The Role of Macroeconomic Unit
Macroeconomic analyses and forecasts

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Outline

- Role of Institut for Financial Policy
- Macroeconomic forecasting schedule
- Sources of data and data processing
- Forecasting process
- Forecasting risks

Mission and goals

Who we are

- Macro-fiscal unit
- Main analytical unit of the Ministry of Finance and top analytical unit in Slovakia
- One of the oldest economic think-tanks of the public administration in Slovakia
- Imbedded in the core agenda of the Ministry – macroeconomic, tax and expenditure forecasts, legislative costing, research, budget analysis

What do we do

Mission of IFP

- Reliable macroeconomic and fiscal analyses and forecasts for the Slovak government and public
- Policy arm of the Finance Ministry
- Keeps a finger on the pulse of the day on economic data and economic topics

Main goals

- Transparency of public budgets
- Sustainability of public finances
- Quality and efficiency of public finances

IFP departments

- **Macroeconomic Unit**
    - Analyses and forecasts development of the Slovak economy, e. g. GDP, inflation or unemployment
    - looks into financial markets and financing of the Slovak government
    - Special unit of behavioral experiments and analysis
- **Tax Policy Unit**
    - Policy recommendations and tax analysis
    - Revenues forecasts and policy costing -taxes, social insurance, etc.
- **Fiscal Unit**
    - Fiscal policy, public finance and its sustainability
- **Public Finance Long-term Sustainability and Economic Growth Unit**
    - Focus on pension expenditures and policies affecting long-term economic development

Macroeconomic forecasting schedule

Forecasting from the crystal ball?

Why to make Forecasts?

- To achieve the medium-term fiscal objectives, Ministry of Finance needs to work with future values of macroeconomic variables
    - If the objective is, for example, to **reduce the structural deficit**, MoF needs to know what will happen to the actual GDP growth, output gap and government revenues in the future

- In order to make the right choices, public needs to have the most accurate information about the future

When to make Forecasts?

- There is no general rule when to do forecast: IMF 2x year, central banks usually more often
- To have a good forecast, the most recent data needs to be available
    - Hence, it is good to make the forecast right after the new data release
- IFP at MoF publishes the forecast **3x a year**: February, June, September
    - Forecast is assessed by independent Macroeconomic Forecasting Committee
    - When necessary, there is an additional forecasting round

Our forecasting schedule

- Short-term forecasts
  - 1 quarter ahead
    - GDP and its components from the production and expenditure side and employment
    - Inputs are available monthly indicators
    - 4 times a year before **flash estimate of the GDP and employment** release by Eurostat
  - 4 quarters ahead
    - **Internal estimate** for Tax Unit every month
    - **Input to medium-term forecast**

Our forecasting schedule (2)

- Medium-term forecasts
  - **5 years ahead**
  - **3 times a year: January, June, September**
  - In line with the budgetary framework:
  - Macroeconomic forecasts->tax revenue forecasts->budget proposal
  - GDP and its components from the demand side: household consumption, government consumption, investment, exports, imports, deflators, CPI, HICP, PPI, real and nominal wages, employment (LFS, ESA, registered), unemployment rate, current account balance
  - Macroeconomic forecasting committee assesses the forecasts
  - Publication at the web site

Data

Real economy

- Main source: Statistical office, Automotive Industry Association, Office of Labour, Social Affairs and Family, National Bank of Slovakia, Financial Administration of the Slovak Republic
- **Monthly data**
  - Confidence indicators - sentiment in industry, services, retail, households' sector and construction
  - Industrial production, sales, new industrial orders
  - Car registrations
  - Cash register data – daily data
  - Employment and average monthly wage in selected sectors of economy
  - Registered unemployment
  - Exports and imports of goods
  - Exports and imports of services
  - Current account and financial account data

Real economy (2)

- Main Source: Statistical office, Eurostat, Social Insurance Agency
- **Quarterly data**
  - National accounts – GDP and its components from the production and expenditure side – flash estimate and actual release
  - Employment ESA methodology - flash estimate and actual release
  - Compensations of employees ESA
  - LFS data - micro and macro level
  - Social insurance assessment base

Prices

- Main source: Statistical office of the SR
- **Monthly data**
    - CPI, HICP, PPI
- **Quarterly data**
    - Household and government expenditure prices, investment prices, export prices, import prices
    - Computed from National accounts data as nominal values divided by real values

Financial sector data

- Main source: National bank of Slovakia
- **Monthly data**
  - Deposits and credits (flows and stocks) of households and companies
  - Interest rates of credits and deposits for households and companies
  - Monetary aggregates

