Editorial

JAN MERTL

Dear readers,

Tlet me introduce this year's second issue of ACTA VŠFS, which was prepared with careful selection and reviewing of the papers that had come to the editors' desk. Before we get to the actual papers, I must mention that we also have got a new website of the journal (https://acta.vsfs.eu/), whose preparation and refinements took a lot of effort. I hope that the new web will help both the readers and the authors to enjoy the journal more and find easier and richer information about the journal itself and its review procedures, as well as its actual content. It is worth to take a look on this new website, and we hope the new structure will serve for many future issues of the journal.

Also, this issue is the first one which is done fully in English – up to now, we had Czech version of editorial and abstracts, too. But, since for a long time only papers in English have been submitted and published in our journal, the usage of Czech written items gradually lost their significance and we decided now to abandon them, making the journal in English language only.

In this issue, we have got five papers for you to look at and read. The first one, called "Environmental reporting and performance of Nigerian listed oil and gas firms", came to the journal from far Africa and adopted an ex-post facto research design method using existing data from the financials of selected firms. The paper concludes that environmental accounting reporting contributed to the firms' performance of Nigerian listed oil and gas firms. Therefore, these firms should be cost-effective and efficient when planning environmental activities to improve firms' performance.

The second paper "Unemployment, effects of government measures and employment effects during the corona crisis in Germany" was written by the German author and returns to the topic that moved the world since the year 2020 – covid-19 pandemic. It focuses on macroeconomic aspects of employment during this epidemic in Germany. It also tackles the gender dimension of unemployment.

The third paper is focused on an evergreen topic for Czechia – the readiness to adopt the European single currency ("Readiness of the Czech Republic to join the euro area"). It pretty deeply analyses the factors and conditions for this process, including both fiscal and monetary criteria. Since the situation affecting the preparedness has been rapidly changing, there is a difficult task to trace the process and still maintain the constructive attitude against evaluating the possibilities to adopt the Euro rationally – but the authors have been successful in this task.

The fourth paper "The development of life insurance in the Czech Republic and the Slovak Republic" is as the name suggests devoted to insurance issues. The authors used quantitative methods to analyse the development of life insurance market in the two specified countries.

Both positive and negative determinants have been found. The paper brings valuable findings about consumers' behaviour on the life insurance market.

The fifth paper "Czech monetary and fiscal policies: big deficits and challenges" is a very interesting, logically argued and skilfully written research work about Czech fiscal and monetary policy challenges and possible pathways in current difficult environment. The author has a lifelong experience both with public and private finance and therefore his paper is well worth reading, even if some of his ideas may seem controversial or surprising at first sight. The paper brings suggestions for Czech tax policy too, consistent with other fiscal and monetary steps, and the analysis of Czech National Bank's position within the current environment.

I hope that you will find this issue attractive and interesting, and I'm wishing you a good time reading it

doc. Ing. Jan Mertl, Ph.D.
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Environmental Reporting and Performance of Nigerian Listed Oil and Gas Firms

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Abstract

The study investigated the environmental reporting and performance of listed oil and gas firms in Nigeria. The study adopted an ex-post facto research design method using existing data from the financials of selected firms. The population of the study consisted of thirteen (13) listed firms as of 2021, out of which ten (10) were purposively selected based on the availability of annual reports and accounts. Secondary data were extracted and the results of the unit-roots test informed the adoption of Auto-Regressive Distributed Lag (ARDL) and Error Correction Techniques. The study found a positive and significant relationship between Environmental Management Cost (EMC) and ROCE ($p<0.05$), also a positive but insignificant relationship between Environmental Protection Cost (EPC) and ROCE ($p>0.05$). However, there was a negative and significant relationship between Environmental Research and Development Cost (ERDC) and ROCE ($p<0.05$). The study concluded that environmental accounting reporting contributed to the firms' performance of Nigerian listed oil and gas firms. Therefore, these firms should be cost-effective and efficient when planning environmental activities to improve firms' performance.

1   Introduction

The present business environment has increased industrial activities capable of causing massive damage to man and inanimate existence. Industrial actions have extensively affected the environment within which human existence is a vital part. Natural resources such as air, water, land, conservatory gases, climate, energy, ecosystems, and biodiversity among others are corrupted and environmental sustainability is endangered. The environment has contributed vastly to the continued survival of commercial activities which has necessitated the concept of environmental accounting as part of the reporting system. Accounting for the environment provides an accurate assessment of the costs and benefits of environmental conservation measures for companies (Schaltegger & Burritt,

2000). Environmental accounting is an inclusive aspect of sustainability accounting reporting, thus, generating reports that provide environmental information useful for decision-making by the internal users and stakeholders.

Yusuf, Samuel, and Ekundayo (2016), opined that companies are facing pressures to behave responsibly towards the host community. In responding to these pressures, companies disclose information about the environmental impact of their activities. In Nigeria, there is no specific accounting standard but rather guidelines issued by some organizations such as the Regulation Enforcement Agency Act of 2007 which mandates the presentation of environmental reports to ensure uniformity in reporting environmental issues. These guidelines are not mandatory but rather advisory, because most companies tend to disclose information just to conform to industrial practices and pressures from environmental advocates (Okafor 2018).

Environmental accounting disclosure may impact the business value of an organization, and improve financial performance. For instance, companies regarded as highly environmentally sensitive are involved in the operations and production of products that are not injurious to the environment. Such companies make efforts to dispose of waste products from operations far away from their operating environment. The production activities of the oil and gas sector have far reached visible environmental impacts, and this has adverse effects on the environment such as ecological emissions, damages, landscape destruction, and pollution.

The nonchalant attitudes of some firms in considering environmental accounting affect their performance adversely (Yusuf, et. al, 2016). This is because environmental accounting aids firms to account for all environmental costs incurred by the business to be cost-effective and improve performance. Pramanik, Shil, and Das (2007) submitted that specific issues regarding environmental reporting include: Identification of environmental cost and expenses, identification of environmental liabilities, and measurement of liabilities. Environmental management costs play a focal role in the financial performance of firms. The role of oil and gas firms in environmental sustainability has necessitated the need for a multidisciplinary approach to issues of environmental protection. Degradation, pollution, accelerated destruction of the ecosystem, and the depletion of non-renewable environmental biodiversity has adversely impacted the financial performance of firms. Investment in environmental research and development has brought about new ideas and innovations that have led to improved performance.

Various studies have revealed that most previous studies concentrated on developed countries and very few on developing countries such as Nigeria. Also, the majority of these studies have reported mixed results. Studies such as Falope, Offor, and Ofurum (2019); Okafor (2018); Oti and Mbu-Ogar (2018) found a positive relationship between environmental accounting and corporate performance while studies like those of Charles, John, and Umeoduagu (2017); Oraka and Egbumike (2016) found a negative relationship between environmental accounting and corporate performance. Hence, the inconsistency in previous findings calls for further investigation. The present study investigated the relationship between environmental reporting and the performance of listed Oil and Gas firms in Nigeria.

The following specific objectives are designed to:

i. assess the influence of environmental management costs on the performance of listed oil and gas firms in Nigeria;

ii. examine the relationship between environmental protection costs and performance of listed Oil and Gas firms in Nigeria; and

iii. evaluate the effect of environmental research and development costs on the performance of listed Oil and Gas firms in Nigeria.

Research Questions

The following research questions were designed to guide the study

i. To what extent does environmental management cost influence performance of listed oil and gas firms in Nigeria?

ii. What relationship exists between environmental protection costs and performance of listed Oil and Gas firms in Nigeria?

iii. What effect do environmental research and development costs have on performance of listed Oil and Gas firms in Nigeria?

Research Hypotheses

The following formulated research hypotheses were empirically tested

i. There is no significant influence of environmental management cost on performance of listed oil and gas firms in Nigeria

ii. There is no significant relationship between environmental protection costs and performance of listed Oil and Gas firms in Nigeria

iii. Environmental research and development costs do not have significant effect on performance of listed Oil and Gas firms in Nigeria

2   Literature Review

2. 1   Conceptual Review

Environmental Accounting is a structure that provides a collective framework for organizations to identify and account for past, present, and future environmental costs to support managerial decision-making. Environmental Accounting has been referred to in a variety of ways in literature namely: environmental management accounting,

corporate social accounting, social accounting, and social and environmental accounting (Cooper, Taylor, Smith, & Peterson, 2005). This, however, has not changed the meaning as all drive towards measuring environmental expenditure. The practice of environmental accounting helps to quantify the impacts of organizational activities on the host community. This does not involve only the expenses incurred but also the cost benefits generated within an accounting period.

Oil & Gas Industry in Nigeria

The Nigerian Oil and Gas industry has been vibrant since the discovery of crude oil in 1956 by the Shell Group (Oraka & Egbumike 2016). However, the sector was largely dominated by multinational corporations until the early 1990s when Nigerian companies began to make a foray into the industry. Local participation was boosted with the implementation of the Nigerian Content Directives issued by the Nigerian National Petroleum Corporation (NNPC) about a decade ago, and eventually, by the promulgation of the Nigerian Oil and Gas Industry Content Development (NOGIC) Act (The Act) in 2010. The Act seeks to promote the use of Nigerian companies' resources in the award of oil licences, contracts and projects. In terms of structure, the industry is broadly divided into upstream sector, downstream sector, and Services sector. The mid-stream operations are usually included in the downstream sector. However, a distinction is now being made between the two sectors. Mid-stream covers the processing, storage, marketing and transportation of crude oil, gas, gas-to Liquids and liquefied natural gas. The Upstream sector is characterized by exploration and production of crude oil and gas (petroleum operations. The upstream oil sector is the single most important sector in the economy, accounting for over 90% of the country's exports and about 80% of the Federal Government (FG's) revenue (Yusuf, et. al, 2016).

Environmental Accounting in Nigeria

The Federal Government on its part in trying to improve environmental disclosure by companies has formulated several environmental laws through the ministry of Environment and Natural Resources. These environmental laws are aimed at: restricting the release of a toxic substance into the environment; stipulating the requirement that industries and facilities generate waste must meet; requiring establishments to develop contingency plans for handling unusual and accidental discharge and developing strategies for waste reduction; making it mandatory for the establishment to install facilities capable of reducing or eliminating pollution arising from production activities and specifying the maximum limits of effluent parameter allowed to be discharged into the air, streams, rivers, drains, and ground. However, the problem with Nigeria is not the enactment of laws and regulations but the implementation of these laws and regulations.

Environmental Management Cost

Environmental management costs are costs spent to manage environmental preservation activities and indirectly contribute to reducing environmental impacts on business operations and also spend on external communications, such as disclosure of environmental information. These include the cost of implementing

an environmental management system; the cost of disclosing environmental information and environmental advertising; the cost of monitoring environmental impacts; the cost of training employees on environmental issues and the cost of environmental improvement activities. Environmental remediation cost is contingent costs allocated to the recovery of environmental degradation due to business activities. These are the cost of restoring the natural environment to its original state; the cost of covering degradation suits connected with environmental conservation and provisions or insurance fees to cover degradation to the environment.

Environmental Protection Costs

Environmental protection costs include the costs of preventing air pollution (including acid rain); cost of preventing water pollution; cost of preventing ground contamination; cost of preventing noise pollution; cost of preventing vibration pollution; cost of preventing odour pollution; cost of preventing ground linkage and cost of preventing other types of pollution. Global environmental conservation costs are those costs associated with negative environmental impacts on the global environment, resulting from human activities. Costs are allocated to prevent global warming, ozone depletion, and other global environmental conservation efforts. These costs include prevention of global warming and energy conservation; prevention of ozone depletion and other global environmental conservation activities.

Environmental Research and Development Cost

Environmental research and development cost is the amount of money spent on research and development activities to conserve the environment. It is the cost incurred by a firm to develop unique resources to enhance eco-innovation that leads to superior environmental reporting and financial performance. These include: Research and Development cost to develop products that improve environmental conservation; Research and Development costs to restrict environmental impact at the product manufacturing stage and other Research and Development costs associated with amelioration of environmental impact at the distribution stage or marketing stage of products.

Return on Capital Employed (ROCE)

The vital aspect of corporate performance involves the measure of profitability, market value, and growth potentials of a business. Hansen and Mowen (2005) confirmed that the performance of a business is indispensable to management for it shows the efficiency and effectiveness of outcomes achieved by people in an organization which relates to authority and responsibility in achieving the legitimate goal and conformity to moral and ethical practices of an organization. Benjalux (2006), performance measures are the essentials of economic units for the decision cannot be made without precise performance measurement. It is an important performance measure of economic units. Katja, (2009) submitted that financial performance measures are indicators used to evaluate the success of economic units to achieve business objectives. Return on capital employed is a profitability ratio that measures the efficiency of a company in utilizing its capital to generate profits. ROCE is stated as a proportion that reveals the industrial

performance within which a company operates. It shows the efficiency of management in the utilization of business assets. Therefore, this specifies the efficiency and profitability of a company's capital investment.

Theoretical Review

Stakeholders Theory

This study was guided by the Stakeholders theory propounded by Edward R. Freeman in 1984. The theory deals with organizational management and business ethics that addresses morals and values in managing an organization. The elementary position of stakeholders' theory is the affirmation of a firm's success in the effective management of the interrelationship between a firm and its stakeholders. The stakeholder theory was initially introduced by Stanford Research Institute (SRI). It refers to the groups that must support an organization and without which such an organization would go into extinction (Freeman 1983). In advancing the stakeholder theory, Freeman (1983) integrated the stakeholder's concept into two categories namely (i) a business planning and policy model, and (ii) a corporate social responsibility model.

The first model of stakeholder focuses analysis on developing and appraising the support of business strategic decisions by groups whose support is needed for the continuity of firms. The category of stakeholders identified in this model includes shareholders, customers, suppliers, and public groups. Though these groups are not opposed in nature, their possibly conflicting behavior is considered a factor in strategically reaching a firm's resources within the environment (Deegan & Gordon, 2006).

The second model concerns corporate planning and analysis that focuses on external influences that may be confrontational to the firm's objectives. These adversarial groups may include regulatory agencies, environmentalists, and/or special interest groups that are so much concerned with social issues (Guthrie & parker, 2000). This model permits managers and accountants to reflect on strategic plans adaptable to change in the social needs of the non-traditional category of stakeholders.

The stakeholders' theory suggested an improved level of environmental consciousness and reflection by the firm that brings about the necessity for firms to enlarge their corporate planning to combine the non-traditional stakeholders like the environmental regulatory or policy adversarial groups to adapt and take advantage of changing social and environmental demands. As pointed out by Bassey, Sunday, and Okon (2013), the major interest of stakeholders' theory as it relates to environmental accounting is to address the environment cost elements and valuation and its inclusion in financial reports.

Empirical Review

A significant number of studies exist in the extant literature that examined the effects of environmental accounting reporting on the corporate performance of oil and gas companies in developed countries, developing countries, and Nigeria. Some of these studies are discussed in turn.

Tadros and Magnan (2019) investigated how environmental performance plots into environmental disclosure. A look at underlying economic incentives and legitimacy aims. The study employed a sample of firms from environmentally sensitive industries over several years and aimed at re-examining the association between environmental disclosure and environmental performance in United State. A panel data analysis was adopted to examine how the interaction between environmental performance and economic and legitimacy factors influence firms' environmental disclosures. The results suggested that environmental performance moderated the effect of economic and legitimacy incentives on firms' propensity to provide proprietary environmental disclosure, with both sets of incentives being influential. More precisely, there appeared to be a reporting bias based on the firm's environmental performance whereas the high-performers disclose more environmental information in the three following vehicles: annual report, 10-K, and sustainability reports combined. Results also show that economic and legitimacy factors influence the disclosure decisions of the low and high environmental performers differently.

Zhenghui and Gaoke (2018) constructed a comprehensive Corporate Environmental Responsibility (CER) engagement measurement to examine the relationship between CER engagement and firm value and also explored the mediating effect of corporate innovation on this relationship based on a sample of 496 China's A-share listed companies from 2008 to 2016. The results showed that when firms start to adopt environmental regulations, CER would harm firm value; though, at a specific level, CER would start to improve firm value positively. More so, corporate innovation plays a mediating role in the relationship between CER and firm value. Corporate innovation encourages the firm value of firms with CER more than firms without CER. The study concluded that CER encouraged firms to enhance their sense of environmental responsibility to enhance their competitive advantages, enhance corporate innovation capabilities, and thus enhance firm value.

Cooray, Gunaratne, and Senaratne (2020) surveyed Sri Lanka and examined the effects of corporate governance on the quality of integrated reporting. This study was conducted by using panel multivariate linear regression to analyze the content of 132 public company annual reports over three years. The study revealed limited support for a corporate governance system to provide stakeholders with quality information about the process of creating value through integrated reporting, while the size of the board and the existence of an independent risk committee the board had a significant association with integrated reporting. In addition, it was argued that there was a greater emphasis on the corporate governance compliance requirements of Sri Lankan companies compared to voluntary reporting models such as integrated reporting.

Oti and Mbu-Ogar, (2018) investigated the impact of environmental and social disclosure on the financial performance of quoted oil and gas companies in Nigeria. The study extracted time series data over five years for analysis using the ordinary least square regression technique. The results of the statistical analysis showed that disclosure of employee health and safety and community development does not significantly affect financial performance while disclosure of waste management had a positive and significant effect on financial performance. The study suggested that oil and gas

companies should constantly review their waste management strategies and use bespoke technology to reduce their impact on the environment. Also, the study proposed that oil and gas companies should include employee health and safety as part of their mission and vision statement. Oil and Gas companies should also ensure sustainable development of the host communities to avoid hostility that can harm business operations.

Okafor (2018) ascertained the effect of environmental costs accounting and reporting on the firm financial performance of quoted Nigerian oil and gas companies. The study adopted regression analysis. The results of the statistical analysis indicated that better environmental reporting has a positive impact on firms' value. Moreover, environmental accounting provides the organization with an opportunity to reduce environmental and social costs to improve performance.

Nwaiwu and Oluka, (2018) investigated environmental cost disclosure and financial performance of oil and gas in Nigeria of listed oil and gas companies in Nigeria. The study adopted time series data extracted from annual financial reporting and economic reviews of the Central Bank of Nigeria. Pearson product-moment coefficient correlation and multiple linear regression analysis were used for analysis. The empirical results revealed a positive relationship between environmental costs and environmental regulatory compliance with financial performance. The study suggested regulatory enforcement for adequate environmental cost disclosure and proper reporting. The study recommended that oil and gas companies in Nigeria should create a well-articulated environmental costing system to ensure a conflict-free corporate atmosphere to improve corporate performance.

3   Methodology

The study adopted an ex-post facto research design using secondary data already in existence in the annual account and reports of selected listed oil and gas firms. This study adopted a quantitative longitudinal research design. The target population of this study was thirteen (13) oil and gas firms listed on Nigerian Stock Exchange as 2021. Out of the listed firms, ten firms were purposively selected based on the availability of relevant data in the annual reports and accounts. The data adopted were already in existence, cleaned, and stored. This data provided the study a unique, detailed picture of the population and provided access to levels of detail that would otherwise be extremely difficult (or impossible) for the researchers to collect through primary data. Using secondary data for this study made it possible to obtain data over larger intervals (10 years period). The data tend to be high-quality and in excellent shape because the datasets had already been validated and therefore required minimal checking. The data covered a period from 2010 to 2019 and were tested for stationarity using Levin, Lin, and the Chu. The results of the unit-roots test informed the use of Auto-Regressive Distributed Lag (ARDL) and Error Correction Techniques for analysis with the aid of Eviews 10.

3.1   Model Specification

This study was based on three measures of independent variables namely environmental management costs (EMC); environmental protection costs (EPC); and environmental research and development costs (ERDC).

A panel-ARDL long-run dynamic result was used to estimate the regression equation:

$Y=f(X)$

ROCE = f (EMC, EPC, ERDC) …………………………………………………... (3.1)

Where

ROCE= Return on Capital Employed

EMC = Environmental Management Cost

EPC = Environmental Protection Cost

ERDC= Environmental Research and Development Cost

β_0= is the intercept,

β_1, β_2, β_3 = parameters of explanatory variables of EMC, EPC, and ERDC

e_{it} = error term at period t, i

$ROCE_{it} = \beta_0 + \beta_1 EMC_{it} + \beta_2 EMC_{it-1} + \beta_3 EPC_{it} + \beta_4 EPC_{it-1} + \beta_5 ERDC_{it} + \beta_6 ERDC_{it-1} + e_{it}$ ………….(3.2)

Measurements and Description of Variables

Table 1: Study variables and their measurements

Variable	Abbreviations	Type	Measurement
Return on capital employed	ROCE	Dependent	Profit before tax x 100 Capital Employed 1
Environmental management costs	EMC	Independent	Log of Employee Training on environmental Management. Log of Environmental Remediation Cost.
Environmental protection costs	EPC	Independent	Log of Pollution control costs. Log of Global Environmental Conservation Cost.
Environmental research and development costs	ERDC	Independent	Log of Research and Development Expense. Log of New Product Research Initiatives.

Source: Researcher's Compilations (2021)

3.2 Rationale for the Metrics adopted for Dependent and Independent variables

The two variables of interest in this study are environmental reporting and financial performance. The independent variable (environmental reporting) is measure by Environmental Management Costs (EMC); Environmental Protection Costs (EPC); and Environmental Research and Development Costs (ERDC) while the proxy for dependent variable (Financial performance) is Return on Capital Employed (ROCE). Environmental Accounting is a concept that tries to recognize the side effects of production and consumption on the physical environment in recent times (Adediran & Atu, 2010). The effect is recognized in the financial statements of organizations. However, none of the regulatory agencies or statutes regulating these companies has made the disclosure of environmental activities of companies mandatory. Environmental protection cost is the amount of money incurred on the preservation, and defense, of natural resources. It includes pollution prevention costs and global environmental preservation costs. Pollution prevention costs are related to the reduction of a production facility's environmental impact or for end-of-pipe solutions, facilities, or equipment attached to the end-of-production facilities. Environmental Research and Development costs are costs incurred to develop unique resources and capabilities that increase its eco-innovation that improves environmental and financial performance. Such costs include costs incurred to develop products that contribute to environmental conservation; costs that curtail environmental impact at product manufacturing stage and costs associated with curtailing the environmental impact at the distribution stage or marketing stage of products manufactured. ROCE is a metric used by investors to evaluate and make an informed decision as to the suitability or otherwise of investing in a company (Hansen & Mowen 2005). It should be noted that a business making a high return on capital employed is a very profitable business (Benjalux 2006).

3.3 Method of Data Analysis

The data collected were analyzed using Auto-Regressive Distributed Lag (ARDL) and Error Correction Techniques. This study adopted panel data in that it simultaneously combines cross-sectional and time series data. Descriptive statistics was adopted and a normality test was undertaken. Data were analyzed using E-Views 9.0 software. This was presented using the long-run Panel-ARDL Dynamic Result. The output was interpreted and a conclusion was drawn based on the results of the panel-ARDL analysis.

4 Results and Interpretations

This section tested and analyzed the data elicited using the Statistical Analysis System (E-views 10). The results for different measures of environmental costs and performance of oil and gas companies including Return on Capital Employed (ROCE) as the dependent variable; environmental management costs (EMC), environmental protection costs (EPC),

and environmental research and development costs (ERDC) as the independent variables are presented below.

Table 2: Descriptive Statistics

	ROCE	LOGEMC	LOGEPC	LOGERDC
Mean	0.129629	17.27843	18.75936	18.30888
Maximum	2.658285	20.08525	21.70823	20.64964
Minimum	-1.841120	13.70458	17.18797	14.38366
Std. Dev.	0.479529	1.495784	1.132559	1.556906
Skewness	1.081805	-0.277105	0.750831	-0.784316
Kurtosis	16.34127	2.589965	2.790920	3.133975
Jarque-Bera	532.7892	1.386225	6.704548	7.229115
Probability	0.000000	0.500017	0.035005	0.026929
Observations	100	100	100	100

Source: Researcher's Computation with the aid of E-views 10

Table 2 showed the descriptive statistics of the model's variables. It showed the mean, maximum, minimum, standard deviation, skewness, kurtosis, and Jarque-bera of the dependent and independent variables. The mean value of the Return on Capital Employed was approximately 13%. This means that the return available to oil and gas companies on average during the period was 13%. The mean values of EMC, EPC, and ERDC were ₦17.28million, ₦18.76million, and ₦18.31million respectively. This is the average amount spent on environmental costs by oil and gas companies in Nigeria. The maximum value of Return on Capital Employed was 265.8% which indicates that the performance level during the period was high. The maximum values of EMC, EPC, and ERDC were ₦20.09million, ₦21.71million, and ₦20.65million respectively. The minimum value for the Return on Capital Employed was -184.1% which indicated a loss in the return available to the company. The minimum values of EMC, EPC, and ERDC were ₦13.70million, ₦17.19million, and ₦14.38million respectively. The standard deviation value showed the dispersion of the data series i.e., the lower the values, the lower the deviations of the series from the mean, and the higher the values, the higher the deviation of the series from its mean. The standard deviation values of ROCE, EMC, EPC, and ERDC were 47.95%, ₦1.50million, ₦1.13million, and ₦1.56million respectively. The variable with the higher degree of dispersion from the mean was ERDC with a value of ₦1.56million.

Skewness measures the degree of asymmetry of the series. It is an indication of normality in the distribution of the series with a threshold of 0. The result, if greater than 0 is defined as positively skewed or skewed to the right while if less than 0 is defined as negatively skewed or skewed to the left. The skewness values of the variables were; ROCE (1.081805), EMC (-0.277105), EPC (0.750831) and ERDC (-0.784316). From Table 2, ROCE and EPC are greater than 0, this means that they are rightly and positively skewed indicating that these data are to the left of the mean value of all the variables while EMC and ERDC are lesser than 0, and this means that they are skewed to the left and negatively skewed.

Kurtosis is used to measure the peakedness or flatness of a probability distribution of a real-valued random variable. It is used to determine whether the variable is mesokurtic, platykurtic, or leptokurtic. Hence, if a variable is less than 3, such variable is platykurtic; if a variable is greater than 3, such variable is leptokurtic and if a variable is equal to 3, the such variable is mesokurtic. The kurtosis values were; ROCE (16.34127), EMC (2.589965), EPC (2.790920), and ERDC (3.133975). It can be deduced that ROCE and ERDC have a kurtosis value that is greater than 3, therefore they are said to be leptokurtic while EMC and EPC have a kurtosis value that is lesser than 3, therefore they are said to be platykurtic.

Jarque-Bera statistics combines skewness and kurtosis properties; it provides more comprehensive information about the normality of the variable. The null hypothesis is that the variable is normally distributed while the alternate hypothesis is that the variable is not normally distributed. At a 5% level of significance, ROCE, EPC, and ERDC have a p-value lesser than the 5% level of significance while EMC has a p-value greater than the 5% level of significance. Therefore, ROCE, EPC, and ERDC are not normally distributed while EMC is normally distributed.

Unit Root Test

The study tested for the absence of Unit Root to ensure that series exhibit stationarity so that the results do not yield spurious and misleading results. This is done to ascertain whether its properties of mean, variance, and auto covariance are constant over time. If these properties are time-variant, the series is said to be non-stationary and thus follow a unit root process otherwise, it is stationary and does not follow a unit root process. Hence, this study subjected each of the series in the model to Levin, Lin & Chu unit root test. The null hypothesis states that the series contains a unit root. However, the alternate hypothesis states otherwise.

