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Stock Market and Economic Growth in the U.S. & France: Evidence from Stock Market Sector Indices

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Many scientists have analyzed a relation among economic and financial market variables. One of the purposes of these researches, and probably the most important one, is to find a better prediction of future economic changes. Economic theory suggests a strong link between stock market and economic activity. The question is whether the stock market is a predictor of future economic activity measured as growth of country's gross domestic product. In this paper we analyze which economic sectors, represented by stock market sector indices, could have most impact on GDP. The aim of this paper is to analyze whether some sectors are more important than others while analyzing GDP change. The study uses data for the period 2000 Q2 – 2012 Q1 of the U.S. seasonally adjusted GDP and Dow Jones indices and data for the period 2001 Q1 – 2012 Q1 of France seasonally adjusted GDP and Euronext CAC indices. In order to find a relation between selected stock market sector indices and GDP, we will use cross correlation analysis. Our findings support the theory that stock market is a leading indicator for economic growth. In France stock market appears to be a stronger indicator for economic growth compared to the U.S. The results revealed that seasonally adjusted GDP growth lagged behind changes in stock market indices four quarters in France and three quarter in the U.S. In the U.S. worst predictive capabilities for GDP growth come from utilities, oil and gas sectors. Industrial and financial sectors gave the best cross correlation results with GDP growth. In France telecommunication, utilities sectors have the worst predictive capabilities, and consumer services and health care sectors gave the best cross correlation results on GDP growth, compared with others.

Keywords: *Economic growth, gross domestic product, stock market, sector indices, Cross correlation.*

Introduction

Many scientists have analyzed a relation among various economic and financial market variables, for example export and economic growth (Lim, 1976); commodity prices and inflation (Surrey, 1989); unemployment and interest rate (Bierens & Broersma,1993);budget deficit and interest rate (Correia-Nunes & Stemitsiotis, 1995); human capital and economic growth (Gammell, 1996); FDI and economic growth (Nair-Reichert & Weinhold, 2001); macroeconomic volatility, inflation and interest rates (Spencer, 2012), yield and GDP (Ang *et al*., 2006). One of the purposes of these researches, and probably the most important one, is to find a better prediction of future economic changes (Marcellino & Schumacher, 2010; Zhang *et al.*, 2009; Gong *et al*., 2004; Mariano & Murasawa, 2010 and others). Favero and Marcellino (2005) proposed small-scale forecast models for Euro area. Angelini *et al*., (2011) in their paper about Euro area GDP growth short-term forecasting concluded that "bridging via factors produces more accurate estimates than traditional bridge equations" and "that survey data and other 'soft' information are valuable for now-casting". Banjeree *et al.* (2005) analyzed leading indicators for inflation and GDP in Euro area and concluded that "best indicator changes over time". For Euro area inflation "labour market variables, prices, fiscal series and GDP growth rate on average outperform the autoregression". For GDP growth "the best indicators on average are the short-term interest rate, public expenditure, total industrial production, and world GDP and demand growth". Also "the set of good the US indicators includes the short and long-term interest rates, the growth in the NYSE share prices, labor market variables [...], and the consumer confidence indicator". The U.S. GDP and growth of industrial production were outperformed by the autoregression. Camba-Mendez *et al.*, (2001) proposed an automatic leading indicator model tested on France, Germany, Italy and the United Kingdom forecasting performance of which "appears better than that of more traditional VAR and BVAR models". Benerjee and Marcellino (2006) suggested a procedure allowing constructing indicator based forecasts.

Stock market and economy relation is also a topic of great interest (Beenstock & Chan, 1988; Beltratti & Morana, 2006). Economic theory suggests a strong link between stock market and economic activity. The question is whether the stock market is a predictor of future economic activity measured as growth of country's gross domestic product. There are works analyzing impact of macroeconomic variables on stock market. Beltratti and Morana concluded that "causality direction is stronger from macroeconomic to stock market volatility". Hsing and Hsieh (2012) found that Poland stock market index is positively affected by industrial production, real GDP, Germany stock market index, and negatively affected by government borrowing/GDP ratio, real interest rate, nominal effective exchange rate, expected inflation rate, and government bond yield in the euro area. Humpe and MacMillan (2005) analyzed the extent to which