Seasonal adjustment

- **Month-on-month/quarter-on-quarter look**
- Mt/Mt-1, Qt/Qt-1
- Identification and elimination of the seasonal component
- X12-Arima, Tramo/Seats method
- In order to identify turnover point in economy
- Significant revisions especially at the end points

Software

- Microsoft Office
- Jdemetra+
- R
- EViews
- Matlab
- STATA

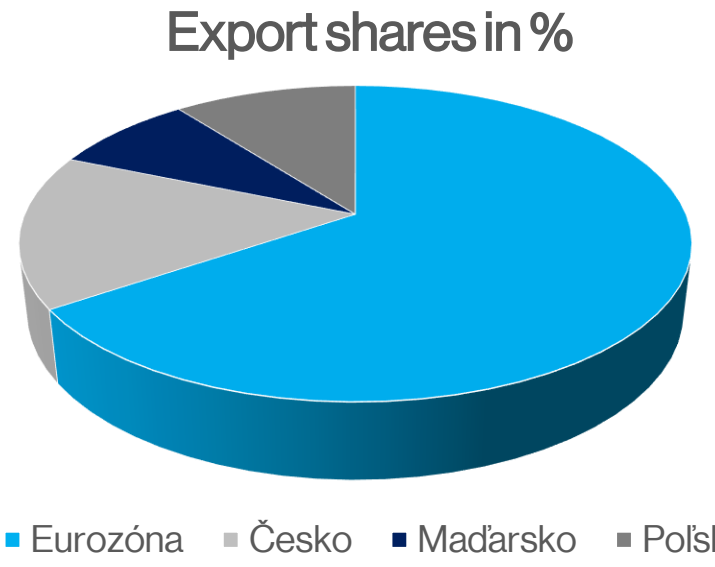
Forecasting process

Start with an external enviroment

- Slovakia is a **small and very open economy** affected by:
  - External demand shocks, inflation shocks, etc.
- **Slovakia cannot affect big markets** (Germany), oil price, euro exchange rate, short-term interest rate, etc.
  - Take these as exogenous
  - Use forecasts from other institutions
  - Explore what has changed (monetary stance, financial market, oil prices) compared to your previous forecast
- Sources: IMF, ECB, EC, OECD, Bundesbank, Bloomberg, etc.

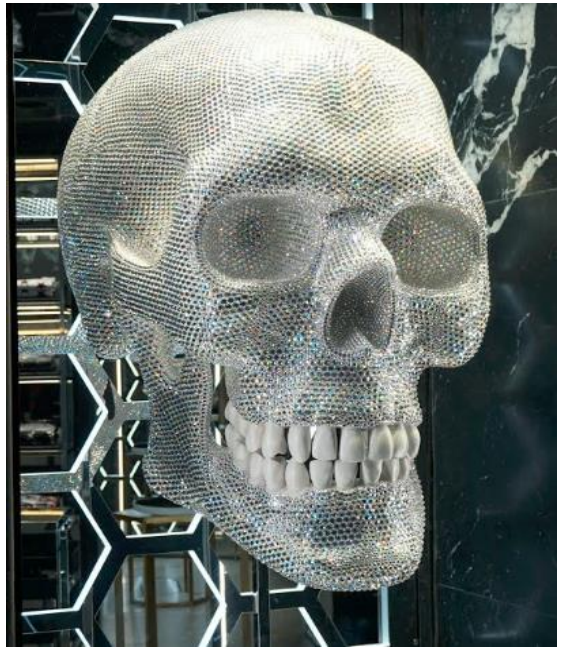
Start with an external environment (2)

- **External demand** is main determinant of GDP
- Weighted average of imports of our main trading partners
- Weights are based on export shares into EA+V3 (CZ, HU, PL)



