

## Comparison of stock market fluctuation spillover effects under the new and old international financial order Seedlings Clear

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**Abstract:** Articles use the GARCH model and Granger Causality Check , Comparative analysis of the new and old international financial order under the United States , UK , Japan , The volatility spillover effect and conduction path of index returns in Hong Kong and mainland China . research shows : in the old international financial order , UK stock markets have varying degrees of volatility in other markets , us is the end of the stock market volatility risk transmission ; in the new international financial order , Domestic The stock market exits from the volatility overflow conduction path , At the same time, the fluctuation contagion effect of other conduction paths decreases in varying degrees ..

**Keywords:** New and Old international financial order ; Stock Market ; Ripple Overflow effect ; GARCH cluster model;

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### Introduction

Enter century , with the economic globalization and financial liberalization of the development , speed of financial risk spreading in the world financial system , in StockThe typical performance in the city is a ripple overflow effect . Study Domestic and foreign stock market volatility Overflow and its conduction mechanism , for the new normal economic situation in China's financial Market Deepening system reform has very important theoretical value and practical significance ..

In recent years, domestic and foreign scholars have measured the volatility spillover effects of financial markets General , GARCH cluster metering model , Focuses on two aspects : One is issued Research on risk spillover between financial markets and emerging financial markets [1-4] , Two is a gold A comparative study of volatility conduction and spillover between financial markets before and after the crisis [5 ,], more number to conclude that : There is strong volatility spillover between major global stock markets in recent years ,, synergies between emerging markets and developed markets . But for the new normal economy The stock market volatility in the context of the "" Study less , The stock market in the new international financial and old order A comparative study of the volatility spillover between does not yet see . This article with Year 9 month 6 Day as dividing line of the new and old order of international finance , takes the GARCH cluster metering model and Granger The fluctuation of causal test to major stock markets at home and abroad Overflow and its conduction path launch empirical study , Explore International stock market volatility and its evolution The provides the basis for the development of our macro-financial policy .

### 1. Research Models and methods

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### 1.1. Volatility Model ----- GARCH Model

Standard GARCH (1,1) The basic form of the model is :

$$\sigma^2_t = \omega + \alpha_1 \epsilon_{t-1}^2 + \beta_1 \sigma_{t-1}^2 \quad (1)$$

(1)  $\omega$  and  $\beta_1$  for the first F period and F -1 period Variance , for a delay one-phase random error entry , for constant entry , and  $\alpha_1$  for variable Department number . coefficient  $\alpha_1$  and  $\beta_1$  reflect current fluctuation dependency on previous fluctuations degree , and  $\beta_1 + \alpha_1 < 1$  reflects the persistence of volatility .

### 1.2. Asymmetric GARCH Model

#### 1.2.1. TARARCH Model

the conditional variance equation defined by the model is :

$$\sigma^2_t = \omega + \alpha_1 \epsilon_{t-1}^2 + \gamma_1 \epsilon_{t-1} \epsilon_{t-1}^2 + \beta_1 \sigma_{t-1}^2 \quad (2)$$

(2)  $\gamma_1$  is a virtual variable , When there is good news in the market ,  $\gamma_1 > 0$ ,  $\gamma_1 = 0$ ; Conversely , When there is bad news in the market ,  $\gamma_1 < 0$ ,  $\gamma_1 = 1$ . as long as , There is an asymmetric effect , General  $\gamma_1$ , called non- Symmetric effect entry .The equation indicates conditional variance  $\sigma^2_t$  dependent on residuals from previous period squared  $\epsilon_{t-1}^2$  . The size of the conditional variance for the previous period . good news and bad messages have different effects on conditional variance : Good news has only one  $\alpha_1$  times the flush Click , No asymmetric entry at this time ; Bad message has  $(\alpha_1 + |\gamma_1|)$  times Impact , existence Asymmetric entry . if  $\gamma_1 > 0$ , indicates a leverage effect , asymmetric effect The main effect is to make the fluctuations increase ; if  $\gamma_1 < 0$  , Effect of asymmetric effects The is to make the fluctuation decrease .

#### 1.2.2 egarch Model

the conditional variance equation defined by the model is :

$$\ln(\sigma^2_t) = \omega + \alpha_1 \ln(\sigma^2_{t-1}) + \gamma_1 \epsilon_{t-1} \epsilon_{t-1}^2 + \beta_1 \ln(\sigma^2_{t-1}) \quad (3)$$

$$F_{t-1} = \epsilon_{t-1} \epsilon_{t-1}^2$$

(3)  $\ln(\sigma^2_t)$  is the logarithm of the conditional variance , because of the conditional variance is logarithmic form , not two times , so its predictive value must be non-negative . as long as  $\gamma_1 > 0$ , There is an asymmetric effect . as long as  $\gamma_1 < 0$ , has a leveraged effect .

