.437**	0.450**	0.416**	0.469**	0.404**	0.407**	0.476**
	[20.05]	[14.08]	[13.64]	[12.74]	[12.07]	[11.19]	[9.90]
Income level 7	0.497**	0.491**	0.494**	0.494**	0.476**	0.460**	0.565**
	[22.58]	[15.17]	[16.19]	[13.04]	[13.80]	[12.47]	[11.46]
Income level 8	0.512**	0.488**	0.525**	0.485**	0.476**	0.419**	0.519**
	[21.69]	[14.18]	[16.09]	[11.91]	[13.29]	[10.87]	[9.71]
Income level 9	0.557**	0.473**	0.671**	0.477**	0.515**	0.433**	0.639**
	[22.07]	[13.32]	[17.89]	[11.29]	[12.82]	[10.77]	[10.37]
Income level 10	0.611**	0.598**	0.643**	0.607**	0.518**	0.564**	0.535**
	[24.14]	[17.03]	[15.58]	[14.81]	[12.15]	[14.31]	[7.44]
Competition * inc. level 2	0.080*	0.033	0.152**	0.009	0.038	-0.027	0.193*
	[2.51]	[0.83]	[2.81]	[0.19]	[0.43]	[0.56]	[2.28]
Competition * inc. level 3	0.096**	0.029	0.191**	0.008	0.216*	-0.032	0.254**
	[3.11]	[0.72]	[3.65]	[0.17]	[2.52]	[0.64]	[3.21]
Competition * inc. level 4	0.081**	0.035	0.139*	0.03	0.247**	0.004	0.161
	[2.60]	[0.89]	[2.54]	[0.64]	[2.97]	[0.09]	[1.89]
Competition * inc. level 5	0.064*	0.004	0.158**	0.03	0.197*	-0.043	0.277**
	[2.01]	[0.10]	[2.79]	[0.60]	[2.34]	[0.89]	[2.99]
Competition * inc. level 6	0.083*	0.016	0.203**	0.018	0.219*	-0.019	0.237*
	[2.57]	[0.39]	[3.40]	[0.38]	[2.57]	[0.38]	[2.22]
Competition * inc. level 7	0.103**	0.065	0.212**	0.026	0.246**	0.013	0.167
	[3.12]	[1.56]	[3.38]	[0.54]	[2.84]	[0.27]	[1.32]
Competition * inc. level 8	0.121**	0.089*	0.220**	0.055	0.157	0.011	0.423**
	[3.39]	[2.11]	[2.66]	[1.11]	[1.71]	[0.23]	[2.77]
Competition * inc. level 9	0.082*	0.025	0.228**	-0.003	0.111	-0.066	0.667**
	[2.35]	[0.58]	[2.81]	[0.06]	[1.11]	[1.34]	[4.91]
Competition * inc. level 10	0.072*	0.033	0.101	-0.008	0.142	-0.05	0.323
	[2.01]	[0.77]	[1.05]	[0.16]	[1.28]	[1.00]	[1.50]
Observations	79064	39321	38572	30359	30043	30734	22724
Pseudo R2	0.079	0.0507	0.0525	0.0656	0.0470	0.0456	0.0572
Number of countries	62	34	27	26	17	28	12

Notes: see Table 2.

Marginal effect to Table 3

	Kaufman Rule of Law 1998		Fraser Jud. Indep. 1995		Fraser Integrity 1995	
	2	3	4	5	6	7
	strict	weak	strict	weak	strict	weak
Income level 2	0.018	0.019	0.013	0.018	0.016	0.020
Income level 3	0.039	0.031	0.029	0.049	0.043	0.030
Income level 4	0.072	0.052	0.064	0.072	0.070	0.051
Income level 5	0.094	0.064	0.092	0.083	0.090	0.077
Income level 6	0.111	0.094	0.113	0.104	0.101	0.118
Income level 7	0.124	0.117	0.120	0.127	0.116	0.147
Income level 8	0.124	0.127	0.119	0.128	0.105	0.134
Income level 9	0.121	0.174	0.118	0.142	0.110	0.174
Income level 10	0.160	0.166	0.158	0.143	0.151	0.141
Competition * inc. level 2	0.007	0.028	0.002	0.008	-0.006	0.039
Competition * inc. level 3	0.006	0.036	0.002	0.048	-0.007	0.051
Competition * inc. level 4	0.007	0.026	0.006	0.055	0.001	0.033
Competition * inc. level 5	0.001	0.030	0.006	0.043	-0.009	0.056
Competition * inc. level 6	0.003	0.038	0.004	0.048	-0.004	0.048
Competition * inc. level 7	0.013	0.040	0.005	0.054	0.003	0.034
Competition * inc. level 8	0.018	0.041	0.011	0.035	0.002	0.086
Competition * inc. level 9	0.005	0.043	-0.001	0.025	-0.014	0.135
Competition * inc. level 10	0.007	0.019	-0.002	0.031	-0.010	0.065
Observations	39321	38572	30359	30043	30734	22724