MEASURING THE RISK OF IMMIGRATION RELATED CONFLICTS

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Abstract:
There has been widespread concern among policymakers that intensive immigration can drive anti-immigrant attitudes, which may further develop into ethnic strife. In order to systematically monitor immigration-related conflict in society, the authors have constructed a theoretical composite conflict risk index for measuring immigration-related conflict risk at a subnational level. The index is called MICRI, short for immigration-related conflict risk index. The index offers new input to the quantitative conflict risk modelling by including subjective indicators, which usually are missing from risk indices, along with objective indicators. The reason behind that is the growing understanding between scholars that groups’ perceived grievances play an important role in whether a conflict arises or not. Therefore, capturing the subjective “feelings” of a group allows us to get closer to the source of conflict, and help to generate a better outcome in risk predictions. Thus, MICRI consists of 17 indicators, out of which thirteen (13) are subjective and four (4) are objective indicators. The data was sourced from the European Social Survey and national statistical database. These sources met the criteria set for data: the data includes information about all the main risk dimensions, including the subjective perceptions of persons; and the data is regularly updated, reliable, provides regional level information and is easily accessible for international use.

The article presents the methodology and data behind the indicators, evaluates the index’s internal consistency using the quantitative regional level data of 75 Estonian municipalities. In constructing the values of MICRI, we followed four consecutive steps: (1) computing the values of the indicators for each municipality; (2) normalising; (3) weighting; and (4) aggregating of the indicators. All indicator were compiled in ten different risk dimensions – identity, distrust, value difference, perceived threat, perceived inequality, dissatisfaction, poor communication, low norm obedience, availability of resources, and regional immigration level – which formed a cumulative index value. The validity of the index was controlled with data of (75) Estonian municipalities from the period 2014 – 2018. The results of initial testing show that the internal consistency of MICRI is good; c-alpha = 0.698, which indicates a good potential for the index’s performance. The future research will focus on external validation of the index and will expand its use internationally.

Keywords: Conflict risk. Immigration. Composite index. European Social Survey.
Introduction

A growing number of anti-immigration protest and attacks against immigrants took place in European countries after the 2015 refugee crisis (ENAR, 2016). Previous research has shown that a sudden influx of immigrants has been linked to negative attitudes and intergroup conflict between citizens and immigrants in host counties (Barbulescue & Beaudonnet, 2014; Dancygier, 2010; Halevy & Cohen, 2019; Marozzi, 2016). Therefore, the security concerns in the country rise when newcomers, especially with different backgrounds from the native population, arrive in the community.

Composite indicators are popular tools for assessing complex issues (Greco et al., 2019), such as intergroup conflict. The aim of our research is to develop a new theoretical composite index that supports policy makers in assessing immigration-related conflict risk at a regional level. There have been several indices compiled in recent years to better predict intergroup conflict. The most recent are the European Commission’s Global Conflict Risk Index (GCRI) (Halkia et al., 2020) and Uppsala University’s research group’s political violence early-warning system ViEWS (Hegre et al., 2019), which measure the likelihood of conflict on a national and/or sub-national level. Although these indices are built to predict general conflict between at least two groups, our focus lies specifically in immigration-related group conflict, which is unique in itself. Even if the general method to develop our index is similar with other indices, then the main problem with previous indices’ is that they are only composed of objective indicators, such as regime type, GDP per capita, crime rate, infant mortality, or population size. However, according to theories, perceived grievances play an important role in emerging conflict situations (e.g. Cederman et al., 2013; Hillesund et al., 2018; Langer & Mikami, 2013; Lindemann, 2014; Miodownik & Nir, 2016; Must, 2016; Rustad, 2016). For example, Gurr (1970) argues that it is the perception that matters, not the judgement of an objective observer, which mobilizes groups.

An absence of subjective variables in previous indices is explained through the lack of comparable databases, poor quality of data, or that subjective indicators are considered too be unstable, incomparable, or unrelated to objective reality (Must & Rustad, 2019; Noll, 2014; Veenhoven, 2001). We acknowledge these risks, however, we cannot ignore that subjective indicators make a better measure for conflict risk – as grievances are changing over time and give a more accurate picture of the situation (Must & Rustad, 2019; Noll, 2004; Wood, 2003). To avoid these risks, we have used the data of the European Social Survey (ESS). The ESS is an academically-driven international database collecting country representative data every second year about people’s general well-being, trust, and attitudes.

Furthermore, the majority of the current conflict predictions are based on country level structural indicators. Since most of the conflicts thrive at the regional level, national averages do not fully explain the complex situation of conflicts. For example, Hillesund et al. (2018) found that the conflict might require only one under-privileged group in the region in order for conflict to start. Thus, country-level measures might not capture the relevant grievances of the groups in a society. Many scholars have indicated the importance of the local dimension and the need to use regionally disaggregated data in the conflict studies (Cederman & Girardin, 2007; Cederman et al., 2009; Costalli & Moro, 2011; Stroschein, 2017; Ward et al., 2010), which might generate a better outcome in predictions. The ESS data allowed us to collect comparable data at a regional level (NUTS3).

Based on the understanding that most conflicts are born locally, and country-level objective data alone cannot adequately explain the risk of the conflict, we have developed a theoretical
composite index, which includes both subjective and objective variables for measuring regional immigration-related risk. The index is called MICRI – short for: measuring immigration-related conflict risk index. Our index is a useful monitoring tool, an early-warning signal to notify the emerging immigration-related conflict in a society. The main contribution of our work is the ability to include individual level perception variables in the conflict index by using the data sourced from the three (2014 – 2018) waves of the ESS and national statistics database. Both datasets allow us to collect data from the subnational level, where conflicts usually start and thrive. The index incorporates in total 17 variables – 13 subjective and 4 objective indicators – over 10 different dimensions.

