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Heterogeneous Impacts of Community-Level Trust on Life Satisfaction in Transition Countries: Perspectives on Institutions and Regional Diversity

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Abstract

This study examines the relationship between trust and life satisfaction in transition countries, focusing on community-level trust, institutions, and regional diversity. Transition countries, characterized by unique levels and trends of subjective well-being (SWB) and trust, present an intriguing case for study. These countries exhibit lower happiness levels compared to non-transition counterparts, despite similar income levels—a phenomenon known as the "transition happiness gap." Additionally, the influence of trust on SWB in these regions remains insufficiently understood, given the lingering effects of communist rule and dictatorship that have fostered fear and distrust. This research fills existing gaps by investigating the impacts of community-level trust on life satisfaction, distinguishing between interpersonal and institutional trust, and differentiating between Central and Eastern Europe (CEE) and the former Soviet Union (FSU). Using data from the Life in Transition Survey conducted in 28 transition countries from 2006, 2010, and 2016, the study employs instrumental variables to address endogeneity. The findings reveal that community-level interpersonal and institutional trust positively influence life satisfaction in transition countries, emphasizing the importance of meso-level trust. Interpersonal trust has a stronger impact on life satisfaction than institutional trust, particularly in countries with low-quality formal institutions. Moreover, the effects of trust on life

The data in this study are based solely on publicly available data, Life in Transition Survey I, II, and III, collected by The European Bank for Reconstruction and Development and the World Bank. Personal information is kept confidential and medical data are not included.

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satisfaction are more significant in the FSU compared to the CEE, potentially due to compensatory effects and the historical accumulation of trust.

Keywords Happiness · Social Trust · Subjective Well-Being · Transition Countries

Introduction

The growing interest in the positive impact of social capital on subjective well-being (SWB) has sparked extensive research validating this relationship. Recently, researchers and policymakers alike have shifted their attention from solely focusing on traditional national economic accounts such as gross domestic product (GDP) towards more subjective and psychological well-being indicators such as life satisfaction and happiness to measure the quality of life (Diener et al., 2015; Stiglitz et al., 2018). Within this new paradigm, trust has emerged as a crucial factor in enhancing SWB. Trust constitutes a central aspect of social capital (Bjørnskov, 2006; Uslaner, 2015), even though defining and conceptualizing social capital remains elusive given its multidimensional nature (Bhandari & Yasunobu, 2009).

This paper aims to investigate the nuanced relationship between trust and life satisfaction across diverse levels and types of trust, and regional variations, with a particular focus on transition countries. Transition countries present a unique case, characterized by distinct levels and trends of SWB, and stocks of trust compared to other regions (Bartolini et al., 2017). Interestingly, these countries report lower happiness levels than their non-transition counterparts with similar income levels, a phenomenon termed the "transition happiness gap" (Guriev & Zhuravskaya, 2009, p. 148). Furthermore, economic growth and GDP exert a significant influence on SWB in these countries that have undergone the rapid economic transition from plan to market as people's attention shifts to the economic situations (Delhey, 2010; Easterlin, 2009; Guriev & Melnikov, 2018). On the other hand, with regard to social aspects such as trust, decades of communist rule and dictatorship have cultivated a pervasive sense of fear and distrust, hindering the development and accumulation of trust (Bartolini et al., 2017; Paldam & Svendsen, 2001). Nevertheless, both trust in people and trust in institutions have been identified as factors increasing SWB in these regions (Aliyev et al., 2022; Bartolini et al., 2017; Helliwell et al., 2014), indicating a complex and yet insufficiently understood relationship.

While recent studies have noted the effects of collective-level trust on SWB, most research predominantly focuses on macro-level (countries or regions) trust, leaving a gap in our understanding of the impacts of meso-level (communities, groups, or institutions) trust. Focusing on a socio-ecological environment can be meaningful in exploring the improvement of SWB because its determinants include individual characteristics, as well as the context, circumstances, and institutions wherein people are situated (Dolan et al., 2008). Uslaner (2002, p. 10) states, "while life in a trusting society is pleasant, life in a country where a majority distrusts other people is highly contentious." Yet, most research demonstrated the role of macro-level trust in SWB including health status (Campos-Matos et al., 2015; Elgar et al., 2011; Glatz

& Eder, 2020; Habibov, 2014; Habibov & Cheung, 2017; Jen et al., 2010; Kim et al., 2011; Lu et al., 2020; Poortinga, 2006; Snelgrove et al., 2009) and hence few studies focused on meso-level trust (Habibov & Afandi, 2011; Habibov et al., 2019a; Subramanian et al., 2002; Yip et al., 2007). This study contributes to filling these gaps by adopting meso-level (community-level) trust.

Furthermore, it is critical to distinguish between two different dimensions of trust, interpersonal and institutional, and two different regions, Central and Eastern Europe (CEE) and the former Soviet Union (FSU), in transition countries. Despite an increasing research focus on trust and SWB, there remains a scarcity of studies differentiating between types of trust or delineating the distinction between trust and confidence. Trust can be bifurcated into interpersonal and institutional trust (Paldam, 2000; Paxton, 1999), with institutional trust encompassing both trust in people who shape and manage institutions and confidence in the social environment of which institutions form a part (Sapsford & Abbott, 2006). In empirical research, Leung et al. (2011) concluded that trust in the family and trust in various institutions is positively related to happiness but trust in neighbors and strangers is not so in Canada. Also, Jovanović (2016) demonstrated that interpersonal trust is more strongly related to SWB than institutional trust in Serbia. On the other hand, Macchia and Plagnol (2019) found that confidence in key national institutions may be a strong determinant of life satisfaction in South America. Those results imply that the impact of trust on SWB can differ depending on the types and concepts of trust and confidence, but it has not been fully considered in transition countries. Furthermore, the effect of trust on SWB is known to differ depending on regional characteristics such as socio-ecological environment and culture. This is because, the diversity of peoples, cultures, traditions, institutions, and economic development in regions affects the relationship between trust and life satisfaction in different ways (Kudebayeva et al., 2022; Rodríguez-Pose & von Berlepsch 2014). Transition countries can be classified into CEE and FSU because of the diverse political and economic transition progress across the regions. Specifically, the literature reveals that CEE has transformed into a relatively well-regulated democracy and market economy, whereas progress in FSU economies has been delayed and inadequate institutional conditions have developed (Abbott et al., 2011). As these dissimilar situations have resulted in heterogeneity in the accumulation of trust in both areas (EBRD, 2006, 2010, 2016), the influence of trust on life satisfaction may differ between the two regions. Therefore, this study contributes to understanding how interactions between trust and life satisfaction differ depending on the types of trust (interpersonal and institutional) and regional and cultural diversity (CEE and FSU).

Further contributions of this paper include using a broad sample of transition countries and employing the instrumental variables (IVs) approach. Many previous studies examining the relationship between trust and life satisfaction were confined to a limited number of transition countries (e.g., Aliyev et al., 2022; Bartolini et al., 2017; Growiec & Growiec, 2014; Helliwell et al., 2014; Jovanović, 2016). In contrast, we utilize data from the Life in Transition Survey (LITS) spanning the 2006, 2010, and 2016 rounds, encompassing 28 transition countries. Moreover, to mitigate the endogeneity problem, often overlooked in related literature but a potential source

of misleading results, we employ the IVs approach. This methodology enhances the rigor of our research on the relationship between trust and life satisfaction.

The remainder of this paper is organized as follows. In the "Literature Review and Hypotheses" section reviews the previous literature on the relationship between community-level trust and life satisfaction and discusses hypotheses for empirical testing. In the "Data and Methodology" section describes the data and methodology utilizes in the analysis. In the "Results" section demonstrates the results and robustness analysis, and finally, we remark on the discussion and conclusions in the "Discussions and Conclusions" section.

Literature Review and Hypotheses

Community-level Interpersonal Trust and Life Satisfaction

Life satisfaction is one of the key indications of SWB. According to Diener (1984), SWB is composed of both cognitive judgments that respondent evaluate their own life as a whole (or aspects of it), and affective reactions that capture the feelings experienced by the respondent at a specific point in time. In addition, eudaimonia which expresses the meaning and purpose of life is included in the concept of SWB (OECD, 2013). In general, SWB is described as people's evaluations of their lives such as the degree of overall life satisfaction and the extent to which one feels happy, hence the literature on SWB covers studies that have used such diverse terms as life satisfaction, happiness, and positive and negative affect (Diener, 1984; Diener et al., 2015; Stiglitz et al., 2018). Although each term is defined in different ways, in several prior research, the terms life satisfaction, happiness, and well-being have been used interchangeably (Arslan, 2023; Frey & Stutzer, 2002; Leung et al., 2011).

Social capital, including trust, is also a multidimensional concept so there still argue some controversy about the conceptualization and measurements of social capital. Based on the pioneering work of Bourdieu (1986), Coleman (1990), and Putnam (1993), social capital is broadly defined to be social norms, values, beliefs, trusts, obligations, relationships, networks, friends, memberships, civic engagement, information flows, and institutions (Bhandari & Yasunobu, 2009). More and more recent studies agree that it can mainly consist of three distinct dimensions: networks (of families, friends, communities, and voluntary associations), norms (shared norms, values, and behaviors), and trust (in other people and institutions) (Glatz & Eder, 2020; Lu et al., 2020). These elements are consistent with Putnam's social capital concept but recent research emphasized the need of separating these components, pointing out the role of trust in particular (Bjørnskov, 2008). Accordingly, empirical studies researching SWB often use trust as a proxy for social capital (Bartolini et al., 2017; Glatz & Eder, 2020; Guo et al., 2022; Habibov et al., 2019a, b; Hudson, 2006; Jovanović, 2016; Kuroki, 2011; Lu et al., 2020; Yamamura et al., 2015).

