

DISCUSSION PAPER SERIES

DP12636

**INEQUALITY OF OPPORTUNITY,
GOVERNANCE AND INDIVIDUAL
BELIEFS**

Michelle Brock

DEVELOPMENT ECONOMICS



INEQUALITY OF OPPORTUNITY, GOVERNANCE AND INDIVIDUAL BELIEFS

Michelle Brock

Discussion Paper DP12636

Published 22 January 2018

Submitted 22 January 2018

Centre for Economic Policy Research
33 Great Sutton Street, London EC1V 0DX, UK
Tel: +44 (0)20 7183 8801
www.cepr.org

This Discussion Paper is issued under the auspices of the Centre's research programme in **DEVELOPMENT ECONOMICS**. Any opinions expressed here are those of the author(s) and not those of the Centre for Economic Policy Research. Research disseminated by CEPR may include views on policy, but the Centre itself takes no institutional policy positions.

The Centre for Economic Policy Research was established in 1983 as an educational charity, to promote independent analysis and public discussion of open economies and the relations among them. It is pluralist and non-partisan, bringing economic research to bear on the analysis of medium- and long-run policy questions.

These Discussion Papers often represent preliminary or incomplete work, circulated to encourage discussion and comment. Citation and use of such a paper should take account of its provisional character.

Copyright: Michelle Brock

INEQUALITY OF OPPORTUNITY, GOVERNANCE AND INDIVIDUAL BELIEFS

Abstract

Inequality of opportunity is a failure of economies to fairly tie incentives to effort and investment, across the socio-economic spectrum. But the actual limitations on economic activity due to this failure may depend on if people believe the system is unfair, and how well governing institutions safeguard fair-play. In this paper, I study whether inequality of opportunity is correlated with beliefs about fairness, and whether good governance can be a substitute in belief formations for decreases in inequality of opportunity. I find that people in countries with recent increases in inequality of opportunity are less likely to believe that success is due to fair processes. The relationship is strongest in countries with poor quality governance. In countries with high quality governance, people appear to be more tolerant of inequality of opportunity, as it is only weakly reflected in their beliefs about process fairness. Finally, increases in income inequality also reduce the likelihood people perceive success as fair, but this relationship is not mitigated by good governance.

JEL Classification: Z13, E00, D31

Keywords: Inequality of opportunity, process fairness, beliefs, governance

Michelle Brock - brockm@ebrd.com
EBRD and CEPR

Acknowledgements

This paper benefited from comments from Ralph De Haas and Sergei Guriev. I thank Rebecca Greenberg, Simon Hess, Jan Luksic and Sara Tonini for their work supporting our inequality of opportunity research agenda. I thank Elisa Wirsching in particular for her excellent contributions to this paper.

Inequality of opportunity, governance and individual beliefs

J. Michelle Brock^{a,b}

^a*Principal Economist, European Bank for Reconstruction and Development*

^b*Research Affiliate at Centre for Economic Policy Research*

Abstract

Inequality of opportunity is a failure of economies to fairly tie incentives to effort and investment, across the socio-economic spectrum. But the actual limitations on economic activity due to this failure may depend on if people believe the system is unfair, and how well governing institutions safeguard fair-play. In this paper, I study whether inequality of opportunity is correlated with beliefs about fairness, and whether good governance can be a substitute in belief formations for decreases in inequality of opportunity. I find that people in countries with recent increases in inequality of opportunity are less likely to believe that success is due to fair processes. The relationship is strongest in countries with poor quality governance. In countries with high quality governance, people appear to be more tolerant of inequality of opportunity, as it is only weakly reflected in their beliefs about process fairness. Finally, increases in income inequality also reduce the likelihood people perceive success as fair, but this relationship is not mitigated by good governance.

Keywords: Inequality of opportunity, process fairness, beliefs, governance

JEL Classification: Z13, E71, D31

1. Introduction

The beliefs an individual holds about the processes that determine economic success or failure (i.e. how one becomes rich or poor) can impact their economic decision-making

¹One Exchange Square, London, EC2A 2JN, UK; *Phone:* +44 20 7338 7193; *Email:* brockm@ebrd.com. This paper benefited from comments from Ralph De Haas and Sergei Guriev. I thank Rebecca Greenberg, Simon Hess, Jan Luksic and Sara Tonini for their work supporting our inequality of opportunity research agenda. I thank Elisa Wirsching in particular for her excellent contributions to this paper.

(Alesina and Giuliano, 2010; Fogli and Veldkamp, 2011; Fernández, 2013). In particular, blaming failure on an unfair system can lead to dramatically different equilibrium effort levels than if one believes effort is largely rewarded (Alesina and Angeletos, 2005). If people do not believe they can get fairly rewarded for hard work and ability, there may be little incentive for people to “buy into the system”, for example by investing in human capital or building a business. This under-investment can in turn impact growth (Marrero and Rodríguez, 2013). Beliefs that processes are deeply unfair may also contribute to civil unrest (Rodrik, 2017), thus reducing sustainability of growth. In order to better understand the formation of such beliefs, this paper looks at the relationship between actual process fairness in an economy, beliefs about process fairness and the quality of formal institutions. Specifically, I look at whether good institutions can be a substitute for objectively fair processes in influencing beliefs.

While beliefs about process fairness should be highly correlated with actual process fairness, this may not always be the case. Individuals may hold onto inaccurate beliefs as a way to protect their identity or view of themselves (Bénabou and Tirole, 2011). For example, a person who has an unpleasant identity formative experience related to their gender may then adopt the belief that women are treated unfairly in their society, even if systemic discrimination is objectively low. Beyond one’s own experience, beliefs can also reflect the experiences and beliefs of past generations (Piketty, 1995; Guiso et al., 2008). Piketty refers to this as belief inheritance. Inherited beliefs can be powerful and self-reinforcing (Alesina et al., 2012), and they may not reflect contemporary realities.

Beliefs about process fairness may also be influenced by the policies and institutions to which individuals are exposed during their life (Piketty, 1995). For example, (Bénabou, 2008, p.321) discusses how “mental constructs” can interact with institutions to generate beliefs. People use moral constructs to “rationalizes society’s structure” and their place therein as institutions change. Formal governing institutions responsible for protecting personal property and managing wealth distribution may be particularly relevant for belief

formation. For example, Di Tella et al. (2007) show that a change in land titles among squatters in Brazil increased the squatters' support for market-supporting beliefs, compared to peers who did not receive formal titles. Institutional quality matters, too. Poor quality formal institutions increase the possibility that the privileged class can achieve a higher return on their effort than everyone else, possibly through unfair or corrupt practices. This kind of unfairness can motivate pessimistic beliefs. In comparison, in countries with better functioning institutions, people will be more confident that the choices they make, as opposed to corrupt or unfair forces outside of their control, will impact their success or failure.

This study contributes to the evidence on the interaction between culture and institutions. Beliefs about the processes behind poverty and corresponding attitudes towards work are common themes in studies on the role of culture in economics (see (Alesina and Giuliano, 2015) for a review). Culture, as we study it in economics, can be defined as “a set of beliefs, values and preferences, capable of affecting behavior, that are socially...transmitted and that are shared by some subset of society” (Mokyr, 2016, p.8). I follow this convention from (Alesina and Giuliano, 2015) and Mokyr (2016), and distinguish between formal institutions and culture.

For this study, I use inequality of opportunity as the measure of process fairness in an economy. This is a country-level variable defined in Bourguignon et al. (2007). Unlike income inequality, inequality of opportunity isolates the extent to which circumstances beyond an individual's control, rather than effort, influences the distribution of economic outcomes.² The relevance of inequality of opportunity is mainly argued on moral and ethical grounds. Morally, we may prefer that people reach their potential and that circumstances out of their control should not inhibit them. Nonetheless, circumstances such as race or gender have been shown to heavily influence outcomes for minority or other disadvantaged groups

²Examples of relevant economic outcomes include wealth, income, educational attainment and employment status.

(Altonji and Blank, 1999; Bertrand and Mullainathan, 2004; Blau and Kahn, 2000). Luck plays a role in everyone's life, but the consensus in philosophy circles, and increasingly among economists, is that inequality due to effort is justified, but inequality due to circumstances is not (Rawls, 1971; Roemer, 1998; van de Gaer, 1993). Inequality of opportunity is thus a suitable measure of process fairness in an economy.

Beliefs about fairness have been studied extensively. They are important for voter turnout (Birch, 2010) and attitudes toward redistribution (Eisenkopf et al., 2013; Alesina and Ferrara, 2005; Durante et al., 2014). In the transition region, perceptions of process fairness, especially fairness in government, have been shown to be correlated with life satisfaction (Djankov et al., 2016) as well as with inequality of employment opportunities (Abrás et al., 2013). Lastly, inequality of opportunity has been shown to impact how people vote (Algan et al., 2017).

The contribution of the paper is three-fold. The primary contribution is testing whether changes in inequality of opportunity impact beliefs about processes fairness, and if institutional quality matters for this relationship. Unlike past work on this issue (e.g. Denisova et al. (2009)), I focus on changes in opportunity inequality, rather than levels. Looking at changes gives better insight into whether beliefs about process fairness are updated with experience. If levels of inequality of opportunity are correlated with beliefs about process fairness, this can reflect persistent inequality of opportunity, persistent intergenerational beliefs or both. On the other hand, if changes in inequality of opportunity are correlated with beliefs now, controlling for initial levels, then it suggests that people are updating based on experience. Furthermore, changes in the correlation by institutional quality provides evidence in support of Piketty's hypothesis that information and experience, in this case experience with with formal institutions, is important for belief formation. I also compare results on inequality of opportunity with results on how perceptions correlate with income inequality.

My secondary contribution is providing estimates of changes in inequality of opportunity over time. I construct measures of inequality of opportunity for a set of 35 countries in 2010 and 34 countries in 2016. This is important to the literature. Estimates of change in inequality of opportunity are rare since collection of sufficient circumstance data is a relatively new effort, especially in large cross country datasets.

Lastly, I look at the differentiation between perceptions of success and perceptions of failure, and their respective relationship with inequality of opportunity. Behavior in gain and loss domains tend to differ (List, 2007; Tversky and Kahneman, 1991; Tom et al., 2007), perhaps due to loss aversion. This behavior has been formalized in Prospect Theory (Tversky and Kahneman, 1992; Kahneman and Tversky, 2013) and extensively studied in experimental economics. But there is less evidence on how formation of beliefs in the two domains may differ.

I find that inequality of opportunity is negatively correlated with beliefs that processes behind success are fair. Also, institutional quality matters. The interaction between changes in inequality of opportunity and level of governance is positive and significant. Thus, if governance is at the level of Central Europe or above, it is more likely that good governance can substitute for reductions in inequality of opportunity for motivating positive beliefs about success. On the other hand, where governance is at the level of Central Asia, increases in inequality of opportunity exhibit a negative and statistically significant effect on beliefs that success is fair. In comparison, I find that good governance is not a good substitute in belief formation for higher levels of or changes in income equality.

The paper proceeds as follows. First, I describe the methodology used to estimate inequality of opportunity, including how I define wealth and circumstances. Second, I discuss the survey items that I use as dependent variables in the analysis. Next I describe my empirical specification for the main estimations and the data. This is followed by a presentation of the results and a conclusion.

2. Methodology

The analysis of the correlation between inequality of opportunity and beliefs requires two stages of estimation. First, I obtain estimates of inequality of opportunity for each country in the 2010 and 2016 datasets, using wealth as the outcome measure of well-being, following the approach in Ferreira et al. (2011). I report these estimates for each year. Second, I use these inequality of opportunity estimates in regression analyses that examine whether changes in inequality of opportunity for wealth, since 2010, are correlated with perceptions of determinants of success and failure, today. I also examine the role of institutional quality in this correlation.

2.1. Measuring inequality of opportunity

The technique I use for measuring inequality of opportunity has its theoretical roots in Roemer (1998). The first step in the measurement is to conceptualise what constitutes opportunity. It is nearly impossible to measure opportunity sets directly, since for any given individual one typically only observes the outcomes obtained. For example, in household survey data one can observe an individual's income or wealth outcomes, but not the full set of opportunities they could consider to obtain those outcomes.

Thus, in place of measuring inequality of opportunity directly, I use the Roemer (1998) framework to measure it indirectly. I follow the methodology set out in Ferreira et al. (2011) and based on earlier work by Bourguignon et al. (2007). In this approach, inequality of opportunity is defined as the portion of inequality in wealth that can be attributed to circumstances at birth. The approach neatly distinguishes between what is an input and what is an output for economic success by going back to birth and characterizing only an individual's "initial conditions" as inputs. Initial conditions (circumstances) typically include gender, place of birth and parental characteristics.

In this paper, I look specifically at wealth outcomes, although the methodology easily accommodates other measures of economic success, such as income. There are important advantages using wealth, especially in the context of the transition region. First, income is often difficult to measure accurately as the rural poor and informal sector workers often do not have a predictable or easily summed up income stream. The use of barter further undermines accurate accounting. Second, self-employed or seasonal workers may report income differently than full-time employees. Lastly, although wealth fails to take account of short-run or temporary shocks, it is more reflective of longer-run household living standards. In the former communist context, asset-based wealth is particularly important as high-level officials and members of the Communist Party were often given supplements or bonuses in the form of goods or housing rather than cash.³ Ultimately, income and wealth are complementary outcomes and future analyses should consider how the inequality of opportunity ranking may differ for the two outcomes.

