

## Forecasting the size and effects of emigration and remittances

### Analysis of results for Macedonia

#### 1. Analysis of expert opinions

For the purpose of this analysis, we gathered the opinions of 10 experts on macroeconomics, development economics and statistics in Macedonia. The group, in particular, comprehended: five university professors, two representatives of research institutes, one statistician from the National bank of the Republic of Macedonia, and two representatives of the commercial banks from their foreign payment divisions.

Table 1 presents the expert results of the survey between the two rounds of the survey. Experts expressed fairly strong consensus on all the issues within the Delphi survey even as of the first round: an average of 72.6% has been achieved. In this round, the consensus on all answers varies between 61% and 89.5%. Then, the second round brought even further consensus building on all six questions, elevating the overall consensus in the survey to 82.4%. Hence, the consensus between the rounds improved by 13.4%, an increase ranging from 6.2% to 23.1%.

**Table 1 – Consensus among experts**

	Amount of remittances	Size of emigration	The emigration effects	The remittances' effect on poverty	Remittances' usage	Remittances' effect on labor market	Average consensus
<b>I round</b>	69.2%	61.0%	79.3%	68.4%	89.5%	68.4%	<b>72.6%</b>
<b>II round</b>	76.5%	65.0%	84.2%	84.2%	100.0%	84.2%	<b>82.4%</b>
<b>Consensus improvement</b>	<b>10.6%</b>	<b>6.6%</b>	<b>6.2%</b>	<b>23.1%</b>	<b>11.8%</b>	<b>23.1%</b>	<b>13.4%</b>

*Source: Authors' calculations.*  
*Note: The consensus is based on the coefficient of variation.*

Given the already high consensus in the first round and its further improvement in the second round, we decided to terminate the Delphi survey after the second round (i.e. conduct only a third cross-samples round, as we discuss in Section 3). Based on this decision, in Table 2 we present the expert-based forecast results obtained through the Delphi survey:

**Table 2 – Results of the forecasting exercise - experts**

	Amount of remittances (million USD)	Size of emigration (number of people)	The emigration effects	The remittances' effect on poverty	Remittances' usage	Remittances' effect on labor market
<b>I round</b>	494	35,600	70.0%	50.0%	90.0%	50.0%
<b>Forecasted answer after round I</b>	23.5% increase in remittances inflow in 5 years	11.0% reduction of emigration in 5 years	Negative, because more educated depart, impairing the medium-term economic prospects	The effect of remittances for poverty reduction will become weaker	Remittances will be further mainly used for current consumption, i.e. for food, bills and clothes	Employment may rise, because remittances may reduce or cease one day, so one must continue searching for a job
<b>II round</b>	410	37,800	80.0%	80.0%	100.0%	80.0%
<b>Forecasted answer after round II</b>	2.5% increase in remittances inflow in 5 years	5.5% reduction of emigration in 5 years	Negative, because more educated depart, impairing the medium-term economic prospects	The effect of remittances for poverty reduction will remain as it is	Remittances will be further mainly used for current consumption, i.e. for food, bills and clothes	Remittances will support inactivity, because nobody is willing to work when there is a constant and stable source of money

*Source: Authors' calculations.*

The table suggests that between the two rounds, experts revised their forecast on the remittances' amount downward, suggesting that the average of 494 million USD obtained in the first round with higher (than in the subsequent round) heterogeneity was then considered to be quite large. This resulted in an overall forecast for remittances in 2021 of 410 million USD, which is a negligible increase of 2.5% than the current level. The opposite is observed for the size of emigration: experts agreed that the current level of about 40.000 citizens of Macedonia emigrating per year will slightly subside by 2021, though remaining high. It is forecasted that the annual emigration rate will reduce by 5.5%.

The next four questions were categorical ones, so that we present the answer which got the largest share of responses. The share of respondents forecasting that the effect of emigration for the society will be negative as more educated emigrate, remained large, at 80% after the second round. When forecasting the effect of remittances on poverty, experts show heterogeneity within the first round: narrow majority of 50% thought the effect would become weaker. However, this answer was revised in the second round and stable majority of 80% forecasted that this effect would remain the same. So, on this question, despite sufficient level of consensus has been obtained in both rounds, still the

answer getting majority in the first round, was not supported in the second round: experts thought that the narrow majority of the first round was probably poorly forecasting.

Respondents were quite in agreement that remittances will be further spent on everyday consumption: 90% expressed this opinion in the first round which then increased to all respondents agreeing to this answer after the second round. While, the last question brought similar case as the fourth question. Some uncertainty shed experts in the first round where narrow majority of 50% agreed that remittances would lead to higher employment. However, in the second round, majority of the experts did not agree with the largest-share answer and they revised their answers, leading to 80% forecasting that remittances would support inactivity.