macroeconomic variables explain stock market movements in the U.S. and Japan. Using a log-linear model, they found that a 1 per cent increase in industrial production triggered a 1,09 per cent increase in the US stock prices whilst a 1 per cent increase in Japanese industrial production triggered a 0,4 per cent increase in Japanese stock prices. Both parameters were highly statistically significant. Others show that stock market is a leading indicator for economy. For instance, Aylwaed & Glen (2000) analyzed 23 countries and concluded that "stock prices generally have predictive ability, but with substantial variation across countries". Of course, there are other researches showing mixed results of causal relations. Pilinkus (2009) analyzed Lithuanian data, and noticed that "GDP deflator, net export, foreign direct investment [...] lead Lithuanian stock market returns", "GDP, material investment, construction volume index [...] are led by OMXV index", "money supply, payment balance [...] and stock market returns Granger-cause each other".

In this paper we will take a different approach. We will analyze which economic sectors, represented by stock market sector indices, could have the most impact on GDP. Our hypothesis is that analysis of stock market benchmark index might not give all information about possible changes in economic activity, and sector indices might provide this additional useful information. This could be useful in constructing new GDP forecasting models.

The *research objective* is a relation between stock market and economic growth. The *aim of this paper* is to analyze whether some sectors are more important than others while analyzing GDP change. Hence the research tasks are:

- to analyze data of the U.S. and France GDP and stock market;
- to calculate the cross correlations between GDP change and stock market sector indices;
- to compare the results of the U.S. and France.

The *research methods* applied include analysis of scientific literature, statistical, time series cross correlation and comparative analysis.

This paper is organized as follows. The next section includes the methodology and data used in the analysis. Subsequently, the research findings are presented in Research Results section. The final section includes the conclusions of the paper.

Research Methodology and Data

Dow Jones indices for the U.S. and Euronext CAC indices for France, representing 10 sectors, will be used to see which sector can more accurately track the U.S. and France GDP change. Dow Jones Industrial Average is recognized as one of the best representatives of the U.S. economy and CAC 40 is a benchmark index of French stock market.

The study uses data for the period 2000 Q2 – 2012 Q1 (48 observations) of the U.S. seasonally adjusted GDP and Dow Jones indices and data for the period 2001 Q1 – 2012 Q1 (45 observations) of France seasonally adjusted GDP and Euronext CAC indices obtained from OECD database, Yahoo! Finance and Euronext. Sector indices used in this paper are presented in Table 1.

Table 1

Dow Jones and Euronext CAC Indices

Index	Symbol	Index	Symbol
Dow Jones Industrial average	DJI	CAC 40 Index	CAC40
Dow Jones the U.S. Utilities Index	DJUSUT	Euronext Paris CAC Utilities Index	EPSPUB
Dow Jones the U.S. Telecommunications Index	DJUSTL	Euronext Paris CAC Telecommunication Index	EPSNCY
Dow Jones the U.S. Technology Index	DJUSTC	Euronext Paris CAC Technology Index	EPTECI
Dow Jones the U.S. Oil & Gas Index	DJUSEN	Euronext Paris CAC Oil & Gas Index	EPRESS
Dow Jones the U.S. Industrials Index	DJUSIN	Euronext Paris CAC Industrials Index	EPGENE
Dow Jones the U.S. Health Care Index	DJUSHC	Euronext Paris CAC Health Care Index	EPBNCY
Dow Jones the U.S. Financials Index	DJUSFN	Euronext Paris CAC Financials Index	EPSFIN
Dow Jones the U.S. Consumer Service Index	DJUSCY	Euronext Paris CAC Consumer Services Index	EPSCYC
Dow Jones the U.S. Consumer Goods Index	DJUSNC	Euronext Paris CAC Consumer Goods Index	EPBCYC
Dow Jones the U.S. Basic Materials Index	DJUSBM	Euronext Paris CAC Basic Materials Index	EPBASE

In order to find a relation between selected stock market sector indices and GDP, we will use cross correlation analysis.

Given two time series, x_t and y_t, for data pairs $(x_1, y_1), (x_2, y_2), ..., (x_n, y_n)$ an estimate of lag k cross covariance is calculated as follows:

$$c_{xy}(k) = \begin{cases} \frac{1}{n}\sum_{i=1}^{n-k}(x_i - \bar{x})(y_{i+k} - \bar{y}), & k = 0,1,2,... \\ \frac{1}{n}\sum_{i=1}^{n-k}(y_i - \bar{y})(x_{i-k} - \bar{x}), & k = 0,-1,-2,... \end{cases} \quad (1)$$

where $\bar{x}$ and $\bar{y}$ are sample means of the time series x_t and y_t.