Table 3: Levin, Lin & Chu t* Unit Root Test

Variables	Level			Order of integration I (d)
	None	**Intercept**	**Intercept & Trend**	
ROCE	-4.706***	-14.018***	-8.830***	I (0)
EMC	-1.087	-0.951	-0.861	I (1)
EPC	-1.621**	-1.341*	0.067	I (0)
ERDC	-0.451	-0.604	-1.710	I (1)

*, **, *** represent significance levels at 10%, 5%, and 1% respectively.

Source: Researcher's Computation with the aid of E-views 10

From the Levin, Lin & Chu t* results, it is observed that variables used in this model have different order of stationarity i.e. I (0) and I (1) considering all test options (None, intercept, intercept & trend). The last column titled "I (d)" in the table above concluded with the order of integration of the variables. Conclusively, variables are integrated at different order i.e. I (0) stationary at the level and I (1) stationary at first difference.

Table 4: Optimal Lag length structure for the Variables

Lag	Log L	LR	EPE	AIC	SC	HQ
0	-348.7792	NA	0.858852	11.19934	11.33541	11.25286
1	-224.5205	228.7938*	0.027664*	7.762554*	8.442914*	8.030143*

Indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)

Source: Researcher's Computation with the aid of E-views 10

In table 4, LR, FPE, AIC, SC, and HQ selected 1 as the optimal lag length for the variables. The study followed the criterion of AIC and therefore used 1 as the optimal lag length in the proposed ARDL equation.

Table 5: Kao Residual Co-integration Test

	t- statistic	*Prob.*
ADF	-1.923079	0.0272
Residual variance	0.285578	
HAC variance	0.144067	

Source: Researcher's Computation with the aid of E-views 10

The Kao Co-integration test result from the table showed that the computed probability value from the ADF equation is not up to the chosen level of significance (0.0272 < 0.05) which signifies that we fail to accept the null hypothesis and conclude that there is a presence of a co-integrating relationship between the panel data variables. This implies that there is a long-run relationship among the variables.

Estimation Analysis

To examine the effect of environmental accounting and reporting on corporate performance of listed Oil and Gas companies in Nigeria, and to test the formulated hypotheses, Pooled Mean Group/AR Distributed Lag models were adopted.

Table 6: Long-run Panel-ARDL Result (Dependent Variable: ROCE)

Variables	Coefficient	Std. Error	t-statics	Prob.*
	Long Run Equation			
Log EMC	0.113195	0.018207	6.217069	0.0000***
Log EPC	0.011746	0.036691	0.320137	0.7509
Log ERDC	-0.132238	0.015974	-8.278421	0.0000***
COINTEQ01	-0.750297	0.227985	-3.290989	0.0024

*, **, *** indicate significance at 10%, 5% and 1% critical level respectively

Source: Researcher's Computation with the aid of E-views 10

The result presented in table 6 showed the long-run estimation and was used to test the significance of the hypotheses in the research study. Only EMC and ERDC, in the long run, were significant at a 5% level. Environmental management cost (EMC) had a positive impact on return on capital employed (ROCE). A percentage increase in EMC increased ROCE by 11.32%. Environmental research and development cost (ERDC) had a negative impact on return on capital employed (ROCE). A percentage change in ERDC causes a -13.22% change in ROCE. Environmental Protection cost (EPC) had a positive effect on Return on capital employed (ROCE) but is not significant at the chosen level of significance of 5%.

Consequently, to adjust for variations from the equilibrium long-run relationship due to short-run systemic shocks, the Error Correction Model (ECM) was considered. The ECM estimation results (COINTEQ01) in table 6 revealed that the independent variables jointly account for approximately 75.03% changes in Return on Capital Employed which is the dependent variable. Therefore, a 75.03% adjustment is required to attain the equilibrium long-run relationship.

Table 7: Long run Panel-ARDL Result (Dependent Variable: ROCE)

Variables	Coefficient	Std. Error	t-statics	Prob.*
	Long Run Equation			
Log EMC	0.113195	0.018207	6.217069	0.0000 ***
Log EPC	0.011746	0.036691	0.320137	0.7509
Log ERDC	-0.132238	0.015974	-8.278421	0.0000 ***

*, **, *** indicate significance at 10%, 5% and 1% critical level respectively

Source: Researcher's Computation with the aid of E-views 10

The result presented in table 7 showed the long-run estimation used to test for the significance of the hypotheses in the research study. Only Environmental Management Cost (EMC) and Environmental Research and Development Cost (ERDC) in the long run were significant at a 5% level of significance while Environmental Protection Cost (EPC) was not significant. Environmental management cost (EMC) had a positive and significant impact on Return on Capital Employed (ROCE). A percentage increase in EMC led to an increase in ROCE by 11.32%. Environmental Research and Development Cost (ERDC) had a negative and significant impact effect on Return on Capital Employed (ROCE). A percentage change in ERDC causes a -13.22% change in ROCE.

Environmental Protection Cost (EPC) had a positive and significant effect on Return on Capital Employed (ROCE).

5   Discussion of Findings

The results of the analysis revealed a positive and significant relationship between Environmental Management Costs and Return on Capital Employed by listed Oil and Gas firms in Nigeria. This implied that a unit increase in EMC brings about a unit increase in ROCE. This result is in line with the study of Zhenghui and Gaoke (2018) who found that corporate environmental reporting has a negative effect on firm value; though, at a specific level, corporate environmental reporting would start to improve firm value positively and have a significant effect on firms' value. There also existed a positive and insignificant relationship between Environmental Protection Costs and Return on Capital Employed by listed oil and gas companies in Nigeria. This means that a unit increase in EPC would bring about an increase in ROCE. However, EPC has not contributed significantly to ROCE. This is in contrast with Falope, Offor, and Ofurum (2019) that found that environmental protection cost has a significant effect on a firm's corporate performance. From the result, there is a negative and significant relationship between Environmental Research and Development Costs and the Return on Capital Employed of listed Oil and Gas companies in Nigeria. This indicated a unit increase in ERDC would bring about a unit decrease in ROCE. This is in contrast with Okafor (2018) that concluded that spending on issues that concerns the environment boosts the performance of quoted Oil and Gas companies in Nigeria.

Conclusion and Recommendations

The study concluded that environmental management cost and environmental protection cost positively influenced firms' performance. Though, only environmental management costs and environmental research and development cost have contributed significantly to firm performance. Management manipulates these costs not to disappoint shareholders waiting to receive higher returns on their investments at the end of each accounting period. The study found an association between environmental reporting indicators and corporate performance indicators which suggested that not all environmental costs contributed to the corporate performance of Oil and Gas companies in Nigeria. Based on the findings, the study recommended that Oil & Gas firms should reduce their spending on environmental research and development cost or be cost-effective in other to increase firms' return on capital employed. Furthermore, Oil and Gas firms in Nigeria should be made to develop an elaborate accounting policy relating to business environment. The disclosure should be sufficiently made in annual reports or in a separate document to disclose the effect of environmental activities. The entity's environmental reporting should fully disclose the organization's efforts at protecting environmental and associated benefits as part of corporate social responsibility performance.

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Unemployment, Effects of Government Measures and Employment Effects During the Corona Crisis in Germany

KATRIN STEYER

Abstract

During the corona pandemic, policymakers in Germany had to act swiftly. There were targeted corona aid and programmes. The impact of the programmes on the development of unemployment is the subject of research, especially in German-speaking countries. There are gaps in knowledge regarding the impact of the pandemic on gender unemployment. By analysing the research in a structured way and combining it with the analysis of unemployment data, it is shown that the Corona measures helped prevent unemployment. It also shows that women were more affected by unemployment. The increased risk of becoming unemployed is followed by a higher risk of remaining unemployed for longer. Studies show that women are significantly more affected by this risk than in previous recessions. The results indicate that women are more likely to be unemployed for longer due to their desire to work in sectors that are typical for women. Considering the shortage of skilled labour is a prevalent issue, the author proposes targeted policy advice to bring women out of unemployment without stereotypes.

1   Introduction

The corona pandemic has brought far-reaching changes for many people. In addition to their private lives, the daily work of employees in Germany has also changed massively. Many people are affected by short-time work, which on the one hand gives confidence in the preservation of jobs, but on the other hand, brings about considerable changes in everyday working life due to the change in the type and situation of working hours. The daily balancing act between family and work also changes employees' everyday life with family responsibilities. The pandemic has made it more difficult for workers with caring responsibilities to pursue regular employment (Bünning et al., 2020).

Companies' communication and working atmosphere have also changed due to strict hygiene and distance regulations (Frodermann et al., 2020).

The Covid-19 pandemic and containment strategies profoundly impact global economies and labour markets (Michelsen et al., 2020). The impact on the labour market is not yet entirely foreseeable and appears to be different from previous recessions, partly because the service sector, especially areas with increased female employment, is severely affected (Alon et al., 2020a; Collins et al., 2020). There is a controversial debate in science as to whether the crisis will bring about an approximation of the equal distribution of labour force participation between men and women with family responsibilities. The IAB notes that weekly working hours have decreased. Reducing weekly work is mainly due to the massive short-time work. Even though men have reduced their working hours slightly more than women, a clear gap between the sexes remains (Globisch et al., 2020). The report notes that mothers have taken on a larger share of childcare before and during the pandemic. According to the survey results, this is also the view of men. However, men are becoming more involved in this task during the pandemic than before. This fact speaks against the thesis that the Covid-19 pandemic is leading to a re-traditionalization of gender relations in this area (Krehenfeld, 2020). In the companies, working hours have arisen for the family mentioned above (Wanger; Weber 2020). According to the IAB, the temporarily introduced right to continued payment of wages for childcare and various working time instruments help compensate for these losses, secure employment and cope with personal challenges (Globisch et al., 2020). During the demand-driven slumps in the financial crisis of 2009, measures such as the temporary reduction of weekly working hours, the insertion of vacation days and the reduction of overtime and credit balances on working time accounts had proven themselves in addition to short-time work (Walwei 2020).

Against this background, this article examines the question of what measures the state has taken on the highly regulated labour market and what effects on gender can be identified. To this end, the author interprets detailed longitudinal data from the study by Möhring et al. and statistical data from the Federal Employment Agency. Lockdown period, lockdown period light, Christmas lockdown period, transitional lockdown period change employment in Germany. In addition, government programs are changing throughout the pandemic. Therefore, further data interpretations from the data of the German Internet Panel (GIP), the longitudinal study of the German population (Blom, Gathmann & Krieger, 2015) and a particular Covid-19 study within the framework of the GIP (Blom et al., 2020) come into play. In the statistical data analysis, the author investigates the impact of gender-specific unemployment and its duration. For this purpose, a data request was made by the Statistical Service of the Federal Employment Agency.

The article aims to shed light on women's employment in the crisis period of the Covid-19 pandemic. The benefit lies in mapping and evaluating the measures taken because this situation can be repeated. It turns out that women and families were particularly affected during the crisis in terms of taking up and pursuing employment. Therefore, the author formulates new approaches, both on the part of employers, those affected and politics.

This article is structured as follows: In the next section, the author describes the material, methods, and research questions. After that, in the first paragraph, the dentition section shows crisis-related abnormalities and state measures on the German labour market. In addition, the corona effect on the development of unemployment is discussed,

and the author describes who is mainly affected by unemployment during the pandemic. The following explains the state measure of „short-time work" and its effect. The focus is on short-time work with special consideration of gender aspects. Based on these descriptions, an overview of the methods described by the cited authors in the literature is given. The article concludes with a discussion of the results and conclusions of the various investigations.

2   Data and methods

This article explores two research questions:

„What government measures have been taken to stabilise the labour market in the Covid19 pandemic?" and „What are the gender impacts on the labour market?"

In order to answer the research questions, a literature search and qualitative literature analysis were first carried out. The method used is based on a conceptual model. The content analysis is carried out according to Mayring (Frenzl/ Mayring, 2009 and Mayring, 2010).

Several databases were used for the literature search, including:

Ideas, Scopus, Google Scholar and the research database of the Institute for Employment Research.

The keyword search shows 275 relevant data sources, and forty-five are used in this article.

Table 1: Code words and literature source overview

Keywords	Topic area	Sub-area	Sub-area 2
Labour market	Unemployment	Labour market restraint	Requirement level
Business cycle forecast	German Economy	sectors	Working time
Coronavirus inequality	Participation on work	Financial condition	Corona Measures
Coronavirus recessions	Women's unemployment	Capitalism	Women Labour force participation
Macroeconomics	Institution: Federal Employment Agency	Liberalism	Women Short-time work
Short time work	Short-time working	Recession	
Financial Policy			

This article uses analysis results from research reports, short reports and reports from the IAB Forum.

In addition, data was requested from the Statistics Service of the Federal Employment Agency. As part of secondary data analysis, literature analysis's aspects are strengthened.

The Research Institute of the Federal Employment Agency (IAB) uses data from the Federal Employment Agency based on theoretical approaches to the development of unemployment.

The IAB currently takes unemployment registrations into account until 14. 4. 2020. Companies that want to use short-time work must first register with an employment agency. These reports are recorded in the statistics of the Federal Employment Agency as soon as they are available electronically. On the one hand, it can be assumed that the currently available data are still under-recorded due to the mass of notifications and a higher actual number of notifications. On the other hand, it is unclear when and if short-time work begins – and for how many people in the company. During the financial crisis, for example, only about one in three companies that registered this went into short-time work. Also, there is still an overlap in the data. Final data on short-time work will only be available with a delay of several months (statistics of the Federal Employment Agency, 2020). The data on short-time work and unemployment registrations in March, April 2020 and 2009 are compared by sector.

Another method is questioning those affected, both by the IAB and by the repeatedly cited study by Moehring et al. (2020). Currently, many surveys of employees are carried out on their current work situation. However, the survey method can lead to a selection of participants. It can be assumed that computer-savvy people who work a lot on the PC, for example, are more likely to participate in an online survey (Frodermann, 2020).

The IAB weights the results presented on those affected by short-time work. They can be transferred to the population of all employees subject to social security contributions which a) use digital information and communication technologies during their work and b) work in companies in the private sector with at least 50 employees subject to social security contributions. According to the IAB, this applies to around 40 % of employees subject to social security contributions in Germany.

Moehring et al. (2020) use GIP data based on a random probability sample of the German general population aged 16 to 75. The panellists were recruited offline according to strict statistical procedures (Blom et al., 2015). The GIP initiated a unique survey on March 2020 to collect data on Covid-19. In the descriptive analysis, Moehring et al. (2020) use weights to extrapolate the characteristics of the participants to the German general population (by age, gender, marital status, the highest level of education, household, height and state). In further research, Moehring et al. (2020) use logit growth curve models with random effects to estimate the average risks of entering short-time work or unemployment in each federal state between March 20 (week 1) and July 9 (week 16).

Unemployment by gender and duration is analysed using descriptive data analysis (Burkhardt/ Sedlmeier, 2015).

These results are the basis for conclusions and recommendations.

3   Results

3.1   The labour market in Germany in the crisis year 2020

In spring 2020, extensive containment measures were taken in Germany and worldwide. As a result, unemployment in Germany rose drastically. The IAB has therefore asked itself how much the containment measures have caused unemployment. The IAB concludes that 60 % of the significantly increased additions to unemployment in April 2020 are due to the decommissioning measures. In total, the decommissioning measures have increased unemployment by 117,000 in the short term (Bauer and Weber 2020). Promoting existing jobs, e.g. through short-time work, is insufficient to prevent a decline in the labour market (Merkl and Weber 2020).

Unemployment rose by 308,000 to 2,644,000 from March to April 2020, but as part of the spring recovery, it usually falls this month. In April of this year, for example, there was a decline of 72,000.

The extent to which unemployment in April could have been significantly lower than in the previous year due to the already emerging economic weakness cannot be quantified and is not taken into account here. People who have become unemployed due to the measures taken to contain the corona crisis account for only part of the crisis-related increase. Another factor is that in April 2020, fewer people ended their unemployment by taking up employment or starting their businesses. Together, these two causes account for about half of the overall effect of unemployment. In addition, an effect that has nothing to do with the employment system plays a role: many people who are normally looked after by an employment agency or a job centre but are not registered as unemployed because, for example, they do not participate in a labour market measure, are now counted as unemployed. The result accounts for 37% of the total effect. Due to the corona crisis, departures to the first labour market and self-employment are slightly lower than in the previous year. In April 2020, 137,000 people left unemployment by entering employment (130,000) or self-employment (7,000). In April 2019, these departures from unemployment amounted to 218,000. The decline of 82,000 people has just as much an increasing effect on unemployment as the increased number of people. The percentage decline in paid employment and self-employment was about the same. Participants in many labour market policy measures and persons who are temporarily unable to work are not counted among the registered unemployed, as they are not available for placement in the short term due to their participation in measures or their illness. However, they are shown in underemployment. Due to the contact bans during the corona crisis, significantly fewer new labour market policy measures are being started. In this context, the Federal Government launched the new Social Service Provider

Deployment Act (SodEG). The Social Service Provider Deployment Act regulates the conditions for granting grants to institutions and social services to combat the effects of the Corona crisis. The Social Service Provider Deployment Act regulates a special warranty mandate for social service providers who provide social services based on the Social Code and the Residence Act. Among other things, the discontinuation of measures in the field of labour market policy for training providers is refinanced by grants. The employment agencies and the joint institutions ensure the continued existence of the social service providers who have a legal relationship with them under social law from January 2021 until further notice.

In order to cushion social and economic hardship and to support economic reconstruction, the Federal Government has continued the measure „Extension of the duration of unemployment benefit I" in the area of unemployment insurance. According to the regulation, the unemployment benefit duration was extended – by three months and for those whose entitlement ended between 1. 5. and 31. 12. 2020. This creates more leeway to compensate for corona-related difficulties in finding work.

Spending on unemployment benefits amounted to 20.6 billion euros, an increase of 15 billion euros in 2019, as more people are unemployed on average.

3.1.1   The sectors and groups affected by short-time working

According to the research results of the IAB (Weber et al., 2020), there are very severely affected industries that could not be active or only to a minimal extent due to the closure and can hardly compensate for the loss of sales. These include aviation, accommodation and catering, travel services, cultural institutions and leisure, entertainment and sports facilities. According to survey results of the IAB Job Survey (Böhme et al., 2020), these are also predominantly the companies that had to make redundancies, although this also applies, for example, to parts of trade and logistics (Böhme et al., IAB 2020/09). The economic structure, particularly the proportion of persons employed in the hotel and catering industry, is of considerable importance for the regional variation of the crisis-related increase in unemployment. However, other regional characteristics also play a role. This is shown, among other things, by a published study (Martin et al., 2016) on the regional effects of major economic crises. Accordingly, „region-specific" or „competitiveness" effects generally seem to play an equally large, if not more significant, role in economic recessions.

A regression analysis carried out by the IAB (Böhme et al., 2020) shows that in addition to the economic structure, the company size structure within the very strongly affected economic sectors is also relevant for the different regional unemployment development (Böhme et al., 2020). A more substantial corona-related increase in unemployment accompanied a higher proportion of employees in micro-enterprises from these sectors. In addition, Böhme et al. (2020) note that a relatively high population density, typical for cities, is also associated with a comparatively high corona effect. Many cities have a comparatively high proportion of workers in hard-hit sectors but have not benefited

from lifting measures to contain the Covid-19 pandemic to the same extent as, for example, the traditional coastal tourism regions.

3.1.2 Affect unemployment from women in comparison to men in the crisis

Germany is a conservative welfare state with a coordinated market economy and a corporatist structure (Esping-Andersen, 1990; Hall & Soskice, 2001). The traditional division of paid work and unpaid care work between men and women has been supported by key elements of the social security system, taxes and wage structure (Schäfer & Gottschall, 2015; Trappe, Pollmann-Schult & Schmitt, 2015). This traditional arrangement has been undergoing change for about three decades. Family policy reforms since the mid-2000s, including the expansion of public childcare in West Germany, have led to a further increase in women's participation in the labour market (Möhring et al., 2020). Taking gender as a cluster feature on the German labour market, women predominate in the part-time and low-wage sectors (Hassel, 2014; Häusermann & Schwander, 2012). With regard to the economic structure, the employment model can be found in the sectors severely affected by the crisis. Möhring et al. (2020) therefore derive the hypothesis that the risk of women becoming unemployed is higher than that of men. This is justified by their higher share of low-wage employment.

The hypothesis is extended by the descriptive secondary data analysis of the statistical data of the Statistics Service of the Federal Agency. For women, there is also the risk of staying longer in unemployment. The proportion of unemployed women in the population decreases between the crisis years 2020 and 2021. Women's unemployment does not correspond to the same extent as that of men. This concludes that the proportion of women staying on unemployment is increasing.

Table 2: Proportions of unemployed men and women in the two crisis years
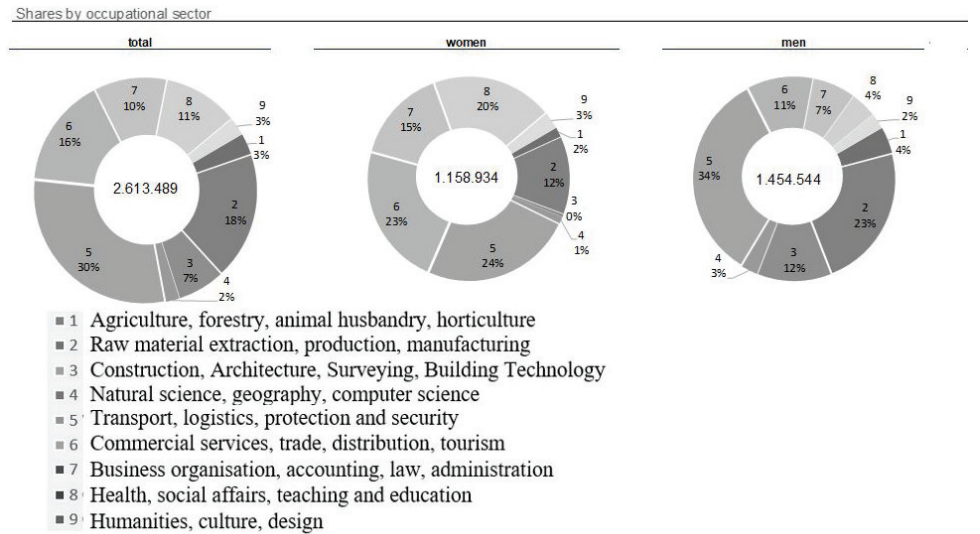
	Germany					
	Number of unemployed		therefrom			
			men		women	
Year	2020	2021	2020	2021	2020	2021
Total (absolute)	2695444	2.613.489	1.520.596	1.454.544	1.174.838	1.158.934
Share of total in %			56,3	55,7	43,6	44,3

Source: Statistics Service of the Federal Employment Agency, own presentation

Möhring et al. and the author's hypothesis on the extended stay are confirmed in the detailed analysis of occupational areas.

The result is that in the event of unemployment women are looking for new employment in the sectors „5 transport, logistics, protection and security", „6 commercial services, trade, distribution, tourism", „8 health, social affairs, teaching and education" and „7 business organisation, accounting, law, the administration". Except for the „5 Transport, Logistics, Protection and Safety", these are not the heavyweight target occupations for men.

Figure 1: Number of unemployed in Germany in 2020 by gender and occupational sector

- 1 Agriculture, forestry, animal husbandry, horticulture
- 2 Raw material extraction, production, manufacturing
- 3 Construction, Architecture, Surveying, Building Technology
- 4 Natural science, geography, computer science
- 5 Transport, logistics, protection and security
- 6 Commercial services, trade, distribution, tourism
- 7 Business organisation, accounting, law, administration
- 8 Health, social affairs, teaching and education
- 9 Humanities, culture, design

Source: Statistics Service of the Federal Employment Agency, own presentation

According to the methodological advice of the Statistics Service of the Federal Employment Agency, the previous duration (also the duration of existence) refers to the number of unemployed and reflects the period from the beginning of unemployment to a statistical counting day. Figure 2 below shows that the pandemic has significantly increased the duration of unemployment for men and women between 2020 (Figure 2.1) and 2021 (Figure 2.2). Without exception, all occupational areas are affected. In the preferred target occupational areas „5 Transport, Logistics, Protection and Security" and „6 Commercial Services, Trade, Sales, Tourism", 630 days on the cut-off date in December 2021 is recorded.

Figure 2: Previous average duration of unemployment by gender 2020 and 2021
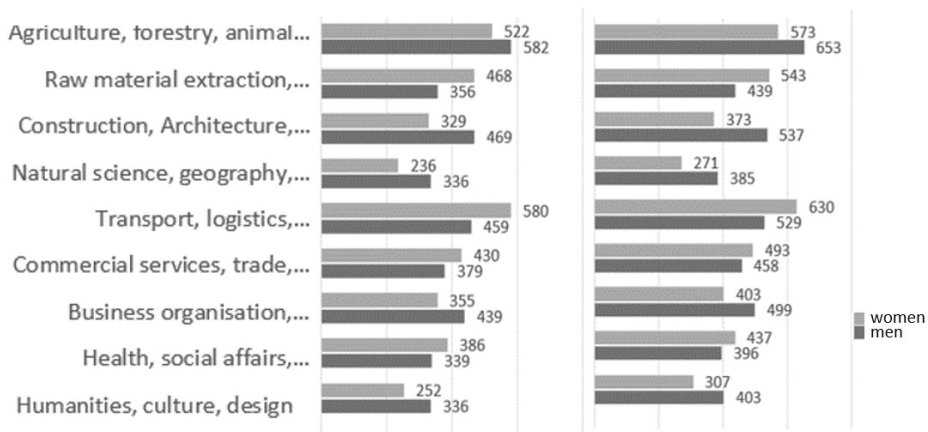


Figure 2.1: Dec 20   Figure 2.2: Dec 21

Source: Statistics Service of the Federal Employment Agency, own presentation

In addition to the analysis of occupational areas, solutions for overcoming unemployment must be found in terms of the level of requirements. The result is that more than one in two unemployed people has the helper level. This proportion of women is over 60%. The level of helpers often leads to a long period of permanent unemployment. Almost three out of four women with helper level are long-term unemployed, i.e. without a job for more than a year. This shows a fact that cannot be attributed to the pandemic skill levels determining the duration of unemployment. In women, this fact is even more pronounced than in men.

Figure 3: level of requirements of women and men

Figures 3.1: Shares according to requirement level (Germany, Dec 2021)
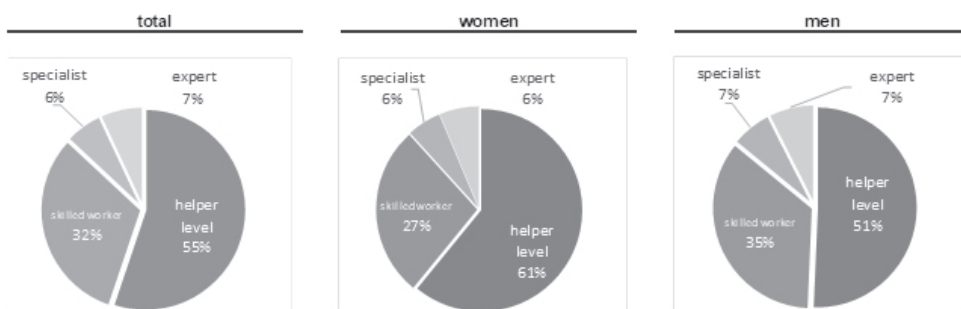
Figures 3.2: Shares of long-term unemployed according to requirement level (Germany, Dec. 2021)

Source: Statistics Service of the Federal Employment Agency, own presentation

Due to the pandemic, priorities have been set in the operational institutions, and the effects on women are not visible in the data. The data for these operational institutions concludes that women need a particular focus on integration work in the transition to mainstream business after the pandemic. Above all, qualifications to overcome the level of helpers and advice on transparency in the labour market must be provided.

