Example Session

Montenegro Macroeconometric Model

for impact assessment of structural reforms in the ERP

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MONTENEGRO
INDEPENDENCE DAY

Content:

- Macroeconomic models
- MMM framework, principles, data, equasions
- Forecasting Model
- Impact Assessment Model
- Impact Assesment used in the ERP
- Scenarios
- Challenges

Types of Models

Model for Macroeconomic Projections	• Two methods of calculating the gross domestic product • The production method • Consumption method • Bottom – up approach
Montenegro Macroeconometric Model (MMM)	• Based on the financial programming approach • Organized into Excel and Eviews software • Developed under IPA 2014 Programme

MMM Framework

Module I – Forecasting module

Used for generating macro-economic forecasts for the real, fiscal, external and financial sectors. Also, it models labour market variables, inflation, the output gap, and the potential GDP growth rate.

Module II – Impact assessment module

Used for policy simulations in assessing net effects implemented measures and provide for ex-ante assessment of future structural reforms.

Forecasting module: Principles

- Consistency of projections
- Transparency and tractability
- Ease of usage
- Ease of data updates
- Accessibility
- A learning tool

Data used

European Commission Forecasts, IMF WEO

- data on external assumptions

Statistical Office of Montenegro- MONSTAT

- data on national accounts, consumer price developments, labour force survey (LFS) data, population and population projections, R&D expenditures

Central Bank of Montenegro

- data on the balance of payments, data on the banking system (deposits and loans)

Ministry of Finance of Montenegro and Social Welfare

- consolidated budget data (expenditures, revenues, budget balance)

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Variables:

- Endogenous
- Exogenous

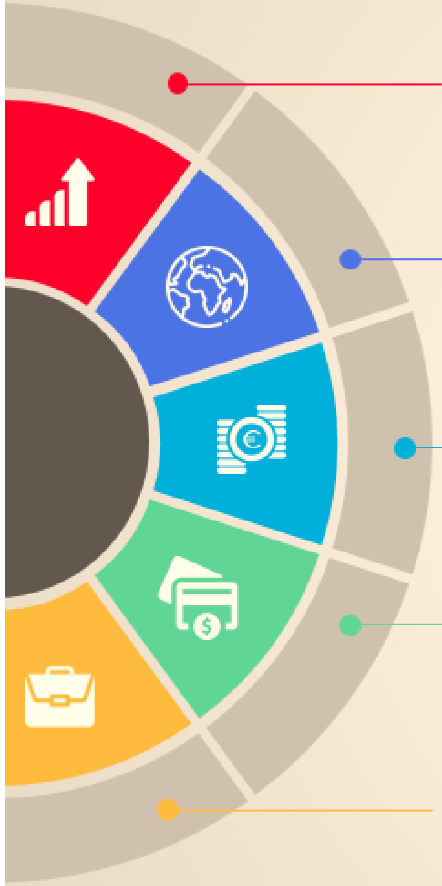
Formal Modelling framework

Expert judgement line

Types of equations

Macro-economic identities	Estimated behavioural equations	Manually calibrated equations
• (from System of National Accounts, BoP manual, labour statistics, etc.)	• parameters are obtained through the application of statistical procedures and methods to data	• parameter values are taken from well-established theoretical and empirical studies, historical ratios, etc.

Structure of the Forecasting module



Real

Historical data (MONSTAT) and forecasts concern the final-use GDP
Aggregate and components are represented in current prices, previous-year prices, and 2010 prices

External

Follows strictly the balance of payments; Historical data are taken as published by the Central Bank of Montenegro; Features all three major accounts (current, capital, financial)

Fiscal

Ministry of Finance and Social Welfare (national methodology) data used for both historical developments and for shaping projections; Covers expenditures, revenues, and budget balances/financing

