

## An empirical analysis of stock market liquidity in China

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**Abstract:** In capital markets, their liquidity is the most important thing to measure the state of the markets. To some extent, the liquidity of capital markets decides their operation state. It is not only an important property, but also a prerequisite for their survival. If the security markets have no liquidity or lower liquidity, then the value of financial assets can be undervalued, or the extreme phenomenon that no one will be willing to possess the assets in some special circumstances will be appeared. The stock markets have two basic functions, that is, to provide liquidity and price discovery. In the existing literature, there is a huge amount of the study about capital pricing, but there is a little study about liquidity. The liquidity of stock markets mainly refers to the stock asset cashability, and it is also an important indicator to measure the efficiency of the stock markets. A higher liquidity of security markets will enhance the confidence of investors and attract more investors, which in returns will increase market liquidity. However, although the factors of the liquidity of the stock markets and their measure indicators have been mentioned for a long time, yet it has not been a convincing conclusion. Some scholars analyze them from a theoretical perspective, while others analyze them from the practical side. Moreover, quantity researches about liquidity deepen people's knowledge about it. This paper analyzes the factors of influencing liquidity from theoretical and empirical perspective, and put forward some suggestions to improve China's stock market liquidity.

**Keywords:** Liquidity; Stock market; Market Microstructure.

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### INTRODUCTION

The stock market is mainly composed of the currency market and the issuing market which means that they become two convenient channels for the public company to raising money by issuing shares and also create an opportunity for investors to trade shares. As one of the most essential problems in the financial market, the liquidity of stock reflects a operation capacity to reach large quantities of trade influenced by the minimum cost and the minimum price in a safe way [1]. When the secondary market appeals for a higher speed of liquidity, it means that the enterprise could raise money as needed in the primary market with a lower expense. Instead, under the illiquidity or a lack of liquidity situation, such financial assets would be substantially undervalued. In other very extreme cases, such asset is left without anybody to care for it. With less liquid, the securities would require a high costs when a large-scale trading positions process in the market [2].

As a matter of fact, the development of the modern stock market is a process that aims to continuously pursue a higher liquidity. After reaching a certain scale,

the stock exchange will have important effect on the liquidity of China stock market. First, owing to the market, the stock trade is fixed in time and place which provide considerable convenience for stock liquidity and reduce the searching costs for investors in the process of investment. Then, there is a unified trading rules in the stock market including the same trading costs and more transparent information. And more people could participate in the deal. Last, the emergence of market makers that provide professional services for the customers as needed satisfies the development of the stock market and the requirement of the investors [3].

A certain liquidity is of more important for the stock market, even the market is functioning. First, the demand of the stock market to liquidity is more urgent than any other products. The investor purchases the stock to make profits rather than direct consumption. When investors think the time is right, the stock would be quickly transferred by all means while these people are reluctant to hold the illiquid securities. Then, the stock has stringent requirements on the liquidity relative to bonds. As an investment with no repayment period,

only market exchange can allow the investor to recoup their entire investment by the stock. For once the company went bankrupt or it's delisted, investors would suffer the losses. Therefore, in order to help investors convert the figure into cash, a higher liquidity of the stock is more necessary[11].

In fact, the liquidity in stock market depends on several things and there are various interpretations for that in theoretical cycle. The Market Microstructure Theory here is that such liquidity is directly determined by the transaction cost and the trade information [5,6,7]. And The Behavioral Finance indicates that people transaction behavior immediately impacts on the market liquidity. Besides, other theories interpret and analyze the liquidity. Certainly, it may not be true in the definite factors that act on the market because the stock markets are in different social, economic and legal environment.

After the reform and opening, the China stock market has developed step by step. So there are complicated reasons for the liquidity in the China stock market. This article, making use of the foreign relevant research products, conducts an empirical analysis on the liquidity in China stock market through the figures from 40 Chinese public companies and put up with the corresponding policy proposal.