The estimate of the cross correlation function between two time series x_t and y_t is expressed as

$$r_{xy}(k) = \frac{c_{xy}(k)}{s_x s_y}, k = 0, \pm 1, \pm 2, ..., \quad (2)$$

where $s_x = \sqrt{c_{xx}(0)}, s_y = \sqrt{c_{yy}(0)}$ are sample standard deviations of the time series x_t and y_t.

Research results

Analyzing the statistical properties of the data representing the seasonally adjusted GDP of the U.S., we note that the skewness parameter of GDP indicates a

"negative asymmetric" distribution. The kurtosis parameter shows a value of 5 and indicates a "peaked" distribution of the data. For DJI index, the value of the skewness parameter is also negative. Kurtosis parameter has a value less than 1, indicating "flatter" distribution than that of GDP. Negative skewness parameter indicates left asymmetry of distribution for all sector indices except DJUSTL and DJUSUT. Negative kurtosis parameter indicates a relatively flat distribution for DJUSCY, DJUSIN indices. For other sector indices kurtosis parameter values are positive, indicating relatively "peaked" distributions.

Similarly analyzing the data of France, we note that the skewness parameter of GDP also indicates a "negative asymmetric" distribution. The kurtosis parameter shows a value close to 5 and also indicates a "peaked" distribution of the data. For CAC40 index, the value of the skewness parameter is also negative. Kurtosis parameter has a value close to 0, indicating "flatter" distribution than that of France GDP. Negative skewness parameter indicates left asymmetry for all sector indices. Negative kurtosis parameter indicates a relatively flat distribution for EPRESS, EPGENE indices. For other sector indices kurtosis parameter values are positive, indicating relatively "peaked" distributions.

The plots of changes in GDP and indices (Figure 1, Figure 2) did not reveal much information about the strength of cross correlation between these pairs of data series or number of lag structures involved. However, it appears that peaks and bottoms in countries' stock markets were followed by similar peaks and bottoms in economic growth. This is more evident in the U.S. than in France data plot.

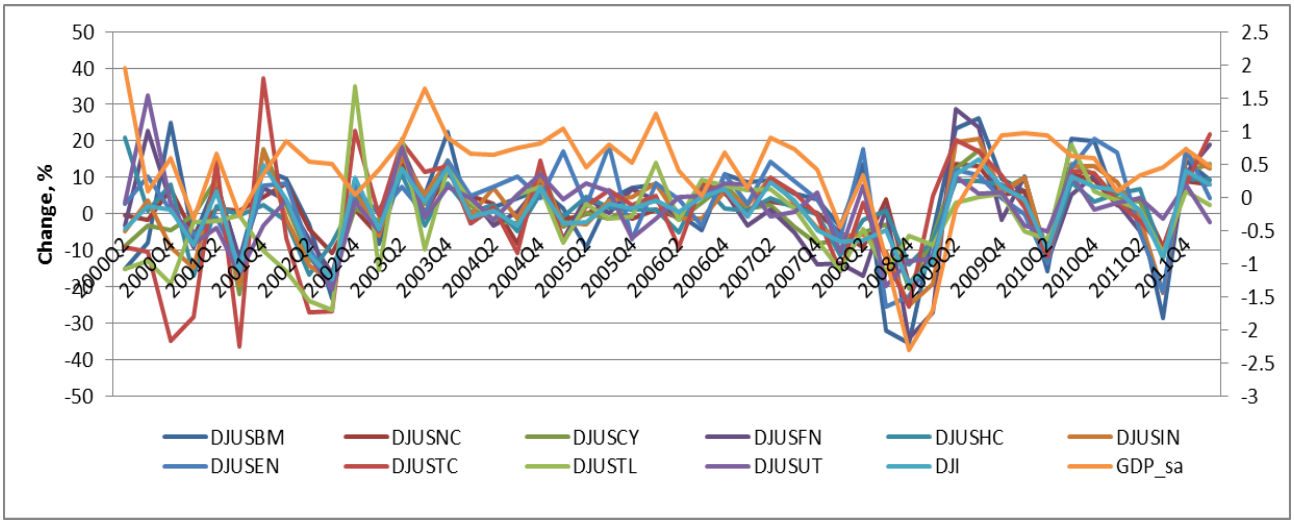

Figure 1. Change, %, of U.S. seasonally adjusted GDP (right axis), Dow Jones Industrial Average (DJI) and Dow Jones sector indices (left axis) in 2000 Q1/Q2 – 2012 Q1.