The paper follows the main steps for constructing a composite indicator: (1) conceptualisation or defining the phenomenon to be measured; (2) selecting a group of indicators; (3) normalising the indicators; (4) aggregating the normalised indicators, and (5) validating the composite indicator (Babbie, 2013; Dialga & Giang, 2017; Freudenberg, 2003; Mazzotta & Pareto, 2017; Nardo et al., 2008; Saisana & Saltelli, 2011). Thus, the paper begins with an overview about theories, and the most recent empirical findings about sources of ethnic conflicts. The next section provides an overview of the design process of the MICRI, including variable selection, data normalisation, model specification, and validation procedure. The validity of the index was controlled with data of (75) Estonian municipalities from the period 2014 – 2018. Estonia is a small country in the European Union with an intensive immigration history (Ainsaar & Roots, 2020) and, therefore, suits well for the validation of the index. Although in this research phase, the data is limited to and tested in only one county, our argument and methodology has a broader scope.

1. Triggers of immigration-related conflict

As the first step in designing MICRI, we mapped the main situations that promote immigration-related conflict, i.e. risk factors. Based on theories and previous empirical findings we identified that confrontation between natives and immigrants can be related to the following issues: discrimination, inequality, injustice, sense of danger, distrust, social exclusion, different understanding of norms and values, lack of or mis-communication, cultural awareness, scarcity or unequal access to economic and social resources (e.g. Cederman et al., 2011; Collier & Hoeffler 2004; Eidelson & Eidelson, 2003; Lujala et al., 2007; Moore, 2003). Another important assumption for conflict is the groups’ size and territorial distribution, which indicate the capacity to mobilize (Weidmann, 2009). The risk for conflict tends to be higher when the region is composed of at least two equally-sized ethnic groups (Bara, 2014; Costalli & Moro, 2011; Montalvo & Reynal-Querol, 2005). We assume that the risk for conflict grows if the cumulative effect of additional potential triggers arise. The main risk factors of immigration-related conflict and their theoretical background are described in more detail below.

Identity / sense of belonging

Identity-based conflicts rely on strong common ethnic identity (Hogg & Adelman, 2013; Sambanis & Shayo, 2013), with the core notion of being with similar others (identification). According to self-categorization (Turner et al., 1987) and social identity theory (Tajfel & Turner, 1986), people perceive the inner group members more positively and members of the external group more negatively. There are numerous descent-based attributes, but only a few of them become socially and politically relevant. Ethnic and religious boundaries are often argued to incite violence (Reynal-Querol, 2002), and as these identities are particularly salient, they cause high conflict risk (Toft 2007; Wellman & Tokuno, 2004). Thus, the existence of groups
with strong common ethnic and/or religious identity markers in one region can be considered an important precondition for the emergence of conflict.

**Distrust**
Conflict can be fuelled by distrust towards others (Eidelson & Eidelson, 2003; Sambanis & Shayo, 2013). Following the classical conflict theory, increasing immigration and growing ethnic diversity weakens trust towards minority outgroups (Gundelach & Manatschal, 2017; Putnam, 2006), as people tend to distrust those who are different from them and with whom they have had no previous interactions with. Low trust in others might lead to conflicting relations between ‘in-group’ and ‘out-group’, creating a fertile ground for conflict. We can distinguish trust between the members of community as well as trust in institutions. When trust is low – either trust in fellow citizens or confidence in institutions – people assume that others do not share their values and beliefs, people do not expect cooperation from others, and consequently, they follow their own self-interests (Rothstein & Stolle, 2008). Previous research also shows that people who do not trust state institutions are less tolerant of immigrants (Husfeldt, 2006; McLaren, 2010; Paas & Halapuu, 2012).

**Value conflict**
Conflicts may arise from differences in belief systems – both real and imagined – between groups. Studies of immigrant values have shown that immigrants often retain the values of their country of origin, even when they arrive in the host country as children (Giuliani et al., 2017). Quite often, the values, norms and religious beliefs differ from the ones of the dominant culture. Misperceptions of outgroups’ characteristics have been linked to increased intergroup hostility (Ahler, 2014; Howat, 2019). Breidahl et al. (2018) sum up the frequently used explanations of why the sharing of values matters; the belief that others share the same values as other members of the community tends to generate trust in, and solidarity with, co-members of that community. Thus, conflict of values arise when different groups attach importance to opposing values and are intolerant of others’ worldview, values and beliefs.

**Low norm obedience**
Low norm obedience is a risk factor for conflict because it increases resistance to societal norms and order. Natives expect that others respect their normative standards, entitlements, and claims that they believe to be right. In the context of immigration, it is often related to the expectation for the minority groups to follow the normative rules of the host community. Conflicts may rise from violation of normative expectations about behaviour or from disregarded claims about human rights, a legal code, and the codex of religion (Berger, 1998; Packer, 2008).

**Threat perception**
Conflict can be fostered by groups’ perception of threat to their material resources (economic, territorial, employment, social benefits, etc.) or other resources, such as identity, culture, power, and security (McLaren & Johnson, 2007). Previous personal experiences of violence may also increase perceptions of danger and the risk of intragroup conflict (Littman, 2018; Rydgren, 2007).