3.1.3 Scope and impact of short-time working

The short-time working allowance is intended to help companies avoid redundancies in economically challenging times. The Federal Employment Agency pays wage compensation for lost working hours. According to initial projections by the Federal Employment Agency, around 2.85 million employees were on short-time work in January 2021. Thus, the increase observed since November 2020 continued in January. The number of short-time workers is very high in a long-term comparison but is well below the previous high of almost 6 million in April 2020 (Bellmann et al., 2021).

In contrast to the financial crisis in 2009, when short-time work was mainly used in the manufacturing sector, significantly more short-time work was registered in all sectors. The highest value is reached in the hotel and catering industry, where short-time work was registered for almost 93 % of all employees in May 2020 (Gehrke et al., 2020).

On the other hand, the manufacturing sector and other economic service providers are more indirectly affected by the corona containment measures. Here, supply difficulties and (global) demand shortfalls lead to the loss of work. The fact that women are more affected by short-time work due to the increased use in all sectors is discussed in research primarily from the point of view of a „re-traditionalization of the gender order" (Allmendinger, 2021). According to Möhring (2020), however, the probability of short-time work occurring is no higher for women than for men. Bauer and Weber (2020) note that the increase in unemployment is due to the lockdown period. In addition, both note that the recruitment margin accounts for more than 80% of the unemployment effect.

Although the federal government provided massive financial support, this could not prevent the collapse of the labour market.

Möhring et al. (2020) show that in January 2020, 42.0 per cent of working women worked part-time, compared to 6.4 per cent and 1.9 per cent of men (excluding those in vocational training). They also found that 21.2 per cent of working women had a net income of less than $1,000. Möhring et al. (2020) also found gender-specific differences in the field of work: 40.0 per cent of employees were employed in the manufacturing sector, only 15.4 per cent of women. They found the highest proportion of women in the private sector (84.5 per cent in „other services", mainly household-related services such as cleaning). Möhring et al. (2020) found in the analysis of the survey results that between the end of March and the beginning of July 2020, 14.2 per cent of women and 24.1 per cent of men had short-time work for at least one week. Weber and Bauer (2020) analysed that an average of a good fifth reduced the contractual working hours of employees on short-time work. Möhring et al. (2020) note that 7.6 per cent of women and 8.7 per cent of men stayed at home unpaid for at least a week in connection with the reduction in working hours. In addition, the authors describe that the proportions of women on unemployment and unpaid leave are almost always slightly higher than those of men.

Möhring et al. (2020) note that workers in the service sector's low-wage segment were negatively affected by the work stoppage and job loss. However, they found that short-time work was more widely distributed, not only in the middle tttt of production, as they had initially assumed. In addition, the authors summarise that during the first closure, women were less likely to work short-time and more likely to be unemployed. Neither Möhring et al. (2020) nor Bauer and Weber (2020) see Allmendinger's thesis on retradition confirmed.

4   Conclusion and recommendations

This article looks at the evolution of unemployment during the corona pandemic. Until 2019, the German labour market absorbed workers in an ideal economic situation – so unemployment fell continuously. Especially among women, there was a higher labour force participation – and workers, especially women from the so-called hidden reserve, could be activated. The Corona 19 virus led Germany and the world into a crisis from which the labour market was not spared. o avoid mass unemployment and a total economic loss, the Federal Government financed numerous measures. This article shows that the short-time working scheme has retained many jobs.

Nevertheless, an increase in unemployment could not be prevented. The increased risk of becoming unemployed is followed by a higher risk of remaining unemployed for longer. Studies show that, unlike in previous recessions, women are significantly more affected by this risk. The corona crisis is a significant challenge for everyone. Especially families with small children and school-age children have to change their everyday lives completely. This is accompanied by significant changes in the world of work – short-time work changes working hours, and home-office changes in work content and forms of communication.

Overcoming female unemployment is a challenge. There are clear concerns in occupational areas that are more typical of women and in the level of requirements for a vocational qualification. Furthermore, it is necessary to investigate whether these are old thought patterns in the job choice or the employers. In addition, a policy advice is needed on approaches and strategies to promote women's employment.

There are various approaches to this – on the one hand, to reduce female unemployment and, on the other hand, to increase women's participation in the labour market. Since the German Federal Gender Equality Act already provides the framework, the following recommendations deal with operational approaches for employers, politicians, networks and those affected.

Increasing women's participation in the labour market should be accelerated through re-entry programmes. Employers have a unique role to play here. When companies offer targeted measures for returnees, this promotes women's participation in the labour market and contributes to employer attractiveness.

The fundamental prerequisite for returning to working life after a family-related break is sufficient care facilities for children and people in need of care. In addition to a quantitatively sufficient supply, transparency is needed. Public administrations and network partners are called upon to do this.

Another starting point is to educate people about gender-related stereotypes of gender mail streaming. This also includes the cliché-free choice of profession, training and workplace. The Federal Employment Agency has a unique role in counselling work, as balancing the fundamental right of free choice of occupation and opportunity-oriented placement has to be performed here. The starting point, however, is the high level of expertise of career counsellors, who need to know such analyses to increase women's chances in the labour market.

A final starting point is the promotion of independent livelihood financing. The equalisation of wage differences and equal rights in career opportunities fall in particular to employers and politicians in operational implementation.

These concrete approaches are solutions related to the situation in the labour market, especially for women's employment.

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Readiness of the Czech Republic to Join the Euro Area

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Abstract

The Czech Republic has been a member of the European Union since 2004. As a Member State, it is obliged to join the euro area upon meeting all the Maastricht criteria. There is still no fixed date for adopting the single European currency. The Czech Republic is failing to meet some criteria. There are ongoing discussions about joining the euro among experts, bank representatives, politicians, entrepreneurs, representatives of the Czech Chamber of Commerce and various associations, economics students and the general public. The aim of this paper is to assess the ongoing fulfilment of the Maastricht convergence criteria in the Czech Republic and to identify the relationship between actual and perceived inflation. The paper reflects new aspects, which were generated by the recent development on financial markets during the last 2 years, including COVID-19 and Russian attack to Ukraine. Due to the fact, that not all statistics reflects recent development, some tables and charts are not reflecting this for hundred percent. The analyses carried out reveal that the only criterion that is currently met is the level of public debt (sustainability will be assessed at the time of application). Smooth adoption of the euro by the public is associated with an increased perception of inflation above actual inflation. This situation should be addressed by economic policy actors in preparation for joining the euro area. The importance of a government communication and explanation campaign was confirmed by countries in a similar position. Since February this year, Europe and the whole world have been facing a new geopolitical situation. There are voices calling for Europe to become stronger, more compact, perhaps move towards a federation, including a strengthening of the common currency's position. Therefore, this is a highly topical issue. The final decision in the Czech Republic to start the process of adopting the euro and to set the date for joining the euro area rests with the Czech Government in cooperation with the Czech National Bank.

Introduction

Foreign authors seek answers to questions such as: what is new, what is good and what is relevant for current and future euro area countries in modern monetary theory (Levoie, 2022), whether it is possible to trace the impact of deteriorating fiscal conditions of euro area countries on bank lending margins (Katsampoxakis, 2022), how far the European South and the European North of euro area countries diverge or converge in the process of European integration (Kostis, 2022), how to interpret, understand and parameterise asymmetries in the economies of specific euro area countries (Dellepiane-Avellaneda et al., 2022).

Germany in particular (also for the sake of the monetary union's longevity) insisted that entry into the union should not be automatic. Countries had to demonstrate an environment of price stability (Baldwin, Wyplosz, 2013). Countries seeking to join the union had to meet five convergence criteria. The entry requirements, also known as the Maastricht convergence criteria, aim to assess the degree of economic convergence. They also serve the purpose of eliminating the emergence of any potential threats to the euro area, i.e. ensuring the ability of the candidate country to integrate smoothly into the euro area monetary regime without creating instability for the country itself and for the euro area as a whole (Dědek, 2013).

According to Aytac (2006), in the framework of the Maastricht convergence criteria, the primary condition for fiscal policy is budgetary discipline, which is based on the reduction of public debt and budget deficit. Pitruzzello (1997) examines the attempts of European political parties to restructure their welfare systems to achieve the required deficit and debt reduction criteria. Bektas, Sarac (2021) examine the fiscal rules applied in Germany, Britain, Spain and Greece between 1998 and 2018 by analysing the fulfilment of five criteria, two of which are financial and three economic. They assess whether the objective of improving macroeconomic performance while limiting the policy use of public resources is being met. They discuss whether the criteria guarantee a competitive future for the European Union.

Medium- and long-term debt sustainability through declining budget deficits and established fiscal discipline have become the focus of EU fiscal rules. Furthermore, constraints have been set on inflation, which is considered one of the performance variables for countries, and there are also rules for the long-term interest rate, which link it to the real economy (Kopits, Symansky, 1998).

In order to fulfil the objective of the paper, we should introduce the individual Maastricht convergence criteria and the theories associated with the concepts of actual and perceived inflation. The following part of the theoretical background will be devoted to this issue, prepared by desk-research.

1   Review of the Literature

Economic integration can be seen as an effective instrument for integrating a national economy into the global economic system. However, according to Koné (2012),

the concept of economic integration is not consistent in terms of linguistic interpretation. This confusion is caused by differing perceptions of the concept, which often go beyond purely economic categories. In other literature, one may come across terms such as regionalisation, regionalism, regional economic integration (Redda, 2021), regional economic cooperation (Omar et al., 2020), regional economic areas (Khawaja, Gilgid-Baltistan, 2021), regional economic blocs (Arreyndip, 2021) or regional trade agreements (Stuchlíková et al., 2021). All of these concepts relate to the phenomenon of regional economic integration, and to economic integration in more general terms. One of the other examples of defining economic integration is the division into macro and micro integration. Macro integration refers to the implementation of relations between governments of integrating countries and micro integration is the development of cooperation between corporate entities (Šíbl, 2000).

Nowadays, monetary integration is a rather attractive and debated topic in many different perspectives. Akalpler (2021) published a study that aimed to investigate the effects of wages, unemployment, and the consumer price index on real gross domestic product, which in optimal monetary area theory implies that countries with higher factor mobility can realise significant gains in the monetary area. However, the defined hypothesis was not proven on the model countries of Germany and Poland. The study by Tohmo et al. (2021) focused on assessing the impact of the Economic and Monetary Union on global high-tech (HT) exports. Among other things, the findings suggested that the effect of EMU on HT exports is country specific. Gehringr, König (2021) study the synchronisation process of business cycles in the European Union and the euro area, as well as the factors influencing the steps of monetary integration. Tomat (2021) analyses the policy of an independent central bank in a monetary union. With homogeneous preferences, the advantages and disadvantages of a committed monetary union policy relative to a discretionary policy for each new candidate or existing member country are a function of its relative size and degree of asymmetry. The degree of convergence of Visegrád Group countries at the national and NUTS 2 level is compared by Řežábek et al. (2022).

1.1   Maastricht convergence criteria

The Treaty on the Functioning of the EU, known as the Maastricht Treaty, sets out the conditions for membership of the euro area. Therefore, the preconditions for economic integration and the economic criteria that assess the readiness of a candidate country to join the Economic and Monetary Union are known as the Maastricht criteria. Their purpose is to ensure a degree of economic convergence, i.e. the ability of the candidate country to integrate smoothly into the euro area monetary regime without creating instability for the country itself and for the euro area as a whole. The Maastricht criteria are assessed by the European Commission and the European Central Bank in Convergence Reports. This is performed either regularly at two-year intervals or exceptionally at a candidate's request. In order to join the euro area, all Maastricht criteria must be met simultaneously at the time of the evaluation (Maastricht treaty – http://data.europa.eu/eli/treaty/teu/sign).

The euro is being introduced in 11 countries for commercial and financial transactions. Banknotes and coins were introduced at a later date. The first countries to use the euro were Austria, Belgium, Finland, France, Germany, Ireland, Italy, Luxembourg, the Netherlands, Portugal and Spain. Denmark, the UK and Sweden decide to stay out for the time being. Now there are 19 countries with euro. Countries had to meet the following criteria:

▪ **The first criterion concerns inflation.** "To qualify for membership of the monetary union, a country's inflation rate should not exceed by more than 1.5 percentage points the average of the three inflation rates achieved by the best-performing EU member states in terms of price stability" (Baldwin, Wyplosz, 2013). The results of these countries are also used for the following criterion. For example, when the first candidate countries joined, Greece did not meet this criterion and therefore its admission was initially postponed (Štěrbová, 2013),

▪ **The second criterion is the long-term interest rate**, which "may be no more than 2.5 percent higher than the rate in the three EU countries with the best price stability records" (Holman, online, 2006).

▪ **The third condition is participation in the ERM2 exchange rate mechanism**. Countries are required to participate in ERM2 for at least two years. It is important to ensure that candidate countries are able to function without distortions once they join the euro area. The criterion is precisely specified in the Treaty on the Functioning of the European Union, specifically in Article 140(1), which describes "the observance of the normal fluctuation margins provided for by the exchange-rate mechanism of the European Monetary System, for at least two years, without devaluing against the euro" (Eurlex, online, 2012). However, compliance with this criterion can only be assessed once the Czech Republic enters the ERM II exchange rate mechanism.

▪ **The fourth criterion limits the size of the government deficit.** This deficit must not exceed 3% of GDP. The criterion is not considered to be breached if the permissible limit is exceptionally exceeded for justified reasons, or if the budget deficit is being continuously and significantly reduced and approaches the three per cent threshold" (Lacina, 2007). In 2014 The Stability and Growth Pact (SGP) was agreed (GSP 2014). It consists of two main building blocks: the preventive arm and the corrective arm. In Preventive arms SGP allowed ranges in which the country-specific MTOs have to be set differ between the preventive arm of the SGP (EU law) and the „Fiscal Compact" (intergovernmental treaty): While the upper limit („surplus") is unspecified and identical in both frameworks, the lower limit („close to balance") is specified differently: if the debt-to-GDP ratio is higher than 60%, the lower limit is more stringent in the Fiscal Compact (structural deficit of 0.5% of GDP) compared to the preventive arm (structural deficit of 1% of GDP). If the public debt is lower than 60% of GDP, there is again no difference between the lower limits in both frameworks (structural deficit of 1% of GDP). In the corrective arm, progress by Member States is measured on the basis of „fiscal effort" in structural terms. If the improvement is in line with the Council recommendation, the Commission and/or Council conclude that „effective action" has been taken.

- ▪ **The fifth and final criterion is the maximum level of gross public debt.** The average debt level when the Maastricht Treaty was negotiated was 60% of GDP (Baldwin, Wyplosz, 2013). Therefore, the ceiling was set at the same level.

Table 1: Overview of euro area members and non-members

Euro area Member States	Non-euro area Member States	A Member State that has opted not to participate
1999 – Belgium, Finland, France, Ireland, Italy, Luxembourg, Germany, Netherlands, Portugal, Austria and Spain. 2001 – Greece 2007 – Slovenia 2008 – Cyprus, Malta 2009 – Slovakia 2011 – Estonia 2014 – Latvia 2015 – Lithuania	Croatia is ready to adopt the euro on 1 January 2023. Bulgaria, Croatia, Czech Republic, Hungary, Poland, Romania, Sweden	Denmark

Source: based on ec.europa.eu. [online]. Who is already a member of the euro area? 2021. [Cit. 2022-02-06]. Available at https://ec.europa.eu/info/business-economy-euro/euro-area/what-euro-area_cs

According to European Commission President Ursula von der Leyen, "Today, Croatia has made a significant step towards adopting the euro, our common currency. Less than a decade after joining the EU, Croatia is now ready to join the euro area on 1 January. This will make Croatia's economy stronger, bringing benefits to its citizens, corporations and society at large. Croatia's adoption of the euro will also make the euro stronger. Twenty years after the introduction of the first banknotes, the euro has become one of the most powerful currencies in the world, improving the livelihoods of millions of citizens across the Union. The euro is a symbol of European strength and unity. Congratulations, Croatia!" The progress made by Bulgaria, Croatia, the Czech Republic, Hungary, Poland, Romania and Sweden towards joining the euro area is assessed as follows:

- • only Croatia and Sweden meet the price stability criterion;

- • the public finance criterion is met by all Member States except Romania (which is the only Member State subject to the Excessive Deficit Procedure);

- • Bulgaria and Croatia meet the exchange rate criterion;

- • Bulgaria, Croatia, the Czech Republic and Sweden fulfil the long-term interest rate criterion. (ec.europa.eu, online, 2022).

1.2   Actual and perceived inflation

When the theory talks about **actual inflation**, it means inflation measured by the statistical office of the country concerned. As such, inflation manifests itself in a long-term increase in the price level of goods and services, or a reduction in the purchasing power of monetary units. It is a process that is induced in the microeconomic and macroeconomic equilibrium, in the monetary sphere, but also in the sphere of the real economy. Market prices change during the reference period, but their movement may not be apparent. From a macroeconomic point of view, the overall price changes are very important. The overall price level of goods and services sold and purchased in the national economy is referred to as the price level. Inflation is an increase in the overall price level, not individual prices. Other concepts related to inflation are disinflation and deflation. Disinflation is a decline in the rate of inflation, or an attempt to end inflation. Deflation if a decline of the price level. Deflation most often expresses the opposite of inflation (Lisý, 2000). Novák, Šlosár (2008) define actual inflation as follows: it is primarily a monetary phenomenon, which means a devaluation of a country's monetary unit and manifests itself mainly in an increase in the overall price level of the economy. However, this negatively affects the whole real economy and its performance.

Price indices are used to measure inflation. A price index is a weighted average of the individual prices of a selected basket of representative goods and services in the two periods being compared, with the weight of the price of each good reflecting the economic importance of that good (Rojíček, 2016). The most important price indices include the consumer price index, the producer price index and the GDP deflator. We also include the cost-of-living index among the frequently monitored indices. It is based on the choice of goods and services that make up the consumer basket. The most widely used price index is the Consumer Price Index. It is used to express the impact of price level changes on households and their cost of living (Jurečka, 2017).

The issue of actual inflation has been studied by many academics from many points of view. Zobl, Ertl (2021) study inflation dynamics in emerging small open economies in Central and Eastern Europe and find new empirical evidence for the existence of a New-Keynesian Phillips Curve (NKPC). Abdul-Asis, Imhotep (2021) estimate bank responses during inflation targeting periods using Taylor rule. They question the logic of the prevailing upper and lower inflation target bounds. Crowley and Hudgins (2021) find that fiscal policy is most aggressive when economic growth is emphasised as a policy objective, while monetary policy is relatively more aggressive when the inflation rate is emphasised. Conflitti, Zizza (2021) examined whether inflation expectations of undertakings were significantly affected by wage growth and information on past, current and future inflation. Price equations that allow predicting future inflation are discussed by Fair (2021). Deryugina, Ponomarenko (2021) argue that there are several key components leading to an anticipation or lag in the relationship between money growth and inflation. Gries, Mitschke (2021) observe and evaluate the lack of investment in the macroeconomy, the effect on subdued inflation, and review current monetary policy challenges.

The topic of stabilising the economy through fiscal policy has been widely discussed for many decades. According to Feto et al. (2021), an increase in fiscal policy shock by one percent leads to a one-period rise in output and inflation by 0.104 and 0.03 percent. The effects of inflation targeting on public spending in the euro area are discussed by Coronel (2022). Chen et al. (2022) show that if fiscal behaviour follows its historical norm to eventually stabilise debt, current high debt levels produce only modest inflation; if confidence in those norms erodes, high debt may deliver substantially more inflation. Fiscal policy plays an important role in stimulating economic activity, but it also has a significant impact on ensuring monetary stability in the economy. A study by Asandului et al. (2021) aimed to analyse the asymmetric effects from fiscal policy on inflation and economic activity in twelve post-communist European countries. The results show that in the long run, the fiscal policy instrument negatively influences both inflation and economic activity; in the short run, the effects are not significant.

Economic growth is becoming a critical component of any country's development as it simultaneously raises living standards and eradicates poverty (Atigala et al., 2022). The essence of **perceived inflation** lies in the fact that although actual or measured inflation shows no increase, consumers (the public) subjectively believe that the changeover to the European currency will be associated with an increase in the prices of most goods, and consequently fear high household debt and a decline in the standard of living.

The relationship between perceived and actual inflation has taken on particular importance in the context of the price effects of the introduction of euro banknotes and coins and the associated recalculation of prices. While most experts considered the average price effect of such changeover to be moderate, the media emphasised individual, very sharp price changes and most consumers believed that the changeover would lead mainly to higher prices for goods (Hoffmann et al., 2006). The power of consumer biases in the context of presented, perceived, and expected inflation was examined by Ahn, Tsuchiya (2022). They established that expected inflation was strongly related to perceived inflation without a significant role for rationality in assessing the impact of actual inflation. Perceived inflation also supports the illusory perception of personal wealth, i.e. it implies rising expected expenditures relative to expected income (Connolly, 2022).

Some talk about a paradox of perceived inflation, a phenomenon that defies and seemingly contradicts common sense. The paradox of the discrepancy between perceived and actual inflation can be explained by the fact that food and some selected services (hairdressers, restaurants, etc.), which are among the more common items in the consumer basket, saw some price increases just as the euro was being introduced. Although prices of other goods fell or rose only slightly, this price movement was not perceived as intensely by the public. The perception of higher prices after the introduction of the euro, especially for durable goods, also stemmed from inconsistent comparisons between current euro prices, which are subject to ordinary inflation, and the national currency prices that existed when the national currencies were replaced by the euro. Citizens also tended to attribute all price increases to the euro, even though the causes may have been unrelated to the euro (zavedenieura.cz, online).

The apparent paradox in our perception also has another explanation. We are more sensitive to upward price movements because they strain our budgets. We tend to remember price movements of products and services that we consume regularly. The consumer basket for calculating inflation includes both types of products – those whose prices we remember and those whose value we are less likely to perceive. The share of products and services from both groups in the inflation calculation corresponds to the expenditure structure of the average household. In addition to the aforementioned explanations based on the imperfection of human observation, there is the fact that there is no such thing as an average household. Everyone's consumer basket is individually specific and varies in time, so their perception of inflation is more or less different from official data. One possible solution is to create an index of perceived inflation by removing items from the consumer basket to which consumers are less price sensitive for various reasons. In this thinned index, the remaining items will then be given more weight and will better match the empirical observations of the consumer. The idea of creating an index of perceived inflation is not new. Such an index has been used in Western European countries to explain the surprisingly small rise in official inflation after the adoption of the euro, which triggered a wave of upward price rounding. The rounding mainly happened in small but visible amounts, but the index of perceived inflation did not change dramatically (Sobíšek, 2014).

2   Data and methods

The data were drawn from data from the Czech Statistical Office (CZSO), press releases from ministries, publicly available analyses of the Czech National Bank (CNB), the Ministry of Finance, Eurostat, the European Central Bank, etc.

In general, the authors addressed the issues discussed in this paper and the different approaches to their solution through a descriptive method, which was supported by a technical analysis consisting in analysis and synthesis. Due to the extensive theoretical background, the authors have used the above methods to capture the most important findings, views and sequence of events related to the fulfilment of the Maastricht convergence criteria and the issue of actual and perceived inflation. In the review of literature, the authors relied on printed and electronic sources, monographic literature, contributions in proceedings, articles from Proquest, Web of Science, Ebsco, Scopus and other databases, expert journals, directives and regulations of EU institutions, and Czech legal norms.

Statistical and time series methods were the main methods used to assess the Maastricht convergence criteria. Time series means a chronological arrangement of data (results of observations) according to predetermined criteria, i.e. years, inflation, unemployment, etc. So-called statistical (stochastic) series are burdened with uncertainty, whereas in the case of deterministic series their behaviour can be clearly described by a mathematical formula. If we apply the theory of random processes, we can say that a stochastic time series represents a particular realisation of the corresponding random (stochastic) process (Křivý, online, 2012). Another method was prediction (forecasting development,

year-to-year changes, future environmental developments, etc.). It uses statistical methods, subjective methods (subjective probability estimation, etc.). Furthermore, the paper relies on the balance sheet statistics method, the Brachinger's approach for measuring the rate of perceived inflation based on statistical data, and the Diaz, Duarte, Rua method calculating perceived inflation using balance sheet statistics recalculated from consumer surveys.

3   Results

The aim of the analyses was to assess the fulfilment of the Maastricht convergence criteria in the Czech Republic over time. It also aimed to identify the relationship between actual and perceived inflation and, based on the inferred relationship, discuss measures to eliminate the growth of perceived inflation or actual inflation.

3.1   Analysis of the fulfilment of the Maastricht criteria in the Czech Republic

The current economic development, both within the countries using euro and in the Czech Republic, is significantly affected by the consequences of the coronavirus pandemic, high inflation, price volatility or shortages of raw materials, the energy crisis, the security of supply chains, the geopolitical risks posed by the conflict between Russia and Ukraine and related measures restricting economic activity. In the following part of the paper, the authors focus mainly on analysing the harmonisation of the Czech Republic's and the euro area's economic development, including the ability to absorb possible asymmetric shocks through other mechanisms after the loss of its own monetary policy.

3.1.1   Price stability criterion

The Czech economy has long been highly correlated with euro area countries, although cyclical alignment has gradually declined in recent years. In 2021, the economic level of the Czech Republic measured as GDP per capita in purchasing power parity will continue to converge towards the euro area average. However, the Czech economy has an above-average share of the industry sector in GDP compared to euro area countries. It can be concluded that the focus on the (automotive) industry is one of the risks in terms of possible asymmetric economic shocks. Closely related to this is the risk of a response from the single monetary policy of the European Union and the ability of central measures to eliminate specific impacts on the Czech economy.

Figure 1: Convergence of the price level of the Czech Republic to Germany and Eurozone countries 2011–2021

Convergence of the price level of the Czech Republic to Germany and the countries of the Eurozone 1995-2021
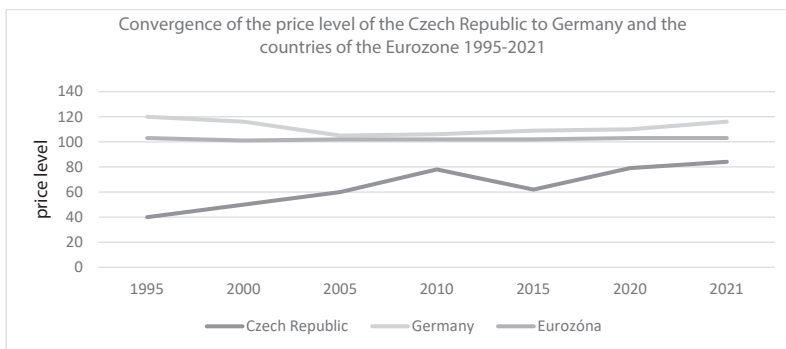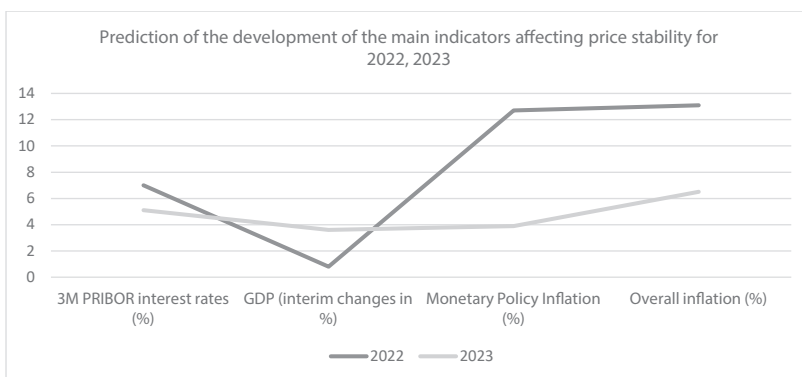
Source: processed by the authors according to the CNB, Continuous Analyzes of the degree of economic alignment of the Czech Republic with the Eurozone 1995–2021

Figure 1 shows that the Czech price level continues to converge towards the euro area with a tendency to slow down. Rising interest rates and inflation suggest that this trend will continue.

