

Financial condition indices and pandemic uncertainty as recession triggers

Indicadores de condição financeira e incerteza pandémica enquanto desencadeadores de recessão

Gancho Todorov Ganchev

South-West University, Bulgaria
ganchev@swu.bg

Mariya Paskaleva

South-West University, Bulgaria
m.gergova@abv.bg

Abstract

The main objective of this paper is to investigate the interactions between the constructed Financial Condition Indices (FCI), assumed as a measure of financial stress; the World Pandemic Uncertainty Index (WPUI), as an external factor and the recession probability. The main research tools are the Principal Component Analysis and the random forest model machine-learning algorithm. In particular, we combine the FCI of 11 European economies - Bulgaria, Czech Republic, Croatia, Estonia, Hungary, Lithuania, Latvia, Poland, Romania, Germany and Turkey - with the WPUI, to explain the current global recession. We conclude that not only the traditional FCI, but in addition a non-economic factor, such as WPUI, are indispensable instruments for the prediction of turning points in the business cycle and recession probabilities, especially as concerns the 2020 lockdown. While this confirms the role of external shocks as an explanatory variable of economic dynamics, our interpretation is that these shocks affect the system not directly, but via monetary parameters, thus excluding money neutrality.

Keywords: Financial conditions index; uncertainty; recession.

Resumo

O objetivo principal deste artigo é investigar as interações entre os Indicadores de Condição Financeira (ICF), enquanto medida de stresse financeiro, o Índice Mundial de Incerteza Pandémica (IMIP), como fator externo, e a probabilidade de recessão. As principais ferramentas de pesquisa são a Análise de Componentes Principais e o Algoritmo de Aprendizagem de Máquina de Modelo Florestal Aleatório. Em particular, combinamos o ICF de onze economias europeias – Bulgária, República Checa, Croácia, Estónia, Hungria, Lituânia, Letónia, Polónia, Roménia, Alemanha e Turquia – com o IMIP, para explicar a atual recessão global. Concluímos que o ICF tradicional e também os fatores não económicos, como o IMIP, são instrumentos indispensáveis para a previsão de pontos de inflexão no ciclo de negócios e probabilidades de recessão, principalmente no que respeita ao confinamento de 2020. Embora isto confirme o papel das influências externas como uma variável explicativa da dinâmica económica, a nossa interpretação é que estes fatores externos não afetam o sistema diretamente, mas por meio de parâmetros monetários, excluindo assim a neutralidade da moeda.

Palavras-chave: Indicadores de condição financeira; incerteza; recessão.

1. Introduction

It is essential to understand the relationship between financial and business cycles, especially as it concerns the role of financial and monetary conditions. Nowadays, the importance of estimating the systematic risk and uncertainty in developing an early warning system to detect the threat of recession is dramatically heightening. In this paper, we explain that the present lockdown adds a new feature - the fact that the endogenous financial variables are not sufficient to explain the contemporary downturn. The need for external variables is evident. This reflects the new global context of the increasing weight of external shocks to the economic and financial conditions. In this research, we aim to explain the current global recession as an interaction between the constructed FCI, assumed as a measure of global financial stress, and the WPUI as an external factor, using a machine-learning algorithm. This article is an upgrade to the previous article of Ganchev and Paskaleva (2020). The latter was focused on the sensitivity of small countries' domestic FCIs to the dynamics of the global financial conditions and the FCIs of the USA and Germany in particular. This approach was sufficient to explain the interdependencies during the Global Financial Crisis (GFC) of 2007-2009 but is unsatisfactory to describe the present state of affairs.

To prove the main research hypothesis, we apply the following tasks:

1. Construction of Financial Conditions Index of the investigated economies in order to estimate FCIs to characterize financial conditions and underlying common drivers in the explored economies;
2. Forecasting of the recession probabilities by applying a machine-learning algorithm;
3. Investigation and establishment of the relationship between the constructed FCI, WPUI, and the recession probability.

We conclude that the constructed FCI and the WPUI are indispensable instruments for the prediction of turning points in the business cycle and recession probabilities, especially as concerns the 2020 lockdown.

2. Literature review

Financial condition indices (FCIs) are considered an essential instrument of analyzing, forecasting, and supervising national financial systems and in tracking down the interdependence between the real and the financial sectors. A financial condition index (FCI) summarizes the information about the future state of the economy contained in current financial variables. It is supposed that FCI should measure financial shocks – exogenous shifts in financial conditions that influence and allow us to forecast the future economic activity, including monetary policy reaction. The construction of FCI is an intricate process because it should include variables reflecting past economic activity, which could contain the relevant extrapolative information. This means that we reject the money neutrality hypothesis.