The estimation of inequality of opportunity using this approach occurs in three steps. The first step is to generate a measure of household wealth. The second step is to regress household wealth on circumstances of the household head at birth. The third step is to calculate an inequality index with the results from the second step to get inequality of opportunity. I discuss each step briefly here, and provide greater detail in the Appendix.

For step one, we measure wealth of household i in country k , y_{ik} , as a weighted sum of assets (Filmer and Pritchett, 2001; McKenzie, 2005; Sahn and Stifel, 2003). Wealth is measured at the household level. This means that inequality of opportunity for obtaining wealth is also at the household level.⁴ The asset index accounts for both a household's durable assets and housing quality indicators (see Table 1). While asset indexes do not

³Turkey and western Europe differ in this sense, but the same analysis was conducted in all countries for purposes of comparison.

⁴Since opportunities will be largely correlated among household members, my estimates can serve as an approximation of inequality of opportunity for individuals. The potential exception to this is whether it is correlated between household members of different genders. I discuss this complication in more detail in the Appendix.

capture flows of income, non-quality adjusted asset ownership is simpler to work with for large cross-country samples. Summary statistics for the asset index by country are reported in Table A1 in the Appendix.

[Table 1 inserted here]

In step two, I estimate how much of the variance in household wealth can be explained by circumstances, for 2010 and 2016 separately. Following the convention in the literature, I assume that wealth is a linear function of circumstances, C_{ik} , and effort, E_{ik} ⁵.

$$y_{ik} = \alpha_k C_{ik} + \beta_k E_{ik} + u_{ik} \tag{1}$$

Circumstances may also influence an individual’s economic success indirectly, through effort, such that $E_{ik} = H_k C_{ik} + v_{ik}$. Substituting this back into (1), one obtains $y_{ik} = (\alpha_k + \beta_k H_k) C_{ik} + \beta_k v_{ik} + u_{ik}$, which can be estimated by OLS as

$$y_{ik} = \Psi_k C_{ik} + \varepsilon_{ik} \tag{2}$$

where $\Psi_k = \alpha_k + \beta_k H_k$ and $\varepsilon_{ik} = \beta_k v_{ik} + u_{ik}$. This regression equation gives the reduced form estimate of the overall impact of circumstances on wealth, capturing the direct and indirect (through effort) channels. Error terms are bootstrapped. In our paper, C_{ik} is a vector including place of birth, father’s education, mother’s education and whether a parent was a member of the communist party. Summary statistics of the circumstance variables can be found in Table 2.

[Table 2 inserted here]

In step three, I apply an inequality index to the predicted values from the first stage to get the measure of inequality of opportunity.⁶ The appropriate inequality index in this

⁵There are also non-parametric methods for quantifying inequality of opportunity. The advantage of the parametric estimation is that it allows us to consider more than one circumstance despite relatively small sample sizes

⁶The inequality index must accommodate the domain of the wealth variable, which theoretically takes

case is the R^2 from equation (2), the per cent variation in wealth that is explained by the circumstances (Ferreira et al., 2011). This is a relative measure, such that high overall inequality can co-exist with low inequality of opportunity. The results will show that in some countries with low GDP and high inequality, such as Azerbaijan, the inequality of opportunity is in fact lower than in some wealthier countries. In cases like these, there are so few opportunities to build wealth that there is little variation in outcomes that needs explaining – everyone is suffering equally from lack of opportunity.

The effort/circumstances approach has three main weaknesses, which all stem from the exclusion of potentially important circumstances from C_{ik} . Missing circumstances may include mother tongue, genetically inherited skill, quality of parents' education or quality of childhood nutrition. If one or more important circumstances are missing, this will result in lower bound estimates of the true inequality of opportunity (Ferreira et al., 2011). If a circumstance added explains zero additional inequality, inequality of opportunity would not change, but there is no case in which it would go down. Also, omitted circumstances mean that individual parameter estimates from the first-stage regressions are likely to be biased. Lastly, omitted variables may undermine cross-country comparability of our inequality of opportunity measures if the optimal set of relevant circumstances, and correlation with the error term, varies from country to country. If this is the case, the lower bound estimate of inequality of opportunity could fall shorter of capturing the real level of inequality of opportunity in some countries than it does in others. For example, mother tongue may be the most important factor influencing economic opportunities in country A, but not at all important elsewhere. Excluding mother tongue then generates a low estimate of inequality of opportunity such that country A appears more equal with regards to opportunity compared with other countries than it is in reality.

values from negative infinity to positive infinity. This means I cannot use conventional indexes of inequality such as the Gini index or the thiel index. Since inequality indices are not translation invariant one cannot simply shift the distribution up and eliminate any negative values.

2.2. *Belief estimations*

The next stage of the analysis is to look at how changes in inequality of opportunity are correlated with beliefs about success and failure today, and how this correlation interacts with institutional quality. This is the main contribution of the paper. I estimate these correlations using multi-level cross-country regressions, controlling for baseline (2010) levels of inequality of opportunity and income inequality, baseline indicators of macroeconomic health (2010) and changes in indicators of macroeconomic health since 2010.

The dependent variables I use in the analyses come from two survey questions. The first question asks respondents to pick the most important factor determining success in their country, from a predetermined list. The list includes effort and hard work, intelligence and skills, political connections, breaking the law and “other”. The second question asks respondents to identify the main reason why there are people in need in their country. The options focus on individual experiences, such that the question is effectively asking about factors that determine individual failure. The options include being unlucky, laziness and lack of willpower, injustice in society, that it is an inevitable part of modern life and “other”.

Each response option to either question can be classified as describing either a fair process or an unfair process. For the first question, success from effort and hard work or from intelligence and skills may be considered fair. Correspondingly, gains from crime or political connections may be considered unfair as they do not originate from honest work.⁷ For the second question, being in need due to bad luck or injustice is unfair, while being in need due to lack of effort may be considered fair.⁸ The last option, people being in need as an inevitable part of modern life, I categorise as a fair process. “Modern life” in former

⁷This is not strictly consistent with the inequality of opportunity framework discussed above because intelligence and skill may be considered largely inherited and thus outside of one’s control, while breaking the law may be considered in one’s control. Nonetheless, it is not fair if the most important determinant of success comes from behavior that is codified as antisocial. Likewise, being rewarded for skills and talents, even when they are not won by hard work, is considered fair in most societies.

⁸Note that while luck may be statistically fair, the colloquial use of the term is to express something that is not fair, or something that is undeserved.

communist countries means a life with free enterprise. In a world with free enterprise, success and failure are more strongly linked to one's effort and skills. This is in contrast to the communist regime, where economic success was much less linked to an individual's choices, and outcomes were more equal for reasons not related to effort or technical skill. Thus, for the second part of the analysis I recode the questions into binary variables, equal to 1 if the respondent attributes the outcome (that is, success or failure) to fair processes and 0 if they attribute the outcome to unfair processes. Table 3 gives a breakdown of this recoding.

[Table 3 inserted here]

Even though success and failure are likely due to similar processes, people can perceive them differently, with correspondingly distinct policy implications. Success is logically the opposite of failure, but multiple factors determine success or failure in any given endeavor. The relative importance of the different factors may be viewed differently depending on the outcome of an effort. If I try hard to find a job and fail, I may not take responsibility for the fact that I did not try hard enough to succeed. Alternatively, if I did try hard enough and still fail, it may be that finding a job requires more than just hard work. For example, functioning infrastructure and institutions may be just as important as effort for my ability to search for jobs, send resumes and make it to interviews on time.

For each of the two dependent variables about perceptions of fairness I estimate three specifications. The first specification is a cross sectional, individual level regression with country fixed effects, σ_k . It tells us the relationship between beliefs and individual characteristics, today ($t = 1$). Characteristics include outcomes for person i in PSU j and country k , Y_{ijk} , and circumstances, C_{ijk} . All specifications use a probit model.

I also include in the regression a variable to capture the median (perceived) economic welfare of the place where the respondent lives. This paper uses a question from the LiTS which asks respondents to place themselves on one rung of a 10-step ladder. The question

specifies that the poorest 10 per cent of the population in the country are on the bottom rung and the richest 10 per cent are on the top rung. I take the median response to this question by PSU, excluding household i . The variable is called PSU median decile $_{jk}$. The regression is:

$$\begin{aligned} \text{fair}_{ijk,t=1} = & \beta_1 Y_{ijk,t=1} + \beta_2 C_{ijk,t=1} + \beta_3 \text{PSU median decile}_{jk,t=1} \\ & + \sigma_k + e_{ijk,t=1} \end{aligned} \quad (3)$$

where the dependent variable, fair_{ijk} , is the binary variable indicating a respondent's opinion about determinants of success or their opinion about determinants of failure. Regressions are probits, with standard errors clustered at the country level. $t = 1$ refers to 2016 data, and $t = 0$ refers to 2010 data.

Measures of economic success, Y_{ijk} , include the respondent's educational attainment, employment status and the decile in which the household falls in the wealth distribution in country k . Circumstances include place of birth, parental education and whether one's parent was a member of the Communist Party. Parental education is equal to the highest degree obtained by either parent. I also control for age and age squared. Controlling for parental membership in the communist party is particularly important here, since parents' ideological affiliation is known to influence the next generation's attitudes and perceptions (Alesina and Fuchs-Schündeln, 2007).

The second and third specifications are multi-level models, with individual beliefs regressed on the change in inequality of opportunity (for wealth) since 2010 and the change in net income inequality since 2010. I also control for baseline level of inequality of opportunity and inequality of net income in 2010. Income inequality, $\text{Gini}_{k,t}$, is the the net income Gini index for each country, for $t = 0$ and $t = 1$. I use net income because this is what will influence purchasing power and wealth accumulation throughout one's lifetime. Lastly, these estimations also include a set of country controls for $t = 0$ and $t = 1$ (to control for

baseline levels and changes over time), $X_{k,t}$, and controls for individual characteristics, as in Equation 3. Additional country controls include GDP per capita, inflation, unemployment and institutional quality. I describe the institutional quality measure I use in the next section.

As before, I cluster standard errors at the country level. The regression is:

$$\begin{aligned} \text{fair}_{ijk,t=1} = & \beta_1 \Delta \text{IOp}_k + \beta_2 \text{IOp}_{k,t=0} + \beta_3 \Delta \text{Gini}_k + \beta_4 \text{Gini}_{k,t=0} \\ & + \beta_5 Y_{ijk,t=1} + \beta_6 C_{ijk} + \beta_7 \text{PSU median decile}_{jk,t=1} \\ & + \beta_8 X_{k,t=0} + \beta_9 \Delta X_k + e_{ijk,t=1} \end{aligned} \quad (4)$$

where “IOp” stands for inequality of opportunity. In the third specification I include interactions of income inequality and inequality of opportunity with institutional quality, referred to in the equation as “governance”. The regression is:

$$\begin{aligned} \text{fair}_{ijk,t=1} = & \beta_1 \Delta \text{IOp}_k + \beta_2 \text{IOp}_{k,t=0} + \beta_3 \Delta \text{Gini}_k + \beta_4 \text{Gini}_{k,t=0} \\ & + \beta_5 (\Delta \text{IOp}_k * \text{Governance}_{k,t=1}) + \beta_6 (\text{IOp}_{k,t=0} * \text{Governance}_{k,t=1}) \\ & + \beta_7 (\Delta \text{Gini}_k * \text{Governance}_{k,t=1}) + \beta_8 (\text{Gini}_{k,t=0} * \text{Governance}_{k,t=1}) \\ & + \beta_9 Y_{ijk,t=1} + \beta_{10} C_{ijk} + \beta_{11} \text{PSU median decile}_{jk,t=1} \\ & + \beta_{12} X_{k,t=0} + \beta_{13} \Delta X_k + e_{ijk,t=1} \end{aligned} \quad (5)$$

While the estimation does not provide strict identification, it does rule out reverse causality because changes in inequality of opportunity between periods $t-1$ and period t cannot be caused by attitudes in period t .

3. Hypotheses

I expect that beliefs about whether processes are fair today will be more pessimistic in countries with larger increases in inequality of opportunity since 2010. In such countries, an individual is more likely to have experienced arbitrarily restricted opportunity sets than in the past. They may also be able to recall a period when this was not the case. Recent experience together with recall of a better time should motivate them to more harshly assess the fairness of the current system. A negative correlation between beliefs about fairness and increases in inequality of opportunity would be consistent with the idea that people observe changes relative to a reference point and update perceptions and beliefs accordingly. In the regression results for both Equation 4 and Equation 5, this would be reflected in $\beta_1 < 0$. It is an open empirical question as to whether these relationships differ when considering beliefs about fairness for success versus failure.

I also expect that people in countries with higher *baseline* inequality of opportunity will have an increased likelihood of attributing outcomes to unfair processes. This would be reflected in $\beta_2 < 0$ in both Equation 4 and Equation 5. This hypothesis is in line with a paper by Abras et al. (2013) that evaluates inequality of employment opportunities data from an earlier version of the LiTS, from 2006.⁹ Abras et al. (2013) consider correlations between inequality of opportunity (for employment) and perceptions of success and life satisfaction. They find that people are likely to attribute success to an unfair process when inequality of employment opportunities is high. They also find that higher inequality of employment opportunities is correlated with lower levels of life satisfaction. Their employment measure gives them a snapshot of labour market outcomes because it asks about whether a person was employed at all over a 12-month period. The results are reflective of attitudes and values in 2006.

⁹This paper is an update of an earlier analysis by the same author that estimates inequality of opportunity and correlations with attitudes using only 2010 data (LiTS2), and including male and female household heads. Results are consistent across the two papers.