Regarding measurements of social capital, it can be measured and analyzed at different levels: individual and collective. At the individual level (micro level), it focuses on individuals, households, and neighborhoods. In contrast, the collective level is

further separated by meso and macro; at the meso-level, it focuses on communities, groups, institutions, and organizations; at the macro-level, it focuses on regions and countries (Bhandari & Yasunobu, 2009; Grootaert & van Bastelaert, 2001). These depend on whether social capital is regarded as personal resources or social resources. According to the latter view, social capital is a societal property and a social or collective phenomenon (Newton, 2001). Namely, collective-level social capital can be a "public good" that positively impacts members of broader society (Putnam, 2000, p. 20). Especially trust is more closely related to collective-level attributes compared to networks and social participation considered to be measuring individual-level attributes (Bhandari & Yasunobu, 2009). Hence it is considered that the analysis of trust should focus on the trustworthiness of society rather than on individuals (Newton, 2001).

Specifically, the mechanism of the effect of community-level interpersonal trust on SWB including life satisfaction can be considered in economic, political, and social dimensions. First, high trust leads to better economic activities and growth, which can enhance life satisfaction. Trust is a determinant of economic growth (Knack & Keefer 1997; Horvath 2013; Lim et al., 2018; Zak & Knack, 2001). Trust helps in removing the need for negotiations and agreements and facilitates coordinated actions and hence reduces transaction costs (Arrow, 1972). Thus, trust can positively affect investment (Lim et al., 2018), productivity (Bjørnskov, 2022), international trade (Guiso et al., 2009), the rule of law (Bjørnskov, 2012), and accumulation of physical capital (Zak & Knack 2001) and human capital (Bjørnskov, 2012), which stimulates economic activities and growth. For instance, at the community level, people in high-trust environments can obtain more entrepreneurship opportunities in comparison to those in low-trust environments because trust may provide useful information that can attract customers and also spread a widely established reputation across socially disparate groups in a community (Kwon et al., 2013). Consequently, such economic outcomes of trust bring a positive impact on life satisfaction (Clark, 2003; Dolan et al., 2008, Helliwell & Putnam, 2004).

Next, trust helps the administration and democracy to improve, which can result in better public services and higher life satisfaction. According to Uslaner (2002, p. 246), trust in people may lead to trust in the government, which can ensure better functioning of the government and democracy. Such improved political activities can redistribute wealth from the rich to the poor in pursuit of more equitable societies, as well as spending more on education and economic growth-oriented programs (Uslaner, 2002, p. 245). Putnam (1993) proved that the creation of social capital among people, such as mutual trust and cooperative behavior, resulted in good democratic performance and the construction of a civic community, which leads to better levels of SWB.

Finally, trust at the community level facilitates cooperation and expectations in solving societal problems that cannot be addressed by an individual but may be detrimental to SWB. During the period before and after the Great East Japan Earthquake, Yamamura et al. (2015) revealed a positive relationship between trust and happiness, denoting that trust has a greater role in improving and mitigating the shock of a disaster on psychological conditions. Additionally, trust makes communities more resilient and capable of cooperation, sustaining, and building happiness in

the case of an emergency (Yamamura et al., 2015). Regarding community health, communities with a higher trust may facilitate quicker and wider diffusion of ideas, promoting healthier behaviors (Yip et al., 2007). Community-level trust is associated with more effective social control over negative health behaviors, such as alcohol abuse and smoking, and solidarity in striving against potential budget cuts for local health services (Habibov & Afandi, 2011; Subramanian et al., 2002). Physical and psychological health are crucial factors in increasing life satisfaction (Dolan et al., 2008).

In transition countries, SWB and trust have been uniquely experienced and developed throughout political and economic transition periods. Most studies concur that happiness levels in transition countries are much lower than those in non-transition countries with similar income levels, a condition known as the "transition happiness gap" (Guriev & Zhuravskaya, 2009). The reason why citizens were unhappy is that the transition process has led to (1) unfairness and inequality, (2) deterioration of public goods, (3) income volatility and increased uncertainty, and (4) change in aspiration levels (Guriev & Zhuravskaya, 2009). Moreover, the rapid and dislocating change resulting from the collapse of the Soviet Union has weakened formal structures and led to lower levels of trust in politicians and institutions whereas informal trust in family, relatives, friends, and face-to-face acquaintances has been accumulated, those are said to have been characteristics of the Soviet Union societies (Sapsford & Abbott, 2006).

Given the distinctive features of SWB and trust in transition countries, it is worthwhile to investigate this relation. Although a close argument is that the link between community-level interpersonal trust and self-rated economic welfare has been demonstrated using a large sample of transition countries (Habibov et al., 2019a), empirical research is insufficient to understand the relationship between trust and SWB in more detail. Hence, addressing these gaps is crucial for advancing the discussion. To explore the influence of trust on life satisfaction by focusing on the role of community, this study hypothesizes the following.

Hypothesis 1: Community-level interpersonal trust enhances life satisfaction in transition countries.

Interpersonal Trust Versus Institutional Trust

The concept of trust can be distinguished into interpersonal and institutional trust (Paldam, 2000; Paxton, 1999), the latter of which include the notion of trust as well as confidence. Based on the distinction between 'trust' and 'confidence' from the work of Luhmann (1988), trust is defined as the willingness to make oneself vulnerable to another based on a judgment of similarity of intentions or values (Seligman, 1998; Siegrist et al., 2005). That is, trust is based on social relations and shared values. Whereas, confidence is defined as the belief, based on experience or evidence that certain future events will occur as expected (Siegrist et al., 2005). The main difference between trust and confidence is that objects of trust are persons, but confidence can be had in just about anything (Siegrist et al., 2005). Based on the prior literature (Sapsford

& Abbott, 2006), we can assume that in the context of post-communist societies, interpersonal trust refers to trust in people, whereas institutional trust refers to both trust and confidence in political and economic institutions, which includes both trust in people who form and administer institutions and confidence in the social environment of which institutions form a part. Therefore, the explanation of institutional trust differs by cultural and institutional theories. According to cultural theory, institutional trust is an extension of individuals' trust beliefs shaped by their previous experience and historically constructed national culture (Valiyev et al., 2017), which may form trust in others. On the other hand, institutional theory suggests that institutional trust represents how individuals evaluate and perceive political and economic institutional performance (Mishler & Rose, 2005), which may form confidence in institutions.

Institutional trust has a beneficial effect on life satisfaction through expectations for institutions and outcomes of institutional performance. Having higher levels of confidence in institutions indicate the expectation that favorable outcomes of political and economic institutions will occur. Such strong expectations based on experience, evidence, or past performance are highly likely to be realized, which would lead to results that positively affect the factors enhancing life satisfaction. For example, better functioning institutions can improve economic indicators such as GDP, unemployment, inflation rates (Macchia & Plagnol, 2019), high quality of public services (Hudson, 2006), maintenance of social order (Danish & Nawaz, 2022), and problems of crime and corruption (Jovanović, 2016). These outcomes can lead to higher quality of life and satisfaction. Whereas, trust in others such as people who form and administer institutions is also crucial because it has a similar positive effect to interpersonal trust on life satisfaction. In the first place, without trust in others, confidence in institutions is not generated (Sapsford & Abbott, 2006).

In the post-communist era, both the expectations and outcomes in terms of political and economic institutions as well as the culture of trusting others have been limited, which has hampered the development of institutional trust. Transition countries have been experiencing a transition to a market economy and democracy since the collapse of the Soviet Union. These rapid and dislocating changes brought weak formal institutions, increasing crime, inequality, and unemployment, and dramatically reducing living standards and public spending on education, health, and housing (Sapsford & Abbott, 2006). The shock of this transition has also decreased average incomes and deteriorated inequality, resulting in lower absolute and relative welfare levels (Gruen & Klasen, 2012) and a major negative impact on citizens' well-being (Sapsford & Abbott, 2006). Such negative consequences of institutional performance have led to lower levels of trust and confidence in national and governmental institutions (Sapsford & Abbott, 2006). Furthermore, a dictatorship, such as leadership controlled by the communist party, has created a strong atmosphere of fear and distrust, which has resulted in a state where citizens learn to trust nobody and obey authority (Paldam & Svendsen, 2001). Hence, the conditions for building institutional trust, as indicated by cultural and institutional theories, have not been created.

Accordingly, people rely heavily on interpersonal resources rather than institutional outcomes in their daily lives, and thus the effect of interpersonal trust on life satisfaction can be considered to be greater than that of institutional trust. The emergence of

new states lacking institutional mechanisms for social integration has forced a majority of the population to survive by depending on informal economic activities and kinship relationships (Abbott et al., 2011; Hiwatari, 2008). For instance, during the transition in Kyrgyzstan, interpersonal networks made up of family members, colleagues, classmates, and neighbors were as important to survival as the Soviet-era shortage economy, which helped people to compensate for the failures of the state (Kuehnast & Dudwick, 2004). In empirical research, Jovanović (2016) found that interpersonal trust is a stronger predictor of SWB than institutional trust in Serbia. The author suggests that interpersonal trust may be a critical source for SWB through its reliance on interpersonal resources to solve problems in a country characterized by poor economic conditions and the extremely low quality of formal institutions. Habibov et al. (2019b) also concluded that interpersonal trust has a greater impact on welfare support than institutional trust as citizens of transition countries had to rely on interpersonal trust due to the low quality of institutions in their countries. Hence, we hypothesize the following.

Hypothesis 2: Community-level interpersonal trust is more important than community-level institutional trust for life satisfaction in transition countries.

Regional Heterogeneity

The transition progress of FSU countries has been significantly delayed and has less established formal political and economic systems compared to CEE countries. After the collapse of the Soviet Union, the length and depth of the economic recession in FSU were considerably deeper, the pace of recovery was much slower, and the future was more uncertain (Abbott et al., 2011). And, inadequate institutional conditions have developed with poorly regulated market economies, authoritarian regimes, and weak civil societies (Abbott et al., 2011). Thus, a majority of the FSU population has suffered from a sharp rise in economic inequality, restrictions on political and civil liberties (Gruen & Klasen 2012), and dislocation in the social structure (Abbott et al., 2011). However, the CEE countries have transformed into well-regulated and growing market economies with democratic governments and civil societies (Abbott et al., 2011). According to Freedom in the World 2022 (Repucci & Slipowitz, 2022), which assesses the quality of democratic governance in 29 transition countries, CEE has all of the top 15 democracy scores, whereas FSU is below them. Additionally, as reported in the Transition Report (EBRD, 2022), which examines and understands the economic process of transition, almost all CEE countries outperform the FSU in all measures of the six qualities of a sustainable market economy.

