ANNEX

CALCULATING THE SIZE OF THE HUMAN SMUGGLING MARKET

Spot Prices:

Analyzing Flows of People, Drugs and Money in the Western Balkans

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CONTENTS

Introduction and assumptions

This section explains the calculations made in order to estimate the value generated by migrant smuggling in the following zones:

- Border between Bosnia and Herzegovina, and Croatia
- Serbian borders with Hungary and Romania
- Greek borders with Albania and North Macedonia

Before calculating, it is important to clarify a number of assumptions and concepts that apply to each of the three zones:

The total population t

The 'total population' refers to the number of individuals who actively contribute to the generation of the market. Each time the terms 'population' or 'total population' are mentioned, they should be understood as the active population, or t.

This said, the calculation of t in each country is based on the following assumptions:

a) Interviews conducted with migrants throughout the region suggest that they enter the Western Balkans (WB6) from the southern border with Greece relatively quickly: within two to three weeks, they are able to move from the Greek border with North Macedonia (where only 13 migrants were intercepted in 2020[1]) to Serbia and then from Serbia to Una Sana Canton in Bosnia and Herzegovina (BiH). Here, migrants frequently stay for a minimum of three months; a few stay for up to two years.[2] The following periods have been calculated (weighted and or/simple means) as the average period of stay in these countries/regions:

1) Six months in Una Sana Canton (BiH)
2) Six months in Serbia (mostly Vojvodina)
3) Two months in Albania, North Macedonia, Kosovo and Montenegro.

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[1] Interviews conducted with migrants at the centre for crisis management facilities 'PTC Vinojug Gevgelia', North Macedonia, March 2021.
[2] Interviews conducted with migrants in Bihac, March 2021.

According to interviewees in Una Sana Canton, the vast majority of migrants in this area are young men aged between 16 and 27.[3] They are mostly unmarried; those with a family have left the other members in Turkey or in their country of origin.[4]

b) The migratory flows follow a defined trajectory going from south-east to north-west, unless evidence suggests otherwise.

c) Pushbacks conducted by border officials are to be understood as attempts to cross the borders with success rates near zero. In many cases, however, fees (or portions of them) are paid to smugglers before migrants get pushed back or arrested. To take this into account, a percentage of the total number of pushbacks registered will be taken into consideration when calculating the total active population t.

In the absence of more detailed data, evidence from the Greek–Albanian border will be used as a model to be applied to the rest of the region: 70% of the total pushbacks were recorded during the migrants' first attempt to cross the border, while the remaining 30% of pushbacks are made during their second or subsequent attempts.[5] Evidence suggests that migrants caught by the police have paid the smugglers for their first attempt. From the second attempt onward, as they start running out of money, they attempt the crossing without paying for or receiving assistance from the smugglers.

The difference between the number of mixed migrants at the end of 2019 and the end of 2020 gives us an idea of how many people left a given country under observation. The biggest risk to acknowledge when applying this logic is that despite the exceptionally strict restrictions put in place in 2020, the formula fails to take into consideration any migrants who entered a given country and managed to exit it in less than a year. To partially fill this gap:

• Assumptions a1), a2) and a3) will be applied to the total t of each area under analysis.

• The population that left relevant neighbouring countries in the same year will be added to the total population in the country under analysis. In other words, following

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[3] Interview conducted with an inspector from SIPA (Agency for Investigation and Protection), November 2020.
[4] Ibid.
[5] Interview with the director of the Albanian State Police Border and Migration Department, Eduard Merkaj, March 2020.

assumption b), it is possible to add all those migrants who probably entered the country under analysis for transit purposes by adding the result of the same calculation in neighbouring countries positioned at the southern, eastern and south-eastern borders (if any).

This leads to a final assumption:

d) The number of migrants in a neighbouring country in 2020 might be higher than in 2019. This would suggest that migrants entered country X in an attempt to get to country Y, but have not succeeded because of the reasons cited in assumption c). In this case, the total population t is modified (i.e. reduced) accordingly, by taking into account all those who for any reason are not in country X.

The prices

Information on the prices paid to smugglers has been collected through interviews with different stakeholders. In case of multiple sources for a single price, the final price adopted is the simple mean of the various estimates.

The success/failure coefficient $\mathbb{R}$

It is reasonable to include in the formula something that would account for the failure risk of each smuggling 'service'. In practical terms, $\mathbb{R}$ consists of a coefficient that can be directly applied to each route and migrant group, weighting the estimations with a failure rate that goes from 0 to 100%. In detail:

$0 \geq \mathbb{R} \geq 1$

For instance, if $\mathbb{R} = 0.1$, the success/failure coefficient would imply that one out of ten migrants make it through the border on the first paid attempt.[6]

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[6] A different success/failure rate is valid for each route (and price), which is calculated based on information gathered through interviews.

Borders between Bosnia and Herzegovina, and Croatia

The following section illustrates how the market value is calculated for two distinct sections of the Bosnian border: Una Sana Canton around Bihac and the border crossing in the Brcko District.

Una Sana Canton

Legend:

t_{USC} : migrants in Una Sana Canton

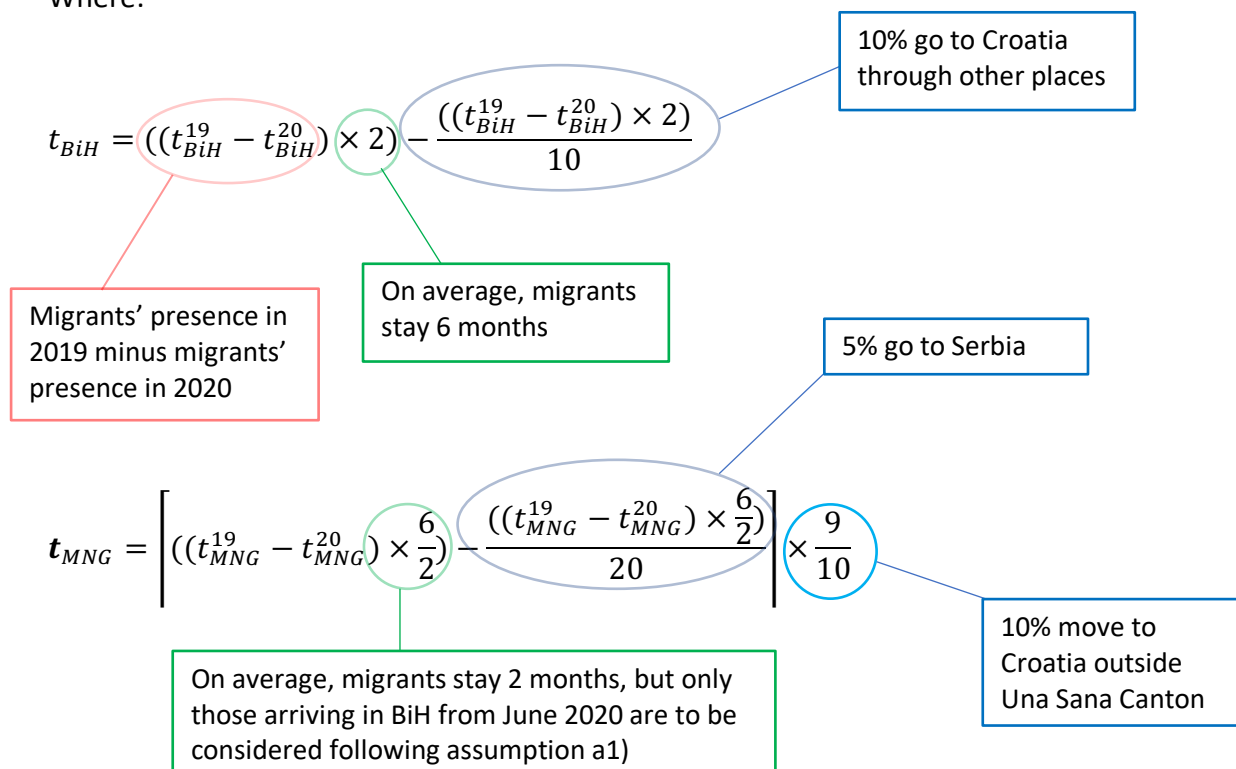t_{BiH} : migrants in Bosnia and Herzegovina

t_{MNG} : migrants from Montenegro

t_{SRB} : migrants from Serbia

Formula for the calculation of t:

$$t_{USC} = t_{BiH} + t_{MNG} + t_{SRB} + t_{*Active\ PB}$$

Where:

$$t_{BiH} = ((t_{BiH}^{19} - t_{BiH}^{20}) \times 2) - \frac{((t_{BiH}^{19} - t_{BiH}^{20}) \times 2)}{10}$$

10% go to Croatia through other places

Migrants' presence in 2019 minus migrants' presence in 2020

On average, migrants stay 6 months

5% go to Serbia

$$t_{MNG} = \left[((t_{MNG}^{19} - t_{MNG}^{20}) \times \frac{6}{2}) - \frac{((t_{MNG}^{19} - t_{MNG}^{20}) \times \frac{6}{2})}{20} \right] \times \frac{9}{10}$$

On average, migrants stay 2 months, but only those arriving in BiH from June 2020 are to be considered following assumption a1)

10% move to Croatia outside Una Sana Canton

$$t_{SRB} = \left[-\left((t_{SRB}^{20} - t_{SRB}^{19}) \times \frac{2}{2}\right) - \frac{\left(-\left((t_{SRB}^{20} - t_{SRB}^{19}) \times \frac{2}{2}\right) \times 9\right)}{10}\right] \times \frac{9}{10}$$

Net migration in Serbia is positive, so here it applies assumption d)

10% go to Croatia outside Una Sana Canton

Available data:

$t_{BIH}^{19} = 29\ 196$

$t_{BIH}^{20} = 16\ 211$

$t_{MNG}^{19} = 8\ 695$

$t_{MNG}^{20} = 2\ 898$

$t_{SRB}^{19} = 30\ 419$

$t_{SRB}^{20} = 39\ 648$

So:

$t_{BiH} = 23\ 373$

$t_{MNG} = 14\ 869$ The sum is 37 412

$t_{SRB} = -830$

The prices ρ distribute to the categories of t_{USC}

Prices are distributed based on the category of the population t: young men (ym) and families (fam).

Based on interviews conducted with migrants in reception centers in Una Sana Canton as well as camp officials, the total population t can be roughly divided as follows:[7]

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[7] Interviews conducted with migrants in Bihac, March 2021.

- Three-quarters of the population is composed of young men. Of these, a quarter move through Una Sana without paying anything to the smugglers. The remaining three-quarters pay a price ρ^{ym} of €400 to get to Croatia.

The final formula for the calculation of the portion of t that pays €400 is then:

$$t_{USC}^{ym} = \left(t_{USC} \times \frac{3}{4} \times \frac{3}{4}\right) \gg t_{USC}^{ym} = \frac{9\,t_{USC}}{16}$$

- A quarter of the population is composed of families. Of these, a quarter are smuggled through the Balkans, but pay outside the region. The remaining three-quarters pay different prices in Una Sana Canton to reach either Croatia, Slovenia or Italy.

The final formula for the calculation of the portion of t composed by families is therefore:

$$t_{USC}^{fam} = \left(t_{USC} \times \frac{1}{4} \times \frac{3}{4}\right) \equiv t_{USC}^{fam} = \frac{3\,t_{USC}}{16}$$

For each final destination, a different portion of the population pays a different price.[8] In detail:

- $\frac{3}{4}$ of t_{USC}^{fam} pays a ρ_{CRO} of €1 500 to get to Croatia

The portion of t paying ρ_{CRO} is then calculated as follows:

$$t_{\rho_{CRO}}^{fam} = \frac{\left(\frac{3\,t_{USC}}{16} \times \frac{3}{4}\right)}{4}$$

> The price paid is for 4 individuals (families composed of a couple and 2 children)

- $\frac{1}{5}$ of t_{USC}^{fam} pays a ρ_{SLO} of €1 700 to get to Slovenia

The portion of t paying ρ_{SLO} is then calculated as follows:

$$t_{\rho_{SLO}}^{fam} = \frac{\left(\frac{3\,t_{USC}}{16} \times \frac{1}{5}\right)}{4}$$

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[8] The same proportions apply to the total pushbacks.