First, Freedman (1994) applied MCI (monetary conditions index) to explore the financial and monetary conditions. He constructed a weighted average of changes in the interest rates and the exchange rate. The financial conditions index exists in several different variants:

Chicago Fed Financial Conditions Index (NFCI) - U.S Financial Conditions in money markets, debt and equity markets, traditional and “shadow” banking system. Positive values of the NFCI indicate financial conditions that are tighter than average, while negative conditions indicate financial conditions that are looser than average;

Kansas City Fed Financial Stress Index (KCFSI) - a measure of the stress in the U.S financial system based on 11 market variables;

St. Louis Fed Financial Stress Index (STLSFI) - It measures the financial stress in the markets and is constructed from 18 data series: seven interest rate series, six yield spreads, and five other indicators. The negative value of this index suggests below-average financial market stress, while positive value suggests above-average market stress;

Deutsche Bank Financial Condition Index- the latter is constructed via a principal components approach. The first principal component is extracted from a set of seven financial variables: exchange rate, bond, stock, and housing market indicators. The weights are determined by the use of regression of the real GDP growth on the financial variables and lagged GDP growth.

According to Guihuan and Yu (2014), the Financial Conditions Index (FCI) is a comprehensive index that is based on the combination of several variables, such as currency price and asset prices. It can overcome the shortage of some conventional indexes, such as money supply and interest rate, in measuring the financial conditions and forecasting the economic trend. They conclude that FCI has become an important reference index in financial analyzing and policymaking in some central banks and international institutions. The variables that they select for the FCI construction are money supply, interest rate, exchange rate, stock prices, and housing prices. They choose the percent change rate of the variables as indicators to construct the FCI, which effectively reflect dynamics and avoid errors arising from the gap measuring. The authors construct FCI through the principal component analysis method and a dynamic factor model. Then, the FCIs constructed via the comparison of the two methods, and the robustness of the FCI is tested. The main results indicate that FCI can reflect China’s financial conditions and may be a crucial predicting indicator as well; FCI can also forecast the overall economic trend, and in particular, it is a better leading indicator of GDP and CPI than single variables.

Kara, Özlü and Ünalmiş (2012) built an FCI for Turkey that weights a number of domestic and foreign variables based on a 4-quarter ahead cumulative response of GDP growth to a one-unit shock to each variable. Their work also emphasizes that in the case of Turkey it makes a considerable difference for the series’ weights whether or not one controls for external factors.

Cuba-Borda, Mechanick and Raffo (2018) construct the Global Conditions Index (GCI) to monitor the world economy. They apply a random forest model to estimate the recession probability and its sensitivity. In the research, they prove that the GCI can be used to produce nowcast estimates of world GDP growth at monthly frequencies well before the release of official GDP data. They conclude that the GCI can provide useful information to predict turning points in world business cycles and to produce world recession probability estimates. The FCI may be accepted as a measure of the stress to the financial system, taking into

account whether financial conditions are tightening or loosening. The dynamic of the FCI index is strongly related to the business cycle.

According to Karamisheva, Markova, Zahariev and Pachedzhiev (2019), a basic assumption of the FCI approach is the importance of non-neoclassical credit channels due to the asymmetric information. In their research they estimate the phases of the financial cycle in the Bulgarian economy using a variety of financial and macroeconomic indicators and investigate its interaction with the business cycle. In order to assess the financial cycle in Bulgaria, two alternative approaches are applied. The first one is based on the use of the band-pass filter and the principal component analysis. The second one relies on a structural unobserved components model. According to both methods, the length of the financial cycle is estimated in the range of 11–12 years, which fits well within the widely accepted in the academic literature range of 8 to 30 years. At the same time, the business cycle is found to exceed the generally assumed maximal length of 8 years. The results from both approaches indicate that the financial cycle in Bulgaria is largely synchronized with the business cycle.

Bulut (2017) examines whether FCI can be a leading indicator of business cycles in Turkey. For this purpose, the study presents an FCI that has been recently developed for Turkey and reveals that the FCI can reflect the developments in the Turkish economy and the world. The research employs unit root tests and cointegration tests. The study finally performs vector autoregressive (VAR) analysis and the bootstrap Granger causality test to examine the relationship between FCI and the output gap in Turkey. Both VAR analysis and the bootstrap Granger causality test indicate that the FCI has predictive power in forecasting future output gaps in Turkey. Based on these findings, this study yields that the FCI can be used as a leading indicator of business cycles in Turkey.

After the global financial crisis 2008-2009, the attention was focused on the relationship between financial conditions and the real economy. According to Kostka and Björn van Roye (2017: 4), financial conditions measure the access to assets and insuring against risk. They consider that according to the investors: “financial conditions can be interpreted as their level of risk appetite, as these measures gauge the price that investors require as compensation for bearing risk and for providing insurance against risk. As loose financial conditions can spur excessive credit growth, composite indicators of financial conditions are found to be leading indicators of financial crises, and wider macroeconomic conditions.”

