

IMPACT OF COVID 19 ON ECONOMIC PERFORMANCE IN REPUBLIC OF NORTH MACEDONIA

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ABSTRACT

The global economy is experiencing the worst economic crisis in the last century caused by the COVID-19 pandemic. North Macedonia as a small and opened economy is not invulnerable from the negative economic effects as its economy depends on health and economic developments of external sites. Also, the containment measures affected domestic demand and supply by considerably decreasing the economic activity. Therefore, the main purpose of this paper is to examine the economic impacts of COVID-19 crisis by means of selected macroeconomic indicators as well as to develop an ARIMA model to predict and forecast the real GDP growth of North Macedonia.

KEYWORDS

Economic impacts, COVID-19, ARIMA, forecast

1. INTRODUCTION

The outbreak of corona virus “COVID-19” has disrupted the world economy across multiple sectors, however the real sector is likely to be mostly depressingly affected. The fall of the overall economic activity confirms the doubts of economic experts and relevant international institutions that the health crisis will exceed in a deep economic recession. Accordingly, the International Monetary Fund (IMF) was imposed to revise the projections of the global GDP growth for 2020 and the upcoming year. Thus, global growth is projected to contract by -4.2 per cent, a difference of 7 percentage points compared to the projections published before the eruption of the crisis (IMF, 2020). The rapid rise of the disease and its further economic impact is still highly uncertain, which makes difficult for policymakers to formulate appropriate macroeconomic policy responses (McKibbin and Fernando, 2020). Many countries have introduced fiscal measures to expand social safety nets and protect those most vulnerable, including wage support to preserve jobs, increased access to unemployment benefits, and targeted cash transfers to low-income households (Global Economic Prospects, 2020), but based on (OECD, 2020) assessment, it is extremely difficult to quantify the exact magnitude of the impact of these measures on GDP growth, as the depressing economic effects of COVID-19 would far outweigh the severe impact of global financial crisis in 2008-09. Barro et al. (2020) use a macro-econometric approach and consider the 1918-1920 Great Influenza Pandemic (known as the Spanish flu) as a worst-case scenario for outcomes under Covid-19. Their estimation suggests declines for GDP and consumption in the typical country of 6 and 8 percent, respectively, although transposing these effects to COVID-19 pandemic is intricate, because conditions and circumstances have changed.

North Macedonia as a small country with an open economy depends on economic developments of external sites. Based on this its economy is not invulnerable to the negative economic effects of the COVID-19 crisis of other countries. It is anticipated that the country will be particularly affected in the external accounts, industrial production, budget liquidity and financial liquidity by a reduction of demand for exports, as well as shrinking of investments and remittances inflows. As in the Global Economic Prospects (2020) report is highlighted, those Western Balkan countries that rely heavily on international trade, tourism, remittances and commodity exports will be particularly hard-hit. In this

regard, North Macedonia is integrated into global value chains (GVCs) and will mainly be affected through lower goods exports. Trade structures will be affected by the combination of a supply side shock, largely through GVCs, and a demand side shock due to recessions in major trading partners (Western Balkans Regular Economic Report, spring 2020). Besides this, the containment measures¹ obviously have an impact on domestic demand and supply by considerably decreasing the economic activity. Supportive macroeconomic policies can partially aid the recovery of demand but cannot completely offset the economic consequences of enforced shutdowns (OECD, 2020).

2. BRIEF REVIEW OF ECONOMIC DEVELOPMENT OF NORTH MACEDONIA

In the last decade, the economy of North Macedonia underwent a difficult period owing to various external shocks and internal problems. Pre- global financial crisis GDP levels were not restored because robust GDP growth rates were delayed due to Eurozone debt crisis and substantially caused by the political crisis in the country. Thus, its economy is characterized by relatively slow growth (see Table 1). Realized rates of economic growth are not satisfactory in terms of strengthening the country's economy and raising the standards of living of the population. The highest growth rate of 6.5% was recorded in 2007. While several indicators have shown significant improvement, the global financial crisis has affected the economy of North Macedonia driven by a decline in the output of the metal and textile sectors, which are the main export earners. As a result, the GDP growth in 2009 was negative at -0.9%. The economy started to recover at the second quarter of the 2010 year, where the annual growth was 2.9%. The positive trend of the economic activity continued during the first half of 2011 year, but the economic instability of some of European countries with the deepening of the Euro zone sovereign debt crisis and pessimistic forecasts for the main trading partners led to a slowdown in economic growth of the country in the second half of the year. Economic activity slowed significantly during late 2011 by not only reflecting weakening external demand but also by increasing public spending during the first half of the year. As a result of these developments, annual economic growth for 2011 was only 2.3%. The negative effects of Euro zone debt crisis continued to be felt in 2012 year, when the economy of North Macedonia fell again in recession by -0.5%. In the period 2013-2015, the economy was recovering again, so the average growth rate was 3.4%. But the political crisis and uncertainty slowed the growth in 2016 and 2017. Real GDP growth fell from 2.8 % in 2016 to 1.1 % in 2017². Based on the Regular Economic Report of the World Bank (2018), the stagnation was mainly due to investments that fell by 4.5 percent, as well as reduced private consumption. In 2018, the growth was only 2.7%, while the economic growth strengthens in 2019 year to a level of 3.6%, driven by domestic demand in investment as well as the increased wholesale and retail trade.