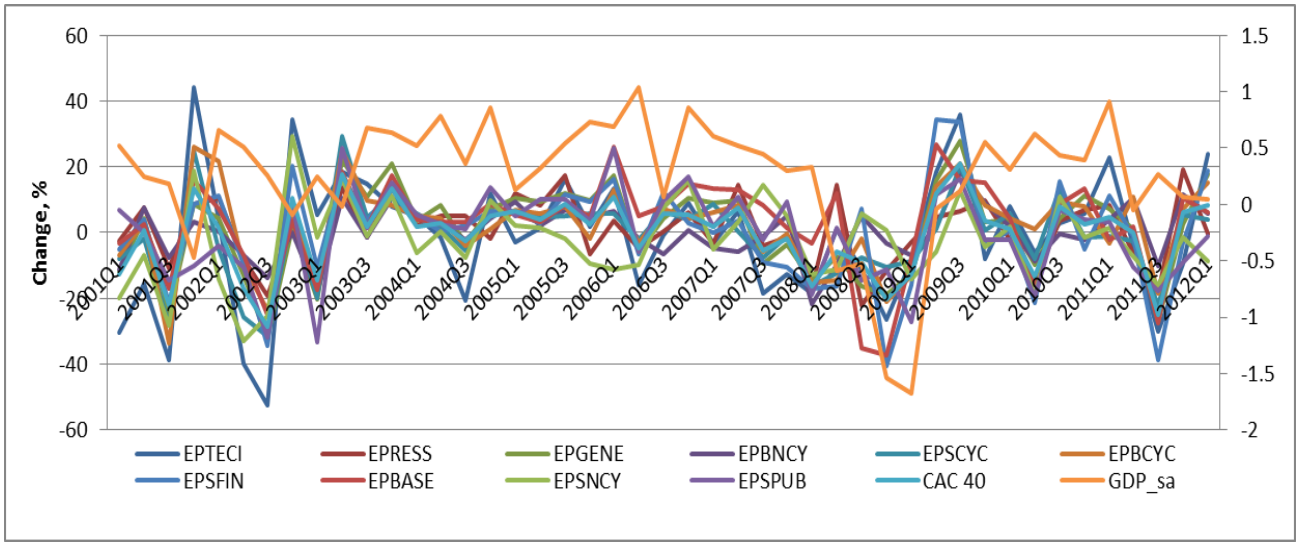

Figure 2. Change, %, of France seasonally adjusted GDP (right axis), CAC 40 and Euronext CAC sector indices (left axis) in 2001Q1 – 2012 Q1.

Table 2 shows the results of cross correlation analysis of the U.S. data for lags of 0 to 10. Analysis of changes in stock market sector indices lagged on seasonally adjusted GDP changes revealed that DJI and all sector indices except DJUSTL index showed maximum positive cross correlation coefficients for lag 0, while maximum negative correlation coefficients for all indices except DJUSEN and DJUSTL appeared for lag 3. For lag 2, we see a change from positive to negative correlation for almost all indices. Similarly, a change from negative to positive correlation is seen for lag 10. DJUSTL DJUSUT, DJUSEN did show a relatively weakest correlation with GDP.

Analysis of seasonally adjusted GDP changes lagged on stock market indices shows relatively stronger cross correlations. Seasonally adjusted GDP growth lagged behind stock market indices by about one to three quarters. For lag 1, the weakest correlation was with DJUSHC index, for lag 2 – with DJUSUT, DJUSEN, DJUSTC, and for lag 3 – with DJUSBM, DJUSEN, DJUSUT, DJUSHC indices.

For lag 1, the strongest correlation was with DJUSIN and DJUSCY, for lag 2 – with DJUSHC, DJUSFN, DJUSIN, for lag 3 – with DJUSTL, DJUSFN indices.