Price stability and its trends can be assessed on the basis of, among other things, forecasts of 3M PRIBOR (%), GDP (y/y in %), Monetary Policy Inflation (%), Headline Inflation (%), see Figure 2.

Figure 2: Prediction of the development of the main indicators affecting price stability for 2022, 2023

Prediction of the development of the main indicators affecting price stability for 2022, 2023

Source: processed by the authors according to the cnb.cz. [online]. Prognóza ČNB – jaro 2022. 5.5.2022. [Cit. 2022-07-06]. Dostupné z https://www.cnb.cz/cs/menova-politika/prognoza/

According to this figure, growth in domestic economic activity is expected to be stifled significantly in 2022 and accelerate significantly the following year. Consistent with the baseline scenario of the spring forecast is a further steep rise in market interest rates until the middle of this year, followed by a gradual decline from this autumn.

In the baseline scenario, the central bank sets interest rates to meet the 2% target at the monetary policy horizon. GDP growth will slow significantly this year and year-on-year economic activity will fall slightly in the second half of the year. The decline in household consumption, fixed investment and exports will contribute significantly to this development. Economic growth will pick up next year. Monetary policy inflation will be below headline inflation over the whole horizon. At the end of the monetary policy horizon, monetary policy inflation will fall close to the inflation target, thanks to the previous tightening of monetary conditions. Inflation will rise further in the second quarter of this year and, with the contribution of all its components, it will reach almost 20%. It will then gradually slow down and fall to single digits at the beginning of next year. During 2023, 2024, it will then further decrease, reaching close to the 2% target.

The level of indebtedness of the private sector (households and non-financial corporations) in the Czech Republic is also an important price stability indicator. This parameter is still well below the euro area average, but this certainly does not mean that the Czech financial sector is to converge more towards this level.

Figure 3: Changes in the indebtedness of European households and non-financial corporations in 2020 in relation to GDP (in p.b.)

Source: processed by the authors according to the FRAIT, Jan a MALINOVÁ [online]. Svět na konci pandemie: pyramida z dluhů. 25.6.2021. [Cit. 2022-02-26 Simona]. Dostupné z https://www.cnb.cz/cs/o_cnb/cnblog/Svet-na-konci-pandemie-pyramida-z-dluhu/

Year-on-year growth in loans to households slowed to 8.7% in Q2 2022, but net new loans continued to rise, except for April. Households' efforts to take out loans before their next expected increase in price probably played a role here. The average client interest rate on new mortgage loans reached 4.3% in June 2022 (up 2.2 p.p. year-on-year). Currently, in September 2022, the rate has reached 5.83%. Growth in loans to non-financial corporations also slowed to 6.7% in Q2. The growth was driven exclusively by foreign currency loans, which can be explained mainly by the high and widening interest rate spread vis-à-vis CZK loans. The average client interest rate on total loans to non-financial corporations increased to 7.0% in June (up 4.4 p.p. year-on-year) (Ministry of Finance of the Czech Republic, online, 2022).

The similarity of the structure of financial liabilities of Czech corporations with those of corporations in euro area countries is relatively high. However, this is not the case for Czech households, where the similarity is still very low (CNB, online, 2021). This is mainly because Czech households prefer to hold cash and deposits in banks, unlike euro area households, which invest more extensively in insurance and pension schemes.

Based on the above analyses and forecasts, a partial conclusion can be made with some certainty: the price stability criterion will not be met in 2022 and will most likely not be met by the end of 2023 either.

3.1.2 Criteria – Public finance, State budget deficit

The general government deficit reached CZK 94.1 billion in Q1 2022, an improvement of CZK 47.7 billion year-on-year. The largest part of the year-on-year decrease was mainly attributable to central government, which ended in a deficit of CZK 102.5 billion, a year-on-year improvement of CZK 53.3 billion. Local government managed a surplus of CZK 5.1 billion and social security funds ended in a surplus of CZK 3.4 billion. In the first quarter of 2022, the general government ended up with a deficit of CZK 94.1 billion, representing 6.1% of GDP. The general government debt ratio fell by 1.1 percentage points year-on-year to 42.8% of GDP. The outturn was significantly affected by an increase on income from taxes on production and imports and a decrease in subsidies paid.

Table 2: General government balance, Q3 2019 – Q1 2022

Period	3.Q 2019	4.Q 2019	1.Q 2020	2.Q 2020	3.Q 2020	4.Q 2020	1.Q 2021	2.Q 2021	3.Q 2021	4.Q 2021	1.Q 2022	2.Q 2022
CZK billion	16,4	-24,1	-47,7	-95,9	-40,7	-133,8	-144	-59,2	-42,7	-105,2	-94,1	0,5
% of GDP	1,1	-1,6	-3,5	-7,1	-2,8	-8,8	-10,4	-3,9	-2,7	-6,5	-6,1	0,0

Source: processed by the authors according to the ČSÚ. [online]. Deficit a dluh vládních institucí – 1. čtvrtletí 2022. 1.7.2022. [Cit. 2022-10-09]. Dostupné z https://www.kurzy.cz/zpravy/660015-deficit-a-dluh-vladnich-instituci-1-ctvrtleti-2022/

The public finance balance of the Czech Republic puts it among the least indebted countries in the EU. It meets both the Maastricht criterion (60% of GDP) and the debt quota level set by the Act on Budgetary Responsibility Rules (55% of GDP net of the cash reserve created by government debt financing). This created the fiscal space necessary for major negative shocks. In addition, the government managed to take advantage of favourable factors on the financial markets, including the positive rating of the Czech Republic's public finances by credit rating agencies.

Based on the above analyses and forecasts, a partial conclusion can be drawn: as a result of the pandemic and the expansionary policy of the government in 2021, the government budget deficit as a share of GDP was 5.9%; the 3% criterion is not met. Public debt rose to CZK 2 466 billion in 2021, i.e. 40.8% of GDP. The sustainability of criteria fulfilment is at risk in the future, as the structural deficit shows a significant negative trend. The CNB expects government debt to rise to 46% in 2024; the 60% criterion is being met and, according to forecasts, will likely continue to be met for several years.

3.1.3   Criterion – Long-term interest rates

The criterion is based on an evaluation of government bond prices. From the perspective of the real economy, we also need to look at market rates. The criterion is fulfilled, but the future is uncertain because the rating agencies have set a negative outlook for the Czech Republic (especially with regard to the sustainability of public finances), which will be reflected in the price of government bonds.

Developments on the current financial markets show that the "opening scissors" trend in the interest rate differential between the Czech koruna and major foreign currencies will continue in the first half of 2022. It can be assumed that the financing of corporations in foreign currencies will continue thanks to this trend, especially for those with revenues in euro or other currencies. The following Figure 4 illustrates this statement.

Figure 4: Interest rates CZK vs. Euro
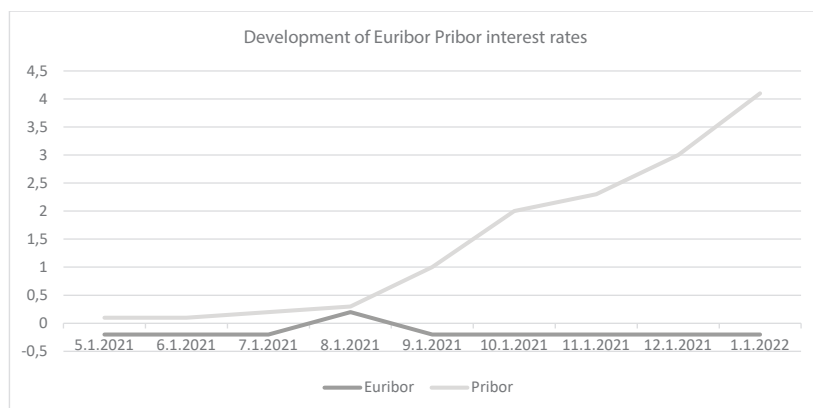
Source: processed by the authors according to the Euribor, ČNB

At the May 2022 monetary policy meeting, the CNB Bank Board raised the two-week repo rate by 0.75 percentage point to 5.75%. At the same time, it decided to increase the discount rate in the same range to 4.75% and the Lombard rate to 6.75%. The Czech economy faces a combination of exceptionally strong and persistent price pressures from abroad and persistent domestic inflationary pressures, which translate into

accelerating and broad-based price growth (CNB, online, 2022). The current significant increase in interest rates according to the CNB's forecasts should change mid-year to a gradual decline in the second half of 2022.

The CNB Bank Board did not raise interest rates at its August meeting. The base rate, the two-week repo rate, currently remains at 7%. According to the new CNB governor, Aleš Michl, the Bank Board will monitor incoming data in the next period and consider whether to raise rates at its following meetings. The board members are generally rather reserved in raising monetary policy rates.

The analysis shows that we currently meet the interest rate convergence criterion, but the outlook is highly uncertain.

3.1.4 Criterion – Exchange rate stability

The Czech Republic has not joined the exchange rate mechanism, so we will base this criterion on real movements in the exchange rate between the Czech koruna and the euro. The convergence of a less developed economy towards the group of original EU countries involves both catching up in terms of economic levels, i.e. real convergence, and convergence in terms of price levels, i.e. nominal convergence.

- • Real convergence occurs when the converging country's real output per capita approaches the level achieved in the countries it aims to catch up to. From this perspective, real convergence leads to a narrowing of the differences in living standards between the countries being compared and a convergence of the populations' purchasing power.

- • Nominal convergence occurs when the price level of the catching economy, expressed in the currency of the target economy, converges faster than that of the target country. This happens in two basic ways – through higher inflation (the inflation differential channel) if the nominal exchange rate of both currencies is stable, or through the appreciation of the nominal exchange rate of the catching country's currency against the target country (the exchange rate channel) in the case of similar inflation in the two countries being compared.

This implies that nominal convergence (an increase in the relative price level) is captured by the appreciation of the real exchange rate.

For the corporate sector, the monitored parameter is the correlation between the Czech koruna and the euro. It is true that there is a very high interdependence, which is confirmed by the development of the exchange rate between the Czech koruna and the euro. As it seen from the following charts, trend correlation between eur and czk is confirmed.

Figure 5: Exchange rates CZK vs. Euro/corelation
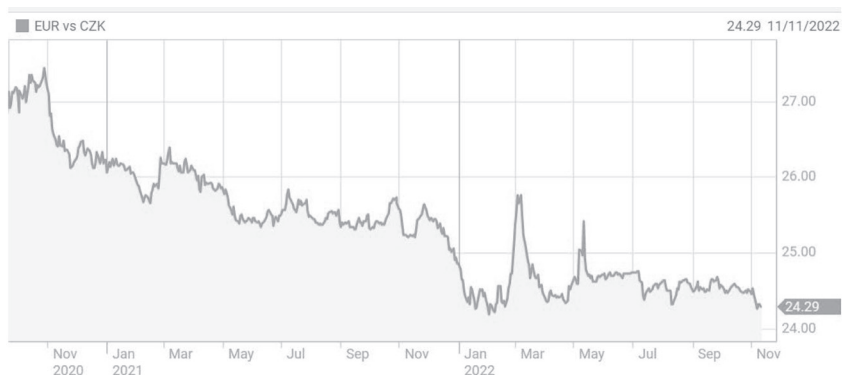
Source: Reuters

Source: Reuters

The pandemic year interrupted the appreciation of the real exchange rate of the Czech koruna observed since the exchange rate commitment period.

Table 3: Real exchange rate against the euro on a HICP basis (2010=100; an increase in the index implies an appreciation of the real exchange rate)

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	1Q 2022
CZ	102,3	101,0	97,8	92,3	93,2	94,4	97,8	100,6	101,9	100,7	100,8	101,2
DE	101,8	102,9	100,9	101,0	101,0	100,9	102,2	103,0	104,6	103,3	103,5	103,7
PT	101,4	102,0	101,8	101,6	100,8	101,2	103,4	104,2	105,2	104,9	104,7	104,3
HU	99,8	99,3	97,1	93,0	92,5	92,3	93,7	91,9	92,1	86,9	88,2	89,1
PL	98,0	97,7	96,9	96,8	96,0	91,6	94,0	93,4	93,4	92,3	92,6	92,5
SK	99,8	99,4	99,7	100,0	100,5	100,6	100,8	101,0	101,1	100,1	100,5	100,7

Source: processed by the authors according to the Eurostat

According to the CNB's data, the exchange rate of the Czech koruna is expected to strengthen against the euro in response to the steep rise in interest rates and settle around CZK 24 to EUR at the turn of Q1 and Q2 2022. The exchange rate is currently at CZK 24.50 to the euro and the central bank is intervening on the foreign exchange market. Given the above-mentioned opinion of the rating agencies and the fiscal developments, it is difficult to predict whether the koruna will continue to appreciate in the longer term.

From the above, it can be concluded that, in the short term, we would probably meet this criterion if we joined the exchange rate mechanism. In the longer term, it would depend on fiscal reforms and the development of the economy, which has been significantly affected by the energy crisis. At the same time, it is apparent that the motivation of the corporate sector for the Czech Republic to join the euro area is high and will continue to grow in the context of rising interest rates of the Czech koruna.

3.1.5 Evaluation of the analyses of Maastricht criteria fulfilment in the Czech Republic

The ongoing coronavirus pandemic was reflected in fiscal policy, which, thanks to its countercyclical role, helped stabilise the Czech economy. Apart from the positives in terms of stabilising the economic, or more precisely, the business environment, this has led to an increase in the State budget deficit. The 3% Maastricht convergence criterion for the general government deficit has been exceeded. The medium-term budgetary objective for the structural balance of -0.75% of GDP was not met as well. On the positive side, the Maastricht debt criterion has not been exceeded, nor has the debt brake criterion, which states that government debt requires the approval of balanced budgets of all government institutions if it rises above 55% of GDP. This shows that the **Czech Republic fulfilled the State debt-to-GDP ratio criterion and the interest rate criterion as of January 2022**.

The state of the Czech labour market is an important parameter in terms of progress towards meeting the Maastricht criteria. Despite the effects of the pandemic, unemployment is one of the lowest in the European Union, with more vacancies than unemployed persons. Another element monitored is mobility of the workforce, which is also gradually improving, mainly due to the increased proportion of foreign nationals in the population. On the contrary, low motivation to work due to the social policy and the minimum wage remains problematic. The labour market is important in terms of inflationary pressures in each EU Member State; therefore, a high degree of consistency in labour market developments is important in each Member State.

As mentioned above, neither the government finances nor the price stability criteria are met. The last criterion, participation in an exchange rate mechanism, cannot be formally met because the Czech Republic does not participate in the exchange rate mechanism. However, according to the CNB's data and its past simulations, the Czech Republic would meet this criterion. The following table summarises the evaluation of the Maastricht criteria fulfilment.

Table 4: Evaluation of the Maastricht criteria fulfilment

Criterion	Requirement	Situation as of	Findings
Price stability	average annual inflation must not exceed by more than 1.5 percentage points the average annual inflation of the three best performing Member States	July 2022 The average of the 3 EU countries with the lowest inflation (harmonised index) was 6.9 Czech Republic – 16.6, i.e. exceeded by 8.5 p.p.	Not met
Public finances	the share of government debt in GDP must not exceed 60%	Government debt rose to CZK 2 466 billion in 2021, i.e. **40.8%** of GDP. The CNB expects government debt to rise to 46% in 2024.	Met until 2021; CNB forecast predicts it will continue to be met
Government budget deficit	the government deficit share in GDP must be less than 3%	As a result of the pandemic and the government's expansionary policy, the government budget deficit to GDP was 5.9% in 2021.	Not met
Interest rate convergence	the long-term nominal interest rate must not exceed by more than 2 p.p. the average of the three best performing countries in terms of price stability	In the first half of 2022, the scissors between interest rates in the euro area and the Czech Republic are opening.	Met until the end of 2021
Exchange rate stability	the candidate country should join ERM II at least two years before joining the monetary union	We are not participating in the mechanism.	Not evaluated.

Source: processed by the authors according to the Eurostat, ČNB

The June 2022 ECB Convergence Report assesses progress made by seven non-euro area EU Member States as follows:

• As regards **the price stability criterion**, only Croatia and Sweden reported inflation rates below or well below the 4.9% reference value. This benchmark is based on average inflation reported by the top three countries over the last 12 months – Finland, France and Greece (excluding outliers for Malta and Portugal). In the remaining five countries under review – Bulgaria, the Czech Republic, Hungary, Poland and Romania – inflation rates have been well above the reference value over the past 12 months, similar to those in the 2020 Convergence Report.

• As regards **the fiscal criteria**, at the time of publication of this report, only Romania is subject to an excessive deficit procedure (opened in April 2020). Although three other countries under review – Bulgaria, the Czech Republic and Hungary – exceeded the 3% of GDP deficit reference value in 2021, no new EDP procedures have been launched.

• Following a sharp increase in 2020 due to the COVID-19 crisis, **budget deficits** remained elevated in 2021 in all countries except Sweden. Compared to 2020, budget balances improved in 2021 in all countries under review except Bulgaria and the Czech

Republic. According to the European Commission's Spring 2022 Economic Forecast, deficit-to-GDP ratios are expected to decline in most of these countries in 2022 and 2023. However, this indicator is projected to exceed the reference value in the Czech Republic, Hungary, Poland and Romania in 2023.

• **The general government debt-to-GDP ratio was between 20% and 40% in Bulgaria and Sweden and between 40% and 60% in the** Czech Republic, Poland and Romania in 2021, while the debt ratio was above the 60% reference value in Croatia and Hungary. Government debt ratios in four of these countries are expected to decline in 2022 and 2023 owing to both the improvement in economic activity and the winding-up of fiscal measures adopted in response to the COVID-19 pandemic, while budget balances should be burdened by the new measures taken in response to high energy prices and Russia's war with Ukraine.

• As regards the **exchange rate criterion**, the Bulgarian lev and the Croatian kuna were part of ERM II for most of the two-year reference period from 26 May 2020 to 25 May 2022 at mid-parities of 1.95583 lev to euro and 7.53450 kuna to euro. The Croatian kuna's exchange rate showed a low degree of volatility and the currency traded close to its mid-parity. The Bulgarian lev did not deviate from its middle parity. With the exception of the Romanian leu, exchange rates for non-ERM II currencies exhibited a relatively high degree of volatility.

• Looking at **the convergence** of long-term interest rates, the lowest 12-month averages of long-term interest rates were reported in Bulgaria, Croatia and Sweden. The Czech Republic was also below the 2.6% reference value at 2.5%. Two of the countries under review – Hungary and Poland – recorded 12-month averages of long-term interest rates above the reference value, while in Romania the 12-month average of long-term interest rates was well above the reference value.

3.2 Relationships and correlations between actual and perceived inflation after the introduction of the euro

The **perceived inflation** variable falls into the category of psychological variables that have their own specific measurement procedures. There are three basic ways of measuring perceived inflation: Balance sheet statistics, Perceived inflation rate calculated from statistical data and Combined method according to Diaz, Duarte and Rua.

The rate of perceived inflation calculated from statistical data – is the Brachinger's approach, which measures the rate of perceived inflation directly from statistical data, not from consumer survey data. He selected some items from the standard consumer basket and assigned a value of 100% to these items. Subsequent recalculation of the selected items yielded statistical data that were used to calculate perceived inflation. The authors apply this approach in Table 5.

Table 5: Perceived inflation rate calculated on the basis of statistical data for 2019

	Official weight	Recalculated weight to measure of perceived inflation
Food, soft drinks	15,0%	32,5%
Electricity, heat, gas, other energies	9,9%	21,5%
Household maintenance goods and services	1,1%	2,4%
Health	2,3%	5,0%
Operation of means of transport	4,8%	10,5%
Transport services	2,0%	4,4,%
Catering services	4,1%	8,8,%

Source: processed by the authors according to the ČSÚ

Combined – a method according to Diaz, Duarte and Rua, who say that the inflation gap arises when we use balance sheet statistics recalculated from the European Central Bank's consumer surveys to calculate perceived inflation. Using this method, it can be concluded that there was no break in the relationship between actual and perceived inflation after the introduction of the euro. It can be deduced that the conclusions obtained may depend on the method chosen to measure and calculate perceived inflation.

Table 6 below, which is based on balance sheet statistics, presents different data relating to actual and perceived inflation in the euro area, allowing an understanding of how both types of inflation move before and after the introduction of the euro. It is also important to note that the biggest wave of euro adoption into cash circulation occurred in 2002. However, some other EU countries have adopted the euro in subsequent years, such as Slovakia in 2009. Data for the euro area are compared with those for the Czech Republic, Slovakia and Austria for the same period.

Table 6: Relationship between actual and perceived inflation in 1999–2017

Year	Real inflation				Perceived inflation			
	Eurozone	**Czech Republic**	**Austria**	**Slovakia**	**Eurozone**	**Czech Republic**	**Austria**	**Slovakia**
1999	1,2	1,8	0,5	10,4	14,94	X	11,45	68,23
2000	2,2	3,9	2,0	12,2	29,25	X	14,25	50,05
2001	2,4	4,5	2,3	7,2	27,44	15,50	12,25	35,08
2002	2,3	1,4	1,7	3,5	57,19	3,80	42,55	29,84
2003	2,1	-0,1	1,3	8,4	48,26	16,63	36,00	37,59
2004	2,2	2,6	2,0	7,5	38,62	13,07	35,30	27,36
2005	2,2	1,6	2,1	2,8	36,86	15,11	36,60	21,17
2006	2,2	2,1	1,7	4,3	37,05	17,90	36,80	6,98
2007	2,2	2,9	2,2	1,9	60,44	8,73	65,25	32,41
2008	3,3	6,3	3,2	3,9	44,43	2,68	43,10	24,54
2009	0,3	0,6	0,4	0,9	0,55	34,40	7,35	9,58
2010	1,6	1,2	1,7	0,7	20,04	15,78	28,20	10,79
2011	2,7	2,2	3,6	4,1	36,72	3,52	55,30	37,76
2012	2,5	3,5	2,6	3,7	35,88	11,71	44,45	37,15
2013	1,3	1,4	2,1	1,5	28,74	4,53	34,60	17,02
2014	0,4	0,4	1,5	-0,1	6,43	7,21	20,30	7,76
2015	0,0	0,3	0,8	-0,3	1,60	13,49	14,55	9,71
2016	0,2	0,6	1,0	-0,5	4,62	13,84	18,10	7,38
2017	1,5	2,4	2,2	1,4	13,75	20,01	36,00	24,17

Source: processed by the authors according to the Eurostat (2018)

Table 6 above shows that **perceived inflation is always higher than actual inflation**. This can be demonstrated in the case of the euro area. In this case, even after other countries became part of EMU in the first or next wave of adoption, the levels of actual inflation did not increase at an exorbitant rate. Before the euro went into cash circulation in 2002, inflation was around 2%. After 2002 and until 2007, it remained around 2%. Therefore, the adoption of the euro had no effect on actual inflation in euro area countries, but changes were noticeable in the case of perceived inflation. It was found that consumers perceived inflation to have increased from 27% to 57% in 2002. Thereafter, perceived inflation began to fall again. The year 2002 was a truly exceptional one for perceived inflation in the euro area. This is due to the fact that a large number of countries joined the euro area in 2002, which affected a large number of consumers.

• The relationship between actual and perceived inflation is well illustrated by the example of Austria. Although actual inflation in this country is around 2–3% over the whole reference period, perceived inflation is many times higher, up to 65%.

• In the case of Slovakia, perceived inflation stood at -9.58% at the time it joined the euro area. Thus, consumers thought that inflation would fall by almost 10% after the adoption of the euro. By contrast, in Austria, perceived inflation was close to 43% in 2002 after the adoption of the euro. Therefore, Slovakia can be seen as a positive example in this respect, thanks to its communication campaign before the adoption of the euro. This measure can be recommended for the Czech Republic if it decides to join the euro area.

Discussion

Given the current turbulent situation on the financial and economic markets caused by the conflict in Ukraine, the unpredictability of Russia's behaviour and the related effects, especially on the energy and food markets, it rather very difficult to predict when the Czech Republic could meet the Maastricht criteria again due to the large number of variables. As the previous summary shows, the differences between the Czech Republic and other euro area countries are visible despite the shared background and it will depend on the Czech Republic's monetary and fiscal policy whether it will be able to start converging again under these conditions. According to the CNB's forecasts for the inflation rate, interest rates and total debt, a change in the negative trend can be expected after 2024 at the earliest.

Expectations about inflation have a subsequent impact on the difference between actual and perceived inflation. It expresses the expectation of households, business managers and money and capital market participants about the annual percentage change in consumer prices by which the prices of goods and services will change over 12 and 36 months. It has a significant impact on the behaviour and decision-making of households and firms and thus on overall economic development and the resulting real inflation rate. It represents one of the major factors influencing the future development of the price level (Molnár, 2022). How people expect prices to develop in the future affects how they spend, invest or borrow money today. Corporations also take these expectations into account when setting prices for their goods and services (ECB, online, 2021). Based on the topics discussed above, a schematic overview model of the impact of inflation expectations can be proposed.

Figure 6: A schematic overview model of the impact of inflation expectations
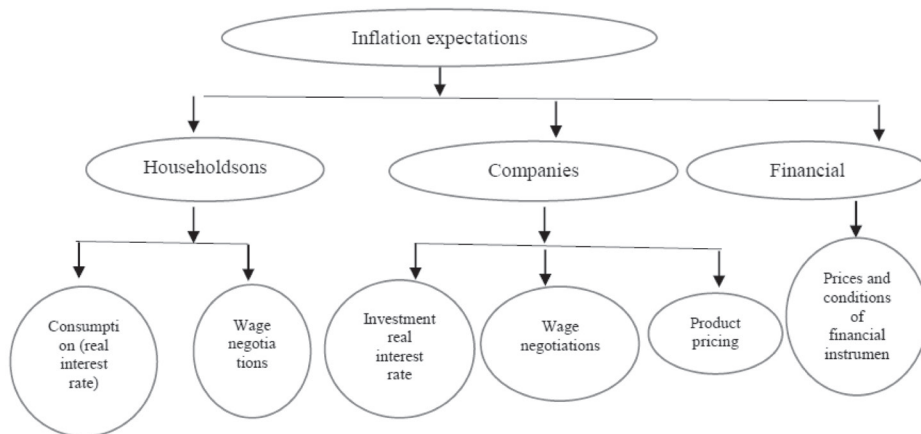
Let us return to the issue of the Czech Republic's entry into the euro area, in which inflation expectations can be anticipated to affect the decision-making of households and corporations. Most of the attention is focused on one-off effects, which are orders of magnitude less important and even marginal in the whole process of adopting the common currency. Paradoxically, however, these have received the most public attention so far, while the more important long-term effects are rather neglected. One-off effects mean estimates of the reactions of traders who will use the introduction of the single currency to round prices upwards only and raise them more than would correspond to a simple arithmetic conversion of CZK prices into euro prices according to a fixed conversion coefficient.

