

# Impact of the Corona Virus (COVID-19) on the European Economy

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#### Abstract

The purpose of this publication is to analyze the impact of the Corona virus (COVID-19) on the European economy, its total impact on the EU and EFTA. This virus has caused the economic and human lives of most countries in the world to decline. This analysis includes the economic development of the normal period of up to a coronavirus (COVID-19) 2020, which resulted in most of the countries of the recession. As a background, we look at the total effect, but then mainly the economy of the European Union together with the EFTA countries. However, not all economies will return in 2020, but some will have annual root growth. Here we look at save space only key economic figures, especially GDP and foreign trade. More specifically, are nominal GDP per capita and extra- and intra-exports of goods. The main focus of the analysis is, as always, on the economies of the major powers, which define the region and also have a strong influence on the global economy. The differences between large countries are also large and sometimes contradictory. The main engine of the EU economy and foreign trade has been Germany. But medium-sized countries such as the Netherlands, the Nordic countries, the Czech Republic, Poland and the Baltic Sea are also successful. As one of Europe's major powers, the United Kingdom, left the EU (Brexit), it is important to analyze how it affects the EU economy. As a rule, since the first half of 2021, the European economy has overcome this crisis, and the level of quarters is now at a record high.

#### **Keywords**

Corona Virus, European Union, EFTA, Economic Downturn, GDP Analysis, Growth of GDP, International Trade, Crisis Lessons, Future

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# **1. Introduction**

Coronavirus disease 2019 (COVID-19) is a contagious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The COVID-19 pandemic is an ongoing pandemic of coronavirus disease 2019 (COVID-19). It has spread worldwide, leading to an ongoing pandemic. The coronavirus is affecting 221 countries and territories.

The coronavirus is clearly shown by statistics, especially the number of deaths. Lost working days and lost products (services) can perhaps be compensated, although this also leaves its mark, at least in the human psyche.

*Coronavirus Cases* has affected 247,046,827 people; of which 74,629 in severe condition; deaths 5,008,989 and recovered 222,043,716 (Last updated: 2021-10-30). [1].

Here we look only at its economic impact on the life of the countries and the regions. As a rule, in 2020 there has been a sharp decline in people's quality of life, loss of confidence in future and also a direct fear of death.

Over million cases were in 16 European countries. The European trend is for cases to increase.

These current total data of global coronavirus gases and deaths justify the economic downturn.

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Table 1. Summary table of confirmed cases in Europe (Oct 30, 2021) [1].

Country	Cases	Deaths	Recoveries
UK	9,019,962	163,515	no data
Russia	8,472,797	237,280	7,331,424
Turkey	7,601,626	67,225	6,453,201
France	7,160,548	117,671	no data
Spain	5,011,148	87,368	no data
Italy	4,767,440	132,074	4,554,985
Germany	4,601,636	96,208	4,267,357
Poland	3,018,100	76,990	2,702,040
Ukraine	2,904,872	67,393	2,430,944
Netherlands	2,115,938	18,384	no data
Total in Europe	55,070,693	1,168,758	47,830,555

Next, let's see - what does the future hold for the European economy, Europeans.

## 2. Methodology and Theoretical Bases

#### 2.1. Methodology

The methodology, techniques, definitions, theoretical bases used by the author, are based on monographs [2 - 3], on international organizations (Eurostat [4 - 9], CIA [10- 11], World Bank [12], OECD [13]), the authors books [14 - 21], and in the works of other authors [22 - 32, 47 - 52], but also partly the author of the methodology used in previous publications [33 - 46]. This methodology gives a more accurate picture of the changes in the economy (GDP), as currency fluctuations are eliminated here.

#### 2.2. Theoretical Bases

The theoretical bases of key indicators have been brought in more detail in this methodology, in the author book [14 - 21], in authors' earlier works [33 - 46] and in the works of other authors [22 - 32, 47 - 52].

All figures are the author illustrations.

A forecast is a scientifically sound judgment about the possible states of an object in the future and (or) about alternative ways and timing of their implementation.

The main forecasting methods include:

statistical methods;

expert opinions (for example, the Delphi method);

modelling methods, including simulation;

intuitive (that is, made without the use of technical means, impromptu, "in the mind" by a specialist who has experience in previously used scientific methods in this type of forecasts). [34]

By now, a complex forecasting method called *Foresight* (futures studies) has become widely used, especially in Europe. Foresight is a system of methods for expert

assessment of strategic directions of socio-economic and innovative development, identification of technological breakthroughs that can have an impact on the economy and society in the medium and long term. Using this method, various possible pictures of the future world are created, including its individual, most important or critical aspects of interest, which are formed as a result of various options for the development of the situation and the planned scenarios of their own actions. [34]

Modelling - the study of objects of knowledge on their models; construction and study of models of real-life objects, processes or phenomena in order to obtain explanations of these phenomena, as well as to *predict* the phenomena of interest to the researcher.

Scientific modelling is a scientific activity, the aim of which is to make a particular part or feature of the world easier to understand, define, quantify, visualize, or simulate by referencing it to existing and usually commonly accepted knowledge. It requires selecting and identifying relevant aspects of a situation in the real world and then using different types of models for different aims, such as conceptual models to better understand, operational models to operationalize, mathematical models to quantify, and graphical models to visualize the subject. [22 - 32]

In *statistical modelling*, regression analysis is a set of statistical processes for estimating the relationships among variables. It includes many techniques for modeling and analyzing several variables, when the focus is on the relationship between *dependent variable* and one or more *independent variables*. More specifically, regression analysis helps one understand how the typical value of the dependent variable changes, when any one of independent variables is varied, while other independent variables are held fixed. [22 - 32]

The aim is *regression analysis* [22 - 32] key indicators of EU, it the theoretical bases and the regularities of these changes. We are analysis superpowers countries the EU economy in the last decade, this are basis the impact others countries, whose development determines the whole EU level. In the following analysis, we examine variety indicators of GDP.

*Regression models* predict a value of Y variable given known values of X variables. Prediction within the range of values in the dataset used for model-fitting is known informally as *interpolation*. Prediction outside this range of the data is known as *extrapolation*. Performing extrapolation relies strongly on the regression assumptions. The further the extrapolation goes outside the data, the more room there is for the model to fail due to differences between the assumptions and the sample data or the true values. [22 - 32] Polynomial curve can be created through the entire known data or just near the end. The resulting curve can then be extended beyond the end of the known data. Polynomial extrapolation is typically done by means of *Lagrange interpolation*. The resulting polynomial is used to extrapolate the data. [22 - 32]

In statistics, nonlinear regression is a form of *regression analysis* in which observational data are modeled by a function which is a nonlinear combination of the model parameters and depends on one or more independent variables. The data are fitted by a method of successive approximations.