- $\frac{1}{20}$ of t_{USC}^{fam} pays a ρ_{ITA} of €2 500 to get to Italy (Trieste)

The portion of t paying ρ_{ITA} is then calculated as follows:

$$t_{\rho_{ITA}}^{fam} = \frac{(\frac{3\,t_{USC}}{16} \times \frac{1}{20})}{4}$$

The failure coefficient $\mathbb{R}$ and the single market values per category of migrant

In the case of young men, all the migrants interviewed in Una Sana affirmed that they have tried to cross the border at least once.[9] However, Croatian border authorities are reportedly arresting many young migrants and sending them back. Evidence suggests that around seven in ten migrants successfully cross the border without getting caught by police: the success rate applied to this category is 0.7.

$$\mathbb{R}_{USC}^{ym} = 0.7$$

In the case of families, evidence suggests that they are more successful in getting to their final destination, especially because – having more to lose than single travellers – they tend to depend on more 'efficient' (therefore expensive) smuggling networks.

The general assumption is that higher prices correspond to better services and therefore a higher chance of success. However, the longer the distance to cover, the higher the failure rate. Interviews have shown how in Bihac there are families which have already tried to cross the border more than 10 times, but only paid smugglers for the first attempt. The success rate applied to the families with three different values of ρ are:

- Families going to Croatia have a success/failure rate of 80%, hence:

$$\mathbb{R}_{USC-CRO}^{fam} = 0.8$$

- Families going to Slovenia have a success/failure rate of 75%, hence:

$$\mathbb{R}_{USC-SLO}^{fam} = 0.75$$

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[9] Interviews conducted with migrants in Bihac, March 2021.

- Families going to Italy have a success/failure rate of 66%, hence:

$$\mathbb{R}^{fam}_{USC-ITA} = 0.66$$

The potential market value $\mathbb{V}$

The potential market value generated in Una Sana Canton can be understood as the simple sum of each portion of the population t that pays a price ρ with a relative success coefficient $\mathbb{R}$. Thus, the generic formula $\mathbb{V} = t \times \rho \times \mathbb{R}$ has to be applied to each category described above.

Therefore:

- The market value generated by young men crossing into Croatia from Una Sana Canton is:

$$\mathbb{V}^{ym}_{USC} = t^{ym}_{USC} \times \rho^{ym}_{USC} \times \mathbb{R}^{ym}_{USC} \gg \mathbb{V}^{ym}_{USC} = \left(\frac{9\, t_{USC}}{16}\right) \times \rho^{ym}_{USC} \times 0.8$$

So: $\mathbb{V}^{ym}_{USC} = €6.4 \text{ million}$

- The market value generated by families smuggled into Croatia from Una Sana Canton is:

$$\mathbb{V}^{fam}_{USC\ to\ CRO} = t^{fam}_{USC\ to\ CRO} \times \rho^{fam}_{USC\ to\ CRO} \times \mathbb{R}^{fam}_{USC\ to\ CRO}$$

So: $\mathbb{V}^{fam}_{USC\ to\ CRO} = \dfrac{\left(\frac{3\, t_{USC}}{16} \times \frac{3}{4}\right)}{4} \times 1\,500 \times 0.80$

And: $\mathbb{V}^{fam}_{USC\ to\ CRO} = €1.57\ million$

- The market value generated by families smuggled into Slovenia from Una Sana Canton is:

$$\mathbb{V}^{fam}_{USC\ to\ SLO} = t^{fam}_{USC\ to\ SLO} \times \rho^{fam}_{USC\ to\ SLO} \times \mathbb{R}^{fam}_{USC\ to\ SLO}$$

So: $\mathbb{V}^{fam}_{USC\ to\ SLO} = \dfrac{\left(\frac{3\, t_{USC}}{16} \times \frac{1}{5}\right)}{4} \times 1\,700 \times 0.75$

And: $\mathbb{V}^{fam}_{USC\ to\ SLO} = €447\ 190$

- The market value generated by families smuggled into Italy from Una Sana Canton:

$$\mathbb{V}^{fam}_{USC\ to\ ITA} = t^{fam}_{USC\ to\ ITA} \times \rho^{fam}_{USC\ to\ ITA} \times \mathbb{R}^{fam}_{USC\ to\ ITA}$$

So: $\mathbb{V}^{fam}_{USC\ to\ ITA} = \dfrac{(\frac{3\ t_{USC}}{16} \times \frac{1}{20})}{4} \times 2\ 500 \times 0.66$

So: $\mathbb{V}^{fam}_{USC\ to\ ITA}\ €144\ 679$

The potential value generated by families in Una Sana Canton is:

$$\mathbb{V}^{fam}_{USC} = \mathbb{V}^{fam}_{USC\ to\ CRO} + \mathbb{V}^{fam}_{USC\ to\ SLO} + \mathbb{V}^{fam}_{USC\ to\ ITA}$$

So: $\mathbb{V}^{fam}_{USC} = 1.57 + 0.447 + 0.144 = €2.1\ \text{million}$

In conclusion, the 2020 potential market value in Una Sana Canton is calculated as follows:

$\mathbb{V}^{2020}_{USC} = \mathbb{V}^{ym}_{USC} + \mathbb{V}^{fam}_{USC} = 6.4 + 2.1 = €8.5\ \text{million}$

By applying a margin of error of $\pm 20\%$, the total potential market value would range from €6.8 million to €10.2 million.

Triangulation with pushbacks/deportations:

Total number of pushbacks by Croatian police = 15 672
Total number of deportations from Croatia = 7 210

The two totals are to be understood as two distinct results of the smuggling process. However, for this study, the total number of deportations will be added to the total number of pushbacks, because interviews suggest that, although they were caught by the police, migrants had often already paid smugglers to get across the border.