My paper complements Abras et al. (2013) by extending the measurement of inequality of opportunity to wealth, a longer-term measure of success, and analyzing the relationships over multiple time periods and levels of institutional quality. I also include an analysis of perceptions of failure. I thus contribute to the debate on how to interpret measures of inequality of opportunity over a more long-term measure of well-being (wealth) and with more in-depth analysis of how it is reflected in people's attitudes.

Lastly, as in Denisova et al. (2009), I expect that institutional quality will interact with people's experience to influence beliefs. Specifically, good institutions should be a substitute for equal opportunity in influencing beliefs about fairness. Recall that inequality of opportunity is the inequality in outcomes due to circumstances at birth. Institutional quality, or governance, can exacerbate this opportunity inequality. For example, in countries with good institutions, people's lives may be less likely to change due to a change in inequality of opportunity because they continue to have their own rights protected. Where institutions are better, people have higher chances of successfully challenging unfair processes at the polls or in the courts. In this analysis, the negative relationship between inequality of opportunity and beliefs would be mitigated by good governing institutions. Correspondingly, in countries with bad governance, beliefs in fair processes will be undermined by increases in inequality of opportunity. Effectively, the views on ex ante inequality of opportunity will be influenced by people's ex post ability to compensate for it, using the available formal institutions. There would be a negative relationship between increases in inequality of opportunity and beliefs that gets more and more positive as institutional quality increases. In the regression results for Equation 5, this would be reflected in a $\beta_1 < 0$ and $\beta_5 > 0$.

4. Data

The data I use for this paper comes from the Life in Transition Survey (LiTS), a cross-sectional household survey administered by the European Bank for Reconstruction and

Development (EBRD) and the World Bank. I use data from the second and third waves of the LiTS (LiTS2 and LiTS3). The LiTS is particularly well suited to study inequality of opportunity and beliefs because has extensive individual-level information on circumstances, economic outcomes and attitudes. The data are comparable across a number of states with heterogeneous institutions. This data includes 29 countries former communist countries and 8 comparator middle and high income countries (across two waves). The analysis of perceptions and inequality has particular relevance for this sample, and the presence of the comparator countries contributes to generalizability of results.

For the estimation of inequality of opportunity, I account for variation in policy environments and endogenous household formation by restricting the sample to male household heads 18 years or older who are in the labor force, excluding students and retired people. This assumes that the choice to either obtain a tertiary degree or go into the labour force and begin accumulating wealth occurs at age 18 for most people. The LiTS2 and LiTS3 samples includes 10,385 and 20,420 of these male household heads, respectively. Approximately 65 per cent of the sample is between 30 and 60 years old.¹⁰

4.1. Circumstances at birth

The circumstance variables used to obtain the inequality of opportunity estimates include: place of birth, parental education, and parental political affiliation. Place of birth incorporates both the opportunities one faced as a child, as well as the exogenous part of where one ultimately resides and the opportunities therein. Place of birth and place of residence

¹⁰One can also restrict the sample to only include only those who were 18 or younger in 1991, for the fall of the Soviet Union (37 in 2010). Wealth accumulation process may have differed considerably for those who chose to obtain degrees or enter the labour force after the fall of communism. Moreover, the environment that exists during the transition to employment may be important for economic outcomes down the line. Nonetheless, results from estimations using the smaller cohort do not change considerably, and are much less reliable due to smaller sample sizes. See Brock (2016) for estimates using the smaller cohort, as well as for inequality of opportunity estimates with respect to education and employment for the different gender age cohorts. Also, while transition from communism was not immediate and varied by country, moving the cohort definition around by a few years on either side of 1989 does not change results.

as an adult are significantly correlated in our data: the correlation is 0.63, significant at the 1% level, in 2010, and in the 2016 data, the correlation is 0.39, also significant at the 1% level. Parental background, as captured by parental education and past political affiliation, proxies for multiple components of an individual's circumstances.

First, parental education can be thought of as determining a portion of a person's own educational attainment. Inheritability of educational achievement has been well documented (Heath et al., 1985; Bartels et al., 2002; Krapohl et al., 2014). Own and parental education are also strongly correlated in our data, such that using parental education as a circumstance effectively captures the exogenous component of one's own educational attainment. Second, parental education incorporates a measure of the professional and social networks that a person's parents may be a part of, which can later provide opportunities for a child.

Finally, parental political affiliation also captures network effects that are particularly important for the former communist countries in our sample. In former communist countries party membership was often required for admission into specific schools and professions. Further, those serving in such professions often received a portion of their payment in assets, which may have affected asset distribution in our sample (parents of respondents or older respondents) (Heyns, 2005).¹¹

4.2. Macroeconomic indicators

Our Gini index data are from the Standardized World Income Inequality Database (Solt, 2016; Jenkins, 2015).¹² Other macro indicators are 2016 (or latest available) values from the IMF World Economic Outlook database (WEO).

¹¹The parental political affiliation circumstance is omitted from estimations for countries where it is not relevant, such as Turkey or western European comparator countries. Including it may reduce cross-country comparability of our inequality of opportunity measure. That being said, excluding it does not substantially change the results. See an earlier version of this paper, (Brock, 2016), for estimates excluding this variable.

¹²SWIID Version 5.1, released July 2016. Downloaded from <https://dataverse.harvard.edu/dataset.xhtml?persistentId=hdl:1902.1/11992>

For the institutional quality indicator I use data from the Worldwide Governance Indicators database (Kaufmann et al., 2011).¹³ This data includes six indices that each capture different aspects of governance, defined as “traditions and institutions by which authority in a country is exercised” (Worldwide Governance Indicators website). These are government effectiveness, regulatory quality, rule of law, control of corruption, voice and accountability and political stability/absence of violence. Each index is an aggregate measure that uses the Unobserved Components Model to combine data from 32 sources, which capture the experiences and views of citizens, entrepreneurs and experts from the public and private sector on the quality of various aspects of governance.

Following the convention in Easterly and Levine (2016), I average the index scores from this database to obtain a single variable for institutional quality. I restrict the average to include only the four governance indicators that capture quality of formal governing institutions that directly support the economy: government effectiveness, regulatory quality, rule of law and control of corruption. We exclude voice/accountability and political stability/absence of violence because these indices mostly capture citizens’ civil liberties, such as freedom of expression, freedom of association and freedom of press, as well as perceptions of the likelihood of social unrest or armed conflict, including terrorism. In contrast to the indicators for economic institutions, I do not expect these political factors to theoretically affect the linkage between *de facto* inequality of opportunity in economic wealth and individuals’ perceptions of processes behind success and failure. Figure 1 shows the institutional quality score for the countries in the 2016 LiTS sample.

[Figure 1 inserted here]

For the interactions with changes in inequality, I use only the 2016 values of the governance indicator. Scores are relative and the scale has no inherent value. Individual index scores for each year are normalized to have a mean of zero, such that in the aggregate score I use,

¹³Downloaded from <http://info.worldbank.org/governance/wgi/home>.

values at or near zero indicate an overall average level of institutional quality. Scores below and above zero indicate lower and higher than average institutional quality, respectively. Institutional quality is only weakly correlated with inequality of opportunity (from 2016), as well as change in inequality of opportunity since 2010.

5. Results

5.1. Inequality of opportunity estimations

Results from the estimation of inequality of opportunity for each year appear in Table 4. The tables include coefficient estimates from Equation 2, the estimates of inequality of opportunity and sample size for working age male household heads in each country. Estimates for 2010 appear in columns (2)-(7). Those for 2016 appear in columns (8)-(13).

[Table 4 inserted here]

Across countries, I find that inequality of opportunity accounts for between 0.6 and 55.6 per cent of wealth inequality in 2010 and 0.7 and 35.8 per cent in 2016. This is a wide range, and there is considerable variation within regions and in changes over time, but by and large inequality of opportunity has gone down since 2010 for male household heads. The drop is significant at a 6 per cent level, using a Wilcoxon signed-rank test. Maximum values in all regions have declined by as much as a quarter, with more countries in 2016 showing levels comparable to low values in western Europe. Due to a large increase in inequality of opportunity for wealth in Germany, Western Europe as a region no longer has the lowest overall values, compared to the other regions in our sample. The relationship between market development and inequality of opportunity is not linear and low inequality of opportunity can coexist with high levels of inequality or low GDP per capita. This can be seen in the fact that both early transition countries and countries furthest along the transition path have lower inequality of opportunity scores.

Moving to the coefficient estimates from Equation 2, some patterns emerge. For example, while being born in an urban area is very important for explaining wealth across countries, parental education is mostly insignificant. But not all circumstances are important in all countries and in both years. Mother's education gains increased importance in 2016 and in some countries it appears to now be more important than father's education for explaining wealth outcomes (e.g. Hungary, FYROM, Serbia and Turkey). In western Europe, Greece, Cyprus and many CEB countries, place of birth does not appear to matter for wealth outcomes. In contrast, it plays a major role in Central Asia and EEC, despite decreases since 2010. Lastly, it is interesting to see that the coefficient of urban birthplace is negative in both 2010 and 2016 for Poland, France, Germany and Kosovo, which means that in these countries wealth accumulation is greater for those who were born in rural areas.

While perhaps not surprising, logically, the result on the relative importance of birthplace is in striking contrast to previous work on other countries, in particular in Latin America (Ferreira and Gignoux, 2011). In that work, the authors find parental educational attainment to be far and away the most important circumstance. This has important policy implications for the transition region as it suggests that addressing urban/rural differences would go further in addressing inequality than would addressing a legacy of under-educated parents.

5.2. Beliefs about success and failure

Results from the regressions on beliefs about success and failure are in Table 5. The first three columns pertain to beliefs about whether success is attributed to fair processes. The last three pertain to beliefs about why people are in need (that is, what processes lead people to fail, economically). Columns (1) and (4) include country fixed effects, while columns (2)-(3) and (5)-(6) include controls for country characteristics.¹⁴ Note that the coefficient

¹⁴For reasons of lucidity, I do not report coefficients of macroeconomic controls, including GDP per capita, unemployment, inflation and polity 2 scores in Table 5. Table A2 in the Appendix reports the

estimates on individual level variables and their significance do not change substantially when I remove the country fixed effects and instead use country controls.

[Table 5 inserted here]

The correlation between both levels of and changes in inequality of opportunity and beliefs about success is negative, as expected. These results are in line with the findings in Abras et al. (2013) that inequality of opportunity for employment is negatively correlated with beliefs about success being fair, across all levels of institutional quality. We also see that the correlation between perceptions of processes and the actual state of the world depends on the institutional environment. But this model only applies to perceptions of processes behind success; the correlations do not hold when looking at beliefs about failure. In countries with average institutional quality, we see the expected negative relationship between changes in inequality of opportunity and perceptions of success. Then, as the institutional quality improves, this effect is mitigated, as is shown by the positive and significant result on the interaction term. The effects are strong and sizable compared to other macro controls such as unemployment and GDP per capita (see the appendix).

Figure 2 illustrates this dynamic for an average respondent. The figure plots the marginal effect of a change in inequality of opportunity on beliefs about success, at each level of institutional quality, holding all other covariates at their sample means. Impacts on the probability of viewing success as fair are on the vertical axis and levels of institutional quality are on the horizontal axis. The vertical bars show the density of countries at each level of governance. This figure clearly illustrates that changes in inequality of opportunity exhibit a negative and statistically significant relationship with perceptions of success, especially in countries with low governance levels (scores less than 1). For my sample, this includes countries such as Tajikistan, Kyrgyz Republic and Belarus. Figure 3 displays the same calculations, but pertaining to beliefs about failure. As in the probit regression

regression results, including those coefficients.

results, the figure shows no meaningful impact of change in inequality of opportunity on beliefs about failure, even in countries with poor quality of institutions.

[Figure 2 and Figure 3 inserted here]

Correlations between overall income inequality and beliefs follow a slightly different pattern. As is the case for inequality of opportunity, increases in overall income inequality are negatively correlated with likelihoods of believing that success is due to fair processes, today. But unlike inequality of opportunity, this relationship does not vary by institutional quality. Also unlike the patterns with inequality of opportunity, levels of baseline income inequality are correlated with perceptions of both success and failure, where people in countries with higher levels of income inequality in 2010 are more likely to attribute outcomes to fair processes, in 2016. This means that baseline levels of income inequality may actually be higher in countries with fair wealth allocation processes. Increases over time, however undermine the positive link of income inequality with perceptions, but only in the gain domain; perceptions about failure in countries with increases in income inequality do not appear to change.

Note that the results for income inequality capture the combined effect of both fair and unfair changes in income inequality. This is because the measure of income inequality combines income inequality that arises from circumstances (“unfair” income inequality) as well as that which arises from hard work (“fair” income inequality). In contrast, inequality of opportunity, in this paper, only captures the unfair portion of inequality.¹⁵ Reducing overall income inequality may have mixed results if higher levels or increases in fair income inequality improves beliefs about success or failure, but changes in unfair inequality have the opposite effect. The latter relationship appears to be the dominant effect captured by the regression results, but it is not definitive. Also, it could be the case that fair and unfair

¹⁵Due to the measurement approach for inequality of opportunity for wealth, it is not informative to report the “fair” portion of wealth inequality. Inequality of opportunity for wealth accumulation, unfair inequality, is a percentage. Thus, assuming total inequality is made up of two parts – fair and unfair inequality – the fair portion of inequality in wealth will simply be the inverse of the unfair portion.

income inequality have opposite effects in the interaction with governance - yielding the overall null result we see in Table 5. Accounting for both fair and unfair income inequality is important because the inequality of opportunity estimate refers to wealth, rather than income, but we do not separate the measures here.