*Regression analysis* is a statistical method for studying the influence of one or several independent variables  $X_1$ ,  $X_2$ ,..,  $X_p$  to the dependent variable Y. Independent variables are otherwise called regressors or predictors, and dependent variables are criterion variables. The terminology of dependent and independent variables reflects only the mathematical dependence of the variables, and not cause-effect relationships. [22 – 32]

In *mathematical modelling*, the dependent variable is studied to see if and how much it varies as the independent variables vary. In the simple *stochastic linear model*  $y_i = a + bx_i + e_i$  term  $y_i$  is the *i*<sup>th</sup> value of the dependent variable and  $x_i$  is the *i*<sup>th</sup> value of the independent variable. The term  $e_i$  is known as the "error" and contains the variability of the dependent variable not explained by the independent variable.

With multiple independent variables, the model is  $y_i = a + b x_{1, i} + b x_{2, i} + ... + b x_{n,i} + e_i$ , where *n* is the number of independent variables. [30 - 32]

The suitability of a polynomial curve is evaluated using the methods of classical regression analysis: the higher the  $R^2$ , the more accurate the mathematical model for assessing dependence.

A *correlation coefficient*  $R^2$  is a numerical measure of some type of correlation, meaning a statistical relationship between two variables. The variables may be two columns of a given data set of observations, called a sample, or two components of a multivariate random variable with a known distribution. [22 - 32]

In various application sectors will take different boundaries intervals to assess the closeness and importance of communication. The popularity of the method is due to two points: the correlation coefficients are relatively simple to calculate their use does not require special mathematical preparation. Combined with the simplicity of interpretation, the simplicity of applying the coefficient has led to its wide distribution in the field of statistical data analysis.

GDP is an indicator for a nation's economic situation and a measure of the economic activity. It reflects the total value of all goods and services produced. [4-6]

GDP (purchasing power parity) compares the GDP or value of all final goods and services produced within a nation in a given year. A nation's GDP at purchasing power parity (PPP) exchange rates is the sum value of all goods and services produced in the country valued at prices prevailing in the U. S. By constant prices and PPP must be considered currency exchange rate changes. [10 - 12]

Expressing GDP in *PPS (purchasing power standards)* eliminates differences in price levels between countries, and calculations on a per head basis allows for the comparison of economies significantly different in absolute size. [7]

*GDP per capita* is calculated by dividing GDP by midyear population. GDP is the total market value of all final goods and services produced in a country in a given year. In nominal method, market exchange rates are used for conversion. GDP per capita in constant prices is found and the ratio of the average population. Often used in constant prices GDP as an indicator of the wealth of nations, as it reflects the average real income in this country. [8 - 9]

GDP - *real growth* rate compares GDP growth on an annual basis adjusted for inflation and expressed as a percent. [4 - 7]

## 3. Development of GDP

For background let's look at what had developed by USA, China and the EEA (EU+EFTA) economy (GDP) 10 years at market prices and PPS of countries in USD and EUR.

The EU-28 economy (GDP) was increasing smooth, cyclical developments. Between 2000 and 2018 GDP grew 2.1 times, but record year 2008 was it 19,240 bn (EU-27 2.2 times: 16,304 bn) USD. In Euros the picture was different: grew was 2.015 times and record year was 2019 - 16,542 bn EUR. It shows that the EU economy faced major challenges after the crisis in 2009, with 2018 GDP still not exceeding record levels in 2008. In 2015 and 2016, however, GDP was lower than in 2009 and 2010. This means: EU-28 and Euro area 19 have developed under the same laws of the economy. 2019 was worse than the previous 2018 year.

For comparison, in 2019 the current prices of GDP of EU-28 were 18,519 bn \$ (-321 bn or -2.0%), the US 21,433 bn (+906 bn or + 4.4%) and China 14,341 bn (+437 bn or + 3.1%) Next year, US GDP decreased (-500 bn or -2.3%) and China increased (+382 bn or + 2.7%).



Figure 1. Gross domestic product at market prices of the EU. Current prices, trillion U.S. dollars. [53; 57]

Poly6 EU-27 \$:  $y = -5E-06x^{6} + 0,0003x^{5} - 0,0034x^{4} - 0,007x^{3} + 0,346x^{2} - 0,5672x + 7,3852$ ; R<sup>2</sup> = 0,9538

Linear EU-27 €: 
$$y = 0.2874x + 7.813$$
;  $R^2 = 0.9712$ 

Fable 2. GDP,	current prices	of EU, bn USD	/ EUR [	53; 57].
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	2000	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
EU-27 \$	7,268	14,717	16,304	14,767	14,556	15,762	14,636	15,299	15,654	13,552	13,894	14,772	15,980	15,690	15,298
EA-19 \$	6,486	12,864	14,149	12,933	12,638	13,637	12,638	13,195	13,508	11,674	11,972	12,677	13,699	13,414	13,021
EU-27 €	7,869	10,739	11,085	10,587	10,980	11,324	11,392	11,520	11,784	12,214	12,552	13,076	13,531	14,016	13,394
EA-19€	7,022	9,387	9,620	9,272	9,533	9,797	9,837	9,935	10,168	10,522	10,816	11,222	11,600	11,983	11,400

In US dollars, during the 2009 economic crisis, there was a sharp decline in the EU-27, while the 2008 level could not be reached. The next decline was in 2012, in 2014 remained at a record high in 2008, missing only 650 bn or 4.0%. However, the decline in 2015 was the largest: 2,192 bn \$ or 13.4%. The decline in the corona virus between 2018 and 2020 was much smaller, at only 682 bn \$ or -4.3% in two years. Thus, the two major EU-27 crises were in 2009 and 2015, but 2020 was a normal decline, characterized by the data in figure 1 and table 2.

In the euro, however, trends are different. The decrease in 2009 was 498 bn euros or 4.5%. The 2008 level was exceeded in two years, but continued to rise. Record GDP was in 2019, with 2020 being significantly higher than 2017 and just below 2018 (-1.0%).

What U.S. dollars and the euro exchange rate large fluctuations between them have caused such different trend lines?

Table 3. Selection of European countries' GDP at market prices. Current prices, million US\$, [53].

