

DEVELOPMENT OF SELECTED LOGISTICS INDICATORS OF INDUSTRY IN SLOVAKIA BEFORE THE COVID-19 CRISIS AND AT PRESENT

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Abstract

The world is facing to various hazards globally over the last three years, such as: the global COVID-19 pandemic crisis. Even the ongoing war conflict between Russia and Ukraine does not add stability to the market and the ever-increasing prices of energy and some staple foods are changing consumer prices and making the situation confusing. This paper points to the development of some logistics indicators of economy and industry in Slovakia over the last 5 years, so the data reflect the development of these indicators before the COVID-19 crisis to the present. The choice of indicators was influenced to a large extent by the availability of data and thanks to the Statistical Office of the Slovak Republic it was possible to prepare analyses of the development of the following indicators: foreign trade (exports and imports), sales for industrial production (including mining) and developments in transport. Year 2020 is a year of significant changes, as in March, April and May, industry (production and consumption) in Europe, but also in other countries of the world, was almost completely stopped. In the conclusion, the paper presents graphical overviews, which are supplemented by forecasts of the expected development of these indicators in the near future.

Keywords: Transport, foreign trade, industry, development and forecast assumption

1. INTRODUCTION

Some macroeconomic indicators can also be considered important in macrologistics. This article provides an overview of the situation and possible development of selected macroeconomic indicators in Slovakia, which are freely available thanks to the Statistical Office of the Slovak Republic. These indicators are influenced by various external factors, which ultimately affect the performance of an enterprise itself. Understanding the behaviour of macroeconomic indicators can help to refine the forecast of sales of specific products in local or global markets. For instance year 2020 is a year of significant changes, as in March, April and May, industry (production and consumption) in Europe, but also in other countries of the world, was almost completely stopped. Among the many indicators the following indicators has been chosen: foreign trade (exports and imports), sales for industrial production (including mining) and developments in transport. The aim of this article is to analyse the history and to point out the possible development of these macroeconomic indicators through selected classic methods of forecasting. This estimated development can also directly reflect the development of other subordinate parameters in various branches of industry and trade, which points to the importance of creating forecasts for macroeconomic indicators.

Foreign trade can be defined as the area of circulation of substantial and unsubstantial goods and services, outside a certain state with foreign countries. It relates to one or more groups of countries in the world. Substantial goods mainly include goods in the form of products, raw materials and agricultural products. Unsubstantial goods include services such as: international and transit transport, education, investment, management and health services. Some countries have lack of raw materials and resources or some countries

have surplus it. In these circumstances, the best starting point is to interchange these necessary resources and raw materials, while large-scale savings and different consumer preferences play a great task. [1,2].

An important part of the world of foreign trade is the principle that a larger country with a larger population, the lower the degree of dependence of the economy on external economic relations. The dependence of this ability can be expressed by the ratio of the volume of foreign trade to gross domestic product. The national economy enhances foreign trade by bringing qualitative as well as quantitative effects that are approved for overall benefit to the economy [3]. Export is one of the two aspects of foreign trade. It is one of the most important foreign trade activities, the purpose of which is the sale of goods and services abroad (technology, licenses, copyrights, etc.). Together with imports, it forms the basic interconnection of the economy. The financial funds obtained by this activity thus make it possible to ensure the import of insufficient raw materials and goods for the further course of the transformation process. The basic export activities include direct and indirect exports. Direct export is used in the export of industrial products, production equipment and investment units. The batches of these products are complicated and are associated with the need to provide a range of professional services in which the presence of the manufacturer on a foreign market is necessary. In the case of indirect exports, the producer is no longer in a direct relationship with a foreign customer, but sells its products and services to companies [4,5].

For small countries with an insufficient raw material base, foreign trade is irreplaceable - it contributes to GDP. Exports mainly contribute to the active trade balance (the passive trade balance is when imports exceed exports) [3,4].