Continue with domestic assumptions

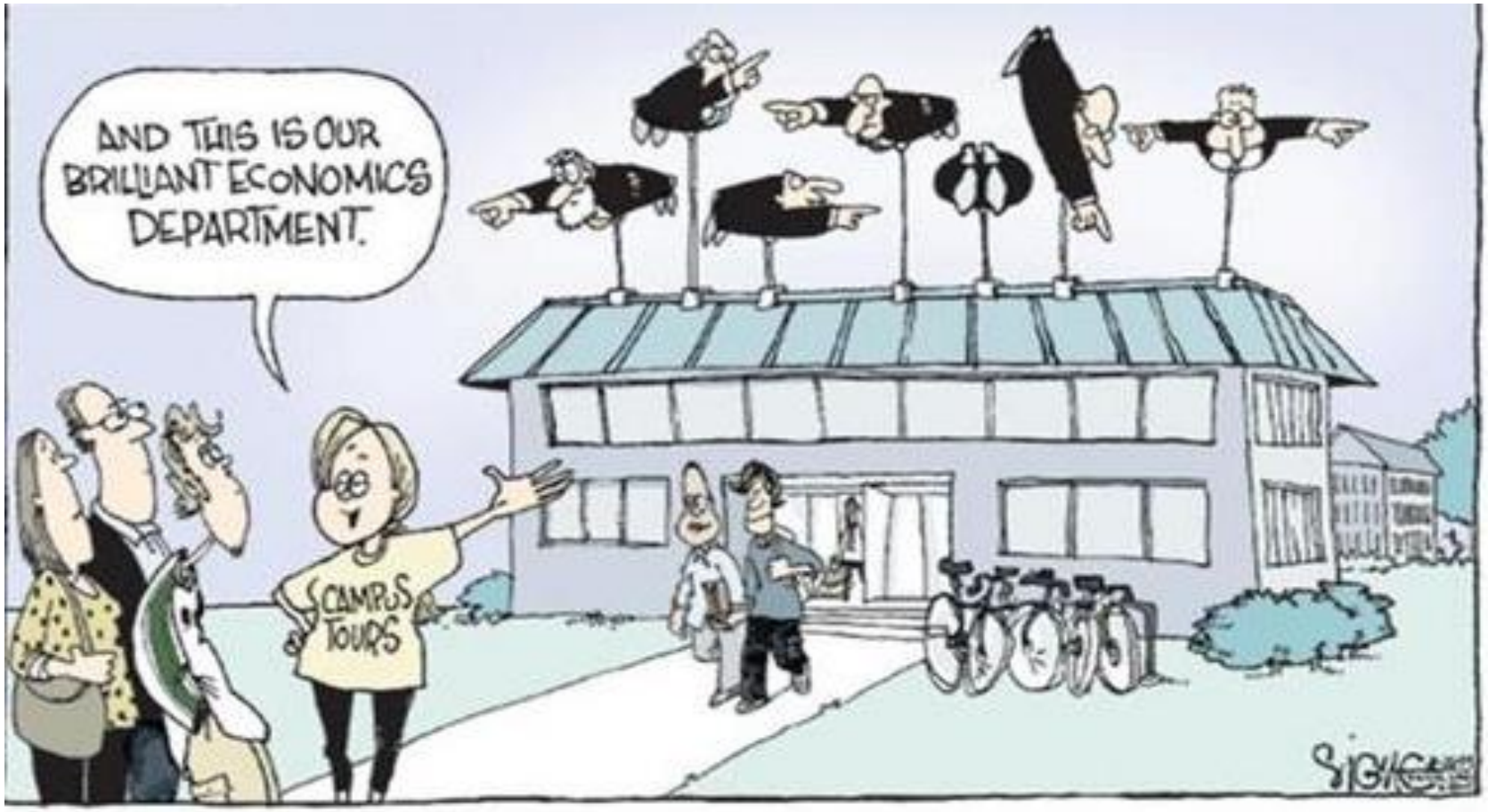
- Assumptions about big investment - car plants
- Highway construction
- Information from newspapers
- Regulated prices
- Fiscal measures
- Summary of basic forecast assumptions is called **skeleton**



We are confident in the short-term horizon...

- **Estimate until end of current year**
- Gross domestic product, consumption, investments, foreign trade, labor market, price level
- An estimate based on available data for the current year, leading indicators and breakdown by sector and category
- **Using combination of several nowcasting methods and expert judgement**
- Structural variables over the entire horizon (population growth, potential productivity, potential employment)

...but less in the medium-term



Hence the model approach

- **New-Keynesian structural model of a small open economy with a fiscal block**
- Exogenous foreign, financial and structural variables
- **Five interconnected blocks: supply block, demand block, price block, households, fiscal block**
- Model without monetary rule (fixed interest rates and exchange rate)
- Backward-looking expectations

Technical details of the model

- **Error correction models + macroeconomic identities**
- Long-run relationships from the economic theory (production function, first order condition, level based)
- Short-run relations focused on maximum fit of variables (econometrical approach, growth based)
- Seasonal adjusted time-series (1995Q1 – 2017Q4)
- More flexibility for forecasting than DSGE, sufficiently detailed structure for policy analysis
- *https://www.mfsr.sk/files/archiv/50/Manual.pdf*

Supply block

- **Potential production using the Cobb-Douglas production function** (productivity, employment, capital)
- Exogenous potential productivity and employment
- Capital through the perpetual inventories method
- We divide employment into companies, government and self-employed
    - Positive impact of output and negative impact of wages
- We divide investments into companies, government and households
    - Positive impact of output and profitability, negative impact of long-term interest rates