The variances in the transition situations of both regions have brought about differences in the levels of trust, with people in the FSU region accumulating more. According to the LITS (EBRD, 2006, 2010, 2016), the degree of both interpersonal and institutional trust is higher in the FSU compared to the CEE. For people in the FSU, interpersonal relationships are crucial resources to spend their daily life since political and economic institutions are low quality (Habibov et al., 2019b; Jovanović, 2016) and thus interpersonal trust may have been enhanced compared to those in CEE countries. On the other hand, regarding institutional trust, these results are not consistent with

institutional theory, as institutional trust is anticipated to be higher in the CEE, where institutions perform better than those in the FSU. Nevertheless, we argue that there are two reasons. First, cultural theory can explain some aspects of institutional trust in both regions. Specifically, these views argue that institutional trust depends on an individual's trust beliefs that generate spillover effects; institutional trust decreases in the CEE, where interpersonal trust is lower than in the FSU. This view can be supported by the study of Valiyev et al. (2017) who found that trust in political institutions is not connected with performance in the case of Azerbaijan, implying the application of cultural theory. Second, it might be because of the different impacts of the 2008 global economic and financial crises on the economies of both regions. Shostya (2014) confirmed that transition countries with higher economic freedom and deeper transitions experienced a more severe decline during the crisis. Hence, the negative impact of the crisis on the economy was higher in the CEE because financial deregulation and trade liberalization were more advanced than in the FSU (Shostya, 2014). Accordingly, expectations for institutions and the development of institutional trust in the CEE dropped following the crisis (Diagne et al., 2012; Habibov & Afandi 2015).

High trust accumulation in the FSU can compensate for the lack of state systems through the positive effects of trust, resulting in a higher level of life satisfaction. For instance, community-level trust can help to stimulate economic growth (Knack & Keefer 1997; Zak & Knack 2001), encourage support for redistribution (Habibov et al., 2017), improve the functioning of the government and democracy (Uslaner, 2002, p. 246), maintain social order (Danish & Nawaz, 2022), facilitate effective social control over negative health behaviors (Yip et al., 2007). In empirical studies, the impact of contextual-level interpersonal trust on health is stronger in the FSU than in the CEE (Habibov & Cheung, 2017), and also the effect of community-level interpersonal trust on self-rated economic welfare is higher in the FSU than in the CEE (Habibov et al., 2019a), Yet, no consensus has been reached regarding institutional trust. Glatz and Eder (2020) showed it has a bigger effect on life satisfaction in less prosperous than in prosperous transition countries, whereas Habibov et al. (2019b) discovered that the effect of institutional trust on welfare support is the almost same between the FSU and the CEE. Further research is required to fully understand the relationship between trust and life satisfaction and hence this research makes the following hypotheses to investigate the effects of trust in different political and economic contexts between the FSU and the CEE:

Hypothesis 3: Community-level trust (interpersonal or institutional trust) affects life satisfaction differently in FSU and CEE countries.

Data and Methodology

Data

Data Source

This study utilized the Life in Transition Survey (LITS) conducted by the European Bank for Reconstruction and Development and the World Bank in 2006,

2010, and 2016. The LITS includes 28 post-communist countries. Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Macedonia, Hungary, Latvia, Lithuania, Montenegro, Poland, Romania, Serbia, Slovakia, and Slovenia are among the countries in Central and Eastern Europe. Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Mongolia, Russia, Tajikistan, Ukraine, and Uzbekistan were classified as former Soviet Union countries.[1] The sampling procedure was based on a two-stage sampling method. In the first stage, primary sampling units (PSU) are established by local electoral territorial units, with limited and clearly defined geographic boundaries. In the second stage, approximately 20 households are randomly selected from each PSU. Each round of the survey covers approximately 1,000 households in each of the surveyed countries. The main objective of the LITS is to assess how the transition process influences the lives of people across transition regions by measuring their well-being. The LITS collects individual-level information, such as life satisfaction and living standards, as well as detailed socio-economic and demographic information at the household level.

Outcome Variable: Subjective Life Satisfaction

Subjective life satisfaction was the primary dependent variable of interest. The respondents were measured for self-reported life satisfaction through the statement, "All things considered, I am satisfied with my life now," and they were asked to what extent they agreed using a five-step scale: 1) strongly disagree, 2) disagree, 3) neither disagree nor agree, 4) agree, and 5) strongly agree.[2] This measurement of life satisfaction is consistent with existing studies and is recognized as a reliable and valid proxy that can express self-esteem, positive affect, and self-rated physical and mental health (Abdel-Khalek, 2006). Moreover, there is a shared notion that people are the best judges of their circumstances (Easterlin, 2009). In other words, we could directly translate these answers into the level of life satisfaction.

[1] Following previous studies (Habibov et al., 2019b), the division between the two regions is based on the European Bank for Reconstruction and Development's classification, which takes into account pre-transitional characteristics, transitional speed, and the current levels of socioeconomic and political development of these countries. Mongolia is included in Central Asia in the classification, although it was not a part of the Soviet Union. And also, we regard the Baltic States (Estonia, Latvia, and Lithuania) with the CEE group because these countries are not considered to be in the FSU in the classification and have a similar feature with the CEE that is a member of the North Atlantic Treaty Organization (NATO) and the European Union (EU).

[2] In the LITS of 2010, respondents were asked a similar life satisfaction question again at the end of the questionnaire in the same interview through the statement, "All things considered, how satisfied or dissatisfied are you with your life as a whole these days? Please answer on a scale from 1 to 10, where 1 means completely dissatisfied and 10 means completely satisfied." According to Nikolova and Sanfey (2016), the answers to the two questions on life satisfaction are highly consistent. Hence, in this study, we follow this view and use only the first question that was also asked in the LITS of 2006 and 2016.

Key Independent Variable: Community-Level Trust

The key independent variable in our empirical work is community-level trust (interpersonal and institutional), which is used as a proxy for social capital (Brehm & Rahn, 1997; Uslaner, 2015 p. 60). First, regarding interpersonal trust measures, the respondents were asked, "Generally speaking, would you say that most people can be trusted, or that you cannot be too careful in dealing with people?" They answered their level of trust using a five-step scale: 1) complete distrust, 2) some distrust, 3) neither distrust nor trust, 4) some trust, and 5) complete trust. The five response categories of interpersonal trust were collapsed into a dichotomous outcome, for which 0 represents complete distrust, some distrust, and neither distrust nor trust and 1 represents complete trust and some trust. Although collapsing into binary variables has a disadvantage as it results in the loss of crucial information, such binary variables provide three advantages. Firstly, since only approximately 5% of the respondents have complete trust in any year, categories with few answers occurred. In that case, such an answer might introduce distortions in the results. Secondly, explanatory variables taking specific values on a scale from 1 to a certain number complicates the interpretation of the final results because the intervals between the variables' numeric values are not interpretable (Rodríguez-Pose & von Berlepsch, 2014). Therefore, previous studies have divided all possible answers into two groups that can be compared, making them useable in the regression analysis and facilitating the interpretation of the results (Alesina et al., 2004; Habibov et al., 2019a; Rodríguez-Pose and von Berlepsch, 2014). Thirdly, using binary variables have comparability with such prior studies using the same category. Given those points, we considered the benefits of employing binary variables to be crucial.[3] That is, our variable expressed whether most people can be trusted or not. Next, we averaged individual-level interpersonal trust for each PSU to estimate community-level interpersonal trust (Habibov et al., 2019a; Poortinga, 2006). The approach of considering the PSU compartment as a community has been implemented in previous studies (Antai & Adaji, 2012; Habibov et al., 2019a). Therefore, our independent variable was the percentage of respondents displaying complete trust or some trust in people in a given PSU community.

Institutional trust was measured using responses on how much they trust the following institutions: (1) the presidency, (2) the government, (3) the parliament, (4) courts, (5) political parties, (6) armed forces, (7) the police, (8) banks and the financial system, (9) foreign investors, (10) non-governmental organizations, (11) trade unions, and (12) religious institutions. We created an additive index by summing the levels of institutional trust for two reasons. First, Paxton (1999) proposes that trust in many aggregate institutions, in addition to trust in governmental institutions, is assessed to capture multiple dimensions

[3] This study also confirmed that the result is similar even when using the trust variable of five response categories in the Robustness analysis.

of institutional trust. Second, using aggregate indicators can improve reliability by examining an individual's level of trust in institutions from several perspectives, contexts, and targets (Ciziceno & Travaglino, 2019). Responses to each question were rated on a five-point Likert-type scale, ranging from 1 (complete distrust) to 5 (complete trust). Similar to the creation of the community-level interpersonal trust variable, the five response categories were collapsed into a dichotomous variable of 0 or 1 and averaged for each PSU to estimate community-level institutional trust (Habibov et al., 2019b). We then summed all community-level institutional trust variables and divided the total score by the number of institutions to obtain an additional index ranging from 0 to 1. This index takes a value of 0 if the respondent does not trust any of the institutions; otherwise, it takes a value of 1 if the respondent trusts all institutions. As for the internal consistency reliability of the index, we calculated Cronbach's α, which was 0.92, indicating that our internal consistencies were adequate.

