A FINANCIAL STABILITY INDEX

Estimated by the Institute of Financial Studies

Last Updated[*]*: second quarter, 2019*

Abstract

In each issue of the Financial Studies Review, we update and publish the Financial Stability Index (FSI) of our Institute of Financial Studies, which tracks the correlation between economic growth and macroeconomic and financial factors in Romania. We constructed a composite index using a linear combination of financial variables that are considered to have a significant impact on economic activity. These financial variables are weighted with respect to their cumulated two quarters impulse response on GDP growth, as estimated by a VAR model.

Developing such a composite index of financial stability or financial stress has two main utilities:

- *The analysis of the correlation between financial variables and the real economy placed in the context of different historical episodes of financial crisis. Also, this correlation analysis reveals, in each period, the significant positive or negative contribution of each financial variable to real economic growth. Following this analysis, the FSI can measure the impact of economic and financial policy measures aimed at mitigating financial crises.*
- *The short-term prediction of real economic growth estimated by forecasting the next period evolution of the real economic activity (GDP_{t+1}) using current period GDP_t and FSI_t and economic and financial variables in the FSI_t composition.*

Keywords: *composite index, financial stress index, economic growth, VAR model, short-term prediction*

JEL Classification: *E63; G01; G28*

Introduction

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For full explanation, you can access numbers 1; 2 and 3 of the review (https://revista.isfin.ro/wp-content/uploads/2017/11/5_ Indicele-de-stabilitate-financiara.pdf).

The Institute of Financial Studies has also undertaken to present to the Romanian and international economic and financial community a Financial Stability Index (FSI) as the barometer of the most representative financial indicators on the evolution of the financial market and, correlatively, of the real economy. The first versions of FSI were published in the 1st – 3th numbers of the Financial Studies Review (http://revista.isfin.ro/arhiva-rsf/). In the current issue of the review, we return with an updated index for the second quarter of 2019 and we introduce a forecast for the next 4 quarters (Q3 2019 – Q1 2020).
The fifth edition of FSI resulted from the update of the data series with the first and second quarters of 2019, as well as revisions of the data series in accordance with the available statistical reports.

Research methodology and results

We used the time series of financial and economic variables, quarterly, for Q1 2004 – Q2 2019:

- CPI, budget balance, net exports
- ROBOR, EURIBOR, REER, VIX
- BET index, Gross Insurance Premiums (PBS)

The EURIBOR and VIX variables have been included in the FSI composition as a result of economic co-integration at European and international level.

For the FSI calculation we used the VAR model, i.e. the response to the impulse to change the variables analysed on GDP, quarterly real-terms variations. The contribution of each component variable to FSI evolution was studied. Then, correlations and potential causal relationships between FSI and GDP, including gaps, were investigated.

The underlying hypothesis of FSI development is both intuitive and empirically correlated with the causal relationship between systemic phenomena in financial markets and their effects on the real economy. The quality of the financial stability index is validated by the intensity and the stability of this correlation, respectively, between the aggregate index of these financial variables and the real economy reflected by real GDP growth.

The FSI evolution thus estimated is illustrated in the chart below (Figure 1).