**Dissatisfaction, perceived inequality and exclusion**
Dissatisfaction is a risk factor for intragroup conflict. There are many sources of dissatisfaction and one of the strongest of them is the feeling of unfair treatment. Schiefer and van der Noll (2017) bring out two major dimensions of inequality – first, the unequal distribution of resources, like access to power, labour market, education, health care, social care, unequal pay and legal means. The second dimension holds a component of unequal treatment of people in
terms of ethnic, religious, social, cultural background or based on other personal markers (e.g. age, sex). However, for a conflict to break out it is not enough that group members perceive inequality between groups, they must also find the conditions unjust (Cederman et al., 2013; Miodownik & Nir, 2016; Must, 2016), and the longer the injustice lasts, the more likely it is that a conflict will arise (Coutant, 2006). Gurr (1970) explicitly emphasizes that it is the perception of deprivation that matters, not the judgement of an objective observer. Following the grievance theory, discrimination, dissatisfaction, and exclusion might lead to grievances against the discriminatory group or state, which in the severest form can lead to violence (Stewart, 2017).

**Communication: understanding others**

Several studies have shown that positive contacts between different groups reduce negative attitudes towards another group (Allport, 1958; Semyonov & Glikman, 2009). However, when locals and immigrants have only superficial contact, it can also be a factor that leads to hostility, which in turn leads to more negative attitudes (Rustenbach, 2010 via Fetzer, 2000). People's communicative ability (common language and willingness to use it) is also important for positive contacts. For example, a lack of individual communication skills and a reluctance to make efforts to understand the other side may contribute to ethnic conflict (Allport, 1958; Hall, 1976).

**Lack of economic resources**

Competition for the same resources is seen by many scholars as a source for conflict. Conflict is particularly likely in situations where there are not enough resources for everyone (Esses et al., 1998; Jackson, 1993). For example, low and declining incomes, unemployment, economic inequality (Hillesund, 2015; Jo & Choi, 2019; Kern et al., 2015; Ortiz et al., 2013), and poverty (Sen, 2018) are risk factors for conflict. As unemployment rises, opinions about the impact of immigrants on the economy become more negative (IMO, 2010).

**Intensive immigration to a region**

Intensive immigration can increase the risk of conflict between locals and newcomers. According to several studies (Karreth et al., 2015; Meuleman et al., 2009; Putnam, 2006), the negative attitude towards immigrants is not influenced by the absolute number of immigrants in the country, but by the recent change in the number of immigrants. As the number of immigrants – especially the number of immigrants distinguished by skin colour and other visual characteristics – increases in the community, the attitude towards immigrants becomes more negative.

2. **Measurement of immigration-related conflict risk**

2.1. **Selection of the indicators**

Based on theoretical and empirical findings – as summarised in the previous section – we first mapped risk indicators, which enable us to express the risk of conflict (see Table 4 in Appendix 1). Next, we looked for empirical databases and variables to cover these indicators. We had the following five criteria for the data: 1) the data should be regularly updated; 2) the data must be reliable; 3) relevant; 4) accessible for international use; and 5) can be measured at a regional level. The main international data sources which we found to be most suitable for MICRI were the European Social Survey (ESS), and the national population census data in combination with regular statistics.
Estonian regional level – 75 municipalities’ out of 79¹ – data were used for operationalisation of the MICRI. We merged the data from three (2014 – 2018) ESS waves to get more reliable regional level² indicators. We did not find indicators corresponding to our selection criteria for 15 theoretical risk indicators. In Appendix 1 they are marked with “ND”, and they were left out from the next stages of the index formation process. 26 indicators corresponded to theoretical grounds and met empirical selection criteria (Table 4 in Appendix 1). After analysing the associations between indicators, we excluded some of them because of (a) negative correlation with other indicators or (b) missing correlation with other indicators, or (c) multicollinearity with other indicators. The indicators eliminated due to these reasons are marked with “LO” in Appendix 1. After those adoptions, MICRI consists of 17 risk indicators, which can be converted into 10 dimensions. Table 4 in Appendix 1 presents the indicators by dimension and the data sources for them. Four of them are objective indicators and 13 express a subjective perception of the situation.

Next, we describe final indicators used in MICRI’s dimensions more in detail.

**Identity/sense of belonging** dimension is represented by two objective indicators: the first is the presence of at least two *groups with strong ethnic identity*, meaning the rate of the titular ethnic group (Estonians) living in the region. If the share was between 15 to 85 percent³, the presence of some other strong ethnic group(s) was assumed in the region and the region got a score of 1, meaning higher risk. All other municipalities with a more homogenous distribution of ethnic groups were ascribed a score of 0.

The second indicator is *groups with strong religious identity*, measured by considering the existence of at least two religious groups in the municipality. For the religious groups, we used a 5 percent threshold. We followed the research results of Chenoweth and Stephan (2011), stating that it takes at least 3.5 percent of the population to create non-violent successful social or political change. We decided to put the threshold higher to 5 percent, as Estonia is one of the most non-religious countries and therefore a lower threshold would not have had any effect on the index. Thus, conflict risk is marked with the value 1 when at least two religious groups each form a minimum 5 percent of the municipalities’ population. The score 0 was marked to municipalities where such groups did not exist.

**Distrust** dimension is represented by two subjective indicators: the first is *distrust of other people/groups/ generalised trust* measured with the ESS question “Overall, do you think most people can be trusted?” The original scale varied from 0 as “you can’t be too careful” to 10 as “most people can be trusted”. We used the percentage of people responding 0 – 4 as a measure of distrust. The second is *distrust of state institutions* measured with the ESS question “How much do you personally trust the following institutions: parliament, the legal system, the police, politicians, and political parties?”, where 0 means, ”you do not trust an institution at all” and 10 “you have complete trust”. The mean percentage of people responding 0 – 4 to the questions about parliament, the legal system, the police, politicians, and political parties was used as a measure of distrust towards state institutions.