In both cases, the coefficient $\mathbb{R}$ is to be considered as a failure coefficient ($\mathbb{R}=1$), which indicates that 100% of migrants have been unsuccessful in getting into Croatia – either because they have been stopped (pushbacks) or because they have been caught soon after crossing the border and sent back to BiH (deportation).

$$t^{USC}_{PB\ 1\ attempt+deported} = t^{USC-pb}\frac{7}{10} = 10\ 970 + t_{deportation} = 10\ 970 + 7\ 210 = 18\ 180^{10}$$

By applying the same proportions used above, the volume generated by pushbacks is composed by:

- Young men:

$$\mathbb{V}^{ym}_{USC-pb} = t^{ym}_{USC-pb} \times \rho^{ym}_{USC} \times \mathbb{R}^{ym}_{USC-pb} \gg \mathbb{V}^{ym}_{USC-pb} = \left(\frac{9\ t_{USC-pb}}{16}\right) \times \rho^{ym}_{USC} \times 1$$

> In case of pushbacks the failure rate is 100% so $\mathbb{R}=1$

So: $\mathbb{V}^{ym}_{USC-pb} = \left(\frac{9 \times 18\ 180}{16}\right) \times 400 \times 1 = €4.1$ million

- The market value generated by families getting into Croatia from Una Sana Canton:

$$\mathbb{V}^{fam}_{USC\ to\ CRO} = t^{fam}_{USC\ to\ CRO} \times \rho^{fam}_{USC\ to\ CRO} \times \mathbb{R}^{fam}_{USC\ to\ CRO}$$

So: $\mathbb{V}^{fam}_{USC\ to\ CRO} = \dfrac{\left(\frac{3\ t_{USC-pb}}{16} \times \frac{3}{4}\right)}{4} \times 1\ 500 \times 1$

$$\mathbb{V}^{fam}_{USC\ to\ CRO} = \frac{\left(\frac{3\ t_{USC-pb}}{16} \times \frac{3}{4}\right)}{4} \times 1\ 500 \times 1$$

So: $\mathbb{V}^{fam}_{USC\ to\ CRO} = €958\ 710$

- The market value generated by families smuggled into Slovenia from Una Sana Canton:

$$\mathbb{V}^{fam}_{USC\ to\ SLO} = t^{fam}_{USC\ to\ SLO} \times \rho^{fam}_{USC\ to\ SLO} \times \mathbb{R}^{fam}_{USC\ to\ SLO}$$

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[10] Only those trying for the first time as considered as having paid smugglers.

So: $\mathbb{V}^{fam}_{USC\ to\ SLO} = \dfrac{\left(\frac{3\ t_{USC-pb}}{16} \times \frac{1}{5}\right)}{4} \times 1\ 700 \times 1$

And: $\mathbb{V}^{fam}_{USC\ to\ SLO} = €289\ 743$

- The market value generated by families smuggled into Italy from Una Sana Canton:

$$\mathbb{V}^{fam}_{USC\ to\ ITA} = t^{fam}_{USC\ to\ ITA} \times \rho^{fam}_{USC\ to\ ITA} \times \mathbb{R}^{fam}_{USC\ to\ ITA}$$

So: $\mathbb{V}^{fam}_{USC\ to\ ITA} = \dfrac{\left(\frac{3\ t_{USC-pb}}{16} \times \frac{1}{20}\right)}{4} \times 2\ 500 \times 1$

And: $\mathbb{V}^{fam}_{USC\ to\ ITA}\ €106\ 523$

The value generated by families pushed back or deported to Una Sana Canton is therefore:

$$\mathbb{V}^{fam}_{USC\ pb/dp} = \mathbb{V}^{fam}_{USC\ to\ CRO\ pb/dp} + \mathbb{V}^{fam}_{USC\ to\ SLO\ pb/dp} + \mathbb{V}^{fam}_{USC\ to\ ITA\ pb/dp}$$

So: $\mathbb{V}^{fam}_{USC} = 0.96 + 0.29 + 0.1 = €1.35$ million

In conclusion, the 2020 potential market value in Una Sana Canton generated by pushbacks and deportations is calculated as follows:

$$\mathbb{V}^{2020}_{USC\ pb\ and\ dep.} = \mathbb{V}^{ym}_{USC\ pb\ and\ dep} + \mathbb{V}^{fam}_{USC\ pb\ and\ dep} = 4.1 + 1.35 = €6.45\ \text{million}$$

By applying a margin of error of $\pm 20\%$, the total potential market value would range from €5.1 million to €7.74 million.

Brcko District

This section shows the calculation of the market generated by migrants trying to cross the Bosnian–Croatian border from Una Sana Canton across the Sava River.

The total active population $t_{BiH(Other)}$ is calculated as follows:

$$t_{BiH(Other)} = t_{BiH} + t_{MNG} + t_{SRB}$$

Where:

$$t_{BiH} = ((t_{BiH}^{19} - t_{BiH}^{20}) \times 2) - \boxed{\frac{((t_{BiH}^{19} - t_{BiH}^{20}) \times 2) \times 9}{10}}$$

$$t_{MNG} = \frac{\left[((t_{MNG}^{19} - t_{MNG}^{20}) \times \frac{6}{2}) - \frac{\left((t_{MNG}^{19} - t_{MNG}^{20}) \times \frac{6}{2}\right) \times 9}{20} \right]}{10}$$

$$t_{SRB} = \frac{\left[-((t_{SRB}^{20} - t_{SRB}^{19}) \times \frac{2}{2}) - \frac{(-((t_{SRB}^{20} - t_{SRB}^{19}) \times \frac{2}{2}) \times 9}{10} \right]}{10}$$

$t_{BiH} = 2\,597$

$t_{MNG} = 1\,652$ — The sum is 4 157

$t_{SRB} = -92$

Reportedly, the price paid for crossing the Sava River $\rho_{Sava\ river}$ is €250, with no distinctions made between families and young men.

$$t_{BiH(Other)} = 2\,597 + 1\,652 - 92 = 4\,157$$

For this reason, it is possible to apply only one $\mathbb{R}$, since young men and families are paying the same rate.

There are fewer people than in Una Sana who try to cross the Sava, because this part of Croatia is geographically still far from western Europe. However, although no pushbacks are reported to be happening, entering Croatia in this area would mean a longer journey through Croatian territory and thus a higher risk of being caught by police on the way to the West.