Demand block

- We model **GDP as aggregate domestic demand**

$$Y_t = C_t + G_t + I_t + X_t - M_t$$

- **Private consumption** is based on disposable income and short-term rates (Euler's equation)
- **Public consumption** is disaggregated into individual components (compensations, intermediate consumption, etc.)
- **Export and import** are determined by foreign and domestic demand, the real exchange rate and the development of market shares

Price block

- We divide **wages** into private and public sector
  - Impact of labor productivity and unemployment gap
  - Also the negotiating position of companies and households
- **Production prices** determine other prices in the economy
  - The impact of unit labor costs and the output gap
  - Persistent plus structural expectations
- We divide **consumer prices** into core and energy inflation
  - Exogenous on the forecasting horizon, endogenous for simulating risk scenarios and budget measures

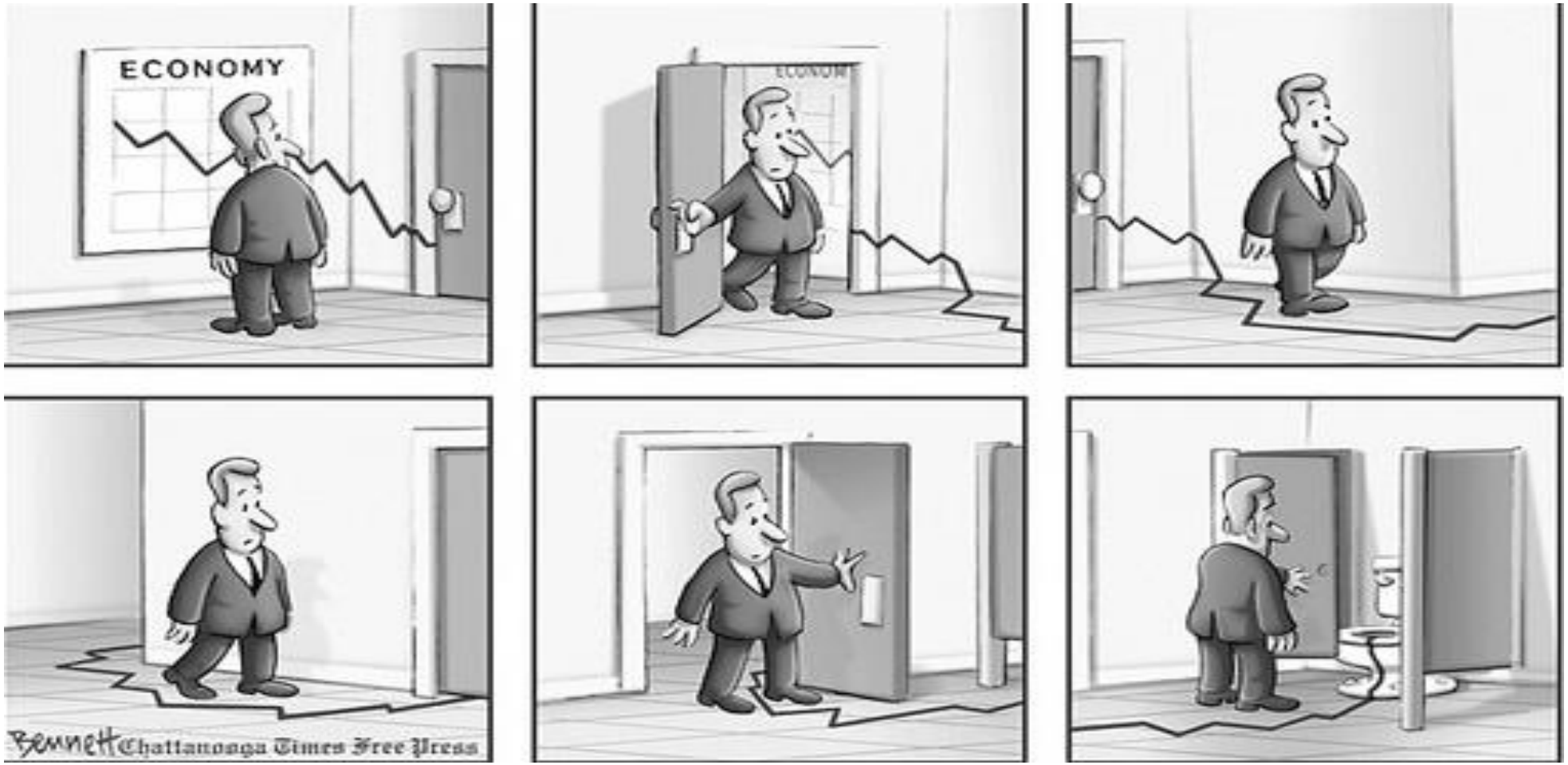
Fiscal block

- Incorporation of fiscal variables - **deficit and debt VS**
- We calculate the primary deficit using disaggregated revenues and expenditures of the public administration
- Interest costs are calculated using debt levels and interest rates
- All significant taxes (personal and corporate income tax, value added tax, consumption taxes)
- We also calculate employee and employer contributions
- The expenditures depend on the current development of the economy
- Plus we assume expenditure fiscal rules