Other Independent Variables

Based on the existing literature, we also controlled for other socio-economic and demographic variables that may be associated with life quality and well-being. Specifically, gender (a dummy for female), age (in age groups of 18–24 years; 25–34 years; 35–44 years; 45–54 years; 55–64 years; and 65 + years), marital status (a dummy for married), occupational status (a dummy for unemployed), education (a dummy for university education), and self-rated health status were utilized as individual-level sociodemographic variables. Regarding self-rated health, respondents rated their health status on a five-point scale: 1 = very good, 2 = good, 3 = medium, 4 = bad, and 5 = very bad. The original scale was collapsed into a binary outcome variable, with a value of 1 representing good health (good and very good), and 0 indicating poor health (medium, bad, and very bad). Additionally, we controlled for household characteristics, including household size (the number of household members), geographic location (a dummy for rural), ownership status of digital devices (0 indicates not holding both a telephone and a computer, 1 indicates holding one of them, and 2 indicates holding both), assets owned (a dummy for owning a dwelling), and subjective economic status. Concerning subjective economic status, the LITS measured through the statement, "Please imagine a 10-step ladder where on the bottom, the first step stands for the poorest 10% of people in our country, and on the highest step, the 10th, stand the richest 10% of people in our country." Respondents answered which step they believed that their household was on today using a 10-step scale. Furthermore, country and year dummy variables were included to capture the unobserved effects of country characteristics and time-variant factors. The summary statistics of all variables are provided in Table 1. The table reports the observation, mean, standard deviation, minimum, and maximum values for all variables.

Table 1 Descriptive Statistics

VARIABLES	(1) Obs	(2) Mean	(3) SD	(4) Min	(5) Max
Life satisfaction	83,728	3.18	1.12	1.00	5.00
Community-level interpersonal trust	84,886	0.33	0.24	0.00	1.00
Community-level institutional trust	82,564	0.36	0.19	0.00	1.00
Female	84,862	0.49	0.50	0.00	1.00
Age 18–24	84,882	0.08	0.26	0.00	1.00
Age 25–34	84,882	0.17	0.37	0.00	1.00
Age 35–44	84,882	0.18	0.39	0.00	1.00
Age 45–54	84,882	0.20	0.40	0.00	1.00
Age 55–64	84,882	0.17	0.38	0.00	1.00
Age 65 +	84,882	0.21	0.41	0.00	1.00
Married	84,764	0.61	0.49	0.00	1.00
Unemployed	84,885	0.50	0.50	0.00	1.00
University educated	84,873	0.18	0.39	0.00	1.00
Good health	84,741	0.48	0.50	0.00	1.00
Household size	84,886	3.04	1.72	1.00	10.00
Rural	84,886	0.43	0.50	0.00	1.00
Digital devices	84,873	1.30	0.73	0.00	2.00
Dwelling	84,739	0.88	0.32	0.00	1.00
Economic status	83,972	4.40	1.69	1.00	10.00
Year 2006	84,886	0.32	0.47	0.00	1.00
Year 2010	84,886	0.28	0.45	0.00	1.00
Year 2016	84,886	0.41	0.49	0.00	1.00
Opinion polarization	84,886	0.68	0.15	0.00	1.00
Religious fractionalization	84,886	0.18	0.20	0.00	0.72
Expenditure tertiles	66,258	2.00	0.82	1.00	3.00
Community-level interpersonal trust (Modify the creation of trust variable)	84,886	2.81	0.62	1.00	5.00
The lost wallet will be returned (An alternative definition of trust)	57,950	0.35	0.27	0.00	1.00
life satisfaction (10-scale variable)	23,433	5.34	2.06	1.00	10.00
Better lives (An alternative definition of life satisfaction)	80,484	2.81	1.15	1.00	5.00
Perceived corruption	84,809	2.39	0.69	1.00	5.00
Intolerance toward immigrants	57,904	0.45	0.31	0.00	1.00

Methodology

The Main Model

The basic estimation equation is as follows:[4]

$$Life\ Satisfaction_{ijct} = \beta_0 + \beta_1 Trust_{jct} + \boldsymbol{X}'_{\boldsymbol{ijct}}\boldsymbol{\beta}_2 + \boldsymbol{Z}'_{\boldsymbol{hjct}}\boldsymbol{\beta}_3 + C_c + Y_t + \eta_{ijct} \quad (1)$$

where $Lifesatisfaction_{ijct}$ represents the self-assessed life satisfaction level of an individual i, in community j, in country c, and at year t. $Trust_{ijct}$ denotes interpersonal or institutional trust of community j, in country c, and at year t. Furthermore, X is a vector of individual-level covariates and Z is a vector of household-level covariates, whereas C and Y denote country- and time-fixed effects, respectively, and η is the error term.

While estimating the above equation, a major concern is the endogeneity problem of trust variables. Most previous studies employing OLS suffer from endogeneity, such as reverse causality, omitted variable bias, and measurement error bias. As for reverse causality, for example, Tov and Diener (2009) asserted that when people experience pleasant emotions and have a higher SWB, they tend to view others and be viewed by others more positively, and they become more active in social activities, which fosters cooperation and trust. Consequently, we may not have investigated the true causal effect of trust on life satisfaction. Moreover, if there is a third unobservable variable that affects both the independent and dependent variables, a link appears between the two variables, resulting in estimation bias. As both trust and life satisfaction are subjective conceptions, measurement errors may occur. Kuroki (2011, p. 445) claimed that geographically limited places, such as ethnically mixed areas, may generate noise in the responses of particular minority populations. In other words, there may be some issues in linking minority group trust answers with community-level trust. Overall, without mitigating the problems above, endogeneity may lead to the underestimation or overestimation of the effect of trust on life satisfaction.

IVs Approach

To tackle the endogeneity problem and estimate the causal association between trust and life satisfaction, we employed the IVs approach. Specifically, we apply two-stage least squares (2SLS) or generalized method of moments (GMM) with multiple explanatory and IVs. Therefore, in the first stage, we estimate the following equation using the instruments:

[4] Although life satisfaction is measured on an ordered five-point scale, Ferrer-i-Carbonell and Frijters (2004) determined that the assumption of cardinality or ordinality of responses to SWB questions is relatively unimportant to the results. Hence, treating SWB as a continuous variable and using the linear estimation method is widely employed in the literature on happiness studies (Bauer et al., 2017; Djankov et al., 2016; Growiec and Growiec, 2014; Lu et al., 2020). This study confirmed that the result is similar even when using the ordered probit and IV probit techniques and also linear regression using the 10-scale life satisfaction variable in the Robustness analysis.

$$Trust_{jct} = \pi_0 + \pi_1 Instrument_{jct} + \boldsymbol{X}'_{\boldsymbol{ijct}}\boldsymbol{\pi}_2 + \boldsymbol{Z}'_{\boldsymbol{hjct}}\boldsymbol{\pi}_3 + C_c + Y_y + v_{ijct} \quad (2)$$

where $Instrument_{jct}$ represents the IV in community j, country c, and year t and v is the error term. All the other variables are the same as those in Eq. (1).

To address the endogeneity problem, the IV analysis requires both "relevant" and "exogenous" IVs. To be "relevant," the IV must be correlated with the endogenous variable, and to be "exogenous," the IV must have no direct effect on the outcome. In this sense, our IV must have a strong association with community-level trust but not with life satisfaction.

Hence, our IVs are political and economic opinion polarization within a community and religious fractionalization within a community, which are related to whether that community is homogeneous or heterogeneous. Nominal social categories, such as religion or ethnicity, divide people into subgroups and engender heterogeneity (Blau, 1974). This division is necessary because, for instance, religion provides people with values and norms, which shapes big differences between people related to their identity and generates situations where there are more people "unlike you" (Lancee & Dronkers, 2011 p. 600; Putnam, 2007 p. 143; Okulicz-Kozaryn, 2011). Thus, the fact that people have different religions or political and economic opinions can be considered as creating heterogeneity and diversity in the community.

A higher degree of diversity in an area can change trust levels. The relationship between them is underpinned by two theories and one important mechanism is the reduction of social cohesion and solidarity (Beugelsdijk & Klasing, 2016). According to contact theory, diversity erodes in-group/out-group distinction and enhances solidarity between groups, enabling people to overcome the initial barriers of ignorance and hesitation and eventually trust one another more (Lancee & Dronkers, 2011; Putnam, 2007). Long-term, increasingly diverse societies can foster greater levels of trust by contacting between groups (Ramos et al., 2019). This theory suggests that religious diversity facilitates interreligious interactions and solidarity that provide opportunities to learn from each other and strengthen their communities and sense of trust (Lu & Yang, 2020; Putnam, 2007). On the other hand, conflict theory suggests that diversity fosters in-group/out-group distinctions and strengthens in-group solidarity, thereby increasing distrust (Putnam, 2007). For instance, opinion diversity can make it difficult for people to share a sense of common values and norms with others and thus brings intolerance and social distance between individuals, which may lead to less social cohesion and thus a decline in levels of trust (Lu & Yang, 2020; Rapp, 2016).

It can be anticipated that opinion polarization negatively affects life satisfaction according to conflict theory, while religious fractionalization has either a positive or negative impact on life satisfaction according to contact and conflict theory. Beugelsdijk and Klasing (2016) found that societies characterized by high levels of political opinion polarization have lower levels of trust. Rapp (2016) also concluded that moral opinion polarization (e.g., issues on abortion, homosexuality, and euthanasia) negatively influences trust; thus, in a society where these issues are controversial, the levels of trust are likely to be lower. Some research has revealed that religious diversity decreases trust in neighborhoods (Bennett et al., 2021; Lancee &

Dronkers, 2011). However, Lu and Yang (2020) discovered evidence that supports contact theory, specifically that high religious fractionalization—a circumstance that happens in societies where many small religious groups coexist—fosters inter-religious dialogue, mutual toleration, and social cohesion, which thus may increase trust levels.

However, for the exclusion restriction condition, these IVs can be considered to have no direct impact on life satisfaction. Although few studies have investigated the link between diversity and SWB, Okulicz-Kozaryn (2011) revealed that people are unhappy in religiously diverse societies as well as Lu and Yang (2020) concluded that religious fractionalization positively impacts health. However, both studies assume that the mechanism is through the effects of social capital. For example, in heterogeneous communities, the levels of bridging social ties or civic engagement become lower, and people tend to leave civic society and lose social capital, which can result in lower levels of SWB (Lu & Yang, 2020; Okulicz-Kozaryn, 2011). Notably, heterogeneity and diversity can indirectly affect life satisfaction through the pathway of changing the levels of social capital. This channel does not deny our "exogenous" conditions. Regarding other diversity variables, such as ethnicity, Li et al. (2021) found that ethnic diversity does not have a long-term effect on life satisfaction. Furthermore, religious diversity has been employed as an IV in previous studies investigating the link between trust and SWB (D'Hombres et al., 2010; Habibov & Cheung, 2017; Kim et al., 2011).