In their research they prove that the adverse impact of economic policy uncertainty on financial conditions in the United States was more than offset by a positive demand shock. In the case of the United Kingdom, they conclude that the resolute accommodative monetary policy actions by the Bank of England was the decisive factor, that supported the financial conditions after the referendum from Brexit. According to the authors, in the case of the euro area, the policy uncertainty increased in several countries in the first months of 2017.

Following Roy, Biswas and Sinha (2015), we can assume that the structure of the financial system is an important determinant of the various channels of transmission. They suggest that in economies with sophisticated financial systems, the transmission channels are diverse and may change over time. If the policy transmission is taking place solely via financial conditions, FCI indicates whether a change in policy will alter the economic prospects. The

relation between financial conditions and economic activity evolves; the importance of factors other than the impact of the monetary policy on financial conditions may vary over time; the response of financial conditions to policy changes may also vary; forces other than financial conditions necessarily affect the performance of the real economy. The latter conclusion is especially important under COVID-19 lockdown.

Koop and Korobilis (2014) demonstrate the usefulness of the FCI as a forecasting tool. In their paper, they calculated the FCI by factor augmented vector autoregressive models with time-varying coefficients and stochastic volatility. They track the growth in the US economy by the so devised FCI. The authors attempt also to forecast inflation, output growth, and unemployment rate by the so composed device.

Mayes and Virén (2001) use panel datasets of Western Europe to explore how asset prices and house and stock prices in particular can provide useful additional indicators of future changes in output and inflation. According to these authors, the most useful role of the FCIs comes from the incorporation of high-frequency data and the opportunity that the latter gives for extracting information about changes in market expectations of inflation and output. This method is useful for market participants to make judgments about the likely central bank reactions. At the same time, it helps the central banks to assess the stance of policy between forecasts. The authors conclude in particular that at quarterly frequency intervals central banks will prefer to use the traditional economic forecasting methods while summary indicators like FCIs will have only a limited role.

To monitor the evolution of the financial conditions, potentially in real-time, Auer (2017) constructs FCIs for each of the three main central and eastern EU member states outside the euro area (Hungary, Poland, and the Czech Republic). The FCI is constructed as an unobserved factor estimated using the EM algorithm. After having assessed their performance in providing information about future economic activity, these FCIs are used to describe the dynamics of the financial conditions in the three above-mentioned economies for the period between 2001 and 2016. The conclusions of this study reveal that after their integration into the EU, the countries enjoyed very accommodative financial conditions until 2008; the Czech Republic and Hungary subsequently turned out to be more exposed than Poland to the spillover effects from both the global financial crisis and the Eurozone sovereign debt quandary.

Hatzius *et al.* (2010) explore the relationship between financial conditions and economic activity. They build an FCI that features three key innovations: a broad range of quantitative and survey-based indicators; use of unbalanced panel estimation techniques resulting in a longer time series than available for the other indexes; and the predictive power of financial conditions for future economic activity. During most of the past two decades, the constructed FCI shows a tighter link with future economic activity than existing indexes, although some of this undoubtedly reflects the fact that the selected variables are partly based on the observation of the recent financial crisis. As of the end of 2009, the FCI showed financial conditions at somewhat worse-than-normal levels. The main reason is that various quantitative credit measures (especially issuance of asset-backed securities) remained unusually weak for an economy that resumed expansion.

Swiston (2008) constructed a U.S. FCI to reveal the endogenous response of selected financial variables and the real economic activity to the exogenous shocks applying VAR models. According to this research, the availability of credit and FCI are the leading drivers of the business cycle.

Akarli *et al.* (2012) constructed an FCI for seven Central Eastern European, Middle Eastern, and African economies (Czech Republic, Hungary, Poland, Russia, Turkey, Israel, South Africa). The index includes three domestic (real 3- month interbank rate, the spread between the 10-year interest rate and the 3-month rate as a proxy of the yield curve, the difference between private borrowing cost and risk-free domestic rates) and two external factors (CDS spreads and the real effective exchange rate). They enter the FCI by weights derived from a VAR exercise calculating the cumulative impact on GDP growth after 3-4 quarters.

The comparison between the GFC and the 2020 economic shock reveals two main differences. First of all, the real economic downturn is strongly related to the intensity of the COVID 19 propagation (Cakmakli *et al.* 2020). Second, the financial system was in relatively robust shape heading into the current shock and household balance sheets are healthier, compared to the GFC situation (Bartsch, Boivin & Hildebrand, 2020). These particularities require a specific approach to the modeling of the 2020 economic crisis, combining endogenous and exogenous explaining variables. In a report of the European Commission (2020) the European economic forecast after the COVID-19 pandemic is estimated. The pandemic struck the European economy when it was moderately and still powerless against new stuns. It has additionally snuffed out early expectations that a trough may have been arrived at when fabricating movement and remote exchange gave indications of bottoming out toward the beginning of this current year. It explains that real-time data suggest that economic activity in Europe has dropped at unusually fast speed over a period of a few weeks, as the containment measures triggered in response to the crisis by most Member States in mid-March put the economy into a state of hibernation. The economic output is thus set to collapse in the first half of 2020 with most of the contraction taking place in the second quarter.