Given the comparable ease of crossing the river, the success rate applied to this route is relatively high. Here, the $\mathbb{R}$ assigned is 70%: seven out of 10 successfully cross the river. Therefore:

$\mathbb{R} = 0.7$

In conclusion, the potential total market value generated in Brcko district $\mathbb{V}^{tot}_{BiH\,(Other)}$ in 2020 is calculated as follows:

$$\mathbb{V}^{tot}_{BiH\,(Other)} = t_{BiH(Other)} \times \rho_{Sava\,river} \times \mathbb{R}_{Sava\,river}$$

So: $\mathbb{V}^{tot}_{BiH\,(Other)} = 4\,157 \times 250 \times 0.7 \equiv \mathbb{V}^{tot}_{BiH\,(Other)} = €727\,475$

Serbian borders with Hungary and Romania

This section shows the basis for the calculation of the market generated by migrants trying to cross the Serbian borders with Hungary and Romania.[11]

The total active population $t_{SRB-HUN}$ is calculated as follows:

> Following assumption b) for this total, we have to consider migrants coming from North Macedonia and Kosovo.

$$t_{SRB\,north} = t_{SRB} + t_{MNG} + t_{BiH} + t_{NMK} + t_{KOS}$$

Where:

$$t_{SRB} = ((t^{20}_{SRB} - t^{19}_{SRB}) \times \frac{2}{2}) - \frac{((t^{20}_{SRB} - t^{19}_{SRB}) \times \frac{2}{2})}{20}$$

> 5% go to BiH

t_{SRB}: data from Serbia shows an increase of 9 000 mixed migrants in 2020 over 2019. This shows that overall, in 2020 more migrants arrived in Serbia than were able to leave the country. The total $t^{20}_{SRB} - t^{19}_{SRB}$ = 9 229 shows the difference, but this is just a portion of all those who actively participated in the generation of the business. This observation is supported by interviews conducted in Serbia in March 2021. Although migrants are

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[11] Bulgaria is not taken into account because evidence from police reports and interviews with migrants indicates that the number of entries from Bulgaria was almost zero in 2020.

understood to spend on average six months in Serbia (assumption a)), there are cases of migrants (especially those older than 40 years of age) staying in Serbia for a year or more.[12]

$$t_{MNG} = \left((t_{MNG}^{19} - t_{MNG}^{20}) \times \frac{6}{2}\right) - \left[\left((t_{MNG}^{19} - t_{MNG}^{20}) \times \frac{6}{2}\right)\right] \times \frac{19}{20}$$

95% go to BiH

$$t_{BiH} = \left((t_{BiH}^{19} - t_{BiH}^{20}) \times 2\right) - \left[\left((t_{BiH}^{19} - t_{BiH}^{20}) \times 2\right)\right] \times \frac{19}{20}$$

5% go to SRB

$$t_{NMK} = \left(-(t_{NMK}^{20} - t_{NMK}^{19}) \times \frac{6}{2}\right) - \frac{\left[\left(-(t_{NMK}^{20} - t_{NMK}^{19}) \times \frac{6}{2}\right)\right]}{10}$$

10% go to KOS

$$t_{KOS} = \left((t_{KOS}^{19} - t_{KOS}^{20}) \times \frac{6}{2}\right) - \left[\left((t_{KOS}^{19} - t_{KOS}^{20}) \times \frac{6}{2}\right)\right] \times \frac{2}{3}$$

66% go to MNG

So:

$t_{SRB} = 8\,767$

$t_{MNG} = 870$

$t_{BiH} = 1\,300$

$t_{NMK} = -999$

$t_{KOS} = 171$

So, if: $t_{SRB\,north} = t_{SRB} + t_{MNG} + t_{BiH} + t_{NMK} + t_{KOS}$

Then: $t_{SRB\,north} = 8\,767 + 870 + 1\,300 - 999 + 171 = 10\,109$

Prices ρ in the $t_{SRBnorth}$ categories

Interviews conducted in Subotica show that approximately half of the migrants in Serbia try to cross the border into Romania; the other half cross towards Hungary. Most migrants interviewed in northern Serbia affirmed that they had tried to cross the borders up to seven times. They stated that they had paid the full price to smugglers the first time, but

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[12] Interview conducted with migrants in Subotica, March 2021.

subsequently tried on their own because they had run out of money. Very few of them pay smugglers a second time, even if they receive money from their families.

There is no strong data on the gender or ages of migrants in the Subotica area, but those interviewed were all males between aged between 18 and 50. Therefore, no distinction will be made in the calculation between men and families; they will all be counted as single individuals.

The prices ρ in the Subotica area are as follows:

Border with Hungary

- Price to be smuggled into Hungary through a risky tunnel $\rho_{H1} = €700$
- Price to be smuggled into Hungary through a safer tunnel $\rho_{H2} = €5\,000$
- Price to be smuggled across the border into Hungary (at Mórahalom) $\rho_{H3} = €350$
- Price to be smuggled across the border into Hungary (via Romania) $\rho_{H4} = €200$

Interviews suggest that crossing the border with Hungary is very risky because even when using tunnels, the exits are constantly monitored by Hungarian police and migrants are immediately pushed back.

Interviews suggest that most migrants tend to jump across, cut through or crawl under fences, because this is cheaper. Should they get caught, they simply keep trying on their own until they succeed – without paying a smuggler.

- Based on information collected on the ground, approximately 20% of the total mixed migrant population are understood as having tried the risky tunnel option. Migrants are unlikely to go for this option, as the failure rate is rather high: 70%, meaning seven in 10 pay the price but do not make it.

    The potential market value generated by this category is:

$$\mathbb{V}_{Price\ 1}^{SR-HUN} = 20\%\ t_{SRBnorth} \times \rho_{H1} \times \mathbb{R}_{H1}$$

So: $\mathbb{V}_{Price\ 1}^{SR-HUN} = \frac{10\ 109}{5} \times 700 \times 0.7 = €990\ 682$

- According to information collected in the field, approximately 10% of the total mixed migrant population have tried the safer tunnel option. Here the failure rate is still high, but lower than the riskier tunnels. It also more expensive, which makes migrants less likely to opt for this route. The failure rate is 50%: half pay the price but do not make it.

  The potential market value generated by this category is:
  $$\mathbb{V}_{Price\ 2}^{SR-HUN} = 10\%\ t_{SRBnorth} \times \rho_{H2} \times \mathbb{R}_{H2}$$

So: $\mathbb{V}_{Price\ 2}^{SR-HUN} = \frac{10109}{10} \times 5\ 000 \times 0.5 = €2.52\ \text{million}$

- Based on information collected on the ground, approximately 40% of the total population have tried to scale fences to get to the Hungarian town of Mórahalom. Here the failure rate is high, but lower than in the case of tunnel routes. The failure rate is 40%: four out of 10 pay the price, but do not make it.

