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Does Subprime Crisis Affect Chinese Stock Market Returns?

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Abstract

This paper aims at testing the influence of Subprime Crisis on Chinese stock market returns. By means of newly proposed time series spatial analysis methodology, we investigate the dominance behavior of daily returns on both Shanghai Stock Exchange Composite Index and Shenzhen Stock Exchange Component Index between before and after the crisis. Little spatial dominance could be found, even considering the appreciation of the RMB, no matter in short-term or long run investment. For rationale investors, there are no significant risk and preference changes about domestic stock market in the post Subprime Crisis era.

JEL classification numbers: G01, G10, C58
Keywords: Subprime crisis, Stock returns, Spatial dominance, Stochastic dominance, Expected utility

1 Introduction

Subprime Crisis brings a big catastrophe to global financial markets as well as casts a cloud over the world economic sustainable growth. Although originating from mortgage loan market, it spreads out rapidly into many different financial fields and even influences worldwide real economy growth. There have been a vast amount of literatures that address the issues of contagion, linkage, volatility spillover and feed back, etc.. Chong (2011) analyzed the effect of Subprime Crisis on U.S. stock market and found bigger impact on stock market volatility rather than on stock returns. Olowe (2009) presented

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little evidence on the relationship between stock returns and risk in the case of Nigeria. Martins *et. al.* (2011) showed that there was a positive relationship between bank stock returns and real estate returns. However, not much attention has been paid to the distributional change of stock market returns initiated by Subprime Crisis.

During the Subprime Crisis, global investment institutions have cut down vast quantities of portfolios in succession in order to write off the off-balance-sheet invisible risk as well as cater to the needs of prudent supervision. In the wake of short selling forces accumulating, worldwide major indexes drop dramatically. Apparently, the influence of Subprime Crisis is lasting and profound which is far more than price decline and asset writedown. It is bound to rebuild the real economy as well as the investment strategy in the post crisis era.

As for Chinese stock market, although not many subordinated debt investments conducted by domestic listed company, it has not been capable of cultivating his own moral worth for a long time. Shanghai Stock Exchange Composite Index collapses from the peak of 6124 points to the present 2300 points. Trillions of market value evaporates. It is commonly believed that Subprime Crisis deeply affects the global investment circumstances. After the crisis, the prudent supervision about financial derivatives becomes an extensive consensus. While, how does Subprime Crisis influence Chinese stock market? What kinds of expected utilities do we have investing Chinese A-share market under the uncertainty outlook of world economy, more or less? In this paper, we will attempt to study the distributional change of the stock market index cumulative returns over time, and see whether there exist spatial distributional dominances.

2 How Could the Subprime Crisis Influence Chinese Stock Market Returns?

The literature on contagion in financial markets is far too extensive for us to review fully in this paper. However, Kindleberger (1978), Dornbusch, Park, and Claessens (2000), and Kaminsky, Reinhart, and Vegh (2003), provided excellent surveys. Longstaff (2010) summarized three major channels by which contagion effects could be propagated.

The first one is termed the correlated-information channel in which a shock to one financial market signals economic news that is relevant for security prices in other markets. The implication embedded in these literatures is that contagion occurs via the price-discovery process.

The second one is designated the liquidity channel in which a shock to one market results in decrease in the overall liquidity of all financial markets. Its implication is that a distress event may be associated with subsequent declines in the availability of credit and increases in trading activity in other markets.

The third one is believed to be the risk-premium channel in which the shock to one market may affect the willingness of market participants to bear risk in any market. The implication is that return shocks to the distressed security may be predictive for the subsequent returns of other assets.

Well then, which one of the three above-mentioned channels is the possible mechanism that the Subprime Crisis affects Chinese stock market returns? Due to the lack of dozens of American financial innovations, it is hard for the shock in oversea derivative market to reach to domestic underlying financial market via the price-discovery process. Thanks to the incomplete asset account open and long-term easy monetary policy, reduced liquidity is never a problem. Just before the market decline, the China National Petroleum Corporation had accomplished the project of returning to A-share market. Comparatively speaking, the Subprime Crisis is more likely to affect Chinese A-share market through risk-premium channel.

