Studies on the Factors Influencing China's Stock Markets under the Background of the Sino-US Trade Frictions

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Abstract: China's stock markets shrinking since the Trade Friction urges us to find out the causes during this period to reach conclusions and suggestions through regression models. A series of potential influential factors were summarized in previous studies, such as macroeconomic indicators, national fiscal status, RMB interest rates and etc.. With U.S. stock indices, LIBOR and capital inflow to Chinese stock markets being added into the model, empirical analysis was then conducted to link these factors with Chinese stock indices by partial least squares. Consequently, fixed base CPI, public fiscal income, M2, overnight SHIBOR, CNY/USD spot exchange rates, and overnight LIBOR have been proved to have explanatory power at different levels of significance in the established models. Predictions were finally drawn to help regulators implement regulation policies to better recover from the unpredictably volatilities in China's stock markets by stabilizing interest rates, smoothing exchange rates, balancing fiscal income, strengthening monetary supply, and keeping sustainably-growing CPI.

Introduction

On March 23rd, 2018, A-share markets dropped heavily after Trump administration launching the Trade Friction. Major stock indices plunged by over 3% and continued declining with over 3,000 stocks falling. Shanghai Composite Index fell by about 500 points (or about 15%) from then on. During this time in Chinese stock markets, what factors have impacts, how they affect prices and fluctuations, as well as whether there are enhancements or offsets among them and whether there is mechanism of influences or whether there are preventing strategies and procedures are to be discussed.

As for Chinese stock markets, X. Zeng (2017) studied elements and effects on fluctuations for various scenarios and assumptions with significances, but may lose reference meanings. [1] H.Z. Huang (2016) explored causes and analyzed qualitatively, but did not dig quantitatively. [2] J. Liu et al. (2015) stated various factors and influences on Shanghai Composite Index, but took very little concern on the Shenzhen or the aggregate one. [3] B. Huang (2015) researched comprehensive correlations on trait volatilities, but failed to separate each element and analyze individually. [4] Y. Qi et al. (2018) and P. Li (2014) constructed factor models qualitatively and quantitatively, but emphasized on long-term rather than short-term effects. [5,6] N. Apergis (2015) [7], C.L. Mbanga et al. (2016) [8], and A. Kurov (2010) [9] explored elements with impacts and mechanisms to relevant stock markets in their countries, but barely associated with the Chinese ones.

From a more relevant, quantitative, comprehensive, individual, and short-term perspective, this paper aims to spread analyses theoretically in Part II and empirically in Part III to derive influences of various factors on the three Chinese stock markets as well as draw possible suggestions in Part IV and conclusions in Part V.

Theoretical Analysis

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Macroeconomic Indicators. Prices of final goods, both imported and exported, would rise due to implementation of additional tax, so CPI would rise and result into a short-term positive effect on logarithmic rates of returns of Chinese stocks, but would be expected to suppress over time. With increasing taxes and prices of goods and services, at a short-term sticky velocity of monetary supply, Chinese stocks would be negatively impacted, but would be expected to relieve over time.

National Fiscal Status. Increasing prices would provide more fiscal income flowing into the government in the short term, but in the long term, whether taxes would stabilize or boost market productions and emotions to further influence fiscal incomes remains uncertain. Similarly, due to taxes on exported goods, it is hard to predict how fiscal expenditure would change. Whether national loans would be positively or negatively impacted remains unclear, but it can be expected that more loans from banks would be used into various ways to boost manufacturing production to indirectly influence stock markets.

National Trade Status. Import and export trade balances between China and the US would be negatively influenced mainly in that heavier taxes are imposed, but consequently trade relationships between them and other countries may be enhanced and may generate benefits in other means, so total effects remain to be discussed. Companies with more imported materials from or less exported goods and services to the US, would be negatively affected on cost increments or profit reduction, as well as cashflows, net income, dividends claimed and to be paid to comprehensively impact stock prices, and vice versa. With lots of companies fluctuating to different extents at distinct frequencies and volatilities, stock markets would then shake to unpredictable directions.

RMB Interest Rates. Policy and deposit rates would shake in normal times because of unexpected incidents. Since the latter is individually given by commercial banks based on the benchmark provided by the central bank, changed at certain frequencies and kept relatively stable in China during certain periods, this paper would mainly focus on another rate, SHIBOR. Real rates may have a slightly rising tendency under circumstance of the Sino-US Trade Frictions due to higher-tax-resulted more funds outflow, higher costs, stricter production limitations, and more monetary needs in the short term, but may relieve in the long term. Tighten flowability would result into narrower capital into production as well as investment directly into manufacturing and indirectly into stock markets to lower stock prices to some extent, thus shrinking Chinese stock markets, and vice versa.