Besides inequality, respondents in countries with less unemployment also have higher probabilities of believing that both success and failure are due to fair processes. The results on income inequality and unemployment are particularly interesting when taken together. Other scholars have speculated that some level of income inequality is good because it allows people to gain from their efforts (Marrero and Rodríguez, 2013; Mirrlees, 1971). Without the chance to achieve more than someone else, there is less incentive to work hard or invest. That higher income inequality leads to a higher probability of believing that outcomes are due to fair processes provides some support for this idea. Lower unemployment also increases belief in fair processes. This suggests that it is not just inequality of opportunity but abundance of opportunities at all levels of the income distribution that give people faith in the fairness of the system.

I now briefly discuss correlations between beliefs and individual characteristics. Some results are consistent across gain and loss domains. Beliefs about both success and failure are linked in similar ways to some types of individual achievement, such as educational attainment and relative position on the income ladder. Men with higher educational attainment have higher probabilities of believing that both success and failure are due to fair processes. Lastly, in neither domain does parental education strongly influence beliefs.

Results that are not consistent across the gain and loss domains include the correlation of beliefs with being employed, wealth decile and parental political affiliation. Being employed and being wealthier are associated with a higher probability of thinking that failure is due to a fair process (coefficients are positive and significant at the 10 and 5 per cent level, respectively). In contrast, being employed is not correlated with any particular view about

success, while respondents with more wealth tend to think success is unfair. Most individual circumstances are not correlated with beliefs, with the exception being parental political affiliation. People with at least one parent having been a member of the communist party are more likely to think success is unfair and that failure is fair. Thus, while people with stronger histories of unfair wealth accumulation may correctly infer that being more well-off is in large part due to unfair processes, they do not admit that being less well-off may also be a function of unfair advantage.

Thus, while most of the correlates of beliefs about success have an impact on beliefs about failure in a similar way, the two perspectives appear to be driven by distinct factors overall. This is surprising since processes behind success and processes behind failure are two sides of the same coin – if success can be attributable to effort and hard work, failure is then logically attributable to lack of effort and hard work. Having success (for example, living in a good neighborhood) does appear to make people more positive about the processes behind both success and failure. But beliefs about failure are overall more linked to individual economic success than they are to country-level estimates of inequality of opportunity (or income inequality).

6. Conclusion

Since beliefs about process fairness have been shown to impact economic decision-making, it is important to understand how these beliefs are formed. Beliefs about fairness may or may not reflect actual fairness, especially at macro levels, which people may struggle to conceptualize if they have no direct experience with fair or unfair processes. According to Piketty's hypothesis about belief formation, beliefs may be inherited, and thus reflect past, instead of current, realities. But they can also be influenced by the information and policies to which individuals are exposed during their social life (Piketty, 1995). This paper provides evidence on Piketty's hypothesis, applied to beliefs about process fairness.

I specifically look at the correlation of inequality of opportunity with these beliefs, and how this correlation varies by institutional quality.

First, I generate measures of inequality of opportunity for 2010 and 2016. I find that inequality of opportunity varies dramatically across countries in my sample. Countries in western Europe tend to display lower values of inequality of opportunity, while those in south-eastern Europe have the highest values. In this sample, circumstances are not as widely or as strongly correlated with outcomes as they are reported to be in other parts of the world. Parental education in particular has a weak correlation with wealth, and instead place of birth is consistently important. But there is some evidence that this may be changing. Decreases in inequality of opportunity for wealth since 2010 can largely be attributed to reductions in the importance of place of birth in determining outcomes, leaving parental education, and in particular mother's education, to take a larger role.

Most importantly, this paper looks at the relationship between inequality of opportunity and beliefs about processes for achieving economic success and failure, and the importance of institutional quality in this relationship. I regress attitudes towards success and failure today on historical levels of inequality of opportunity, and on changes in the last 6 years. I also interact these inequality of opportunity terms with a measure of institutional quality. Finally, I compare these results to estimates of the correlation of beliefs with overall income inequality.

I find that while changes in inequality of opportunity are not related to beliefs about what it takes to fail, they are important for beliefs about the processes behind success. In countries with larger increases in inequality of opportunity, people are more likely to attribute success to bad luck or injustice (compared with market dynamics and/or laziness). Thus, people seem to recognise that success in their country can be attributed to unfair advantages, rooted in circumstances from birth. The influence of inequality of opportunity on this belief is large and outweighs effects of other factors, including individual economic

outcomes but excluding income inequality. This relationship does vary with quality of formal institutional. In countries with average and below average institutional quality, the correlation between poor process fairness and beliefs that processes are not fair is strongest. As institutional quality increases, people are less likely to perceive a link between increases in inequality of opportunity and unfairness in the processes (behind success).

Income inequality exhibits a different pattern from that of inequality of opportunity - people in countries with higher levels of income inequality tend to believe that success can be attributed to fair processes, though increases in income inequality over time mitigate this positive relationship. Like the case for inequality of opportunity, there is no correlation between income inequality and beliefs about failure. Finally, unlike with inequality of opportunity, institutional quality is not important for how income inequality gets reflected in beliefs.

These results suggest that reducing both inequality of opportunity for wealth accumulation, as well as overall income inequality, can improve sentiment about success, which in turn can have implications for support of market-oriented reforms. But the relationship varies substantially depending on the quality of a country's formal institutions. For countries with better governing institutions, the strength of (and perhaps faith in) the institutions may compensate for increases in inequality of opportunity. Meanwhile, reducing inequality of opportunity in countries with below average governing institutions without addressing problems with institutional quality can have a strong detrimental effect on beliefs. In effect, ambitious reforms for reducing inequality of opportunity must be accompanied, or preceded, by improvements in governance.

The lack of correlation between beliefs about failure and inequality of opportunity introduces ambiguity into these policy implications. Beliefs about failure are more correlated with own economic outcomes than with macroeconomic measures of inequality or inequality of opportunity. This means that those who have had success perceive failure as a fair result

of laziness or lack of will power. This can in turn reduce their support of redistributive policies (Balafoutas et al., 2013), which is problematic if inequality of opportunity is in fact quite high.

These results have important implications for how we think inequality of opportunity and income inequality may influence individual choices. It is argued that both high inequality of opportunity and high income inequality can cause mass discontent and civil unrest because people will be frustrated with their inability to achieve what others achieve in their society. But the relationship between inequality of opportunity and perceptions is not straightforward. Processes behind success and failure are two sides of the same coin, but people perceive them differently. Moreover, the quality of formal governing institutions plays an important role only for beliefs about success. This points to potentially different policy implications. A mapping between beliefs and actions is needed to fully conceptualise whether beliefs can serve to accurately inform the need for and potential growth impacts of specific policy interventions.

Appendices

A. Using an asset index to measure wealth

The convention in the literature for assessing wealth from a household survey is to use an asset index (Filmer and Pritchett, 2001; McKenzie, 2005; Sahn and Stifel, 2003). An asset index is essentially a weighted sum of binary asset indicators. An asset indicator captures whether a household possesses a particular (durable) good. For example, let us denote asset indicators as $a_{[n]}$, where n pertains to any given asset. Suppose the survey asks about five assets: car, microwave, color television, computer and mobile phone. If a household owns a color television, a microwave and a car, then their asset index score would apply a weight to each $a_{[n]}$ in that set and add these up. Asset index scores are relative to the number of assets in the survey and the survey sample. The weights for the asset index are estimated using principal component analysis (PCA). The weights are taken from the first component of the Stata PCA output. By definition an asset index has a mean of zero, with negative value capturing wealth of those below the mean and positive values for wealth of those above the mean.

The asset index in this study uses 14 assets available in the LiTS survey in both 2010 and 2016 (Table 1). This list of assets accounts for both a household's durable assets and housing quality indicators. While I use the same list of assets in each of the two years and across countries, I run the PCA separately for each country and for each year. I do this since asset index weights are sample-specific and I am interested in inequality of opportunity estimates within each country. Also, I will use the asset index to look at country-specific wealth decile, and relative wealth position in each country may be defined by a different combination of assets.

Table A1 shows the descriptive statistics for each country's resulting wealth variable, by year. The asset index takes values from -7.520 to 8.479 in 2010 and -8.007 to 10.526 in

2016. Note that the median, minimum and maximum in Table A1 cannot be compared across countries. I list these to give a sense of the wealth distribution in each country. I also show histograms of each country's index, by year, in Figure A1 and Figure A2.

[Table A1, Figure A1, Figure A2 inserted here]

Even though an asset index can be a useful proxy for levels of well-being, it may not be well-suited to studying inequality if the index suffers from clumping or truncation (McKenzie, 2005). If an insufficient number of assets is used to construct the index, then households will be clumped together in a small number of groups. Having too few groups limits the amount of useful information about inequality that can be inferred from the asset index. A second potential issue is that of truncation of the asset index distribution, which can arise if there are not enough assets in the index that allow one to tell between the poor and the very poor, or between the rich and the upper middle class. In order to avoid clumping and truncation, a sufficient number of indicators must be used.

I use a large number of common assets to construct our asset indexes, which are mostly free of clumping. But they do display truncation at the top and bottom in many instances. This will limit the extent to which variation in the index will capture the very poor or the very rich. Truncation at the top occurs for wealthier countries, such as Germany, as well as in Latvia, Russia and Ukraine (2016), meaning that many households near the middle of the income distribution in those countries own all the assets in the survey and the index fails to distinguish between the upper middle class and the rich. Since I am more interested in the factors that contribute to the inequality between the poor and the middle class, this is not of concern in our case. Nonetheless, care should be taken when comparing the results from wealthier countries with the rest of the sample, since the variation being explained by circumstances in these countries is coming almost exclusively from the left tail of their respective asset distributions. There is also some truncation at the bottom in Kyrgyz Republic, Tajikistan and Uzbekistan, making it difficult to distinguish between the poor and very poor. Lastly, while Azerbaijan, Georgia and Lithuania suffer from some

clumping, the density functions of most of the indexes are relatively smooth (McKenzie, 2005). Thus, the analysis most accurately captures inequality between the poor and the middle class. This is a policy relevant threshold. A strong middle class is important for growth, and increased vulnerability of those on the threshold between poor and middle class is of increasing concern in high and middle income countries. Understanding the importance of circumstances for determining long run outcomes in this group, such as wealth, can guide policy for reducing their vulnerability.

B. Circumstances at birth, household level

While the household is the relevant unit of analysis to look at accumulation of assets, using a household level variable for estimates of inequality of opportunity is not straightforward. This is because the method we use to estimate inequality of opportunity traces economic outcomes back to an individual's circumstances at birth. Meanwhile, each member of the household, with their individual circumstances, potentially contributes to overall household wealth. The conflict that arises here can be resolved by carefully selecting which circumstances and which individual in the household to use.

We use the household head as representative of circumstances at the household level. Most of the circumstances of the household head can serve as a reasonable summary statistic for circumstances among the rest of the household. Parental education, for example, is known to be highly correlated within households (Blossfeld and Timm, 2003). This analysis, therefore, assumes that the circumstances of the household head serve as a summary statistic for the average circumstance of the contributing household members.

One important limitation applies: Because spouses or partners are usually of a different gender, it makes no sense to measure the influence of gender on household wealth. While gender is always a characteristic of the head of the household, it is rarely a characteristic of the household. Hence, it is not considered in the statistical analysis estimating inequality

of opportunity. Ideally one would estimate inequality of opportunity separately for male- and female-headed households and compare results. But these groups are not strictly comparable because men are household heads by default (in most countries in the sample), meaning that the results for men hold on average for all men in the population. On the other hand, women who are heads are likely not representative of the average and thus the regression results for this group would not be comparable to either the average women in the population or to the average male household head.¹⁶ Also, it is impossible to identify the comparable male household heads in our survey data to allow for such a comparison. Lastly, local economic conditions can also determine whether a female is a household head in a way that makes results difficult to interpret. For example, in Tajikistan opportunities at home are poor and many men migrate abroad for work. Here I find female-headed households doing quite well compared with male-headed households. This is not necessarily because women have better economic outcomes but because the women that are household heads in those countries are, by and large, heads because the would-be male head is abroad working. The men working abroad are sending back more money than the comparable male-headed households in domestic jobs are making.

For these reasons I follow the convention in the literature and restrict the estimates of inequality of opportunity to male household heads, excluding students and retired people. The estimate will give a sense of inequality of opportunity overall and will be sufficient for cross-country comparisons, but it will not allow us to say anything about how inequality of opportunity differs by gender within or across countries.

Some circumstance variables available in our data are not included in this analysis. These include ethnicity, mother tongue and religion. In this sample, the interpretation of these variables differs considerably across countries and generations. For example, in some countries in our sample, speaking only Russian is sufficient for access to good jobs, but in others,

¹⁶There are no matrilineal societies in our sample.

not speaking the local language may severely restrict good employment opportunities. Because of this, including these variables reduces cross country comparability. Furthermore, due to item non-response, including religion and mother tongue reduces the sample size for the regressions considerably. Because item non-response for these variables is not random, including these variables would introduce bias and increase variance of the estimates. Nonetheless, for completeness, I performed multiple robustness checks on the inequality of opportunity estimates, where I include these variables. Including one or all of them does not change inequality of opportunity estimates or country rankings considerably. For example, being of a minority ethnicity has very little explanatory power for household wealth in most countries in the sample. See European Bank for Reconstruction and Development (2016) for estimates that include ethnicity.