From December, 2006 to October, 2007, the Shanghai Stock Exchange Composite Index achieved remarkable rapid rise process that maybe last for years in other countries within less than one year, without a reasonable market adjustment meanwhile. The average P/E ratio of blue chips is close to 50 times in September, 2007. Before the Subprime Crisis breaking out, domestic stock market has accumulated massive risk. In fact, the Subprime Crisis provides domestic stock market a breakthrough for releasing the risk. The crisis makes American stock market drop, and meanwhile weakens the willingness of participants to bear risk in Chinese stock market. When the risk premium for an asset increases during the current period, it also impacts the distribution of future asset returns.

3 Stochastic Dominance

Technically speaking, the distributional change is one extension of the theme about structure change. The stochastic dominance test is widely used for comparing the difference between stationary distributions. For two stationary processes X and Y with time invariant densities π^X and π^Y, and the distribution functions Π^X and Π^Y, X stochastically dominates Y if and only if $\Pi^X(x) \leq \Pi^Y(x)$, for all $x \in \Re$. It holds if and only if $Eu(X_t) \geq Eu(Y_t)$, or equivalently

$$\int_{-\infty}^{\infty} u(x)\pi^X(x)dx \geq \int_{-\infty}^{\infty} u(x)\pi^Y(x)dx$$

for every monotone nondecreasing utility function u.

In various areas of economics, finance and even ecology, there have been considerable empirical applications based on stochastic dominance in the past decades. Stochastic dominance provides a general framework for studying investors' behavior under uncertainty. Hadar and Russell (1969), Hanoch and Levy (1969), Rothschild and Stiglitz (1970) and Whitmore (1970) build up the foundations of stochastic dominance analysis. Since stochastic dominance concerns utility comparison, it is an effective analysis method about decision making involving risk. In fact, stochastic dominance is an optimal selection rule when all individuals' utility functions are assumed to be of a given general class of admissible functions. Hence, stochastic dominance rules are more general than conventional mean-variance analysis and asset pricing models, which are valid only if asset returns follows a normal distribution and utility functions are quadratic. However, stochastic dominance tests could be applied only to stationary time series processes, while many financial time series are believed to have dynamic and time-varying properties contrary to the typical stationary behavior. Thus, the notion of stochastic dominance and its numerous applications may not be as meaningful as previously thought.

4 Spatial Dominance Methodology

Park (2007) developed a new framework of spatial analysis for time series. The inspiration of spatial dominance comes from stochastic dominance. Spatial dominance generalizes the concept of stochastic dominance. It compares the spatial distribution functions of two stochastic processes and thus is applicable to nonstationary as well as stationary processes.

Let $X = (X_t)$ be a stochastic process. μ denotes the Lebesgue measure on $\Re$. The sojourn time v of X in any Borel set $A \subset \Re$ up to time T is given by $v(T, A) = \mu\{t \in [0, T] | X_t \in A\}$. Under the assumption that $v(T,\cdot)$ is absolutely continuous with respect to μ, the local time $\ell(T,\cdot)$ of X is defined as the Radon-Nykodim derivative of $v(T,\cdot)$. If $\ell(T,\cdot)$ is continuous, then the ***local time*** deduced from the occupation times formula follows

$$\ell(T,x) = \lim_{\varepsilon \to 0} \frac{1}{2\varepsilon} \int_0^T 1\{|X_t - x| < \varepsilon\} dt \tag{1}$$

In order to deal with more general dynamic decision making problems, for some discount rate $r > 0$, applying the occupation times formula with $u(y) = 1\{y \le x\}$, the ***discounted integrated local time*** can be obtained as

$$L(T,x) = \int_{-\infty}^{x} \left(\int_0^T e^{-rt} \ell(dt, y) \right) dy = \int_0^T e^{-rt} 1\{X_t \le x\} dt \tag{2}$$

Assume the underlying stochastic process is a semi-martingale. The local time itself is a stochastic process, and thus the ***spatial density*** λ and the ***spatial distribution function*** Λ can be defined as the expectations of discounted local time and integrated local time, respectively. In particular, Lemma 2.1 in Park (2007) shows that, for any given utility function, the sum of expected utilities is determined by, and only by, the spatial distribution of stochastic process. Actually, this is the very foundation of spatial dominance analysis.