By exploring the above-mentioned research, we aim to reveal the importance of the FCI. It may be accepted as a forecasting tool for the business cycle, it may reflect the negative global shocks and to estimate the dynamic of the real economy.

3. Methodology

In this research, Financial Conditions Indices were constructed for 11 European countries - Bulgaria, Czech Republic, Croatia, Estonia, Hungary, Lithuania, Latvia, Poland, Romania, Germany, and Turkey. The explored period covers 2000 -2020.

To achieve the main aim and tasks in the current research, we followed these methodological steps:

First, we constructed the FCI. The process includes the following sub-steps:

- Optimal data selection (financial variables) for FCI construction;

- Data selection to eliminate those variables that are correlated with the economic cycle;
- Applying the appropriate econometric approach;
- Analysis of the dynamics of FCI and its relationship to recession probability.

We applied Principal Component Analysis to construct an index of financial conditions for the explored countries, based on the following studies: Hatzius *et al.* (2010); Brave and Butters (2011); Darracq Paries, Maurin and Moccerro (2014); Traykov *et al.*, (2018). According to them, the FCI should contain financial variables. This means that it can be considered as a measure of the financial shock or the so-called exogenous changes in financial conditions that could affect future economic activity. Following the empirical approaches based on the existing literature, we have included the following variables:

Table 1. Variables for FCI construction

Variables	Description	Source
Term Spreads	The yield on 10-year government bonds minus the yield on three-month treasury bills	IMF staff
Interbank market spread	Overnight borrowing and long-term borrowing	Euribor-rates.eu
Interest Rate spread	Difference between the lending rate and deposit rate in percentage	World Bank, IMF statistics
Effective Exchange Rate		BIS
Nominal Exchange Rate		BIS
Credit Growth	Percentage change of credit of NFC and households (% of GDP)	BIS
Sovereign spread	EMU convergence criterion bond yields minus EMU convergence criterion bond yields of the benchmark country	Eurostat
Broad Money (% of GDP)	Broad money as a percentage of GDP	World Bank
Equity returns	The returns of equity prices	IMF statistics
House Price Returns	Percentage change in the house price index	BIS

Second, after the construction of the FCI we estimated the recession probability, by a random forest model. This model is an ensemble tree-based learning algorithm: that is the algorithm averages predictions over many individual trees. The random forest model is a method of generating predictions using tree structures. The random forest model is appropriate because it does not require the existence of a functional relation between the explored variables, which corresponds to the low values of false signals. To estimate the recession outcome, we have constructed the following econometric model that determines the relationship between the constructed FCI, WPUI, and the recession probability. We aim to estimate the recession probability one year ahead.

$$y_{t|t+k} = F(FCI_t, WPUI_t) \tag{1}$$

Where $y_{t|t+k}$ is the world recession indicator. It represents a dummy variable that takes value 1 if the world is in recession at any moment over the following k months. It takes value 1 for the following periods: March 2001 – November 2001; April 2008 – May 2009; April 2020. The recession indicator is estimated by the country-specific recession dates obtained from the Economic Cycle Research Institute. The recession period is defined when the economies of the countries that represent two-thirds of the world GDP are in a recession.

FCI_t it represents the constructed FCI for the explored 11 European economies;

$WPUI_t$ is world pandemic uncertainty index at moment t . The WPUI index is constructed by counting the number of times uncertainty is mentioned within proximity to a word related to pandemics in the Economist Intelligence Unit (EIU) country reports. Specifically, the index is the percent of the word “uncertain”, and its variants, that appear near the pandemic terms in EIU country reports, multiplied by 1,000. A higher number means higher uncertainty related to pandemics and vice versa (Ahir, Bloom & Furceri, 2018).

By applying the random forest model, we estimate that the unconditional probability of observing a recession in the subsequent 12 months is equal to 23%.