I also exclude age as a circumstance. The year of one's birth is certainly something one has no control over and outcomes will vary by age. Using age as a circumstance, however, captures not only an individual's age, but also the policies and economic environments that mark their years and determine outcomes. Consequently, any significant result from including age as a circumstance in the regression cannot be clearly interpreted as the impact of age itself. Also, for the R^2 to be interpreted as a legitimate measure of inequality of opportunity and decomposed inequality of opportunity, it is necessary to exclude controlling variables. I thus exclude age and age^2 as controls. As a robustness check, the analyses were also run with age and age^2 included. While these controls tend to be significant, they do not explain much additional variation in outcomes; R^2 values are essentially unchanged. Results are available upon request.

7. References

- Abras, Ana, Hoyos, Alejandro, Narayan, Ambar, Tiwari, Sailesh, 2013. Inequality of opportunities in the labor market: Evidence from life in transition surveys in Europe and Central Asia. Background Paper for the World Development Report.
- Alesina, Alberto, Angeletos, George-Marios, 2005. Fairness and redistribution. *The American Economic Review* 95, 960–980.
- Alesina, Alberto, Cozzi, Guido, Mantovan, Noemi, 2012. The Evolution of Ideology, Fairness and Redistribution. *The Economic Journal* 122, 1244–1261.
- Alesina, Alberto, Ferrara, Eliana La, 2005. Preferences for redistribution in the land of opportunities. *Journal of Public Economics* 89, 897–931.
- Alesina, Alberto, Fuchs-Schündeln, Nicola, 2007. Good-bye Lenin (or not?): The effect of communism on people’s preferences. *The American Economic Review* 97, 1507–1528.
- Alesina, Alberto, Giuliano, Paola, 2010. Preferences for redistribution, in: Benhabib, Jess, Bisin, Alberto, Jackson, Matthew O (Eds.), *Handbook of Social Economics*. Elsevier, North-Holland, Amsterdam and Boston. volume 1A, pp. 93–132.
- Alesina, Alberto, Giuliano, Paola, 2015. Culture and institutions. *Journal of Economic Literature* 53, 898–944.
- Algan, Yann, Guriev, Sergei, Papaioannou, Elias, Passari, Evgenia, 2017. The european trust crisis and the rise of populism *Brookings Papers on Economic Activity*, BPEA Conference Drafts.
- Altonji, Joseph G., Blank, Rebecca M., 1999. Race and gender in the labor market, in: Ashenfelter, Orley, Card, David (Eds.), *Handbook of Labour Economics*. Elsevier. volume 3, Part C. chapter 48, pp. 3143–3259.
- Balafoutas, Loukas, Kocher, Martin G., Putterman, Louis, Sutter, Matthias, 2013. Equality, equity and incentives: An experiment. *European Economic Review* 60, 32–51.

- Bartels, Meike, Rietveld, Marjolein J. H., Van Baal, G. Caroline M., Boomsma, Dorret I., 2002. Heritability of educational achievement in 12-year-olds and the overlap with cognitive ability. *Twin Research and Human Genetics* 5, 544–553.
- Bénabou, Roland, 2008. Joseph schumpeter lecture: ideology. *Journal of the European Economic Association* 6, 321–352.
- Bénabou, Roland, Tirole, Jean, 2011. Identity, morals, and taboos: Beliefs as assets. *The Quarterly Journal of Economics* 126, 805–855.
- Bertrand, Marianne, Mullainathan, Sendhil, 2004. Are Emily and Greg more employable than Lakisha and Jamal? A field experiment on labor market discrimination. *The American Economic Review* 94, 991–1013.
- Birch, Sarah, 2010. Perceptions of electoral fairness and voter turnout. *Comparative Political Studies* 43, 1601–1622. <http://cps.sagepub.com/content/43/12/1601.full.pdf+html>.
- Blau, Francine D., Kahn, Lawrence M., 2000. Gender differences in pay. *The Journal of Economic Perspectives* 14, 75–99.
- Blossfeld, Hans-Peter, Timm, Andreas, 2003. Educational Systems as Marriage Markets in Modern Societies: a Conceptual Framework, in: Blossfeld, Hans-Peter, Timm, Andreas (Eds.), *Who Marries Whom?*. Springer Netherlands. volume 12 of *European Studies of Population*, pp. 1–18.
- Bourguignon, François, Ferreira, Francisco H. G., Menéndez, Marta, 2007. Inequality of Opportunity in Brazil. *Review of Income and Wealth* 53, 585–618.
- Brock, J. Michelle, 2016. Inequality of opportunity and beliefs about success and failure. Working Paper No. 187. European Bank for Reconstruction and Development.
- Denisova, Irina, Eller, Markus, Frye, Timothy, Zhuravskaya, Ekaterina, 2009. Who wants

- to revise privatization? the complementarity of market skills and institutions. *American Political Science Review* 103, 284–304.
- Di Tella, Rafael, Galiani, Sebastian, Schargrotsky, Ernesto, 2007. The formation of beliefs: evidence from the allocation of land titles to squatters. *The Quarterly Journal of Economics* 122, 209–241.
- Djankov, Simeon, Nikolova, Elena, Zilinsky, Jan, 2016. The happiness gap in eastern Europe. *Journal of Comparative Economics* 44, 108–124.
- Durante, Ruben, Putterman, Louis, Van der Weele, Joël, 2014. Preferences for redistribution and perception of fairness: An experimental study. *Journal of the European Economic Association* 12, 1059–1086.
- Easterly, William, Levine, Ross, 2016. The european origins of economic development. *Journal of Economic Growth* 21, 225–257.
- Eisenkopf, Gerald, Fischbacher, Urs, Föllmi-Heusi, Franziska, 2013. Unequal opportunities and distributive justice. *Journal of Economic Behavior & Organization* 93, 51–61.
- European Bank for Reconstruction and Development, 2016. Inequality of opportunity, in: *Transition Report 2016-17. Transition for all: Equal opportunities in an unequal world.* chapter 3, pp. 44–52.
- Fernández, Raquel, 2013. Cultural change as learning: The evolution of female labor force participation over a century. *The American Economic Review* 103, 472–500.
- Ferreira, Francisco H.G., Gignoux, Jérémie, 2011. The measurement of inequality of opportunity: Theory and an application to Latin America. *Review of Income and Wealth* 57, 622–657.
- Ferreira, Francisco H.G., Gignoux, Jérémie, Aran, Meltem, 2011. Measuring inequality of opportunity with imperfect data: the case of Turkey. *The Journal of Economic Inequality* 9, 651–680.

- Filmer, Deon, Pritchett, Lant H., 2001. Estimating Wealth Effects without Expenditure Data-or Tears: An Application to Educational Enrollments in States of India. *Demography* 38, 115–132.
- Fogli, Alessandra, Veldkamp, Laura, 2011. Nature or nurture? learning and the geography of female labor force participation. *Econometrica* 79, 1103–1138.
- Guiso, Luigi, Sapienza, Paola, Zingales, Luigi, 2008. Social capital as good culture. *Journal of the European Economic Association* 6, 295–320.
- Heath, Andrew C., Berg, Kare, Eaves, Lindon J., Solaas, Marit H., Corey, Linda A., Sundet, Jon, Magnus, Per, Nance, Walter E., 1985. Education policy and the heritability of educational attainment. *Nature* 314, 734–736.
- Heyns, Barbara, 2005. Emerging Inequalities in Central and Eastern Europe. *Annual Review of Sociology* 31, 163–197.
- Jenkins, Stephen P., 2015. World income inequality databases: an assessment of WIID and SWIID. *The Journal of Economic Inequality* 13, 629–671.
- Kahneman, Daniel, Tversky, Amos, 2013. Prospect theory: An analysis of decision under risk, in: *Handbook of the fundamentals of financial decision making: Part I*. World Scientific, pp. 99–127.
- Kaufmann, Daniel, Kraay, Aart, Mastruzzi, Massimo, 2011. The worldwide governance indicators: methodology and analytical issues. *Hague Journal on the Rule of Law* 3, 220–246.
- Krapohl, Eva, Rimfeld, Kaili, Shakeshaft, Nicholas G., Trzaskowski, Maciej, McMillan, Andrew, Pingault, Jean-Baptiste, Asbury, Kathryn, Harlaar, Nicole, Kovas, Yulia, Dale, Philip S., Plomin, Robert, 2014. The high heritability of educational achievement reflects many genetically influenced traits, not just intelligence. *Proceedings of the National Academy of Sciences* 111, 15273–15278.

- List, John A, 2007. On the interpretation of giving in dictator games. *Journal of Political economy* 115, 482–493.
- Marrero, Gustavo A., Rodríguez, Juan G., 2013. Inequality of opportunity and growth. *Journal of Development Economics* 104, 107–122.
- McKenzie, David J., 2005. Measuring Inequality with Asset Indicators. *Journal of Population Economics* 18, 229–260.
- Mirrlees, James A., 1971. An exploration in the theory of optimum income taxation. *The Review of Economic Studies* 38, 175–208.
- Mokyr, Joel, 2016. *A culture of growth: the origins of the modern economy*. Princeton University Press.
- Piketty, Thomas, 1995. Social mobility and redistributive politics. *The Quarterly Journal of Economics* 110, 551–584.
- Rawls, John, 1971. *A Theory of Justice*. Belknap Press, Cambridge MA.
- Rodrik, Dani, 2017. *Populism and the Economics of Globalization*. Technical Report. National Bureau of Economic Research.
- Roemer, John E., 1998. *Theories of Distributive Justice*. Harvard University Press, Boston.
- Sahn, David E., Stifel, David, 2003. Exploring Alternative Measures of Welfare in the Absence of Expenditure Data. *Review of Income and Wealth* 49, 463–489.
- Solt, Frederick, 2016. The standardized world income inequality database. *Social Science Quarterly* 97, 1267–1281.
- Tom, Sabrina M, Fox, Craig R, Trepel, Christopher, Poldrack, Russell A, 2007. The neural basis of loss aversion in decision-making under risk. *Science* 315, 515–518.
- Tversky, Amos, Kahneman, Daniel, 1991. Loss aversion in riskless choice: A reference-dependent model. *The quarterly journal of economics* 106, 1039–1061.

Tversky, Amos, Kahneman, Daniel, 1992. Advances in prospect theory: Cumulative representation of uncertainty. *Journal of Risk and uncertainty* 5, 297–323.

van de Gaer, Dirk, 1993. Equality of opportunity and investment in human capital. Ph.D. thesis. Catholic University of Louvain.

8. Tables

Table 1: Measuring wealth – assets available in the Life in Transition Survey, 2010

Type of asset	Asset
Home ownership:	Renter
	Owner
Type of house:	Detached
	Semi-detached
	Apartment
	Other
Utilities in the dwelling:	Heat in the dwelling
	Electricity
	Running water
	Internet
Other assets:	Car
	Mobile phone
	Computer
	Bank account

Notes: For type of house, “other” includes hostel, primitive/mobile dwelling, part commercial/industrial, and any other type not listed.

Table 2: Summary of circumstances by country, among male household heads in the labor force (18+)

Country	2010				2016			
	Born in urban area	Father's education	Mother's education	Member communist party	Born in urban area	Father's education	Mother's education	Member communist party
<i>Central Europe and the Baltic States</i>								
Croatia	57.24	39.37	27.93	7.64	71.77	59.04	47.37	10.40
Czech Rep.	81.41	81.63	73.53	17.83	81.21	87.06	78.75	23.67
Estonia	60.23	71.56	66.42	10.11	60.81	77.78	76.06	13.39
Hungary	70.52	71.12	71.23	6.58	65.15	55.30	41.38	6.97
Latvia	64.43	74.75	72.84	9.97	65.58	81.71	80.58	10.11
Lithuania	52.23	42.05	42.05	6.67	46.13	57.98	56.65	6.96
Poland	54.92	58.60	56.98	5.66	51.59	63.85	61.52	9.65
Slovak Rep.	67.06	67.39	72.00	14.62	66.15	64.75	53.48	11.57
Slovenia	69.31	47.55	38.73	7.73	60.73	57.30	39.72	6.81
<i>South-eastern Europe</i>								
Albania	61.30	57.55	53.11	9.01	54.13	56.51	48.66	14.69
Bosnia and Herz.	52.55	66.67	51.45	10.75	52.23	48.99	34.78	9.52
Bulgaria	51.34	58.25	53.40	18.12	62.38	48.57	44.43	17.91
Cyprus					43.44	26.67	20.50	
FYR Macedonia	53.85	56.68	40.64	11.85	53.82	30.52	21.33	12.92
Greece					56.96	38.97	30.69	
Kosovo	41.32	76.15	70.75	7.81	35.94	27.88	12.73	6.35
Montenegro	49.10	51.97	36.00	21.15	59.46	58.21	48.38	23.61
Romania	51.00	59.64	57.25	17.33	51.51	60.45	55.21	11.79
Serbia	46.28	60.53	51.10	18.99	52.12	53.58	41.67	15.03
<i>Eastern Europe and the Caucasus</i>								
Armenia	62.76	80.39	83.12	13.5	48.65	78.10	74.17	16.71
Azerbaijan	48.58	74.85	66.06	12.74	41.54	99.41	99.81	8.32

Continued on next page

Summary of circumstances by country, among male household heads in the labor force (18+)

Country	2010				2016			
	Born in urban area	Father's education	Mother's education	Member communist party	Born in urban area	Father's education	Mother's education	Member communist party
Belarus	66.54	63.89	66.48	12.24	66.15	95.95	94.38	25.81
Georgia	36.60	81.30	85.59	11.76	47.56	85.94	84.78	22.03
Moldova	29.05	50.79	55.68	7.64	30.56	65.56	61.72	7.68
Ukraine	52.87	73.05	75.00	18.62	58.66	91.52	90.97	20.34
<i>Central Asia</i>								
Kazakhstan	49.77	78.17	77.18	13.06	42.54	89.42	86.47	22.43
Kyrgyz Rep.	25.63	58.06	52.91	14.29	27.86	86.73	86.62	17.69
Mongolia	29.43	52.06	56.86	18.33	17.03	56.57	51.77	30.90
Tajikistan	12.25	86.39	73.97	4.85	14.22	88.77	81.02	11.75
Uzbekistan	37.90	82.31	80.77	7.27	38.58	89.31	88.11	8.59
<i>Comparator countries</i>								
France	70.93	68.85	69.63	3.74				
Germany	60.28	93.09	93.02	3.66	49.34	88.9	80.07	1.19
UK	77.80	86.56	84.64	0.58				
Italy	36.00	42.35	37.25	1.99	82.18	62.60	56.95	
Sweden	77.78	86.02	84.27	2.71				
<i>Without regional classification</i>								
Russia	64.88	80.27	80.37	17.18	67.16	93.37	91.62	19.60
Turkey	64.49	15.27	8.37	0.67	78.86	26.45	20.16	

Notes: Figures are percentages. For parental education, the figure is the per cent of the sample whose mother (father) completed at least secondary education.