Besides, the ***discounted integrated integrated local time***, which can be defined as

$$IL(T,x) = \int_{-\infty}^{x} L(T,y) dy \tag{3}$$

is necessary for the second order spatial dominance analysis. The ***discounted integrated spatial distribution*** is therefore given by

$$I\Lambda(T,x) = \mathrm{E}\, IL(T,x) = \int_{-\infty}^{x} (x-t) d\Lambda(T,t) = \int_0^T e^{-rt} (x-t) \mathrm{P}\{X_t \le x\} dt \tag{4}$$

4.1 Spatial Dominance

Let X and Y be two stochastic processes. λ^X, Λ^X, $I\Lambda^X$ and λ^Y, Λ^Y, $I\Lambda^Y$ denote the discounted spatial densities, spatial distribution functions, and integrated spatial distribution functions of X and Y, respectively. Let υ_1 denote the class of all Von Neumann-Morgenstern type utility functions u, such that $u' \ge 0$; a set of every monotone nondecreasing utility functions. Let υ_2 denote the class of all utility functions in $u'' \le 0$;

a set of every strictly concave functions. In this article, we follow the definitions of spatial dominance in Kim (2009).

The First Order Spatial Dominance

X first order spatially dominates Y if and only if either

(a) $\Lambda^X(T,x) \le \Lambda^Y(T,x)$ *for all* $x \in \Re$*, where the inequality holds for some x, or*

(b) $\mathrm{E}\int_0^T e^{-rt}u(X_t)\,dt \ge \mathrm{E}\int_0^T e^{-rt}u(Y_t)\,dt$ *or equivalently,*

$\int_{-\infty}^{\infty} u(x)\lambda^X(x)\,dx \ge \int_{-\infty}^{\infty} u(x)\lambda^Y(x)\,dx$ *for all* $u \in \upsilon_1$*, where the inequality holds for some u.*

The Second Order Spatial Dominance

X second order spatially dominates Y if and only if either

(a) $\int_{-\infty}^{x} \Lambda^X(T,x) \le \int_{-\infty}^{x} \Lambda^Y(T,x)$ *for all* $x \in \Re$*, where the inequality holds for some x, or*

(b) $\mathrm{E}\int_0^T e^{-rt}u(X_t)\,dt \ge \mathrm{E}\int_0^T e^{-rt}u(Y_t)\,dt$ *for all* $u \in \upsilon_2$*, where the inequality holds for some u.*

4.2 Estimation of Local Time and Its Variants

Given observations $(X_{i\Delta})$, $i = 1, \ldots, n$ from $X = (X_t)$, the discounted local time of underlying stochastic process X can be consistently estimated by,

$$\hat{\ell}(T,x) = \frac{\Delta}{h}\sum_{i=1}^{n} e^{-ri} K\left(\frac{X_{i\Delta}-x}{h}\right) \tag{5}$$

where K is the kernel function and h is the bandwidth parameter. And the more straightforward sample analogue estimator of the discounted integrated local time can be obtained by

$$\hat{L}(T,x) = \Delta\sum_{i=1}^{n} e^{-ri\Delta} 1\{X_{i\Delta} \le x\}. \tag{6}$$

The results establish global L^1-consistency and are also applicable for more general semi-martingales (Park, 2007). Similarly, Kim (2009) shows that the consistent estimation of the discounted integrated integrated local time can be achieved by the analogue sample method

$$IL(T,x) = \Delta\sum_{i=1}^{n} e^{-ri\Delta}(x - X_{i\Delta}) 1\{X_{i\Delta} \le x\}. \tag{7}$$

Accordingly, the corresponding estimators of the spatial density, spatial distribution function, and integrated spatial distribution function can be obtained as

$$\hat{\lambda}_N(T,x)=\frac{1}{N}\sum_{k=1}^{N}\hat{\ell}_k(T,x) \tag{8}$$

$$\hat{\Lambda}_N(T,x)=\frac{1}{N}\sum_{k=1}^{N}\hat{L}_k(T,x) \tag{9}$$

$$I\Lambda_N(T,x)=\frac{1}{N}\sum_{k=1}^{N}IL_k(T,x) \tag{10}$$

4.3 Test Statistics for Spatial Dominance

For the sake of simplicity, we make such following definitions

$$\delta^F(T)=\sup_{x\in\Re}\left(\Lambda^X(T,x)-\Lambda^Y(T,x)\right) \tag{11}$$

and

$$\delta^S(T)=\sup_{x\in\Re}\left(I\Lambda^X(T,x)-I\Lambda^Y(T,x)\right) \tag{12}$$