Table 2

Results of the U.S. data cross correlation analysis

Correlation coefficients of DJ indices lagged on seasonally adjusted GDP											
Lag	**DJI**	**DJUSBM**	**DJUSCY**	**DJUSEN**	**DJUSFN**	**DJUSHC**	**DJUSIN**	**DJUSNC**	**DJUSTC**	**DJUSTL**	**DJUSUT**
0	0,427690	0,40192	0,32245	0,48016	0,40281	0,41802	0,45409	0,40258	0,25799	0,09984	0,37169
1	0,122428	-0,01606	0,00084	0,15825	0,23346	0,04165	0,12741	0,15930	-0,14488	0,08784	0,27828
2	-0,065177	-0,05139	-0,13638	0,09886	-0,15858	-0,02235	-0,09727	-0,12583	-0,16413	-0,00995	0,05133
3	-0,219669	-0,17502	-0,19651	0,03441	-0,21011	-0,20903	-0,22480	-0,19137	-0,24226	0,07657	-0,02270
4	-0,039268	-0,04347	-0,03461	0,11112	-0,00595	-0,05765	0,00272	-0,12142	0,00035	0,08167	0,10023
5	-0,094304	-0,14321	-0,12681	-0,01188	-0,09240	0,02738	-0,12529	-0,01415	-0,14690	0,03444	-0,03476
6	0,059658	-0,00063	0,01452	0,11743	-0,03837	0,05227	0,00456	-0,03266	0,14621	0,02346	0,08812
7	-0,108127	-0,16663	-0,13366	-0,10404	-0,02472	-0,03349	-0,14777	-0,04862	-0,08456	-0,30599	-0,05949
8	-0,124431	-0,06840	-0,18511	-0,13380	-0,03978	-0,17666	-0,13283	-0,11241	-0,11756	-0,08457	0,00603
9	-0,142193	0,00486	-0,12988	-0,10480	-0,05269	-0,10076	-0,08340	-0,15162	-0,04813	-0,19398	-0,17304
10	0,118876	0,14318	0,01946	0,11260	0,16018	0,01469	0,13975	0,04243	0,06846	0,18727	-0,07287
Correlation coefficient of seasonally adjusted GDP lagged on											
Lag	**DJI**	**DJUSBM**	**DJUSCY**	**DJUSEN**	**DJUSFN**	**DJUSHC**	**DJUSIN**	**DJUSNC**	**DJUSTC**	**DJUSTL**	**DJUSUT**
0	0,427690	0,40192	0.32245	0,48016	0,40281	0,41802	0,45409	0,40258	0,25799	0,09984	0,37169
1	0,396286	0,37704	0.40295	0,32703	0,39434	0,19994	0,42334	0,33543	0,33202	0,30835	0,37632
2	0,253780	0,21824	0.20263	0,18631	0,24262	0,25589	0,24026	0,24706	0,18778	0,20183	0,17096
3	0,248038	0,03565	0.25962	0,04170	0,32004	0,18056	0,21358	0,20787	0,27674	0,34871	0,12031
4	-0,020869	-0,09504	0.05405	-0,10787	0,09257	0,01581	-0,06226	-0,01665	-0,04165	0,07564	-0,15924
5	-0,052253	-0,04098	0.08622	-0,16527	0,08020	-0,15190	-0,06545	-0,01358	-0,08390	-0,06644	-0,10625
6	-0,179151	-0,14439	-0.04770	-0,19350	0,00620	-0,19392	-0,16655	-0,14796	-0,15654	-0,20867	-0,06896
7	-0,096921	-0,13014	-0.06973	-0,12022	-0,05114	0,00062	-0,08835	-0,06544	-0,01978	-0,23596	-0,18408
8	-0,173241	-0,17360	-0.17455	-0,14271	-0,10888	-0,08000	-0,13455	-0,10245	-0,09088	-0,22658	-0,20661
9	-0,058944	0,05003	-0.04869	0,01588	-0,07374	-0,06869	-0,00450	-0,04600	-0,02832	-0,11185	-0,16608
10	-0,095318	0,05999	-0.03908	-0,06035	-0,09370	-0,13890	-0,05117	-0,05664	-0,07029	-0,22415	-0,15007