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Belgium	481,414	523,347	496,157	521,783	535,389	462,330	476,061	502,773	543,294	535,301	521,863
Czechia	209,355	229,961	208,892	211,780	209,665	188,124	196,406	219,311	249,105	252,524	245,866
Denmark	322,364	345,048	327,081	343,636	353,058	302,913	313,374	333,044	357,050	347,577	356,956
Germany	3,399,625	3,749,435	3,527,174	3,733,753	3,889,090	3,357,546	3,469,843	3,690,910	3,977,442	3,888,415	3,846,427
Ireland	221,873	238,983	225,498	238,276	258,969	291,576	298,927	335,436	385,056	399,131	425,890
Greece	297,121	283,005	242,031	238,904	235,458	195,681	193,147	199,847	212,057	205,149	188,836
Spain	1,422,090	1,480,758	1,324,756	1,355,124	1,371,221	1,195,586	1,232,909	1,312,561	1,421,048	1,393,078	1,281,489
France	2,645,154	2,865,249	2,683,695	2,811,838	2,855,962	2,439,160	2,472,957	2,595,194	2,791,064	2,728,932	2,630,327
Italy	2,136,073	2,295,068	2,086,976	2,141,895	2,162,008	1,836,616	1,877,066	1,961,828	2,092,013	2,009,429	1,888,716
Hungary	132,323	142,253	128,841	135,832	141,216	125,177	128,709	143,523	160,702	163,574	156,050
Netherlands	847,370	905,299	838,930	877,160	892,167	765,563	784,058	833,883	914,078	910,215	913,868
Austria	392,270	431,699	409,405	430,185	442,584	381,966	395,836	417,268	455,185	445,022	433,260
Poland	480,156	528,765	498,434	521,027	543,313	477,601	472,747	528,051	587,951	597,365	598,133
Portugal	238,110	245,125	216,226	226,430	229,901	199,391	206,425	221,361	242,322	239,992	228,540
Romania	166,338	183,523	170,507	190,835	200,216	177,686	188,243	212,126	241,510	249,830	249,188
Slovakia	90,800	99,496	94,254	98,568	101,089	88,635	89,674	95,395	105,616	105,287	105,173
Finland	249,421	275,613	258,292	271,358	274,862	234,531	240,770	255,652	275,725	268,788	269,752
Sweden	496,733	574,679	552,511	586,821	582,990	505,371	516,110	542,284	555,864	533,855	542,881
Norway	429,209	498,808	509,453	522,486	499,446	385,697	369,119	399,141	437,317	405,530	363,603
Switzerland	604,431	724,120	691,786	712,702	735,912	702,058	695,940	704,926	735,463	731,853.6	753,544

This is table of countries by past and projected nominal GDP as ranked by the IMF. Figures are based on official exchange

rates. These values are in millions of USD and are not adjusted for inflation. They are taken from the IMF's WEO

database (October 2021) and other sources. [53]

Nom GDP of EU-27 fell in 2020 from 15,690.5 bn to 15,298.3 bn \$ or 392.2 bn or 2.5%. By comparison, in 2020 the GDP of Norway was 363.6 bn, which is the GDP of the average successful Western European country.

In 2020, nom GDP increased compared to the previous year in Denmark, in Ireland, in the Netherlands, in Poland, in Finland, in Sweden and in Lithuania. The minimal decrease was in Germany (-1.08%), in Romania (-0.26%) and in Slovakia (-0.11%).

The decline in GDP of other major European countries was: France 98.605 million or -3.6%, Italy 120.713 million or -6.0% and Spain 111.589 million or 8.0%. The economic success of great powers depends on the development of much smaller countries, especially in times of crisis.

The biggest declines were in politically unstable countries outside Europe. However, the largest growth was in China, where nom GDP increased from 14,341 bn to 14,723 bn or \$ 382 bn. In World in 2020, GDP fell to \$ 2,807 bn or 3.2%.



Figure 2. GDP at market prices of the Germany, Spain, Italy and France. Current prices, trillion USD [53]

Ger Poly6:  $y = 4E-05x^{6} - 0,0016x^{5} + 0,0253x^{4} - 0,18x^{3} + 0,5588x^{2} - 0,5742x + 3,6019; R^{2} = 0,5791$ 

Fr Poly6: 
$$y = 2E-05x^{6} - 0,001x^{5} + 0,0175x^{4} - 0,1308x^{3} + 0,4217x^{2} - 0,4839x + 2,8429$$
;  $R^{2} = 0,5578$ 

The GDP of the five largest West-European countries exceeded one trillion US dollars. These countries gave up 72.8% of total GDP of EU-28 and without the UK shares of GDP of EU-27 were in 2020: Germany 25.1%; France 17.2%; Italy 12.3% and Spain 8.4%.

Figures 2 shows a complex 6-degree polynomial, where  $R^2$  is high. GDP polynomials are usually much simpler and  $R^2$  is

0.9 larger. This indicates an unstable economy of the UK.

They had two major periods of decline during the period under analysis, that is, in this century. Between of 2007 -2009 the GDP declined 680 million USD or nearly a quarter (22%), and from 2014 to 2017 of 379 million USD or about one eighth (12.5%). The 2007 level has not yet been reached in 2018, missing a quarter of a trillion or 8.55%. Other super countries also had smaller fluctuations in GDP. Apart from Germany, their record level in 2018 was not reached.

*Growth rate* of GDP in 2018 was in EU-27 2.1%, in 2019 it was in EU-27 1.6%, in Germany 0.6%, France 1.5%, Italy 0.3%, Spain 2.0% and UK 1.3%.

Based on current prices and exchange rates of the euro the EU is still low superiority in front the U. S. Only China was considerably larger. [53]

Since 2019Q4, there has been a two-quarter large decline in GDP, respectively 16.4% and 16.3%. 2020Q3 was followed by an increase, which slightly exceeded the levels of 2020Q1 and 2018Q2, but was still significantly below the 2019 indicators.

The trend lines of both Germany and France in the 6th degree run practically in parallel, only Germany GDP 1.4 times higher. The trend lines in Italy and Spain are also similar. All four EU countries had a small decline in 2012 and a large decline in 2015, with 13.7% in Germany. France, Italy and Spain's GDP remained at a record level in 2011. Germany surpassed 2011 in 2014, as in 2018 and 2019. These four major countries account for almost 2/3 (64.4%) of the EU-27 economy, with Germany accounting for almost a quarter (24.9%). In the old days, when the UK was also part of the EU, the share of the EU-27 was 86% in the EU-28.

By comparison, the largest economies by nominal GDP in 2019 were: US 21,482 bn; of the EU 18,704 bn and China PR 14,172 bn US \$.

Nominal GDP of World was in 2019 87,265 (in 2018 84,835) billion of US\$. In the world are 16 countries + EU, whose nom GDP is over trillion USD (\$). While in 2018 Russia was still in 12th place, the following year it rose by one place, ahead of South Korea. [56].

In the following, we analyze the development of the European economy (GDP) by quarters provides a more accurate overview of the peak of the crisis.

Table 4. GDP at market, current prices, quarterly data, bn euro [54; 57].

		-			
-	2018Q1	2019Q4	2020Q2	2020Q4	2021Q2
EU-27	3,253,364	3,655,395	3,073,828	3,568,916	3,542,705
EU-28	3,851,943	4,315,741	:	:	:
EA-19	2,807,330	3,104,657	2,612,774	3,021,206	3,003,975



Figure 3. GDP at market, current prices, quarterly data, bn euro [54; 57].

Since the UK left the EU, from 2020 we will look at the EU-27. The trends are similar for everyone. The downturn was 2018-03,

although this year was a record economy for most. This was followed by a good increase (+ 5.1%) and a decline characteristic of the beginning of the year (-5.0%), which made the level of GDP slightly lower than in previous quarters. This was followed by growth until the end of the year (+108.3 bn). However, the record decline in the EU-27 economy (GDP) over the next two quarters was 596.6 bn or a total of 16.4%. There was a significant increase until the end of the year, but the level of 2019-Q4 was not reached. In 2021-Q1, the traditional decline at the beginning of the year was -201.2 bn or -5.6%.

