ORIGINAL ARTICLE
INNOVATIONS IN RESEARCH METHODOLOGY

The material value of public safety in Poland in the face of 2021 migrant crisis – a pilot study

Authors' Contribution:
A Study Design
B Data Collection
C Statistical Analysis
D Manuscript Preparation
E Funds Collection

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Abstract

Background & Study Aim: Public security in the face of the current large-scale migration crisis in Central and Eastern Europe, which is the first since World War II, is an issue that should be examined taking into account various criteria (social, economic, political, extreme threat, etc.). The aim of this paper is to answer the research questions: (1) do people in Poland fear migrants? (2) how do they value public safety?

Material & Methods: To answer the research question, the authors conducted a survey and estimated the value of public safety with the use of the contingent valuation method. Because of the Covid-19 pandemic, the questionnaires were collected online (previously also sent online to academic communities throughout Poland). The research was carried out in Poland in November and December 2021 in an attempt to grasp the migrant crisis at the eastern EU border.

Results: According to the study results, the value of public safety in Poland amounts to PLN 210.8 billion (almost EUR 45 billion).

Conclusions: Based on the situation in Central and Eastern Europe in 2022, it was found that most respondents are not afraid of migrants. Such a result should encourage further in-depth analyses of the broadly understood phenomena of personal security and social security, taking into account also other empirical variables including.

Keywords: contingent valuation method • Eastern EU border • security • willingness to pay

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INTRODUCTION

The Polish-Belarusian border – is part of the external border of the European Union (EU), the Schengen Area and the North Atlantic Treaty Organization (NATO). The length of the border between the Republic of Poland and the Republic of Belarus is 418 km, which represents 11.9% of the length of Poland's land border. There are two Polish provinces bordering Belarus: Podlaskie and Lubelskie. Road border crossings are located in the following towns in the Podlaskie province: Kuźnica, Bobrowniki, Połowce; in the Lublin province: Koroszczyn (Kukuryki), Terespol, Sławatycze. The border divides the Białowieża Forest into two parts. Part of the border runs along the Bug river. The Białowieża Forest Euroregion is located on the border [37-39].

Motivation for the research was the introduction of a 30-day state of emergency at the Polish-Belarus border in part of the Podlaskie province and part of the Lubelskie province, by the Regulation of the President of the Republic of Poland of September 2, 2021, (Journal of Laws 2021, item 1,612). On September 30, 2021, the state of emergency was extended by 60 days [1]. The reason for the introduction of the state of emergency was that in June 2021, Belarussian president Aleksandr Lukashenko threatened the European Union to allow human traffickers along with drug smugglers to stream into its territory. According to some EU officials, his government was also encouraging migrants to move to the EU by: cooperating with a Belarusian tour operator to offer tourist visas, arranging flights and then transferring people from Minsk, capitol city of Belarus, to the Lithuanian border [2].

In October 2021, the German police recorded 5285 illegal entries of migrants to Germany from Belarus. Although in the first half of 2021 only 26 people illegally crossed the eastern German border, it was already 500 in August and as many as 1,900 in September. The newspaper also cites the number of 13,000 people detained in October by Polish services while trying to cross the border with Belarus, stressing the fact that many of them still reach Germany [3]. Public safety in the face of the current large-scale migrant crisis in Central and Eastern Europe, which is the first since World War II, is an issue that should be addressed and investigated.

The aim of this paper is therefore to answer the following research questions: (1) Do people in Poland fear migrants and (2) How do they value public safety?

PART I: PREMISES AND ASSUMPTIONS FOR OWN RESEARCH

Poland is located in Central Europe, on the Baltic Sea. In the south of the country there is a mountain belt that is highly diversified in terms of geology and relief. The main rivers of the Republic of Poland are the Vistula and the Oder. The country's climate is of a transitional temperate zone. Poland borders north with Russia (its Kaliningrad Oblast) and Lithuania, south with Slovakia and the Czech Republic, west with Germany, and east with Belarus and Ukraine. The number of Polish residents is 38,080,411 while the number of inhabitants of working and post-working age is 30,743,972. Poland is divided into 16 provinces [4-9]. Of these, two provinces were most badly hit by the migration crisis: Podlaskie and Lubelskie.