Another indicator for the analysis is revenues from mining and quarrying and industrial production, which are associated with industry. The development of sales refers to the year 2015 (base December 2015 = 100, respectively annual average 2015 = 100), which was set by the statistical office as the reference year when the end of the previous economic crisis was definitively ended. The development of the following years is monitored up to the present to this reference.

The third indicator of macroeconomics is development and utilisation of transportation system. Transport has become a phenomenon that could not be addressed by immediate action alone, and there is a need to plan transport infrastructure and meet the growing demands on its services. It is based on the historically confirmed fact of a "closed circle", in which more vehicles generate traffic growth [6,7]. Road transport, together with rail transport, forms the basis of the transport system in Slovakia. The state of the transport and telecommunications system reflects the degree of introduction of new technologies into the economy, but it is also a prerequisite for the overall development of the economy. There are approximately 18,350 km of roads (1st, 2nd and 3rd class) and motorways and approximately 3,600 km of railways in Slovakia. Quantitative characteristics (e.g. density or length) are good, qualitative indicators (e.g. road surface quality, capacity, permeability, electrification, high-speed railways) lag behind the developed countries of the world.

Road freight transport is the most widespread mode of transport to ensure the transport of goods and raw materials. This mode of transport represents up to 80% of all transported goods and raw materials in Slovakia and achieves the highest degree of transport performance in tonne-kilometres (TKMs).

2. METHODOLOGY

The forecasting methodology is based on classical methods, with the aim of creating a medium-term forecast of the determined indicators over a period of 3 years. However, the main precondition for the development of the given situation still remains the idea that the development is expected to "return" to the period before the outbreak of the COVID19 pandemic, with a view to other positive trends. This is also indicated by the fact that, despite the current high fuel prices, there has been no declination in fuel consumption and thus no traffic density in densely populated areas in Slovakia. The only things that can hinder the development of the industry

are scarce goods (chip crisis as a remnant of the COVID-19 pandemic and raw materials, energy or semi-finished products supplied from Russia or Ukraine).

It follows, from the above mentioned, that the classical methods for trend and seasonal types of data behaviour are sufficient for a rough analysis and subsequent prediction of development. Selected methods for predicting the development of seasonal time series are: Holt-Winters method, method of seasonal indices and SARIMA. Exponential smoothing methods and regression analysis and ARIMA were chosen to predict trend time series.

3. RESULTS

Foreign trade statistics of the Slovak Republic, as one of the macroeconomic indicators, generally includes the movement of goods between Slovakia and the rest of the world. Since 2009, the development of prices in foreign trade has been monitored on a monthly basis by regular sample. The aim of this research is to obtain information on import and export prices of selected goods for the calculation of price indices in foreign trade for the purposes of analytical evaluation of the development of the price level in total imports and exports.

Based on the long-term development of the territorial structure of Slovakia's foreign trade, EU member states, the Russian Federation, China and the USA can be identified as the main trading partners of the Slovak Republic.

3.1. Import

In the long term of view, primary commodities are expected to dominate imports, but the share of food and agricultural products should also gradually increase. In the case of relations with the USA and the EU, exports of services will increase, while the USA should become, based on the development of the volume of stocks and production of unconventional natural gas, an exporter of natural gas [economy.gov.sk]. This is also supported by the fact that the EU is trying to cut off gas and oil supplies from Russia. After last year's declination of 5.5 %, import returned to higher growth and it became a record in 2021, reaching 86.6 milliards euros and currently increased by up to 19.3% year on year (**Figure 1**) [8].