Monetary

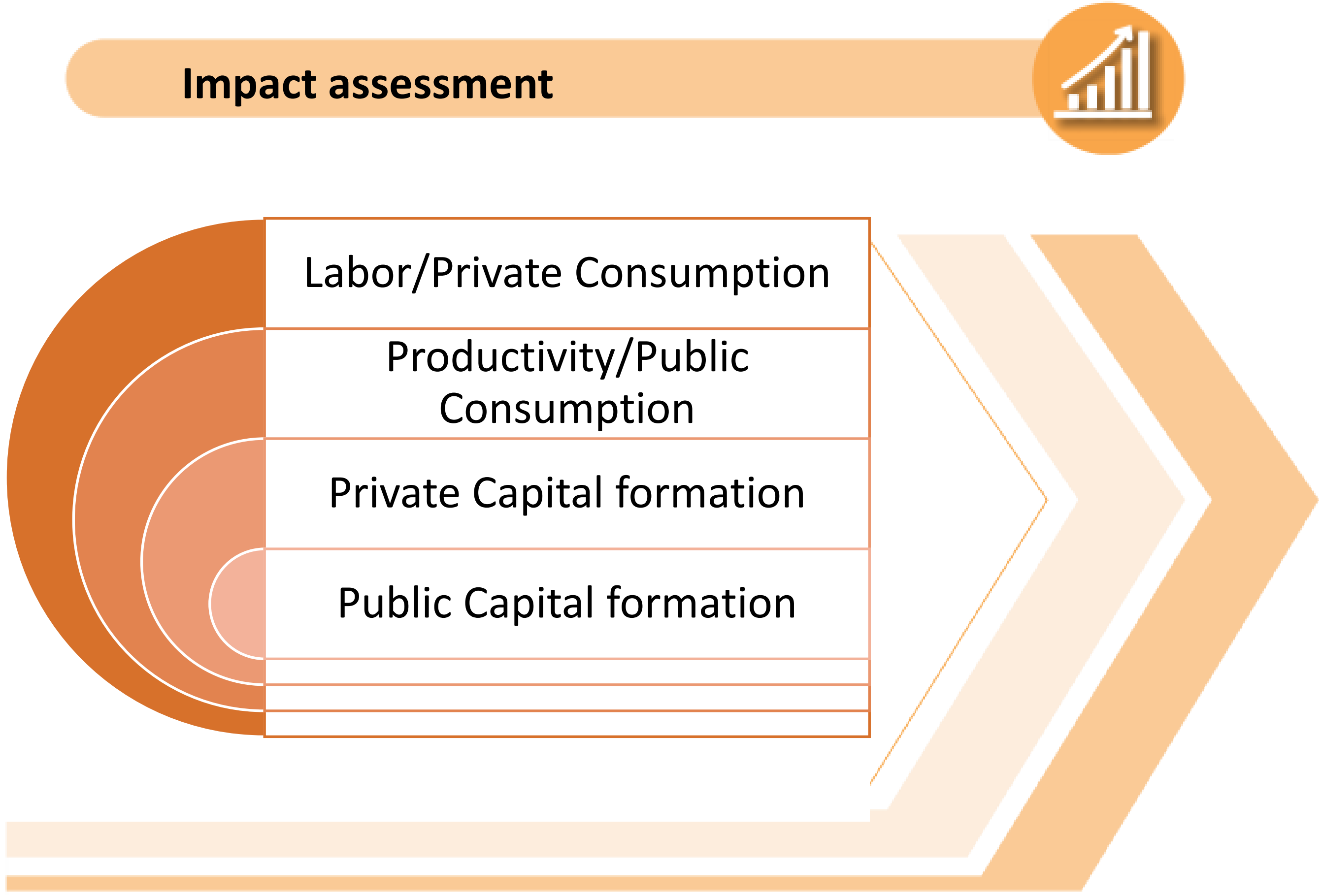
Monetary aggregates still unavailable for Montenegro. Therefore, the module works only with assets and liabilities of the banking system (commercial banks)

Labour

Labour Force Survey (LFS) data used; Labour force, employment, employees, unemployment, monthly wages, and labour productivity are treated
Some variables are also in terms of rates (unemployment rate, participation rate,...)