Additional Factors Considered. The US stock indices such as Standard & Poor's 500 Index, may affect Chinese stock markets in opposite directions. The consequent solidarization of investors' confidence in the US and possible prosperities of the US stock markets would indicate surges in the US stock indices. More capital would flow into the US stock markets to strengthen this effect and widen the gaps among stock markets in different countries, potentially causing shrinks in the Chinese ones.

Dollar interest rates such as LIBOR may impact Chinese stock markets in homogeneous directions. Indication of more power of the US and an attractive place for investment would lower LIBOR with more capital inflow and boost the US stock markets, thus negatively affect the Chinese ones by the same logic as above.

Direct capital inflow into Chinese stock markets such as net active purchase amount of funds may influence Chinese stock markets in consistent directions. More attentions of cashflows drawn into the US capital markets or other safer, more developed and favorable capital markets, rather than the Chinese ones by the same analysis as above, would hit Chinese stock markets.

Empirical Analysis

Establishing Independent Variables and Dependent Variables. Overnight SHIBOR (SHIBOR), CNY/USD Spot Exchange Rate (EX), Standard & Poor's 500 Index (SP500), Overnight LIBOR (LIBOR), Net Active Purchase Amount of Funds to A-Shares (Inflow), Fixed Base CPI (CPI), Monthly Public Fiscal Income (Income), Monthly Additional RMB Loans from Financial Institutions (Loan), Monthly Amount of Imports and Exports (Trade), and M2 (M2) are selected (and denoted) as independent variables; while dependent variables include CSI 300 Index (CSI300),

Shanghai Composite Index (SCI) and Shenzhen Component Index (SZSECI), downloaded from Wind and derived from the National Interbank Funding Center, China Money Net, News-Accordingly Summary, the National Bureau of Statistics, People's Bank of China, General Administration of Customs, as well as Shanghai and Shenzhen Stock Exchanges.

Modeling. Due to limited samples, partial least squares method is adopted instead of OLS.

Taking CSI300 as the dependent variable, CPI, Income, M2, SHIBOR, EX, and LIBOR with significant Pearson Correlations are selected as predictors, while Trade is combined with the predictors to form instrumentals. So are for SCI and SZSECI.

Parameter Estimation.

Table 1 Coefficients for CSI300 as Dependent Variable

	Unstandardized Coefficients			Parameter Estimation (Interval)			
	B	Std. Error	t	Left	Right	Beta	Sig.
(Constant)	-324.244	4853.644	-.067	-221.4085811	-427.0794189		.951
CPI	91.261	39.147	2.331	62.40469236	120.1173076	.227	.102
Income	.021	.008	2.822	0.013860842	0.028139158	.214	.067
M2	.003	.002	1.243	0.002213858	0.003786142	.268	.302
SHIBOR	-933.813	213.298	-4.378	-638.5136163	-1229.112384	-.374	.022
EX	-937.620	181.466	-5.167	-641.1138349	-1234.126165	-.821	.014
LIBOR	-1128.563	186.392	-6.055	-771.6672175	-1485.458782	-.854	.009

$$\widehat{CSI300} = -324.244 + 91.261CPI + 0.021Income + 0.003M2 - 933.813SHIBOR - 937.620EX - 1128.563LIBOR \quad (1)$$

Table 2 Coefficients for SCI as Dependent Variable

	Unstandardized Coefficients			Parameter Estimation (Interval)			
	B	Std. Error	t	Left	Right	Beta	Sig.
(Constant)	-4388.231	3048.832	-1.439	-3000.854647	-5775.607353		.246
CPI	101.667	24.590	4.134	69.52084747	133.8131525	.328	.026
Income	.018	.005	3.884	0.011858857	0.024141143	.240	.030
M2	.004	.001	2.698	0.003146817	0.004853183	.473	.074
SHIBOR	-867.735	133.984	-6.476	-593.3503706	-1142.119629	-.450	.007
EX	-888.145	113.988	-7.792	-607.2732387	-1169.016761	-1.009	.004
LIBOR	-1027.716	117.083	-8.778	-702.7114671	-1352.720533	-1.008	.003

$$\widehat{SCI} = -4388.231 + 101.667CPI + 0.018Income + 0.004M2 - 867.735SHIBOR - 888.145EX - 1027.716LIBOR \quad (2)$$