4. Results

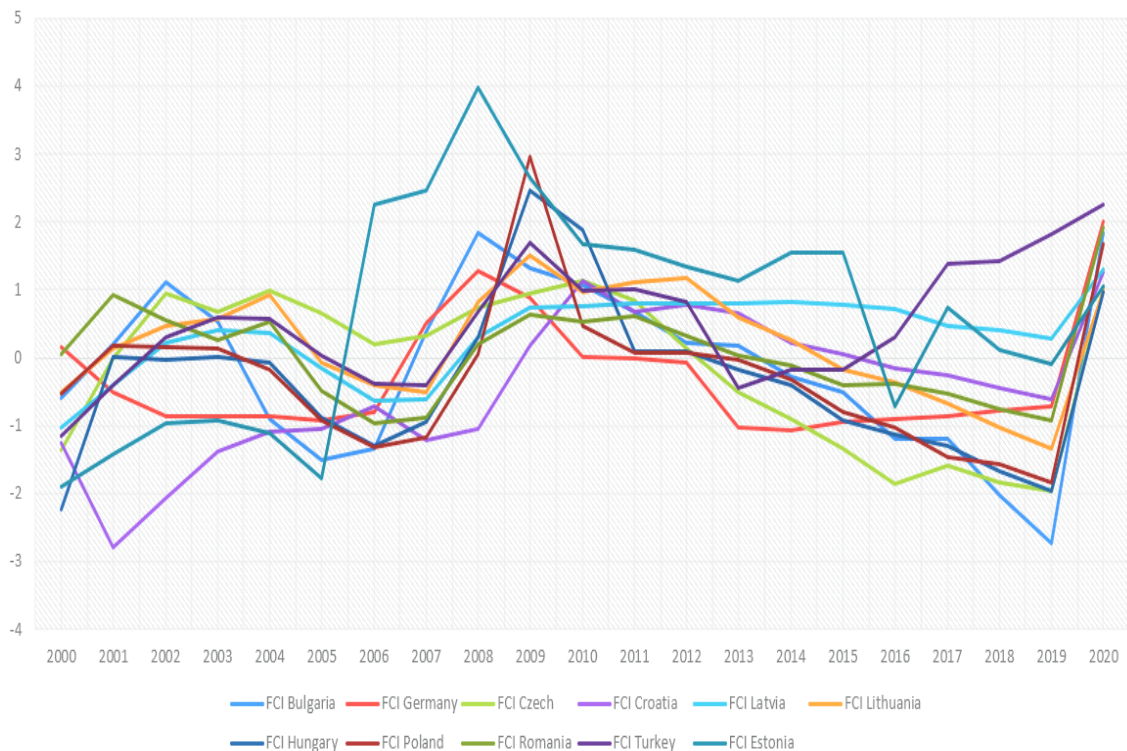
FCI dynamics may be interpreted as changes in the financial conditions that are exogenous to the business cycle. In macroeconomic theory, these exogenous financial conditions should capture investors' preferences for liquidity, i.e., they reflect the changes in the LM curve. These variations are not induced directly by central banks' money supply shifts and may be considered as endogenous. If investors' liquidity preferences upturn is triggered by exogenous shocks, it will be more difficult for businesses and households to obtain financing, so we assume that financial conditions are tightening. This translates into an increase in FCI and into the LM curve moving to the left, especially in terms of the transaction demand for money. If we include also the precautionary and the speculative demand for money, the LM curve shifts become unpredictable and the swings may be assumed to be even to the right.

The WPUI impact is more complicated to explain. It has a direct effect on the IS and LM curves shifts, not related directly to the monetary and fiscal policies and conditions. Note, however, that the nature of the WPUI impact on the economy is via the economic agent's perceptions and behavior and to a lesser extent through resources availability. In a monetary economy the behaviour is conveyed by the management of the monetary assets. In the case of the 2020 economic downturn, we can assume that both IS and LM curves shift to the left, thus leaving the interest rate temporarily unchanged. In the case if IS shifts to the left and LM to the right, because of precautionary considerations, the interest rates may become negative. Therefore, the COVID-19 pandemic impact may be one of the reasons of protracted negative interest rates phenomenon.

The difference between the FCI and WPUI impact on the business cycle is that the FCI are related to the trends, generated by the financial system itself, while the WPUI reflects the reaction of the financial system to the external shocks.

In particular, Figure 1 reveals the dynamics of the constructed FCI at the country level.

Figure 1. The dynamic of the constructed FCI of the explored countries



We demonstrate that:

- The Hungarian and Polish FCIs have positive values for a short period, namely from 2008 to 2012. In 2012 the FCIs' values are approximately equal to zero;
- The Turkish FCI is positive for the years 2002-2005, 2008-2012 with a significant increase in its value again from 2016;
- The Croatian, the Latvian, and the Lithuanian FCIs are also influenced by the financial crisis. The financial distress affects their financial environment later, namely, we observe that the highest values of FCIs are after 2009. This reveals a long period of tight financial conditions. For Latvia, this period begins in 2008, as its FCI reaches its peak in 2014 and maintains its trend to 2017;
- Comparing the FCIs of Bulgaria and Romania, we reveal that Bulgaria accounts for a faster, stronger, and longer change in financial conditions. This can be explained by the impact of the Currency Board Arrangement in Bulgaria.
- Among all of the explored European economies, the Estonian FCI had the highest value in 2008 – almost equivalent to 4. This is a value that is almost 4 times higher than the FCI values of all of the scrutinized economies, except for the Bulgarian one, which in 2008 was approximately equal to 2. The Estonian Financial Conditions Index retains high values: between 1.5-2.5 points until 2015;
- In comparative terms, we must focus our attention on the dynamics of the FCI of the Czech Republic. This is a country where the constructed index has not

undergone significant changes during the financial crisis. Financial conditions tightened significantly in the Czech Republic only in 2010. After 2010 the value of FCI was characterized by a continuous declining trend;

- In 2019 almost all of the constructed FCI had negative values except for the FCIs of Turkey, Romania, and Latvia;
- The dynamics of the constructed FCI reveals that during the first quarter of 2020 COVID-19 has influenced the financial and economic conditions in all of the explored countries. We show that Turkey is the country with the highest value of the FCI.