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¹ Due to the small number of observations, the municipalities of Kihnu, Ruhnu, Vormsi and Muhu were not considered.
² Thus, ESS weights are not used because they are for whole country data correction.
³ Most scholars have found that the risk of intrastate violence decreases or is negatively correlated in highly homogeneous and highly diverse societies (Costalli & Moro, 2011; Horowitz, 1985). Thus the threshold of 15/85 was set by the authors.
Measuring the risk of immigration related conflicts

Conflicting values dimension is represented by three subjective indicators: the first, negative attitudes toward immigrants, is measured with the three ESS questions “To what extent do you think Estonia should allow to come and live here (1) people of the same race or ethnic group as most Estonia’s people; (2) people of different race or ethnic group as most Estonia’s people; (3) immigrants from poorer countries outside Europe?” The response varied from: 1 “Allow many to come and live here”; 2 “Allow some”; 3 “Allow a few”; 4 “Allow none”. The mean percentage of people responding “Allow few or none” for these three questions was used as a measure. The second, negative stereotypes towards immigrants, is measured with the ESS question “Is Estonia made a worse or a better place to live by people coming to live here from other countries?”, where 0 means “Worse place to live” and 10 “Better place to live”. The percentage of people responding 0 – 4 was used as the measure. The third, conflicting values, is measured with the ESS question “Gay men and lesbians should be free to live their own life as they wish.”, where 1 means “Agree strongly”; 2 “Agree”; 3 “Neither agree nor disagree”; 4 “Disagree”; 5 “Disagree strongly”. The difference between the percentage of local people’ and the percentage of immigrants’ who “disagree or disagree strongly” that gay men and lesbians should be free to live their own life as they wish, is used as the measure. We used the ESS question about same-sex couples for measurement of a value gap because this is one key variable in the world recognised values studies (Inglehart, 2006) and several authors found that conflicts related to the position of LGBT is among three of the most prominent immigration-related value gaps in Europe (Ondrušek et al., 2018; Roder & Mühlau, 2014).

Feelings of threat dimensions is represented by three subjective indicators: the first, feelings of cultural threat induced by immigrants, is measured with the ESS question “Would you say that Estonia's cultural life is generally undermined or enriched by people coming to live here from other countries?”, where 0 means “cultural life undermined” and 10 “cultural life enriched”. The percentage of people who think that Estonia’s cultural life is undermined by immigrants (percentage who answered 0 – 4) is used as the measure. The second, feelings of threat to economic resources induced by immigration, is measured with the ESS question “Would you say it is generally bad or good for Estonia's economy that people come to live here from other countries?”, where 0 means “bad for the economy” and 10 “good for the economy”. The percentage of people who think that immigration is bad for Estonia’s economy (percentage who answered 0 – 4) is used as the measure. The third, feelings of threat to physical security, is measured with the ESS question “How safe do you – or would you – feel walking alone in this area after dark?”, where 1 means “Very safe”; 2 “Safe”; 3 “Unsafe”; 4 “Very unsafe”. The percentage of people who feel unsafe or very unsafe walking alone in the local area after dark was used as the measure.

Inequality dimension is represented by one subjective indicator. Perception of injustice is measured with the ESS question “Would you describe yourself as being a member of a group that is discriminated against in this country?”, where 1 means “yes” and 2 “no”. The percentage of people who think that they belong to a group discriminated against in Estonia (yes percentage) is used as the measure.

Dissatisfaction dimension is represented by one subjective indicator. Feelings of dissatisfaction is measured with the ESS question “How satisfied are you with your life as a whole nowadays?”, where 0 means “extremely dissatisfied” and 10 “extremely satisfied”. The percentage of people who are dissatisfied with their life as a whole (percentage who answered 0 – 4) is used as the measure.
Poor communication dimension is represented by one subjective indicator. Communication skills are measured with the ESS question “It is important to her/him to listen to people who are different from her/him. Even when she/he disagrees with them, she/he still wants to understand them.”, where 1 means “Very much like me”; 2 “Like me”; 3 “Somewhat like me”; 4 “A little like me”; 5 “Not like me”; 6 “Not like me at all”. The percentage of people who think that it is little, not, or not at all important to them to understand and listen to different people, is used as the measure.

Norm obedience dimension is represented by one subjective indicator. Low norm/rule obedience is measured with ESS questions “How much each person is or is not like you? 1) She/he believes that people should do what they're told. She/he thinks people should follow rules at all times, even when no-one is watching. 2) It is important to her/him always to behave properly. She/he wants to avoid doing anything people would say is wrong.”, where 1 means “Very much like me”; 2 “Like me”; 3 “Somewhat like me”; 4 “A little like me”; 5 “Not like me”; 6 “Not like me at all”. The mean percentage of people who think that it is little, not, or not at all important to them to (1) do what is told and follow rules, and (2) behave properly is used as the measure.

Lack of economic resources dimension is represented by two indicators, out of which one is subjective and one objective. Two different indicators were chosen because research (see Langer & Mikami, 2013; Miodownic & Nir, 2016; Rustad, 2016) has shown that people often misperceive their or their group’s economic situation. To avoid tilted results, both kind of indicators were included in the index. The first, poverty, is measured with the ESS question “Which of the descriptions comes closest to how you feel about your household's income nowadays?”, where 1 means “Living comfortably on present income”; 2 “Coping on present income”; 3 “Difficult on present income”; 4 “Very difficult on present income”. The percentage of people who think that it is difficult or very difficult on present income is used as the measure. The second, unemployment, was measured with the mean registered unemployment rate between 2015 to 2018 based on national statistics.

Immigration dimension is represented by one objective indicator: international immigration rate in the municipality. We assume that immigration does not have an immediate effect on the attitudes, but the effect is cumulative. Therefore, an average of the last four years is calculated, based on national statistics.

2.2. Formation of the index

To obtain the values of MICRI, we followed four consecutive steps: (1) computing the values of the 17 indicators for each municipality; (2) normalising; (3) weighting; and (4) aggregating of the indicators. The methods chosen for normalization, weighting and aggregation are explained in each state. There is always a degree of subjectivity in selecting one particular method. Each choice of the method to normalize, weight and aggregate data leads to a different index and in general to different results. We did experiment with different methods and the results did not differ notably.