Module II – Impact assessment

- … is used for policy simulations in assessing net effects implemented measures and provide for ex-ante assessment of future structural reforms.
- 70+ formulas and equations
- Eviews and Excel spreadsheet
- Direct effects on GDP
- Alternate Scenario



Impact Assessment in ERP 2022

The quantitative assessment included the following structural reform measures:

- Measures 1, 4 and 6 – dealing with the labor force;
- Measures 5, and 7 to 21 – dealing with the government spending, or total factor productivity; and
- Measure 22– dealing with the private fixed capital formation.
- +Fixed Capital Formation – Major investments projects

(which will update substantially and improve Montenegro's competitiveness concerning transport, energy, and water management)

Assessment of Measures

Measures 1, 4 and 6 – dealing with the labor force

Measures 5, and 7 to 21 – dealing with the government spending, or total factor productivity;

Measure 22– dealing with the private fixed capital formation.

+ Fixed Capital Formation – Major investments projects

Impact Assessment in ERP 2022

- ***1: Strengthening operational capacities of the Employment Office for carrying out services and measures via digitalization***
- ***4: Increasing employability of adults by improving their skills and competences needed at the labor market***
- ***6: Reform of the national system for disability assessment***
- ***5: Digitalization of the education and development of digital skills***
- ***7: Defining financial preconditions for reforms proposed by the Road Map***
- ***21: Reducing release into circulation of lightweight carrier plastic bags and single-use plastic products***
- ***22: Supporting investments in the food manufacturing sector aimed at strengthening the competitiveness***

Assessment of Measures

Measures 1, 4 and 6 – dealing with the labor force

Measures 5, and 7 to 21 – dealing with the government spending, or total factor productivity;

Measure 22– dealing with the private fixed capital formation.

+ Fixed Capital Formation – Major investments projects

Private consuption / Labor force measures

Reform Measure 1: Strengthening operational capacities of the Employment Office for carrying out services and measures via digitalisation								
Year	Central budget	Local budgets	Other national public finance sources	IPA funds	Other grants	Project loans	To be determined	Total
2022	127,059.00	0.00	0.00	719,999.00	205,889.00	0.00	0.00	1,052,947.00
2023	190,589.00	0.00	0.00	1,080,000.00	0.00	0.00	0.00	
2024	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Reform Measure 4: Increasing employability of adults by improving their skills and competences needed at the labour market								
Year	Central budget	Local budgets	Other national public finance sources	IPA funds	Other grants	Project loans	To be determined	Total
2022	25,000.00	0.00	0.00	0.00	0.00	0.00	0.00	25,000.00
2023	255,000.00	0.00	0.00	0.00	0.00	0.00	0.00	255,000.00
2024	755,000.00	0.00	0.00	0.00	0.00	0.00	0.00	755,000.00

Reform Measure 6: Reform of the national system for disability assessment								
Year	Central budget	Local budgets	Other national public finance sources	IPA funds	Other grants	Project loans	To be determined	Total
2022	0.00	0.00	0.00	214,334.00	0.00	0.00	0.00	214,334.00
2023	0.00	0.00	0.00	341,752.00	0.00	0.00	0.00	341,752.00
2024	0.00	0.00	0.00	443,914.00	0.00	0.00	0.00	443,914.00

Public consuption / Productivity

Reform Measure 5: Digitalisation of the education and development of digital skills								
Year	Central budget	Local budgets	Other national public finance sources	IPA funds	Other grants	Project loans	To be determined	Total
2022	0.00	0.00	30,000.00	0.00	10,000.00	4,000,000.00	0.00	4,040,000.00
2023	1,600,000.00	0.00	350,000.00	0.00	0.00	550,000.00	0.00	2,500,000.00
2024	500,000.00	0.00	0.00	0.00	0.00	0.00	0.00	500,000.00