Taxes and social contributions

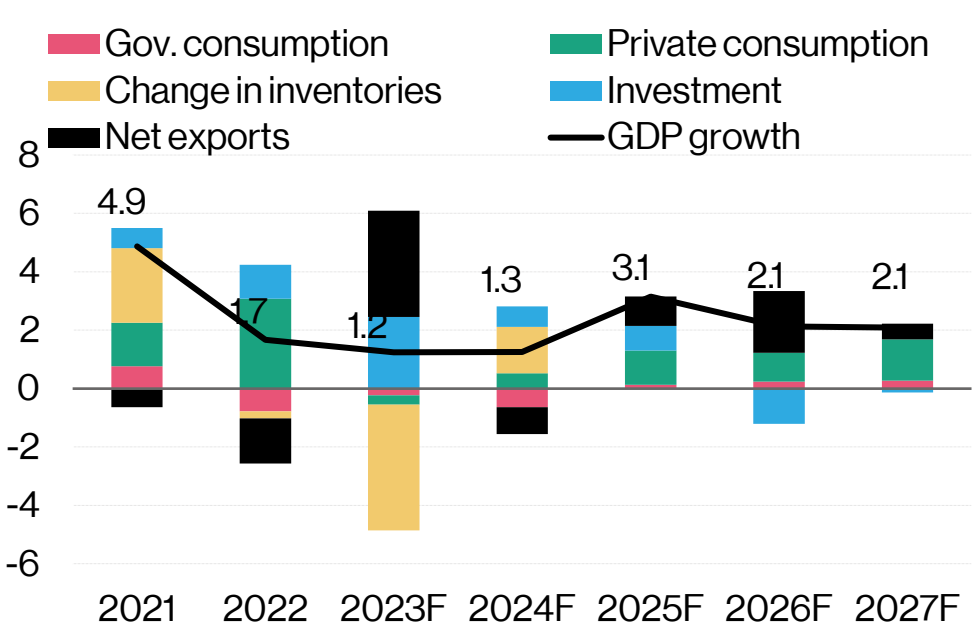
- Taxes and social contributions have a significant impact on the domestic economy
- Effective tax rate is unchanged over the forecasting horizon
- PIT will negatively affect the labor supply in the short and long term and will slow down private consumption
- CIT will be divided between profitability (47%), compensations (43%) and price increases (10%), will slow down investment and capital growth
- Consumption taxes are reflected in consumer prices
- Social contributions are divided between the employer and the employee