## THE STOCK MARKET LIQUIDITY AND ITS MEASURE

### Stock market liquidity

Tobin [10] the founder of The Financial Assets Liquidity, thinks how much the seller losses represents the liquidity situation if he decides to sell all his financial assets. It's not an easy thing to make an accurate definition resulting from everyone diverse understanding about the liquidity.

Baker [11] pointed out that there actually is not a clear or an absolutely right definition about the liquidity that is accepted by all. Literally, liquidity can signify the time spent in stock exchange. The less time it spends, the better performance the liquidity shows. Meanwhile, the deeper level definition can be expressed as a certain number of deals by low enough costs. We can see from it that the liquidity primarily involves the spent time to make deal and the cost as needed to close a number of transactions. The market with sound liquidity has contributed to the process of block business and the trade price would not be affected and changed much. While in the illiquid market, the stock transaction is time-consuming and costly.

The Bank for International Settlements [12] believes that a liquid market is a place for participants to engage a large amounts of deals quickly and it has less for price. The definition dimension to liquidity

shall vary accordingly with the development of the market. For example, in the relatively stable period, the market liquidity focuses on the cost in a real-time transaction; on the contrary, it focuses on the time in a real-time transaction.

From the above it can be seen that the liquidity is mainly involved with transaction rate, price and influence to the price after trading. Based on above, there are five dimensions that dominate the liquidity: closeness, timeliness, breadth, depth and elasticity, in which closeness is the total cost to close the deal covering some implicit cost, timeliness is involved in stock exchange which means to satisfy the willingness timely whenever they want to invest, breadth is the number of the stock committed by the investor under a certain optimal level, depth is the trading capacity at the current price and elasticity is the speed that the stock restores to the former level when the prices of some properties float up or down. Nevertheless, the five characters can coexist in the stock market while sometimes they are inconsistent.

### The measure of the stock market liquidity

#### Price method indicator

##### a. Bid-ask spread

As one of the common measure index, it's the difference amount between the highest price for sellers and the lowest price for buyers. Suppose  $S$  is the absolute price differences,  $RS$  is the relative price differences,  $PA$  is the highest price for sellers,  $PB$  is the lowest price for buyers and  $M$  is the median point of the price differences, the formula can be obtained as follows:

$$S = PA - PB \quad (1)$$

$$RS = (PA - PB) / M \quad (2)$$

$$M = (PA + PB) / 2 \quad (3)$$

##### b. Effective spread

It mainly refers to the difference amount between the average price at which the transaction is executed and the median point of the bid-ask spread. The formula is:

$$EF = |P - M| \quad (4)$$

Where,  $EF$  is the effective spread.  $P$  is the actual price.

##### c. Realized spread

Zukin  $S$  [13] represents it as the difference amount between the dealer's selling price at some point and the purchasing price before that. The realized spread is used to measure the cost that the execution of every transaction impact on the market. The formula is:

$$ARS = |P - M t| \quad (5)$$

$$RRS = |P - M t| / M \quad (6)$$

And ARS is the absolute realized spread. RRS is the relative realized spread. Mt is the median point of the realized spread in some time after the transaction.

d. Positioning spread

There are many situations that the stock market exists the asymmetric information between the sellers and the buyers for a variety of reasons. Positioning spread reflects the effectiveness to the price after the transaction. Naik and Yadav used this for the first time and interpreted it as the difference amount through the

realized spread subtracting the effective spread. Its formula is:

$$APS = |M - Mt| \tag{7}$$

$$RPS = |M - Mt| / M \tag{8}$$

Where, APS is the absolute positioning spread. RPS is the relative positioning spread.

In the indicators above, except that bid-ask spread belongs to bilateral spread, the other three belong to one-way spread. The comparison of the four indicators as listed above is shown in the table 1.