From 2021 to Q2, a joyous time began, it can be said, that this economic crisis was overcome (+), but it should be noted, that in addition to the deaths of millions, the coronavirus left a deep mark on human health and their quality of life.

Table 5. GDP	by quarter, million euros	[54; 57]
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	2018-03	2019-04	2020-02	2020-03	2021-02	
Germany	843,062	878,996	785,466	848,856	868,675	
Spain	302,037	315,833	245,832	288,754	297,717	
France	593,001	611,312	522,851	596,022	609,357	
Italy	442,526	447,900	373,268	429,666	445,453	

In 2020-03, Germany and France had exceeded the two-year-old 2018-03 GDP level other major.



2021-04' - IMF forecast (Oct 2021).

Poly6 (Germany) 
$$y = 0,0003x^6 - 0,0247x^5 + 0,6979x^4 - 8,4448x^3 + 44,832x^2 - 86,829x + 876,56; R^2 = 0,7171$$
  
Poly6 (France)  $y = 0,0023x^6 - 0,1184x^5 + 2,3315x^4 - 21,859x^3 + 97,909x^2 - 183,11x + 691,61; R^2 = 0,5705$ 

Correlation coefficient  $R^2$  is relatively low, indicating a large difference between real 2020-02 GDP and the theoretical trend line. This big difference characterizes that the declines in 2020-02 and the accompanying other quarters are not based on economic laws, but as a result of unpredictable events - *Force majeure*.

*Force majeure* is a common clause in contracts which essentially frees both parties from liability or obligation when an extraordinary event or circumstance beyond the control of the parties, such as a war, strike, riot, crime, epidemic or sudden legal changes prevents one or both parties from fulfilling their obligations under the contract. [61]

Poly6 (NL) 
$$y = 0,0003x^{6} - 0,0157x^{5} + 0,3438x^{4} - 3,3987x^{3} + 15,245x^{2} - 26,05x + 208,89; R^{2} = 0,5986$$
  
Poly6 (Sweden)  $y = -0,001x^{6} + 0,0359x^{5} - 0,5035x^{4} + 3,4959x^{3} - 12,922x^{2} + 24,443x + 100,96; R^{2} = 0,8721$   
Poly6 (Poland)  $y = -0,0007x^{6} + 0,0196x^{5} - 0,1765x^{4} + 0,3187x^{3} + 2,1288x^{2} - 5,1583x + 127,59; R^{2} = 0,5668$ 

Poly6 (Ireland)  $y = -0,0003x^6 + 0,0098x^5 - 0,0839x^4 + 0,0957x^3 + 1,468x^2 - 2,7471x + 82,719; R^2 = 0,886$ Poly6 (Belgium)  $y = -0,001x^6 + 0,0308x^5 - 0,3437x^4 + 1,5668x^2 - 2,6701x^2 + 1,8875x + 115,04; R^2 = 0,5584$ 

	2018Q1	2018Q2	2018Q3	2018Q4	2019Q1	2019Q2	2019Q3	2019Q4	2020Q1	2020Q2	2020Q3	2020Q4	2021Q1	2021Q2
Belgium	110,469	116,020	111,040	122,500	114,7160	120,140	116,108	127,196	115,430	104,737	113,105	123,622	118,317	125,867
Bulgaria	11,337	13,743	15,5877	15,556	12,926	15,261	16,347	17,023	13,213.4	14,163	16,680	17,274	13,812	15,941
Czechia	49,123	53,087	53,454	55,216	51,930	56,483	57,622	59,542	53,487.6	49,846	55,150	56,797	53,136	59,668
Denmark	72,332	76,431	75,135	78,427	74,787	78,343	77,276	80,067	77,166.3	75,261	78,444	81,648	78,132	84,820
Estonia	5,854	6,468	6,509	6,986	6,387	6,948	7,029	7,367	6,382	6,335	6,829	7,287	6,706	7,413
Ireland	79,310	78,151	84,578	84,003	86,104	84,701	93,185	92,532	93,183	84,561	100,959	94,163	101,565	100,342
Greece	41,137	44,888	48,323	45,379	41,551	46,069	50,051	45,741	40,561	38,128	44,593	42,547	39,383	44,341
Croatia	11,4268	13,330	14,853	13,084	12,220	13,987	15,631	13,738	12,451	11,656	13,462	12,623	12,335	14,039
Cyprus	5,068	5,524	5,515	5,504	5,392	5,844	5,971	5,802	5,466	4,994	5,615	5,472	5,367	5,757
Latvia	6,298	7,318	7,680	7,856	6,801	7,695	8,091	8,059	6,775	6,953	7,834	7,947	6,837	8,114
Lithuania	10,013	11,291	12,151	12,058	10,800	12,152	13,044	12,862	11,373	11,722	13,401	13,010	11,919	13,522
Luxemb.	14,326	14,923	14,905	16,206	14,598	15,679	15,530	16,896	15,398	15,085	15,891	17,846	16,822	17,695
Hungary	30,111	33,661	34,577	37,593	32,579	36,388	37,282	39,734	32,518	30,964	34,869	38,128	31,696	37,729
Malta	2,987	3,230	3,445	3,316	3,260	3,508	3,679	3,600	3,369	3,026	3,304	3,354	3,361	3,475
Netherl.	188,022	196,711	190,249	199,005	197,442	207,286	199,768	208,559	201,819	191,724	198,696	207,856	201,249	216,819
Austria	92,928	95,513	95,439	101,543	96,163	98,608	98,908	103,838	94,599	88,126	96,699	99,895	91,446	99,984
Poland	116,823	119,420	122,365	139,035	122,684	129,656	131,963	149,370	129,429	117,617	131,572	144,9558	129,210	136,237
Portugal	48,609	51,366	52,349	52,858	51,076	53,731	54,451	55,115	50,682	45,607	51,483	52,313	48,476	52,685
Romania	38,807	47,469	56,819	61,397	42,770	52,110	61,206	67,009	45,466	46,626	58,718	67,193	46,123	55,078
Slovenia	10,560	11,534	11,837	11,932	11,199	12,154	12,512	12,531	11,348	10,987	12,307	12,274	11,698	13,070
Slovakia	20,274	22,451	23,673	23,030	21,672	23,608	24,559	24,207	21,642	21,534	24,577	24,325	21,819	24,078
Finland	55,736	58,910	57,748	61,074	57,170	60,690	59,651	62,586	58,225	57,414	58,509	62,021	57,575	62,639
Sweden	116,009	120,854	110,271	123,606	116,663	122,155	113,842	124,211	116,311	114,396	115,584	129,152	124,286	134,799
Iceland	5,314	5,740	5,953	5,324	5,038	5,535	5,786	5,836	4,956	4,548	4,645	4,900	4,726	5,345
Norway	90,195	92,351	90,511	97,225	93,168	89,911	86,643	92,542	85,733	71,744	77,060	84,055	91,400	93,998
Switzerl.	149,619	154,143	156,949	162,162	157,044	161,437	165,718	169,575	165,287	158,797	165,909	169,724	160,981	167,637

Table 6. GDP at market prices. Current prices, quarterly data, in million euro [54; 60].