Model outcome ☺

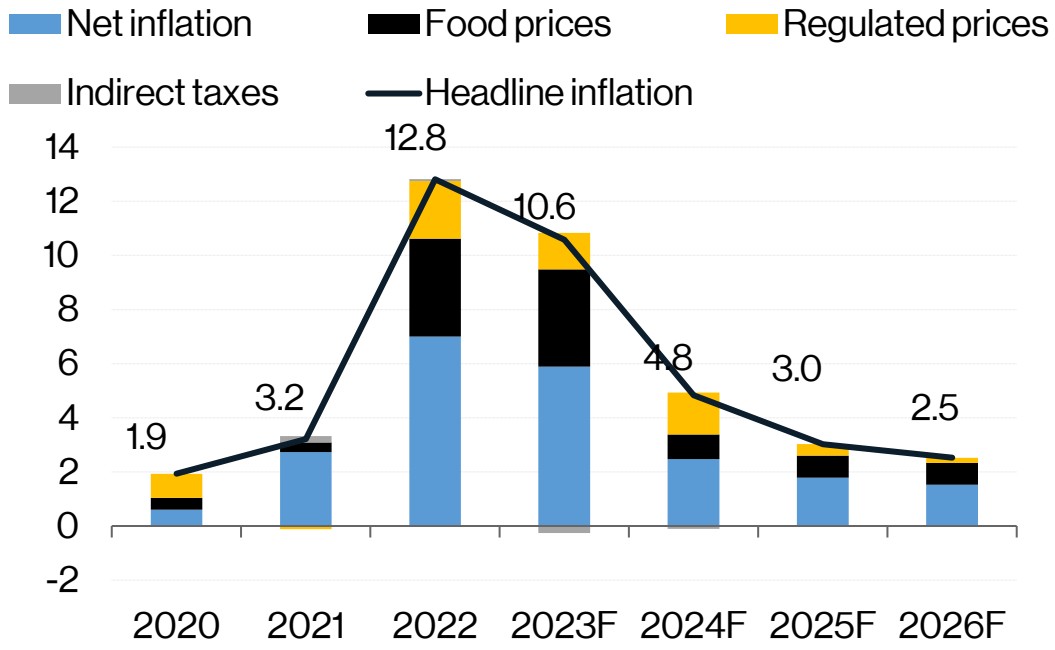


Model outcome

Contributions of individual components to GDP growth (constant prices, p.p.)



Inflation and contributions of individual components (p.p.)



- Plug short-run forecast into the big model and run it

Summarize clearly (1)

MF SR FORECAST- MAIN ECONOMIC INDICATORS (June 2023)

indicator (growth in per cent unless otherwise noted)	2022	forecast 2023	2024	2025	2026	2027	dff. From Feb. 2023 2023	2024	2025	2026
Gross Domestic Product										
GDP, real	1.7	1.2	1.3	3.1	2.1	2.1	-0.1	-0.5	0.4	0.2
GDP, nominal (bn. €)	9.3	10.3	7.7	6.0	4.5	5.4	1.2	0.4	-0.9	0.0
Private consumption, real	5.5	-0.5	0.9	2.1	1.7	2.5	-1.2	-0.2	0.6	0.4
Private consumption, nominal	18.4	9.8	5.5	5.1	4.3	5.2	-0.4	-0.9	-0.8	0.7
Government spending	-4.3	-1.4	-3.8	0.8	1.6	1.7	-3.7	-5.2	0.3	0.6
Fixed investment	5.9	11.9	3.1	3.6	-5.2	-0.6	-2.7	1.9	2.3	-1.9
Export of goods and services	2.3	-1.8	5.7	6.9	6.7	5.0	-3.1	-1.2	0.3	1.3
Import of goods and services	4.0	-5.6	7.0	6.2	4.8	4.8	-9.8	0.8	1.0	1.0
Labour market										
Registered employment	1.7	0.2	0.2	0.6	0.5	0.3	-0.2	-0.3	0.0	0.2
Wages, nominal	7.7	9.9	7.0	5.8	4.4	5.3	-0.6	-1.1	-0.5	0.2
Wages, real	-4.5	-0.6	2.2	2.7	1.9	2.6	-1.2	-0.4	0.7	0.0
Unemployment rate	6.1	6.1	5.7	5.4	5.1	5.0	0.3	0.3	0.2	-0.1
Inflation										
CPI	12.8	10.6	4.8	3.0	2.5	2.6	0.8	-0.5	-1.2	0.3

Source: SO SR, IFP

Summarize clearly (2)

inštitút finančnej politiky
Policy brief 2023/06
Ministry of Finance SR / www.finance.gov.sk/ifp

29th of June 2023

Inflation hits households' consumption

Macroeconomic forecast for years 2023 – 2027

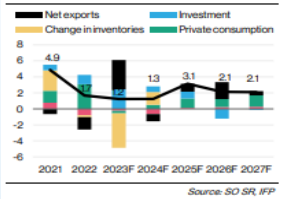
IFP Analysts

The Slovak economy has slowed down as a result of Russia's invasion of Ukraine and GDP is projected to grow by a modest 1.2 per cent in 2023. After the depletion of savings owing to inflationary shock, households will seek to replenish them decreasing their consumption. Despite that real disposable incomes and savings will rise slightly thanks to government measures. Consequently, number of employed people will rise as well. However, foreign demand will weaken, with recovery in European industry lagging behind services. The growth will be supported by EU funding, which will boost capital formation. In 2024, economic growth is projected to accelerate only slightly and real GDP will increase by 1.3 per cent. Economic performance will be dampened by budget consolidation efforts. However, global price pressures will ease and domestic inflation will fall below 5 per cent. In 2025, household consumption will recover and the export will catchiup on lost export market shares. The development of the war and the non-utilisation of EU funds remain risks to the forecast. Finally, as an scenario, we estimate the impact of a balanced budget on the economy.