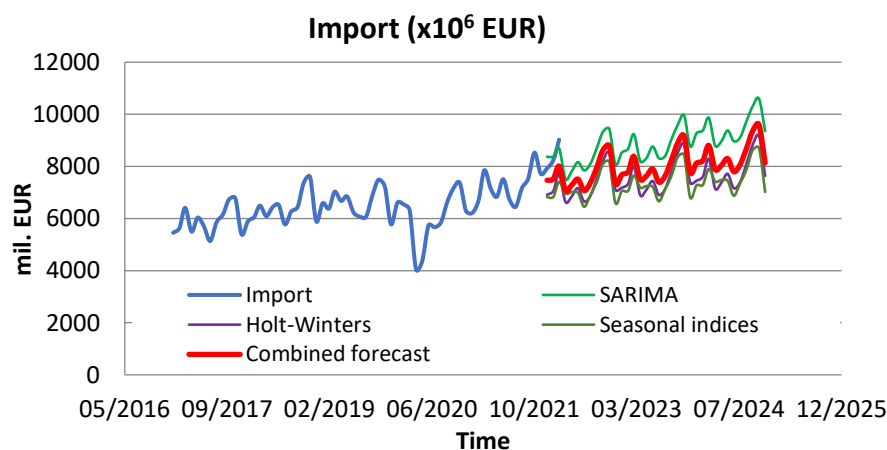


Figure 1 History and development of the Slovak import in the foreign trade

3.2. Export

Slovak exports were a record last year too, despite the autumn outages. For the whole of 2021, exports of goods from Slovakia increased by 16.3 % year on year and at the same time exceeded the values from 2019 (before the pandemic) by almost a tenth. Total exports of goods reached 7,6 milliards of euros in December 2021, with a year-on-year increase of 18.5 percent [8]. According to preliminary data, goods worth 88.3 billion

euros were exported from the Slovak Republic last year, which was the most in the history of independent Slovakia (**Figure 2**) [9].

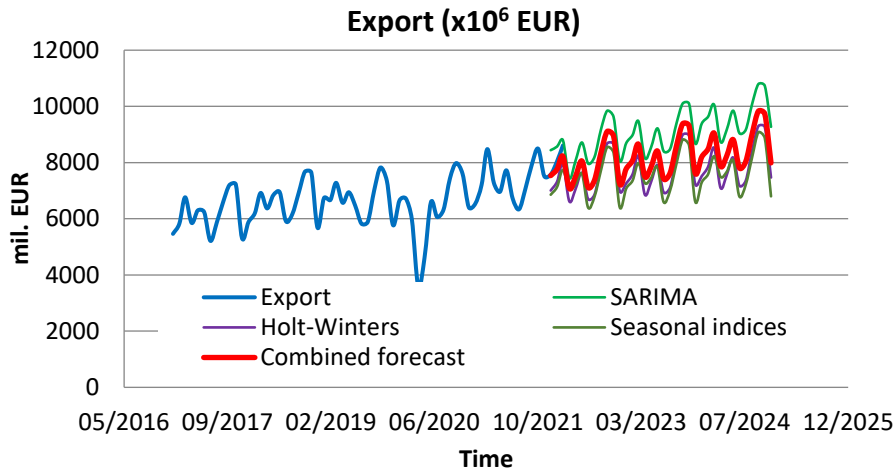


Figure 2 History and development of the Slovak export in the foreign trade

3.3. Industry revenues

Another selected macroeconomic indicator is revenues from industrial production mining and from quarrying and revenues, which are associated with industry. The development of sales refers to the year 2015, which was set by the statistical office as the reference year when the definitive end of the global economic crisis was considered. The development of the following years is monitored up to the present and is shown in **Figure 3**.

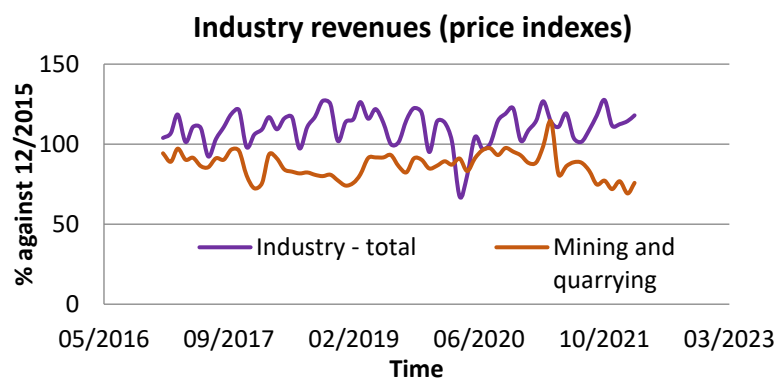


Figure 3 The comparison of a history and development of the total industry revenues and mining and quarrying