  The potential market value generated by this category is:
  $$\mathbb{V}_{Price\ 3}^{SR-HUN} = 40\%\ t_{SRBnorth} \times \rho_{H3} \times \mathbb{R}_{H3}$$

So: $\mathbb{V}_{Price\ 3}^{SR-HUN} = \frac{2 \times 10\ 109}{5} \times 350 \times 0.4 = €566\ 104$

- According to information collected in the field, the remaining 30% of the total population have tried to scale fences and get to Hungary via Romania. Here the failure rate is still high, but lower than with the tunnels. Because of the cheaper price, the failure rate is 50%: half pay the price, but do not make it.

  The potential market value generated by this category is:
  $$\mathbb{V}_{Price\ 4}^{SR-HUN} = 30\%\ t_{SRBnorth} \times \rho_{H4} \times \mathbb{R}_{H4}$$

So: $\mathbb{V}_{Price\ 4}^{SR-HUN} = \frac{3 \times 10\ 109}{10} \times 200 \times 0.5 = €303\ 270$

The total potential market value generated at the border with Hungary is hence calculated as follows:

$$\mathbb{V}_{total}^{SR-HUN} = \mathbb{V}_{Price\ 1}^{SR-HUN} + \mathbb{V}_{Price\ 2}^{SR-HUN} + \mathbb{V}_{Price\ 3}^{SR-HUN} + \mathbb{V}_{Price\ 4}^{SR-HUN}$$

So: $\mathbb{V}_{total}^{SR-HUN} = 0.99 + 2.52 + 0.56 + 0.30 = €4.37$ million

Border with Romania

Interviews and evidence from law enforcement authorities suggest that crossing the border with Romania is increasingly popular among migrants. They usually cross the border, then immediately turn west and try to enter Hungary. Evidence from interviews suggests the existence of two main prices paid by migrants:

- Price to be smuggled to Romania with fake documents $\rho_{R1} = €6\ 500$
- Price to be smuggled to Romania without documents $\rho_{R2} = €2\ 000$

Given the high number of pushbacks by Romanian police, this route is to considered to be extremely risky: most migrants have tried many times (from five to 25 times)[13] to cross the border but the Romanian police are vigilant, using drones and GPS systems in their surveillance.

- Based on information collected on the ground, only one person in 10 (10%) of the total population has tried the first option. This option is extremely expensive and most likely quite rare. Many of the migrants we interviewed have tried many times without paying, although they said they 'knew somebody' who paid this amount once. Here, the failure/success rate is 20%: around one in five pay the price, but do not make it.

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[13] Interview conducted with migrants in Subotica, March 2021.

The potential market value generated by this category is:

$$\mathbb{V}_{Price\ 1}^{SR-ROM} = 25\%\ t_{SRBnorth} \times \rho_{R1} \times \mathbb{R}_{R1}$$

So: $\mathbb{V}_{Price\ 1}^{SR-ROM} = \frac{10\ 109}{10} \times 6\ 500 \times 0.2 = €1.31$ million

- Based on information collected on the ground, nine out of 10 people (90%) of the total population have likely tried the second option. This route to Romania is still rather expensive. As in the previous case, most migrants interviewed 'know somebody' who paid this amount once. Here, the failure/success rate is 20%: around one in five pay the price, but do not make it.

The potential market value generated by this category is:

$$\mathbb{V}_{Price\ 2}^{SR-ROM} = 90\%\ t_{SRBnorth} \times \rho_{R1} \times \mathbb{R}_{R1}$$

So: $\mathbb{V}_{Price\ 2}^{SR-ROM} = \frac{9 \times 10\ 109}{10} \times 2\ 000 \times 0.2 = €3.6$ million

The total potential market value generated at the border with Romania is then calculated as follows:

$$\mathbb{V}_{Total}^{SR-ROM} = \mathbb{V}_{Price\ 1}^{SR-ROM} + \mathbb{V}_{Price\ 2}^{SR-ROM} = 1.31 + 3.6 = €4.91\ \text{million}$$

The total potential market value generated in the north of Serbia at the borders with Hungary and Romania is:

$$\mathbb{V}^{SRB-north} = \mathbb{V}^{SR-HUN} + \mathbb{V}^{SR-ROM} = 4.37 + 4.91 = €9.28\ \text{million}$$

By applying a margin of error of $\pm 20\%$, the total potential market value would range from €7.43 million to €11.13 million.

Triangulation with pushbacks/deportations:

Total number of pushbacks at the Hungarian border: 672

Total number of pushbacks at the Romanian border: 12 735

By applying assumption c), only 70% of the total pushbacks registered are to be considered as first attempts (for which migrants paid).

In this scenario, the active total number of pushbacks at the Hungarian border is:
$$t_{active}^{HUN} = 70\% \, t^{HUN}$$

So: $t_{active}^{HUN} = \frac{7 \times 672}{10} = 471$

In both cases, the coefficient $\mathbb{R}$ is to be considered a failure coefficient ($\mathbb{R}=1$), which indicates that 100% of the paying migrants have been unsuccessful in getting through the borders. The following calculations apply the same proportions used above:

Hungary

- $\mathbb{V}_{PB-Price\ 1}^{SR-HUN} = \frac{471}{5} \times 700 \times 1 = €65\ 940$

- $\mathbb{V}_{PB-Price\ 2}^{SR-HUN} = \frac{471}{10} \times 5\ 000 \times 1 = €240\ 000$

- $\mathbb{V}_{PB-Price\ 3}^{SR-HUN} = \frac{2 \times 471}{5} \times 350 \times 1 = €66\ 000$

The total value generated at the border with Hungary by the attempts thwarted by the Serbian police is calculated as follows:
$$\mathbb{V}_{PB-total}^{SR-HUN} = \mathbb{V}_{PB-Price\ 1}^{SR-HUN} + \mathbb{V}_{PB-Price\ 2}^{SR-HUN} + \mathbb{V}_{PB-Price\ 3}^{SR-HUN}$$