### 1.3. Granger Causality checking method

Granger The causality test is used to analyze the causal relationship between two sequences exists , main look at current variable Y the extent to which can be used by previous variable X explain , and plus person variable X After latency period , increase to variable Y The ability to interpret . if X on forecast Y has help , or X and Y The correlation factor for is statistically significant with, then variable Y is the variable X Granger causes the , ; and vice versa .

Granger The causality test passes the validation for

Whether a lag variable can be placed in the equation of another variable ,

If the variable is affected by other variable lag periods , Two variables Granger causality , where lag period selection according to AIC and SC guidelines to determine .

## 2. Empirical Analysis

### 2.1. Sample selection and data preprocessing

This article selects the Dow Jones industrial Average (DJIA), Hong Kong Hang Seng index (HSI), Nikkei With exponent (N255), ft exponent (FTSE) and Shanghai deep index (CSI), respectively as Americas (AM), Asia Pacific (AP), Europe Non-Middle East ( EMEA) and Greater China (GC) The stock market represents the , on the index day rate of returns profiling object . sample period year 1 month 4 Day to 2015 Year 3 month Day , where , The first stage is Year 1 Month 4 Day to % Year 9 Month 5 Day ,

The second stage is % Year 9 Month 6 Day to 2015 Year 3 Month To Day . eliminate Non-common trading days due to inconsistencies in area closures , Total 1154Transactions Day Data , where , First Stage 587 Transaction Data , Phase Two 567 Transaction Data . to effectively avoid variance of financial time series , in real

to do logarithmic differential processing of the original yield sequence , specific :

$$R_{i,t} = \ln P_{i,t} - \ln P_{i,t-1} \quad (4)$$

(4) $R_{i,t}$  , represents the first I Index in the first T logarithmic rate of return for day ,  $P_{i,t}$  , represents the first I Index in the first T Day's closing price . take into account the time between regions difference , take , -1 as US stock market session , and t As other stock exchanges Day . data from the Rui Si financial database and NetEase finance , Place Data Rimi with Eviews 8.0 and Excel2007.

## 2.2. Descriptive statistical analysis

Compared to the old financial environment , each stock City in new financial environment , rates of return are significantly improved , United States , Hong Kong, China , Japan , stock market yields in London and mainland China rose separately 50%, 267%, 450% , 625% , 238% . from standard deviation , new Old gold compare to Environment, except Japan stock market slightly up , Mainland China stock market flat outside , The rest of the stock markets are lower , shows that the average return on stock returns is more representative potential . from skewness , Peak and J -B statistics see , in both environments , all units the City yield is significantly different from the normal distribution , There is a clear Peak thick tail " now like . from the autocorrelation check view , on 5%. with a significant level of , sequence LBQ The statistic shows the , the old order , Day stock market has obvious autocorrelation , The UK , Hong Kong, China, and mainland China stock markets are not marked by a significant sequence. off Phenomenon , under the new order only the Mainland China stock market yield sequence has a significant self-related phenomena , Other stocks have no significant autocorrelation ; sequence Flat Square, lbq statistics show , under Old order except mainland China stock market itsThere are significant autocorrelation phenomena in the yield sequence of remaining stock markets , New Order except The return sequence of the rest of the stock market outside China's Hong Kong stock market is significantly divided between off , shows the variability and aggregation characteristics of stock market volatility are more pronounced . from ADF Check to see , in both order , All stock market returns are rejected with Machine Walk's original assumption , indicates that the sequence is a stationary sequence .

## 2.3. GARCH (1,1) Model Selection

maximum and based on logarithmic maximum likelihood function AIC Minimum selection Optional Standard , for stock markets under the new and old order GARCH (1,1)model to select optional.

Hong Kong and mainland China stock markets should chooseTARCH (1,1)- G Model , UK Stock City should choose TARCH(1,1)- T Model .

### Table 2 GARCH (1,1) Molded Selection

from the table 3 Know , in the old order , US and Hong Kong stock markets TARCH The asymmetric effect item coefficients in the model conditional variance equation are significantly greater than 0, and Japan , UK and mainland China markets egarch model Condition Variance Square The asymmetric effect item coefficients in the process are significantly less than 0, and indicates this 5 stock market shares price fluctuations have a significant leverage effect , Bad News can be better than the same amount of positive The message generates greater volatility . under New Order ,US and Japan stock market egarch model conditional variance Equation Asymmetric effect The due factor is significantly negative , Hong Kong and UK stock market TARCH The asymmetric effect entry coefficients in the model conditional variance equation is significantly positive , Show this 4 There is a clear lever on the stock market effect , effect of asymmetric effect make stock price fluctuate plus large ; and the mainland China market TARCH model Condition Variance Square The asymmetric effect item coefficients in the thread are significantly less than 0, show The stock price fluctuates without leverage effect , but there are non symmetric effect , Good news is better than the equivalent of bad news output make greater fluctuations , and the effect of asymmetric effects makes the stock price fluctuation decrease . Impact of different messages on stock price fluctuations as table 4 is shown in .