Figure 5. GDP at market prices, quarterly data. Current prices, trillion USD [54; 60]

As Germany will provide a quarter of the EU-27 GDP volume, you can make some generalizations about the accuracy on the development of the EU as a whole. Over the past 10 quarterly GDP dynamics theory predicts economic growth trend line. That means the exit of the recession and all

EU exported from the recession. This trend line is complicated - a 6th degree polynomial, but at the same time an almost functional dependence with a very high degree of accuracy, where  $R^2 = 0.9951$ .

This figure also shows something similar other major Western European powers. As two EU Member States, Ireland and Lithuania, have already emerged from the economic crisis, their 2020Q3 GDP was at record levels.

It can therefore be concluded that the EU as a whole is successfully emerging from the corona crisis, along a difficult path, as two small countries have done. Their theoretical economic development trend lines were very complex, where they  $R^2 = 0.935$  and  $R^2 = 0.8135$ .

For global analyse we look GDP by PPP (PPS).

Table 7. GDP, purchasing power standards [5].

	2010	2015	2017	2018	2019
EU-27	11,101	12,771	13,317	13,778	14,260
EU-28	12,851	14,856	15,429	15,938	16,486
EA-19	9,201	10,473	10,882	11,225	11,561

Total GDP (PPP) of Russia is less, than from China 6.3, EU 5.1, USA 4.9 and India 2.6 times (!). In 2014 was Russian GDP even higher than in Germany, but the difference is small: the German economy is more powerful than Russia. Despite the growth in 2017, Russia's GDP (PPP) is at almost 2014 levels. Russia's economy is five times lower than in the USA and the EU and over six times remain below China. [10]

Table 8. GDP, PPP (billions current international \$), WB [12].

	2013	2016	2017	2018	2019	2020
China	16185	18713	19887	21866	23460	24273
USA	16784	18745	19542	20611	21374	20937
India	6477	7666	8123	8995	9612	8907
Japan	4967	5076	5180	5230	5459	5328
Germany	3628	4164	4401	4531	4660	4463
Russia	3741	3538	3818	4223	4282	4133
Indonesia	2535	2745	2894	3117	3329	3302
France	2608	2863	2997	3120	3315	3315
UK	2563	2897	3037	3120	3255	3019

According to GDP by PPS, the UK has already exceeded 2007 levels on 2012. GDP by PPS has led to a steady increase in the UK economy and in 2016 France has passed, with France falling from 2007 to 2015. The UK GDP by PPS is from Germany only 69.4%. The UK share of GDP by PPS was also 13.8% in EU-28 on 2016.

While in the years 2008 - 2013 France was stronger than in the UK economy (PPS), with UK GDP accounted for only 75.5% from the Germany.

The WB forecasts Brazil to be 8th in 2020 at 3154 bn Int \$.

In 2017 was GDP *per capita* in Germany 39,600; Spain 25,100; France 34,100; Italy 28,500 and the UK 35,300 euro. In 2015 it was in the UK 40,000 euro.

In 2018 these were in Germany 40,340; in Spain 25,730; in

France 34,980; in Italy 29,220 and in UK 36,410 euro. In the case of the UK GDP per capita was the largest in the years 2005 - 2008 and in 2015. In other years, Germany was superior to the great powers. GDP per capita of UK is larger than France, Italy and Spain, but less than Germany, other Central European and Nordic countries; 1.6 times smaller than Ireland. The average of the new EU member states and the EU-28 (29.100) GDP per capita is lower than the UK. The UK was ranked 10th in the 2016 EU ranking. [7]

In 2018 were GDP per capita in current prices in Germany 40,900; in Spain 25,800; in France 35,100; in Italy 29,000 and in UK 36,000 euro. UK GDP per capita was barely larger than France. In 2018 GDP per capita of the UK decreased compared to 2015 by 4000 euros or 10%. [7]

GDP per capita of UK (36,500) is larger than France, Italy and Spain, but less than Germany, other Central European and Nordic countries; 1.6 times smaller than Ireland. The average of the new EU member states and the EU-28 (29.300) GDP per capita is lower than the UK. The UK was ranked 10th in the EU ranking.

In the case of the EU great powers, the UK GDP per capita was the largest in the years 2005 - 2008 and 2015. In 2015 was GDP per capita in UK 40,000 euro. On other years, Germany was superior to the great powers.

For comparison, nom GDP per capita: United States (8th) - 65,062 (it was 5.5 times to world); Russia (68th) 11,461 and China (73th) 8,643.1 USD.

Table 9. Nominal GDP per capita (\$), IMF [53; 57].

Country	2019	Rank	2020	Rank
Luxembourg	115,839	1	109,602	1
Switzerland	82,484	2	81,867	2
Ireland	80,504	3	79,669	3
Norway	75,294	5	67,989	4
United States	65,254	7	63,051	5
Denmark	59,770	10	58,439	7
Netherlands	52,646	12	51,290	11
Sweden	51,404	13	50,339	12
Finland	48,810	15	48,461	14
Germany	46,473	18	45,466	15
France	41,897	23	39,257	21
UK	42,379	22	39,229	22
Italy	33,159	28	30,657	27
Spain	29,993	32	26,832	33
Estonia	23,758	40	22,986	37
Lithuania	19,482	45	19,883	43
Greece	19,570	44	18,168	46
Latvia	17,772	50	17,230	47
Poland	15,601	58	15,304	52
China	10,522	69	10,839	64
Russia	11,601	65	9,972	66
World	11,557		10,954	

Nominal GDP per capita in eight countries was five times the

world average, wherein just above was less than the China (in 2020 + \$ 317) and Russia (-1629 \$). All EU countries exceeded the EU average, except Bulgaria. 63 countries were above average. The poorest economy, South Sudan, would be only 2.4% of the global nominal GDP per capita.

Table 10. GDP (in US\$) per capita by country, 2020 [54; 57].

	IMF (2021)	<b>United Nations</b>	World Bank
Switzerland	94,696	85,135	86,602
Ireland	94,556	81,637	83,813
Norway	81,995	74,986	67,295
USA	68,309	65,134	63,544
Denmark	67,218	60,657	60,909
Sweden	58,977	52,896	51,926
Netherlands	58,003	53,053	52,304
Finland	54,330	48,678	49,041
Austria	53,859	49,701	48,105
Germany	51,860	46,232	45,724
Belgium	50,103	46,198	44,594
UK	46,344	41,855	40,285
France	44,995	40,319	38,625
Italy	34,997	33,090	31,676
Spain	30,996	29,816	27,057

Table 11. World Economic Growth Projections (IMF) [54].