Countries with autonomous monetary policy (Czech Republic, Romania, Poland, Hungary, and Turkey) adjust faster and more successfully to the negative external shocks. In the case of Turkey, we observe a self-inflicted negative financial shock after 2016 and with the highest value of the FCI in 2020.

Figure 2 presents the one-year ahead recession probability results obtained from the applied random forest model. According to the results, the values of the estimated recession probability moved synchronously with the three recession periods. The probability was increasing sharply during the recession. We should emphasize that the estimated one-year ahead probability increases higher over the unconditional probability months before the two recessions: March 2001 – November 2001; April 2008 – May 2009. This is proof of the high predictive power of the applied econometric model for estimating the business cycle. We do not observe an increase in the estimated recession probability for the third recession period – in April 2020. This may be explained by the fact that the aforementioned recession is a result of the world spread of COVID-19.

We observe some false signals. A false signal is classified as an increase in the estimated one year ahead probability over 50 percent without accompanying recession period in the subsequent months (Cuba-Borda *et al.*, 2018). False signals are estimated in 2015. The exposed results in Figure 1 confirm that the one year ahead probability estimates point to a high risk of a forthcoming recession.

Figure 2. Average estimated probability of recession

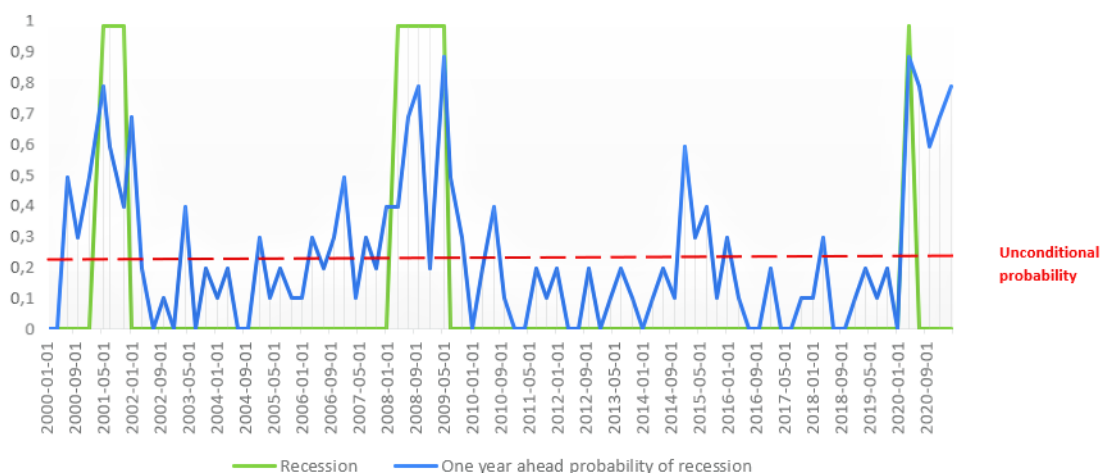
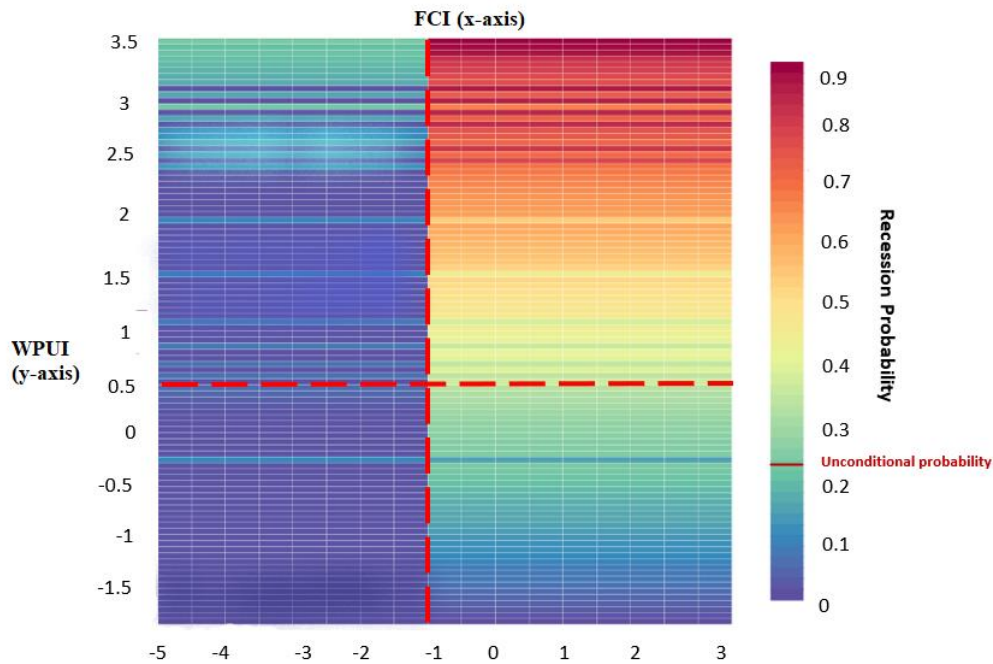