Regarding other indicators, low inflation is maintained through prudential monetary policy by fixing the domestic currency against the euro. The average inflation rate for the period 2012-2019 was 2.5%.

The unemployment rate is significantly decreased in the last couple of years to a record of 17.3% in 2019. It has been accompanied by a rising employment rate.

Due to the low level of tax collection in the last decade, government revenues drop off, while the budget deficit deepened to -3% of GDP in the period 2012-2019. Unlike some more advanced transition countries, the country did not experience large capital inflows from the developed economies. The net foreign direct investments (FDI) were only 2.9% of GDP in the period 2012-2019.

¹ At the beginning of the outbreak, the Government of North Macedonia had closed all schools, educational institutions, cultural premises and restaurants. Only food stores, pharmacies and stores allowing sufficient physical distance remained open. Schools and Universities were closed and the lectures continued via electronic means.

² The GDP growth data are compiled from National Bank of North Macedonia: Basic macroeconomic data and Residential Real Estate Prices https://www.nbrm.mk/osnovni_ekonomski_pokazateli-en.nspix

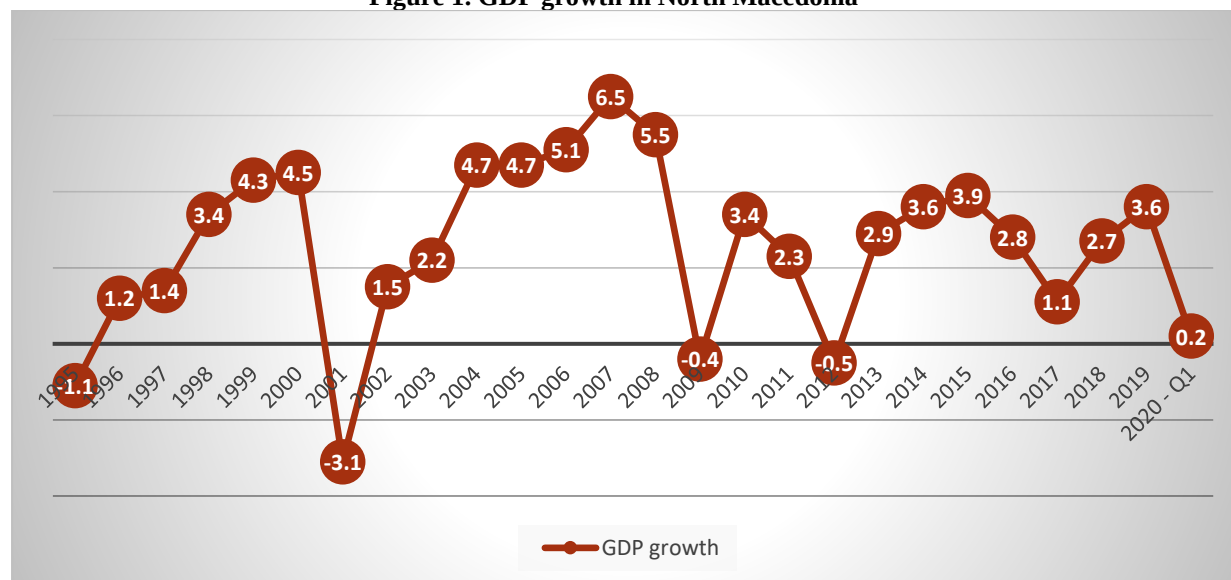
Table 1. Selected macroeconomic indicators, average for periods

	1995-2003	2004-2012	2012-2019
Real GDP growth (in %)	1.6	4.0	2.5
Inflation (end of period, yearly basis, in %)	3.2	2.4	0.6
Unemployment rate	33.5	34.0	23.9
Budget balance (central government and funds, in % of GDP)	-1.5	-1.3	-3.0
Current account balance (in % of GDP)	-5.3	-5.0	-1.6
Foreign Direct Investment net (% of GDP)	4.9	4.3	2.9

Source: National Bank of R. North Macedonia; author's calculations average for periods

3. FIRST SIGNS OF ECONOMIC IMPACT OF COVID-19

The COVID-19 pandemic gave the first signal in the economy of North Macedonia in March of 2020 caused primarily by containment measures. In the first quarter (see Figure 1), the economic growth was only 0.2%. Based on current circumstances and forecasts as well as sector composition, the other three quarters is very likely to be much worse. The GDP growth for 2020 was projected to be 3.4%, but the pandemic will most likely cause a reduction of 4.0%¹, mainly due to reduced private consumption. The negative GDP growth of 4% in 2020 will reflect a reduction of both domestic demand and net foreign demand (net exports). The depressed domestic demand in 2020 will contribute to a reduction of 2.7 percentage points and the fall in net exports by 1.3 percentage points in the overall economic activity (UNDP, 2020).