**Table-1:Liquidity measure indicators and comparison**

	Advantages	Disadvantages	Calculated method
Bid-ask spread	Simple and practical, applicable to the small transactions	Low veracity, capable to overestimate or underestimate the transaction costs	The lowest selling price subtract the highest buying price
Effective spread	Capable to measure the actual transaction costs	Might influence the accuracy	Difference value between the transaction price and the spread midpoint
Realized spread	Capable to embody the changes after the transaction	the same as above	Difference value between the transaction price and the spread midpoint in some time after the transaction
Positioning spread	Capable to reflect the information frictional costs	Might influence the accuracy according to the determined average price	Difference amount between the realized spread and the effective spread

*Quantity indicator*

In addition to the methods as described above, quantity indicator is another common method to measure the liquidity. There are major measure indicators:

a. Market depth

It's the transaction volumes at the best price that is the quoted price depth. The formula is:

$$Dmv = (Va + Vb) / 2 \tag{9}$$

Here, Dmv is the quantity market depth. Va is the total orders bought at the highest price. Vb is the the total orders at the lowest price.

b. Trade depth

As another indicator reveals the market depth, it shows the total transaction volume at the best bid-ask price. The trade depth, the last indicator afterwards, cannot manifest the orders' relevant information in the market on every transaction. The relationship is that:

$$Vq = \sum_{i=1}^n M_i^t \tag{10}$$

$$Vm = \sum_{i=1}^n M_i^t P_i^t \tag{11}$$

Where, Vq is the transaction volume. Vm is the transaction volume that represents the quantity of the No. "i" transaction in the phase "t". "p" refers to the price.

c. Turnover depth

Turnover depth, taking into consideration the total shares, is used for the comparison between kinds of stocks' cross-section figures which can be called the turnover ratio of transaction. There are mainly two calculation methods: the individual stock turnover depth and the transaction amount turnover depth. Suppose Tq as the individual stock turnover depth, Tm as the the transaction amount turnover depth, TS as the total shares and  $P_i$  as the stock price of the negotiable market cap on the base day. The formula can be obtained as follows:

$$Tq = \sum_{i=1}^n M_i^t / TS \tag{12}$$

$$Tm = \sum_{i=1}^n M_i^t P_i^t / (TS * P^t) \quad (13)$$

The turnover depth reciprocal represent the holding period. The higher the turnover depth is, the lower its reciprocal would be which indicates that the holding period is shorter and further demonstrates the liquidity performs well, whereas the liquidity is poor.

### THE INFLUENCES OF STOCK MARKET LIQUIDITY BASED ON MARKET MICRO-STRUCTURE

Many studies have shown that liquidity has become more of a factor that influences investors' decision to purchase the stock or not. Therefore, the factor that effects on the liquidity would definitely effects on the stock price. The market micro-structure controls the stock market liquidity through acting on block trades, quote driven, transaction costs and information disclosure.

#### *Order tickets forms and market liquidity*

Order tickets (including orders, commission and instructions), as one of the directives the traders make to their brokers that sells or buy financial assets as needed by authorization. An integrated order ticket should cover price order, time, volume and trading orientation.

There is diverse stock transaction regulations and practices in every country all around the world. So various order tickets come into being. However, among so many categories, the limit order and the market order are the most basic classes. The former is a stock purchasing procedure executed by the broker as the request of the principal within the specified time and price. We are capable to predict and control the risk price as the highest price is specified by the limit order. As a result, the limit order always contributes to obtain a price that facilitates the transaction comparing with the market order price [11].

Market order just refers to the quantity of the proposed transaction and it greatly reduces the risk during the execution of this ticket on accounting of the principle of price precedence. But apparently, the weakness is that the sale price is the lower one in the market and cannot be determined during the execution.

Limit order is of great important to the liquidity. In continuous auction market, liquidity is provided by limit orders. The orders' principal also has certain influence to the liquidity in the market. And the principle of price precedence will maximize all the power of the price competition and minimize the bid-ask spread. While the principle of time precedence

could confer some protection to the first traders submitting the orders and guarantee the limit order's promptness as far as possible. But the principle of volume precedence has a certain active role for improving the depth in the limit order.