There is truly no need to worry about the extent of these effects. According to the National Plan for the introduction of the euro, there will be a relatively long period of the mandatory dual price marking (everyone will have to mark all prices in both CZK and EUR five months before E-Day and one year after it). Therefore, it will be possible to keep track of how prices in both currencies are evolving. The author sees this measure as a tool to accustom the public to a different numerical expression of prices rather than as a tool to control "dishonest" traders.

It can be assumed that higher perceived inflation will be one of the non-economic costs of joining the euro area. An interesting experience from abroad is that higher perceived euro-related inflation was systematically measured in countries where the public had the least warm attitude towards the euro (Greece) and the most warm (Austria, Finland). Higher perceived inflation was also measured in countries where people switched from large denominations of domestic currency banknotes and coins to smaller euro denominations. They suddenly felt poorer, while prices did not seem that much lower (Italy). Very simply put, the greater the enthusiasm for the euro and the stronger the exchange rate of the domestic currency against the euro before joining the euro area, the smaller the cost in terms of a rise in perceived inflation and the faster its dissipation (Mentlík, 2022).

Conclusion and Recommendations

It remains the case that the Czech Republic has committed itself by the Act of Accession of the Czech Republic to the European Union to take steps to be ready to join the euro area as soon as possible. In April 2007, the Government of the Czech Republic approved the National Plan for the introduction of the euro. Information on the introduction of the euro in the Czech Republic can be found on the portal of the Ministry of Finance of the Czech Republic at https://www.zavedenieura.cz. However, the latest report "Government accepts MoF and CNB recommendation not to set a target date for euro adoption yet" is dated 7 December 2020. The Ministry of Finance continuously prepares the Macroeconomic Forecast of the Czech Republic; the latest data were published in August 2022. On 6 January 2022, the Government of Petr Fiala approved the final version of the Policy Statement of the Government of the Czech Republic. In this statement, the government, among other things, committed itself to meeting the Maastricht criteria, in the context of the general proclamation to stabilise public finances. However, a commitment that the Czech Republic will move towards adopting the euro is still missing (Just, online, 2022).

According to the Convergence Programme of the Czech Republic of April 2022, the government aims to take a more ambitious approach to reducing public finance deficits than as set by the statutory limits. The strengthening of the Czech economy dynamics should also be facilitated by funds from the European Union, such as from the ending 2014–2020 financial period, the new financial period or the NextGenerationEU instrument. However, the current geopolitical situation brings with it changes in economic policy priorities and settings, the financial side of which will be reflected in the structure of the economy. Taking into account the current legal framework, public finances can be expected to again meet the Stability and Growth Pact criterion for the general government deficit in 2024 (Ministry of Finance, 2022). However, the draft budget for 2023 and the medium-term budgetary outlook do not support this intention.

The Eurogroup has discussed the fiscal policy guidelines for 2023. It concluded that supporting aggregate demand through fiscal policies in 2023 is not justified and that the focus should instead be on protecting the most vulnerable groups, while continuing to react quickly and adapt as appropriate. Fiscal policies in all countries should aim to maintain debt sustainability and raise growth potential in a sustainable way to support the recovery. Although the current global context presents significant challenges, the Eurogroup has full confidence in the resilience of the euro area economies and remains fully committed to ensuring the conditions for high sustainable growth in the EU countries (consillium.europa.eu, online, 2022).

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The Development of Life Insurance in the Czech Republic and the Slovak Republic

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Abstract

This article investigates the influence of selected determinants on the development of life insurance in the Czech Republic and the Slovak Republic in the years 2007–2019. The aim of the present study is to examine whether there are relationships between the development of selected determinants and the development of life insurance in the Czech Republic and Slovak Republic. We are using the correlation analysis, specifically Spearman's correlation coefficient, performed in the Eviews program with quarterly data. The determinants can be divided into positive and negative. Positive determinants encourage consumers to take out an insurance contract, thus acting to increase interest in insurance. Negative determinants have the opposite effect, which means that the consumer's willingness to take out insurance decreases, and the consumer is not interested in insurance on the development of life insurance in selected countries in the period under review. A positive impact on the development of life insurance was found in the case of gross domestic product, average gross monthly wage, interest rate on deposits and population in selected countries in the period under review.

Introduction

The topic of life insurance was chosen based on the existence of the importance of insurance in the daily lives of all citizens. Life insurance mainly covers risks associated with the health and life of citizens. It is built in such a way that any insurance indemnity will facilitate the insured's subsequent complex life situation in the event of an accident or disability, or in the event of his death, his family and loved ones will be secured. Significance is also seen in the impact on the development of the country's economy. Insurance companies enter the financial market through investment and are a significant institutional investor.

The aim of the present study is to examine whether there are relationships between the development of selected determinants and the development of life insurance in the Czech Republic and Slovak Republic. These determinants are gross domestic product, consumer price index, general unemployment rate, population, number of children born, average gross wage, and interest rate on deposits. The following research questions were established at the beginning of the investigation. Are the Czech and Slovak insurance markets developing in a similar way in the selected period? Are the factors that influence the demand for life insurance in the Czech and Slovak Republics the same or different?

This article provides an overview of the Czech and Slovak insurance markets in our estimated period. We focus primarily on the growth rate of life insurance, the ratio of life insurance to total insurance, and the written premium. Two selected markets are also briefly compared. Some studies on the problem of factors influencing the development of life insurance in different countries and time periods are presented in the paper. Based on those selected studies, determinants that could influence the development of life insurance were further selected and examined. The determinants can be divided into positive and negative. Positive determinants encourage consumers to take out an insurance contract, thus acting to increase interest in insurance. Negative determinants have the opposite effect, which means that the consumer's willingness to take out insurance decreases, and the consumer is not interested in insurance. Afterwards, we present the characteristics of the data and methods used in the paper. In conclusion, the empirical results are discussed and the results of our analysis are summarized.

The topic of life insurance was chosen based on the existence of various studies that examine the development of life insurance and look for the reasons for the development. Authors differ in their results, and this topic is highly debated. Different influences can be found in different countries. The purpose of this article is to find out what determinants operate in two similar economies that belong to the CEE region. The Czech Republic and the Slovak Republics were chosen based on the similarity of the historical development of the countries and their insurance markets.

1   The Czech and Slovak Insurance Market

Insurance market analysis shows that in the monitored period the ratio in the Czech Republic is averagely 60:40 in favour of non-life insurance. In the Czech Republic, nonlife insurance still predominates over life insurance. This trend can be observed throughout the period since 1991, when the insurance market began to develop in the Czech Republic. According to the Instant Research survey commissioned by ČSOB from 2021, Czechs generally do not understand life insurance very well, and almost half of the population of the Czech Republic does not have life insurance at all. This lack of interest in life insurance is a long-term phenomenon. The reason is probably the lack of awareness among the population. The indifference of Czechs to life insurance is also proven by the Broker Trust survey conducted by the STEM/MARK agency from 2017. According to the conclusion of this survey, the proportion of citizens in the Czech Republic who do not have life insurance is still significantly higher than in western countries. The results show that every second Czech does not have life insurance, specifically 47% of respondents.

The highest share of the uninsured is in the group of citizens with incomes up to 20,000 CZK per month, and up to a quarter of Czechs do not even know what the purpose of life insurance is. In general, it can be stated that in the Czech Republic, citizens insure their property more than their own lives. Ratio of life and non-life insurance in the Slovak Republic in monitored period is averagely 55:45 but in favour of life insurance. At the beginning of the period we are monitoring, specifically in 2007, a study was carried out by the Slovak Association of Insurance Companies, which points to a different development in the Slovak Republic. This study points to the year-over-year growth of life insurance, which was equal to 13%. Thus, it overtook the growth of non-life insurance, which grew by only 2% over the same period. In general, it can be stated that the Slovak Republic is much closer to all other developed countries than the Czech Republic.

The premiums in both countries increased during the monitored period. In the Czech Republic, the growth of insurance premiums was mainly influenced by the one-time premium. In 2012, a larger drop was recorded, but there was a change in the calculation methodology, so it is not appropriate to give much weight to this phenomenon. In the following years, after the change in methodology, a growing trend was recorded in the Czech Republic, which, according to calculations, was for the most part an increase in the volume of nonlife insurance premiums. In the Slovak Republic, there was an increase in prescribed premiums until the end of 2015, but then a larger decrease can be seen in 2016. The decrease was caused by a decrease in prescribed life insurance premiums. Since 2016 in the Slovak Republic, life and non-life insurance have contributed almost equally to the annual increase in premiums from total insurance, although life insurance still predominates in percentage terms. This comparison shows that Czech insurance applicants always prefer property insurance, while Slovak clients prefer life insurance.

With regard to total insurance coverage, an initially increasing trend is visible in the Czech Republic until 2011, although fluctuations are noticeable. After that, total insurance coverage in the Czech Republic dropped sharply in 2012 and maintained a slight overall downward trend until the end of the monitored period. In the first observed quarter, the total insurance coverage in the Czech Republic was equal to 3.79% and in the Slovak Republic 2.95%, and in the last observed quarter these values dropped to 2.23% in the Czech Republic and 2.66% in Slovakia. However, in both national economies, insurance coverage is significantly lower than the average of the member states of the European Union, creating room for growth in the area of the entire insurance market.

Through an analysis of the development of the insurance markets of both countries, it was found that the written premium in the Czech Republic is almost three times higher than the written premium in the Slovak Republic. This difference is due to the different size of the economies of the countries. The markets are different and there is a known difference in the amount of GDP, population, and other variables. Despite this fact, the penetration of life insurance, the ratio of life insurance to gross domestic product, was higher in the Slovak Republic. The average value of life insurance penetration in Slovakia is equal to 1.47% in the observed period, while in the Czech Republic this value is equal to 1.19%. Therefore, we can again state that the citizens of the Slovak Republic place more emphasis on their own life insurance.

2   Literature review

One of the most important studies on which further research is based is the work of Beck and Webb (2003), which examined the determinants influencing life insurance between 1961 and 2000 in 68 countries. In this study, the authors divided the determinants into demographic, economic, and institutional. The following determinants were identified as demographic: religion, education, life expectancy, urbanization. Then they identified the following determinants as economic: income, inflation rate, inflation volatility, private savings, real interest rates, banking sector development, social security, and the Gini coefficient. Then institutional determinants were identified: institutional order, revolutions and coups, and institutional development. Analysis was performed using panel data analysis. This research has shown that higher income, lower inflation, better banking sector development, higher household savings, and higher real interest rates have a positive effect on life insurance development.

The next study, Li et al. (2007), examined the influence of determinants influencing life insurance demand in 30 OECD countries in 1993–2000. The following determinants were identified as determinants with a positive impact: the income of the individual, the number of dependents cared for by the family, the level of the highest level of education attained and the level of development of the financial services infrastructure in the given country. On the contrary, the following were identified as determinants with a negative impact: age, social security level, and government transfers to the population.

Factors that influence foreign participation in life insurance in 24 OECD countries in 1993–2000 were the subject of research by Ye et al. (2009). As the main determinants with positive impact were identified, life expectancy, the degree of interdependence of young and old people, and the level of household income. However, an important finding in this study was that institutional determinants that positively influence the participation of foreign entities in domestic premiums include a higher degree of liberalization, a more stable government environment, and greater effectiveness of government regulations.

Koklar (2011) dealt with the identification of determinants affecting real gross life insurance premiums in the Czech Republic. The determinants were chosen on the basis of previous work and were divided into four groups: economic, social, supply, and demographic. The practical part was performed on the basis of Granger causality and a model of vector autoregression or linear regression. Among economic factors, this study confirmed the positive relationship between GDP and real gross premiums written. With respect to social factors, a negative relationship between the written real gross premiums and the selected social security expenditures was confirmed here. From the supply determinants, a negative relationship was proven between the life expectancy of the children born and the real gross premiums written. From the demographic factors group, the number of newborns had a positive impact on real gross written premiums.

In the research of Brokešová et al. (2014), the determinants influencing life insurance in the four Visegrad countries in the years 1995–2010 were examined, specifically the countries of Central Europe: The Czech Republic, Poland, the Slovak Republic, and Hungary. The determinants were divided into the following groups: economic, demographic, sociocultural, and business determinants. The economic determinants

included gross domestic product, annual inflation rate, foreign trade, and the number of motor vehicles. The authors included population, dependency index, and life expectancy in the demographic factor group. Among the sociocultural determinants, the authors chose education, the degree of urbanization, the social security system, and the crime rate in the country. The quality of regulation and the concentration of the insurance market were chosen as business determinants. The results showed that the determinants otherwise affect insurance in the four Visegrad countries and differently in economically developed countries, due to different political and social developments. According to the study, economic determinants had a positive and fundamental effect on the development of life insurance. On the contrary, the annual inflation rate, the social security system, and the crime rate had a negative impact.

Yin's research (2015) analysed the factors influencing life insurance demand in the Malaysian insurance market in 2015. A 2012 survey showed that only 41% of Malaysians have life insurance, so Yin focused on this issue. The author included income, education, age, gender, dependency, and indebtedness among the examined determinants. This study found that age and gender education have a positive effect on life insurance demand. Other factors were identified as factors with zero impact on life insurance.

The development of the insurance market in the Czech and Slovak Republics was examined by Grmanová et al. (2016). In this monograph, emphasis was placed on aspects of the economic environment and the application of models to express the effectiveness of Slovak and Czech commercial insurance companies. The monograph points out current issues and includes a correlation analysis and a linear regression model examining the effects of determinants on life and nonlife insurance in the Czech Republic and Slovakia in the years 2004–2014. This study showed that there is a strong direct linear relationship between gross domestic product and premiums. It also emerged that there was an indirect moderate linear relationship between the unemployment rate and the premium, but it was found that at a significance level of 0.05, the correlation coefficient between the unemployment rate and the premium was not statistically significant. According to Grmanová et al. there is a close link between the positive development of the economy and the positive development of premiums.

Muslija and Satrovic (2018) conducted research on the impact of economic and demographic determinants on life insurance demand in 2005–2010. Data were collected from a total of 150 countries. In this study, a multivariate analysis was used when principal component analysis (PCA) and multiple linear regression were used. The study showed that both economic and demographic determinants have a statistically significant effect on life insurance demand. According to the study, economic determinants have a stronger influence.

In the next study, Artlová and Kábrt (2018) examined the main determinants that influence the demand for life insurance in the Czech Republic in the years 1993–2015. The authors used their own calculations based on the multidimensional principal component method and econometric time-series analysis for empirical research. Identical to Beck and Webb (2003), they divided the investigated determinants into three groups: economic determinants, demographic determinants, and institutional determinants. The economic

factors were as follows: net disposable income per capita, net national savings per capita, Czech national bank discount rate, Gini index, gross domestic product per capita, inflation rate, unemployment rate, number of self-employed persons per 1,000 inhabitants, average number of tertiary educated, average per capita wages, per capita housing loans, per capita loans to households and per capita household consumption expenditure. The demographic group in this study consists of five indicators which are: life expectancy at birth for both sexes, the dependency index, the old age dependency index, the young people's dependency index, and the number of people with tertiary education per 1,000 inhabitants. Institutional indicators included tax revenues per capita, social support benefits per capita, average old age pension, development of the banking sector, and size of the public sector. In the first step of the analysis, when the unit root test was performed, it was necessary to exclude the number of university graduates, the size of the public sector, and per capita household consumption expenditure due to a different order of integration of these variables. Compared to other studies, this was a surprising conclusion, because it was the number of tertiary educated people in the study by Yea et al. (2009) where the positive impact on life insurance demand was confirmed and the size of the public sector had a negative impact on life insurance demand in the 2007 study by Li et al. It was found that a group of demographic factors negatively affect life insurance demand. Furthermore, it was found that economic factors had a positive impact and institutional factors had a positive impact in the density model, but they played an insignificant role in the penetration model. Regarding the analysis of individual determinants, the negative impact of interest rates and net national savings on life insurance demand was identified.

Under the auspices of the Czech National Bank, Časta (2020) tested potential determinants of the development of the insurance sector in 1997–2017. The analysis was carried out on a set of data from 24 European countries in the years 1997–2017. The authors examined the effects on life insurance and non-life insurance. The determinants were selected on the basis of previous studies. The panel estimate confirmed that premiums in both life and non-life insurance are very closely linked to a country's economic cycle due to their strong and statistically significant relationship to real GDP growth. Furthermore, it has been proven that a higher concentration of the insurance market means a higher volume of premiums in the area of life insurance. Higher household savings and a more developed financial system also have a positive effect on the growth of premiums in life insurance. On the contrary, higher social security contributions have a negative impact. This and other studies mention that the higher the state contributions, the lower the demand for life insurance. Those state social security payments mentioned above crowd out life insurance products, and it is therefore logical that social security systems provide protection against the risk of death. In this article, the authors also mention the effects of the COVID-19 pandemic, which discusses possible premium declines related to declining economic performance. The pandemic could also be associated with an increase in claims in life insurance and in some non-life insurance sectors, but this increase may be mitigated to some extent by exclusion clauses.

Based on the studies mentioned above, the following determinants were chosen: gross domestic product, consumer price index, unemployment rate, number of children born, average gross monthly wage, population, interest rate on deposits. In this study, we examine the influence of these determinants on the development of life insurance.

3   Data and methodology

We obtained the data set from the Czech national bank, Slovak national bank, Czech insurance association, Slovak insurance association and Czech statistical office.

All quarterly data comes from period 2007–2019. We examine the relationship between the development of selected determinants and the development of life insurance in the Czech Republic and the Slovak Republic in a selected period. The inputs include the gross domestic product, consumer price index, general unemployment rate, population, number of children born, average gross wage, and interest rate on deposits. We decided to choose the penetration and density of life insurance as explanatory variables. Penetration is calculated as the share of life insurance in the gross domestic product of the country. The density is calculated as the share of life insurance per capita. Growth rates were calculated from all data so that they could be further used for calculations.

Recent empirical studies use the regression panel method, the least squares method, the linear regression model, and correlation analysis to describe the relationships between selected determinants and the development of life insurance. Due to the characteristics of our data sample, we cannot use panel regression or linear regression because all assumptions were not met. Therefore, we apply correlation analysis.

The correlation analysis shows the statistical dependence of two quantitative quantities. The degree of correlation is expressed by a correlation coefficient, which can vary in the interval <-1; 1>. Thus, the correlation between two quantities can be described as a correlation. If one of them changes, the other changes correlate, and vice versa. If the value of the correlation coefficient is equal to -1, it is possible to describe the dependence between the variables as completely indirect. If the value of the correlation coefficient is equal to 1, it is possible to mark the dependence between the variables as completely direct. If the value of the correlation coefficient is equal to 0, which means that the variables are not correlated, then there is no statistically detectable dependence between the characters. We use the Spearman correlation coefficient to determine the influence of determinants on the development of life insurance. The Spearman correlation coefficient is called rs in the calculation and according to Adamec, Hampel and Střelec (2017), the Spearman correlation coefficient is calculated according to the following formula:

$$r_s = \frac{\sum_{i=1}^{n} x_{ri} \cdot y_{ri} - n \cdot \bar{x}_r \cdot \bar{y}_r}{(n-1) \cdot s_{x_r} \cdot s_{y_r}} \qquad (1)$$

The values of the Spearman correlation coefficient range from -1 to 1. The closer the value is to 1, the stronger the direct relationship exists between x and y. On the contrary, the closer the correlation coefficient to -1, the stronger the indirect relationship between the variables x and y.

4   Empirical results and discussion

In the appendix we can see the results of correlation analysis, specifically Spearman correlation coefficients of the chosen determinants. Using two variants, the influence between density and selected factors and between penetration and selected factors was investigated. The impact was examined among factors both in the Czech Republic and in the Slovak Republic in the whole period Q1 2007–Q4 2019 and at the same time in periods that are divided based on the change in the methodology of calculation of life insurance premiums in 2012 in the Czech Republic and accepting the Solvency II regime in 2016 in the Slovak Republic.

Table 1 compares the expected effect determined from the results of the studies mentioned above and the effects found, which were calculated using the Spearman correlation coefficient.

Table 1: Expected and determined influence of determinants on the development of life insurance

Determinants	Expected impact	Observed impact CZ	Observed impact SK
Number of children born	+/-	**-**	**-**
Consumer price index	-	/	/
Unemployment rate	+/-	/	/
Gross domestic product	+	**+**	**-**
Average gross monthly wage	+	**+**	/
Interest rate on deposits	-	**+**	/
Population	+/-	/	**+**

The effect of the number of children born with life insurance was first evaluated. It is clear from Table 1 that the results of the studies differed and both negative and positive effects were confirmed. From all the above, a negative relationship was found between the growth rate of the number of children born, the growth rate of density, and the growth rate of penetration. A negative link was demonstrated in both countries monitored. Therefore, the result is the opposite of what Koklar (2016) states in his study. In contrast, Elango and Jones, who conducted their study in 2011, confirmed the same effect, namely that population growth has a negative impact on life insurance developments.

Another indicator evaluated was the consumer price index. Many studies have shown a negative effect of inflation on the development of life insurance, specifically in the study of Beck and Web (2003), then Celik and Kayali (2009), in the study of Kjosevski (2012), then in the study Sliwinsky, Michalsky and Rozskiewicz (2013) and also in the study by Brokešová et al. (2014). However, Spearman's correlation analysis performed in the fourth chapter showed that there is a zero correlation between the growth rate of the consumer price index and the penetration growth rate and the density growth rate in 2007–2019 in the Czech and Slovak Republics, that is, there is no dependence between these factors.

The growth rate of the unemployment rate was another factor examined. Again, it is clear that the expected effect was both negative and positive, since the results of the studies differed. For example, a 2013 study by Sliwinski, Michalski, and Rozskiewicz showed a negative impact of the unemployment rate on the development of life insurance in Poland in 1991–2005. In contrast, in the study of Kábrt in 2016, Kábrt states that the unemployment rate in the Czech Republic, Germany, and the United States in 1990–2004 had both a positive impact and a negative impact on the development of life insurance. The results of the correlation analysis showed that in the Czech and Slovak Republics, the existence of dependence among the selected factors was not found in 2007–2019.

From all the studies mentioned in Section 2, which examined the impact of GDP on life insurance, it was found that gross domestic product has a positive impact on the development of life insurance. Therefore, the expected effect was positive. However, as can be seen from the appendix, the results of the correlation analysis were different. In the Czech Republic, the positive link between the growth rate of the gross domestic product and the growth rate of the density in 2007–2019 was confirmed, as well as in the Kábrt study (2016) or in the study of Burić et al. (2017). An unexpected result is the negative effect found between the growth rate of gross domestic product and the growth rate of density in the Slovak Republic in 2007–2019. No similar results were observed in any of the studies studied. This result could say that the more successful the Slovak economy, the less the population's interest in life insurance products, which would be the exact opposite of consumer behaviour than in the Czech Republic.

Another factor chosen for the correlation analysis was the average gross monthly wage. From all the examined studies mentioned in Section 2, which dealt with the influence of income of the population, it is clear that this factor has always had a positive impact on the development of life insurance, that is, the more people earn, the greater the demand for life insurance. This hypothesis was confirmed only in the correlation analysis between the density growth rate and the growth rate of the average gross monthly wage in the Czech Republic. In the Slovak Republic, zero dependence was found between the average gross monthly wage and density and penetration in the observed period.

In a study from 2017, Burić examined the interest rate on deposits in his study. Burić examined the impact of the interest rate on deposits on the development of life insurance in Balkan countries in 2005–2015 using an analysis of panel data. His conclusions show that the interest rate on deposits has a negative impact on the development of life insurance. However, it is clear from the appendix that there could be a positive link between the growth rate of the interest rate on deposits and the growth rate of penetration in the Czech Republic in 2007–2019. This result is the exact opposite of what Sawadogo, Guerineau, and Ouedraogo (2018) also say in their study. In the Slovak Republic, zero dependence was found between the factors mentioned above in the observed period.

The last factor examined was the population. The results of the studies differ and the impact was negative, but also a positive impact was found. For example, in the study of Celik and Kayali from 2009. The above correlation analysis showed that no connection was found between the growth rate of the population and the growth rate of penetration and density in the Czech Republic. In the Slovak Republic, on the other hand, the existence

of dependency was proven between the growth rate of the population and the growth rate of penetration in 2007–2019.

As can be seen from the appendix and Table 1, the Czech Republic has shown a link between the development of life insurance and the growth rate of gross domestic product, as well as the growth rate of the average gross monthly wage, the growth rate of children born and the growth rate of interest rates on deposits. In the Slovak Republic, the findings were slightly different. As in the Czech Republic, the existence of a link between the development of life insurance and the growth rate of gross domestic product, as well as the growth rate of the number of children born, was proved here. Furthermore, a link was found between the development of life insurance and the growth rate of the population. For other factors, the existence of dependence was not found, and the correlation was zero.

Conclusions

The aim of this paper was to determine the influence of selected determinants on the development of life insurance in the Czech Republic and Slovak Republics in the period 2007–2019. Based on studies dealing with the same issues, seven determinants were selected for this work, the influence of which on the development of life insurance was further analyzed. The following research questions were established at the beginning of the investigation. Are the Czech and Slovak insurance markets developing in a similar way in the selected period?

Are the factors that influence the demand for life insurance in the Czech and Slovak Republics the same or different?

The influence of determinants was investigated in connection with the density and penetration of life insurance in the Czech and Slovak Republics in the years 2007–2019. Quarterly data from freely available databases of the Czech National Bank, the Slovak National Bank, the Czech Insurance Association, the Slovak Insurance Association, and the Czech Statistical Office were used for this analysis. The values of the Spearman correlation coefficient were determined by correlation analysis. The values of the Spearman correlation coefficient were used to evaluate the influence of individual factors. The results, which are visible in the appendix, show that in the Czech Republic the link between the development of life insurance, density or penetration, and the growth rate of gross domestic product, the growth rate of gross monthly wage, the growth rate of children born, and the growth rate of interest rates on deposits. In the Slovak Republic, the existence of a link between the development of life insurance, the density or penetration of life insurance, and the growth rate of gross domestic product, the growth rate of the number of children born, and the growth rate of the population was proved. For other factors, the existence of dependence was not found, and the correlation links were zero.

The research questions focused primarily on the existence of differences in the development of the Czech and Slovak insurance markets and also on whether the Czech and Slovak insurance markets are influenced by the same or different factors. Based on the analysis performed, certain differences were found in the development of the Czech and Slovak insurance markets. One of the reasons is probably the difference in the behaviour of Czech and Slovak consumers. In the Slovak Republic, life insurance has long prevailed over non-life insurance, as in other developed countries. In the Czech Republic, the trend is different, and a larger share of non-life insurance is constantly visible. Czech citizens thus prefer property insurance to life insurance. However, in both economies, below-average insurance was found compared to the European Union, and there is room for growth in the entire insurance market. The links between individual factors in the Czech and Slovak Republics were also different. In the Czech Republic, a link was found between the development of life insurance and the growth rate of GDP, the growth rate of the average gross monthly wage, the growth rate of the number of children born and the growth rate of the interest rate on deposits. In the Slovak Republic, the existence of a link between the development of life insurance and the growth rate of GDP, the growth rate of the number of children born and the growth rate of the population has been proven.

However, it was not possible to determine and confirm the reasons for the differences mentioned above between the Czech Republic and the Slovak Republic on the basis of research. Therefore, it would be appropriate to include other factors that belong to the field of behavior and perform a deeper analysis of the influence of determinants on the development of life insurance.