Table 3 Coefficients for SZSECI as Dependent Variable

	Unstandardized Coefficients			Parameter Estimation (Interval)			
	B	Std. Error	t	Left	Right	Beta	Sig.
(Constant)	31539.235	16914.170	1.865	21563.85319	41514.61681		.159
CPI	-18.224	136.420	-.134	-12.44326789	-24.00473211	-.011	.902
Income	.061	.026	2.340	0.041760703	0.080239297	.153	.101
M2	.008	.007	1.129	0.005500852	0.010499148	.209	.341
SHIBOR	-3071.949	743.310	-4.133	-2100.465607	-4043.432393	-.303	.026
EX	-3175.243	632.379	-5.021	-2171.164516	-4179.321484	-.686	.015
LIBOR	-3747.804	649.546	-5.770	-2562.620147	-4932.987853	-.700	.010

$$\widehat{SZSECI} = 31539.235 - 18.224CPI + 0.061Income + 0.008M2 - 3071.949SHIBOR - 3175.243EX - 3747.804LIBOR \quad (3)$$

Model Test. Half of the $t-$values in Eq.1 are significant at 5% level and another significant at 10% level, with the overall $F-STAT$ significant at 0.1% level, appearing acceptable. Adjusted R^2 of Eq.1 is 98.9%, high enough to demonstrate the fitness. Similar conclusions are drawn from most and half of the $t-$values significant at 5% level, one and none of the $t-$values significant at 10% level, the overall $F-STAT$ significant at 0.1% level, and Adjusted R^2 of 99.2% respectively for Eq.2 and Eq.3.

Analyzing the Problem Using the Model. Income (Public Fiscal Income) and M2 (Monetary Supply) have slight positive effects on all stock indices, while SHIBOR (Overnight SHIBOR), EX (CNY/USD Spot Exchange Rate), and LIBOR (Overnight LIBOR) have drastic negative impacts at 5% significance level. Apart from a 3% significantly positive influence of Public Fiscal Income on the Shanghai market, impacts from Public Fiscal Income and Monetary Supply are insignificant. Thus, exchange and interest rates need more attention.

CPI has a positive effect on the aggregate and the Shanghai markets, with that on the Shanghai one more significant, while it possesses an opposite impact on the Shenzhen market with the least significance. Therefore, CPI should be handled separately in different markets.

Possible Prediction and Anticipation. As widening globalization and deepening development go further, it is expected that the Sino-US Trade Frictions would relieve by combined efforts of multiple sides through negotiations, agreements, policies, legitimations, etc., but with conflicts no matter fierce or subtle existing increasingly to become more like normality. Although frictions are happening sporadically with the number of them rising, shocks to both countries and other economic entities may alleviate as time passes and numbers increase. As a result, those factors affecting Chinese stock markets would weaken and finally transform into normal status just as nothing occurred, but for changeable and fast-developing financial markets, it is natural for them to change and to response, to shock and to relieve, to soar and to dive.

Suggestion

Stabilizing Interest Rates. Interest rates such as policy rates and deposit rates usually indicate whether economic entities are healthy or not. Stabilizing interest rates is helpful to relieve fierce fluctuations, locking costs of borrowing money and sealing interests of lending capitals to promote capital markets to develop healthily and orderly as well as further boost the entire economy.

Considering a significantly negative relationship between interest rates and performances of stock markets, it is suggested to sustainably and slightly decrease interest rates such as the central bank deposit reserve rate in China to boost stock markets under the background set.

Smoothing Exchange Rates. Exchange rates reflect comprehensive national power and international political status. Smoothing exchange rates between China and other countries are effective to provide confidence to creativity and production as well as attract foreign investment by making China a safer place for capital inflows.

Concerning a significantly negative relationship between spot CNY/USD exchange rate and performances of stock markets, it is suggested to sustainably and subtly downsize floating spot CNY/USD exchange rate, i.e. to appreciate RMB against USD to boost stock markets under the background set.

Balancing Fiscal Income. Balancing fiscal income with expenditures mainly focusing on technological research and development, military, trade issues, international assisting transfer, etc. not only keeps the entire country internally well-functioned, but also assists international peace and harmony to supply public activities and fulfill functions of public management, public services, and market-oriented management of national economy, signaling that the national macroeconomy is strong.

In terms of a significantly positive relationship between public fiscal income and performances of stock markets, it is advised to sustainably and slightly raise public fiscal income or wisely use fiscal expenditures on the mentioned areas above to boost stock markets under the backgrounds set.

Strengthening Monetary Supply. Strengthening monetary supply is useful to the prosperity of

economic entities and financial markets as well as sustainability and confidence of global investors. Strong M2 reflects realistic and potential purchasing power, with a faster increasing speed showing activation of investment and intermediary markets, from which the central bank and can decide monetary policies and commercial banks can construct lending strategies, while investors can make judgements.