So: $\mathbb{V}_{PB-total}^{SR-HUN} = 65\ 940 + 240\ 000 + 66\ 000 = €371\ 940$

We have to add to this number the value generated by those migrants who were intercepted by the Hungarian police. The only official data on this is a total of 4 903 pushbacks reported

by Hungarian authorities from December 2020 until February 2021.[14] With little information on the total until December 2020, the following calculation is made by dividing a one-year period into three four-month sub-periods:

$$t_{feb20-jun20} \qquad t_{jul20-oct20} \qquad t_{nov20-feb21}$$

This assumes that the total number of pushbacks is 60% less in the second period than in the third and 20% less in the first period than in the second. In this sense,

$$t_{PB} = t_{feb20-jun20} + t_{jul20-oct20} + t_{nov20-feb21}$$

Where: $t_{dec20-feb21} = 4\,903$

$$t_{jul20-oct20} = t_{nov20-feb21} - \frac{t_{nov20-feb21} \times 3}{5} \quad \text{and} \quad t_{feb20-june20} = t_{jul20-oct20} - \frac{t_{jul20-oct20}}{5}$$

So: $t_{jul20-oct20} = 1\,961$ and $t_{feb20-june20} = 1\,568$

Then, if $t_{PB} = t_{feb20-june20} + t_{jul20-oct20} + t_{nov20-feb21}$ then $t_{PB-HUN} = 6\,662$

We also apply assumption c) to the total. Thus, the number of active pushbacks is calculated as follows:

$$t_{active}^{HUN} = 70\%\, t^{PB-HUN} = \frac{7 \times 6\,662}{10} = 4\,663$$

The total value generated at the border with Hungary by the attempts prevented by the Hungarian police is then calculated as follows:

- $\mathbb{V}_{PB-Price\ 1}^{SR-HUN} = \frac{4\,663}{5} \times 700 \times 1 = €652\,875$

- $\mathbb{V}_{PB-Price\ 2}^{SR-HUN} = \frac{4\,663}{10} \times 5\,000 \times 1 = €2.3 \text{ million}$

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[14] Emma Wallis, Hungary: 4,903 pushbacks after EU Court declared them illegal, Info Migrants, 1 February 2021, https://www.infomigrants.net/en/post/29944/hungary-4-903-pushbacks-after-eu-court-declared-them-illegal.

- $\mathbb{V}^{SR-HUN}_{PB-Price\,3} = \frac{2\times4\,663}{5} \times 350 \times 1 = €652\,820$

And: $\mathbb{V}^{SR-HUN}_{PB-tot} = \mathbb{V}^{SR-HUN}_{PB-Price\,1} + \mathbb{V}^{SR-HUN}_{PB-Price\,2} + \mathbb{V}^{SR-HUN}_{PB-Price\,3}$

So: $\mathbb{V}^{SR-HUN}_{PB-tot} = 0.65 + 2.3 + 0.65 = €3.6$ million

In total, the value generated by the pushbacks from both the Serbian and Hungarian authorities is the simple sum of the two values just calculated:

$\mathbb{V}^{SR-HUN\,1-2}_{PB-tot} = 3.6 + 0.3 = €3.9$ million

Romania

In the case of Romania, interviews suggest that migrants paying for the smuggling option including fake documents (€6 500) have a better chance of a successful result to the smuggling process. Evidence further suggests migrants refer to getting into Romania as 'the game': they go, try and get pushed back to Subotica. Almost nobody pays and they try on average five or six times after paying the first time.

So, the total market value generated by pushbacks should take into consideration that five out of six attempts do not include any sort of payment. For this reason, the portion of people considered to be actively paying smugglers to get to Romania should not be based on assumption c) (70%), but on the considerably lower estimate of 25%. This means that one in four migrants trying to get to Romania pay €2 000, while the other three-quarters do not pay anything.

So: $t^{ROM}_{active\,PB} = 25\% t^{ROM}_{PB} = 3\,183$

$\mathbb{V}^{SR-ROM}_{PB-tot} = 90\% \, t^{ROM}_{activePB} \times \rho_{R2} \times \mathbb{R}_{R2}$

So: $\mathbb{V}^{SR-ROM}_{PB-tot} = \frac{9\times3\,183}{10} \times 2\,000 \times 1 = €5.7$ million

The total value generated by pushbacks on the northern borders of Serbia with Hungary and Romania is then the simple sum of the two values calculated above:

$$\mathbb{V}_{PB-tot}^{SR-ROM-HUN} = \mathbb{V}_{PB-tot}^{SR-ROM} + \mathbb{V}_{PB-tot}^{SR-HUN\ 1-2}$$

So: $\mathbb{V}_{PB-tot}^{SR-ROM-HUN} = 5.7 + 3.9 = €9.6\ \text{million}$

Greek borders with Albania and North Macedonia

This section illustrates the calculation made to estimate the potential market value in selected spots along the borders between Greece and North Macedonia as well as between Greece and Albania.

In the absence of data gathered at the border between Greece and Albania, it has not been possible to quantify how many migrants present in Greece in 2020 entered the Western Balkans via the southern border in Albania or North Macedonia. However, the following information and clarifications help to better understand different flow directions:

a) Of the migrants present in Greece, a third to a half of the total reportedly stay on the Greek islands and attempt to reach Italy or other western European countries by boat or plane.

b) Interviews conducted in North Macedonia and Serbia in March 2021 have shown that migrants tend to stay on average five months in Greece prior to reaching the WB6 (or Bulgaria).[16]

c) According to Albanian law enforcement authorities, police have carried out a total of 18 700 pushbacks at the border with Greece. As 13 000 of these were registered as first attempts, this amount will be taken into consideration as the potential active population in Albania ($t_{GRE-ALB}^{20}$).