#### *Transparency and liquidity*

The transparency in market is mainly about how easily the investor get the information relating to the upcoming transaction, the better transparency is, the more easily we are capable to acquire the information. The information consist mainly of specific conditions including price, volume, orders and so on. Some experts group transparency into two main areas. First, it's how easily to obtain the information before the deal that is also called the transparency after the deal. The former refers to the information disclosure about order tickets before the transaction, and the latter is information reveal about the transaction afterwards [8].

In the market existing the informed and uninformed traders, the market transparency is more beneficial to the latter because when the transparency has been increased they will get more information and tend to trade as soon as possible but the the informed has less chance to utilize the inside information. Suppose under information symmetry in the market, the liquid information supplier could set the bid-ask spread to the consumption cost from executing the orders. So increasing the transparency will help the supplier distinguish the informed and liquid traders, then, the price quoted by liquid traders will be decreased. If the informed make up the largest part of the stock market, the price spread would rise so that the market liquidity would significantly decrease.

The transparency demonstrates the fairness and the justice in the stock market to some degree. With better transparency, the stock market is running well and it also increases the confidence of investors which attracts more traders to take part in the transaction. All of these will enhance the market liquidity. Some scholars think that the market with higher transparency will have more attraction to investors. However, some think that a higher transparency does not represent a more liquid market. When reaching a certain level, the transparency continues to increase but the liquidity will decrease.

Through the relevant research and analyzing, this transparency does not mean the higher the better too and the entire transparency may not be desirable. The relation between the liquidity and transparency can be perceived as the regulating mechanism of the transaction between the informed and uninformed traders. No doubt, the market with lower liquidity will benefit the informed while the liquidity decreases and

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the cost of the uninformed trades' purchases increases. The market transparency that has increased to some degree will benefit the informed and uninformed investors in earlier stage [9].

#### *Price supervision mechanism and market liquidity*

The price supervision mechanism as the system in stock market aims to reduce temporary fluctuation range of the security price that is designed to lower the dramatic fluctuation range and confine the price anomalous fluctuations in order to reduce the probability of unexpected risk in stock market and avoid the financial crisis result from the market crash. The supervision mechanism might be different in each stock market. For example, liberty supervising mode is appropriate for the more mature stock market and the price supervision mechanism is suitable for the rising securities business.

We can divide this mechanism into transaction prices control system and extraneous orders flow augment. The former greatly effects the market liquidity. Traders could predict this limit and the requirement to liquidity compensation. On the contrary, the price liquidity will increase. Price is prone to reaching that limit because of the process effects by the price limit which leads to the unidirectional or bidirectional liquidity vanishing. Sacrificing the liquidity is the precondition to making the price policy produce results. It thinks that during the period of price increasing and reaching to its limit, price has been gradually increasing. When price increases and reaches to its limit, price starts to decrease. And in the period of price decreasing and reaching to its limit, price has been gradually decreasing[14].

#### *The impacts of trade costs on market liquidity*

Trade costs generally fall into two categories: explicit trade and implicit trade. The former refers to the service charge paid to intermediary agent and taxes paid to government. The latter refers to the information fee during the transaction.

If it requires a higher expense, some investors' enthusiasm will diminishes and they slowly withdraw from trading, then liquidity will drop. In contrast, lower costs will attract investors to participate into the market and the liquidity increases.

#### *The impacts of tick size on market liquidity*

The tick size could have a significant bearing on market liquidity. If it's higher than the ordinary, the bid-ask spread will remain wide and enhance the costs. On condition that the expense is too high, it will restrict traders' investment aspiration and reduce the market liquidity. It doesn't mean that keeping tick size as small as necessary. A pretty low ticket size will result in

higher bargaining costs which instigate the investors making large limit orders.