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Appendix A. Spearman correlation coefficient

	Number of children born	Consumer price index	General unemployment rate	Gross domestic product	Average gross wage	Interest rate on deposits
VLIV DENSITA ČR						
2Q 2007 - Q4 2019						
k	-0.251765	0.041357	0.141397	**0.44543***	**0.689864***	0.028692
2Q 2007 - Q4 2011						
k	-0.259649	0.064912	-0.028194	**0.449123****	**0.817544***	0.130759
1Q 2012 - 4Q 2019						
k	-0.335411	-0.021628	0.246304	**0.38673****	**0.591642***	-0.034464
VLIV PENETRACE ČR						
	Number of children born	Consumer price index	Population	General unemployment rate	Average gross wage	Interest rate on deposits
2Q 2007 - Q4 2019						
k	**-0.500633***	-0.097104	-0.05276	0.061518	0.057557	**0.271627****
2Q 2007 - Q4 2011						
k	**-0.561404****	-0.070175	-0.014035	0.027313	0.431579	0.272927
1Q 2012 - 4Q 2019						
k	**-0.460044***	-0.164589	-0.179985	0.017816	-0.179619	0.280477
VLIV DENSITA SR						
	Number of children born	Consumer price index	General unemployment rate	Gross domestic product	Average gross wage	Interest rate on deposits
2Q 2007 - Q4 2019						
k	**-0.512127***	-0.050317	-0.028959	**-0.603891***	0.110136	0.201357
2Q 2007 - Q4 2015						
k	**-0.591597***	0.071989	-0.110084	**-0.465546***	0.120168	0.311765
Q1 2016 - Q4 2019						
k	-0.391176	-0.297059	0.288235	**-0.761765***	0.041176	0.052941
VLIV PENETRACE SR						
	Number of children born	Consumer price index	Population	General unemployment rate	Average gross wage	Interest rate on deposits
2Q 2007 - Q4 2019						
k	**-0.327149****	-0.123439	**0.296742****	0.062896	0.03448	0.114389
2Q 2007 - Q4 2015						
k	-0.32549	-0.056583	**0.35098****	-0.045098	-0.061064	0.117927
Q1 2016 - Q4 2019						
k	-0.188235	-0.282353	0.102941	0.473529	0.032353	0.055882

*When significant, marked */***
 * indicates significance level 1%;
** indicates significance level 5%.

Czech Monetary and Fiscal Policies: Big Deficits and Challenges

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Abstract

Czech monetary and fiscal policies require fundamental reform, even without considering the current war in Ukraine. The tax structure can be rationalized within 1–2 years. The very introduction of a single collection point must be taken seriously, and there is no need to undertake a fundamental tax reform to implement its main stage. Czech social security contributions are very specific, dominated by their tax nature. This allows for a quick consolidation of employer contributions into one levy to the state budget and the inclusion of employee contributions in personal income tax. Only slightly more politically challenging is the integration of dividend income taxation into corporate tax and the removal of interest from corporate tax costs.

The OECD recommendations are one-sided, mechanically oriented according to the neoliberal welfare regime. Our analyses and subsequent proposals do not foresee and do not require any reform of social security benefits, including public funding of healthcare. Strengthening value-added tax in the tax structure is completely wrong. The overall insufficient taxation of value added in the Czech financial sector needs to be eliminated.

Czech monetary policy is not very effective in the fight against inflation, the link to overall economic policy is lacking. This policy has created excessive foreign exchange reserves that can be transferred to the state assets. It is economically desirable to link the Czech currency to the euro. The proceeds of the issue of all money belong to the state budget.

1 Introduction

Not only Czech economic and social policies have been confronted with new challenges in the recent decade, which is the reason for analyzing here not only past economic and social developments, but also the effectiveness of these entire systems. The initial consideration for writing this paper was the question of how to deal with the rapidly growing

deficits of Czech public finances and with ideas for establishing national investment funds, moreover, in a situation when nominal incomes and liquidity of the population are growing rapidly. Should the state tax or borrow from elites or banks? Should we give the elites only an almost equal old-age pension and at the same time contribute significantly and complicatedly to their building or pension savings, which are devalued by inflation?

We cannot answer all these questions here. However, we try to find answers primarily at least to the basic questions of possible streamlining of the interconnection of monetary and fiscal policies, where trillions of Czech crowns are involved, which might eventually be „cancelled out" fortunately. A fundamental related issue is the business outcome of the Czech National Bank – also from the point of view that „the remaining profit should be paid into the state budget, so far it has never happened" (Sedláček, 2020). We also discuss the connection with the issuance of money and with the potential bank tax.

We must also pay attention to main taxes and social security contributions because there are also significant opportunities for economic savings. With the fundamental step introducing a single collection point (which the government has promised to realize), it is useful to rationalize all social security contributions, and employee contributions suggest themselves directly to be included in the personal income tax. Even more fundamentally, and for the benefit of Czech public finances, it is possible to rationalize the taxation of corporate and capital incomes. The biggest problem tax policy problem is perhaps the lobbyists´ concept of value added tax in the European Union, which mainly concerns the tax treatment of financial (and therefore also banking) services. How does a bank or insurance levy fit into this? Which financial institutions are superfluous? The aim of this paper is to analyze these basic Czech monetary and fiscal problems; the respective reforms might be very effective.

2   Monetary policy

„The Czech National Bank strives to achieve price stability, i.e. low and predictable inflation, by setting short-term, so-called monetary policy interest rates. How influencing future inflation through interest rate adjustments works is described by the so-called transmission mechanism. It is a relatively complicated and complex process that, with a certain time lag, leads to the effects of changes in interest rates on the development of the economy and inflation... Particularly three transmission channels play an important role in the Czech economy: the exchange rate, interest rate and asset price channels. In all these channels, the change in interest rates affects the development of inflation in the same direction: an increase in interest rates reduces future inflation ceteris paribus, and conversely, a decrease in interest rates acts in the direction of higher future inflation all else being equal" (CNB, 2021a). Figure 1 presents the influence of each transmission channel.

Figure 1: Monetary Policy Transmission Channels
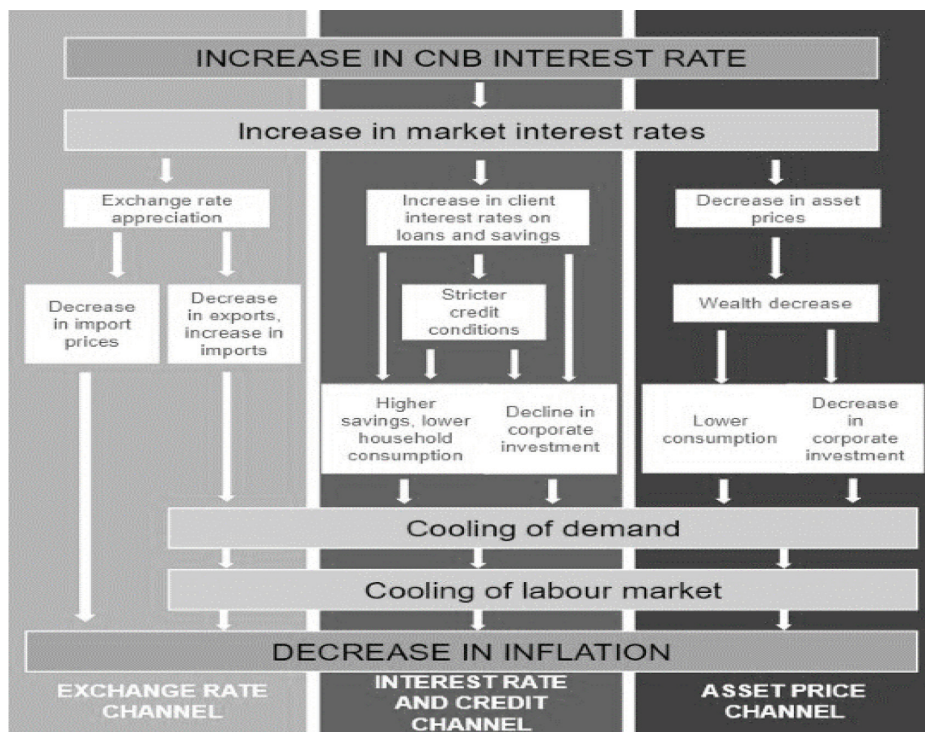
Source: CNB (2021a)

„According to the Constitution of the Czech Republic and in accordance with EU primary law, the CNB's main objective is to maintain price stability. By maintaining a low-inflation environment, the central bank contributes to creating the conditions for sustainable economic growth. We have been taking care of price stability since 1998 as part of the inflation targeting regime… The basis of our monetary policy is the publicly announced inflation target of 2% and open communication with the public… The Bank Board's decision made today will affect inflation in 12 to 18 months… The CNB's main monetary policy instrument is the two-week repo rate. The decision to set it up sends an impulse through the financial market to the entire economy and, as a result, influences inflation so that it remains close to the targets" (CNB, 2022a). „The CNB's current inflation target corresponds to the practice of the central banks of advanced economies, and it will therefore remain at 2% until the Czech Republic joins the euro area" (CNB, 2022b).

The CNB uses the two-week repo rate „as the limit interest rate for its repo operations, through which it influences short-term market interest rates. Given that the Czech economy has a long-term surplus of liquidity for historical reasons, the CNB withdraws it during repo operations and provides securities to banks as collateral. When negotiating a transaction, both parties conclude a repurchase agreement, which means that after the maturity, the CNB returns the borrowed principal plus the agreed interest to the creditor bank and the creditor bank returns the collateral provided. Repo operations are usually carried out by the CNB three times a week in the form of variable rate tenders.

The announced 2T repo rate serves as the maximum rate at which banks can be satisfied in the tender. Banks' bids are settled according to the US auction procedure, in which the CNB preferentially accepts bids demanding the lowest interest rate, up to the amount of the predicted liquidity surplus for the given day. The basic duration of these operations is 14 days… In addition to the repo rate, the CNB also announces the lombard and discount interest rates. At the lombard rate, commercial banks can borrow liquidity from the CNB overnight against the collateral provided under the lending facility. On the other hand, at the discount rate, commercial banks deposit liquidity with the central bank in the deposit facility overnight" (CNB, 2022c). From April 2, 2022, these rates apply: 2T repo rate 5%, discount rate 4%, lombard rate 6%.

The CNB's second monetary policy instrument is the exchange rate or rather foreign exchange interventions, based on the Bank Board's decision in autumn 2012. It was activated on November 7, 2013. „This instrument is more effective for the Czech Republic, which is a small open economy with a long-term excess of liquidity in the banking sector, to ease monetary conditions than other instruments… Why did the CNB decide to further ease monetary policy by weakening the koruna to CZK 27 per euro? In 2012–2013, the Czech economy went through a period of economic downturn, which was adversely reflected in an increase in unemployment, a decline in household income and consumption, as well as profits and investments of companies. The Czech National Bank … made full use of its main monetary policy instrument, cutting interest rates to technical zero (0.05%) at the end of 2012. Furthermore, the CNB made a commitment to keep interest rates at this record low level for as long as needed (CNB, 2020). The aim of using foreign exchange interventions to weaken the Czech currency was the same as for interest rates: to maintain price stability in the Czech economy; it was an effort to prevent deflation and to accelerate the return to a situation where the CNB will be able to start using its standard instrument, interest rates, again. The use of foreign exchange interventions as a tool against deflationary risks was also recommended to us in 2013 by the International Monetary Fund's evaluation mission. „From the point of view of the CNB's secondary objective, i.e. support for the government's general economic policy leading to sustainable economic growth, our measure contributed to overcoming the longest economic recession in the independent Czech history… Thanks to the weakening of the exchange rate, the threat of a deflationary trap has passed and economic growth has accelerated… Higher household incomes and consumption, as well as corporate profits and investments, meant higher tax revenues for public budgets. The main benefit for citizens was that they were more confident of keeping their jobs or finding a new job. An important message to consumers was that it no longer makes sense to postpone consumption in the hope of constantly decreasing prices" (CNB, 2020). The CNB ended the „exchange rate commitment" in April 2017. The „exchange rate commitment" is an unconventional monetary policy instrument (Komárek and Polák, 2022).

According to the CNB, the so-called (managed) floating exchange rate regime is „consistent with inflation targeting in the long term. The exchange rate in our small open economy often serves as a shock absorber for the shocks that fall on it. Adjustment through the movement of the rate is smoother and less painful than if it had to take place through real variables such as employment or wages… In the long run, the value of the exchange rate reflects the development of economic fundamentals. But if there are large fluctuations

in the exchange rate that do not correspond to the development of the economy, the central bank can mitigate them with its policy. We assume that the floating exchange rate regime will be applied until the Czech Republic joins the euro area, or the so-called ERM II" (CNB, 2020).

At the beginning of March 2022, the CNB began to intervene in favour of the Czech currency. „Two reasons can be found for this decision. One is the stabilisation of the koruna market, which is under pressure from capital outflows due to a global increase of the risk. The second reason are the additional strong inflationary pressures that the weakening koruna, together with rising energy commodity prices, creates. The CNB has not published the intervention level and we do not expect it to do so. Interest rates remain the main monetary policy instrument. Due to current developments, there is a risk that domestic rates exceed the 5% threshold, and their reduction postpones until next year" (Gürtler, 2022).

Figure 2 shows that the inflation rate at the time of the CNB's „exchange rate commitment" was well below the (general) inflation target of 2% per year. Foreign exchange interventions did not have the expected impact. „While the inflation forecasts of the foreign exchange intervention scenario assumed a relatively rapid return of overall inflation to the inflation target and its subsequent rise to the upper end of the tolerance band, the actual realized inflation was at the deflation threshold until the third quarter of 2016. The achievement of the inflation target thus delayed by more than a year. This unexpected development was the reason why the CNB decided to hold the exchange rate commitment for much longer than it had originally anticipated. In a 2013 statement, the CNB made a pledge to carry out foreign exchange interventions at least until the beginning of 2015. In fact, this period was extended by more than a year and foreign exchange interventions were released only in April 2017, when inflation was finally managed to return to the inflation target and the forecasts promised its further favourable development" (Miňhová, 2020).

**Figure 2**: Annual growth of consumer prices in Czechia in 2010–2021 (%)
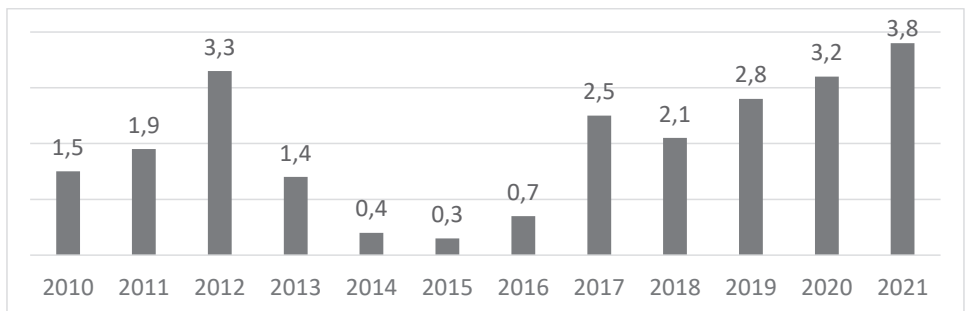
Source: ČSÚ (2022a)

„The total account for foreign exchange interventions amounted to CZK 2,050 billion, which necessarily had an impact on the multiple increase in foreign exchange reserves in the central bank's balance sheet. At the beginning of November 2013, the CNB recorded CZK 873 billion of foreign exchange reserves in the assets of its balance sheet.

At the end of April 2017, this amount increased to CZK 3,355 billion. This corresponds to almost fourfold growth" (Miňhová, 2020). Figure 3 illustrates the evolution of foreign exchange reserves since 2010. At the end of February 2022, these reserves increased further to CZK 3,936 billion (EUR 157 billion or USD 176 billion).

Figure 3: CNB foreign exchange reserves in 2010–2021 (CZK billion, end of year)
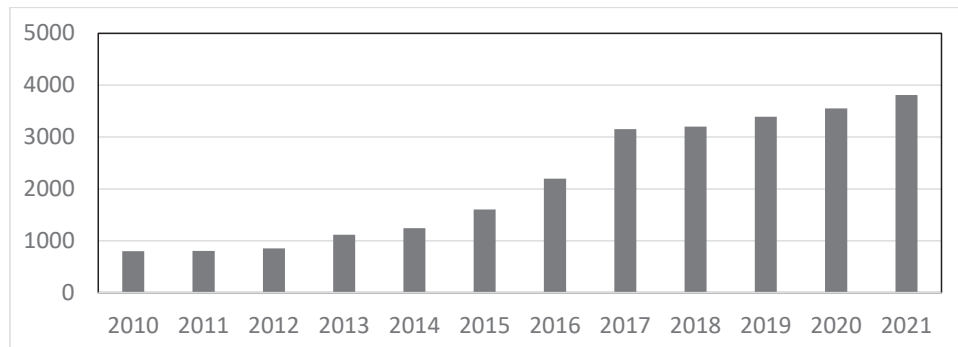
Source: CNB (2022d)

Since October 2017, the CNB has divided foreign exchange reserves into two large portfolios: liquidity and investment tranches. „As the name suggests, the liquidity part should serve to cover the immediate need for foreign currency (e.g. in the event of a failure of foreign currency inflows from abroad or, conversely, its significant outflow). On the other hand, the investment part serves primarily to generate profit... The expected impact of this distribution, which we call tranching, is overall a higher expected return. The investment horizon of the investment tranche is medium-term, i.e. around 5 years. So far, our investment horizon has been 1–2 years. In the event of a market downturn, it is thus possible to wait for the market to recover and realise a higher yield than in the case of short-term investments" (CNB, 2018). The CNB equity portfolios are managed by BlackRock and State Street Global Advisors; „They are invested in benchmark index markets: European (MSCI Euro), American (S&P 500), British (FTSE 100), Japanese (Nikkei 225), Canadian (S&P TSX) and Australian (S&P ASX 200)" (Lacina, 2022a).

In October 2021, the CNB Bank Board decided to renew the programme for the sale of part of the income from foreign exchange reserves. „The programme was launched in April 2004 and suspended in November 2012 in order to avoid any conflict with further monetary policy easing using the koruna exchange rate, i.e. the so-called exchange rate commitment. The renewal of the programme is part of the so-called normalisation of monetary policy, which has been taking place since the end of the exchange rate commitment in April 2017 and which was temporarily interrupted by the Covid crisis. Starting in January 2022, the CNB will gradually sell part of the income from foreign exchange reserves on the foreign exchange market. Transactions will be carried out in such a way that their impact on the exchange rate is minimal" (CNB, 2021b). „The possible start of divestments has been speculated for a long time, as the koruna is not strengthening much despite the expected rapid increase in rates. Although the CNB will try not to influence the market too much with the sell-off, it can be expected that this will have a positive effect
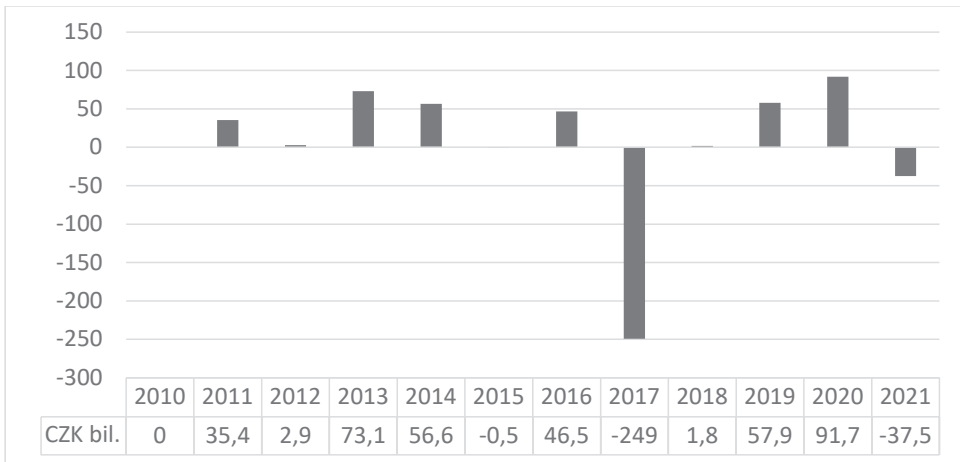
on the koruna," said Seidler, Chief Economist of the CBA... Revenue divestitures from 2009 to 2012 amounted to ... about one billion euros per year" (Patria, 2021).

At the beginning of March 2022, „CNB launched interventions to support the Czech koruna. In the last few days, it has reacted very sensitively to the escalation of tensions between the West and Russia. Since the beginning of the Russian invasion of Ukraine, the koruna has lost almost 7%. The CNB has decided to defend the crown by intervening in the market while maintaining a regime of „managed floating". That is, it does not give the market any obligation to defend the exchange rate at a particular level. On the other hand, by starting to defend the exchange rate in the vicinity of 25.90 CZK/EUR, it made it quite clear that the weakening beyond the 26.00 CZK/EUR mark is difficult for it to imagine. At the same time, the CNB has more than enough „firepower" to stabilise the koruna. Foreign exchange reserves at the level of EUR 157 billion are the highest in the region and more than double the volume of Czech short-term external debt. On the relatively illiquid Czech foreign exchange market, it should therefore not be a problem for the CNB to stabilise the koruna and eventually strengthen it. In addition, by stabilising the exchange rate, the CNB will gain the necessary room for manoeuvre so that it does not have to react to rising energy inflation by continuing to raise rapidly the interest rates. With a more stable exchange rate, it will have time to evaluate how Czech households will react to the new inflationary wave and whether consumption will be reduced and labour market tensions will be eased as a result of a more significant decline in real wages" (Bureš, 2022).

According to the Act on the CNB „The Czech National Bank performs the following tasks: a) determines and implements monetary policy, b) issues banknotes and coins, c) manages the money circulation ... (e) identifies, monitors and evaluates the risks to the stability of the financial system and contributes, through its powers, to the resilience of the financial system, limiting the build-up of systemic risks and maintaining financial stability, thereby creating macroprudential policy; cooperates, where necessary, with state authorities in macroprudential policy-making'. According to the same Act, the CNB „uses the generated profit to replenish the reserve fund and other funds created from profits and for other uses in the budgeted amount. The remaining profit is paid into the state budget".

During the last amendment to the Act on the CNB (2021a), Section 34a „Prohibition of Monetary Financing" was inserted, para. (1) states:„The Czech National Bank, in accordance with the Treaty on the Functioning of the European Union ... shall not provide for an overdraft facility or any other type of credit to the institutions, bodies, offices or agencies of the European Union, central governments ... or other public authorities ... undertakings...; the direct purchase of their debt instruments by the Czech National Bank is also prohibited'. It follows that indirect monetary financing is newly not prohibited! „The Czech National Bank has obtained a legal, i.e. indefinite, opportunity to purchase government and corporate bonds, including Czech government bonds, on the financial markets. Technically, this instrument is called quantitative easing, but it is popularly called printing money because it increases the amount of money in circulation. ... Some economists agree with this amendment. It will make debt servicing cheaper and pump money into the economy, which are legitimate arguments, and the economy needs an injection in a pandemic... CNB Governor Rusnok assured us that„the amendment to the Act on the CNB aligns our central bank's instruments with those in developed countries, including the euro area" (Milión chvilek, 2021).

Figure 4: CNB financial results in 2010–2021 (CZK billion)

|	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
CZK bil.	0	35,4	2,9	73,1	56,6	-0,5	46,5	-249	1,8	57,9	91,7	-37,5

Source: CNB (2021c, 2022c)

The financial results of the CNB in individual years (see Figure 4) are materially influenced by the monetary area (exchange rate differences, management of foreign reserve assets, conduct of monetary policy). For example, in 2017, the loss from exchange rate differences amounted to CZK 271 billion (CNB, 2021c). The CNB reported a loss CZK 37.5 billion for 2021; this amount increased outstanding lossesfrom previous periods. The bank's balance sheet thus remained unpaid accounting loss from previous years in the amount of CZK 38 billion. Equity reached an aggregate negative value of CZK −69 billion at the end of 2021. The aggregate exchange rate losses were CZK 92 billion, while the profit from foreign exchange reserves was CZK 80 billion. „According to Seidler, the Chief Economist of the Czech Banking Association, the debate on transferring the CNB profits to the state budget will thus be closed for a long time. The loss occurred in 2017... The reason for this was the increase in foreign exchange reserves in connection with the termination of foreign exchange interventions and the subsequent appreciation of the CZK exchange rate" (Lacina, 2022b). However, Czech economic and social policy will also play an essential role here in the next period, it may undergo significant changes!

The CNB „exchange rate commitment" meant a devaluation of the Czech currency, which had previously been directed towards a gradual revaluation, bringing the exchange rate closer to purchasing power parity (see Figure 5); previously, it was rather a question of when the exchange rate would reach a level below 22 CZK/EUR. From the point of view of the Czech economic and social policy as a whole, it is necessary to at least consider a return to the former exchange rate policy and to anchor the Czech currency in the euro area.

Figure 5: CZK/EUR: exchange rates (ER) and purchasing power parities (PPP) 2004–2020
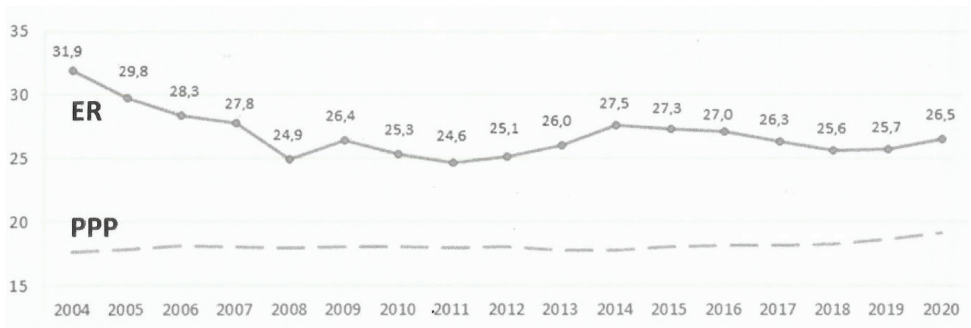

Source: ČSÚ (2022b)

The CNB huge foreign exchange reserves cannot be considered an advantage of the CNB current monetary policy. What to do with them? It is a problem of the Czech economic policy, not merely of the CNB Board.

3 Tax policy

The Czech tax structure differs significantly from the OECD average for three fiscal revenues: we have very low personal income and property taxes, and on the contrary, we have a high share of social security contributions – see Figure 6; the abolition of the taxation of the super-gross wage from 2021 will be reflected in the tax structure by a reduction in the share of the personal income tax (individual taxes). The OECD notes that the Czech „structure of government revenues is unbalanced, with a reliance on social security contributions. ... collected social security contributions, the Czech Republic ranks among the highest countries across the OECD. ... VAT revenues are above the OECD average. ... Imbalances in the structure of government revenues contribute to relatively high cost of labour. The tax wedge is the 6th highest across the OECD and the average rate of employer social contributions is the second highest... Up to now, this has not been detrimental to labour market performance, in particular to employment, only because the average wage is low compared to other EU countries. Indeed, the Czech Republic has built its comparative advantage by holding wages low to attract foreign direct investment, in particular in manufacturing industries. ... However, as wage convergence towards OECD and EU averages is continuing and given the recent acceleration of wage growth, the high level of wage taxation could become burdensome. To maintain wage competitiveness, the government should consider shifting part of the financing of social protection from wages towards taxes on goods and services or on all kinds of income (e.g. capital and property income) and environmental taxes. For instance, there is room to shift one percentage point of GDP of social contributions collected towards VAT revenues and/or environmental taxes … indirect taxes are less harmful for growth than taxes on wages" (OECD, 2018).