Table 3: Survey items on beliefs about determinants of success and failure

Survey question	Response options	Fair process variable code	Share in sample
In your opinion, which of the following factors is the most important to succeed in life in our country now?	Effort and hard work	1	42.59%
	Intelligence and skills	1	26.97%
	By political connections	0	23.45%
	By breaking the law	0	6.99%
	Other	missing	
In your opinion, what is the main reason why there are some people in need in our country today?	Because they have been unlucky	0	10.27%
	Because of laziness and lack of willpower	1	26.33%
	Because of injustice in our society	0	46.37%
	It is an inevitable part of modern life	1	17.03%
	Other	missing	

Table 4: OLS regression of wealth on circumstances, male household heads

Country	2010						2016					
	Born in urban area	Father's education	Mother's education	Member communist party	N	IOp	Born in urban area	Father's education	Mother's education	Member communist party	N	IOp
<i>Central Europe and the Baltic States</i>												
Croatia	0.991*** (0.322)	0.706*** (0.220)	0.316 (0.220)	0.235 (0.363)	191	0.375	0.943*** (0.191)	0.275* (0.144)	0.611*** (0.157)	-0.142 (0.213)	404	0.228
Czech Rep.	-1.013** (0.451)	-1.075** (0.499)	1.347*** (0.479)	1.132*** (0.382)	76	0.201	0.296 (0.472)	0.115 (0.208)	0.332 (0.289)	0.180 (0.185)	468	0.018
Estonia	-0.527 (0.379)	0.637* (0.366)	-0.108 (0.423)	0.108 (0.500)	55	0.094	-0.191 (0.184)	-0.124 (0.198)	0.100 (0.198)	0.269 (0.238)	350	0.007
Hungary	-0.130 (0.299)	0.286* (0.169)	0.349 (0.228)	-0.695 (0.739)	174	0.066	0.312 (0.272)	0.351* (0.192)	0.755*** (0.169)	-0.461 (0.335)	379	0.181
Latvia	-0.370 (0.440)	0.580 (0.468)	0.090 (0.337)	-0.514 (0.403)	137	0.066	0.542* (0.277)	0.371** (0.186)	0.228 (0.139)	-0.120 (0.280)	302	0.084
Lithuania	1.095** (0.524)	-0.046 (0.337)	0.760** (0.342)	0.519 (0.666)	44	0.402	1.408*** (0.206)	0.415*** (0.127)	0.242* (0.127)	0.521** (0.235)	362	0.324
Poland	-0.535** (0.208)	0.144 (0.196)	0.501** (0.196)	-0.576 (0.427)	128	0.131	-0.085 (0.226)	0.115 (0.246)	0.566** (0.274)	-1.212** (0.541)	481	0.086
Slovak Rep.	1.233*** (0.437)	0.051 (0.404)	0.104 (0.508)	0.812*** (0.289)	80	0.178	0.541 (0.442)	0.757*** (0.273)	0.149 (0.249)	-0.133 (0.247)	351	0.107
Slovenia	-1.504*** (0.270)	-0.079 (0.289)	0.265 (0.258)	0.626** (0.282)	91	0.193	0.489** (0.212)	0.048 (0.178)	0.030 (0.194)	0.055 (0.301)	338	0.019
<i>South-eastern Europe</i>												
Albania	0.628* (0.372)	0.321 (0.206)	0.369* (0.210)	0.362 (0.266)	202	0.132	1.621*** (0.206)	0.212 (0.147)	0.426*** (0.110)	-0.064 (0.260)	421	0.358

Continued on next page

OLS regression of wealth on circumstances, male household heads; *continued from previous page*

	Born in urban area	Father's education	Mother's education	Member communist party	N	IOp	Born in urban area	Father's education	Mother's education	Member communist party	N	IOp
Bosnia and Herz.	1.282*** (0.394)	0.089 (0.227)	0.258 (0.246)	0.256 (0.360)	198	0.188	0.911*** (0.184)	0.346** (0.146)	0.275** (0.121)	-0.367 (0.250)	478	0.197
Bulgaria	1.314*** (0.328)	0.170 (0.195)	0.541** (0.217)	0.231 (0.329)	144	0.309	0.817*** (0.235)	0.479*** (0.148)	0.607*** (0.154)	0.021 (0.235)	425	0.349
Cyprus							-0.200 (0.178)	-0.079 (0.181)	-0.530*** (0.199)		340	0.082
FYR Macedonia	1.090*** (0.236)	0.649** (0.260)	0.112 (0.236)	0.657 (0.419)	140	0.340	0.183 (0.221)	0.228 (0.172)	0.749*** (0.177)	0.210 (0.198)	379	0.258
Greece							-0.271 (0.199)	0.111 (0.182)	0.012 (0.195)		412	0.008
Kosovo	-0.299 (0.423)	-0.237 (0.414)	0.994** (0.461)	0.031 (0.408)	97	0.143	-0.525** (0.216)	0.081 (0.140)	-0.207 (0.185)	0.551*** (0.162)	348	0.046
Montenegro	0.838*** (0.295)	0.289 (0.216)	0.371 (0.235)	-0.241 (0.262)	174	0.142	0.448* (0.236)	0.156 (0.161)	0.326** (0.160)	0.324** (0.165)	426	0.090
Romania	2.405*** (0.338)	0.206 (0.378)	0.157 (0.308)	-0.083 (0.304)	151	0.425	1.128*** (0.274)	0.670*** (0.222)	0.576*** (0.199)	-0.085 (0.332)	334	0.333
Serbia	1.345*** (0.252)	0.365 (0.239)	0.164 (0.229)	0.086 (0.241)	268	0.255	0.856*** (0.241)	-0.012 (0.223)	1.033*** (0.199)	0.043 (0.295)	337	0.265
<i>Eastern Europe and the Caucasus</i>												
Armenia	0.142 (0.375)	0.648*** (0.182)	0.225 (0.214)	0.037 (0.428)	127	0.111	0.313 (0.227)	0.271 (0.187)	-0.103 (0.186)	0.192 (0.233)	277	0.026
Azerbaijan	0.787* (0.417)	0.453 (0.373)	-0.295 (0.394)	-0.315 (0.426)	138	0.078	0.542*** (0.200)	0.717* (0.380)	0.203 (0.395)	0.104 (0.269)	480	0.057
Belarus	0.736*** (0.276)	0.068 (0.221)	0.403* (0.230)	0.146 (0.265)	132	0.127	0.635** (0.287)	0.065 (0.211)	0.401** (0.182)	-0.272 (0.185)	423	0.047

Continued on next page

OLS regression of wealth on circumstances, male household heads; *continued from previous page*

	Born in urban area	Father's education	Mother's education	Member communist party	N	IOp	Born in urban area	Father's education	Mother's education	Member communist party	N	IOp
Georgia	2.732*** (0.284)	0.023 (0.247)	-0.166 (0.443)	1.220** (0.536)	84	0.556	0.623*** (0.241)	0.635** (0.259)	-0.004 (0.248)	-0.152 (0.213)	421	0.107
Moldova	1.495*** (0.466)	-0.036 (0.206)	0.829*** (0.181)	-0.676* (0.411)	127	0.256	1.318*** (0.247)	-0.057 (0.176)	0.746*** (0.186)	0.271 (0.235)	374	0.282
Ukraine	1.646*** (0.387)	0.106 (0.211)	0.299 (0.254)	0.502 (0.398)	162	0.277	1.642*** (0.205)	0.638*** (0.217)	0.306 (0.227)	-0.319 (0.231)	490	0.292
<i>Central Asia</i>												
Kazakhstan	1.056** (0.437)	0.035 (0.347)	0.656** (0.325)	0.627 (0.555)	111	0.169	1.033*** (0.252)	0.190 (0.179)	0.464*** (0.180)	-0.271 (0.211)	438	0.138
Kyrgyz Rep.	1.421*** (0.423)	0.012 (0.228)	0.374* (0.220)	-0.393 (0.389)	173	0.202	1.007*** (0.293)	0.174 (0.172)	0.108 (0.137)	0.575** (0.273)	458	0.107
Mongolia	0.221 (0.269)	0.393** (0.181)	-0.091 (0.210)	-0.157 (0.222)	169	0.039	1.077*** (0.329)	0.346** (0.155)	0.349** (0.174)	-0.098 (0.186)	465	0.141
Tajikistan	3.325*** (0.519)	-0.271 (0.277)	0.134 (0.208)	0.144 (0.424)	128	0.379	1.375*** (0.425)	0.129 (0.125)	0.343*** (0.127)	-0.299** (0.129)	375	0.105
Uzbekistan	1.043*** (0.405)	-0.160 (0.159)	0.026 (0.172)	-0.357* (0.201)	207	0.096	1.543*** (0.350)	0.249 (0.175)	0.397 (0.283)	-0.093 (0.215)	396	0.239
<i>Comparator countries</i>												
France	-0.606** (0.290)	0.129 (0.194)	-0.294 (0.220)	0.384 (0.417)	232	0.034						
Germany	-0.467 (0.291)	0.123 (0.408)	-0.547 (0.413)	-0.658 (0.635)	243	0.033	-1.105*** (0.209)	-0.210 (0.160)	-0.141 (0.139)	-0.924* (0.538)	663	0.109
Great Britain	-0.138 (0.275)	0.056 (0.242)	0.014 (0.211)	-1.601*** (0.296)	231	0.006						

Continued on next page

OLS regression of wealth on circumstances, male household heads; *continued from previous page*

	Born in urban area	Father's education	Mother's education	Member communist party	N	IOp	Born in urban area	Father's education	Mother's education	Member communist party	N	IOp
Italy	0.149 (0.305)	-0.334 (0.322)	0.255 (0.327)	0.884** (0.415)	146	0.015	-0.216 (0.214)	-0.036 (0.140)	-0.130 (0.158)		479	0.007
Sweden	0.063 (0.271)	0.207 (0.207)	-0.250 (0.208)	-0.960 (0.813)	307	0.012						
<i>Without regional classification</i>												
Russia	1.106** (0.481)	0.442** (0.204)	-0.116 (0.164)	-0.056 (0.240)	226	0.128	1.261*** (0.295)	0.240 (0.171)	0.100 (0.178)	0.073 (0.187)	409	0.142
Turkey	0.972*** (0.371)	0.618*** (0.155)	0.032 (0.179)	2.997*** (0.365)	175	0.194	0.779** (0.397)	0.308* (0.183)	0.824*** (0.153)		639	0.234

Notes: Standard errors in parentheses. *** (**, *) indicates significance at 1% (5%, 10%) level. The sample includes only non-student, non-retired male household heads over 18.