Reform Measure 7: Defining financial preconditions for reforms proposed by the Road Map								
Year	Central budget	Local budgets	Other national public finance sources	IPA funds	Other grants	Project loans	To be determined	Total
2022	143,000.00	0.00	0.00	0.00	110,000.00	0.00	0.00	253,000.00
2023	123,000.00	0.00	0.00	150,000.00	60,000.00	0.00	0.00	333,000.00
2024	123,000.00	0.00	0.00	0.00	0.00	0.00	0.00	123,000.00

Reform Measure 21: Reducing release into circulation of lightweight carrier plastic bags and single-use plastic products								
Year	Central budget	Local budgets	Other national public finance sources	IPA funds	Other grants	Project loans	To be determined	Total
2022	130,000.00	0.00	0.00	0.00	0.00	0.00	0.00	130,000.00
2023	80,000.00	0.00	0.00	0.00	0.00	0.00	0.00	80,000.00
2024	70,000.00	0.00	0.00	0.00	0.00	0.00	0.00	70,000.00

Public consuption / Productivity

Year	Central budget	Local budgets	Other national public finance sources	IPA funds	Other grants	Project loans	To be determined	Total
Reform Measure 5: Digitalisation of the education and development of digital skills								
2022	0.00	0.00	30,000.00	0.00	10,000.00	4,000,000.00	0.00	4,040,000.00
2023	1,600,000.00	0.00	350,000.00	0.00	0.00	550,000.00	0.00	2,500,000.00
2024	500,000.00	0.00	0.00	0.00	0.00	0.00	0.00	500,000.00

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2024	123,000.00	0.00	0.00	0.00	0.00	0.00	0.00	123,000.00

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2023	80,000.00	0.00	0.00	0.00	0.00	0.00	0.00	80,000.00
2024	70,000.00	0.00	0.00	0.00	0.00	0.00	0.00	70,000.00

Private Capital Formation

Reform Measure 22: Supporing investments in the food manufacturing sector aimed at strengthening the competitiveness								
Year	Central budget	Local budgets	Other national public finance sources	IPA funds	Other grants	Project loans	To be determined	Total
2022	2,615,015.50	0.00	0.00	7,845,048.10	0.00	0.00	0.00	10,460,063.60
2023	3,690,429.77	0.00	0.00	11,071,294.54	0.00	0.00	0.00	14,761,724.31
2024	266,611.19	0.00	0.00	799,833.60	0.00	0.00	0.00	1,066,444.79

Due to the limited effect of selected structural reform measures, the impact assessment model took as additional survey calculations for some key and major investments projects: Bar-Boljare Highway, Adriatic-Ionian Highway, Solar-power plant Briska Gora, Wind-power turbines Brajići and Gvozd, environmental rehabilitation of the Thermal-power Plant Pljevlja, Hydropower Plant Komarnica project, redirecting the River Zeta, energy efficiency in public and private buildings, and system for wastewater treatment in Podgorica.

Some of them are public-private investment* or sole private investment**, and would partialy count as Private capital formation

Fixed capital formation

Table 3.4: Fixed capital formation from public sources (unless otherwise indicated), in thousand euro

	2020	2021	2022	2023	2024
Transport					
Highway Bar-Boljare – First section	48,000	50,000	50,000		
Highway Bar-Boljare – Second section				200,000	200,000
Adriatic-Ionian Highway			20,000	20,000	20,000
Energy					
Solar-power plant Briska Gora Ulcinj*	2300	15500	14500	14700	2300
Wind farm Brajići**	2,244	4,193	35,340	59,502	2,244
Wind farm Gvozd*			500	3000	
Environmental reconstruction of the Thermal-power Plant Pljevlja		13,300	15,250	4,250	4,250
Hydropower Plant Komarnica	23	1,060	2,100	14,500	24,500
Redirecting the River Zete		530	9,400	8,800	8,300
Energy efficiency – Public buildings – Third Phase	906	1,500	6,000	1,000	1,500
Energy efficiency – Second Phase	1,936	739	1,002	573	
Wastewaters					
Wastewater treatment system Podgorica	6,658	4,612	16,032	13,456	11,834
Notes:					
Government fixed capital formation - Total:	***57,523***	***72,891***	***127,784***	***271,329***	***277,734***
Private fixed capital formation – Total:	**3,394**	**12,193**	**44,090**	**66,852**	**3,394**

Effects of Implementation of Selected Structural Measures and Infrastructure Projects

Effects of implementation of the considered structural measures, together with capital infrastructure projects, would have considerable net effect in the private investments growth (ranging between 8.8 percent in 2022 and 22.2 percent in 2024), as well as on increase of imports (between 6.6 percent and 19.2 percent) and export of goods (between 6.4 percent and 18.9 percent).