Figure 6: Tax structures in 2020: Czechia, Germany, Sweden, USA, OECD average (%)
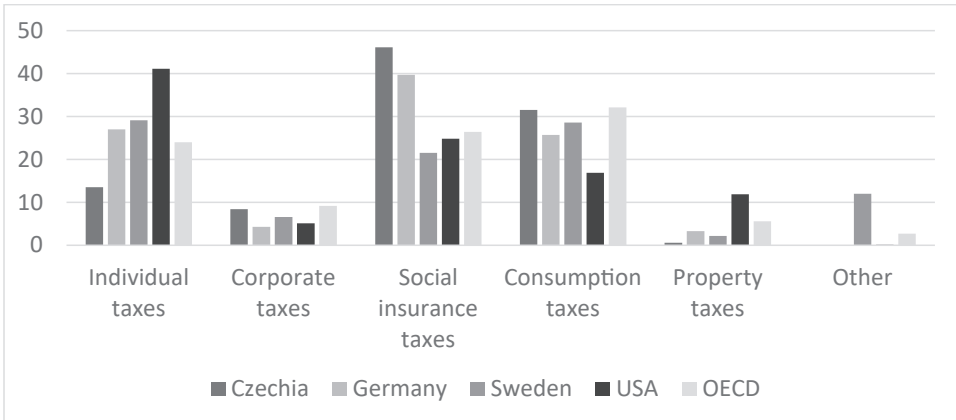
Source: Bunn (2022)

Specifically, the OECD recommends that we reduce the total rate of social insurance premiums paid by employers from 34% to 31%. The argument about the lesser harmfulness of indirect taxes is from the neoliberal workshop, the counterargument could be high tax evasion of VAT, above-average current Czech standard VAT rate within the OECD and also lower VAT rates in three neighbouring countries. Another OECD source (2019) shows that standard VAT rates have stabilised at historically high levels in recent years; in 2019, the average base rate was 19.3%. For these reasons, we cannot agree with the recommendation to increase Czech VAT rates.

Analyses of the Czech tax structure show that the key to the reform of social security contributions must be sought primarily in the conception and financing of social security. In other words: before we start thinking about replacing a few percentage points of social security contributions, for example, by increasing the VAT rates, it is necessary to think about the justification of the social insurance premiums. There is a fundamental conceptual difference between social insurance premiums and general taxes! Social insurance premiums should certainly not have a fiscal function solely or mainly; just as their task cannot be (and was not) e.g., to increase the price of labour (in post-communist countries).

Since the first half of the 90s, Czech social security contributions have had three basic forms:

• "Social security premium and contributions to the state employment policy" with a total current rate of 31.3% of the gross wage, which consists of three components:

– Pension insurance premium with a total rate of 28%, of which the employer pays 21.5% and the employee 6.5%. Self-employed persons pay insurance premiums at a rate of 28% of the optional assessment base, but at least one quarter of the average wage.

– Sickness insurance premium paid by the employer: 2.1% (self-employed voluntarily).

– Contribution to the state employment policy, which is paid by the employer and the self-employed: 1.2% (the assessment base of the self-employed is the same as the optional base for pension insurance premiums).

• "General health insurance premium" with a rate of 13.5% (employer 9%, employee 4.5%), which is also paid by the state for the so-called state insured persons (the assessment base from 1 January 2022 was a purpose-determined amount of CZK 14,570 per month): the insurance premium from this amount is CZK 1,967 per month. Self-employed persons pay insurance premiums at the same rate, but from half of the profit, while for full-time entrepreneurs („main activity"), the minimum amount of health insurance premium is set at the level of half of the employee average wage, which represents CZK 2,627 per month (2022). „Persons without taxable income" who have not been included by the state among the state insured persons are to pay a flat-rate insurance premium of 13.5% of the minimum wage (CZK 2,187 per month from 2022).

• Statutory employer liability insurance for damage in the event of an accident at work and occupational disease: the historical insurance premium tariff (since 1993) contains 7 rates: 2.8‰, 4.2‰, 5.6‰, 7‰, 8.4‰, 10.5‰ and 50.4‰. The premium for this „private" insurance is paid by the employer.

The brief overview of insurance premiums alone shows that Czech social security contributions have no comprehensive concept: the construction of pension insurance premium and contribution to the state employment policy gives the impression of an insurance system with specifics for self-employed persons. Health insurance premiums, on the other hand, at first glance are an unfair health tax. The statutory liability insurance premiums, in turn, suite to compulsory private insurance. It would be best if the entire Czech social security system were based on a single welfare regime. In this respect, it is characteristic of the OECD consultancy that it does not deal with the very concept of Czech social security at all; it concludes, based on the tax structure alone, that social security contributions should be reduced. This is also a simple reflection of the fact that they have classified insurance premiums as taxes – and assume that they can manipulate the (total) rate of social security contributions according to the general considerations of the so-called optimal taxation theory.

According to our analyses, the Czech tax structure is unbalanced mainly because we have very high social security contributions, at the expense of personal income tax! Shifting a significant tax burden from social security contributions to personal income tax is very easy and highly effective, as all employee contributions can be simply included in the personal income tax, leaving only the social security contributions paid by employers and self-employed persons. Even after this rationalization tax reform, (employer) contributions will be dominated by their tax nature, which allows a further fundamental rationalization of the existing social security premiums and contributions to the state employment policy, general health insurance premiums and statutory employer liability insurance for damage caused by work injuries and occupational diseases, all within

the first (and decisive) stage of the implementation of the single collection point. The merger of all these premiums (including contributions to the state employment policy) will create a single employer social security contribution (or „social insurance premium"), which will also significantly reduce the (internationally monitored) administrative burden on (medium-sized) enterprises or employers in general (Vostatek, 2022).

The greatest rationalization will occur, within this „technical" tax reform, in the existing health insurance premium sector, which is an unnecessary complication in the conditions of central state management of health care financing, based on the so-called reimbursement decree of the Ministry of Health. Health insurance premiums will thus become, like the other insurance premiums and contributions mentioned, an integral part of the collection of the new social insurance premium paid by employers and self-employed persons. The integration of health insurance premiums will also eliminate existing state payments for state insured persons and health insurance premiums paid by persons without taxable income. The public health care will be financed from the state budget in the amounts foreseen in the reimbursement decree of the Ministry of Health. For simplicity we may declare that public health care is (will be) tax financed. In any case the aim of the introduction of the "our" single collection point is not to reduce the public health care expenditure. The only aim is to cancel the collection of the "health tax" with a uniform rate of 13.5% by 7 health insurance institutions!

Today, employee insurance premiums consist of a pension insurance premium (6.5%) and health insurance premium (4.5%). These two premiums, totaling 11%, are unnecessary and can be integrated into the income tax on dependent activities. In the basic variant, the basic tax rate will be increased from 15% to 26% when moving to a single collection point. The second personal income tax rate can be eliminated in this reform because it is non-systemic; the progressivity of the tax is sufficiently ensured by the basic tax credit per taxpayer. An additional argument is that the (now existing) second tax rate is applied only to taxpayers with exceptionally high incomes (four times the national average wage) and, in addition, the existing pension premiums are subject to an earnings ceiling when calculating premiums, also in the amount of four times the national average wage! Generally speaking, rather than having a (provocatively) very high earnings ceiling, it is better not to have any; this also applies to the earnings ceiling for insurance premiums paid by employers. To be sure, we would like to point out that the rate of withholding tax on income in this reform may remain at the level of 15% (on the other hand, however, in Austria, for example, this rate is 27.5%, which is quite in line with the Western average). Our „higher principle" here is the political viability of a single collection point for all social security contributions, with a single rate of 34.1% of the uniform assessment base, from 2024!

Further scope for reducing the overall future rate of social security contribution is due to the high equalization of Czech public pensions, but this can be ignored at this stage because the pension reform may strengthen the insurance principle in pensions, too. The higher necessary (total) rate of social security contributions would result from the potential introduction of taxation of key social security benefits in the future. Even from these points of view, it is clear that our integrated social security contribution (as a whole) will also fulfil a fiscal function beyond the scope of the model social insurance.

The necessary restructuring of social security contributions and personal income taxation might be reflected in the taxation of dividends, interest, and other capital gains. It is useful to briefly address the related issue of corporate income taxation. The primary socio-political question is whether dividends should be taxed once as part of corporate income taxation and for the second time as individual income.

The classical theory and policy of corporate tax had no problem with the „double taxation of dividends" of joint-stock and similar companies because the theoretical basis for taxing the income of joint-stock companies was their so-called material ability to pay (Engliš, 1929). By contrast, the integrated concept of taxation of personal and corporate income is based solely on personal ability to pay. Table 1 shows the different practices today in the taxation of dividends in OECD countries, with assumed full distribution of corporate profits in the form of dividends. For example, the Czech taxation of dividend income is based on the classic concept: the company pays corporate income tax at a rate of 19% and distributes the entire profit after tax in the form of a dividend, which will be taxed at a rate of 15%, so the resulting tax burden on profit is: $0.19 + (1-0.19) * 0.15 = 31.15\%$. With this „classical" system of interconnection of both income taxes, for example, Germany has total tax burden on profits of 48.42% and Austria 45.63%. In some countries, the corporate tax paid is reflected in full or in part in the calculation of personal income tax. In Australia, for example, the corporate profit is taxed at 30% and shareholder income at 47%, and the overall tax rate is 47%. The same is true in Mexico, Chile and New Zealand („imputation system"). In Estonia and Latvia, dividends are not taxed, and corporations pay tax at a rate of 20%. A combination of these variants is applied in several countries. One way or another, it is clear from the table that the aggregate Czech taxation of corporate and personal income is the 7th lowest of the 36 OECD countries; this corresponds to post-communist policies, but we should (already) get rid of them. Austria has reduced its corporate tax rate from 25% to 23% this year and to 21% next year; the personal capital gains tax rate remains 27.5%. If we wanted to emulate Austria a little, we could increase the withholding tax on dividends from 15% to 26%. We recommend considering a harsher option for foreign capital: to increase the corporate tax rate from 19% to 31.15% (i.e. to the level of today's total tax burden on profits) and to abolish the withholding tax on dividends. Foreign capital will certainly „survive" this reform because the overall relative level of profits in our country is significantly higher, de facto at the expense of wages. In general, we recommend implementing (preferably in the whole EU) the concept of CBIT (comprehensive business income tax) for the corporate tax, in which interest is not deducted from the corporate tax base. Corporate income is taxed here regardless of whether the company is funded by bonds or shares. This approach eliminates the debt-bias in corporate taxation.

Table 1: Corporate tax rates on distributed profits (CIT), personal income tax rates on dividends (PIT) and total taxation of these incomes (CIT+PIT) in 2021

	CIT	PIT	CIT+PIT		CIT	PIT	CIT+PIT
Korea	27,50	49,50	59,36	Spain	25,00	26,00	44,50
Ireland	12,50	51,00	57,13	Finland	20,00	34,00	43,12
Canada	26,15	53,53	55,21	Mexico	30,00	42,00	42,00
Denmark	22,00	42,00	54,76	Slovenia	19,00	27,00	41,28
France	28,41	34,00	52,76	Chile	10,00	40,00	40,00
Portugal	31,50	28,00	50,68	Luxembourg	24,94	42,00	40,70
UK	19,00	38,10	49,90	N. Zealand	28,00	39,00	39,00
Germany	29,94	26,38	48,42	Iceland	20,00	22,00	37,60
Israel	23,00	33,00	48,41	Switzerland	19,70	22,29	37,59
Belgium	25,00	30,00	47,50	Turkey	20,00	40,00	36,00
USA	25,75	28,91	47,22	Poland	19,00	19,00	34,39
Australia	30,00	47,00	47,00	**Czechia**	**19,00**	**15,00**	**31,15**
Norway	22,00	31,68	46,71	Greece	24,00	5,00	27,80
Netherlands	25,00	26,90	46,56	Slovakia	21,00	7,00	26,53
Austria	25,00	27,50	45,63	Hungary	9,00	15,00	22,65
Sweden	20,60	30,00	44,98	Lithuania	15,00	...	20,00
Japan	29,74	20,32	44,42	Latvia	20,00	0,00	20,00
Italy	24,00	26,00	43,76	Estonia	20,00	7,00	20,00

Source: OECD (2022)

Value added tax in the EU is an exemplary policy failure. The predecessor of VAT was the turnover tax, introduced in European countries after the First World War as a „temporary" measure until public finances were „normalized". The turnover tax is not „competitively neutral" because it favours large enterprises. „From the point of view of personal and material ability to pay, the turnover tax does not stand up to criticism and cannot have a place in the normal tax system. It is a manifestation of the extraordinary need for public finances, especially in the post-war period. Its financial advantage is its enormous receipt, because the entire yield of national labour runs through it, and partly more than once, so that even with a small percentage of taxation, its yield is great" (Engliš, 1929). For these reasons, it has been replaced, especially in the EEC and EU countries, by value added tax, which in its model form is competitively neutral. VAT has been introduced in more than 150 countries around the world and it is hailed as „undoubtedly the most successful fiscal innovation of the last half-century" (Mirrlees et al., 2010). The only (determinant) country that has not introduced VAT is the US; they have state and, where appropriate, local sales taxes; this is also reflected in the US tax structure, in a significantly lower share of consumption taxation – see Figure 6. Leaving aside the (rather substantial) question of whether to tax consumption at all, the disadvantages are, among other things, complex administration, tax evasion, rate differentiation and tax exemptions. The value-added system used in the EU is the worst one in this respect; it is also the oldest one, which is why it is considered as the first generation of VAT. The second generation of VAT (with one tax rate and significantly fewer exemptions) includes, for example, New Zealand, Australia, Canada and South Africa. The third generation of VAT could be a ,reverse charge', where the tax is passed on to the customer, so that the tax is only

charged between businesses and therefore there is a significantly lower ‚turnover' of that tax between businesses and tax administration. The EU allows only partial application of this construction here, e.g. in a sector highly affected by tax evasion. The ‚income type' of VAT applied in Japan is also referred to as the value added tax system; the ‚subtraction method' used here consists in the fact that, at the level of the undertaking, the taxable amount is total turnover/sales after deduction of total purchases; it is therefore essentially a taxation of wages and profits.

In the US, Hall and Rabushka tried to replace VAT (which the federation cannot introduce there) with two taxes with an equal rate of 19%: an individual wage tax (with a tax deduction according to family members) and a business tax (taxing sales minus purchases including investments). These two „substitute" taxes with one flat rate were applied in several post-communist countries (personal income tax, corporate income tax), including references to Hall and Rabushka, but these countries also introduced a value-added tax with the same rate! In the next phase, this policy was reformed (usually after a change of government). On top of all this, Hall changed his mind about flat wage taxation, recommending 2 rates in 2011: e.g. 15% and 30%!

One of the fundamental weaknesses of the current value added tax system in the EU and in other countries is the treatment of financial services: these products are in principle exempt from VAT, which also means the impossibility of deducting the tax contained in the price of products purchased by the companies concerned. This approach has been explained by the specifics of the functioning of these financial services. According to this approach, financial institutions can charge for their services (Poddar and English, 1997):

- Explicit fees and commissions and

- Implicit fees in the form of margin.

Taxation of „explicit" VAT fees and commissions is considered to be trouble-free; the basic construction of VAT can be applied here. However, the problem (generated by the lobbying!) is reportedly with margin-based financial services. Margin, e.g. interest spreads in themselves even represent value added, but the basic problem is to „divide" this margin into a part belonging to the business with the supplier (deposit) and with the customer (credit). Nevertheless, the renunciation is very simple because all businesses are based „on margin"! Credit transactions are not excluded. Interest on the loan is constructed in the same way as „explicit" fees and commissions, and it is no problem to add VAT to it. A similar case is the interest on deposits, it is only a little more „complicated" if the „supplier" is an individual who is not a VAT payer. However, the same case is, for example, buying scrap from the population. It may seem like a complication (or it is a complication), but the problem is not the so-called implicit fee. In several countries of the world, financial services are „normally" taxed by VAT. The problem stems primarily from lobbying! Alternatively, let us look for the problem in the very existence of VAT, or rather in its „subtraction method" in the EU. The next generation of VAT may be its transformation into a US tax on sales to the final consumer; it would be just another „shift" in comparison to moving to a general reverse charge.

The insufficient taxation of financial services is (as a rule) compensated by special taxes. International theory and policy in this direction recommends the use of the concept of the tax on financial activities; the most appropriate construction is the taxation of the wages and profits of financial services providers. In Denmark, for example, financial services providers pay a special payroll tax at a rate of 15.3% (2021); the tax is deductible from the corporate income tax base. Another option is a higher corporate tax rate. In the UK, banks pay a corporate tax surcharge at a rate of 8% of profits. The corporate tax rate there is 19%, from April 2023 a second corporate tax rate of 25% is (was) to be introduced for profits over £250,000 and on this occasion the bank surcharge rate is to be reduced to 3% of profits over £25 million. Mirrlees et al. (2011) recommended to eliminate almost all zero and reduced VAT rates and to introduce a financial services tax as an VAT equivalent.

Figure 7: Basic insurance tax rates in Europe (2018)
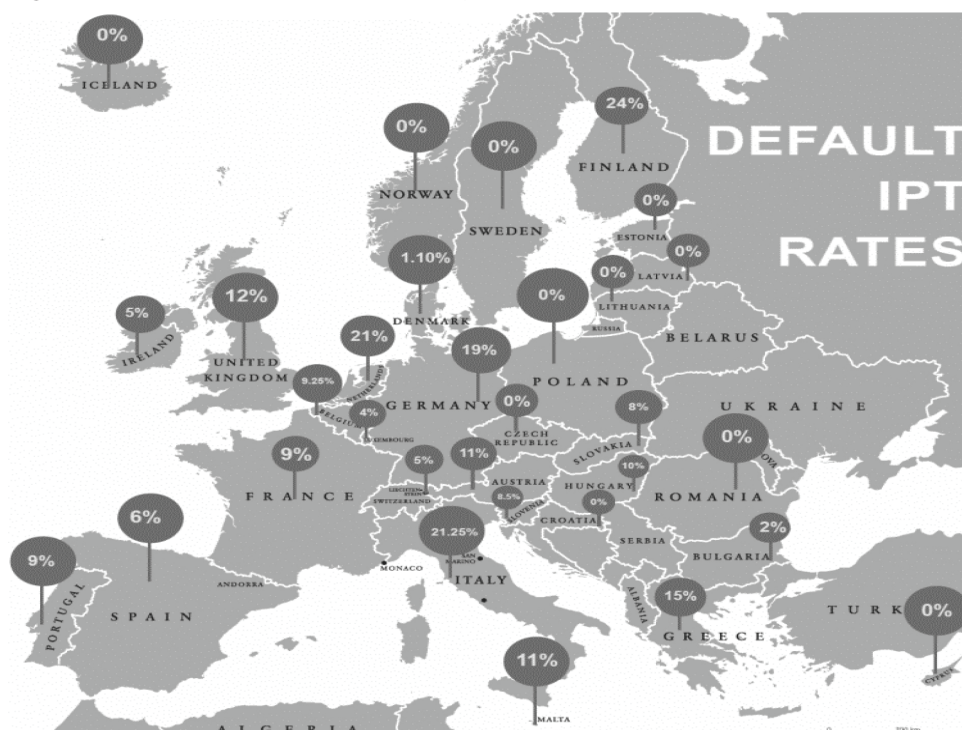
Source: Bourdaire (2018)

Another specialty is the taxation of insurance services – an insurance tax that is levied on insurance premiums: in 20 European countries it taxes almost all non-life insurance, several of these countries use rates identical to or close to the basic rate of value added tax (Finland, the Netherlands, Germany). German insurance tax represents 4% of all tax revenues; the country's Christian Democratic model of income taxation provides a deduction of the entire premium from the personal income tax base. Austria and some other countries also tax life insurance premiums. The Baltic countries and Norway do not have this taxation, Slovakia (and some other post-communist countries) introduced a sectoral tax („special levy of selected financial institutions", rate in per mille

from assets) and after a few years „replaced" it with an insurance tax (8% of non-life insurance premiums). The basic orientation about the different rates is given in Figure 7.

In Czechia, insurance companies pay only 3% of the premiums received from motor liability insurance to the Damage Prevention Fund, which is administered by the Czech Insurers' Bureau; de facto it is a special-purpose tax. The insurance tax was discussed years ago. „Ministerial experts in their proposals ... considered other ways to reach out insurance companies. For example, the income tax of insurance companies would be structured in proportion to the insurance premiums written, and if it did not reach the specified minimum (for example, three percent), the insurance company would have to pay the rest. They also wanted to touch the tax deductibility of technical reserves... However, there will be changes in reserves due to a European directive. The so-called Solvency II rules free up insurance companies' hands when investing. Instead of a strictly enumerated composition of reserves, they will have to adhere only to the prescribed risk-capital ratio" (Mašek and Vlková, 2011). The Babiš government said in its programme statement: „We will review the tax deductibility of technical provisions in the insurance sector. Tax-deductible technical reserves will be newly linked to the rules contained in the European Solvency II Directive. This system will be more resistant to possible overvaluation by taxpayers, as the amount of technical reserves thus determined can be influenced by the taxpayer significantly less than in the current procedure, which is based on the Accounting Act" (Babiš et al., 2018). This review of tax deductibility was implemented in 2020, despite the opposition of insurance companies and academicians. We do not have a comparison with foreign countries in Czechia.

In general, the approach to taxation of the financial sector should depend on the reform of the value added tax, because the (now necessary) alternative solution to this issue can hardly consider the unevenness of the tax burden resulting from the very construction of the first-generation value added tax. However, the modernisation of value added tax is very difficult in the EU conditions, although it could theoretically be relatively simple. In the medium term, we have no choice but to accept the given concept of value added tax in the EU. This implies the necessity of introducing a substitute tax on financial services in Czechia – unlike most EU countries, we do not have any such solution. At the same time, we could/should prefer the most general solution, which is a financial services tax constructed as VAT, along the lines of Mirrlees et al. Special taxes, such as bank tax or insurance tax, are secondary solutions.

Tax policy can relatively quickly contribute to increasing the efficiency of the entire economy, primarily by rationalizing and unifying the entire existing spectrum of social security contributions, resulting in a uniform employer contribution to social security and the inclusion of contributions paid by employees into the tax on income from dependent activities. Further rationalisation can be linked to social security reforms, including health care. In the area of corporate tax, it is advisable to focus on a fundamental reform consisting of the integration of the dividend tax into the corporate tax and the exclusion of interest from the corporate tax deduction; here, the EU is active only towards a common corporate tax base, which will probably mean international discussions or negotiations.

4   Money creation and exchange rate policy

At the time of the emergence of modern currencies, the so-called seigniorage played a relatively important role – the yield from the minting of coins and later from the issuance of state notes. Nowadays, electronic money prevails – deposits in accounts with (private) banks and the related use of payment cards. In the US, for example, cash dollars account for only about 10% of the total money supply (Rodeck and Curry, 2021). Figure 8 shows the central bank's balance sheet; in the liabilities there are coins and banknotes, as well as (mandatory) reserves of commercial banks. Electronic money is in the liabilities of commercial banks, loans completely predominate in assets; reserves deposited with the central bank represent only a small fraction of assets.

**Figure 8**: Cash and electronic money in a two-tier monetary system
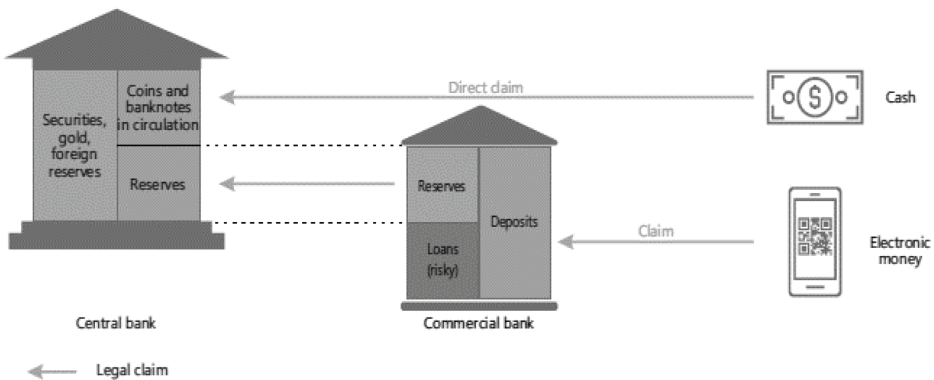
Source: Auer and Böhme (2020)

We can imagine the complete replacement of cash money with electronic money; from the point of view of one smaller country (Czechia), it can be assumed with certainty that the national currency will lose its practical meaning for people if (almost) everyone switches to paying by card or mobile. In Figure 9, cash money would be reduced and, in principle, the central bank would be left with the reserve agenda; the role of reserve requirements as an instrument of central bank monetary policy is already minimal. The future of the official digital currency is the subject of research (Rodeck and Curry, 2021). At the same time, two related questions also arise: whether the privatization of the issue of money (in private banks) is (or was) necessary, and whether the revenue from the issue of electronic money should not be revenue for the state budget. Given that we are primarily concerned with the coherence and adequacy of the Czech economic and social policy in the medium term, we can assume that Czechia will not be a leader in the further development of monetary policy in the EU or even in the world. Together with other (related) economies, we can assume that the digitalization of the currency will also take place in our country, in cooperation with all participants, including the private banking sector. Internationally, it will also be a question of whether the US dollar will maintain its significant position in foreign exchange reserves in the world – this position is important or advantageous

for the US. The general scheme of the „two-tier" model of the USD is shown in Figure 9. Note also that here the Treasury produces cash and digital USD for the Federal Reserve Bank (Fed); this can be taken for granted as a conceptual requirement – it is already non-systemic for one money to be issued by the state or central bank and the other money to be created by private banks through their lending operations. Today's world is closer to the variant of the production of (even digital) money by the state/national bank, with the fact that the proceeds of this production/issue of money will be paid into the state budget.

Figure 9: Two-tier distribution model of physical cash and tokenized digital dollars
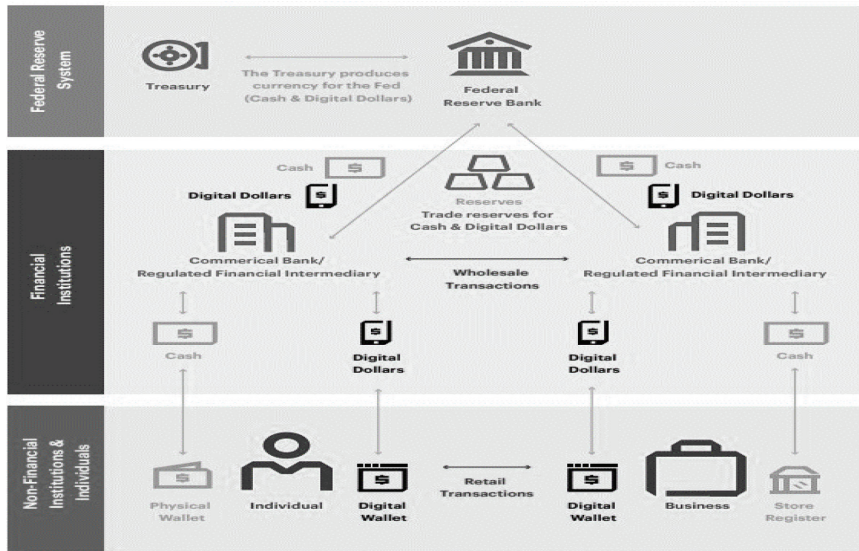
This diagram reflects the current US, two-tier distribution model of physical cash and hypothesized tokenized digital dollars to sit alongside it.