	2020	2021	2022
World Output		-4.4	5.2
United States	-3.4	6.0	5.2
Euro Area	-6.3	5.0	4.3
Germany	-4.6	3.1	4.6
France	-8.0	6.3	3.9
Italy	-8.9	5.8	4.2
Spain	-10.8	5.7	6.4
Japan	-4.6	6.8	5.0
UK	-9.8	2.4	3.2
China	2.3	8.0	5.6
India	-7.3	9.5	8.5
Russia	-3.0	4.7	2.9

At the same time, this *IMF assessment* [57], which was carried out just before the end of the year, also shows the impact of the corona virus on the world's countries, including the most successful ones.

Out of 193 economies, nominal GDP per capita of the 29 economies would increase, and 164 economies would decrease in 2020 compared to 2019. They were successful China PR, Taiwan (Province of China), Bulgaria, Lithuania and some other countries.

By World Bank of Western Europe mini-countries was GDP per capita in Monaco 190,513; in Liechtenstein 180,367 and in Luxembourg 115,874 US\$.

This is real GDP annual percent change projections to 2021 and 2022 of IMF.

#### International trade of the EU and EFTA

The following is analyzed international economy.

The global economy is projected to grow 6.0 percent in 2021 and 4.9 percent in 2022.



Figure 6. External balance of goods and services & goods, Current prices, million euro [54, 60]

Table 12. Exports and imports of goods and services of EU - 27, Current prices, million euro [54; 60]

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Exports	4,893,838	5,104,018	5,180,033	5,384,216	5,754,311	5,860,167	6,323,517	6,657,581	6,915,995	6,248,664
Imports	4,703,200	4,777,224	4,775,141	4,938,970	5,219,307	5,310,697	5,764,189	6,133,443	6,432,550	5,742,247

Table 13. Exports and imports	s of goods of EU - 27,	Current prices,	million e54uro	[54; 60]
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	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Exports	3,738,153	3,872,791	3,889,759	3,989,470	4,225,809	4,278,405	4,609,008	4,816,944	4,929,903	4,554,083
Imports	3,649,198	3,670,464	3,621,752	3,695,429	3,798,379	3,841,658	4,198,869	4,486,831	4,565,989	4,137,982

Table 14	. External	balance of	goods and	l services &	k goods.	Current p	rices, mi	illion euro	[54; 6	0]
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	2011	2017	2018	2019	2020
Goods & Services	190,637	559,328	524,138	483,445	506,417
Goods	88,954	410,139	330,113	363,913	416,100

Next look international trade of EU of all countries of world.

Table 15. International trade of	he EU, million	EUR	[55;	57;	60]	ŀ
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Imports	2011	2014	2017	2018	2019	2020
Belgium	335,447	341,426	362,585	385,355	383,064	347,746
Bulgaria	23,406	26,118	30,213	32,083	33,650	30,636
Czechia	109,285	116,202	144,482	156,457	159,958	149,564
Denmark	68,723	74,970	82,245	86,814	87,388	85,372
Germany	901,486	908,574	1,029,652	1,087,431	1,102,153	1,024,335
Ireland	52,460	61,832	82,594	91,410	90,328	87,149
Greece	47,888	46,695	47,356	54,120	55,839	48,737
Spain	270,550	270,172	311,651	330,636	332,958	286,801
France	517,262	509,231	548,626	572,576	584,682	509,630
Italy	401,427	356,939	401,487	426,046	424,236	369,969
Lithuania	22,825	25,889	28,516	30,943	31,949	29,154
Hungary	73,591	78,978	95,157	102,260	107,726	100,996
Netherlands	426,987	443,688	508,372	546,826	567,890	521,792
Austria	137,512	137,001	155,576	164,007	165,008	150,934
Poland	151,291	168,366	206,820	227,796	236,991	224,813
Portugal	59,551	59,032	69,688	75,439	79,977	68,145
Romania	54,943	58,555	75,567	82,829	86,254	80,481
Slovenia	25,525	25,551	31,917	35,803	39,319	36,913
Slovakia	57,601	61,404	72,192	78,727	80,407	73,759
Finland	60,535	57,769	62,460	66,577	65,847	59,757
Sweden	127,174	122,132	136,475	144,489	142,006	131,087
Exports	2011	2014	2017	2018	2019	2020
Belgium	341,718	355,287	380,590	396,270	399,102	369,456
Bulgaria	20,264	22,043	27,780	28,496	29,788	27,927
Czechia	117,054	131,799	161,214	171,260	177,903	167,597
Denmark	80,362	83,911	90,756	92,926	98,972	94,871
Germany	1,058,897	1,125,034	1,281,946	1,320,732	1,330,414	1,207,545
Ireland	91,554	91,217	121,759	139,637	151,515	157,743
Greece	24,242	27,085	28,863	33,472	33,864	30,770
Spain	220,223	244,287	283,094	293,458	298,337	270,431
France	428,500	437,786	473,814	492,964	509,948	426,994
Italy	375,904	398,870	449,129	465,325	480,352	433,559
Lithuania	20,151	24,361	26,410	28 271	29,623	28,689
Hungary			/	20,271		
Netherlands	80,683	83,266	100,752	105,572	110,578	105,475
	80,683 479,239	83,266 506,339	100,752 577,087	105,572 615,600	110,578 633,057	105,475 590,289
Austria	80,683 479,239 127,462	83,266 506,339 134,172	100,752 577,087 148,756	105,572 615,600 156,428	110,578 633,057 159,588	105,475 590,289 148,288
Austria Poland	80,683 479,239 127,462 135,557	83,266 506,339 134,172 165,715	100,752 577,087 148,756 207,385	105,572 615,600 156,428 223,213	110,578 633,057 159,588 238,178	105,475 590,289 148,288 236,841
Austria Poland Portugal	80,683 479,239 127,462 135,557 42,828	83,266 506,339 134,172 165,715 48,053	100,752 577,087 148,756 207,385 55,018	105,572 615,600 156,428 223,213 57,850	110,578 633,057 159,588 238,178 59,902	105,475 590,289 148,288 236,841 53,757
Austria Poland Portugal Romania	80,683 479,239 127,462 135,557 42,828 45,284	83,266 506,339 134,172 165,715 48,053 52,500	100,752 577,087 148,756 207,385 55,018 62,615	105,572 615,600 156,428 223,213 57,850 67,424	110,578 633,057 159,588 238,178 59,902 68,667	105,475 590,289 148,288 236,841 53,757 61,775
Austria Poland Portugal Romania Slovenia	80,683 479,239 127,462 135,557 42,828 45,284 24,915	83,266 506,339 134,172 165,715 48,053 52,500 27,075	100,752 577,087 148,756 207,385 55,018 62,615 34,007	105,572 615,600 156,428 223,213 57,850 67,424 37,423	110,578 633,057 159,588 238,178 59,902 68,667 40,147	105,475 590,289 148,288 236,841 53,757 61,775 39,246
Austria Poland Portugal Romania Slovenia Slovakia	80,683 479,239 127,462 135,557 42,828 45,284 24,915 57,297	83,266 506,339 134,172 165,715 48,053 52,500 27,075 64,913	100,752 577,087 148,756 207,385 55,018 62,615 34,007 73,790	105,572 615,600 156,428 223,213 57,850 67,424 37,423 79,137	110,578 633,057 159,588 238,178 59,902 68,667 40,147 79,962	105,475 590,289 148,288 236,841 53,757 61,775 39,246 75,742
Austria Poland Portugal Romania Slovenia Slovakia Finland	80,683 479,239 127,462 135,557 42,828 45,284 24,915 57,297 56,855	83,266 506,339 134,172 165,715 48,053 52,500 27,075 64,913 55,973	100,752 577,087 148,756 207,385 55,018 62,615 34,007 73,790 60,239.	105,572 615,600 156,428 223,213 57,850 67,424 37,423 79,137 64,236	110,578 633,057 159,588 238,178 59,902 68,667 40,147 79,962 65,615	105,475 590,289 148,288 236,841 53,757 61,775 39,246 75,742 57,874