Therefore, one should note that in the case of experts, despite sufficient consensus has been achieved in each round, the agreed answer changed between rounds on two out of four categorical questions.

Table 3 presents some tests of stability of the responses between the two rounds. According to the t-test and the Wilcoxon test, means and proportions have not changed between rounds in a statistically meaningful manner, supporting results' stability. Similarly, shares of responses maintained between rounds is fairly satisfactory in four out of six cases.

**Table 3 – Tests of results' stability – experts**

	Amount of remittances (million USD)	Size of emigration (number of people)	The emigration effects	The remittances' effect on poverty	Remittances' usage	Remittances' effect on labor market
<b>T-test of paired samples</b> (H0: Sample means are the same / Sample proportions are the same)	0.148	0.702	1.000	0.323	1.000	0.323
<b>Wilcoxon signed-rank test / Two-tailed test</b> (H0: The two samples follow the same distribution)	0.097	0.721				
<b>Share of individual responses maintained between rounds</b>	70%	40%	70%	40%	90%	50%

*Source: Authors' calculations*

*Note: The share of individual responses between the rounds is calculated as follows: i) for the continuous variable, by considering a maintained result to be if it falls within +/- one standard deviation of the mean in the previous round; ii) for the categorical variables, if the respondent answered the same option.*

Overall, experts forecast that by 2021, remittances will rise only a little, while the emigration size will slightly subside. They forecast that emigration will exert negative influence onto society and economy as more educated depart, but the effect on poverty will remain as it is. That this may likely be true is supported by experts' forecast that remittances will be further used for current consumption – food, clothes, bills – while also deterring people from active job search.

## 2. Analysis of remittance-receivers' opinion

We further gathered the opinions of 17 remittance receivers. Initially, the sample consisted 20 respondents, but three of them became un-reachable after the first round, so that we decided to keep the reduced sample instead of replacing them. Receivers are leaving in at least four out of the eight planning regions in Macedonia, approximately half leave in urban settlement or are females.

Table 4 presents the receivers' results of the survey between the two rounds of the survey. Satisfactory consensus has been built even as of the first round. The average consensus has been 71.9%, ranging from 55% to 79.7%. Then, in the second round, the consensus sees a sizeable increase of 19.1%, observed throughout all the questions. This suggests that remittance-receivers were more prone to revision and approximating the average result of the group, than experts were. Hence, the overall achieved consensus of 85.7% at the end of the survey is slightly below experts' consensus (see Table 1), corroborating the finding that remittance receivers tend to build consensus quicker, as they more believe the average result of the previous round, than experts do.

**Table 4 – Consensus among remittance-receivers**

	Amount of remittances	Size of emigration	The emigration effects	The remittances' effect on poverty	Remittances' usage	Remittances' effect on labor market	Average consensus
<b>I round</b>	55.0%	71.9%	74.3%	71.0%	79.7%	79.7%	<b>71.9%</b>
<b>II round</b>	66.7%	90.8%	93.9%	82.1%	93.9%	86.5%	<b>85.7%</b>
<b>Consensus improvement</b>	<b>21.3%</b>	<b>26.4%</b>	<b>26.5%</b>	<b>15.6%</b>	<b>17.9%</b>	<b>8.6%</b>	<b>19.1%</b>

*Source: Authors' calculations.*  
*Note: The consensus is based on the coefficient of variation.*

Table 5 gives the forecasts of the remittance receivers. During the first round, they forecasted a 21.3% increase of remittances in five-year period, which was then revised further upward (though with more consensus, as argued in Table 3). Hence, the final forecast of receivers is that remittances would soar to above 500 million USD in 2021, which is a sizeable increase of 26.3% for a five-year period, or assuming linear annual increase, an increase of about 5% per year. Similarly, receivers forecasted a boom of the emigration wave by 29.4% by 2021, which was then revised further upward to large 41.5% in the second round. As we observed in Table 4, the consensus between the rounds on both questions improved, in particular on the issue on the size of emigration. This likely confirms that remittance-receivers are more prone to believe the average result and revise in the direction of the average result. On the contrary, experts' steps took opposite direction on these two questions: their revision was reverse.

Similarly, we observe that remittance receivers significantly increased the shares on the categorical questions in the second round. In addition, there has been no case where they changed the majority opinion between the rounds. For example, the narrow first-round majority of 40% thinking that emigration exerts negative societal effects as more educated leave, soared to 94% in the second round. The 59% of first-round respondents thinking that remittances will be further used primarily for current consumption increased to 94%. Similar though more modest share increases have been noted on the opinions for remittances' effect on poverty and on the labor-market outcomes.