The null and alternative hypotheses for the first order spatial dominance of *X* over *Y* are as follows

$$H_0:\delta^F(T)\le 0 \qquad \text{vs.} \qquad H_1:\delta^F(T)>0.$$

Similarly, the second order spatial dominance of *X* over *Y* can be represented as

$$H_0:\delta^S(T)\le 0 \qquad \text{vs.} \qquad H_1:\delta^S(T)>0.$$

The test statistic based on the Kolmogorov-Smirnov uniform distance for the first order spatial dominance is then given by

$$D_N^F=\sqrt{N}\sup_{x\in\Re}\left(\hat{\Lambda}_N^X(T,x)-\hat{\Lambda}_N^Y(T,x)\right) \tag{13}$$

which $\hat{\Lambda}_N^X(T,x)$ and $\hat{\Lambda}_N^Y(T,x)$ represent the sample estimator for the stationary increments process.[3]

Similarly, the test statistic for the second order spatial dominance is then given by

$$D_N^S(T)=\sqrt{N}\sup_{x\in\Re}\left(I\Lambda_N^X(T,x)-I\Lambda_N^Y(T,x)\right) \tag{14}$$

in the case of stationary increments process.

Park (2007) demonstrates that the limiting distribution of test statistic depends on the unknown probability law of underlying stochastic process. Subsampling appears to be the most readily available to obtain the limit distributions. Thus, we employ the subsampling method to obtain the *p*-value.

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[3]The stationarity of (X^k) is referred to as a sequence in *k*, not that of *X*. In general, *X* is nonstationary.

5 Empirical Research

5.1 Data

Amongst kinds of domestic stock indexes, the Shanghai Stock Exchange Composite Index (SHSE Composite Index) and Shenzhen Stock Exchange Component Index (SZSE Component Index) are deemed to be the representatives of domestic stock markets. Thus, 5-minutes returns of those two indexes from January 4, 2000 to May 10, 2012 are used for spatial dominance tests.

The Subprime Crisis had a devastating impact on not just Chinese financial market but the overall economy. The impact was conspicuous, and the economic growth slowed down noticeably. The purpose of our research is to analyze the distribution change of stock market returns before and after the crisis which could reflect the changing investors' preference. Accordingly, the whole sample is divided into two periods: prior to the crisis, which consists of the data from January 4, 2000 to December 29, 2006, and after the crisis, which consists of the data from January 5, 2009 to May 10, 2012. The data between January, 2007 and December, 2008 are excluded, since Subprime Crisis go through the complete cycle from eruption, contagion to recovery, during this time. Certainly, the exclusion will not affect our main conclusions on spatial dominances.

Besides, we consider two different investment strategies depending on different investment periods: the cumulative returns of one week viewed as short-term investments, and the cumulative returns of 24 weeks representing long run investments.[4] Cumulative returns calculated by simple stock return data are used for the dynamic analysis of expected future utilities. In order to deal with more general dynamic decision making problems, 3% time discount rate[5] is used in the estimation of discounted spatial density, discounted spatial distribution function, and integrated discounted spatial distribution function.

5.2 Spatial Dominance for Domestic Investors

At the very beginning, let us focus on the dominance behavior of stock market for domestic investors. The spatial dominance test on stock market returns between before and after Subprime Crisis indicates several points as follows. First, risk-averse investors would prefer the first orderly dominant market regime. Second, the second order spatial dominance illustrates us the increase or decrease of stock market risk.

Let X and Y denote the cumulative returns before and after Subprime Crisis, respectively. We first consider the first and second order spatial dominances with SHSE Composite Index. Two different null hypotheses are considered to avoid mutual conflict so that we can draw more clear conclusions for different investment periods.

$$H_0\text{: } X \text{ first (second) order spatially dominates } Y$$
$$H_0'\text{: } Y \text{ first (second) order spatially dominates } X$$

Let $X >_{FSD} Y$ ($X >_{SSD} Y$) represents that X first (second) order spatially dominates Y. We

[4]We have also performed the same analysis with daily, bi-weekly, and one month cumulative returns data as the short-term investment as well as 12 week accumulative returns as the long-term investment, and the results are quite similar.

[5]We also tried different discount rate from 0 to 10%, and no different results could be found.

tried different subsample sizes in the range of [$N^{0.6}$, $N^{0.9}$]. The major reason for changing subsample size is a robustness consideration of the test statistics. In order to obtain robust inference result, we compute all *p*-values for different subsample sizes and report the median critical value. The empirical results are summarized in table 1.