Podlaskie province is located in north-east Poland. It is adjacent to the following provinces: Warmińsko-Mazurskie, Mazowieckie and Lubelskie. It borders Belarus to the east and Lithuania to the north. Podlaskie province covers an area of 20,180 km^2. Its capital city is Białystok. It has a population of just over 1.2 million, which translates into a low population density 61 people per km^2. The province has numerous monuments of material culture, including sacred ones, numerous places recorded in the history of the country, and rich folklore with features of a cultural borderland. The natural environment of this lowland province (approx. 150 m above sea level on average) with a high degree of naturalness and purity, consists mainly of: the largest complex of swamps in Europe with unique ecological values of Narew and Biebrza National Parks, the complex of lakes in the Suwalsko-Augustowskie Lakeland with the Wigry National Park and the Suwałki Landscape Park; Białowieża National Park, Knyszyn Forest Landscape Park and the Augustów Primeval Forest. Natural protected areas constitute about a third of the province area [10].

The Lublin province is located in mid-east Poland. To the east, it borders with Belarus and Ukraine. It is adjacent to 4 provinces: Podlaskie, Mazowieckie, Świętokrzyskie and Podkarpackie. It has a population of 2.15 million and covers an area of 17,970 km^2. The population density is 86 people per km^2. The most important city in the studied area and the capital of the voivodship is Lublin. Other important centres are Chełm, Zamość, Biała Podlaska, Puławy and Świdnik. In the study area there are both lowlands (lake district, Polesie) and upland areas (Roztocze), crisscrossed by river valleys: Bug and Vistula [11].

Literature study

When entering a combination of two key phrases: 'contingent valuation method' and 'migrant crisis'/ 'refugee crisis', the search resulted nothing, revealing a substantial lack of international research on that topic. A similar combination of two key phrases was entered: 'contingent

valuation method' and 'public safety' and the search yielded 54 results which are later mentioned in the literature study section. Of these, only one paper concerned the valuation of public safety [12] in the context of migrants and large events. Therefore, this is the first study to fill this research niche.

Studies concerning migrants in Poland were conducted by Pawelec-Górny [13], Leszkowicz-Baczyński [14], Piepiora [15] and [16]. The existing body of literature presents a very scarce amount of research on public safety measured with the contingent valuation method. The method has been used to investigate a variety of phenomena, such as risk reduction, health, agriculture, crime and safety in various contexts: transport safety, large scale events safety, beach safety, nuclear safety, water supply safety and public safety vs. private safety etc. for the past 25 years. It was used for the first time by Johanesson et al. [17] to explore the value of private safety versus the value of public safety. Thus, its usefulness in research, especially in terms of safety issues, has been proven. Then, similar studies on the topic were carried out by Andersson [18, 19], Svensson and Johansson [20, 21], Pedersen et al. [22]. So far, Piepiora and Kujawa's study [12] was the first (and only one) to use this method for public safety in the context of large-scale and migrant events. The authors wanted to find out whether the people of Jelenia Góra feared migrants more and valued public safety more prior to the Warsaw NATO Summit 2016 and the 31st World Youth Day (WYD), with the use of the contingent valuation method. Jelenia Góra was selected because of its proximity to the German border (one of the targets of migration), and to the border with the Czech Republic (situated close to migration route through Turkey, the Aegean Sea, and Greece). The study showed that the value of public safety in Jelenia Gora before the NATO summit and the WYD decreased. Thus, there is a discernible literature gap, and our paper is the first one that concerns public safety valuation in the face of migrant crisis.

Object of the research

Public safety as a commodity is one of the non-market goods. In order to determine the value of public safety, we chose the contingent valuation method (CVM) as it is used when the market information is limited. In this method, the opinions on their needs for a particular good are collected, under the assumption that the consumer knows which option is most rational for him. The surveys specify the amount of money that the individuals are willing to pay for accessing this good, or assess the amount making up for the inability to use this good. Thus, a hypothetical market is generated that defines the willingness of the respondents to pay for a service or good, or the compensation for the loss.

There are two variations of the CVM: willingness to pay (WTP) and willingness to accept (WTA). The WTP is the maximum amount that consumers can spend on a good, instead of giving it up. The WTA concerns cases where people agree to let go of a given good. In return, they receive a certain amount of money given the assumption that an individual will maintain the same level of welfare that he/she would have had upon keeping the good and not getting the money. The WTA and WTP concepts can both measure the value of non-market and market goods, or the prosperity of an individual [23-30]. The authors have selected the first variant, WTP.

Study assumptions

There were the following study assumptions: the minimum statistical sample was 196 respondents; the maximum statistical error was set at 7%; confidence interval was 95%; fraction size was set at 0.5. Number of inhabitants of Poland in working and post-working age is 30,743,972, and interest rate was set at the level of the reference interest rate of the National Bank of Poland and it amounted to 1.75% in 2021. 1 Euro is 4.68 PLN [9, 31-33].