Figure 1. GDP growth in North Macedonia

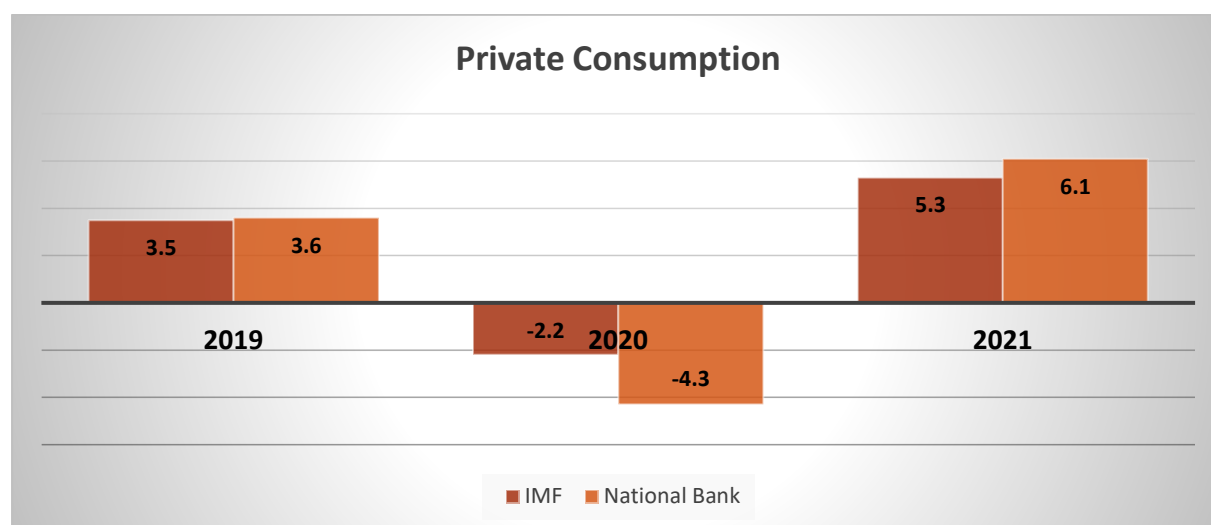
Source: National Bank of R. North Macedonia, Basic macroeconomic indicators

Examined by individual GDP components, the private consumption is projected to shrink by 2.2% (IMF, April 2020) and 4.3% (National Bank, May 2020) in 2020 (see Figure 2). According to UNDP (2020) assessment, the fall of private consumption will be caused by labor layoffs, lower and uncertain

³ IMF projections: <https://www.imf.org/en/Countries/MKD#countrydata>, whereas according to NBRNM, GDP is expected to decline by -3.5%.

incomes; slashed spending on travel, hospitality and entertainment is slashed due to regulatory restrictions, a general fall in consumer confidence, and lower net inflows of remittances from abroad.

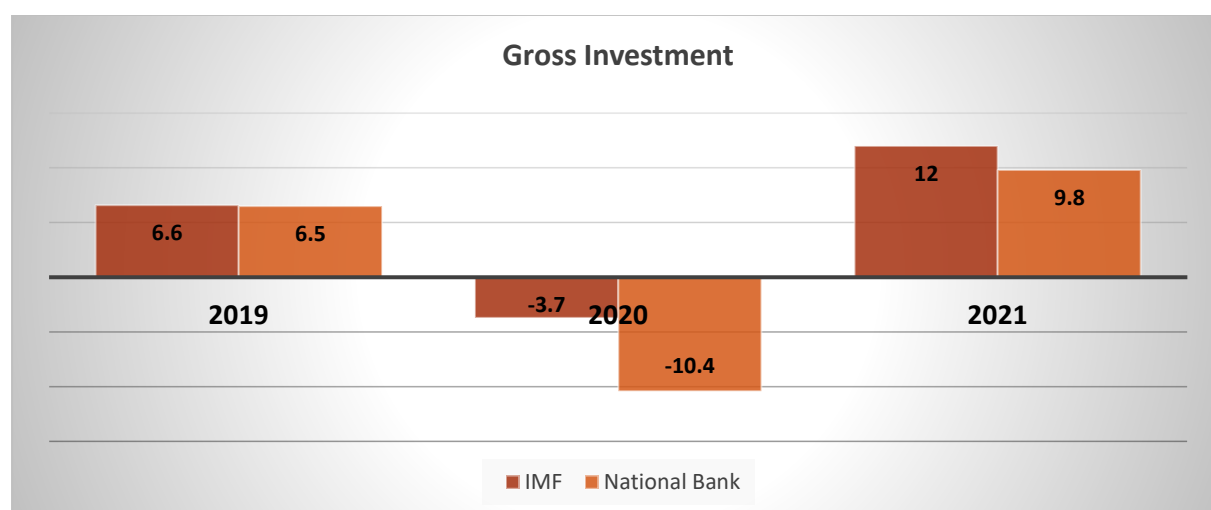
Figure 2. Private consumption forecast for 2020 and 2021.