Table 3 shows the results of cross correlation analysis of France data for lags of 0 to 10. Analysis of stock market sector indices lagged on seasonally adjusted GDP changes revealed that more than a half of chosen indices showed maximum positive cross correlation coefficients for lag 0, while maximum negative correlation coefficients for 8 indices out of 11 appeared for lag 3. For lag 2, we see a change from positive to negative correlation for almost all indices. Similarly, a change from negative to positive correlation is seen for lag 10. EPBASE and EPRESS indices did show a relatively weakest correlation with GDP. Analysis of GDP changes lagged on stock market indices shows relatively stronger cross correlations compared to the results of the U.S. data analysis. Seasonally adjusted GDP growth lagged behind stock market indices by about one to four quarters. For lag 1, the weakest correlation was with EPSNCY index, for lag 2 – with EPSNCY, EPBNCY, EPSPUB, for lag 3 – with EPBASE, EPSNCY, EPRESS, EPSPUB, and for lag 4 – EPSNCY, EPBASE, EPTECI, EPRESS, EPBCYC, EPSPUB indices. For lag 1, the strongest correlation was with EPBASE and EPGENE, for lag 2 – with EPGENE, EPSCYC, EPBASE, for lag 3 – with EPBNCY, EPGENE, EPBCYC, EPSCYC, and for lag 4 – EPBNCY, EPSFIN, EPGENE, EPSCYC indices.

Table 3

Results of France data cross correlation analysis

Correlation coefficients of indices lagged on seasonally adjusted GDP											
Lag	**CAC40**	**EPBASE**	**EPSCYC**	**EPRESS**	**EPSFIN**	**EPBNCY**	**EPGENE**	**EPBCYC**	**EPTECI**	**EPSNCY**	**EPSPUB**
0	0,21318	0,35060	0,09412	0,13683	0,24767	0,08157	0,28474	0,20423	0,04755	-0,05387	0,34614
1	0,12198	0,19858	0,13069	0,13208	-0,00477	0,07852	0,12528	0,06064	-0,10615	0,04982	0,24417
2	-0,20617	-0,14030	-0,17364	-0,12278	-0,30181	-0,27886	-0,23340	-0,19606	-0,19209	0,01427	-0,03626

Lag	CAC40	EPBASE	EPSCYC	EPRESS	EPSFIN	EPBNCY	EPGENE	EPBCYC	EPTECI	EPSNCY	EPSPUB
3	-0,03904	-0,04212	0,00384	0,03769	-0,10255	-0,17047	-0,09199	-0,09691	-0,05870	0,18123	0,06623
4	-0,12733	-0,13515	-0,11104	-0,05717	-0,13863	-0,21155	-0,07816	-0,12097	-0,11826	-0,09519	-0,02659
5	0,03764	0,10844	-0,02858	0,14146	0,03169	-0,00867	0,04758	-0,06415	-0,07268	0,06501	0,21702
6	-0,05784	-0,01901	-0,14981	0,05154	-0,06195	0,06709	-0,04207	-0,16068	-0,09700	-0,04140	0,01712
7	-0,07938	-0,10390	-0,11426	-0,13266	-0,01652	0,00582	-0,11670	-0,13813	-0,09686	-0,01664	-0,01162
8	-0,11381	0,00873	-0,07910	-0,05062	-0,11886	-0,08664	-0,15439	-0,14493	-0,14913	-0,06113	-0,04535
9	-0,05552	0,03416	-0,01146	-0,13669	0,00930	-0,18145	-0,04967	-0,05866	-0,08392	-0,03882	0,00458
10	0,14244	0,16350	0,12885	0,11341	0,19360	-0,06200	0,11318	0,04460	0,08755	0,14195	0,.21923
Correlation coefficient of seasonally adjusted GDP lagged on											
Lag	**CAC40**	**EPBASE**	**EPSCYC**	**EPRESS**	**EPSFIN**	**EPBNCY**	**EPGENE**	**EPBCYC**	**EPTECI**	**EPSNCY**	**EPSPUB**
0	0,21318	0,35060	0,09412	0,13683	0,24767	0,08157	0,28474	0,20423	0,04755	-0,05387	0,34614
1	0,56135	0,69082	0,50449	0,48639	0,48094	0,28630	0,60667	0,59332	0,40548	0,16166	0,50699
2	0,29609	0,31520	0,33433	0,21998	0,24121	0,15746	0,34133	0,25696	0,20296	0,11769	0,18967
3	0,30309	0,08517	0,31130	0,15347	0,29586	0,38063	0,32679	0,31705	0,28436	0,13069	0,18157
4	0,19311	0,06312	0,21782	0,13967	0,24488	0,28483	0,21897	0,14441	0,12511	0,05075	0,18335
5	0,01984	-0,10374	0,00628	0,01604	0,13131	0,06545	0,04774	0,02741	0,09464	-0,16373	-0,09395
6	0,02636	-0,12440	0,04286	-0,01890	0,12299	0,14129	0,04688	0,01023	0,10106	-0,13583	0,02893
7	-0,13070	-0,20389	-0,16030	-0.09412	-0,01609	0,07219	-0,15934	-0,09308	-0,04758	-0,13655	-0,26135
8	-0.08230	-0,20302	-0,11214	0.01556	-0,05401	0,09176	-0,11422	-0,09522	0,01778	-0,08202	-0,12985
9	-0.20812	-0,27695	-0,17281	-0.08204	-0,18948	0,01036	-0,18930	-0,15564	-0,15561	-0,17388	-0,27118
10	-0,04701	-0,12580	-0,070564	0.08251	-0,04717	0,04728	-0,04377	-0,00130	-0,00611	0,03943	-0,09870