Figure 3 presents a heatmap. The heatmap is a graphical representation of data where the individual values contained in a matrix are represented as colors. The heatmap estimates the sensitivity of the recession probability to the dynamics of the financial conditions and the pandemic uncertainty levels. The risk of a forthcoming recession depends on the changes of the constructed FCI (x-axis) and WPUI (y-axis). As shown by the vertical bar in the right, blue cells indicate near-zero recession probability whereas red cells indicate near unity recession probability results. According to the northeast quadrant, when FCI increases over -1 and the WPUI increases above 0.5 the recession probability over the next twelve months increases its value from 23% (the estimated value of the unconditional probability) to nearly 90%. When both indicators FCI and WPUI decrease their values below -1 and 0.5, respectively, the recession probability is almost equal to zero. The recession probability is strongly sensitive to the increase in the values of WPUI. This is proved by the north-west and southeast quadrants.

Figure 3. Recession Probability Heatmap



5. Conclusions

This research allows for some important conclusions. According to the dynamics of the constructed FCI, we reveal that the different countries demonstrate distinct sensitivity to the global economic shocks. The countries with fixed exchange rates like Bulgaria and Estonia (during the 2008 crisis) were especially vulnerable, while the Czech Republic confirms the positive role of the floating exchange rate and the implementation of sophisticated monetary policy. Negative financial trends have a longer impact on growth in the emerging

economies compared to the benchmark developed countries. Countries with autonomous monetary policy (Czech Republic, Romania, Poland, Hungary, and Turkey) adjust faster and more successfully to the negative external shocks.

A second important contribution of this research is the result that the constructed FCI and the explored WPUI can be considered as handy instruments for the prediction of turning points in the business cycle and recession probabilities. Without the WPUI index, it would be impossible to explain the 2020 crises, so the present downturn embodies an external shock, affecting the real economy and the financial system with feedback from the latter to the cycle dynamics' probabilities. Thus the external shocks affect the real economy via the FCI.

The current research has several limitations: the first one includes methodological restrictions, namely the models are set by the statistical properties of the underlying data imposing the application of specific econometric tests and models giving opportunity for reflection. The proposed methodology does not claim to be the only possible and applicable when inspecting and proving the research hypothesis of this study. The geographical limitation-the analysis and the inspection of the research thesis are concentrated on the following 11 European countries - Bulgaria, Czech Republic, Croatia, Estonia, Hungary, Lithuania, Latvia, Poland, Romania, Germany, and Turkey.

References

- Ahir, H., Bloom, N. & Furceri, D. (2018, October 29). The world uncertainty index. Available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3275033. doi: 10.2139/ssrn.3275033
- Akarli, A., Clemens, P., Magdalena, Lund-Jensen, Kasper, M., & Andrew, M. (2012). Recent financial loosening could provide upside to growth. *Goldman Sachs CEEMEA Economics Analyst*, n. ° 12/03.
- Auer, S. (2017). A financial conditions index for the CEE economies. *Bank of Italy Temi di Discussione (Working Paper) No. 1145*. Available at SSRN: <https://ssrn.com/abstract=3066697>. doi: 10.2139/ssrn.3066697
- Bartsch E., Boivin J. & Hildebrand, P. (2020). How large is the coronavirus macro shock? Putting the near-term record-breaking shock in the long-term context. *SUERF Policy Note, Issue No. 162*, May 2020.
- Brave S. & Butters A. (2011). Monitoring financial stability: A financial conditions index approach, economic perspectives. *Economic Perspectives*, 1Q, 22-43.
- Bulut, U. (2017). Financial conditions index as a leading indicator of business cycles in Turkey. In U. Hacıoğlu & H. Dinçer (Eds.), *Global financial crisis and its ramifications on capital markets. Contributions to economics*. Springer. doi: 10.1007/978-3-319-47021-4_17
- Cakmakli C., Demiralp S., Ozcan S. K., Yesiltas S., & Yildirim, M. A. (2020). COVID-19 and emerging markets: An epidemiological model with international production networks and capital flows. *International Monetary Fund – IMF, Working Paper n. ° 20/133*.
- Cuba-Borda, P., Mechanick, A. & Raffo, A. (2018, June). *Monitoring the world economy: A global conditions index*. *IFDP Notes*. Washington: Board of Governors of the Federal Reserve System.
- Darracq Paris, M., Maurin, L. & Moccerro, D. (2014) Financial conditions index and credit supply shocks for the euro area. *ECB Working Paper No. 1644*. Available at <https://ssrn.com/abstract=2397123>
- European Commission (2020). *European Economic Forecast, Institutional Paper 125*.