Table 1: Spatial Dominance test on Shanghai Stock Exchange Composite Index

Short-term investment	First order		Second order	
Hypothesis	$X^S >_{FSD} Y^S$	$Y^S >_{FSD} X^S$	$X^S >_{SSD} Y^S$	$Y^S >_{SSD} X^S$
5% critical value	1.0269	1.3206	0.0376	0.0463
1% critical value	1.1311	1.4536	0.0444	0.0476
Test statistic	0.2482	0.7256	0.0013	0.0186
P-value	0.2830	0.5596	0.3867	0.6526
Long run investment				
Hypothesis	$X^L >_{FSD} Y^L$	$Y^L >_{FSD} X^L$	$X^L >_{SSD} Y^L$	$Y^L >_{SSD} X^L$
5% critical value	1.0066	1.4786	0.0058	0.0672
1% critical value	1.1318	1.5319	0.0177	0.0698
Test statistic	0.3745	0.7570	0.0003	0.0302
P-value	0.1284	0.5455	0.1874	0.6263

Note: $X >_{FSD} Y$ ($X >_{SSD} Y$) represents that *X* first (second) order spatially dominates *Y*; *X* represents the cumulative returns before Subprime Crisis, and *Y* denotes the cumulative returns after. The superscript *S* and *L* denote short-term and long run strategies, respectively.

In the test of spatial dominance about Shanghai stock market, all the *p*-values lie in reasonable ranges where explicit statistic inference can be done, except for the first order spatial dominance in long run investment strategy for $X^L >_{FSD} Y^L$. Almost one quarter of its values are less than 0.05 which suggest a mixed result that partially reject the null hypothesis. However, there are no clear conclusions of spatial dominance on SHSE Composite Index we can draw no matter in short-term or long run investment.

Table 2: Spatial Dominance test on Shenzhen Stock Exchange Component Index

Short-term investment	First order		Second order	
Hypothesis	$X^S >_{FSD} Y^S$	$Y^S >_{FSD} X^S$	$X^S >_{SSD} Y^S$	$Y^S >_{SSD} X^S$
5% critical value	1.0062	1.3424	0.0447	0.0535
1% critical value	1.2078	1.4907	0.0630	0.0560
Test statistic	0.6382	0.8111	0.0042	0.0229
P-value	0.2264	0.4643	0.2476	0.6481
Long run investment				
Hypothesis	$X^L >_{FSD} Y^L$	$Y^L >_{FSD} X^L$	$X^L >_{SSD} Y^L$	$Y^L >_{SSD} X^L$
5% critical value	1.5862	1.4640	0.0545	0.0734
1% critical value	1.7525	1.5395	0.0773	0.0757
Test statistic	1.0382	0.7318	0.0101	0.0342
P-value	0.1574	0.6364	0.1684	0.5758

Note: $X >_{FSD} Y$ ($X >_{SSD} Y$) represents that *X* first (second) order spatially dominates *Y*; *X* represents the cumulative returns before Subprime Crisis, and *Y* denotes the cumulative returns after. The superscript *S* and *L* denote short-term and long run strategies, respectively.

Analogously, the same test procedures can be applied to SZSE Component Index. All the *p*-values lie in proper ranges. No spatial dominance can be found in Shenzhen stock market, either.

5.3 Spatial Dominance Considering the Appreciation of the RMB

Until now, we test the impact of Subprime Crisis for domestic investors. It is well known that since the reform in 2005, the RMB exchange rate against the dollar has accessed the long run appreciation passage. Although the People's Bank of China tightened the amplitude of RMB exchange rate to fight against the Subprime Crisis, the change of exchange rate may still significantly affect the investment returns of Qualified Foreign Institutional Investors (QFII, hereafter) and other global institutions dominated in US dollars. So it is necessary to test possible spatial dominances after getting rid of the influence of exchange rate variation.