In the first step, the values of the indicators originating from ESS were computed as a mean of the values from 2014, 2016 and the 2018 survey; and the values of unemployment and international immigration rate as a mean of the values of 2015 to 2018 of the Estonian statistics. For other indicators, no computation was needed as we used values from the 2011 Estonian Census. The second step was to normalise or make the values of indicators comparable with
each other, all indicators were transformed to a scale of 0 to 1. We chose this method over standardisation (or Z-scores), ranking, re-scaling (or Min-Max), distance from a reference etc. to keep the values of individual indicators more easily interpretable. Normalization was performed for each variable. Originally, all indicators (number 3 – 16 in Table 4 in Appendix 1), were on a 0 to 100 scale. We divided these values by 100 to transform them to a 0 to 1 scale. The initial value of the international immigration rate (indicator number 17) was divided by 10 to bring it closer to a 0 – 1 scale. We also analysed the division of the value by 100 – but the internal consistency measured by Cronbach Alpha coefficient (c-alpha) was essentially lower, compared to a division by 10. This was the main reason to keep the division with 10, although the maximum value remained above 1 in some regions.

In the third step we weighted the normalised indicators. Several weighting methods can be used to build a composite indicator (see e.g. Booysen, 2002; Freudenberg, 2003; Nardo et al., 2008), and the selection of the weighting method is highly debated – often, individuals, policy makers and proponents themselves disagree on the weight that each component should have in the composite indicator (Hagerty & Land, 2007). Several weighting methods can be used to build a composite indicator (see e.g. Booysen, 2002; Freudenberg, 2003). Indicators can be weighted according to a theoretical framework (Nardo et al., 2008) or equally unless there are compelling reasons for differential weighting (Babbie, 2013). A popular solution is indeed to use equal weights to keep things simple (Stapleton & Garrod, 2007). Since there were no theoretical or practical grounds for choosing unequal weights, and the indicators are considered equally important, we followed the principle of equal representation. As some risk dimensions were measured by several indicators, while others by one, we aimed to achieve the situation where risk dimensions would contribute to the MICRI more or less equally. Following the principle of equal representation, we analyzed the contribution of 10 dimensions in the final index in Estonia (Table 1). Table 1 illustrates the distribution of risk dimensions in the most risk-prone municipality, in the municipality with the lowest MICRI, and an average MICRI value in Estonia. As an average, all the dimensions contribute to the overall risk level quite equally, but from the results of the extreme cases we see that the contribution and distribution of risk varies quite differently regarding each municipality.

Table 1
Values of 10 dimensions of MICRI in the most risk-prone, least risk-prone and average Estonian region

| Dimension           | The most risk-prone | Average | The least risk-prone |
|--------------------|---------------------|---------|---------------------|
| Identity           | 2.0                 | 0.7     | 0.0                 |
| Distrust           | 1.0                 | 0.7     | 0.5                 |
| Values             | 1.7                 | 1.2     | 0.7                 |
| Feelings of threat | 1.4                 | 0.9     | 0.5                 |
| Inequality         | 1.4                 | 0.5     | 0.0                 |
| Dissatisfaction    | 1.7                 | 0.6     | 0.4                 |
| Poor communication | 0.1                 | 0.1     | 0.1                 |
| Norm obedience     | 0.3                 | 0.3     | 0.3                 |
| Lack of resources  | 0.8                 | 0.6     | 0.5                 |
| Immigration        | 2.4                 | 0.9     | 0.6                 |
| Total risk score   | 12.84               | 6.8     | 3.6                 |
Table 2
MICRI normalised and weighted indicators and their dimensions (measured minimum, maximum, arithmetic mean and standard deviation in Estonian municipalities)