## **THE EMPIRICAL ANALYSIS ABOUT THE IMPACTS OF THE MARKET MICRO-STRUCTURE ON MARKET LIQUIDITY**

### ***Sample and data***

This article chooses 40 companies from all listed companies by 2013 as research objects and the information is based on "CSMAR" Stock Database and DRCNET Statistical Database System. Samples' financial figures mainly include:

Stock prices = transaction prices in secondary stock market

EPS= net margin/ general capital

ROE(return on equity)= EPS/ net assets per share

Circulating stocks proportion= liquid equity/general capital\*100%

### ***Assumptions***

Taking the analysis of the relevant factors above, besides price, market transparency that influence, some other characteristic variables act on the liquidity. Therefore, We put forward some assumptions as follows:

Assumption 1. The positive correlation between share price and liquidity.

In China, the tick size is 0.01. According to the liquidity theory, under the same tick size unit, the higher the stock price, the lower the liquidity cost and the higher liquidity.

Assumption 2. The positive correlation between companies performance and liquidity

The listed company with preferable performance could lure investors into trade who lead to liquidity increase. Conversely, one as it has slid into loss will strike traders' initiative and investor reduce, so the market liquidity declines.

Assumption 3. The positive correlation between liquid shareholding and liquidity

Our stock markets divide into state shares, legal person shares, liquid shares which can only in circulation. Much more liquid shares boost investors' participation enthusiasm. It can rise liquidity in the market.

Assumption 4. The positive correlation between company scale and liquidity

The larger listed company actually not quite suffer too big effect by block trade and the liquidity flows smoothly. On the contrary, a small-scale company generates severe information asymmetry against enthusiasm of investors and the stock liquidity decreases.



Assumption 5 The negative correlation between the shareholding ratio of top ten controlling shareholders and liquidity

It refers to the concentration ratio of shares. The company with higher ratio is more prefer to has higher stock concentration. In general, the higher concentration ratio illustrates a bad liquidity of the stock. The company bearing a high shares concentration has more stable equity. The big shareholders with obviously rich profits than the minority shareholders, seeking for more benefits will attach more importance to company's long-run development, operation management capacity, strategic decision-making and its performance improving. Because all these make investors full of confidence in the growth and sustainable development in the future, they will not purchase frequently following the changes of dividend distribution and stock price. Thus, the stock liquidity will decrease.

Assumption 6. The remarkable relationship between the asset-liability ratio and liquidity

Through the assumptions above, we can assume the formula that demonstrates the influences to liquidity as follows:

$$L = \alpha + \sum_{i=1}^n \beta_i X_i + \varepsilon \quad (14)$$

Here, L is the stock liquidity,  $\alpha$  is constant terms,  $\beta_i$  is the coefficient of  $X_i$ ,  $X_i$  independent variables and  $\varepsilon$  is a random disturbance item.

#### Variables selection

In the thesis, liquidity is the explained variable denoted with L and we can count the daily liquidity of stock through liquidity index computing method previously addressed previously. According to the selected factors, the variable norms are shown in table 2.

We carry out the descriptive statistics by daily average values of Jan to Dec in 2009 with regard of the variables listed above. The results are shown in Table-3.

Table 3 demonstrates these factors' statistical characteristic and their effects on the liquidity. And now, here are the concrete analysis.

**Table-2: Explanatory variables**

name	mark	numeric form	factors
average stock price	X <sub>1</sub>	absolute amount	share price
EPS	X <sub>2</sub>	absolute amount	company performance
ROE	X <sub>3</sub>	ratio (%)	
circulating value	X <sub>4</sub>	absolute amount(100 million yuan)	company size
DABR	X <sub>5</sub>	ratio (%)	DAB
the shareholding ratio of top ten controlling shareholders	X <sub>6</sub>	ratio (%)	