- Freedman, C. (1994). The use of indicators and of the monetary conditions index in Canada. In T. J.T. Baliño & C. Cottarelli (Eds.). *Frameworks for monetary stability: Policy issues and country experiences* (pp. 458- 476). Washington, D.C.: IMF.
- Ganchev, G. T. & Paskaleva M. G. (2020). The importance of financial condition indices in South-Eastern Europe. *International Journal of Contemporary Economics and Administrative Sciences*, 10(1), 78-106. doi: 10.5281/zenodo.3940493
- Guihuana, Z. & Yub, W. (2014). Financial conditions index's construction and its application on financial monitoring and economic forecasting. *Procedia Computer Science*, 31, 32-39. doi: 10.1016/j.procs.2014.05.242
- Hatzius, J., Hooper, P., Mishkin, F. S., Schoenholtz, K. L. & Watson, M. W. (2010). Financial condition indexes: A fresh look after the financial crisis. *Proceedings of the US Monetary Policy Forum 2010*. doi: 10.3386/w16150
- Kara, H., Özlü, P. & Ünalmiş D. (2012). Financial conditions indices for the Turkish economy. *CBRT Research Notes in Economics*, No.12/31. Central Bank of Turkey.
- Karamisheva, T., Markova, G., Zahariev, B. & Pachedzhiev, S. (2019). Financial cycle in Bulgarian economy and its interaction with the business cycle. *Discussion Paper DP/113/2019*. Bulgarian National Bank.
- Koop, G. & Korobilis, D. (2014). A new index of financial conditions. *European Economic Review*, 71(C), 101–116. doi: 10.1016/j.euroecorev.2014.07.002
- Kostka, T. & Björn van Roye. (2017). Assessing the decoupling of economic policy uncertainty and financial conditions. *Financial Stability Review, May 2017*.
- Mayes, D. & Virén, M. (2001). Financial condition indexes. *Bank of Finland, Discussion Papers, 17/2001*. Helsinki: Bank of Finland.
- Roy, I., Biswas, D. & Sinha, A. (2015). Financial conditions composite indicator (FCCI) for India. In Bank for International Settlements (Ed.), *Indicators to support monetary and financial stability analysis: Data sources and statistical methodologies*, 39.
- Swiston, A. (2008). A U.S. financial conditions index: Putting credit where credit is due. *IMF Working Paper*, n. ° 08/161. Available at <https://ssrn.com/abstract=1160054>
- Traykov, M., Trenchev, M., Stavrova, E., Mavrevski, R. & Trenchev, I. (2018). Risk analysis in the economics through R language. *WSEAS Transactions on Business and Economics*, 15, 180-186.

G.T. GANCHEV graduated from Moscow State Institute of International Relations. Later Prof. Ganchev joined the Institute of International Relations of the Bulgarian Academy of Sciences. There he focused his research on East-West economic relations. Prof. Ganchev has been member of the Plenary Council of the Bulgarian National Bank, vice-minister of Economic Development, President of the Agency of Economic Coordination and Development, Advisor to the Prime Minister and others. Prof. Ganchev has been lecturing at South-West University, Sofia University, New Bulgarian University and at universities in France and Kazakhstan. He has more than 200 publications in Bulgarian, English and French. He teaches courses in the area of monetary theory, financial markets, and public finance. He is a member of the editorial board of the journal *Economic Thought* of the Bulgarian Academy of Sciences and a member of the SUERF- "Société Universitaire Européenne de Recherches Financières". Institutional address: Educational building No.8, Faculty of Economics, Ivan Mihailov Street No. 60, 2700 Blagoevgrad, Bulgaria.

MARIYA PASKALEVA is a Ph.D. graduate at SWU "Neofit Rilski" - Blagoevgrad, Faculty of Economics, with specialty "Finance". She began her research and teaching career at the Faculty of Economics of SWU "Neofit Rilski", Department of Finance and Accounting. She successfully defended her thesis on "Risk management by sovereign credit default swaps (CDS) in the European context" in 2018. Her research interests are in the field of risk management, financial derivatives, stock markets, and financial crises. She is the winner of prizes in the academic competitions "Dr. Ivanka Petkova" and "Young Economist". Institutional address: Educational building No. 8, Faculty of Economics, Ivan Mihailov Street no. 60, 2700 Blagoevgrad, Bulgaria.

Submetido em 02 de agosto de 2020

Aceite em 10 de novembro de 2020