| Dimension   | Indicator                                                                 | Min  | Max  | Aver | St_d |
|-------------|---------------------------------------------------------------------------|------|------|------|------|
| Identity    | ID1: Ethnic groups (15 to 85 percent of inhabitants identify themselves in the titular ethic group (1=yes; 0=no) | 0.00 | 1.00 | 0.31 | 0.46 |
|             | ID2: Religious groups (at least two form 5 percent of the population) (1=yes; 0=no) | 0.00 | 1.00 | 0.37 | 0.49 |
| Distrust    | DT1: Generalized trust (percentage of people who do not trust other people / 100) | 0.00 | 0.42 | 0.23 | 0.09 |
|             | DT2: Institutional trust (Mean of percentage of people having low (< 5) trust in country's parliament, legal system; police; political parties; politicians / 100) | 0.14 | 0.79 | 0.49 | 0.12 |
| Values      | V1: Negative immigration attitudes (Mean percentage of people allowing few or no immigrants of (1) same race/ethnic group as majority; (2) different race/ethnic group from majority; (3) from poorer countries outside Europe / 100) | 0.27 | 0.81 | 0.52 | 0.10 |
|             | V2: Negative stereotypes (percentage of people who think that immigrants make country a worse place to live / 100) | 0.20 | 0.86 | 0.46 | 0.14 |
|             | V3: Value gap (Difference between percentage of local people and immigrants who disagree that gay men and lesbians should be free to live their own life as they wish / 100) | 0.00 | 0.88 | 0.23 | 0.21 |
| Threat      | TH1: Cultural threat (percentage who think that cultural life is undermined by immigrants / 100) | 0.07 | 0.69 | 0.35 | 0.12 |
|             | TH2: Economic threat (percentage who think that immigration is bad for economy / 100) | 0.17 | 0.77 | 0.43 | 0.14 |
|             | TH3: Physical threat (percentage who feel unsafe walking alone in local area after dark / 100) | 0.00 | 0.48 | 0.15 | 0.11 |
| Inequality  | IN: Discrimination perception (percentage who think that they belong to a group discriminated in a country / 100)*10 | 0.00 | 3.11 | 0.48 | 0.64 |
| Dissatisfact| D: Dissatisfaction (percentage who are dissatisfied with life as a whole / 100)*5 | 0.00 | 1.67 | 0.59 | 0.34 |
| Poor communi| PC: Communication skills (percentage who think that it is little, not, or not at all important to them to understand different people / 100) | 0.00 | 0.50 | 0.15 | 0.09 |
| Low norm obedience | LNO: Low norm obedience (Mean percentage of people who say that it is not important to them to (1) do what is told and follow rules, and (2) behave properly /100) | 0.19 | 0.54 | 0.34 | 0.07 |
| Lack of economic resources | LER1: Poverty (percentage who think that it is difficult or very difficult on present income / 100) | 0.00 | 0.69 | 0.27 | 0.15 |
|             | LER2: 10* Average registered unemployment rate during last 4 years / 100 | 0.17 | 0.67 | 0.31 | 0.10 |
| Immigration | IM: Average international immigration rate during last 4 years / 10 | 0.50 | 2.40 | 0.87 | 0.29 |
Cronbach-Alpha (c-alpha) measured an internal consistency of the construct, and it was used as a quantitative additional criteria for decision making about the efficiency of weighting in this stage. We weighted up the following risk indicators to achieve more equal representation of risk dimensions: discrimination perception and unemployment rate by multiplying their values by 10, and dissatisfaction by multiplying their values by 5. Without weighting – especially in the case of discrimination perception and dissatisfaction which are single indicators measuring their dimension – these indicators’ contribution would have been unreasonably low. The contribution of the dimension of communication skills were also relatively low. We tested the version where the value for communication skills was multiplied by 10, but then the internal consistency of the overall index decreased, and we decided not to apply weights to this indicator. Table 2 presents normalised and weighted indicators’ minimum, maximum, arithmetic mean, and standard deviation values.

In the fourth step we used linear additive aggregation method to calculate the values of risk dimensions and MICRI. We considered the most familiar aggregation rules: the additive one and the multiplicative one. There is no consensus on which one is more suitable; there are benefits and restrictions in both of these (see Marozzi & Bolzan, 2016). For the known simplicity and for being compatible with all normalization methods, and because it can compensate for possible errors in the data set, we chose the additive method. The values of normalized and weighted indicators (see Table 2) were aggregated, as follows:

\[
\text{MICRI} = \text{ID1} + \text{ID2} + \text{DT1} + \text{DT2} + \text{V1} + \text{V2} + \text{V3} + \text{TH1} + \text{TH2} + \text{TH3} + \text{IN} + \text{D} + \text{PC} + \text{LNO} + \text{LER1} + \text{LER2} + \text{IM}
\]

This aggregation method is fully-compensatory, meaning that any deficit in one dimension can be compensated with a surplus in another. Although a complete compensability among the dimensions is often not desirable, we do not consider it as an important problem in the case of MICRI. For example, living in a municipality with high immigration influx can be compensated for by a low level of cultural threat perception.

**Internal validation of the index**

Internal validation is an assessment of the relationships of index components, e.g., whether each of the items included in a composite indicator makes an independent contribution or strongly overlaps with other items (Babbie, 2013, 209). Internal consistency analysis can apply several methods, like principal components analysis, factor analysis, c-alpha, cluster analysis, Pearson’s correlation coefficient, and Spearman’s rank correlation coefficient (Nardo et al., 2008, 72). The c-alpha is the most common estimate of internal consistency, and it is most often used for a single unidimensional construct. We also analyzed the composition of MICRI with the Spearman’s rank correlation (Table 3) because it provides insight into the structure of the data set of the composite index.
Table 3
Spearman correlation coefficients between MICRI’s 10 dimensions

|                  | Identity | Distrust | Values | Feelings of threat | Inequality | Dissatisfaction | Poor communication | Norm obedience | Lack of resources | Immigration |
|------------------|----------|----------|--------|---------------------|------------|-----------------|---------------------|----------------|------------------|-------------|
| Distrust         | 0.055    | 1        |        |                     |            |                 |                     |                |                  |             |
| Values           | 0.088    | .425**   | 1      |                     |            |                 |                     |                |                  |             |
| Feelings of threat | 0.183   | .533**   | .594** | 1                   |            |                 |                     |                |                  |             |
| Inequality       | .334**   | 0.131    | 0.185  | 0.226               | 1          |                 |                     |                |                  |             |
| Dissatisfaction  | 0.224    | .508**   | .366** | .366**              | .256*      | 1               |                     |                |                  |             |
| Poor communication | -0.082  | 0.039    | 0.168  | 0.141              | -0.136     | 0.178           | 1                   |                |                  |             |
| Norm obedience   | -0.219   | -0.250*  | -0.282* | -0.356**          | -0.377**   | -0.271*         | 0.283*              | 1              |                  |             |
| Lack of resources | 0.126   | .408**   | .343** | .569**            | .256*      | .547**          | .334**              | -0.177        | 1                |             |
| Intensive immigration | .530**  | -0.005   | -0.044 | -0.049          | .351**     | .329**          | 0.073               | 0.024         | 0.087            | 1           |
| MICRI total      | .727**   | .421**   | .472** | .586**          | .642**     | .525**          | 0.124               | -.354**       | .542**           | .512**      |
MICRI’s c-alpha was 0.698, indicating an acceptable level of internal consistency. Ideally, all components in the index should be positively correlated, preferably not too strongly. That applies to the majority of the indicators. Most of the dimensions are correlated with the overall index MICRI moderately (Table 3). Only the indicator “Low norm obedience” has a negative correlation with the other indicators, but due to its’ theoretical significance we decided to keep it in the overall index. The norm obedience serves as a protective measure against a breakout of public conflict, even when the situation is heated and close to the conflict. One explanation of a negative correlation with other variables is the fact that we use regionally aggregated average variables, not individual variables, and the averages for regions depends also on the population composition in the region.