For the index of fractionalization and polarization measurements, the index of fractionalization was used, which was originally presented by Taylor and Hudson (1972), and the polarization was originally proposed by Reynal-Querol (2002).

$$\textit{The fractionalization index} = 1 - \sum_{n=1}^{N} x_{njct}^2$$

$$\textit{The polarization index} = 1 - \sum_{n=1}^{N} \left(\frac{1/2 - x_{njct}}{1/2} \right)^2 x_{njct}$$

where x is the proportion of people who belong to group n ($n = 1, \ldots, N$) in community j, country c, and year t. In other words, fractionalization denotes the probability of two randomly selected individuals belonging to different groups. It shows the degree to which a community is composed of different small groups; hence, it equals 1 if each member belongs to a different group, and 0 if everyone belongs to the same group (Lu & Yang, 2020). In turn, polarization indicates the degree to which a community is divided through a few similarly strong subgroups (Lu & Yang, 2020). It becomes maximum when two equally sized groups face each other (Montalvo & Reynal-Querol, 2005). Following previous studies, employing it as an index of religious fractionalization is appropriate for capturing how groups are fragmented, and an index of opinion polarization is suitable to understand how groups are divided into two groups (Okulicz-Kozaryn, 2011; Rapp, 2016).

Each variable is created as follows. First, regarding political and economic opinions, respondents were asked, "With which one of the following statements do you agree the most?" As for politics, they answered using three views: (1) democracy is preferable to any other form of political system; (2) under some circumstances, an

authoritarian government may be preferable to a democratic one; and (3) for people like me, it does not matter whether a government is democratic or authoritarian. Similarly, in terms of economics, they answered using three views: (1) a market economy is preferable to any other form of economic system; (2) under some circumstances, a planned economy may be preferable to a market economy; and (3) for people like me, it does not matter whether the economic system is organized as a market or as a planned economy. By multiplying the answers to the two questions, political and economic opinions were grouped into nine categories. Regarding the question on religion, respondents chose their religion from six categories, namely theistic/agnostic/none, Buddhist, Jewish, Christian, Muslim, and Other. Finally, the index of polarization and fractionalization was calculated using the formula for the indices for each community.

Overall, three empirical tests were performed to demonstrate whether our IVs were valid and appropriate for the IVs approach. First, we checked whether the explanatory variables (community-level trust) were endogenous and required the IVs method. It has been suggested that when an explanatory variable is exogenous, the IV estimator is less efficient than OLS (Wooldridge, 2012, p. 534). A test for endogeneity in our model found that community-level trust is indeed endogenous; hence, we should employ the IVs approach. Second, to verify the "relevant" condition that an IV is associated with community-level trust, we estimated the first-stage F score. According to all our estimations, the first-stage F-score is larger than 10, highlighting that our IVs are not weak predictors of community-level trust. When we use two IVs for one endogenous variable, namely, in the case of over-identification, we must investigate the null hypothesis that both IV estimators are approximately equal. If so, both IVs are considered valid for IV estimations. The null hypothesis was not rejected based on the results of the over-identification test in Models 4 and 5 in Table 2 and Models 1 and 2 in Table 3, which employ two IVs for one endogenous. Accordingly, we can conclude that using two IVs simultaneously does not introduce bias into our estimation.

Results

Community-Level Interpersonal Trust and Life Satisfaction

Table 2 shows the results of the estimations of community-level interpersonal trust in life satisfaction of 28 transition countries using the OLS, IV, and GMM methods. Model 1 is the basic OLS with fixed effects for country and time, and Model 2 adds individual and household characteristics to Model 1. Additionally, Models 3–5 present the results of the IV approach to consider the endogeneity problem. Model 3 uses political and economic opinion polarization within a community as an IV, and Models 4 and 5 incorporate a second instrument variable, religious fractionalization within a community. Robust standard errors are indicated in parentheses, and the findings of the first-stage regression are presented in Table 6 in the Appendix.

Overall, a trend was observed wherein community-level trust increased life satisfaction in all models, as suggested by Hypothesis 1. In the OLS model, positive

Table 2 Estimated results of the effect of community-level trust on Life satisfaction

VARIABLES	(1) Model 1 OLS	(2) Model 2 OLS	(3) Model 3 2SLS	(4) Model 4 2SLS	(5) Model 5 GMM
Community-level interpersonal trust	0.437***	0.278***	2.982***	2.675***	2.659***
	(0.016)	(0.015)	(0.813)	(0.732)	(0.731)
Female		0.033***	0.016	0.018*	0.018*
		(0.007)	(0.010)	(0.010)	(0.010)
Age 25–34		-0.145***	-0.127***	-0.129***	-0.129***
		(0.015)	(0.019)	(0.018)	(0.018)
Age 35–44		-0.216***	-0.230***	-0.228***	-0.228***
		(0.015)	(0.019)	(0.018)	(0.018)
Age 45–54		-0.217***	-0.250***	-0.246***	-0.246***
		(0.016)	(0.021)	(0.020)	(0.020)
Age 55–64		-0.155***	-0.181***	-0.178***	-0.178***
		(0.016)	(0.020)	(0.020)	(0.020)
Age 65 +		-0.001	-0.041*	-0.037*	-0.036*
		(0.017)	(0.023)	(0.022)	(0.022)
Married		0.131***	0.129***	0.129***	0.129***
		(0.008)	(0.010)	(0.009)	(0.009)
Unemployed		-0.032***	-0.028***	-0.029***	-0.029***
		(0.008)	(0.010)	(0.009)	(0.009)
University educated		0.101***	0.054***	0.059***	0.059***
		(0.009)	(0.018)	(0.017)	(0.017)
Good health		0.229***	0.180***	0.186***	0.186***
		(0.008)	(0.017)	(0.016)	(0.016)
Household size		-0.007***	-0.006*	-0.006**	-0.006**
		(0.003)	(0.003)	(0.003)	(0.003)
Rural		0.039***	0.044***	0.044***	0.043***
		(0.007)	(0.009)	(0.008)	(0.008)
Digital devices		0.130***	0.159***	0.156***	0.156***
		(0.007)	(0.012)	(0.011)	(0.011)
Dwelling		0.096***	0.081***	0.083***	0.083***
		(0.011)	(0.014)	(0.013)	(0.014)
Economic status		0.192***	0.162***	0.165***	0.166***
		(0.002)	(0.009)	(0.008)	(0.008)
Constant	2.862***	1.725***	1.703***	1.806***	1.812***
	(0.022)	(0.031)	(0.275)	(0.248)	(0.248)
Observations	83,728	82,454	82,454	82,454	82,454
Country fixed effects	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES
Robust First stage F score			28.27	17.22	17.22
Endogeneity test (p-value)			0.000	0.000	0.000
Over-identifying test (p-value)				0.221	0.221

Table 2 (continued)

Robust standard errors in parentheses, *** $p<0.01$, ** $p<0.05$, * $p<0.1$

(1) Models 3 to 5 demonstrate the results by using the IV approach. Model 3 used community-level political-economic opinion polarization as an instrumental variable. Models 4 and 5 used community-level political-economic opinion polarization and religious fractionalization as instrumental variables. (2) Endogeneity test represents Robust score chi2(1) in Models 3 and 4, and GMM C statistic chi2(2) in Model 5. The over-identifying test represents Sargan (score) chi2(1)

effects hold even when no explanatory variables other than fixed effects are included (1) and when individual-level explanatory variables are included (2). The results of the estimation with IVs also maintain a positive effect of a close level of magnitude in the 2SLS with different pairs of IVs (3 and 4) and in the estimation with GMMs (5).

Comparing the results of the OLS and IVs methods, the OLS method considerably underestimates the effect of community-level interpersonal trust on life satisfaction compared to the IVs method. This underestimation problem has been recognized in previous studies that employed OLS and IVs methods to examine the effects of interpersonal trust (Habibov et al. 2017, 2019a; Kim et al., 2011). This problem is caused by a failure to address endogeneity (Habibov et al., 2019a), and overcoming it can help predict the true influence of trust on SWB.

The model also shows that a number of control variables are statistically significant. Being married, receiving a university educated, having good health, living rural area, having digital devices and dwelling, and expressing a higher level of economic status are positively related to life satisfaction. Whereas, being older, being unemployed, and having a large household size are negatively associated with life satisfaction. These findings are consistent with prior studies, for example, physical and psychological health are positively associated with SWB (Dolan et al., 2008) and geographical location living in rural areas is a significant determinant of SWB (Hudson, 2006). Similarly, economic conditions are known to be a strong positive impact on SWB especially in transition economies (Easterlin, 2009; Guriev & Melnikov, 2018) and it is also well-established that unemployment leads to decreased SWB levels (Clark, 2003). Our results indicate that relative to the reference category of age group 18–24, the negative impact of age on SWB reaches the age group 45–54 and disappears beyond 65 years suggesting that the relationship between age and life satisfaction is U shaped with SWB levels being greater in the younger and older and lower in middle age (Dolan et al., 2008; Helliwell & Putnam, 2004). Although the use of digital devices has some negative consequences like addiction, depression, and isolation, it also has some positive effects, such as making it easier to contact distant friends and family members, obtain useful information about daily life and business, and receive high-quality health and educational services, which may increase SWB (Amichai-Hamburger & Furnham, 2007; Castellacci & Tveito, 2018). The other positive results of married status, higher education, and home ownership and the negative effect of bigger household size on SWB are also similar to earlier studies (e.g., Anakpo & Kollamparambil, 2021; Habibov & Afandi, 2015; Han, 2015, Kuroki, 2011).