While the export of EU goods was 885.3 bn in 2002, then in 2018 it was already 1957.7 bn euros, an increase of 2.2 times. However, at the same time imports also increased from 936.9 bn to 1980.2 bn, that giving a TB deficit of 22.5 bn in 2018. However, between 2013 and 2017, the EU goods TB were still positive. At the same time, foreign trade volumes of all EU countries are growing, but not evenly.

Exports of German goods were 2.15 times higher than in second place the Netherlands, 2.7 times of France; 2.8 of Italy and 3.2 of UK.

By Eurostat for world comparison, in 2018 there was an export of goods: China 2112 bn; EU28 1958 bn and USA 1410 bn euro. Share in the world trade exports of EU was 15.6%, USA 11.2% and China 16.8%.

By comparison, the powerful nuclear power Russia exports was 382 bn (2016 = 273), which was at the same level as Mexico, Canada and Singapore, but lower than Netherlands and Belgium exports. [54]

By ITC in USD: China 2494 bn; USA 1666 bn and Germany 1557 bn USD. Share in the world trade exports of China was 12.9%, USA 8.6% and Germany 8.1%. [54; 60]

Germany has always been Europe's the largest exporter of goods and with the largest trade surplus. In second place is the small, but successful Netherlands ahead of the major powers. However, Belgian exports are only 4.5% lower than the UK.

In 2019 Euro area export was 1973 bn, import 1945 bn and TB +29.9 bn; Intra-EU28 export was 3586 bn, import 3512 bn and TB +73.4 bn; Extra-EU28 export was 2037 bn, import

72057 bn and TB -20.5 bn euro. [55; 57]

In the analyzed period, in addition to 2020, exports decreased in 2016 and imports in 2013, 2014 and 2016.

In January to October 2020, euro area exports of goods to the rest of the world fell to  $\notin$ 1744 bn (- 11.1%), and imports fell to  $\notin$ 1564 bn (- 12.4%). As a result, the euro area recorded a surplus of  $\notin$ 180.1 bn,

Intra-euro area trade fell to €1478.4 bn in Jan-Oct 2020 (-10.8%). In Jan to Oct 2020, extra-EU exports of goods fell to €1579.4 bn (-11.3%), and imports fell to €1417.2 bn (-13.0%). As a result, the EU recorded a surplus of €162.2 bn. Intra-EU trade fell to €2334.4 bn (-9.5%). [57]



Figure 7. International trade in goods, EU, bn EUR, 2019-2020 [55; 57]

If in Oct-2019 was EU export of goods 199.4 bn, but in Apr-2020 125.1 bn and in May-2020 123.3 bn. The decline was a third (-38.2%).

This was followed by exports and imports growth, but than in 2019 at a better level in the months.

Table 16	.EU	trade	in	goods,	bn	EUR,	2020	[55;	57]
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	Exports	Imports	Trade balance
Extra	1,931.7	1,714.2	217.5
Intra	2,843.2	2,781.5	61.7

Table 17.	EU.	trade i	in	January to	June	2021,	bn	€	[55;	57	l
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	Jan-Jun 20	Jan-Jun 21	Growth
EA trade			
Extra-EA exports	1 015.2	1 172.5	15.5%
Extra-EA imports	929.2	1 070.1	15.2%
Extra-EA trade balance	86.0	102.5	
Intra-EA trade	870.7	1 047.8	20.3%
European Union			
Flows			
Extra-EA exports	921.9	1 048.9	13.8%
Extra-EA imports	846.7	964.5	13.9%
Extra-EA trade balance	75.2	84.4	
Intra-EA trade	1 364.6	1 654.2	21.2%

European Union trade from January to June 2021.

EU trade - in Jan-Jun 20 to Jan-Jun 21 growth Extra-EU exports +13.8%; Extra-EU imports +13.9%; Extra-EU trade balance from 75.2 to 84.4 bn and Intra-EU trade +21.2%

In January to June 2021, extra-EU exports of goods rose to  $\notin 1$  048.9 bn (+ 13.8%), and imports rose to  $\notin 964.5$  bn

(+13.9%). As a result, the EU recorded a surplus of  $\notin$ 84.4 bn, compared with  $+\notin$ 75.2 bn in January-June 2020. Intra-EU trade rose to  $\notin$ 1 654.2 bn (+21.2%).

Extra-EU exports of goods in June 2021 up by 22.3% and Imports from the rest of the world up by 29.6% compared with June 2020. As a result, the EU recorded a  $\notin$ 14.8 bn surplus in trade in goods with the rest of the world in June 2021, compared with + $\notin$ 20.0 bn in June 2020. Intra-EU trade rose +24.6% compared with June 2020.

In May 2021 were extra-EU exports 178.7 bn and imports 168.5 bn; in June were: 177.7 bn and 169.2 bn  $\in$ . [55]

Only Finland and Luxembourg had a smaller decline in *Real* GDP than EU members in 2020 than the Baltics.