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[16] Interviews with migrants in North Macedonia, March 2021.

d) According to Info Migrants, a total of 9 682 migrants entered Greece from Turkey in 2020. This amount will be added to the potential total population accounted for in Greece ($t_{TUR-GRE}^{2020}$). The assumptions on length of stay in point b) will also apply to this amount.[17]

Border with North Macedonia

With the above considerations in mind, the potential population for this area is calculated as follows:

$$t_{GRE-NMK} = t_{GRE} + t_{TUR-GRE} - t_{GRE-ALB}$$

Where:

$$t_{GRE-NMK} = \left((t_{GRE}^{19} - t_{GRE}^{20}) \times \frac{12}{5}\right) - \frac{\left((t_{GRE}^{19} - t_{GRE}^{20}) \times \frac{12}{5}\right)}{\frac{2}{5}} + t_{TUR-GRE} - t_{GRE-ALB}$$

assumption b) — assumption a)

So:

$$t_{GRE-NMK} = \left((112\,300 - 95\,000) \times \frac{12}{5}\right) - \frac{\left((112\,300 - 95\,000) \times \frac{12}{5}\right)}{\frac{5}{2}} + 9\,682$$
$$- 13\,000$$

So: $t_{GRE-NMK} = 21\,594$

Interviews conducted with migrants, NGO representatives and investigative journalists show that the price ρ paid to be smuggled from Greece to either the North Macedonian border with Serbia or settlements in the Presevo Valley (Serbia) can vary from a minimum of €800 to a maximum of €1 000, with no observed differences in cost between people travelling alone, in groups or as a family. For this calculation, a simple mean amounting to €900 has been calculated as:

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[17] Sertan Sanderson, Number of migrant arrivals from Turkey declining sharply, Info Migrants, 10 August 2020, https://www.infomigrants.net/en/post/26548/number-of-migrant-arrivals-from-turkey-declining-sharply.

$$\rho_{GRE-NMK} = 900$$

Regarding the success/failure rate, interviews conducted with migrants in North Macedonia show a relatively high success rate in crossing the border and getting into North Macedonian territory. Roughly three-quarters of the interviewees declared that they were able to enter the country on their first attempt. For this reason, the success rate applied to this calculation amounts to 75%:

$$\mathbb{R}_{GRE-NMK} = 0,75$$

The potential market value at the border between Greece and North Macedonia is therefore calculated as follows:

$$\mathbb{V}^{2020}_{GRE-NMK} = t_{GRE-NMK} \times \rho_{GRE-NMK} \times \mathbb{R}_{GRE-NMK}$$

So: $\mathbb{V}^{2020}_{GRE-NMK} = 21\,594 \times 900 \times 0.75 = €14 \text{ million}$

By applying a $\pm$ 20% margin of error, the value ranges from €11.2 to €16.5 million.

Calculation with the total number of pushbacks

As reported by Info Migrants, according to the Macedonian police there have been a total of 25 000 intercepted attempts to cross the border between Greece and North Macedonia.

Therefore, for this calculation, 25 000 is the value given to the new total population t_{PB} (total pushbacks). Also, in the absence of specific data on the number of attempts per migrant, general assumption c) will be applied.

So if: $\mathbb{V}^{2020}_{PB} = t_{PB} \times \rho_{GRE-NMK} \times \mathbb{R}_{(c)}$

Then: $\mathbb{V}^{2020}_{PB} = 25\,000 \times 900 \times 0.7 = €15.7 \text{ million}$

By applying a $\pm$ 20% margin of error, the value ranges from €12.7 to €18.7 million.

Border with Albania

In the absence of specific data on the number of migrants in this area, the total potential population $t_{GRE-ALB}$ calculated here follows the approach taken for the border between Greece and North Macedonia, but with the total number of pushbacks from North Macedonia instead of Albania. Thus:

$$t_{GRE-ALB} = t_{GRE} + t_{TUR-GRE} - t_{PB-NMK}$$

Where: $t_{GRE-ALB} = \left((t_{GRE}^{19} - t_{GRE}^{20}) \times \frac{12}{5} \right) - \dfrac{\left((t_{GRE}^{19} - t_{GRE}^{20}) \times \frac{12}{5} \right)}{\frac{2}{5}} + t_{TUR-GRE} - t_{PB-NMK}$

So if:

$$t_{GRE-ALB} = \left((112\,300 - 95\,000) \times \frac{12}{5} \right) - \frac{\left((112\,300 - 95\,000) \times \frac{12}{5} \right)}{\frac{5}{2}} + 9\,682$$
$$- 25\,000$$

Then: $t_{GRE-ALB} = 9\,594$

Interviews conducted with migrants, NGO representatives and migrants' legal representatives show that the price ρ paid to be smuggled from Greece to Albania can vary from a minimum of €400 to a maximum of €2 000, with no observed differences between people travelling alone, in groups or with a family. For this calculation, a simple mean amounting to €1 200 has been calculated:

$$\rho_{GRE-ALB} = 1\,200$$

Regarding the success/failure rate, interviews conducted with migrants and law enforcement authorities in Albania and Greece show a relatively high success rate in crossing the border and getting into Albanian territory. According to Albanian police sources, information on how many migrants are present on Albanian territory is rather confusing, as reports with

contrasting numbers come from many different stakeholders.[18] This, in addition to the very scarce official statistics from the Greek side, makes it difficult to estimate the potential population that has actively participated in the generation of the market. In this view, assumption c) will be applied for the estimation of the success/failure risk:

$$\mathbb{R}_{GRE-ALB} = 0.7$$

The potential market value at the border between Greece and Albania is therefore calculated as follows:

$$\mathbb{V}^{2020}_{GRE-ALB} = t_{GRE-ALB} \times \rho_{GRE-ALB} \times \mathbb{R}_{GRE-ALB}$$

So: $\mathbb{V}^{2020}_{GRE-ALB} = 9\,594 \times 1\,200 \times 0.7 = €8.1$ million

By applying a $\pm$ 20% margin of error, the value ranges from €6.5 to €9.7 million.

Calculation with the total number of pushbacks

According to the Albanian police, there were a total of 18 700 thwarted attempts to cross the border between Greece and Albania in 2020. However, the same source illustrated that of this total, only 13 000 were first attempts. Therefore, for this calculation, 13 000 is the value given to the new total population t_{PB} (total pushbacks). However, assumption c) will be also applied to this total.

So if: $\mathbb{V}^{2020}_{PB} = t_{PB} \times \rho_{GRE-ALB} \times \mathbb{R}_{(c)}$

Then: $\mathbb{V}^{2020}_{PB} = 13\,000 \times 1\,200 \times 0.7 = €10.9$ million

By applying a $\pm$ 20% margin of error, the value ranges from €8.1 to €13.7 million.

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[18] Interview with E. Merkaj, head of the department of border and emigration at the national police.