Labor market: The net effect on nominal wages is higher (between 1.3 percent and 4.1 percent), the employment is higher (between 0.5 percent and 1.5 percent), while the unemployment is lower (between 0.3 percent and 0.8 percent), relative to the scenario of absence of these projects.

REAL GDP GROWTH INDEX

	2020	2021	2022	2023	2024
Real sector					
GDP (in 2010 prices), net effect in %	0.3	0.6	1.3	2.7	4.1
Private consumption (in 2010 prices), net effect in %	0.3	0.7	1.5	3.1	4.8
Private investments (in 2010 prices), net effect in %	1.4	2.5	8.8	16.7	21.2
Export of goods (in 2010 prices), net effect in %	0.0	0.0	0.0	0.0	0.0
Export of services (in 2010 prices), net effect in %	2.0	3.0	6.4	16.8	18.9
Import of goods (in 2010 prices), net effect in %	2.0	3.1	6.6	17.1	19.2
Import of services (in 2010 prices), net effect in %	0.5	1.1	2.3	4.8	7.4
Labour market					
Labour force, net effect in %	0.1	0.2	0.4	0.8	1.2
Employment, net effect in %	0.1	0.2	0.5	1.0	1.5
Unemployment, net effect in %	-0.1	-0.1	-0.3	-0.5	-0.8
Unemployment rate, net effect in p.p.	0.0	0.0	-0.1	-0.2	-0.3
Nominal wage, net effect in %	0.3	0.6	1.3	2.7	4.1

Base year for the GDP index (2015=100); Prices= 2010

Effects of Implementation of Selected Structural Measures and Infrastructure Projects

Results of these indicators have a particular importance, given that their multiplier effect would generate even stronger results of the Montenegrin economy rebound and for improvement of its competitiveness.

- Expected net effect from the projects mentioned above on the real GDP is 1.3 percent in 2022, 2.7 percent in 2023 and 4.1 percent in 2024.
- This could be interpreted that the GDP level at the end of 2024 would be lower by 4.1 percent than in the scenario without implementation of the structural reforms and infrastructural projects