PART II. ORIGINAL RESEARCH

Materials and Methods

Study design

The authors used the contingent valuation method. After literature study which was to verify the existing research methods, authors conducted the willingness to pay (WTP) survey which was deemed the most appropriate. They then computed the effects and presented their observations.

Tools

In order to develop the questionnaire, the authors based on Piepiora and Kujawa [12], data from the Polish Main Statistical Office [9] and exchange

rates from the National Bank of Poland [32]. The authors chose the contingent valuation method (willingness to pay option) as the most appropriate method. Three types of questions were asked: regarding the attitude towards migrants, regarding the valuation of safety, and metric questions.

Each respondent was asked: *Are you afraid of migrants?*

To obtain WTP, the authors asked: *If a charity foundation was established to improve security by setting up temporary camps for migrants in Poland (during the current migration crisis on the Polish-Belarusian border), how much would you be willing to pay monthly for this purpose? (guaranteed that 100% of the donation will go to transit camps for non-refugees where migrants would be admitted, selected and returned to their countries of origin)… (and please specify the currency: EUR, PLN, USD).*

Then, the metric questions were asked about the respondents': province of residence, locality of residence, gender, age group, education and average monthly net income ('on hand').

The survey was conducted online (in academic communities throughout Poland) from November 22 to December 11, 2021 due to the Covid-19 pandemic.

Mathematical calculation

According to the formula (the monthly median of WTP value multiplied by the 12 months multiplied by the number of inhabitants of Poland in working and post-working age) the annual stream of willingness-to-pay was calculated:

YWTP = PLN 10 * 12 * 30,743,972 = PLN 3.7 billion (EUR 0.8 billion).

According to the formula the perpetual annuity was calculated.

PV = PLN 3.7 billion / 1.75% = PLN 210.8 billion (EUR 45 billion).

Statistical analysis

The estimation of the results is based on the following indicators: frequency (n); mean; median; minimum; Maximum; standard deviation; ratio (%).We also calculated skewness and Pearson's linear correlation between WTP coefficients with sample variables.

RESULTS

The question regarding the province of residence yielded 260 answers. The majority of respondents live in Dolnośląskie province (72.7%), followed by residents from: Wielkopolskie, Opolskie, Łódzkie, Śląskie and other (to a much lesser extent) provinces (Table 1).

Table 1. Province of residence of respondents.

Province	Number of respondents	Share [%]
Dolnośląskie	189	72.69
Wielkopolskie	18	6.92
Opolskie	12	4.62
Łódzkie	11	4.23
Śląskie	11	4.23
Lubuskie	7	2.69
Zachodniopomorskie	3	1.15
Lubelskie	2	0.77
Podkarpackie	2	0.77
Kujawsko-pomorskie	1	0.38
Małopolskie	1	0.38
Mazowieckie	1	0.38
Świętokrzyskie	1	0.38
Warmińsko-mazurskie	1	0.38
Podlaskie	0	0.00
Pomorskie	0	0.00
Total	**260**	**100**

Question 2 referred to the locality of residence (259 answers). Almost 45% of the respondents live in large cities. Almost 18% of the respondents live in villages, and mid-sized cities and town inhabitants comprised almost 15% of the respondents. The smallest group of respondents live in cities of 100,000 to 199,999 inhabitants (Table 2).

Question 3 was based on the gender (257 answers). Women prevailed in the research sample, almost 60% (154 persons). Question 4, regarding age group, got 260 answers. The respondents aged 20-24 were the dominating group, almost ¾ of the research group. They were followed by the respondents from the '25-34' and 'up to 19' groups 10% each (Table 3).

Table 2. Locality of residence of respondents.

Locality	Number of respondents	Share [%]
village	45	17.37
town under 20,000 inhabitants	38	14.67
city 20,000 to 99,999 inhabitants	45	17.37
city 100,000 to 199,999 inhabitants	15	5.79
city 200,000 and more inhabitants	116	44.79
Total	**259**	**100**

Question 4 was based on the education of the respondents. The authors received 258 responses. Respondents with higher education prevailed – almost 60%. One-third of the research group had secondary and post-secondary college education (Table 4).

Question 5 regarded the average monthly net income ('on hand') and yielded 254 answers. Almost one third of the respondents has a net income of 2,061.68 to 4,077.34 PLN (EUR 440.53 to 871.23), which is below the average wages in Poland. Then the next group of respondents (31.9%) had a net income of 862.14 to 2,061.67 PLN (EUR 184.20 to 440.53), which is below the minimum wage level in Poland. Finally, 17.7% respondents declared the lowest possible net income, less than under 563.79 PLN (EUR 114.70) (Table 5).