## 2.4. Wave Overflow effect validation

uses Granger Causality Check , to the old rank of international finance The stock market volatility spillover effect check , results See table 5.

from the table 5 Know , in the old international financial order , from The volatility spillover test between China's mainland stock market and other stock markets to See ,There is a one-way wave of the mainland Chinese stock market against US equities Dynamic overflow and the one-way wave of the UK stock market to the mainland stock market Dynamic Overflow , while mainland China shares with other stock markets In any wave overflow relationship . on the Hong Kong stock market and its to volatility overflow . also , UK stock market to US and Japan stock market one-way overflow , Japanese stock market to US shares There is a one-way fluctuation overflow in the city . does not exist between the stock markets any what bidirectional fluctuation overflow . the above relationship as shown in the diagram 1 is as follows .

Mainland China stock market and There is no ripple overflow relationship between other stocks . Hong Kong and Japanese shares All cities have one-way volatility spillover to US markets , UK stock market against US , Japan Both the and the Hong Kong stock market have one-way overflow . No exists between the stock markets bidirectional fluctuation overflow.

UK stock market still is the source of financial risk , to us , both Japan and Hong Kong stock markets have a straight Connect risk overrun , and UK stock markets can also move through Hong Kong and Japan the Risk is indirectly transmitted to the U.S. stock market .

The volatility in the conduction path in the new order is less than the old order minus weak . for reasons : in the old international financial order , affected by European sovereign debt machine affect , UK cannot be alone , also trapped government debt crisis , UK The market passes shocks to markets outside Europe via foreign trade , Global Major stock markets in turmoil, As the largest trading partner of the European Union , The U.S. stock market is also the biggest hit . In recent years with the information industry faster capital and information flow between emerging and developed markets , Asia Pacific stock market with developed stock market linkage strengthened , causes Asia Pacific stock market volatility risk plus Big , But can pass the volatility risk outward through foreign trade . in international finance New Order , European countries tighten fiscal policies and loose monetary policy and foreign aid rescue mechanisms , Effective mitigation and containment A further spread of the crisis , Heavily indebted countries have gradually returned to market financing , and Achieve economic growth , Systemic risk in European financial markets is effectively controlled system . In addition , World Countries ( or region by ) Reforming currency system , Tighten finance regulation , Improve financial governance , promote domestic and even global economic recovery Sue , improve external risk overrun . in particular , China on provides a real way to buy bonds and direct investment during the European crisis Quality help , Simultaneous domestic adoption of a series of structural reforms and expansion of domestic demand Stimulus , implementing New Energy , " re-industrialization Strategy , improves the port and investment mode , boosts China's economic growth , To The main force for pulling the world economy , not only lower own financial risk , also greatly improved the external Financial risk resilience .

### 3. Conclusion

This article is in the United States , Japan , UK , China Hong Kong and mainland China 5 World Major stock index Year 1 Month 4 Day to 2015 Year 3 Month To Day- Day earnings

The rate sequence is the study object , in the new and old ranks of international finance In different backgrounds , apply GARCH model and Granger causality checkCheck method Analysis of stock price fluctuation spillover effect and its conduction path , get as conclusion : First , in the old order , significant leverage in each stock market should be ; in the New Order , except the Mainland China stock market , The rest of the stock market still has a significant leverage , and Mainland China stock market only asymmetric effect . second , No matter the old and new order , UK stock markets are the exporter of financial risk , And the United States , the state market is the recipient of financial risk . in the old international financial order environment , UK stock

market to United States , Japan , both China and Hong Kong and mainland China have a "" risk overrun , can also be passed through the , Day stock market moves volatility risk to US shares city ; in the context of the new international financial order , UK stock market against US , Japanese and medium Hong Kong stock market all have risk overruns , also through Hong Kong and Japan stock markets will wave Move risk conduction to US stock market . compared to the Old order , New Order mainland China stock market exit volatility overflow conduction path , Other volatility spillover relationships are also weak sign . This differs from the research conclusions of the existing literature , Possible cause of the world bound countries ( or region ) to prevent the spread of the European debt crisis , take a number of measures apply , Enhanced international cooperation , promotes the rebuilding and ordering of the international financial orderdevelopment .

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