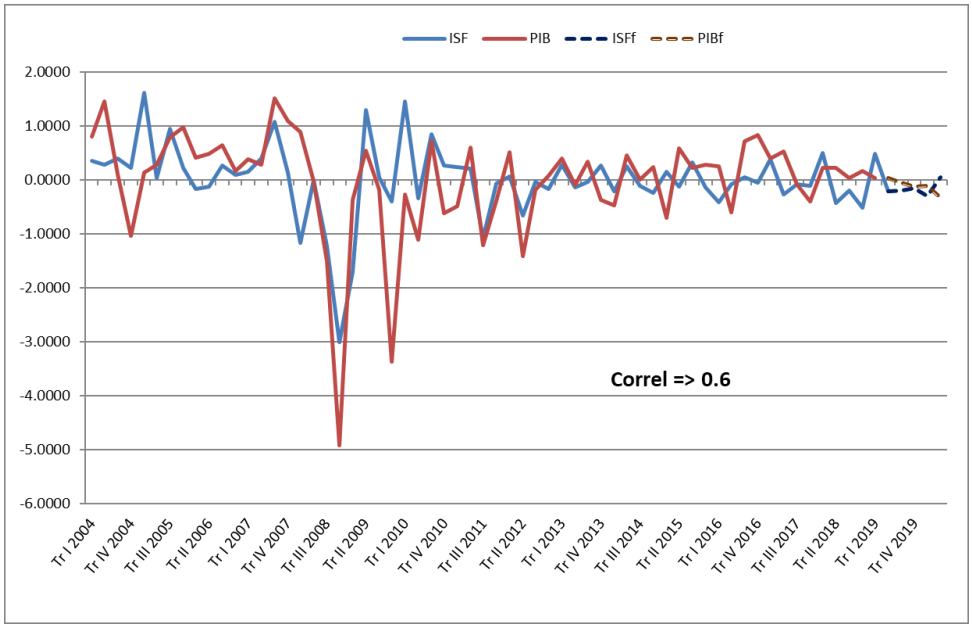

Figure no. 1. Graphical representation of estimated FSI evolution correlated with real GDP evolution

Our results show, first of all, a high intensity of the evolution of ISF(-1) with the evolution of the real GDP: $\rho = 0.604$. Second, our results are also supported by the correlation of ISF with the main episodes of financial crisis in Romania and international markets: the global crisis of 2008-2009; the crisis of public debt in the euro area from 2012-2012; escalation of the political and military conflict in Ukraine in 2014, as well as the social-political crisis in Turkey in 2014 (see in detail these correlations in issues 1 and 2 of our journal).

As mentioned above, FSI reveals, in each period, the contribution of each economic and financial variable to the evolution of the real economy, implicitly the impact of public policy measures aimed at mitigating financial crises (Figure 2)

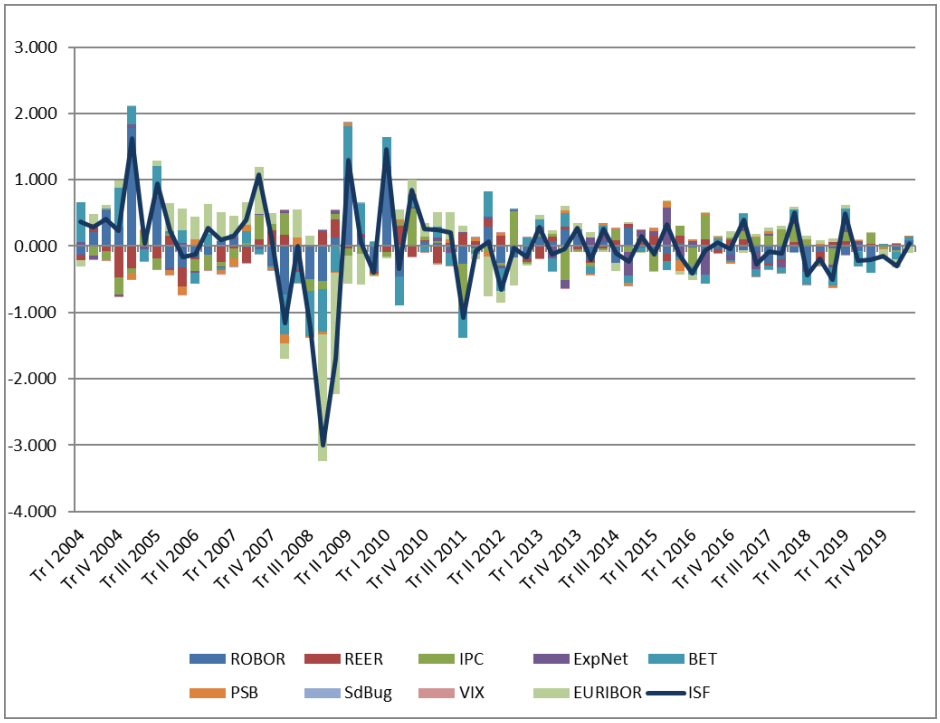

Figure no. 2. Graphical representation of the contribution of each financial variable to the estimated FSI

The decrease of the FSI in the fourth quarter of 2008 is largely driven by the evolution of the EURIBOR, BET and ROBOR financial variables which, combined with the response to the impulse on GDP, have the largest contributions to the decrease in FSI. The phenomenon was also evident in the first quarter of 2009 through the contribution of EURIBOR, BET and REER. These FSI developments are also confirmed by the decline in GDP in the respective quarters of 2008 and 2009.