Industrial production is dominated by the automotive industry and the metallurgical industry in Slovakia. Despite significant prices rising, growing demand and the resulting growing production are expected, which may be dampened by the absence of supplies of the required material inputs. As regards the mining and quarrying industry, a gradual decline in activity is expected [10]. In Slovakia, the extraction of minerals is concentrated mainly in surface quarries and deep mining is slowly disappearing. The most important deep mines include the Upper Nitra mines of Prievidza, where brown coal is mined, and the mines in Jelšava and Lubeník, where magnesite is mined. Although it is thriving in magnesite mining and Slovakia ranks 5th in the world ranking in magnesite mining, the declination can be seen mainly in coal mining due to its negative consequences for the environment [11,12]. The following figures (**Figure 4** and **Figure 5**) show a possible forecast of the future development.

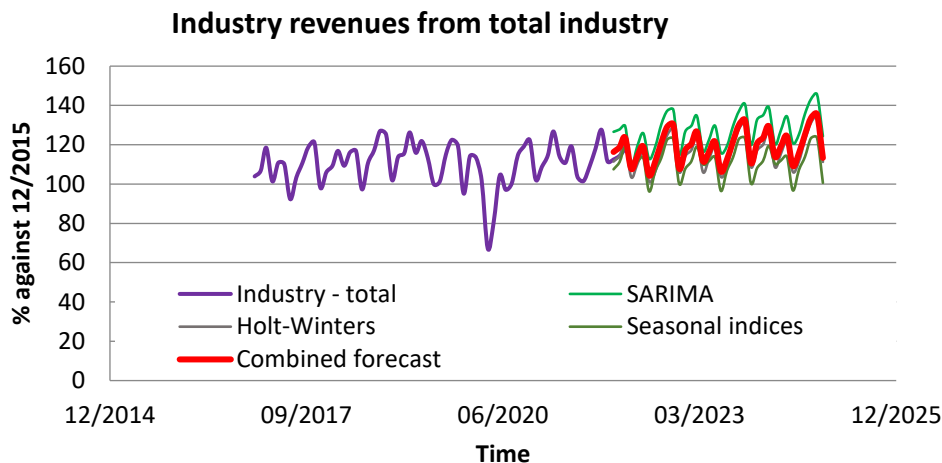


Figure 4 Total industry revenues and its forecast

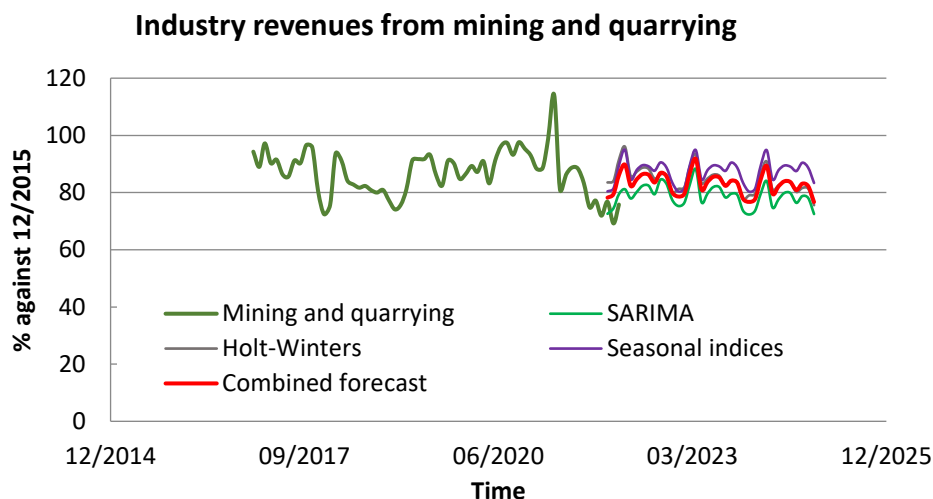


Figure 5 Revenues from mining and quarrying and its forecast

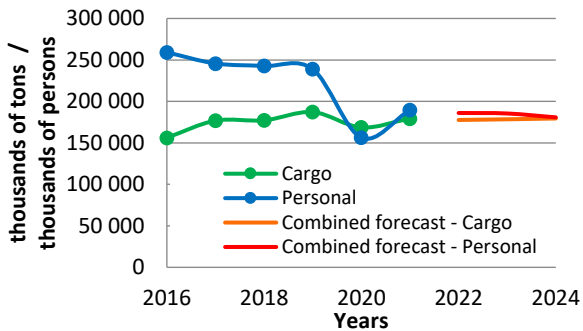
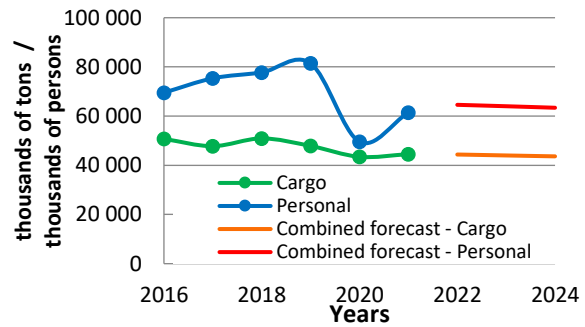
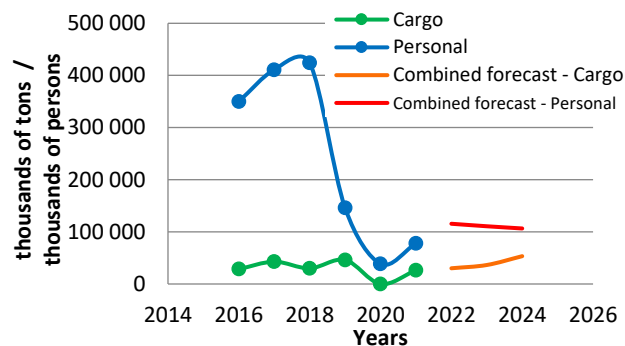
3.4. Transport

Within transport in Slovakia, three basic indicators of transport are selected: road, rail and air transport. Road transport together with rail transport forms the basis of the transport system in Slovakia. The most common type is road freight transport, which transports the most goods in tons and achieves the highest degree of transport performance in TKMs. It allows the widest market coverage, its flexibility is affected by the density of the road network. Due to its versatility, it best meets customer requirements.