Question 6 was: 'Are you afraid of migrants?'. The authors received 261 answers. Almost 56%

Table 3. Age group of respondents.

Age [years]	Number of respondents	Share [%]
under 19	26	10.00
20-24	193	74.23
25-34	26	10.00
35-44	10	3.85
45-54	1	0.38
55-64	2	0.77
65 and more	2	0.77
Total	**260**	**100**

Table 4. Education of respondents.

Education	Number of respondents	Share [%]
primary school	6	2.33
lower secondary school	3	1.16
vocational education	8	3.10
secondary school and post-secondary college	87	33.72
higher education	154	59.69
Total	**258**	**100**

Table 5. Average monthly net income of respondents.

Income*	Number of respondents	Share [%]
under 563.79 PLN (EUR 114.70)	45	17.72
563.79 to 862.13 PLN (EUR 114.70 to184.20)	18	7.09
862.14 to 2,061.67 PLN (EUR 184.20 to 440.53)	81	31.89
from 2,061.68 to 4,077.34 PLN (EUR 440.53 to 871.23)	84	33.07
from 4,077.35 to 5,113.66 PLN (EUR 871.23 to 1,092.66)	10	3.94
from 5,113.67 to 7,552.45 PLN (EUR 1,092.66 to 1,613.77)	12	4.72
more than 7,552.45 PLN (more than EUR 1,613.77)	4	1.57
Total	**254**	**100**

**'on hand'*

respondents (146 persons) said that they are not afraid of migrants. Then, the authors asked the question *"If a charity foundation was established ... etc.* (see section *Tools*) which received 261 responses. It allowed for calculation of the mode, median, and mean values for WTP. The monthly mode for WTP was PLN 0, the monthly median for WTP was PLN 10 and the monthly mean value for WTP was PLN 26.53. The WTP distribution turned out to be right-skewed because the mean value was higher than the mode (therefore, the median WTP was used for further calculations). We found out a very weak linear correlation between WTP and the level of income (Table 6).

Table 6. Correlation coefficients of WTP and characteristics of respondents.

	Variable	r
WTP with:	Respondent's place of residence	–0.048
	Respondent's age	–0.016
	Respondent's level of education:	0.007
	Respondent's income level	0.142

The yearly median for WTP is much greater than the amounts obtained in the earlier study's (Table 7).

Table 7. Comparison of the current study with previous study of Piepiora and Kujawa [12] – value in PLN.

Feature [yearly]	Previous study		Current study (n = 261)
	first (n = 94)	second (n = 77)	
Global value	2,970	2,275	83,078.76
Average	31.60	29.55	318.31
Maximum	150	200	4,800
Minimum	5	1	0
Lower quartile	10	10	0
Top quartile	50	30	360
Median	20	20	120
Dominant	10	10	0.00
Standard deviation	31.18	33.07	623.95

DISCUSSION

The contribution of the article is to fill in the knowledge gap concerning the public safety assessment of a migrant crisis that became apparent after the authors' query in the Web of Science database and in the Scopus database.

On February 24, 2022, Russia invaded Ukraine. On March 12, 2022, the Polish government adopted the Act of March 12, 2022, on aid to Ukrainian citizens in connection with an armed conflict in that country [34]. To date (March 16, 2022), Poland has accepted almost 2 million war refugees. The government has established numerous refugee reception points [35]. It turned out that Poles are not only not afraid of migrants, but have begun to spontaneously help war refugees, feed them, administer first aid, and take them to their homes and accommodation facilities [36].

Based on the research results, it was concluded that the value of public safety in Poland in the face of the migrant crisis amounted to PLN 210.8 billion (almost EUR 45 billion). Almost 56% of respondents said they are not afraid of migrants. The answer to the research question was negative. Pearson's linear correlation coefficient for WTP and the respondent's income level was 0.142 (a very weak correlation between the aforementioned items). However, it is worth nothing that a little less than half of the respondents were afraid of the migrants (44.1%) and that the respondent group consisted mainly of young people (up to 34 years of age) and inhabitants of the Lower Silesia province. The answer to research question is confirmed by the real-life situation that took place in Central and Eastern Europe in 2022.

At this point, the limitations of the study should be noted, which result from the limitations of the contingent valuation method itself: it bases on stated preferences and creates only hypothetical market. In the future, the research shall be extended to other countries of the European Union.

CONCLUSIONS

Most of the respondents are not afraid of migrants in the light of the migration crisis in Central and Eastern Europe in 2022. Such a result should encourage further in-depth analyses of the broadly understood phenomena of personal security and social security, taking into account also other empirical variables including.

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