Source: IMF and National Bank of North Macedonia (2020)

A deceleration of gross investment is expected in the second quarter of 2020, due to extremely high uncertainty and reduced confidence, difficulties in performing investment activities arising from restrictive measures as well as possible liquidity problems in certain corporate sectors (NBRNM, 2020). Based on the projections of National Bank the gross investment is predicted to slow dramatically by 10.4% in 2020. Also, the public investment is predicted to deteriorate, as IMF (2020) forecasts a decline of government investment from initially budgeted 23.8 Bill Denars in 2020 to 12.7 Bill Denars, a reduction of 46.6% in one year (UNDP, 2020).

Figure 3. Gross Investment forecast for 2020 and 2021

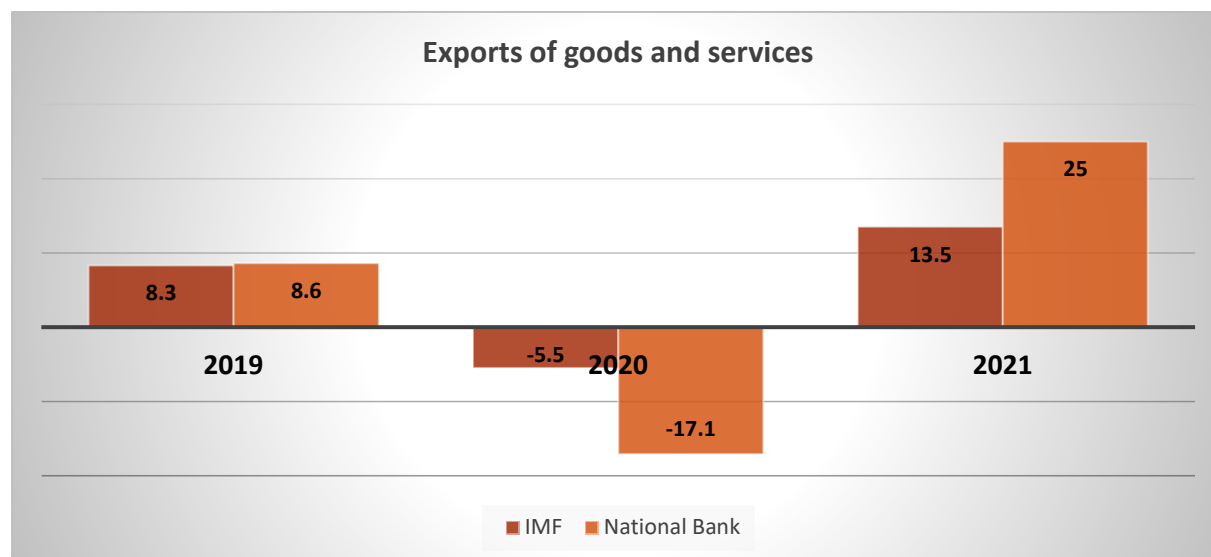


Source: IMF and National Bank of North Macedonia (2020)

As stated by UNCTAD global foreign direct investment (FDI) flows in 2020 are expected to fall 5 to 15 percent, to the lowest level since 2008–09. Average FDI in the region of Western Balkan is expected to fall from 5.1 percent of GDP in 2019 to 3.6 percent in 2020—the lowest level since 2005. The biggest declines compared to 2019 are expected in Montenegro 4 percentage points, Serbia 3

percentage points, and North Macedonia 1.2 percentage points (Western Balkans Regular Economic report, spring 2020).