Rail transport is suitable for transport over medium and long distances, especially bulk and oversized deliveries in complete trains. The most frequently transported materials are fuels, ore, building materials and other types of goods that do not matter the speed of transport.

Air transport is considered to be the most modern and above standard. It excels in its speed, but the disadvantage is its high price. It is therefore used to transport small, light but valuable consignments, which are extremely time consuming [13,14].

The development of these types of transport can be seen in **Figure 6**, **Figure 7** and **Figure 8**. It is very problematic to predict their development for the next two years, because the traffic slowdown in the period of COVID-19 restrictions had a significant effect in the last two years.


Figure 6 Road transport

Figure 7 Rail transport

Figure 8 Air transport

4. CONCLUSION

The results of the expected development in the next three years in foreign trade show an increase of approximately 24%, compared to the average from 2017 - 2021, whether it is export or import. This increase may seem high, but it is calculated also with year 2020, which was quite a weak year due to restrictions around the world. In total industrial revenues, the forecast shows growth of less than 8% over the next three years, but revenues forecasts in mining and quarrying show a declination of more than 5%. The increases in industry indicators will also be reflected in the growth of transport demand. Transport will continue to be dominated by the busiest road transport.

Because the forecast is estimated for the longer future, it is not possible to predict its exact development. Unforeseen situations such as weather effects (like natural disasters), geopolitical factors, economic crises, further waves of COVID-19 epidemics or pandemics or the war in Ukraine, can significantly affect the future of the Slovak and global economy.

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