Conclusions and Discussion

Our findings support the theory that stock market is a leading indicator for economic growth. In France stock market appears to be a stronger indicator for economic growth compared to the U.S.

The results of ten analyzed stock market sector indices revealed that:

- Seasonally adjusted GDP growth lagged behind changes in stock market sector indices four quarters in France and three quarter in the U.S.
- Both for the U.S. and France sector indices gave better cross correlation results than stock market benchmark indices DJI and CAC40.
- In the U.S. best predictive capabilities for GDP growth come from financials and industrials sectors. Consumer goods, consumer services and health care sectors also gave good cross correlation results with GDP growth.
- In France best predictive capabilities for GDP growth come from industrials sector. Consumer goods, consumer services, financials and basic materials sectors gave good cross correlation results on GDP growth, compared with others.

It is proven that market is a leading indicator for country's GDP. We also know that changes in sector of economy directly affect the same sector's stock market sector index. Knowing this, we can assume that the influence of sectors of economy on country's GDP can be evaluated using stock market sector indices.

We analyzed which economic sectors, represented by stock market sector indices, have most impact on GDP. These results support our hypothesis that stock market benchmark index might not give all information about possible changes in economic activity, and sector indices provide this additional useful information.

Our empirical study on the U.S. and France shows that we can find the most influential sectors of country's economy. What's more, our analysis reveals the time frame of influence, i.e. we can find a number of quarters this influence continues.

These findings suggest that the use of selection of stock market sector indices instead of one index like DJI or CAC40 might mimic the changes in country's GDP more accurately. This could be used in construction of GDP forecasts. Theoretically, if we find a set of stock market sector indices that have a high cross correlation with country's GDP and the number of periods GDP lags behind stock market, we can construct a new weighted index from selected sector indices.

Stock market indices are an important measure to predict GDP, but having a new composite index containing data from main sectors of country's economy could forecast GDP changes more accurately. More research has to be done to examine different ways of constructing new GDP forecast model.

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Akcijų rinka ir ekonomikos augimas JAV ir Prancūzijoje: akcijų rinkos sektorinių indeksų panaudojimo rezultatai

Santrauka

Daugelis mokslininkų nagrinėja ekonomininius ir finansinius rinkų kintamuosiuos. Vienas iš šių tyrimų tikslų – ir turbūt pats svarbiausias – nustatyti kuo tikslesnę šalies ekonominių pokyčių prognozę. Tyrimai rodo, kad egzistuoja ryšys tarp akcijų rinkų ir ekonomikos pokyčių. Daug autorių nagrinėja klausimą: ar akcijų rinkų kitimas gali nusakyti būsimus ekonominius pokyčius, išreikštus šalies BVP. Šiame straipsnyje pasirinktas kiek kitoks požiūris. Analizuojama, kurie ekonomikos sektoriai, atstovaujami akcijų rinkos sektorių indeksų, gali turėti stipriausią ryšį su šalies BVP. Iškelta hipotezė, kad *akcijų rinkos lyginamojo indekso analizė negali suteikti visos informacijos apie galimus šalies ekonominės situacijos pokyčius. Tokią papildomą informaciją gali suteikti sektorių indeksai.*