Figure 4. Exports forecast for 2020 and 2021



Source: IMF and National Bank of North Macedonia (2020)

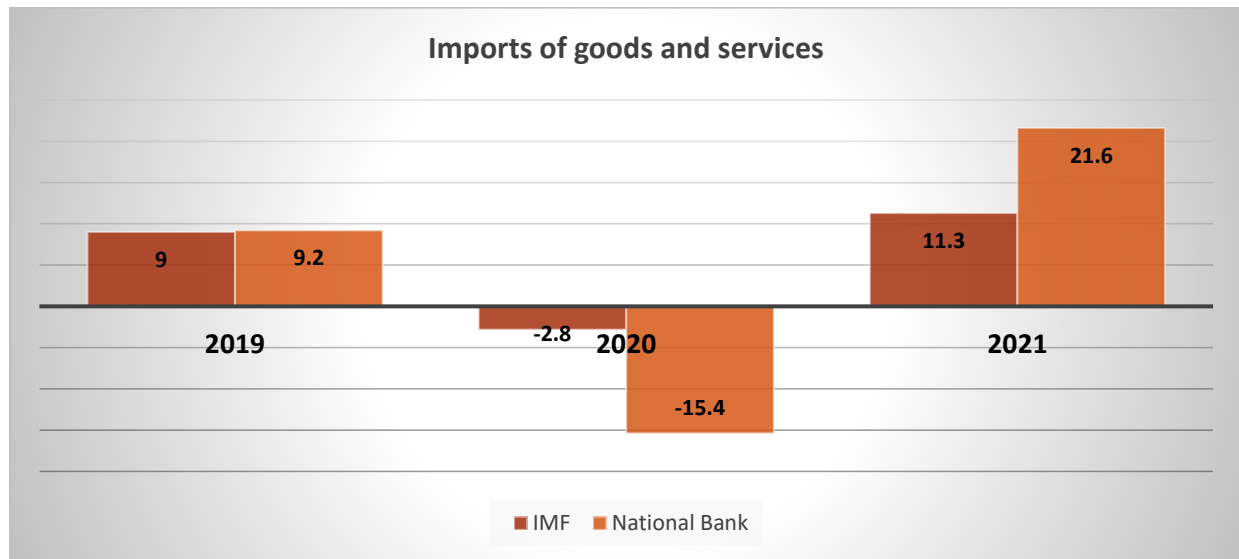
COVID-19 pandemic is disrupting economic activity through its impact on global value chains (GVCs), which can intensify the effects of shocks on trade. Since the goods trade integration is more pronounced in the economy of North Macedonia, the disruption of the supply chains by the slowdown in manufacturing in China, Europe, and the USA and the global drop in aggregate demand caused by the economic downturn will be the main channels of transmission (Western Balkans Regular Economic report, spring 2020). Based on projections of the National Bank exports of goods and services will drop by 17.1%, whereas IMF projects a slowdown of 5.5%. National Bank predicts that the decline in exports will be particularly expressed in the second quarter of the year. Also, a significant decline in imports of goods and services is predicted in 2020, however the National Bank assesses a drop with similar extent as export and domestic demand which will lead to a positive net exports contribution to the GDP rate. The projected decrease in imports of goods and services is amidst 2.8% (IMF, 2020) and 15.4% (National Bank, 2020).

The unemployment rate has been on a diminishing trend in the last period, but it is very doubtful that this favorable tendency will continue in 2020. It is forecasted to increase to 20.4% at end of 2020, due to labor layoffs and remarkably due to canceling of new planned working places. These predispositions will certainly affect the poverty rate as well, which according to (UNDP, 2020) forecasts, will increase to 21%.

Taking into consideration the deterioration of domestic demand, and the substantial decrease of global oil prices and some food prices, the inflation rate in 2020 is expected to be around 0%, compared to the previous forecast of 1.5%, while for 2021 and 2022 prices are expected to grow from 1.5% to around 2%, respectively (National Bank of R. North Macedonia, 2020).

Based on National Bank projections, the current account deficit is predicted to deepen by 0.4 % of GDP and to reach -3.2% of GDP, in 2020. The global uncertainty triggered by the Covid-19 virus, as well as the low confidence and the restraining measures would lead to an expressively decline of remittances. Improvement in the current account deficit is expected in 2021-2022, that is expected to be -1.6% of GDP on average.

Figure 5. Imports forecast for 2020 and 2021



Source: IMF and National Bank of North Macedonia (2020)

4. ARIMA FORECASTING OF GDP GROWTH OF NORTH MACEDONIA

This paper also forecasts GDP growth of North Macedonia using the Autoregressive Integrated Moving Average (ARIMA) model that fit series and forecast the future value of variables. The AR section of ARIMA model indicates that the variable of interest is regressed on its own preceding values. In a stationary time series the average of the error term is zero and the variance is expressed as σ^2 . ARIMA models involve three parameters (p, d, q), where p is the order of autoregressive terms, d is the order of integration, and q is the number of moving average terms. The AR(p) model of a time series Y_t at time t is as following:

$$Y_t = \gamma + \varphi_1 Y_{t-1} + \varphi_2 Y_{t-2} + \dots + \varphi_p Y_{t-p} + \varepsilon_t \quad (1)$$