The negative effects of inflation to fully articulate this year

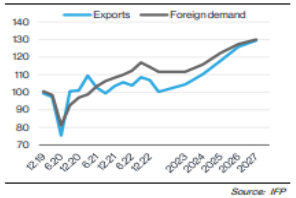
Domestic demand will be hit by high prices in 2023 and GDP growth will slow to 1.2 per cent. Household consumption moderated at the beginning of the year and will fall by 0.5 per cent this year. As the year continues, inflation will ease and households will be able to redirect part of the growth in disposable income to rebuild their savings. The volume of government consumption will fall again year-on-year, as high prices have not allowed the consumption of public goods and services to grow more strongly in real terms. Weaker domestic demand and lower energy imports this year may help to temporarily boost the positive contribution of external demand to GDP. However, the export performance will be dragged down by slow recovery in industrial sectors abroad. The investment will remain the only strong component of the domestic economy. Capital injections from EU funds will peak, with the implementation of the Recovery and Resilience Plan (RRP) starting in the second half of the year. The investment will help to stabilise the unemployment rate and support the wages growth.

Figure 1: Contributions of individual components to GDP growth (constant prices, p.p.)



Source: SO SR, IFP

Figure 2: Export convergence weak in 2022 and 2023 (constant prices, 2019 = 100)



Source: IFP

Foreign trade will weaken in 2023

The forecast of the economic development in our foreign partners indicates a 1.6 per cent decline in trade in 2023. This is mainly due to the receding negative energy prices shock while the supply chain disruptions have not completely disappeared as well. The recovery in the euro area is driven mainly by the service sector so the export-oriented industrial economies will benefit less (more in Box 1).

In 2024, economic growth will accelerate slightly to 1.3 per cent. A gradual recovery in the purchasing power of the population, with real wage growth returning above 2 per cent is expected. The 2023 peak in EU fund absorption will be largely replaced by the stronger implementation of RRP projects in the following year. On the other hand, the lower government expenditure will dampen activity. The budget consolidation to the extent of 1.1 per cent of GDP will reduce the growth of real GDP by 0.8 percentage points in 2024. The possibility of a balanced budget is also in place. However, its impact on the economy would be significantly stronger (more in Box 2).

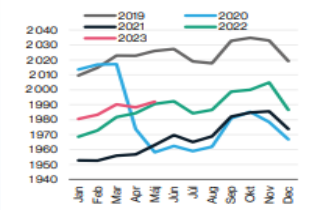
The main impulse for GDP acceleration from 2025 onwards will be a decline of inflation below 3 per cent. Household consumption will return to the strong growth have not seen since the pandemic. The additional increase in the export capacity of the automotive industry from 2026 onwards will also boost the Slovak economy in the years to come. However, imports will also increase due to the renewal of military equipment.

Public finance consolidation is supposed to start in 2024

Risk is balanced

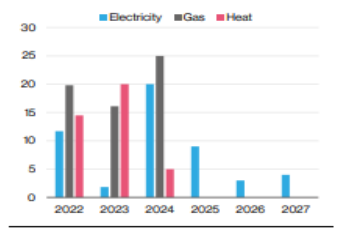
The development of Russia's aggression in Ukraine remains a risk to the forecast. A renewed rise in input prices for the food industry may delay the recovery in consumer spending. On the positive side, there is a risk that foreigners will become more involved in the Slovak labour market and thus fill the shortage of workers in key sectors. The smooth transition to electro-mobility in the context of the introduction of stricter emission rules in Europe is a prerequisite for the successful penetration of Slovak car manufacturers into foreign markets.

Figure 3: Social security records signal weak employment growth this year (employment relations in thousands)



Source: Social Insurance Agency

Figure 4: Energy prices haven't had the last word, we expect them to increase in the following years (y/y growth in %)



Source: SO SR, IFP

Inflation has passed the peak

Inflation will reach 10.6 per cent on average in 2023. Year-on-year price growth will be largely influenced by the base effect from the strong price increases at the end of last year. Government measures led to household energy prices rising only slightly in January compared to developments in commodity markets. Prices of agricultural commodities have been decreasing (wheat, oilseeds, dairy products) or have stabilised (meat, eggs), which is reflected in a slowdown in food price growth. Fuel prices have been on the

Foreigners help fill vacancies

The labour market will continue to be significantly supported by foreigners, of whom more than 93,000 currently work in Slovakia. In addition to those from Ukraine, workers from Serbia, Georgia and India are also coming to Slovakia in greater numbers. Up to 80 per cent of the total number of employed foreigners work in western Slovakia, which has the highest number of unfilled positions and an unemployment rate below 3 per cent. Most of them are employed as unskilled auxiliary workers and machine operators and assemblers. These positions are also the most in-demand and have been a long-term problem to fill. Foreign workers thus help us to fill vacancies more effectively.