Conclusions

Most scholars agree that perceived grievances play an important role in group-related conflicts in society. Theoretical analyses show the importance of identity, distrust, values, feelings of threat, inequality, dissatisfaction, lack of communication, low norm obedience, unequal access to resources, and some other subjectively-perceived situations in immigration-related conflict formation. However, a coherent and complex measurement indicator for international comparative analyses is missing so far.

This paper introduces an innovative methodology for an index for measuring immigration-related conflict risk internationally and regionally. The index includes unique subjectively-reported risk factors, which are usually difficult to collect and therefore missing from the existing conflict indexes. For example GCRI (Halkia et al., 2020) and ViEWS (Hegre et al., 2019) include only objective variables.

After careful theoretical analyse and investigation of multiple international and national databases, two major empirical sources for the index indicators were found: The European Social Survey for subjective indicators, and national statistics for objective indicators. The European Social Survey meets all essential data selection criteria for this index; it includes information about all main risk dimensions, guarantees high quality of data, and provides regional level information. In addition, the original data source are regularly updated, reliable, relevant, and easily accessible for international use.

The new index for the measurement of immigration-related conflict risk incorporates 17 variables – 13 subjective and 4 objective indicators, compiled in ten different risk dimensions. The ten dimensions – identity, distrust, value difference, perceived threat, perceived inequality, dissatisfaction, poor communication, norm obedience, availability of resources, and immigration level – form a cumulative index value. We validated and tested the index with the data of 75 Estonian municipalities and found good internal consistency of the index - 0.698 (c-alpha).

The new index has several practical implementation areas. First, it allows systematic monitoring of conflict risk level and therefore serves as a tool for policymakers to take active precautions. Second, the index can be used for academic social analyses in combination with other variables or independently. Finally, although it was validated with regional level data from Estonia, it is designed in a way that can be used to measure risks internationally for all countries participating in the European Social Survey.
Limitations

As with many innovative work, this one has some limitations. First of all, the risk variables in the current index is limited only with those that can be measured internationally. Therefore, some potentially important indicators, like the role of group leaders, and the role of social media, were left out from the index during the work process. The list of these kind of variables are provided in the Appendixes.

One other important limitation is related to external validation; namely, the index is not externally validated yet because of a missing good reference variable. Public ethnic conflicts on the grounds of immigration are too rare in Estonia and cannot be used for this purpose. However, we hope to collect relevant information in future, and continue the work with validation.

We also see the need for applying and testing the index with data of other European countries. The current methodological paper used regional data from Estonia for testing and validation to create the index, but the data of other European countries will add robustness to the index. Future research regarding the index will focus on external validation of the index and will expand its use internationally.

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Appendix 1.

**Table 4**

*Ethnic conflict risk factors and their dimensions, indicators, and data sources (numbered risk factors are included in MICRI; risk factors marked as “LO” is left out from the Index mainly because of empirical inappropriateness; risk factors marked as “ND” is left out from the Index because there is no data; ESS=European Social Survey)*

| Dimension and risk factors | Indicator | Measurement | Final status and data source |
|----------------------------|-----------|-------------|------------------------------|
| **I. Identity** | | | |
| 1. At least several bigger groups with different ethnic identity | 1 = at least 15 percent of population identify themselves as non-titular nation. 0 = no | Share of titular population in the region | In MICRI, 2011 Census data, Estonian Statistics database |
| 2. At least two bigger groups with different religious identity | 1 = if at least two religious groups, who each form at least 5 percent of population. 0 = no | Calculated from at least 15-year-old persons by religion | In MICRI, 2011 Census data, Estonian Statistics database |
| Groups with weak state identity | Percentage of people who did not feel emotional attachment with a country (percentage who answered 0-4) | How emotionally attached do you feel to country? 0 = not at all 10 = very... | LO, can be measured in ESS |
| Feeling unaccepted by other people | | ND | |
| **II. Distrust** | | | |
| 3. Distrust of other people / groups | Percentage of people thinking that you can't be too careful trusting other people (% who answered '0-4') Average of 2014, 2016 and 2018 values | Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people? 0 = you can't be too careful...10 = most people can be trusted | In MICRI, ESS |
| 4. Distrust of state institutions | Arithmetic mean of percent of people having low (<5) trust in country's parliament, legal system; police; political parties; politicians. Average of 2014, 2016 and 2018 values | Please tell me on a score of 0-10 how much you personally trust each of the institutions. 0 means you do not trust an institution at all, and 10 means you have complete trust. ...[country]'s parliament? ...the legal system? ...the police? ...politicians? ...political parties? | In MICRI, ESS |
### III. Values

| 5. Negative attitudes toward immigrants | Mean percentage of „Allow few or none“ percentage in (1) Allow many/few immigrants of same race/ethnic group as majority; (2) Allow many/few immigrants of different race/ethnic group from majority; (3) Allow many/few immigrants from poorer countries outside Europe. Average of 2014, 2016 and 2018 values | To what extent do you think Estonia should allow people of the same race or ethnic group as most Estonia's people to come and live here? 1 = Allow many to come and live here; 2 = Allow some; 3 = Allow a few; 4 = Allow none | In MICRI, ESS |
|----------------------------------------|--------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|
| 6. Negative stereotypes towards immigrants | Percentage of people who think that immigrants make country worse place to live (percentage who answered ’0-4‘). Average of 2014, 2016 and 2018 values | Is Estonia made a worse or a better place to live by people coming to live here from other countries? 0 = Worse place to live … 10 = Better place to live | In MICRI, ESS |
| 7. Conflicting values | Difference between 'percentage of local people’ and 'percentage of immigrants’ who „disagree or disagree strongly” that Gay men and lesbians should be free to live their own life as they wish. Average of 2014, 2016 and 2018 values | Gay men and lesbians should be free to live their own life as they wish. 1 = Agree strongly; … 5 = Disagree strongly | In MICRI, ESS |