Table 3 Robustness results with the modifications

VARIABLES	(1) Model 1 2SLS	(2) Model 2 2SLS	(3) Model 3 2SLS	(4) Model 4 2SLS	(5) Model 5 2SLS	(6) Model 6 2SLS	(7) Model 7 2SLS	(8) Model 8 2SLS	(9) Model 9 Ordered Probit	(10) Model 10 IV Probit
Community-level interpersonal trust	3.156*** (0.812)	2.325*** (0.571)			5.196*** (1.593)	5.884*** (1.580)	3.763*** (0.129)	2.360*** (0.587)	0.306*** (0.017)	3.358*** (0.992)
Community-level interpersonal trust (Modify the creation of trust variable)			2.101*** (0.710)							
The lost wallet will be returned (An alternative definition of trust)				2.870*** (0.687)						
Expenditure tertiles		0.083*** (0.006)								
Observations	77,897	64,819	82,454	56,351	22,966	79,295	82,387	56,310	82,454	83,532
Country fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	NO	YES	YES	YES	YES	YES
Number of rounds	3	3	3	2	1	3	3	2	3	3
Change dependent variable	NO	NO	NO	NO	YES	YES	NO	NO	NO	NO
Change instrumental variable	NO	NO	NO	NO	NO	NO	YES	YES	NO	NO
Robust First stage F score	16.01	26.02	13.79	37.48	23.36	17.78	1816.96	56.01		
Endogeneity test (p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
Over-identifying test (p-value)	0.369	0.439								

Table 3 (continued)

Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

(1) Model 1 demonstrates the result while restricting the sample size to each community consisting of 10 or more households. (2) Model 2 shows the result controlling for household expenditures tertiles. We created tertiles of household expenditures from the poorest tertile to the wealthiest tertile by dividing total household expenditure in local currency by the square root of the household size and dividing it into three equal portions for each country. (3) The creation and definition of the key independent variables of Models 3 and 4 were changed. We used community-level interpersonal trust ranging from 1 to 5 using the trust variable of five response categories instead of dichotomous in Model 3. In Model 4, we used the LITS question in rounds 2 and 3, which asked respondents, "Suppose you lost your (purse/wallet) containing your address details, and it was found in the street by someone living in this neighborhood. How likely is it that it would be returned to you with nothing missing?". They answered on a four-point scale ranging from 1 (not likely at all) to 4 (very likely), thus "very likely" and "Quite likely" summed and averaged to create an alternative variable indicating a high level of interpersonal trust at the community level. (4) In Model 5, we used the 10-scale life satisfaction variable. Only in the LITS of 2010, respondents were asked a similar life satisfaction question again at the end of the questionnaire in the same interview through the statement, "All things considered, how satisfied or dissatisfied are you with your life as a whole these days? Please answer on a scale from 1 to 10, where 1 means completely dissatisfied and 10 means completely satisfied." (5) Model 6 employed better lives as a dependent variable. We employed the LITS question: "My household lives better nowadays than around 4 years ago". Respondents used a five-point scale ranging from 1 (strongly disagree) to 5 (strongly agree). This variable can be regarded as an indicator of the quality of life, with a similar meaning to life satisfaction. (6) In Models 7 and 8, perceived corruption and intolerance toward immigrants were used as instrumental variables respectively. The corruption variable is the community average of respondents displaying strongly agree or agree out of five options with the question "There is less corruption now than around 4 years ago" in a given community. In model 7, we used the community average of respondents displaying that "immigrants are a burden for the national social protection system" in the LITS question in rounds 2 and 3. (7) Models 9 and 10 demonstrate the results with ordered probit and IV probit estimation techniques. (8) Models 1, 2, and 10 used community-level political-economic opinion polarization and religious fractionalization as instrumental variables. Models 3 to 6 used community-level political-economic opinion polarization as an instrumental variable. (9) Models 4 and 8 used data from the 2010 and 2016 rounds, and Model 5 used only data from the 2010 rounds. (10) Models 3 and 10 represent standard errors and the First stage F score instead of robust standard errors and robust First stage F score and Durbin (score) chi2(1) in the Endogeneity test. (11) Endogeneity test represents Robust score chi2(1) and the Over-identifying test represents Sargan (score) chi2(1). (12) Those contain the same explanatory variables as Table 2, but their coefficients are omitted

Robustness Analysis

We conducted robustness analyses of our main estimation in six ways: (1) limiting the sample size, (2) incorporating an additional control variable, (3) modifying the method of creating and defining the key independent variable, (4) using different scale and definition of the dependent variable, (5) incorporating new instrumental variables, and (6) employing different estimation techniques to determine whether the effect of community-level interpersonal trust on life satisfaction is sensitive. Table 3 displays the results of all regressions with modifications. Those contain the same explanatory variables as Table 2, but their coefficients are omitted. The results of listing all control variables are given in Online Resource 1. Except for Models 3 and 10, all the models provided robust standard errors and a robust first-stage F score. The results of the first-stage regression are presented in Table 7 in the Appendix. Overall, the results of the sensitivity analyses support the positive and significant effect of community-level interpersonal trust on life satisfaction in transition countries. Therefore, we conclude that the results of our analysis support Hypothesis 1.

Interpersonal versus Institutional Trust

Table 4 provides the results of the effects of interpersonal and institutional trust on life satisfaction in 28 transition countries using the IVs approach. Those contain the same explanatory variables as Table 2, but their coefficients are omitted. The results of listing all control variables are given in Online Resource 2. In Models 1 and 2, we tested the effects of the two types of trust separately, and in Models 3 and 4, we estimated a model that included both types of trust simultaneously using two estimation methods. Robust standard errors are in parentheses, and the outcomes of the first-stage regression are presented in Table 8 in the Appendix.

The estimation results confirm that both interpersonal and institutional trust seems to increase life satisfaction, but a comparison of their magnitudes confirms a non-negligible difference. Therefore, Models 1 and 2 confirm that both interpersonal and institutional trust is positive and significant at the 1% level and that there is little difference in the magnitude of both. However, in Models 3 and 4, which include both variables simultaneously, we can confirm that the coefficients and significance of interpersonal trust remain almost the same, while the magnitude and significance of the coefficient of institutional trust drop significantly. This notion suggests that a large part of institutional trust comes from the spillover effect of individuals' trust beliefs, as explained by cultural theory, and thus the effect of confidence in institutions is minor. These results support Hypothesis 2.

Regional Heterogeneity

Table 5 examines the effects of both types of community-level trust variables on the FSU and the CEE. Those contain the same explanatory variables as Table 2, but their coefficients are omitted. The results of listing all control variables are given in Online Resource 3. For Models 1–4, the sample was divided into the FSU and the CEE, and the magnitude

Table 4 Estimated results for the effects of different types of community-level trust

VARIABLES	(1) Model 1 2SLS	(2) Model 2 2SLS	(3) Model 3 2SLS	(4) Model 4 GMM
Community-level interpersonal trust	2.982***		2.405***	2.405***
	(0.813)		(0.754)	(0.754)
Community-level institutional trust		3.039***	0.974**	0.974**
		(0.739)	(0.479)	(0.479)
Observations	82,454	80,256	80,256	80,256
Country fixed effects	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES
Robust First stage F score (interpersonal trust)	28.27		17.65	17.65
Robust First stage F score (institutional trust)		54.96	96.80	96.80
Endogeneity test (p-value)	0.000	0.002	0.002	0.002

Robust standard errors in parentheses, *** $p<0.01$, ** $p<0.05$, * $p<0.1$

(1) All models demonstrate the results by using the IV approach. Models 1 and 2 used community-level political-economic opinion polarization as an instrumental variable and Models 3 and 4 used community-level political-economic opinion polarization and religious fractionalization as instrumental variables. (2) Endogeneity test represents Robust score chi2(1) in Model 1, 2, and 3, and GMM C statistic chi2(2) in Model 4. (3) Those contain the same explanatory variables as Table 2, but their coefficients are omitted

of the confidence coefficient was estimated for each. In Models 5 and 6, to statistically test for differences in marginal effects, we tested models that included an interaction term between community-level trust variables and a regional dummy using the overall sample. All models use IVs, but for Models 5 and 6, we also consider the intersection term to be an endogenous variable and employ an estimation technique (Wooldridge, 2010, chap. 9) wherein the intersection terms between political-economic opinion polarization and the regional variable are IVs.

The results support Hypothesis 3, particularly the finding that both types of community-level trust variables have larger positive effects on life satisfaction in the FSU than in the CEE. While this result is confirmed by the difference in the magnitude of the coefficients in the estimations for the separate samples from Models 1 to 4, clearer evidence is found in Models 5 and 6, where the interaction terms of the community-level trust variable and the FSU are positive and significant and considerably larger than interaction terms for CEE. As noted above, it is known that the level of community-level trust is higher in the FSU than in the CEE, and the present analysis suggests that this type of trust has a greater role in increasing life satisfaction in FSU.