Table 5: Correlates of beliefs about success and failure, probit effects

	Is success due to fair processes?			Is failure due to fair processes?		
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Region and country variables</i>						
Δ IOp (2016-2010)		-2.152*** (0.639)	-2.927*** (0.403)		-0.279 (0.445)	-0.083 (0.635)
IOp (2010)		-1.057* (0.640)	-2.013*** (0.539)		0.166 (0.351)	0.317 (0.704)
Δ Gini (2016-2010)		-7.541** (3.109)	-6.342*** (2.272)		-3.194 (2.490)	-1.819 (2.561)
Gini (2010)		2.007 (1.240)	2.935** (1.415)		0.484 (1.004)	0.889 (1.394)
Δ IOp (2016-2010)*Governance (2016)			2.362*** (0.798)			-0.413 (1.001)
IOp (2010)*Governance (2016)			1.268* (0.756)			-0.362 (0.939)
Δ Gini (2016-2010)*Governance (2016)			-12.816 (8.791)			-4.798 (5.183)
Gini (2010)*Governance (2016)			-1.543 (1.949)			-1.580 (2.201)
Governance (2016)		-0.613*** (0.140)	-0.002 (0.621)		-0.226 (0.188)	0.353 (0.712)
Median decile choice, by PSU	0.057*** (0.017)	0.041** (0.017)	0.039** (0.017)	0.030* (0.016)	0.033* (0.018)	0.032* (0.018)
Wealth decile	-0.008 (0.006)	-0.007 (0.006)	-0.006 (0.006)	0.012* (0.007)	0.011* (0.007)	0.012* (0.007)
Respondent education	0.036** (0.016)	0.029* (0.015)	0.022 (0.016)	0.042** (0.018)	0.032* (0.017)	0.033** (0.017)
Employed	0.046 (0.029)	0.003 (0.034)	0.026 (0.031)	0.075*** (0.024)	0.067** (0.027)	0.069*** (0.026)

Continued on next page

Correlates of beliefs about success and failure, probit effects; *continued from previous page*

	Is success due to fair processes?			Is failure due to fair processes?		
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Circumstance variables</i>						
Age	-0.020*** (0.006)	-0.020*** (0.006)	-0.020*** (0.006)	-0.011** (0.005)	-0.010** (0.005)	-0.010** (0.005)
Age-squared	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000** (0.000)	0.000 (0.000)	0.000 (0.000)
Highest parent education	-0.029 (0.021)	-0.012 (0.024)	-0.018 (0.024)	-0.023 (0.025)	-0.024 (0.025)	-0.027 (0.026)
Urban birthplace	-0.007 (0.032)	-0.069* (0.039)	-0.036 (0.036)	-0.048 (0.030)	-0.066* (0.035)	-0.061* (0.033)
Parent in communist party	-0.116*** (0.043)	-0.095** (0.045)	-0.083* (0.046)	0.068** (0.029)	0.073*** (0.028)	0.067** (0.030)
Constant	0.507*** (0.172)	0.182 (0.471)	0.113 (0.491)	-0.344** (0.147)	-0.164 (0.308)	-0.313 (0.372)
Country FE	Yes	No	No	Yes	No	No
Country controls for 2010 and 2016	No	Yes	Yes	No	Yes	Yes
Pseudo R-squared	0.090	0.069	0.076	0.041	0.030	0.030
N	14922	14922	14922	14733	14733	14733

Notes: Standard errors clustered at the country level are in parentheses. *** (**, *) indicates significance at 1% (5%, 10%) level. The sample includes only male household heads. The Gini indexes are 2010 and 2016 values from the SWIID database (Solt, 2016). The governance indicator is the average of the scores of 2016 indicators for government effectiveness, regulatory quality, rule of law and control of corruption, taken from the Worldbank's Worldwide Governance Indicators database. The macroeconomic country controls include 2010 levels and 2016-2010 changes for GDP per capita, unemployment, inflation and polity 2. The polity 2 score contains values from the Polity IV Project database, all other macro variables are measures from the IMF World Economic Outlook database.

Table A1: Measuring wealth – assets index summary statistics among male household heads in the labor force (18+)

Country	2010				2016			
	SD	Median	Min	Max	SD	Median	Min	Max
<i>Central Europe and the Baltic States</i>								
Croatia	1.750	-0.348	-4.315	3.463	1.685	-0.626	-4.576	3.532
Czech Rep.	1.787	0.128	-6.397	1.834	1.799	0.133	-4.827	2.795
Estonia	1.628	-0.346	-4.426	1.799	1.699	-0.193	-5.040	3.131
Hungary	1.820	-0.465	-4.951	1.847	1.820	-0.584	-4.102	3.256
Latvia	1.914	0.004	-7.169	1.515	1.854	0.599	-7.022	1.239
Lithuania	1.679	-0.455	-2.707	3.519	1.864	-0.097	-6.213	2.258
Poland	2.065	0.028	-6.373	1.897	1.905	0.194	-8.007	1.748
Slovak Rep.	1.661	-0.062	-5.443	1.493	1.923	0.070	-7.475	1.196
Slovenia	1.619	0.013	-4.408	1.764	1.575	-1.078	-2.890	3.234
<i>South-eastern Europe</i>								
Albania	1.593	-0.461	-3.495	3.415	1.665	-0.138	-3.719	2.799
Bosnia and Herz.	1.786	-0.575	-2.595	5.000	1.689	-0.816	-3.182	4.437
Bulgaria	1.836	-0.505	-3.912	2.637	1.942	-0.017	-4.820	2.460
Cyprus					1.534	1.064	-4.511	1.399
FYR Macedonia	1.578	-0.401	-2.452	6.175	1.699	0.552	-4.573	2.219
Greece					1.641	-0.056	-5.181	1.932
Kosovo	1.679	0.171	-3.949	2.321	1.595	0.825	-7.130	1.074
Montenegro	1.551	-1.010	-2.420	3.630	1.522	0.298	-5.840	1.937
Romania	2.019	-0.740	-4.069	2.827	1.945	-0.398	-4.135	2.883
Serbia	1.716	-0.418	-3.032	4.545	2.007	-0.859	-4.796	3.142
<i>Eastern Europe and the Caucasus</i>								
Armenia	1.663	-0.788	-2.165	3.199	1.443	0.313	-4.307	2.438
Azerbaijan	1.619	-0.913	-1.586	4.857	1.472	-0.331	-4.198	5.625
Belarus	1.790	0.589	-6.068	2.105	1.937	-0.555	-5.012	3.097
Georgia	1.813	-0.957	-2.522	3.982	1.745	-0.361	-2.426	5.139
Moldova	1.950	-1.290	-2.580	5.379	1.817	-0.571	-2.502	4.782
Ukraine	1.841	0.192	-3.826	3.815	1.919	-0.250	-4.844	1.927
<i>Central Asia</i>								
Kazakhstan	1.855	0.660	-3.465	3.313	1.714	-0.602	-3.309	2.882
Kyrgyz Rep.	1.631	-0.705	-1.312	5.110	1.686	-0.581	-1.662	6.812
Mongolia	1.605	-0.415	-2.308	4.132	2.074	-0.756	-2.443	4.455
Tajikistan	1.712	-0.665	-1.256	8.479	1.662	-0.414	-0.829	10.526
Uzbekistan	1.816	-0.633	-1.125	8.075	1.637	-0.507	-1.615	5.959
<i>Comparator countries</i>								
France	1.688	0.828	-4.522	2.083				
Germany	1.874	-1.053	-3.765	2.786	1.874	0.112	-2.957	1.885
Great Britain	1.831	0.303	-5.105	1.856				
Italy	1.685	0.584	-7.390	1.755	1.576	0.530	-4.726	2.226
Sweden	1.783	-0.210	-4.063	2.308				
<i>Without regional classification</i>								
Russia	1.797	0.507	-7.520	1.769	1.887	0.647	-6.486	1.304
Turkey	1.723	0.001	-3.440	2.713	1.759	0.125	-4.642	2.129

Table A2: Correlates of beliefs about success and failure, probit effects

	Is success due to fair processes?			Is failure due to fair processes?		
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Region and country variables</i>						
Δ IOp (2016-2010)		-2.152*** (0.639)	-2.927*** (0.403)		-0.279 (0.445)	-0.083 (0.635)
IOp (2010)		-1.057* (0.640)	-2.013*** (0.539)		0.166 (0.351)	0.317 (0.704)
Δ Gini (2016-2010)		-7.541** (3.109)	-6.342*** (2.272)		-3.194 (2.490)	-1.819 (2.561)
Gini (2010)		2.007 (1.240)	2.935** (1.415)		0.484 (1.004)	0.889 (1.394)
Δ IOp (2016-2010)*Governance (2016)			2.362*** (0.798)			-0.413 (1.001)
IOp (2010)*Governance (2016)			1.268* (0.756)			-0.362 (0.939)
Δ Gini (2016-2010)*Governance (2016)			-12.816 (8.791)			-4.798 (5.183)
Gini (2010)*Governance (2016)			-1.543 (1.949)			-1.580 (2.201)
Governance (2016)		-0.613*** (0.140)	-0.002 (0.621)		-0.226 (0.188)	0.353 (0.712)
<i>Macroeconomic controls</i>						
GDP per capita (2010)		0.000*** (0.000)	0.000*** (0.000)		0.000* (0.000)	0.000 (0.000)
Unemployment (2010)		-0.044*** (0.007)	-0.039*** (0.007)		-0.035*** (0.007)	-0.033*** (0.007)
Inflation (2010)		0.000 (0.000)	0.000*** (0.000)		-0.000* (0.000)	-0.000 (0.000)
Polity 2 (2010)		0.022 (0.014)	0.024* (0.013)		-0.003 (0.018)	-0.008 (0.017)

Continued on next page

Correlates of beliefs about success and failure, probit effects; *continued from previous page*

	Is success due to fair processes?			Is failure due to fair processes?		
	(1)	(2)	(3)	(4)	(5)	(6)
Δ GDP per capita (2016-2010)		0.000** (0.000)	0.000*** (0.000)		0.000 (0.000)	0.000 (0.000)
Δ Unemployment (2016-2010)		-0.038* (0.022)	-0.005 (0.021)		-0.051*** (0.017)	-0.045** (0.021)
Δ Inflation (2016-2010)		-0.000 (0.000)	-0.000*** (0.000)		0.000* (0.000)	0.000 (0.000)
Δ Polity 2 (2015-2010)		0.051* (0.027)	0.045 (0.028)		-0.002 (0.025)	0.003 (0.028)
<i>Own economic success variables</i>						
Median decile choice, by PSU	0.057*** (0.017)	0.041** (0.017)	0.039** (0.017)	0.030* (0.016)	0.033* (0.018)	0.032* (0.018)
Wealth decile	-0.008 (0.006)	-0.007 (0.006)	-0.006 (0.006)	0.012* (0.007)	0.011* (0.007)	0.012* (0.007)
Respondent education	0.036** (0.016)	0.029* (0.015)	0.022 (0.016)	0.042** (0.018)	0.032* (0.017)	0.033** (0.017)
Employed	0.046 (0.029)	0.003 (0.034)	0.026 (0.031)	0.075*** (0.024)	0.067** (0.027)	0.069*** (0.026)
<i>Circumstance variables</i>						
Age	-0.020*** (0.006)	-0.020*** (0.006)	-0.020*** (0.006)	-0.011** (0.005)	-0.010** (0.005)	-0.010** (0.005)
Age-squared	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000** (0.000)	0.000 (0.000)	0.000 (0.000)
Highest parent education	-0.029 (0.021)	-0.012 (0.024)	-0.018 (0.024)	-0.023 (0.025)	-0.024 (0.025)	-0.027 (0.026)
Urban birthplace	-0.007 (0.032)	-0.069* (0.039)	-0.036 (0.036)	-0.048 (0.030)	-0.066* (0.035)	-0.061* (0.033)
Parent in communist party	-0.116*** (0.043)	-0.095** (0.045)	-0.083* (0.046)	0.068** (0.029)	0.073*** (0.028)	0.067** (0.030)

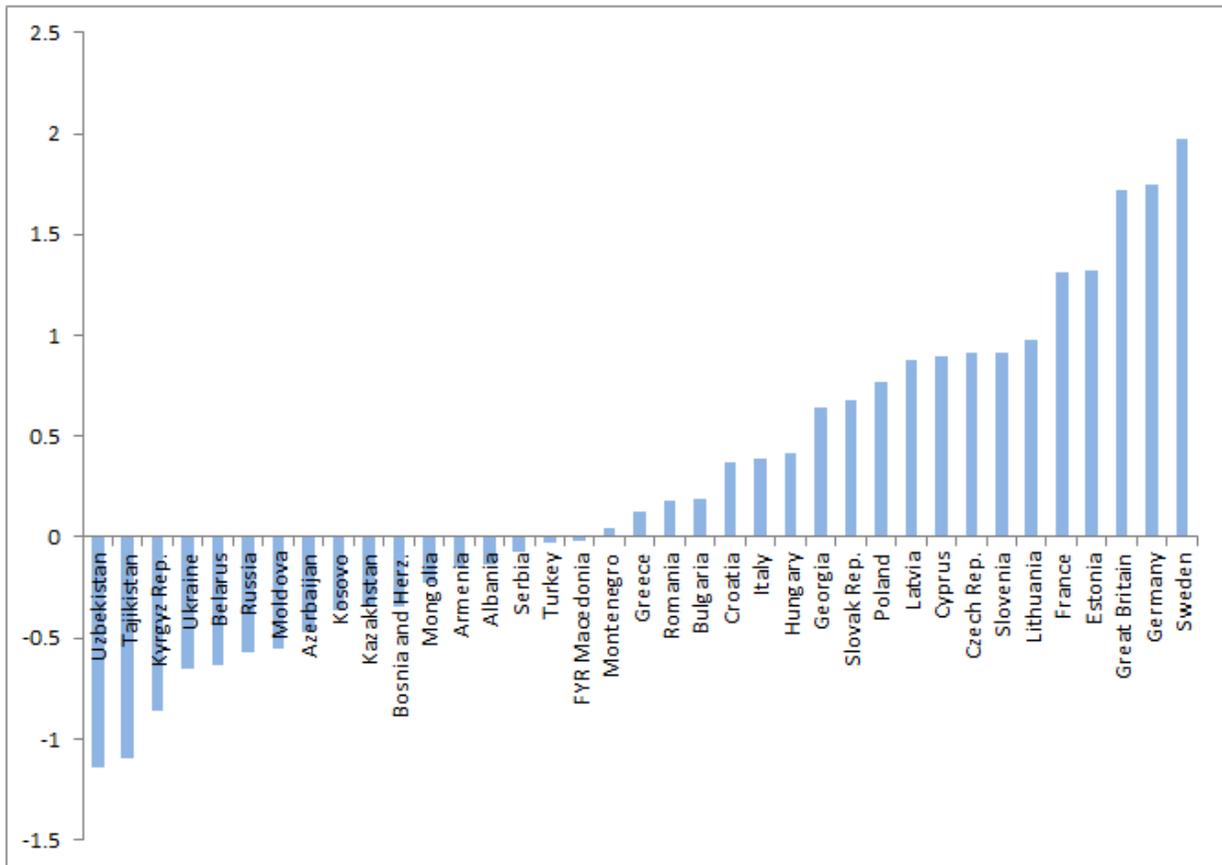
Continued on next page

Correlates of beliefs about success and failure, probit effects; *continued from previous page*