Where, γ is the constant, φ_t the slope coefficient and ε_t is the error term. Time series as a q-th degree of moving average procedure MA(q) is expressed by the next model:

$$Y_t = \mu + \varepsilon_t + \theta_1 \varepsilon_{t-1} + \theta_2 \varepsilon_{t-2} + \dots + \theta_q \varepsilon_{t-q} \quad (2)$$

ARMA (p, q) expression can be obtained by combining two AR(p) and MA(q) equations:

$$Y_t = \gamma + \varphi_1 Y_{t-1} + \varphi_2 Y_{t-2} + \dots + \varphi_p Y_{t-p} + \varepsilon_t + \theta_1 \varepsilon_{t-1} + \theta_2 \varepsilon_{t-2} + \dots + \theta_q \varepsilon_{t-q} \quad (3)$$

If the analyzed time series is non stationary, it can be turned to stationary by taking the difference d times. Once the difference of non-stationary Y_t series is taken, ΔY series, which expresses stationary feature, can be calculated by: $\Delta Y_t = Y_t - Y_{t-1} = Y_t - LY_t = Y'_t$. Thus, the ARIMA (p, d, q) would be expressed as:

$$(1 - \varphi_1 L - \varphi_2 L^2 - \dots - \varphi_p L^p) \Delta^d Y_t = \mu + \varepsilon_t + \theta_1 \varepsilon_{t-1} + \theta_2 \varepsilon_{t-2} + \dots + \theta_q \varepsilon_{t-q} \quad (4)$$

In order to obtain the most appropriate parameter in the ARIMA approach, the model performance is usually measured by the Akaike Information Criteria (AIC) principle. The model with the lowest AIC criterion is considered more proper than the others. The parameters showing the highest performance were achieved from the ARIMA (3,0,4) model.

4.1 Regression results

In (Table 2) below are summarized the various ARIMA models according to the order of autoregressive terms and the number of moving average terms, whereas the parameter d is equal to 0, because the time series of real GDP growth is stationary in level $I(0)$.

Table 2. ARIMA regression results for several models

GDP growth	ARIMA	(1,0,1)	(2,0,2)	(3,0,3)	(3,0,4)
	_Constant	2.94652 (0.000)***	2.94472 (0.000)***	2.879921 (0.000)	3.10305 (0.000)***
ARMA	L1.AR	0.206076 (0.402)	-0.503827 (0.100)*	0.747695 (0.000)***	1.023706 (0.000)***
	L1.MA	0.148099 (0.496)	0.91366 (0.999)	-0.53398 (0.999)	-0.7474786 (0.104)*
	L2.AR	-	0.330202 (0.121)	0.345604 (0.020)**	0.78416 (0.000)***
	L2.MA	-	-0.08634 (0.999)	-0.53397 (0.998)	-1.2508 (0.000)***
	L3.AR	-	-	-0.776125 (0.000)***	-0.83137 (0.000)***
	L3.MA	-	-	0.99997 (0.999)	0.74843 (0.001)***
	L4.MA	-	-	-	0.25175 (0.103)*
Sigma	_cons	3.927502 (0.000)***	3.807823 (0.499)	3.634732 (0.498)	3.600305 (0.004)**
N	85	85	85	85	85