Discussions and Conclusions

In this study, we empirically investigated how the relationship between trust and life satisfaction differs by levels and types of trust as well as across regions in the context of transition countries. In addition, to fill some knowledge gaps identified in the

Table 5 Estimated results for the effects of community level-trust in the FSU and the CEE

VARIABLES	(1) Model 1 FSU 2SLS	(2) Model2 CEE 2SLS	(3) Model3 FSU 2SLS	(4) Model 4 CEE 2SLS	(5) Model 5 All GMM	(6) Model 6 All GMM
Community Interpersonal trust	3.869**	2.644***				
	(1.691)	(0.940)				
Community Interpersonal trust × CEE					2.020**	
					(1.009)	
Community Interpersonal trust × FSU					4.247**	
					(2.082)	
Community Institutional trust			3.863**	2.785***		
			(1.570)	(0.916)		
Community Institutional trust × CEE						2.357***
						(0.879)
Community Institutional trust × FSU						4.021**
						(1.623)
Observations	35,303	47,151	33,212	47,044	82,454	80,256
Country fixed effects	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES
First stage F score (trust)	10.82	30.98	20.28	60.27		
Robust First stage F score (trust×CEE)					11.21	22.97
Robust First stage F score (trust × FSU)					53.54	38.32
Endogeneity test (p-value)	0.005	0.004	0.042	0.036	0.000	0.009

Standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

(1) FSU represents the former Soviet Union countries and CEE represents Central and Eastern European countries. (2) All models demonstrate the results by using the IV approach. Models 1, 2, 3, and 4 used community-level political-economic opinion polarization as an instrumental variable. Models 5 and 6 used community-level political-economic opinion polarization × FSU dummy as instrumental variables. (3) Endogeneity test represents Durbin (score) chi2(1) in Model 1, 2, 3, and 4, and GMM C statistic chi2(2) in Models 5 and 6. (4) Models 5 and 6 represent robust standard errors instead of standard errors. (5) Those contain the same explanatory variables as Table 2, but their coefficients are omitted

existing literature (Aliyev et al., 2022; Bartolini et al., 2017), we contributed to further clarifying ambiguous relationships among interpersonal trust, institutional trust, and life satisfaction by using a large sample of transition countries and mitigating the endogeneity problem.

Our research has three implications. Firstly, we found that community-level interpersonal and institutional trust positively affects life satisfaction in transition countries. In particular, economic conditions have been considered to have a strong impact on SWB in these countries that have undergone the rapid economic transition from plan to market (Delhey, 2010; Easterlin, 2009; Guriev & Melnikov, 2018). However, as previous studies indicated that social situations such as trust relations are also important in increasing SWB in transition countries (Aliyev et al., 2022; Bartolini et al., 2017; Helliwell et al., 2014), our results are in accordance with this view. Notably, this study newly suggests that living in a trusting community

is particularly beneficial for residents' life satisfaction in transition countries. This finding denotes that a sense of trust can have implications not only for people who have strong trust but also for other members of the same community. Namely, high community-level trust is thought to generate a socio-ecological environment that goes beyond individuals, which can function as a public resource and bring positive effects on psychological tendencies, such as life satisfaction and happiness (Fukushima et al., 2021). This study provides the meaning to consider the role of meso-level trust in terms of its psychological effects while most research focuses on micro or macro-level trust.

Secondly, our findings show that interpersonal trust is more important than institutional trust for life satisfaction in transitional countries. This view is consistent with previous literature, which concluded that the role of interpersonal trust is more critical than institutional trust in a country characterized by low-quality formal institutions (Habibov et al., 2019b; Jovanović, 2016). Additionally, this supports the idea that different forms of social capital may have heterogenous impacts on SWB (Gómez-Balcácer et al., 2023; Leung et al., 2011; Rodríguez-Pose & von Berlepsch, 2014), and the same applies to the concept of trust (Glatz & Eder, 2020; Habibov et al., 2019b; Jovanović, 2016). Remarkably, our results imply that a large part of the effect of institutional trust can be the spillover effect of trust beliefs such as trusting people instead of the effect of confidence in institutions. When either interpersonal trust or institutional trust are separately controlled, they each have a positive, significant, and approximately similar impact on life satisfaction. However, when controlling for both types of trust simultaneously, we found that interpersonal trust has a considerable impact on life satisfaction but institutional trust has a lower impact. This suggests that the effect of confidence in institutions is minor and thus individuals' trust beliefs which can shape both interpersonal and institutional trust, as explained by cultural theory, might be important for life satisfaction.

Finally, this study indicates that the effects of trust on life satisfaction are greater in the FSU than in the CEE. One of the differences between the two regions is that the CEE outperforms the FSU in terms of the success and progress of political and economic transitions (Abbott et al., 2011; Arslan, 2023; EBRD, 2022; Repucci & Slipowitz, 2022). Hence, in the FSU, the benefits from trust can be considered to compensate for the lack of state systems that should originally provide public goods and services, resulting in an improvement in life quality (Habibov et al., 2019b; Jovanović, 2016). Namely, trust functions as another channel to address daily issues. Another difference between the two regions is the accumulation of trust. Having an abundance of available social capital might be important for the enhancement of life satisfaction because "individuals can only benefit from social capital if they are able to access it" (Poortinga, 2006, p. 300). Namely, CEE countries are in a "low trust trap" that the low stocks of social capital lead to relatively low levels of SWB (Growiec & Growiec, 2014, p. 1038–1039), whereas FSU historically accumulates trust more than CEE (EBRD, 2006, 2010, 2016), which can bring greater effects on life satisfaction. Our results that both effects of interpersonal trust and institutional trust are greater in the FSU than in the CEE further shed light on the ambiguous relationship between trust and life satisfaction which can vary by regional characteristics (Kudebayeva et al., 2022; Rodríguez-Pose & von Berlepsch, 2014).

Clearly, it contains several limitations, and we note three of them. First, while the results suggest the role of community-level interpersonal and institutional trust in improving life satisfaction, the mechanisms behind these relations have not been elucidated in our analysis. Although it can be considered in economic, political, social, and psychological dimensions mechanisms, our framework did not allow us to explore which aspects can be reasonable. Second, addressing endogeneity remains a future challenge for further investigation. While we conducted tests to validate the use of IVs, ongoing research is needed to fully understand and mitigate the potential biases associated with endogeneity. Third, a future challenge lies in the appropriateness of our community-level trust variables. Our variable was constructed based on PSU districts and may not accurately capture the true size of communities. Based on the above limitations, future research is required to understand the nature of the relationship between community-level trust and life satisfaction.

Appendix A

Table 6 First stage of 2SLS regressions for main results (Table 2)

VARIABLES	(1) Model 3	(2) Model 4	(3) Model 5
Opinion polarization	-0.035***	-0.035***	-0.035***
	(0.007)	(0.007)	(0.007)
Religious fractionalization		0.012**	0.012**
		(0.005)	(0.005)
Female	0.006***	0.006***	0.006***
	(0.002)	(0.002)	(0.002)
Age 25–34	-0.006*	-0.006*	-0.006*
	(0.003)	(0.003)	(0.003)
Age 35–44	0.005	0.005	0.005
	(0.004)	(0.004)	(0.004)
Age 45–54	0.012***	0.012***	0.012***
	(0.004)	(0.004)	(0.004)
Age 55–64	0.010***	0.010***	0.010***
	(0.004)	(0.004)	(0.004)
Age 65 +	0.015***	0.015***	0.015***
	(0.004)	(0.004)	(0.004)
Married	0.001	0.001	0.001
	(0.002)	(0.002)	(0.002)
Unemployed	-0.001	-0.001	-0.001
	(0.002)	(0.002)	(0.002)
University educated	0.018***	0.018***	0.018***
	(0.002)	(0.002)	(0.002)

Table 6 (continued)

VARIABLES	(1) Model 3	(2) Model 4	(3) Model 5
Good health	0.018***	0.018***	0.018***
	(0.002)	(0.002)	(0.002)
Household size	-0.001	-0.000	-0.000
	(0.001)	(0.001)	(0.001)
Rural	-0.002	-0.001	-0.001
	(0.002)	(0.002)	(0.002)
Digital devices	-0.011***	-0.011***	-0.011***
	(0.001)	(0.001)	(0.001)
Dwelling	0.006**	0.006**	0.006**
	(0.002)	(0.002)	(0.002)
Economic status	0.011***	0.011***	0.011***
	(0.000)	(0.000)	(0.000)
Constant	0.237***	0.234***	0.234***
	(0.008)	(0.008)	(0.008)
Observations	82,454	82,454	82,454
R-squared	0.135	0.135	0.135
Country fixed effects	YES	YES	YES
Year fixed effects	YES	YES	YES
F-statistics	351.6	345.5	345.5

Robust standard errors in parentheses *** $p<0.01$, ** $p<0.05$, * $p<0.1$

(1) The dependent variable is community-level interpersonal trust in all Models

Table 7 First stage of 2SLS regressions for robustness analysis (Table 3)

VARIABLES	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4	(5) Model 5	(6) Model 6	(7) Model 7	(8) Model 8
Opinion polarization	-0.038***	-0.051***	-0.050***	-0.050***	-0.059***	-0.028***		
	(0.007)	(0.008)	(0.013)	(0.008)	(0.012)	(0.007)		
Religious fractionalization	0.007	0.014***						
	(0.005)	(0.006)						
Perceived corruption							0.060***	
							(0.001)	
Intolerance toward immigrants								-0.032***
								(0.004)
Female	0.006***	0.005***	0.013***	-0.004*	0.003	0.006***	0.005***	0.006***
	(0.002)	(0.002)	(0.004)	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)
Age 25–34	-0.006*	-0.004	-0.016*	-0.006	0.006	-0.005	-0.006	-0.004
	(0.004)	(0.004)	(0.009)	(0.004)	(0.006)	(0.004)	(0.003)	(0.004)
Age 35–44	0.006*	0.004	0.009	0.002	0.009	0.007*	0.007*	0.013***
	(0.004)	(0.004)	(0.009)	(0.004)	(0.006)	(0.004)	(0.003)	(0.004)
Age 45–54	0.013***	0.010**	0.017*	0.012***	0.022***	0.014***	0.014***	0.018***
	(0.004)	(0.004)	(0.009)	(0.004)	(0.006)	(0.004)	(0.003)	(0.004)
Age 55–64	0.010***	0.010**	0.011	0.007	0.021***	0.012***	0.012***	0.016***
	(0.004)	(0.004)	(0.009)	(0.004)	(0.006)	(0.004)	(0.004)	(0.004)
Age 65 +	0.015***	0.013***	0.019**	0.007	0.027***	0.018***	0.019***	0.023***
	(0.004)	(0.004)	(0.010)	(0.005)	(0.007)	(0.004)	(0.004)	(0.004)
Married	0.001	0.002	0.003	0.005**	-0.004	0.000	-0.000	-0.003
	(0.002)	(0.002)	(0.005)	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)

Table 7 (continued)