In the graphical representation above but also in Table 1, a close correlation between the real GDP evolution and the EURIBOR evolution ($\rho = 0{,}562$), VIX ($\rho = 0{,}229$), ROBOR ($\rho = 0{,}124$) and PBS Asig ($\rho = 0{,}138$), respectively, the evolution of SdBug ($\rho = -0{,}164$), which led to significant weightings of these financial variables on the ISF values from 2018 to 2019.

Table no. 1. Identify correlations, impulse / GDP responses and recent developments in FSI

Accum. response of PIB =>			-0.392864	-0.145608	0.204376	-0.119295	0.282855	-0.052454	0.000335	0.000530	0.408553
Time	ISF	PIB	ROBOR	REER	IPC	ExpNet	BET	PBS Asig	SdBug	VIX	EURIBOR
Tr III 2018	-0.1962	0.2229	0.2112	1.1774	-0.1623	0.0015	0.0458	-0.4019	0.0271	-0.8115	0.1417
Tr IV 2018	-0.5091	0.0390	0.1016	-0.3903	-1.1920	0.2740	-1.0005	0.4123	-0.0673	2.9167	0.1306
Tr I 2019	0.4860	0.1616	0.3336	-0.5266	0.6749	-0.5123	1.0334	-0.0795	0.5602	-1.4692	0.1113
Tr II 2019	-0.2138	0.0390	0.1983	-0.0857	-0.0289	-0.5260	-0.7747	-0.1688	0.2303	0.5071	0.0116

1. During 2018Q4 ISF shows a clear decrease (as the GDP) o the background of the the decrease in inflation, corroborated with the GDP response of 0.204 to the impulse of the change in inflation and also due to the decrease of the BET index corroborated with the GDP response of 0.283 to the impulse modification of BET.[†]
2. On the contrary, in 2019 Q1 there is a substantial increase of the ISF (also similar to the GDP growth) mainly as a result of the increase in inflation and the BET index.

3. In 2019 Q2 there is a decrease of the ISF due in particular to the BET decrease.

The GDP forecast for the next 4 quarters (2019Q3 – 2020Q2) was estimated by the economic and financial variables in the FSI, at one lag and two lags[‡]. Based on the equation used, the GDP growth rate is 2.76% for the prediction interval with quarterly rates of 0.61%; 0.68%; 0.45%; respectively, 1.01%. This is in line with the World Bank's forecasts for Romania, respectively a GDP growth of 3.6% for 2019 and 3.3% for 2020. Our forecast is prudent and was determined in particular by the recent evolution of ROBOR (3M), CPI, BET and SdBug.

The quarterly update, when the data becomes available, will allow us to assess the prediction power of the model and make estimates as close as possible to economic reality.

Conclusions and future research

- There is a significant correlation between FSI and GDP, including a relevant response in times of crisis.
- The inclusion of variables related to non-banking entities in the financial sector in the model does not significantly improve the performance of the model.

[†] The values in Table 2 are quarterly variations, standardized and therefore different from the real growth values ROBOR, ExpNet VIX and EURIBOR

[‡] The equation is of the form: GDP = C (1) + C (2) * GDP (-1) + C (3) * GDP (-2) + C (4) ROBOR (-2) + C (6) * REER (-1) + C (7) C (12) * BET (-1) + C (13) * EXPET (-1) + C (11) (-1) + C (15) * PBS (-2) + C (16) * DEFBUG (-1) + C (17) (20) * EURIBOR (-1) + C (21) * EURIBOR (-2) + EURIBOR (-2)

- It is also necessary to test other methods for building the financial stability index (eg PCA, weighted averages).
- At the same time, it is necessary to find and test the inclusion in the model of other variables related to the Romanian non-banking financial system (eg investment funds, pension funds, other indicators of the insurance market).

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