With respect to an insignificantly positive relationship between M2 and performances of stock markets, it is suggested to sustainably and subtly lift M2 by printing more money or at a higher speed, otherwise, by selling more bonds using public market operations, to boost stock markets under the background set.

Keeping Sustainably-Growing CPI. Depicting the well-being of economic entities, monthly calculated CPI is useful in economic analysis and decision-making, aggregate price level monitoring and controlling as well as national economic accounting. Continuous increments in CPI imply inflation, which, to moderate extents, is inversely a good sign for economies.

When it comes to a significantly positive relationship between CPI and performances of the aggregate and the Shanghai stock markets, it is suggested to sustainably and subtly expand CPI by policies such as historically ‘pulling domestic demand’ or present-implementing ‘supply-side structural reform’, with an only and simple intention to encourage consumptions and stimulate the economy. Whereas for an insignificantly negative relationship between CPI and the performance of Shenzhen stock market, it is not advised to suppress CPI to only add that little probability to push Shenzhen stock market, considering that the negative correlation is not strong, and CPI has a lot to do with macroeconomy. Alternative methods as mentioned above should be taken instead.

Conclusion

Firstly, introductions to the Sino-US Trade Frictions were generalized according to multiple sources of news published and information released to clarify current situations and strong influences of this incident, which led to the topic discussed and raised the problems to be solved.

Secondly, studies available from China National Knowledge Infrastructure and foreign databases in terms of elements disturbing stock markets were looked up, read, classified and learned variables from, but there was nothing exactly relevant, since this topic was novel and specific. Domestic articles mainly focused on elements historically affecting Chinese stock markets in both the short and long terms, while the foreign ones emphasized factors impacting stock markets in various countries and economic entities based on the familiarities of authors, resulting into a summarized combination mainly including macroeconomic indicators, national fiscal status, and RMB interest rates.

Next, theoretical analyses were carried out with regard to detailed economic variables from the mentioned above towards the Chinese stock markets in the short term. Macroeconomic indicators such as CPI may have positive effects, while monetary supply may have negative impacts. Influences of national fiscal status such as public fiscal income and national loans are uncertain, but were expected positive. National trade status may be negatively impacted, which might influence Chinese stock markets in different directions based on company types. RMB interest rates such as policy and deposit rates may rise and then possibly shrink Chinese stock markets. It should be highlighted that the US stock indices, dollar interest rates, and direct capital inflow were all analyzed apart from studies reviewed, which may respectively have opposite, homogeneous, and consistent effects on Chinese stock markets, while being boosted, lowered, and hit respectively.

Empirical analyses then confirmed or revised the theoretical ones by constructing models between the three major Chinese stock market indices and ten possible disturbing terms respectively since the beginning of the Sino-US Trade Frictions to the paper written date, which proved that both public fiscal income and monetary supply had subtle positive impacts on all stock indices at different significance levels, while overnight SHIBOR, spot CNY/USD exchange rate, and overnight LIBOR had vast negative effects significantly, thus needing more attention. Whereas CPI played different roles against different stock indices, consequently requiring different ways to handle.

Political suggestions were finally drawn and listed in the order of significance levels of the variables. Therefore, to deal with shocks brought by the Sino-US Trade Frictions and to boost the Chinese stock markets according to the behaviors of the three main stock indices, interest rates such as the central bank deposit reserve rates in China should be stabilized or sustainably decreased. Spot CNY/USD exchange rates should be smoothed or slightly reduced by appreciating RMB, while fiscal income should be balanced with wise expenditures or subtly expanded. Monetary supply should be strengthened continuously, while CPI should be sustained and kept growing except for the Shenzhen market.

Research Prospects

Some data were available at low frequencies. If all variables are acquired at higher frequencies or reliable estimates are made to get equivalently frequent data, models would have lower standard errors and more individual significances. Simultaneously, impacts from the historical Sino-US trade conflicts or those between China and other economic entities may have references, which were considered. Consequently, models may bias. Meanwhile, market predictions and suggested investment strategies can be made according to customs of political influents or past market behaviors and responses as well as knowledges such as education improvement, psychology enhancement, risk avoidance, underlying preferences, etc.

The followings are still promising:

(1) Studies on this topic can be renewed accordingly with the incident;

(2) More quantifiable variables related to the Sino-US trades can be added into modeling;

(3) Suggestions can be drawn and targeted to different recipients, not restricted to regulators.

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