VARIABLES	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4	(5) Model 5	(6) Model 6	(7) Model 7	(8) Model 8
Unemployed	-0.002	-0.002	-0.000	0.004*	-0.004	-0.001	-0.002	-0.002
	(0.002)	(0.002)	(0.005)	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)
University educated	0.017***	0.016***	0.035***	-0.008***	0.012***	0.018***	0.019***	0.020***
	(0.002)	(0.002)	(0.005)	(0.003)	(0.004)	(0.002)	(0.002)	(0.003)
Good health	0.017***	0.017***	0.050***	0.007***	0.013***	0.018***	0.017***	0.019***
	(0.002)	(0.002)	(0.005)	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)
Household size	-0.001	-0.001*	-0.005***	0.005***	0.002	-0.000	-0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Rural	-0.001	-0.004**	0.015***	0.073***	-0.016***	-0.003*	-0.005***	-0.004**
	(0.002)	(0.002)	(0.004)	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)
Digital devices	-0.012***	-0.010***	-0.028***	-0.005**	-0.010***	-0.011***	-0.009***	-0.012***
	(0.001)	(0.002)	(0.004)	(0.002)	(0.003)	(0.001)	(0.001)	(0.002)
Dwelling	0.004*	0.007***	0.028***	0.037***	0.009*	0.006**	0.004	0.005*
	(0.002)	(0.003)	(0.006)	(0.003)	(0.005)	(0.002)	(0.002)	(0.003)
Economic status	0.011***	0.010***	0.035***	0.004***	0.014***	0.011***	0.009***	0.012***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)
Expenditure tertiles		-0.001						
		(0.001)						
Constant	0.208***	0.327***	2.523***	0.387***	0.321***	0.409***	0.087***	0.208***
	(0.008)	(0.010)	(0.020)	(0.011)	(0.016)	(0.009)	(0.007)	(0.008)
Observations	77,897	64,819	82,454	56,351	22,966	79,295	82,387	56,310
R-squared	0.138	0.123	0.169	0.240	0.226	0.138	0.156	0.171

Table 7 (continued)

VARIABLES	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4	(5) Model 5	(6) Model 6	(7) Model 7	(8) Model 8
Country fixed effects	YES	YES	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	NO	YES	YES	YES
F-statistics	340.2	237.2	372.2	447.5	269.7	353.6	400.2	428.8

Robust standard errors in parentheses *** $p<0.01$, ** $p<0.05$, * $p<0.1$

(1) The dependent variable is community-level interpersonal trust in Models 1, 2, 5, 6, 7, and 8. The dependent variable is community-level interpersonal trust ranging from 1 to 5 in Model 3 and is trust variable related to the lost wallet will be returned in Model 4. (3) Standard errors in parentheses in Model 3)

Table 8 First stage of 2SLS regressions for trust types (Table 4)

VARIABLES	(1) Model 1	(2) Model 2	(3) Model 3–1	(4) Model 3–2	(5) Model 4–1	(6) Model 4–2
Opinion polarization	-0.035***	-0.033***	-0.029***	-0.033***	-0.029***	-0.033***
	(0.007)	(0.004)	(0.007)	(0.004)	(0.007)	(0.004)
Religious fractionalization			0.020***	-0.042***	0.020***	-0.042***
			(0.005)	(0.003)	(0.005)	(0.003)
Female	0.006***	0.002**	0.006***	0.002**	0.006***	0.002**
	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)
Age 25–34	-0.006*	-0.002	-0.005	-0.002	-0.005	-0.002
	(0.003)	(0.002)	(0.003)	(0.002)	(0.003)	(0.002)
Age 35–44	0.005	-0.000	0.005	-0.000	0.005	-0.000
	(0.004)	(0.002)	(0.004)	(0.002)	(0.004)	(0.002)
Age 45–54	0.012***	0.003	0.013***	0.003	0.013***	0.003
	(0.004)	(0.002)	(0.004)	(0.002)	(0.004)	(0.002)
Age 55–64	0.010***	0.005**	0.011***	0.005**	0.011***	0.005**
	(0.004)	(0.002)	(0.004)	(0.002)	(0.004)	(0.002)
Age 65 +	0.015***	0.011***	0.017***	0.011***	0.017***	0.011***
	(0.004)	(0.003)	(0.004)	(0.003)	(0.004)	(0.003)
Married	0.001	0.001	0.000	0.001	0.000	0.001
	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)
Unemployed	-0.001	-0.002	-0.001	-0.002	-0.001	-0.002
	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)
University educated	0.018***	0.006***	0.018***	0.006***	0.018***	0.006***
	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)

Table 8 (continued)

VARIABLES	(1) Model 1	(2) Model 2	(3) Model 3–1	(4) Model 3–2	(5) Model 4–1	(6) Model 4–2
Good health	0.018***	0.011***	0.017***	0.011***	0.017***	0.011***
	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)
Household size	-0.001	0.004***	0.000	0.004***	0.000	0.004***
	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)
Rural	-0.002	0.025***	-0.003**	0.023***	-0.003**	0.023***
	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)
Digital devices	-0.011***	-0.011***	-0.011***	-0.010***	-0.011***	-0.010***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Dwelling	0.006**	0.000	0.007***	-0.001	0.007***	-0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Economic status	0.011***	0.007***	0.011***	0.007***	0.011***	0.007***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	0.237***	0.327***	0.268***	0.337***	0.268***	0.337***
	(0.008)	(0.006)	(0.009)	(0.006)	(0.009)	(0.006)
Observations	82,454	80,256	80,256	80,256	80,256	80,256
R-squared	0.135	0.380	0.132	0.381	0.132	0.381
Country fixed effects	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES
F-statistics	351.6	903.4	331.9	897.2	331.9	897.2

Robust standard errors in parentheses *** $p<0.01$, ** $p<0.05$, * $p<0.1$

(1) The dependent variable is community-level interpersonal trust in Models 1, 3–1, and 4–1, and is community-level institutional trust in Models 2, 3–2, and 4–2

Table 9 First stage of 2SLS regressions for regional results (Table 5)

VARIABLES	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4	(5) Model 5–1 FSU	(6) Model 5–2 CEE	(7) Model 6–1 FSU	(8) Model 6–2 CEE
Opinion polarization	-0.026***	-0.039***	-0.024***	-0.037***				
	(0.008)	(0.007)	(0.005)	(0.005)				
Opinion polarization (FSU = 1)					-0.024** (0.009)	-0.001** (0.001)	-0.024*** (0.007)	0.001** (0.000)
Opinion polarization (FSU = 0)					-0.007*** (0.001)	-0.038*** (0.009)	-0.004*** (0.001)	-0.038*** (0.006)
Female	0.004	0.008***	0.004**	0.002	0.002	0.005***	0.001*	0.001
	(0.003)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Age 25–34	-0.004	-0.005	-0.008**	0.005	-0.004*	-0.002	-0.004**	0.002
	(0.005)	(0.005)	(0.004)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)
Age 35–44	0.011**	-0.001	-0.005	0.003	0.003	0.001	-0.001	0.001
	(0.005)	(0.005)	(0.004)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)
Age 45–54	0.023***	0.003	-0.000	0.006*	0.009***	0.003	0.001	0.002
	(0.005)	(0.005)	(0.004)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)
Age 55–64	0.012**	0.008*	0.002	0.008**	0.004*	0.005**	0.002	0.003*
	(0.006)	(0.005)	(0.004)	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)
Age 65+	0.012**	0.018***	-0.003	0.021***	0.004	0.011***	-0.000	0.012***
	(0.006)	(0.005)	(0.004)	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)
Married	-0.002	0.004	0.002	0.003*	-0.002	0.002*	-0.001	0.002**
	(0.003)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
Unemployed	0.005*	-0.003	0.004**	-0.004***	0.002	-0.003**	0.001	-0.003***
	(0.003)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
University educated	0.019***	0.010***	0.003	0.002	0.011***	0.007***	0.003***	0.003***
	(0.003)	(0.003)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)

Table 9 (continued)

VARIABLES	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4	(5) Model 5–1 FSU	(6) Model 5–2 CEE	(7) Model 6–1 FSU	(8) Model 6–2 CEE
Good health	0.013***	0.020***	0.014***	0.007***	0.006***	0.012***	0.007***	0.004***
	(0.003)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
Household size	-0.001	-0.000	0.005***	0.002***	-0.000	-0.000	0.003***	0.001**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
Rural	0.006**	-0.010***	0.048***	0.008***	0.005***	-0.007***	0.020***	0.005***
	(0.003)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Digital devices	-0.017***	-0.002	-0.015***	-0.001	-0.008***	-0.003***	-0.010***	-0.001
	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Dwelling	0.005	0.007**	0.010***	-0.003	-0.001	0.006***	0.002	-0.001
	(0.005)	(0.003)	(0.003)	(0.002)	(0.001)	(0.002)	(0.001)	(0.001)
Economic status	0.010***	0.011***	0.008***	0.006***	0.004***	0.007***	0.004***	0.004***
	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	0.412***	0.187***	0.676***	0.365***	-0.016***	0.260***	-0.019***	0.270***
	(0.011)	(0.009)	(0.008)	(0.006)	(0.004)	(0.008)	(0.002)	(0.005)
Observations	35,303	47,151	33,212	47,044	82,454	82,454	80,256	80,256
R-squared	0.147	0.117	0.503	0.148	0.595	0.509	0.836	0.699
Country fixed effects	YES	YES	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES	YES	YES
F-statistics	209	188.7	1160	247.4	1875	2414	5967	6680

Standard errors in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

(1) The dependent variable is community-level interpersonal trust in Models 1 and 2, is community-level institutional trust in Models 3 and 4, is community-level interpersonal trust × FSU in Models 5–1 and 6–1, and is community-level institutional trust × CEE in Models 5–2 and 6–2

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Data Availability The study used third-party data available at https://www.ebrd.com/what-we-do/economic-research-and-data/data/lits.html.

Declarations

The research is not applicable.

Informed Consent The research is not applicable.

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