	Is success due to fair processes?			Is failure due to fair processes?		
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	0.507*** (0.172)	0.182 (0.471)	0.113 (0.491)	-0.344** (0.147)	-0.164 (0.308)	-0.313 (0.372)
Country FE	Yes	No	No	Yes	No	No
Country controls for 2010 and 2016	No	Yes	Yes	No	Yes	Yes
Pseudo R-squared	0.090	0.069	0.076	0.041	0.030	0.030
N	14922	14922	14922	14733	14733	14733

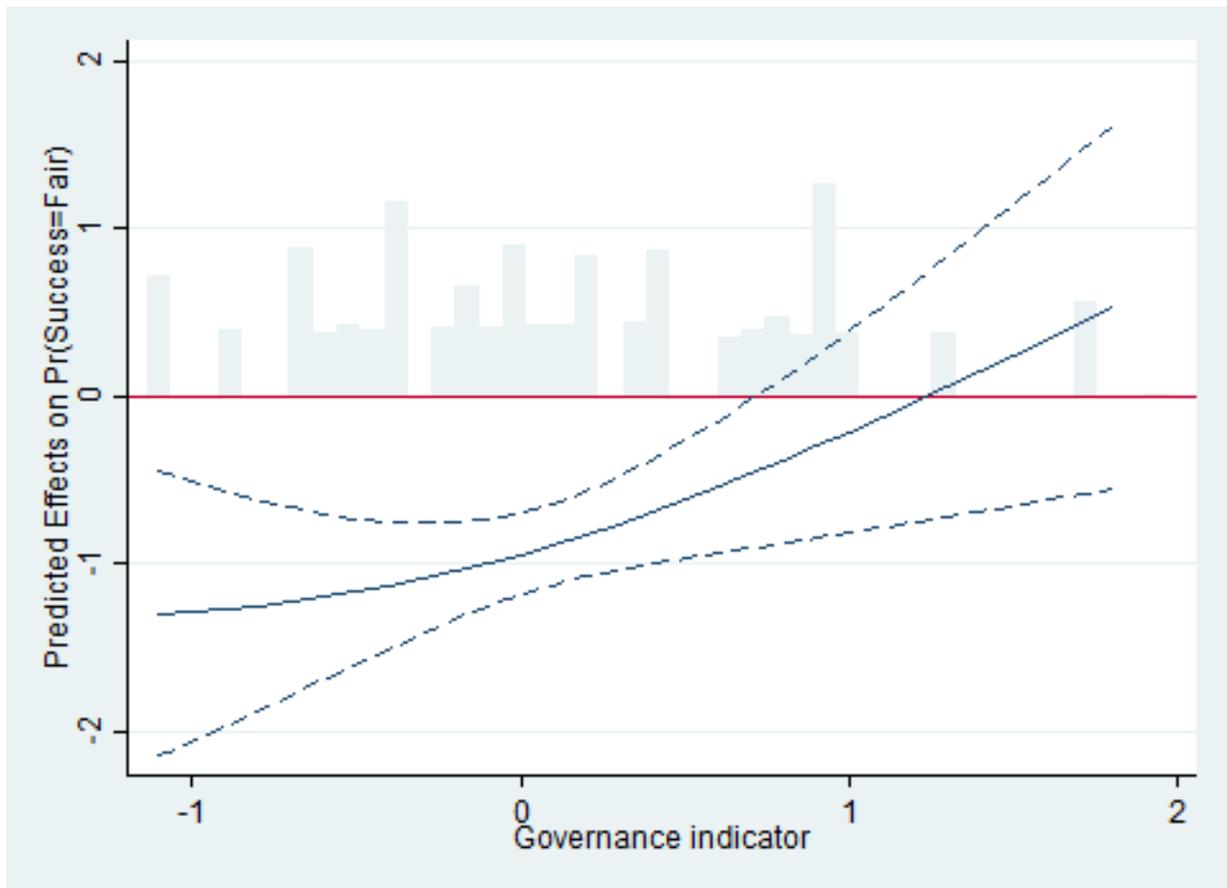
Notes: Standard errors clustered at the country level are in parentheses. *** (**, *) indicates significance at 1% (5%, 10%) level. The sample includes only male household heads. The Gini indexes are 2010 and 2016 values from the SWIID database (Solt, 2016). The governance indicator is the average of the scores of 2016 indicators for government effectiveness, regulatory quality, rule of law and control of corruption, taken from the Worldbank's Worldwide Governance Indicators database. The macroeconomic country controls include 2010 levels and 2016-2010 changes for GDP per capita, unemployment, inflation and polity 2. The polity 2 score contains values from the Polity IV Project database, all other macro variables are measures from the IMF World Economic Outlook database.

Figure 1: Institutional quality for 2016, by country



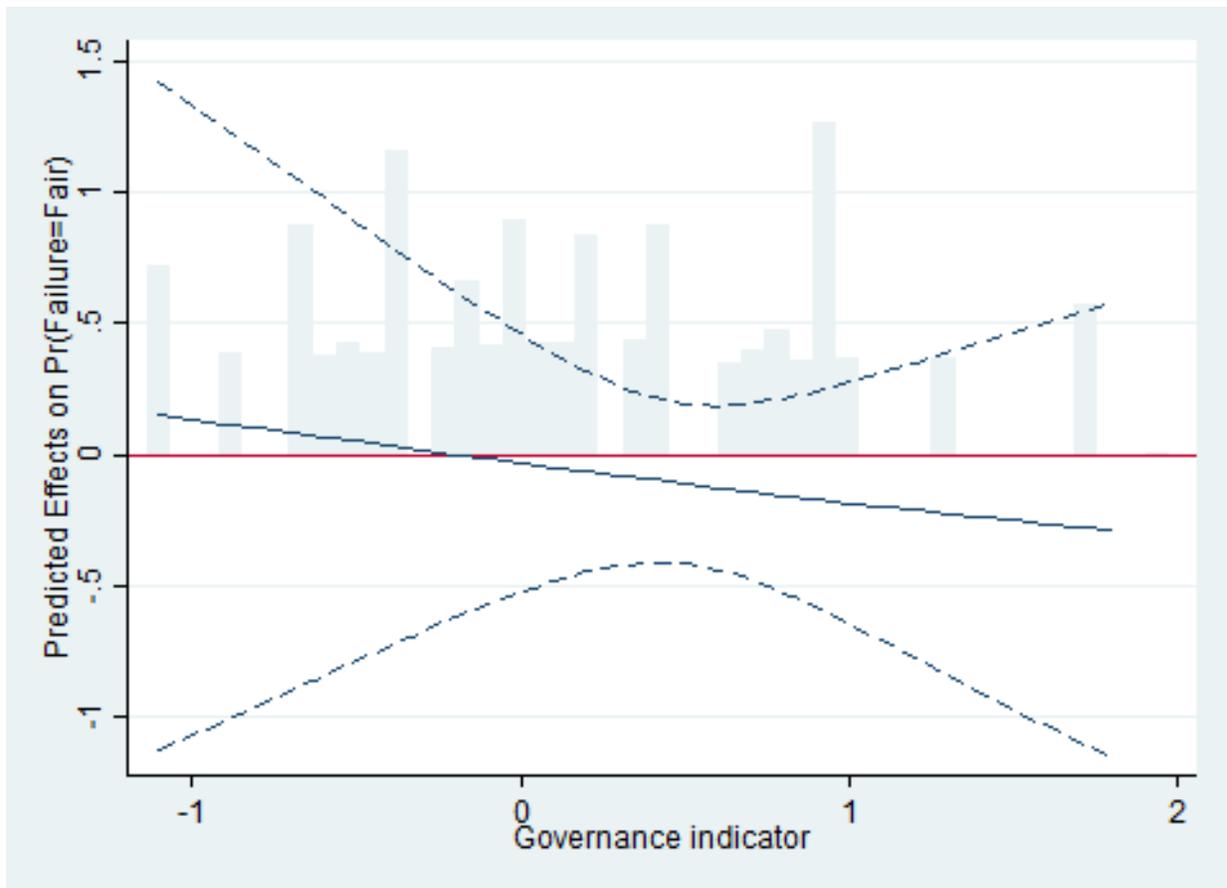
Notes: The height of the bars shows the aggregate governance index for each country in the sample. Countries are ordered from the highest to the lowest institutional quality.

Figure 2: Marginal Effects of Change in IOp on Pr(Success=Fair) Conditional on Governance, Full Model, 95% CIs



Notes: Depicted are conditional marginal effects of change in IOp on the probability of perceiving success as being due to fair processes together with the density histogram, computed from Model 3 of Table 5.

Figure 3: Marginal Effects of Change in IOp on Pr(Failure=Fair) Conditional on Governance, Full Model, 95% CIs



Notes: Depicted are conditional marginal effects of change in IOp on the probability of perceiving failure as being due to fair processes together with the density histogram, computed from Model 6 of Table 5.

Figure A1: Histograms of asset index for male household heads in the labor force (18+) in 2010, by country

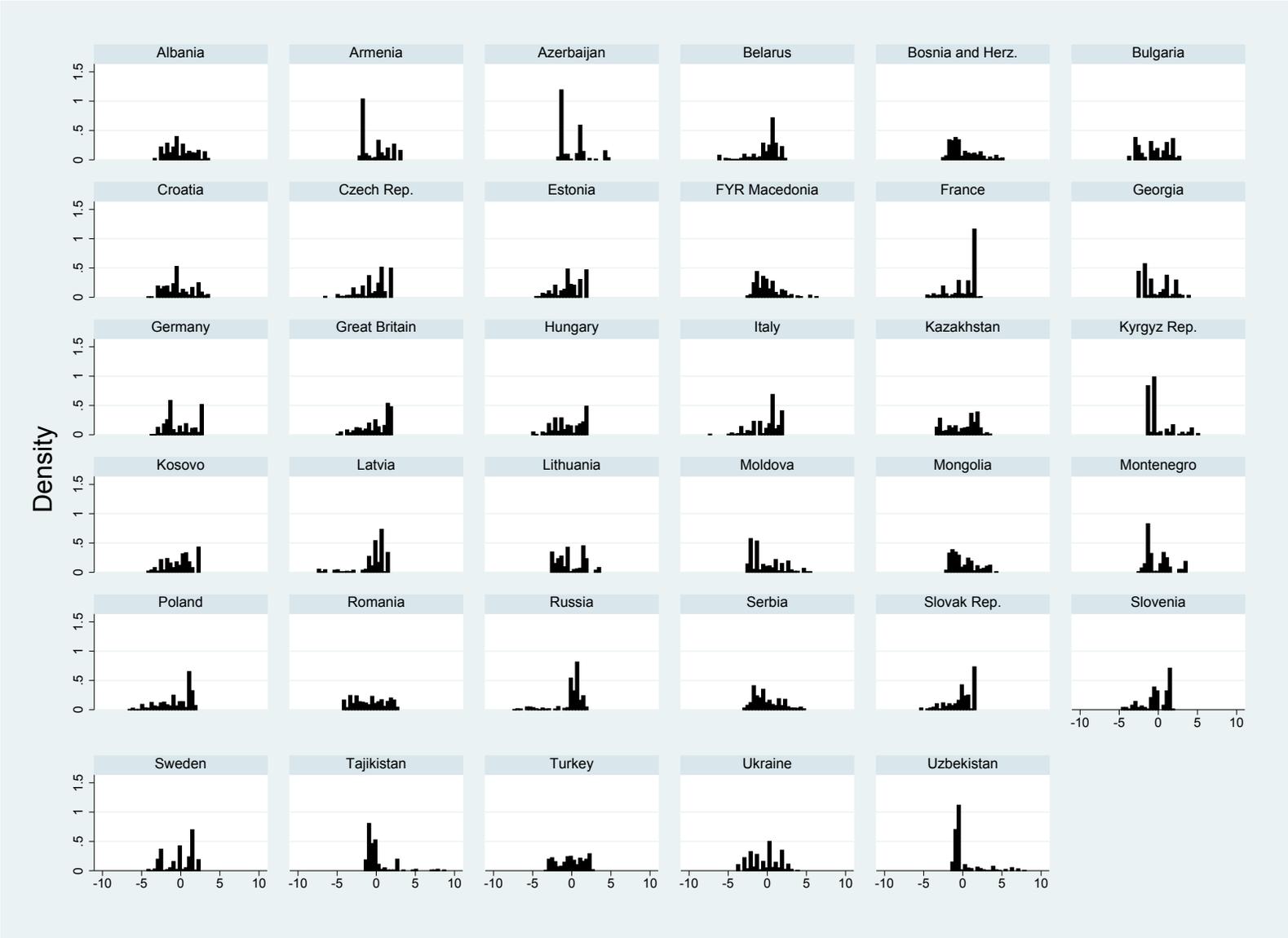


Figure A2: Histograms of asset index for male household heads in the labor force (18+) in 2016, by country