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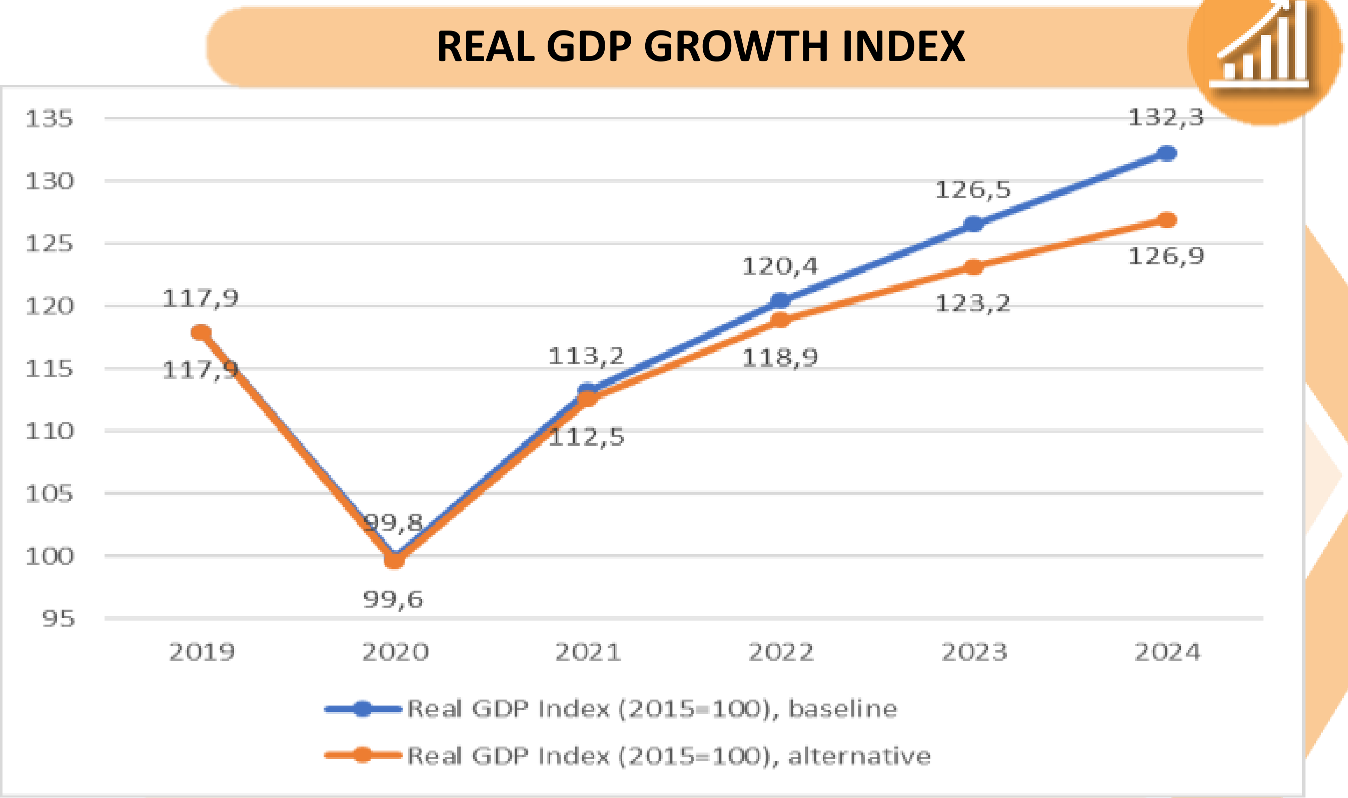
Base year for the GDP index (2015=100); Prices= 2010