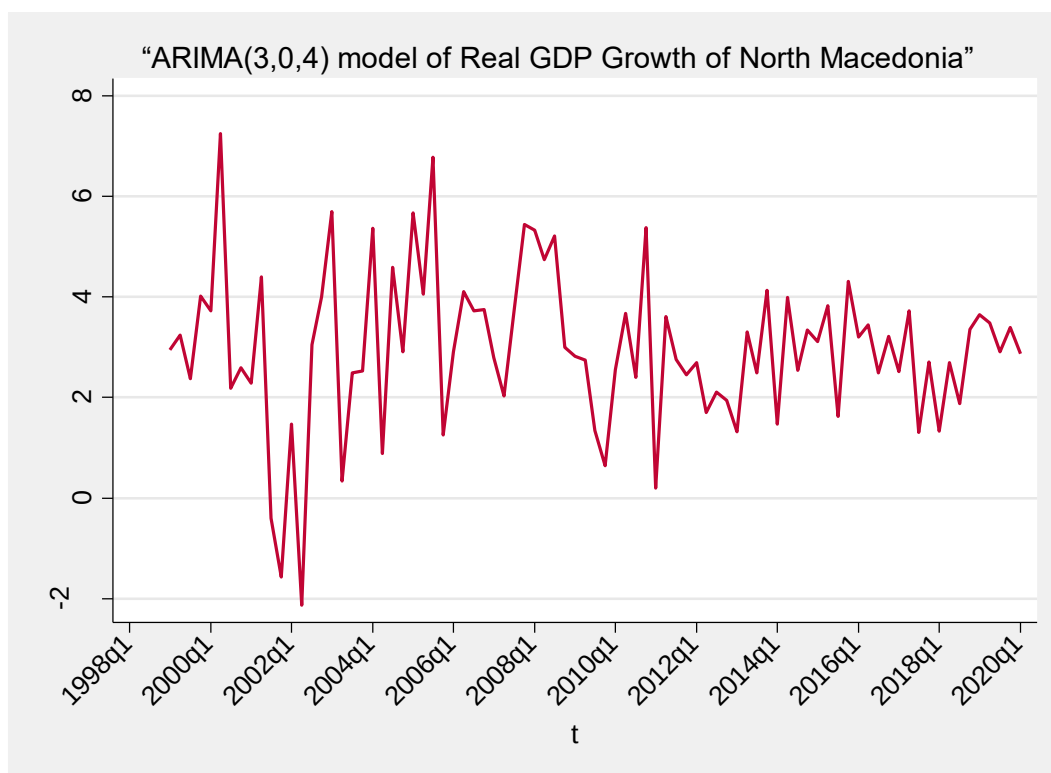
Source: Author's calculations

Note: p-values are in parentheses. The notifications ***, ** and * denote 1%, 5% and 10% level of significance, respectively.

In order to determine which model best fits the data of real GDP growth, I follow the procedure developed by Becketti (2013) and select ARMA (3, 4). Moreover, this model has the lowest AIC criterion and the same will be used for forecasting purposes. According to ARIMA (3,0,4) model and the predicted values, the GDP growth is more volatile during the past period than in the recent years (see Figure 6). It is mostly due to various shocks that have hit the economy. The high volatility and large movements that have been characterized the country, occasionally make forecasts unreliable. All efficient economies are assumed to follow a random walk but it is usually probable to detect trends.

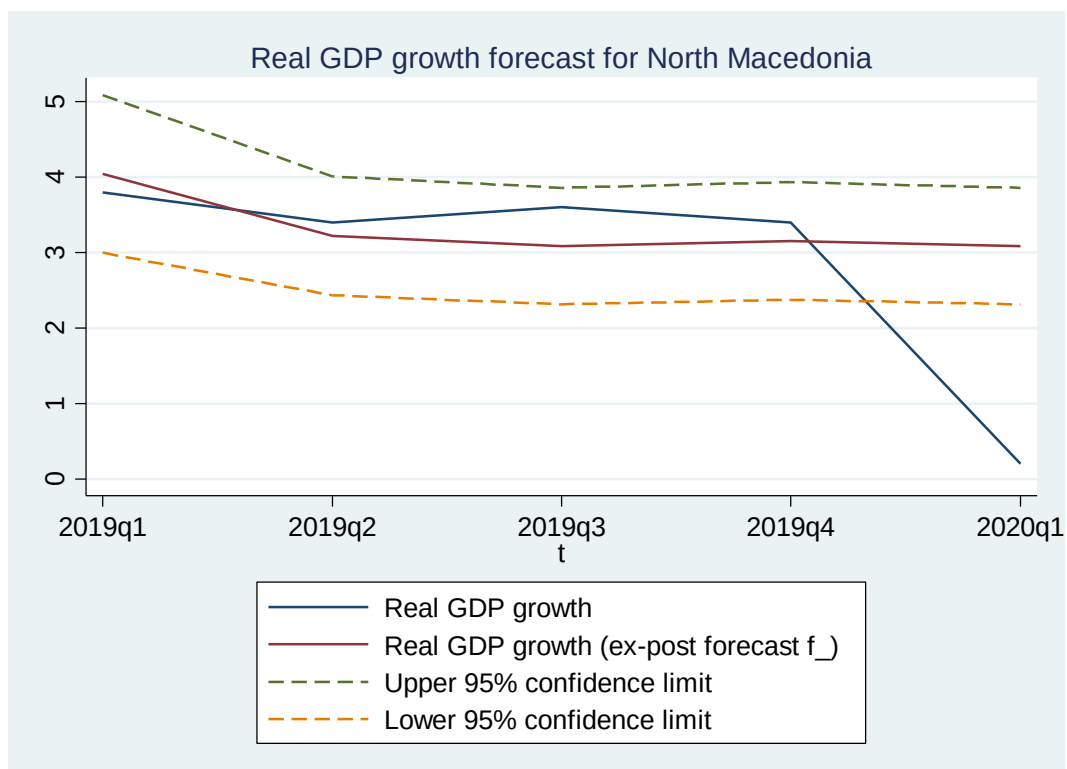
The surveyed model predicts that the GDP growth in North Macedonia had to be around 3.08% in the first quarter of 2020, without counting on the negative effects of COVID-19 pandemic. The actual value is 0.2%, whereas the forecasted value is 3.08%. The upper limit confidence interval is 3.6%, while the lower limit confidence interval is 2.3%. The upper limit is very close to the National Bank October projections of GDP growth for 2020 of 3.4%. The mean of actual data is 2.96, whereas for forecast estimates is 2.94, which are very close to each other, thus it implies that the ARIMA (3,0,4) model performs well.