Hence, compared to experts, the remittance-receivers forecasts are different in at least three veins: i) receivers tend to accept the average/majority opinion more easily; ii) they forecast a sizeable increase of remittances, but also of emigration in a five-year period; and iii) there have been no switches among different answers between the two rounds.

**Table 5 - Results of the forecasting exercise – receivers**

	Amount of remittances (million USD)	Size of emigration (number of people)	The emigration effects	The remittances' effect on poverty	Remittances' usage	Remittances' effect on labor market
<b>I round</b>	485	51,765	40%	41%	59%	59%
<b>Forecasted answer after round I</b>	21.3% increase in remittances inflow in 5 years	29.4% increase of emigration in 5 years	Negative, because more educated depart, impairing the medium-term economic prospects	The effect of remittances for poverty reduction will remain as it is	Remittances will be further mainly used for current consumption, i.e. for food, bills and clothes	Employment may rise, because remittances may reduce or cease one day, so one must continue searching for a job
<b>II round</b>	505	56,588	94%	65%	94%	76%
<b>Forecasted answer after round II</b>	26.3% increase in remittances inflow in 5 years	41.5% increase of emigration in 5 years	Negative, because more educated depart, impairing the medium-term economic prospects	The effect of remittances for poverty reduction will remain as it is	Remittances will be further mainly used for current consumption, i.e. for food, bills and clothes	Employment may rise, because remittances may reduce or cease one day, so one must continue searching for a job
<i>Source: Authors' calculations.</i>						

Table 6 presents the stability tests for the receivers group. Interestingly, remittance receivers tend to stick to their results more frequently than experts. However, results' stability cannot be statistically supported in the case of the questions on emigration effects and remittances' usage. This could be reconciled with the almost unanimous revision of the first-round answer during the second round toward the answer which got narrow majority (Table 5).

**Table 6 – Tests of results’ stability – remittance receivers**

	Amount of remittances (million USD)	Size of emigration (number of people)	The emigration effects	The remittances’ effect on poverty	Remittances’ usage	Remittances’ effect on labor market
<b>T-test of paired samples</b> (H0: Sample means are the same / Sample proportions are the same)	0.698	0.103	0.001	0.398	0.033	0.742
<b>Wilcoxon signed-rank test / Two-tailed test</b> (H0: The two samples follow the same distribution)	0.476	0.168				
<b>Share of individual responses maintained between rounds</b>	82%	76%	53%	47%	65%	59%
<i>Source: Authors’ calculations</i>						
<i>Note: The share of individual responses between the rounds is calculated as follows: i) for the continuous variable, by considering a maintained result to be if it falls within +/- one standard deviation of the mean in the previous round; ii) for the categorical variables, if the respondent answered the same option.</i>						

Overall, remittance receivers forecast sizeable increases of both remittances and emigration in a five-year period. They are convinced that emigration will exert negative effect on society as more educated leave, while the effect of remittances on poverty is forecasted to remain as is. Remittances’ primary usage is forecasted to be daily consumption, while they are projected to work for an increase of employment.

Therefore, in forecasting remittances, experts and remittance receivers are in agreement on the direction of remittances evolvement: both agree they will increase. Both agree that the effect of emigration for the society will be negative due to departure of skilled labor, as well that remittances’ effect on poverty will remain as is and they will be further primarily used for everyday consumption. Both groups disagree on the size of the increase in remittances: experts believe the increase will be negligible, while receivers generous. Then, experts forecast reduction of emigration rate, while receivers an increase. Finally, experts forecast remittances will support inactivity, while receivers forecast they will spur employment.

Could both group reconcile their forecasts, and to what extent? We reveal this next.

### **3. Cross-analysis of changing patterns between the two samples of respondents**

In the third final round, uncustomary to the most Delphi studies, we crossed the samples. We offered the second-round forecasts of each group to the other group, and asked them to revise if they wanted. We present results next.