Baseline vs Alternative GDP index scenario

- Graphical presentation of the real GDP growth relative to the base year



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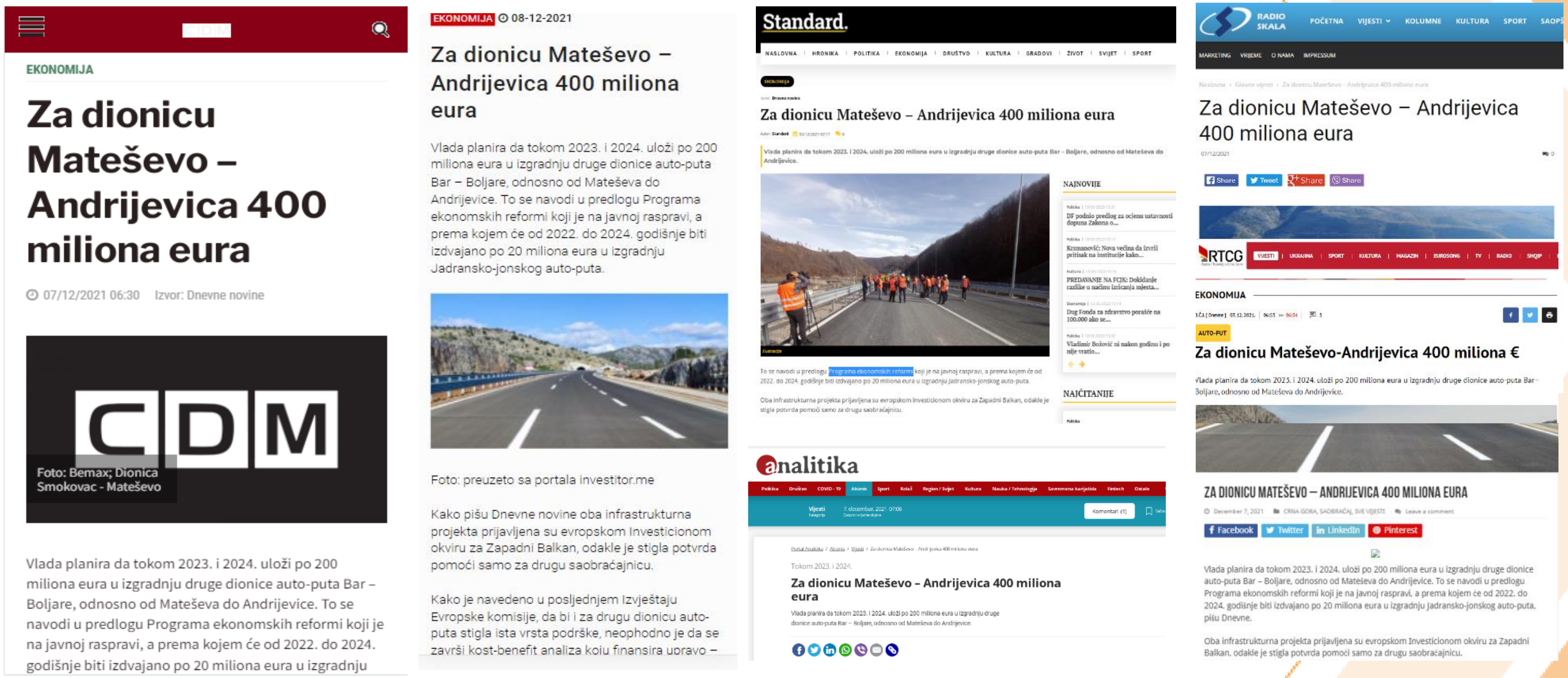
In the Media



EKONOMIJA

Za dionicu Mateševo – Andrijevica 400 miliona eura

07/12/2021 06:30 Izvor: Dnevne novine

Foto: Bemax; Dionica Smokovac - Mateševo

Vlada planira da tokom 2023. i 2024. uloži po 200 miliona eura u izgradnju druge dionice auto-puta Bar – Boljare, odnosno od Mateševa do Andrijevice. To se navodi u predlogu Programa ekonomskih reformi koji je na javnoj raspravi, a prema kojem će od 2022. do 2024. godišnje biti izdvajano po 20 miliona eura u izgradnju

EKONOMIJA 08-12-2021

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Foto: preuzeto sa portala investitor.me

Kako pišu Dnevne novine oba infrastrukturna projekta prijavljena su evropskom Investicionom okviru za Zapadni Balkan, odakle je stigla potvrda pomoći samo za drugu saobraćajnicu.

Kako je navedeno u posljednjem Izvještaju Evropske komisije, da bi i za drugu dionicu auto-puta stigla ista vrsta podrške, neophodno je da se završi kost-benefit analiza koju finansira upravo –

Standard.

Za dionicu Mateševo – Andrijevica 400 miliona eura

analitika

Za dionicu Mateševo – Andrijevica 400 miliona eura

RADIO SKALA

Za dionicu Mateševo – Andrijevica 400 miliona eura

RTCG

EKONOMIJA

AUTO-PUT

Za dionicu Mateševo-Andrijevica 400 miliona €

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Oba infrastrukturna projekta prijavljena su evropskom Investicionom okviru za Zapadni Balkan, odakle je stigla potvrda pomoći samo za drugu saobraćajnicu.

Challenges

Endogenous:

- Training Cycle of the staff; Lack of staff capacities to fully implement the model; purchase and development of IT tools; quality and availability of statistical data

Exogenous:

Turbulent times

- Financial crisis 2008-
- Covid 2019
- Ukraine
- the Balkans

Montenegro Macroeconometric Model

for impact assessment of structural reforms in the ERP

Thank you for your attention

Questions?

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