### IV. Feelings of threat

| 8. Feelings of cultural threat induced by immigrants | Percentage of people who think that country’s cultural life is undermined by immigrants (percentage who answered 0-4). Average of 2014, 2016 and 2018 values | Would you say that Estonia's cultural life is generally undermined or enriched by people coming to live here from other countries? 0 = Cultural life undermined …10 = Cultural life enriched | In MICRI, ESS |
|------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|
| 9. Feelings of threat to economic resources induced by immigration | Percentage of people who think that immigration is bad for Estonia’s economy (percentage who answered 0-4). Average of 2014, 2016 and 2018 values | Would you say it is generally bad or good for country’s economy that people come to live here from other countries? 0 = Bad for the economy…10 = Good for the economy | In MICRI, ESS |
| 10. Feelings of threat to physical security | Percentage of people who feel unsafe or very unsafe walking alone in local area after dark. Average of 2014, 2016 and 2018 values | How safe do you - or would you – feel walking alone in this area after dark? 1 = Very safe;… 4 = Very unsafe | In MICRI, ESS |
| Previous experience with violence | Respondent or household member victim of burglary/assault last 5 years (yes percentage) | Have you or a member of your household been the victim of a burglary or assault in the last 5 years? 1 = yes; 2 = no | LO, ESS |
|----------------------------------|-------------------------------------------------------------------------------|---------------------------------------------------------------------------------|--------|
| ND Feelings of threat to his/her group power | Conflict proneness | Previous ethnic or cultural conflicts, existence of triggers, external locus of control, conflict prone messages in (social)media | ND |
| V. Inequality | | | |
| 11. Perception of injustice | age of people who think that they belong to a group discriminated against in Estonia (yes percentage) Average of 2014, 2016 and 2018 values | Would you describe yourself as being a member of a group that is discriminated against in this country? 1 = yes; 2 = no | In MICRI, ESS |
| Accepting inequality | Percentage of people who disagree or strongly disagree that government should reduce differences in income levels | The government should take measures to reduce differences in income levels. 1 = Agree strongly; 2 = Agree; 3 = Neither agree nor disagree; 4 = Disagree; 5 = Disagree strongly | LO, ESS |
| VI. Dissatisfaction | | | |
| 12. Feelings of dissatisfaction | Percentage of people who are dissatisfied with life as a whole (percentage who answered 0-4) Average of 2014, 2016 and 2018 values | How satisfied are you with your life as a whole nowadays? 0 = extremely dissatisfied…10 = extremely satisfied | In MICRI, ESS |
| VII. Poor communication | | | |
| 13. Communication skills | Percentage of people who think that it is little, not, or not at all important to them to understand different people Average of 2014, 2016 and 2018 values | It is important to her/him to listen to people who are different from her/him. Even when she/he disagrees with them, she/he still wants to understand them. 1 = Very much like me; 6 = Not like me at all | In MICRI, ESS |
| Common language skill | Percentage of people who are 15 years old and older and who cannot speak the local majority (51 percent and more) language | RL0433: Population by mother tongue, sex, age group and administrative unit, 31 December 2011 Population by command of foreign languages, age group and place of residence, 31 December 2011 | LO, 2011 Census data, Estonian Statistics database |
| Little contact with other group | ND |
| Inclusiveness | ND |
| Low of participation in society | ND |

### VIII. Norm obedience

- **14. Low norm/rule obedience**
  Mean percentage of people who think that it is little, not, or not at all important to them to (1) do what is told and follow rules, and (2) behave properly
  Average of 2014, 2016 and 2018 values
  How much each person is or is not like you? (1) She/he believes that people should do what they're told. She/he thinks people should follow the rules at all times, even when no-one is watching. 2) It is important to her/him always to behave properly. She/he wants to avoid doing anything people would say is wrong. 1 = Very much like me; 6 = Not like me at all
  In MICRI, ESS

### IX. Lack of economic resources

- **15. Low income, poverty**
  Change of percentage of people who think that it is difficult or very difficult on present income
  Average of 2014, 2016 and 2018 values
  Which of the descriptions comes closest to how you feel about your household's income nowadays? 1 = Living…; 4 = Very difficult on present income
  In MICRI, ESS

- **Diminishing income**
  Change of percentage of people who think that it is difficult or very difficult on present income
  LO, ESS

- **16. Unemployment**
  Mean registered unemployment rate between 2015 to 2018
  Registered unemployed
  In MICRI, Estonian Statistics database

- **Increasing unemployment**
  Difference between registered unemployment rate in a year n+1 and in a year n
  LO

- **Economic income inequality of ethnic groups**
  ND

- **Homelessness**
  ND

### X. Intensive immigration

- **17. Immigration rate**
  Average immigration rate from international migration between 2015-2018
  Average of migration by administrative unit/type / population mean 2015-2018
  In MICRI, Estonian Statistics database

### Other

- **Misdeeds and crime**
  Registered crimes and misdeeds
  Registered crimes in 2014-2019 by paragraph, time of registration and municipality, Registered misdeeds in 2014-2019 by paragraph, time of registration and municipality
  LO, Police and Border Guard Board

- **Amount of NEET youth**
  Percentage of NEET from all youth group
  ND

- **Inner vulnerability**
  ND