Table 3: Spatial Dominance test on Shanghai Stock Exchange Composite Index deleting exchange rate variations

Short-term investment	First order		Second order	
Hypothesis	$X^S >_{FSD} Y^S$	$Y^S >_{FSD} X^S$	$X^S >_{SSD} Y^S$	$Y^S >_{SSD} X^S$
5% critical value	1.1508	1.3810	0.0240	0.0508
1% critical value	1.2478	1.4613	0.0413	0.0562
Test statistic	0.2645	0.6849	0.0003	0.0192
P-value	0.2609	0.6182	0.3719	0.6542
Long run investment				
Hypothesis	$X^L >_{FSD} Y^L$	$Y^L >_{FSD} X^L$	$X^L >_{SSD} Y^L$	$Y^L >_{SSD} X^L$
5% critical value	1.3173	1.4785	0.0308	0.0675
1% critical value	1.3805	1.5554	0.0547	0.0699
Test statistic	0.4851	0.7464	0.0016	0.0293
P-value	0.1622	0.5816	0.1754	0.6364

Note: $X >_{FSD} Y$ ($X >_{SSD} Y$) represents that *X* first (second) order spatially dominates *Y*; *X* represents the cumulative returns before Subprime Crisis, and *Y* denotes the cumulative returns after. The superscript *S* and *L* denote short-term and long run strategies, respectively.

The empirical results also illustrate that all the *p*-values lie in appropriate ranges, and there are no spatial dominances in either Shanghai stock market or Shenzhen stock market, no matter in short-term or long run investment.

Table 4: Spatial Dominance test on Shenzhen Stock Exchange Component Index deleting exchange rate variations

Short-term investment	First order		Second order	
Hypothesis	$X^S >_{FSD} Y^S$	$Y^S >_{FSD} X^S$	$X^S >_{SSD} Y^S$	$Y^S >_{SSD} X^S$
5% critical value	1.1354	1.3556	0.0592	0.0537
1% critical value	1.3733	1.4222	0.0701	0.0562
Test statistic	0.6586	0.8437	0.0045	0.0231

P-value	0.2261	0.4348	0.2456	0.6574
Long run investment				
Hypothesis	$X^L >_{FSD} Y^L$	$Y^L >_{FSD} X^L$	$X^L >_{SSD} Y^L$	$Y^L >_{SSD} X^L$
5% critical value	1.4352	1.4671	0.0539	0.0734
1% critical value	1.6987	1.5397	0.0738	0.0785
Test statistic	1.0819	0.7281	0.0153	0.0347
P-value	0.1584	0.6263	0.1684	0.5743

Note: $X >_{FSD} Y$ ($X >_{SSD} Y$) represents that X first (second) order spatially dominates Y; X represents the cumulative returns before Subprime Crisis, and Y denotes the cumulative returns after. The superscript S and L denote short-term and long run strategies, respectively.

Based on the results of spatial analysis, domestic and foreign investors who have a nonsatiable utility with risk-aversion over the given period of time would have no preference change after the Subprime Crisis regardless of the time length. The expected utilities of investing in Chinese domestic stock markets with or without considerations of exchange rate variation remain the same after Subprime Crisis. The appreciation of RMB would not spur the foreign capital inflow and stock market bubble.

6 Why does the Subprime Crisis Not Affect Chinese Stock Market Returns?

After testing spatial dominance on two different time span investment strategies for both domestic and foreign investors, we find little evidence on preference and risk change in domestic stock market in the post crisis era. Even considering the appreciation of RMB, there is still no explicit dominance relationship between before and after Subprime Crisis. Although domestic stock market follows the step of decline, Subprime Crisis seems to have no severe influence on Chinese stock market.

Apparently, not big scale of Qualified Domestic Institutional Investor (QDII) oversea investment, examination and approval as well as annual quota institution about Qualified Foreign Institutional Investors (QFII), and incomplete capital account convertibility build the firewall to isolate risks.

Besides, lack of Short-Mechanism makes the profiting way relatively unitary. Not advanced financial innovation system lets domestic stock market avoid the hook. As for China, transitional arrangement of capital and finance account open with prudent supervision about fundamental finance market as well as orderly promoted derivatives innovation will be the actual mechanism of isolating external market risk.

7 Conclusion

A classical problem in mathematical finance is to maximize the expected utility from terminal wealth. At the heart of expected utility theory is a set of mathematic results concerning stochastic dominance, which provides a compact and elegant characterization of the preferences of monotonic and/or risk-averse investors over probability distributions of gross returns. The breakout of Subprime Crisis is a real challenge to both investors and regulators, which maybe change previous expected utility. The investment strategy ought to be adjusted properly to accommodate to new market circumstance. Empirical results show that little evidence about spatial dominance in domestic stock market could be found, even considering the appreciation of RMB. There are no significant risk and preference changes about domestic stock market after the Subprime Crisis.

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