Tai gali būti naudinga sudarant naujus BVP prognozavimo modelius. *Dow Jones* indeksai JAV ir *Euronext* CAC indeksai Prancūzijoje, atstovaujantys 10 ekonomikos sektorių, buvo naudojami tyrimui, siekiant išsiaiškinti, kurie sektoriai gali tiksliau įžvelgti ir (ar) nurodyti JAV ir Prancūzijos BVP pokyčius. *Dow Jones Industrial Average* yra laikomas vienu, geriausiai atitinkančiu JAV ekonomikos pokyčius indeksu, o *CAC40* yra lyginamasis indeksas Prancūzijos vertybinių popierių rinkoje. Tyrime naudojami JAV BVP (eliminavus sezono įtaką) ir *Dow Jones* indeksų duomenys, apima laikotarpį nuo 2000 m. II-ojo ketvirčio iki 2012 m. I-ojo ketvirčio, o Prancūzijos BVP (eliminavus sezono įtaką) ir *Euronext CAC,* indeksų duomenys apima 2001 - 2012 metų I-ųjų ketvirčių laikotarpį. Siekiant rasti ryšį tarp pasirinktų akcijų rinkų sektorių indeksų ir šalių BVP, naudojama kryžminės koreliacijos analizė. Gauti rezultatai patvirtina teoriją, kad akcijų rinka yra vienas iš pirmaujančių ekonomikos augimo faktorių. Prancūzijoje akcijų rinka yra šiek tiek stipresnis ekonomikos augimo faktorius palyginti su JAV. Išanalizavus dešimties akcijų rinkų sektorių indeksus, galima matyti, kad pašalinus sezono įtaką, BVP augimas atsiliko nuo akcijų rinkos sektorių indeksų pokyčių keturiais ketvirčiais Prancūzijoje ir trimis ketvirčiais JAV. Ir JAV ir Prancūzijoje sektorių indeksai pateikė geresnius kryžminės koreliacijos rezultatus, nei akcijų rinkos lyginamieji indeksai *DJI* ir *CAC40*. JAV geriausias BVP augimo prognozavimo galimybes teikia finansų ir pramonės sektoriai.

Vartojimo prekių, plataus vartojimo paslaugų ir sveikatos priežiūros sektoriai pateikė taip pat gerus kryžminės koreliacijos su BVP augimu rezultatus; Prancūzijoje geriausias BVP augimo prognozavimo galimybes teikia pramonės sektorius. Vartojimo prekės, plataus vartojimo paslaugos, finansų ir pagrindinių pramonės medžiagų sektoriai taip pat pateikė gerus kryžminės koreliacijos su šalies BVP augimu rezultatus, palyginti su kitais sektoriais. Įrodyta, kad akcijų rinka yra vienas iš pirmaujančių šalies BVP kaitos indikatorių. Taip pat žinoma, kad pokyčiai tam tikrame ekonomikos sektoriuje, tiesiogiai veikia to sektoriaus akcijų rinkos indeksą. Žinant tai, galima daryti prielaidą, kad ekonomikos sektorių įtaka dėl šalies BVP gali būti įvertinta naudojant akcijų rinkos sektorių indeksus. Tirta, kurie šalies ekonomikos sektoriai, nusakomi akcijų rinkos sektorių indeksais, turi stipriausią ryšį su šalies BVP. Rezultatai patvirtina išsikeltą hipotezę, kad akcijų rinkos lyginamasis indeksas gali nesuteikti visos informacijos apie galimus šalies ekonominės situacijos pasikeitimus, o sektorių indeksai gali suteikti šią papildomą naudingą informaciją. Atliktas empirinis tyrimas JAV ir Prancūzijos atvejais rodo, kad galima išskirti svarbiausius šalies ekonomikai sektorius. Be to, analizė atskleidžia tarpusavyje susietus laikotarpius, t. y. galima rasti tam tikrą ketvirčių skaičių, kurių metu pasireiškia indeksų ir BVP ryšis. Šie rezultatai rodo, kad atrinktų akcijų rinkos sektorių indeksų, o ne vieno rinkos indekso, kaip pavyzdžiui, *DJI* ar *CAC40* naudojimas, gali tiksliau atkartoti šalies BVP pokyčius. Ši metodika galėtų būti taikoma sudarant BVP prognozes. Teoriškai, jei randami akcijų rinkos sektorių indeksai, kurie pasižymi aukšta kryžmine koreliaciją su šalies BVP ir nustatomi vėlavimai, iš pasirinktų sektorių indeksų galima sudaryti naują svertinį indeksą. Taigi akcijų rinkų indeksai yra svarbi priemonė, galinti padėti prognozuoti BVP. Naujo, sudėtinio akcijų rinkos indekso, kuriame būtų įtraukiami duomenys iš pagrindinių šalies ekonomikos sektorių pritaikymas, leistų tiksliau prognozuoti BVP pokyčius.

Raktažodžiai: *ekonominis augimas, bendrasis vidaus produktas, akcijų rinka, sektoriniai indeksai, koreliacija.*

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