Figure 6. ARIMA (3,0,4) model



Source: Author’s calculation

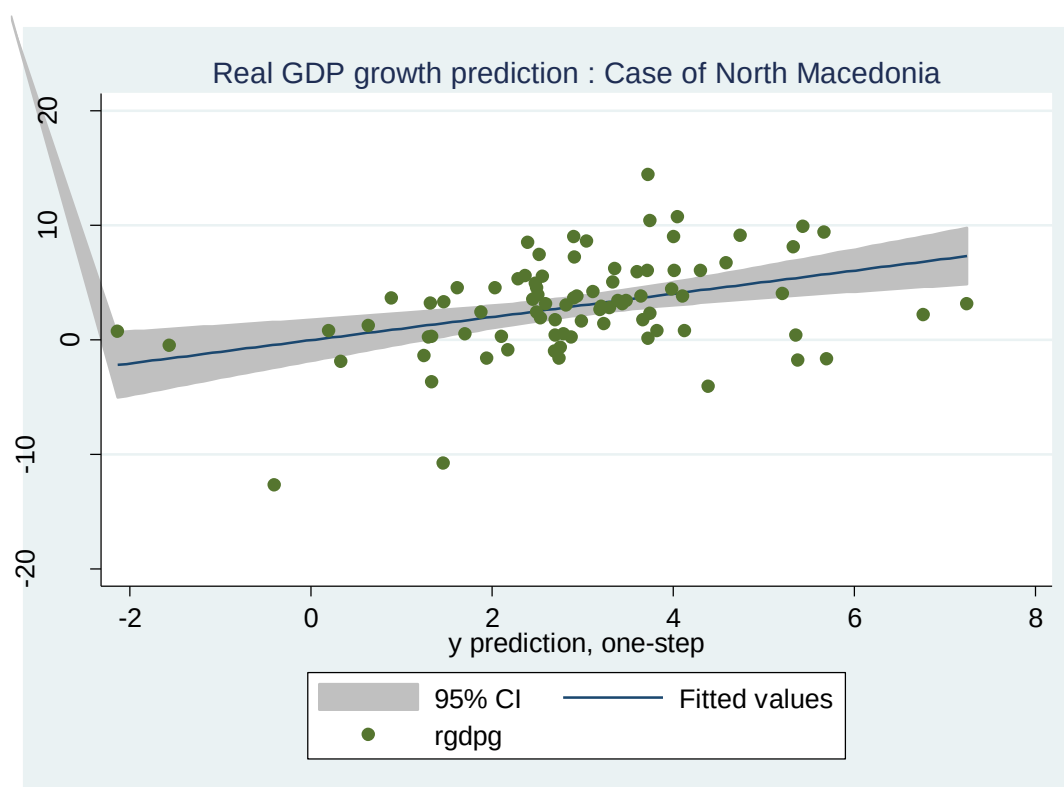
Figure. 7. Real GDP growth forecast for 2019-2020



Source: Author’s calculation

Also, it is forecasted the trend of GDP growth using the time series for the time spin 1999Q1-2020Q1. The predicted values show a positive trend with a flatter line (see Figure 8). This is the most classical method of economic forecasting, which is concerned with the movement of variables through time. The trend projection method is based on the assumption that the factors accountable for the past trends in the variable to be projected will continue to perform in the future in the same manner and to the same extent.

Figure 8. Real GDP growth trend prediction



Source: Author's calculation

5. CONCLUSION

COVID-19 was spreading significantly in North Macedonia, especially in the last two months, leaving severe consequences on the economy of the country. However, the main accent by the authorities should be on reducing the number of cases affected by virus and aid the community to cope with the pandemic. Different projections designate that the potential loss of income in North Macedonia will be significant, with real GDP growth declining by up to 4%. Several transmission channels will cause such a downward tendency, such as the uncertainty driven demand contraction, the expected slump in foreign trade, the decline of remittances sent from abroad, tourism and FDI.

The paper also predicts the real GDP growth pattern through ARIMA modeling. The prediction results suggest that the GDP growth in 2020 had to be between 2.3%-3.6%, based on the historical data, however the health crisis gave immediately the first signal in the first quarter of the current year, with an economic growth of only 0.2%. Yet, the spreading of COVID-19 pandemic is still unknown and is quite challenging for thorough modeling and forecasting.

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