Unemployment will stagnate

The unemployment rate (according to the LFS) will remain at last year's level of 6.1 per cent. The moderation of the decline reflects weaker employment trends and at the same time an increase in the working population due to the inflow of Ukrainian refugees which is to be reflected in statistics later this year. The negative trend of active population participation will be partly mitigated by the continuing increased participation of foreign workers together with Slovaks returning from abroad. At the end of the forecast horizon, the unemployment rate will decline to 5 per cent.

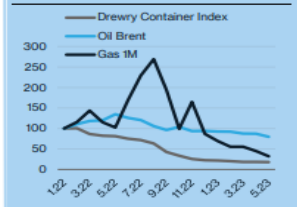
Stellar 10 per cent wages growth

The growth of the average nominal wage will accelerate to 10 per cent in 2023. Wages will rise fastest in the construction sector, which reports the highest worker shortage in 23 years. Public sector employees, whose wage growth lagged the private sector last year, will be better off due to a 10.5 per cent wage indexation. From 2024 onwards, wage bargaining will reflect the lower rate of consumer price inflation. In the public sector, wage increases will be dampened by the consolidation of public finances. Real wage growth will stay negative for the year, but real household incomes will rise thanks to government measures. In subsequent years, wages will grow slightly more than labour productivity, which was a persistent trend before the pandemic.

BOX 1: External environment assumptions

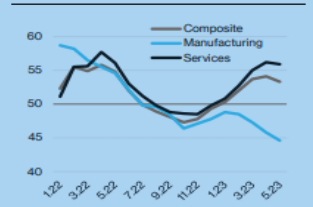
The beginning of 2023 was marked by a recovery in economic activity, but the industry has stumbled back. The recovery was supported by a significant decrease in energy commodity prices as well as warmer weather during the spring months. The more service-oriented economies of the European South, such as Italy and Spain, did particularly well. In contrast, countries with a predominantly industrial sector, such as Germany and the Czech Republic, stagnated or experienced negative growth.

Figure A: Energy commodity prices continue to decline (price inde , January 2022=100)



Source: Bloomberg, IFP

Figure B: Recovery in euro area is driven by services (Purchasing managers index, values above 50 = expansion)



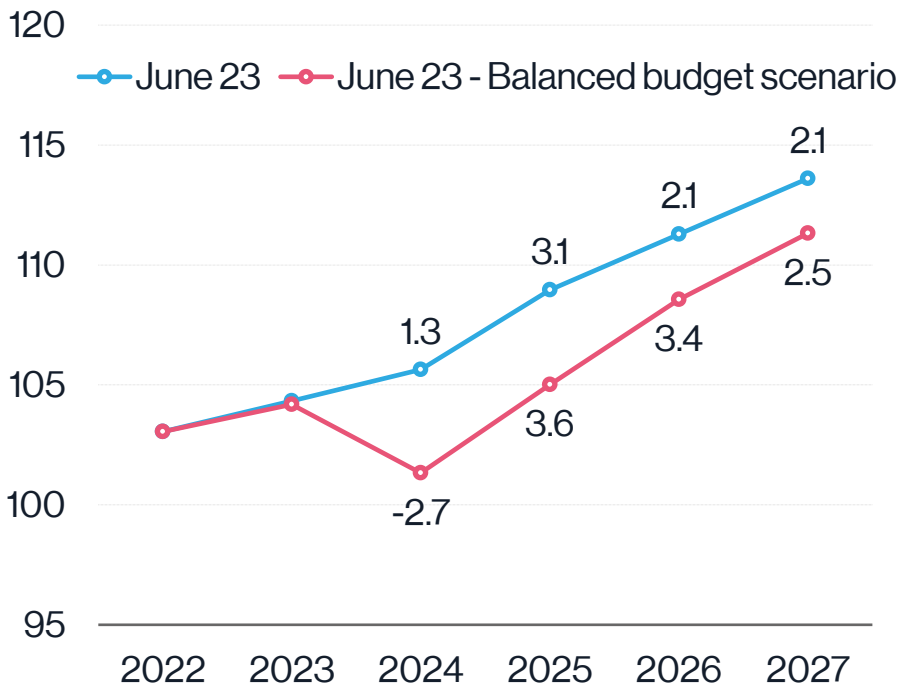
Source: Macrobond, IFP

Forecasting risks

More than forecasts

- Using the model, we can quantify economic and fiscal shocks to the Slovak economy
- Simulation of selected risk scenarios (PS, DBP)
- Calculation of dynamic effects of budgetary measures
- Estimation of fiscal multipliers for individual revenues and expenditures of public administration

Real GDP in the balance budget scenario (index, 2019 = 100, labels in yoy %)



Useful links in english

https://www.mfsr.sk/files/archiv/50/Manual.pdf

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https://www.mfsr.sk/files/archiv/43/Policy-brief_MV_jun2023.pdf

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