In 2021, Estonia (13.0%) and also Turkey (9.0%) will grow more than Estonia. In the world was still Chile (11.0%) and Peru (10.0%). Also, Maghreb group: Algeria, Libya, Mauritania, Morocco, and Tunisia (14.0%). [55; 60]

 Table 18. Leading exporters and importers in world merchandise trade (excl. intra-EU trade), bn USD and %, 2020 [60]

Rank	Exporters	Value	Share	AnnualChange, %
1	China	2591	18.1	4
2	Extra-EU Exports	2209	15.4	-7
3	USA	1432	10.0	-13
4	Japan	641	4.5	-9
5	Hong Kong, China	549	3.8	3
6	Korea, Republic of	512	3.6	-5
7	Mexico	418	2.9	-9
8	United Kingdom	403	2.8	-14
9	Canada	391	2.7	-13
10	Singapore	363	2.5	-7
11	Chinese Taipei	347	2.4	5
12	Russian Federation	332	2.3	-21
13	Switzerland	319	2.2	2
World excl. intra-EU exports		14334	100.0	-8

Rank	Importers	Value	Share	Annual Change, %
1	United States of America	2408	16.5	-6
2	China	2056	14.0	-1
3	Extra-EU Imports	1958	13.4	-10
4	United Kingdom	635	4.3	-9
5	Japan	635	4.3	-12
6	Hong Kong, China	570	3.9	-1
7	Korea, Republic of	468	3.2	-7
8	Canada	414	2.8	-11
9	Mexico	393	2.7	-16
10	India	372	2.5	-23
11	Singapore	330	2.3	-8
12	Switzerland	291	2.0	5
13	Chinese Taipei	288	2.0	0
14	Viet Nam	263	1.8	4
15	Russian Federation (2)	240	1.6	-6
World excl. intra-EU imports		14634	100.0	-8

Historically, successful foreign trade has been one of Europe's sources of wealth. Now its global importance has gone to Asia.

In the *World Exporters 2020 rankings list* is in the top 50 24 European countries, 19 of them from the EU. The top 10 are half of Europe. Germany is 1267 bn 3rd, Netherlands 509 bn 4th, Italy 434 bn 8th, France 427 bn 9th and Belgium 369 bn \$ 10th.

In the *World Importers list* there are also 24 European countries, 19 of them from the EU. The top 10 are half of Europe. Germany is 1024 bn 3rd, United Kingdom 635 bn 4th, Netherlands 522 bn 6th, France 510 bn 7th and Italy 370 bn \$ 10th. [60]

The following brief summary also provides some of the author's views on the economic crisis. However, the in-depth analysis by economic field is very extensive. Our book [14] "The Economic Crisis Lessons of Europe" is 540 pages long + other books and articles.

## 4. Conclusions

The leaders of the world economy are alongside the United States emerged in China and among them years after India. Germany is largest European economy, the EU economic motor, which depends on development of most economic indicators throughout of EU.

A relatively strong economic base and long experience helped Europe overcome the economic downturn. However, they varied considerably from country to country.

Cooperation between EU Member States has had a positive effect both on overcoming the crisis and on improving living standards.

The successful exit from the crisis was based on relatively sound labor market policies, high quality labor, and in particular the experience and know-how of managers; lessons from the previous crisis (2009); making the right investments; foreign trade; good cooperation with other countries, especially EU Member States and neighboring countries - mutual assistance; as a rule, the consideration and fulfillment of the medical requirements of the Corona virus, which ensured that the spread of this virus was limited as much as was objectively possible, the standard of living and moral stimuli were maintained, and much more.

For discussions and recommendations for increasing the efficiency of the economy (Company).

Stimulating the expansion of entrepreneurship and the creation of new ones. Creating better conditions for the development of small businesses. Expanding foreign trade and encouraging the expansion and establishment of links. Expanding the export eligibility of product quality and increasing the nomenclature of export items. Encouraging the development of education and research, especially in the

field of practical research. Comprehensive curbing and ending corruption and promoting honest, ethical business practices.

World population changes affected also Europe. Migration will increase with the resulting effects.

Climate issues have become more pressing, necessitating economic restructuring with additional costs.

The GDP of the four largest EU countries exceeded one trillion US dollars. These countries gave of total EU-27 GDP 54.8%. Shares of GDP were: Germany 21.3%; France 14.8%; Italy 14.0% and Spain 7.6%. Their economic levels partly affect other European countries.

Stimulating the development of science and technology and fostering innovation are important factors in overcoming economic difficulties. Public policies conducive to economic development, in particular small business.

The EU appears to be successful in this area, as evidenced by the high volumes of high technology production exports  $-\frac{3}{4}$  trillion euro per year.

In US dollars, during the 2009 economic crisis, there was a sharp decline in the EU-27, while the 2008 level could not be reached. The next decline was in 2012, in 2014 remained at a record high in 2008. GDP decline in 2015 was the largest: 2,192 bn \$ or 13.4%. The decline in the corona virus between 2018 and 2020 was much smaller, 682 bn \$ or -4.3% in two years. Thus, the two major EU-27 crises were in 2009 and 2015, but 2020 was a normal decline or small drop.

Historically, successful foreign trade has been one of Europe's sources of wealth. Now its global importance has gone to Asia.

The economies (GDP) of the EU great powers have developed in a complex and sometimes contradictory way, characterized by complex 6th degree polynomials with a fairly high  $R^2$ . On the other hand, it is an objective inevitability that the market economy develops cyclically, with highs and lows.

Those managers, who were more knowledgeable of the laws of the economy and managed to use them to their advantage, were better at exiting the crisis. Significantly decreasing the number of incompetent managers and hiring large number of specialists also helped exit the economic crisis successfully and thus saved the economy of the state.

A crisis inevitably cleans the economy with its harsh market economy laws; the weaker fail to keep up. The economic crisis cleansed the business market of weak companies, thus creating grounds for new development.

Countries economy has increased after the 2020. crisis. The economies of the countries have grown since the crisis.

Economic growth was mainly achieved by increasing labour productivity.

In 2020, nom GDP increased compared to the previous year in Denmark, in Ireland, in the Netherlands, in Poland, in Finland, in Sweden and in Lithuania. The minimal decrease was in Germany, in Romania and in Slovakia.

Just as the entire EU economy and foreign trade has been a major engine of Germany. However, medium-sized countries such as the Netherlands, the Nordic countries, Belgium, Poland and the Baltic, among the EU newcomers, are also successful.

Development has been uneven and partially ineffective.

*How to raise competitiveness?* Better use research potential. Knowledge of the economic law will help to make better and more effective decisions. In the information society is most important the know-how, which means education and experience. This the correctness confirms in the world the richest countries practice.

#### Knowledge-based state!

Not all economic theoretical views can be considered dogmas, but their exploitation must be creative.

After a thorough analysis of the economic crises, it has become clear that current economic laws must be specified. This in turn provides the opportunity to further explanation and prediction the labour market situation in the future.

Their decision-making should take into account both the politicians and business leaders in the economic development of a cyclical nature, the fact that after the economic boom slows down or even go back to it (the crisis), then to grow again after some time.

In conclusion, the EU and EFTA economies are weakening in the increasingly competitive world with the USA, China, Japan, India and other countries.

From 2021 to Q2, a joyous time began, it can be said, that this economic crisis was overcome (+), but it should be noted, that in addition to the deaths of millions, the coronavirus left a deep mark on human health and their quality of life.

*How does the liberal market economy in Europe today?* The liberal market economy is efficient, it confirmed by the practice. One of the key words is also *economic freedom*.

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