Source: Cacioli (2020)

Both the Federal Reserve Board and the US President are very cautious about introducing a central bank digital currency (CBDC). Federal Reserve Board Chair Powell said: „We think it is important that any potential CBDC could serve as a complement to, and not a replacement of, cash and current private-sector digital forms of the dollar, such as deposits at commercial banks … „The design of a CBDC would raise important monetary policy, financial stability, consumer protection, legal, and privacy considerations and will require careful thought and analysis-including input from the public and elected officials" (Fed, 2021).

In 2018, a referendum was held in Switzerland on the transfer of the electronic money issuance to the Swiss National Bank (SNB); 24% of participants were in favour of this proposal to introduce ,Vollgeld'. The purpose of this „monetary reform" was to raise new resources for the cantonal budgets, where the SNB transfers its profits.

„At present, monetary policy in countries with high sovereign debt is getting dragged along by fiscal policy. Gradually, the independence of central banks is disappearing de facto. The bank-credit issuance of money is gradually displaced by the issuance

of money through the state budget deficit and the purchase of government bonds by central or commercial banks. In the policy of quantitative easing, it is in fact a hidden „modern" form of budgetary issuance of money, where we do not encounter the forced circulation of state notes, but the effects on the functioning of the monetary system are and will be similar. National (or common) currencies have clearly failed to store value for a long time. Their exchange value is rapidly declining against gold, real estate, and art objects. Gradually also against the standard consumer basket, even after considering interest income from term deposits. Inflation targeting loses its content and only the verbal diction of inflation reports remains. Quantitative easing is losing its extraordinary monetary character and is becoming a fiscally enforced standard in over-indebted countries... Countries (or groupings of countries) whose currency performs the functions of „world" money, are in a specific position. These countries are also assisted with the sovereign debt monetizing by foreign central banks, which hold government bonds as foreign exchange reserves.[1]... The massive increase in the volume of government bonds held by central banks inevitably leads to unprecedented increases in the free liquidity of commercial banks at the central bank ... Against these assets of commercial banks, deposits of households and firms are created in their liabilities. ... Deposits and bank liquidity are a balance sheet product of the uncontrolled growth of government debt and its monetization. Central banks are in a historically paradoxical situation where their anti-inflationary policy of rising interest rates leads to an increase in the yields of commercial banks and an increase in their own losses. The textbook proposition that central banking is a profitable industry ceases to apply" (Mandel and Dvořák, 2021). We consider it necessary to change this in our country as a priority. We are not interested in profit at any cost. We can proceed from the fact that in principle the state should/could issue (also) the electronic money or the central bank on its behalf, with the proceeds of this operation belonging to the state. We can prepare this basic model variant placidly. In principle, however, we can immediately take advantage of the fact that the banking sector in our country is underburdened with the value added tax – as we have stated above. Thus, under the heading of substitute value-added taxation, we can introduce a special bank tax or an additional tax on bank profits, etc. These tax constructions occur abroad – so we can introduce them regardless of the need to siphon off banks' profits resulting from the issuance of electronic money. Regardless of these constructions, a simple indirect solution is available: we do not have to strive for a direct issue of electronic money by the state or its national bank, at least for the beginning it is sufficient to regularly check the creation of money in the private sector in a given period (year) and distribute this creation among commercial banks, for example, according to the volume of deposits or loans in the given period. This is probably the cleanest and also the simplest solution; after all, we do not need to „hide" behind a bank tax or VAT. Polański and Szadkowski (2021) „estimated seigniorage and showed its evolution in the context of central banks' financial results for seven central banks... the estimated seigniorage was usually below 0.4 per cent of GDP in 2003–2019". After all, adequate value-added taxation should be introduced independently of the levy on the creation of electronic CZK. The actual financial transfer of the issue of electronic money to the state or the state budget is feasible from 2024! The question is, of course, how the banking sector will react to this; but this is a subordinate issue that cannot prevent a fair national economic policy – not only in this respect. The CNB may be in charge of analyses and calculations of the seigniorage levy.

[1] *Foreign central banks (or governments) hold US government bonds for $6.81 trillion, or about 1/3, of U.S. public debt.*

Czech exchange rate policy should fit into the overall economic policy. We need a new „exchange rate commitment" that will primarily lead to the integration of the CZK into the euro area. The overall level of the CZK exchange rate has an impact on the structural transformations of the economy; as Figure 5 shows, the exchange rate is well a long way from purchasing power parity over the long term. That is why we need a binding programme of strengthening the CZK exchange rate, e.g. to the 20 CZK/EUR rate. A specific proposal is to announce a fixed exchange rate regime e.g. from March 2023, with a default rate of 24.30 CZK/EUR, with the plan that every subsequent month this exchange rate will be strengthened by 0.10 CZK/EUR – until the rate 20 CZK/EUR is reached. Everything else must step aside; the possible last „instance" (the financial guarantor of the whole operation) will be the state budget. The possible objection that the (albeit only relatively) freely moving „market rate" of the CZK is the optimal instrument of economic policy is long outdated. „Fluctuations in the exchange rate pose a risk to the economy, especially in crisis periods… /this/ risk that could have been eliminated by switching to a common currency… we could avoid this risk if we fulfilled the obligation, to which we committed ourselves when joining the Union, and adopted the euro" (Šramko and Petříček, 2022).

„A stable CZK exchange rate, without major fluctuations can help Czech citizens to protect the real value of money and companies reduce the cost of hedging against exchange rate losses. Slovakia was in ERM II for over 3 years and was gradually targeting three different exchange rates of the Slovak koruna against the euro depending on the development of the economy, with the Slovak koruna gradually strengthening by more than 21% in ERM II from the initial 38.455 to 30.126 per euro. This regime was used in Estonia, Lithuania and Latvia, which spent 8 years in ERM II before adopting the euro. Denmark, which has an opt-out for the adoption of the euro, has been a member of ERM II since 1999… The mere entry into ERM II seems advantageous for Czech citizens and the state" (Martínek, 2021). In the future, the Czech exchange rate policy should be based on the state economic policy.

5   Government debt and foreign exchange reserves

"The inflationary experiences of the twentieth century led to the erection of institutional barriers against deficit financing and the financing of deficits by means of seignorage. Those barriers took the form of fiscal rules, central bank (CB) independence and inflation targeting. CBs were given instrument independence in setting short-term interest rates and the monetary base and directed to focus their policies mainly on price stability. Most importantly, CBs were prohibited from lending to government by directly buying new government bonds in order to prevent the use of seignorage by fiscal authorities. Those institutional measures along with the global financial crisis wiped out inflation altogether. The traumatic memories of the previous century cemented those institutions to such an extent that they managed to survive even in the face of extended deflationary periods and the associated zero lower bound on interest rates" (Cukierman, 2021).

The role of public debt in economic policy has changed significantly in the last decade. Many analysts have even concluded that state finances are no longer based on taxes (tax-based state), but on debt (debt-based state). At the same time, there are also relatively

big differences between individual states. Overall, developed countries are significantly more indebted. However, even among developed countries, there are major differences; Figure 10 shows the different relationships between gross government debt and GDP in the G7 countries (average 134.7%), including data for the EU as a whole (89.8%). There are also great differences within the EU – see Figure 11. At the end of June 2022, this debt in Czechia was relatively low: 43.5%, the „record holders" in the EU are southern European countries. However, the Czech debt is increasing significantly: the Czech state budget deficit increased in 2021 from 2,050 to 2,466 bil. CZK, with a substantial contribution from the Babiš income tax reform. The question is, not only in our country, who will pay for it, or whether public debts and deficits are (un)advantageous. An essential factor here is the overall development of the relevant economy, which is significantly influenced, among other things, by its rating. We focus here „only" on the interconnection of fiscal and monetary policy, where there are enormous differences between Czechia and the euro area.

Figure 10: General government gross debt as a percentage of GDP, at the end of 2021: UK, EU and G7 member states
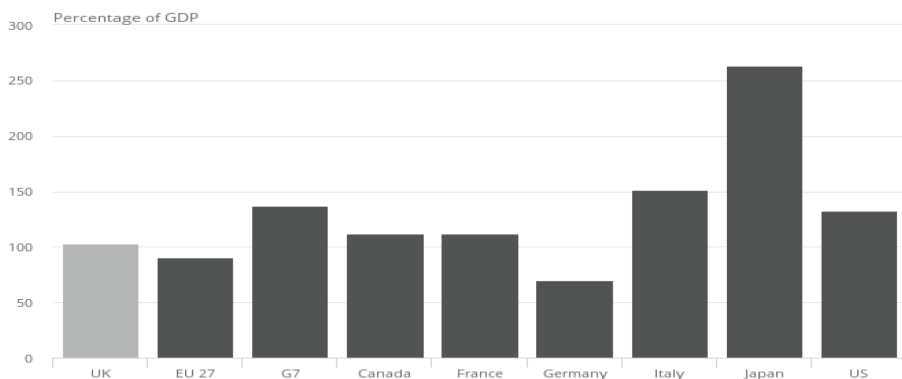
Source: Office for National Statistics (2022)

Figure 11: General government gross debt as a percentage of GDP: UK and EU member states, at the end of June 2022
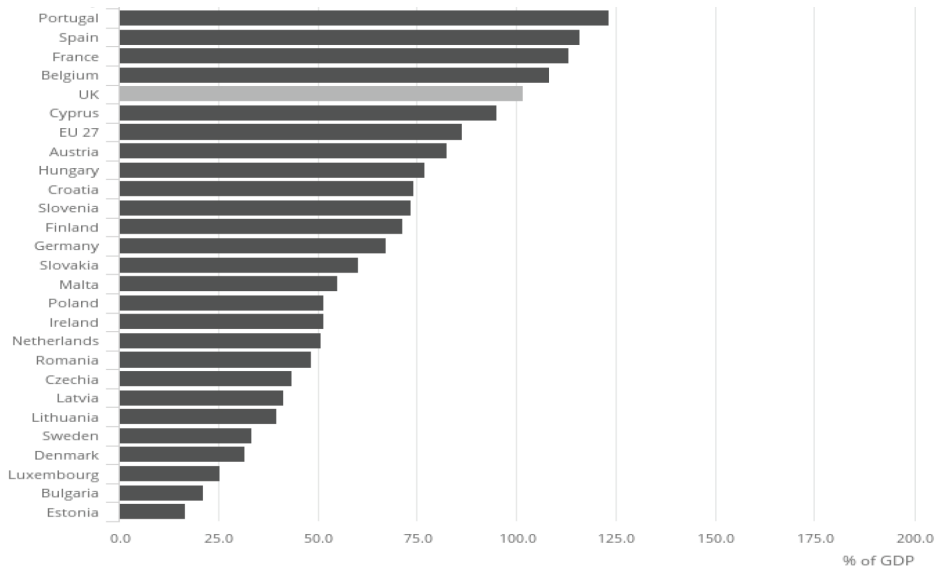
Source: Office for National Statistics (2022)

The results of the CNB policy are huge foreign exchange reserves: less than CZK 4 trillion, and economic losses – CZK 38 billion last year (see Figures 3 and 4). How is this possible? „52.5 percent of the reserves are in world bonds, mainly government bonds. Then we have deposits with various banks around the world, a total of 31.2 percent of the portfolio... The yield on foreign exchange reserves measured in foreign currency reached 2.11 percent over the past year – thanks to shares. For comparison, the average annual return in 2006–2020 was 2.67 percent. Last year, therefore, it was a slightly below-average year – unfortunately we have an ultra-conservative strategy" (Michl, 2022). The real return, after deducting inflation, is negative, so these results are disastrous. The official response is of this type: „The CNB's task is primarily to ensure price and financial stability, not to generate profit... The payment of a dividend to the state budget is legitimate, but it is not possible now. The CNB must preferentially cover past losses and fulfil the so-called reserve fund" (Mora, 2021). Where are (some) of the CNB Board deliberations heading? „Michl ... sees the potential for better appreciation of foreign exchange reserves ... His vision ... following the example of Norway, is the creation of a large state investment fund for future generations, which the Czech National Bank is to manage. This could also pay for pension reform, which will be necessary in the coming years due to the unsustainability of the current first pillar of the pension system. However, he himself points out that this will not be an easy task. However, the foreign exchange reserves can help with it. „The first and substantial step towards this fund is a long-term profitable central bank, which will be fueled by the foreign exchange reserves of the Czech National Bank. These amounted to EUR 135.4 billion at the end of 2020. The task will be, among other things, to spread these foreign exchange reserves so that they earn more in the long term than the potential exchange rate loss from the appreciation of the CZK will be," Michl said. The Czech National Bank board member has also prepared a concrete

plan for the long-term profitability of the Czech National Bank. It proposes that the central bank increases the holding of shares of foreign firms from 13.5 to 20 percent within one to three years. In the next five years, this holding is even to increase to fifty percent" (Lacina, 2022a). These are all (wishful) wishes to „save" more than CZK 2 trillion for the CNB that it does not need for anything. The state also does not need a „large sovereign investment fund for future generations"; the task of the state is not to create pension funds. Not to mention the fact that there are more than enough savings in the world … and there is no adequate use for them. It is (to a limited extent) more advantageous for the state to borrow at zero or negative real interest.

„Another effect of excessive foreign exchange reserves, which the CNB has created by issuing CZK on foreign exchange markets, is the strengthening of inflationary pressures in the economy. Inflation in the Czech Republic, with its more than 6%, is significantly higher than inflation in the euro area countries and cuts real value not only nominally rising wages and old-age pensions, but also the savings of the population, which the population has stored at virtually zero interest on bank accounts. Every year, citizens lose about CZK 90 billion, which reduces the purchasing power of their savings" (Makovec, 2021).

Already in 2017, it was written: „The Czech National Bank has increased foreign exchange reserves from CZK 900 billion to CZK 3.35 trillion over more than three years of interventions. The question now on the table is whether such a volume is too large and what to do with the money collected. One of the ideas is the creation of a national wealth fund. However, this is complete nonsense, writes Martin Lobotka from Conseq in the commentary. At first glance, Governor Jiří Rusnok does not worry about the large amount of money in the accounts of the Czech National Bank. He only considers how to divide the reserves into (historically usual) deposits that are shorter-term, but do not earn much, and longer-term and riskier ones – for example, stocks that could yield something. That is correct. Former governor Zdeněk Tůma came up with a much more bizarre idea. (It should be added, however, that the current Governor Rusnok agreed with him by saying „I would like it".) The government could buy some of the foreign exchange reserves and a national wealth fund would be created – along the lines of Norway or the Arab countries. Which is an undiluted nonsense. Yet a true „sovereign" fund typically arises (ninety percent) as a result of extracting commodities (usually oil) that are exhaustible and where the state knows they will run out one day. It could also arise because of a series of surplus budgets, but this is only a theory: each government would distribute surpluses on an ongoing basis rather than convincing citizens that it is better to accumulate in the money box and perhaps invest abroad" (Lobotka, 2017). „Helena Horská … adds that the Czech National Bank currently lacks any strategy in relation to foreign exchange reserves" (Lacina, 2022a). A similar nonsense is the National Development Fund, which was invented by (former) Prime Minister Babiš to actively defeat the simplified proposal of his coalition partner to introduce a bank tax. „The National Investment Fund is an inefficient and unnecessary way of financing that will benefit only banks" (Borovička, 2020). (Former) „Minister of Industry and Trade Karel Havlíček (for ANO) … presented the first two projects, which will be financed by the National Development Fund. It will be a multifunctional arena in Brno for CZK 3.3 billion and the purchase of 20 train sets for Czech Railways, a project with a budget of CZK 13 billion. According to Havlíček, both projects were at the stage of final agreements, waiting only for the approval of supervisory boards and the like" (ČTK, 2021).

The Czech state debt reached CZK 2,466 billion at the end of 2021; over the past two years, it has grown by CZK 826 billion – see Figure 12. The CNB has excess foreign exchange reserves in the range of over CZK 2,000 billion. Rational national economic policy is simple: with a (very small) amendment to the law, to impose an extraordinary levy on the Czech National Bank to the state budget in the amount of CZK 2 trillion, with the obligation to transfer these funds to state assets by 31 June 2023. And the problem (where to go with those 2 trillion) will be solved. The state will then be able to increase the registered capital of Czech Railways, for example, by CZK 13 billion; of which the purchase of 20 trainsets could be paid. The National Development Fund project should be cancelled immediately.

Figure 12: Czech government debt 1993–2021 (CZK billions and % of GDP)
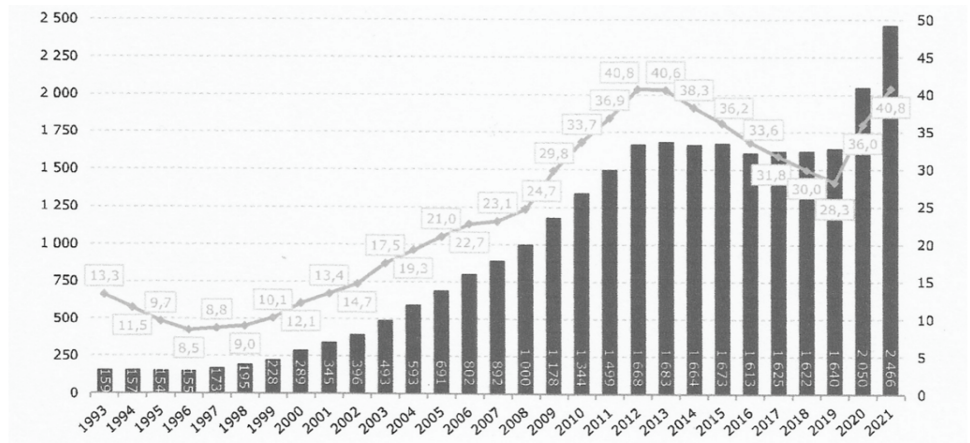
Source: MF ČR (2022)

6   Government interest rate policy

„Starting in October 2011, the Ministry allowed households and selected legal entities to participate directly in the financing of the Government of the Czech Republic and thus valorize their savings for the first time through the direct holding of so-called savings government bonds. Between 2011 and 2014, savings government bonds with a total nominal value of CZK 106 billion were sold within six subscription periods; up to six types of savings government bonds were offered. Due to the fall of the government bond yields to all-time lows, this project was suspended in 2014. On the occasion of the celebration of the 100th anniversary of the founding of Czechoslovakia, the direct distribution channel of government bonds intended only for natural persons called „Bond of the Republic" was reopened in December 2018, thus building on the previous project of savings government bonds. Within the thirteen consecutive subscription periods, citizens purchased the Bond of the Republic with a total nominal value of CZK 79.6 billion, while up to three types of six-year government bonds were offered. The yields of individual issues of the Bond of the Republic have always been set at the level of market conditions, respectively in accordance with the development of the year-on-year inflation rate according

to international practice in the case of inflation-indexed government bonds. The yields of these bonds are reinvested after each yield period by issuing and crediting other government bonds to the given asset account in a separate register kept by the Ministry in the amount of the bond yield after tax according to the relevant legal regulations. Demand for the issued Bond of the Republic in the first twelve subscription periods averaged around CZK 3.2 billion and between 2019 and 2021 these bonds were issued with a total nominal value of CZK 38.5 billion. Although the absolute value of government debt has increased significantly in the last two years, the share of government bonds intended for citizens has gradually increased. Traditionally, the highest interest was in anti-inflationary government bonds, the yield of which is linked to the consumer price index, which was also confirmed by the 13th subscription period, which ran from 20 September to 23 December 2021. It resulted in a record demand of CZK 41.1 billion, which not only exceeded the total nominal value of the Bond of the Republic sold so far, but also represented the highest demand in history within all subscriptions of government bonds made so far intended primarily for citizens since 2011. The Ministry considers an increase in the share of households in the national debt to be desirable. Retail investors are usually conservatively focused and not subject to short-term fluctuations in international bond markets, which contributes to greater stability and diversification of the investor base with a positive impact on the refinancing and interest rate risk of the debt portfolio. Holding of the government bonds intended for natural persons is also advantageous in that the vast majority of them are domestic entities and part of the interest expenditure on servicing the state debt will thus create additional income of domestic households. In connection with the issuance of the Bond of the Republic in a record amount on 3 January 2022 and the assumption of reaching the second highest value of the nominal value of these bonds in circulation at the end of 2022, the Ministry proceeded to temporarily suspend the start of the next subscription period, since these issues represent only one of the instruments for financing the borrowing needs of the state and the aim was never to maximize the sale of these bonds regardless of other factors of the state's issuance activity, but to offer citizens a conservative and stable form of appreciation of their savings while leaving sufficient space for refinancing CZK repayments of state debt on the domestic bond market through other available instruments" (MF ČR, 2022).

The previous interpretation does not document a clear, comprehensive concept of the sale of government bonds to the population. In general, two basic variants are possible:

- the sale of these bonds according to the same principles as when sold to private institutions (including banks, investment funds, etc.), where the government follows from its needs and market situation,

- the sale of special bonds for the population, where the (social) security of the population in accordance with one or another welfare regime should be decisive, not the debt needs of the government.

The first option is, from the point of view of fiscal and social policy, basically uninteresting for us here. The second option is or may be interesting/significant, nevertheless the government policy should be clearly formulated; from this point of view, we could

evaluate the current Czech government policy (probably only the policy of the Ministry of Finance) as a marketing policy only. In this second option, sovereign loans are competing products for retail financial services; the general rules for these services should apply here. If public financial services should have any advantage or incentive, it should be clearly analysed and formulated. Since this has not been the case so far, it can be assumed that in our country it is only about political marketing without further concept, with more or less random intentions.

However, there is room for a broader, conceptual government policy in the area of savings or investing in government bonds – and rather variable inflation significantly increases this room. Nowadays, the population is largely at the mercy of an unstable market, and there is therefore considerable scope for illiberal government interest rate policies – especially if governments do not want to solve, for example, the problem of growing national debt at the expense of citizens. Inflation depreciates savings – if real appreciation is negative. And nowadays it is not an exceptional situation, but rather a typical case. We can say that the basic illiberal option is to invest in government bonds with a guarantee of a non-negative real yield. This construction has been used for Czech anti-inflationary government bonds. However, these should not be (as before) special offer events, but deposit/financial services, normally provided by a state bank or post office. However, the volume of services thus provided should be limited to the annual amount (for an adult); the state can thus provide for the middle class "only". The relevant volumes of hidden state subsidies of this kind should be published annually, as well as all tax expenditures.

In this context, it is necessary to mention the extensive and very diverse subsidization of selected financial services in our country. The so-called third pension pillar exists in more countries, but nowhere is it of practical importance. In our country, we have a rather complicated system of state support for „supplementary pension savings", which is almost entirely the result of lobbying by systemically completely useless „pension companies" that have a monopoly on its provision. State support for employer contributions to this savings amounts to 65% of these contributions, which is the highest in the world. State support for participant contributions is noticeably lower, in addition to having two forms (state contribution, tax deduction). The main purpose of „supplementary pension savings" for participants is a tax optimization, coupled with the fiscal illusion that state support is free. State injections end up here essentially in the overhead costs and profits of the providers. In line with the relevant welfare regimes, we recommend either to completely abolish state support for all financial products, or to switch to a single tax regime TEE (income tax exemption of yields) – optimally in the form of British Individual Savings Accounts (ISAs) or Canadian Tax-Free Savings Accounts (TFSAs), where annual deposits are limited, and withdrawals are unlimited. Not only in Czech practice, investments in housing are also far more important for (future) pensioners than any third pension pillar. A peculiar caricature of financial services are Czech building savings, especially in (the most common) combination with the so-called bridging loan: building savings are artificially inserted into the loan in order to be entitled to a state contribution even with the actual exclusive drawing of the loan; (otherwise generally unnecessary) building savings bank collects higher interest on this loan, by which it draws a larger part of the state contribution to fake building savings. It's no longer possible in Slovakia! (Vostatek, 2020).

It is advisable to combine the reform of the government interest rate policy into one reform step, preferably as early as possible. The biggest political problem is the cessation of state support for supplementary pension savings and building savings; the current economic crisis will facilitate this, especially when combined with the introduction of tax-free savings accounts and a new policy of investing in government bonds with a guarantee of a non-negative real return. Here, too, the new economic policy simplifies the system of financial institutions.

7   Conclusion

The CNB primary monetary policy objective is inflation of 2% per annum; CNB mainly uses two-week repo rates here. The CNB second monetary policy instrument is the CZK exchange rate; this should play an important role in supporting the government's economic policy towards sustainable economic growth. The „exchange rate commitment" was an unconventional monetary policy instrument; in 2013–2017 it led to the creation of excessive foreign exchange reserves in the range of over CZK 2 trillion. In this situation and also taking into account the international turbulence of the last 2 years, it is necessary to announce a new, completely different exchange rate commitment that would prevent the depreciation of the Czech currency in relation to the (determinant) euro. In the interest of stable economic development, it is useful to fix the CZK exchange rate to the euro and then smoothly approach this exchange rate to the purchasing power parity. By agreement between the Czech government and the CNB board, which will then be reflected in the amendment to the Act on the CNB, it is possible, for example, to set a fixed exchange rate 24.30 CZK/EUR from March 2023, with the exchange rate strengthening by 0.10 CZK/EUR each subsequent month, until the 20 CZK/EUR is reached. A possible extension of this exchange rate commitment may follow. The aim of this economic policy is to fix the exchange rate at a sustainable level in the long term and then to join the euro area. The CNB exchange rate policy should be fully reoriented towards the euro. If necessary, the state budget would support the fixing of the exchange rate. In this case, too, it is expedient to transfer the excess investment tranche of the CNB foreign exchange reserves in the amount of CZK 2 trillion by 31 June 2023 to state assets.

The Czech tax structure and policy is significantly deformed, especially in the area of income and value added taxes. Already from 2024, it is possible to implement a basic manoeuvre in the introduction of a single collection point: to concentrate the collection of all social security contributions into the Czech Social Security Administration, including health insurance premiums and insurance premiums for employer liability insurance for work injuries and occupational diseases. In addition, insurance premiums paid by employees can be included in the income tax on dependent activities, which would now have a flat rate of 26%. At the same time, all insurance premiums paid by employers can be combined into a single, fully integrated social security contribution at a rate of 34.1%, paid to the state budget.

In the tax reform, it is also rational to increase the corporate income tax rate by the current taxation of dividend income to a total rate of 31.15%. At the same time, interest can be set

aside from the tax-deductible costs of corporations. Both are covered by relevant model policies, including efforts to tax incomes in the country where they are generated.

Value added tax is heavily harmonised in the EU, but with several outdated and lobbying constructs. Only an alternative, but important fair solution is to introduce a tax on financial services also in our country, e.g. in the form of a bank tax and an insurance tax. The same category of unfair and inefficient constructions includes the Czech fiscal treatment of the so-called supplementary pension savings and building savings (including bridging loans). On the contrary, an acceptable solution are the so-called tax-free savings accounts and a savings product based on the existing so-called anti-inflationary government bonds.

The monetary system also includes the creation of all money from the state budget, which can technically be replaced by an equivalent seigniorage levy to the state budget. Implementation could be completed as early as 2024. This levy does not have to „go through" the CNB's profit and loss account. On the contrary, the state certainly does not need a „national development fund" where banks would place their long-term excess liquidity.

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