Table 7 presents the results of the expert opinion in the third round when they were given the remittance-receivers consensual results of the second round. Results suggest that experts agreed with receivers’ opinion on four out of the six questions. Experts agreed that the amount of remittances in five years will be much higher than they thought, but still lower than receivers’ opinion. On the other

hand, experts declined to approximate to receivers' opinion on the size of emigration in five years, as well in the effect of remittances for the labor market. Namely, experts continue to forecast that the size of the emigration will decline and they further fortify their opinion: in the third round, the consensual decline is 9.8%, instead of 5.5% in experts' second round. Similarly, experts declined to change their majority opinion that remittances will support inactivity into employment rising, as receivers agreed on their own. However, on both questions, consensus among experts is smaller not only when compared to receivers' consensus, but also compared to experts' previous own consensus, suggesting that while they maintained their distinct opinion on these issues, the results of the remittance receivers brought some noise and heterogeneity in addition to the ones experts already had.

**Table 7 – Experts' opinion on receivers' consensual responses**

	Amount of remittances	Size of emigration	The emigration effects	The remittances' effect on poverty	Remittances' usage	Remittances' effect on labor market
<b>Consensus</b>						
<b>Round II, receivers</b>	66.7%	90.8%	93.9%	82.1%	93.9%	86.5%
<b>Round II, experts</b>	76.5%	65.0%	84.2%	84.2%	100.0%	84.2%
<b>Round III, experts</b>	86.3%	64.6%	100.0%	89.5%	100.0%	68.4%
<b>Does consensus increase?</b>	YES	NO	YES	YES	YES	NO
<b>Results</b>						
<b>Round II, receivers</b>	+26.3%	+41.5%	Negative, educated depart	Will remain as it is	Mainly used for current consumption	Employment may rise
<b>Round II, experts</b>	+2.5%	-5.5%	Negative, educated depart	Will remain as it is	Mainly used for current consumption	Remittances will support inactivity
<b>Round III, experts</b>	+15.8%	-9.8%	Negative, educated depart	Will remain as it is	Mainly used for current consumption	Remittances will support inactivity

*Source: Authors' calculations.*

Table 8 presents the results of the receivers' opinion in the third round when they were given the experts consensual results of the second round. Results suggest that receivers agreed with expert consensual opinion on five out of six questions. Receivers agreed that the growth they forecasted for remittances in five-year period is likely exaggerated and reduced their figure to 2.2%, much aligned with the experts' one. Likewise, experts agreed to revise downward their emigration-size figure, to align with experts' forecast that emigration will decline compared to today's level. Still, receivers forecast a small emigration growth of 3.8%. The consensus has been reconfirmed on the next three questions. However, similar to experts, remittance-receivers declined to lean towards expert opinion on remittances' effect for the labor market. Both groups have shown obstinacy and maintained their previous forecasts.

**Table 8 – Receivers’ opinion on experts’ consensual responses**

	Amount of remittances	Size of emigration	The emigration effects	The remittances' effect on poverty	Remittances' usage	Remittances' effect on labor market
<b>Consensus</b>						
<b>Round II, experts</b>	76.5%	65.0%	84.2%	84.2%	100.0%	84.2%
<b>Round II, receivers</b>	66.7%	90.8%	93.9%	82.1%	93.9%	86.5%
<b>Round III, receivers</b>	86.2%	89.3%	93.9%	88.8%	100.0%	84.3%
<b>Does consensus increase?</b>	YES	YES	YES	YES	YES	YES / NO
<b>Results</b>						
<b>Round II, experts</b>	+2.5%	-5.5%	Negative, educated depart	Will remain as it is	Mainly used for current consumption	Remittances will support inactivity
<b>Round II, receivers</b>	+26.3%	+41.5%	Negative, educated depart	Will remain as it is	Mainly used for current consumption	Employment may rise
<b>Round III, receivers</b>	+2.2%	+3.8%	Negative, educated depart	Will remain as it is	Mainly used for current consumption	Employment may rise

*Source: Authors' calculations.*

Overall, both groups finally agreed on five out of six forecasts on the size and effects of remittances and emigration in Macedonia. According to the forecast, by 2021, the amount of remittances is projected to increase by 2.2% to 15.8% compared to the current level, which means that the current level of 400 million USD per year may increase up to about 460 million USD in 2021. Respondents forecasted that the emigration size will likely not change much, i.e. will roam around the current figure of about 40.000 per year. Despite both group have still slightly divergent results, over the subsequent rounds they were able to significantly reconcile their initial diametrically opposed opinions. The forecast suggests that emigration effect for the society will be negative, as more educated depart, while the effect of remittances on poverty will remain as is. The latter corroborates with the forecasted remittances’ increase of up to 15.8% in five years, which implies a linear annual increase of about 3%, being sufficient to maintain the effect on poverty rather than to change it. Remittances are forecasted to be further used for everyday consumption only. The main point of divergence between experts and receivers has been the effect of remittances for the labor market: the former forecast remittances to spur inactivity, while the latter to spur employment.