**Table-3: Sample company's correlated variables average descriptive statistics in 2009**

Variable	mean	median	maximum	minimum	Std.Dev.
liquidity	26.29842	26.72	50.5	11.5	10.23364
average stock price	22.27132	20.085	51.84	6.7	11.27362
EPS	0.905	0.74	4.09	0.1	0.750224
ROER	0.196053	0.155	1.03	0.01	0.173914
circulating value	301.6353	228.995	1201.67	81.18	238.3496
DABR	55.85474	58.89	94.04	7.74	19.36205
the shareholding ratio of top ten controlling shareholders	58.48211	60.11	84.63	22.91	11.81815

**Single factor correlation analysis**

In order to figure out whether there is a certain relation between the above factors and liquidity, we use the equation (using hereby the equation 14<sup>th</sup>) to analyze separately some factors' (including stock price as X<sub>1</sub>,

EPS as X<sub>2</sub>, ROER as X<sub>3</sub>, circulating value as X<sub>4</sub>, DABR as X<sub>5</sub> and the shareholding ratio of top ten controlling shareholders as X<sub>6</sub>) effects on liquidity so as to determine this relationship. The details of the regression results are shown in the following table 4.

**Table-4: Regression results**

Factor (X)	C	coefficient	t-Statistic	R-squared
X <sub>1</sub>	14.115	0.547	4.531	0.363
X <sub>2</sub>	19.762	7.618	3.904	0.292
X <sub>3</sub>	23.688	15.741	1.611	0.066
X <sub>4</sub>	18.646	0.026	5.504	0.364
X <sub>5</sub>	28.605	-0.032	-0.370	0.004
X <sub>6</sub>	34.224	-0.128	0.139	0.022

From table 4, we can reach the following conclusion.

a. The fitting degree of liquidity (substituting for L) and average stock price (substituting for X<sub>1</sub>) is good. There must be a linear relationship between the two. We find that the regression equation is workable to test of goodness of fit and significance test by regression.

b. EPS (represented by X<sub>2</sub>) present the positive relation with liquidity and so the circulating value (represented by X<sub>4</sub>) does. DABR (represented by X<sub>5</sub>) and the shareholding ratio of top ten controlling shareholders (represented by X<sub>6</sub>) fail to make a visible positive relation with liquidity.

**All factors model analysis**

Through the single-factor model test, we achieve some preliminary results that are the positive relations of average stock price, EPS, circulating value and

ROER with liquidity respectively. However, the relationships of DABR and the shareholding ratio of top ten controlling shareholders separately with liquidity is relatively weak and fail the test "t".

For studying the joint influence of all variables to liquidity, liquidity (represented by L) is determined as the explained variable and other as the explanatory variables so as to carry on the all factors model analysis. Suppose the formula is:

$$L_t = b_0 + b_1X_{1t} + b_2X_{2t} + b_3X_{3t} + b_4X_{4t} + b_5X_{5t} + b_6X_{6t} + e_t \quad (15)$$

Where, L represents the liquidity. X<sub>1</sub>, X<sub>2</sub>, X<sub>3</sub>, X<sub>4</sub>, X<sub>5</sub> and X<sub>6</sub> respectively denote the stock price, EPS, circulating value, DABR and the shareholding ratio of top ten controlling shareholders. e<sub>t</sub> is residual term.

**Table-5: All factors regression model**

Factor (X)	coefficient	Std. Error	t-Statistic	Prob.(t-statistic)
X <sub>1</sub>	0.448	0.128	3.500	0.001
X <sub>2</sub>	5.221	2.551	2.047	0.049
X <sub>3</sub>	-4.416	6.467	-0.683	0.500
X <sub>4</sub>	0.028	0.004	6.896	0.000
X <sub>5</sub>	0.081	0.050	1.600	0.120
X <sub>6</sub>	0.145	0.086	1.697	0.100
C	-5.084	7.461	-0.681	0.500
R-squared	0.769			
Prob.(F-statistic)	0.000			

The regression result shows in table 5. Through regression analysis, we find that average stock price, EPS, circulating value, DABR and the shareholding ratio of top ten controlling shareholders are consistent with the theory and experience while the performance of net asset value per share is the opposite of what we expected and DABR is negative. Taking into

consideration the particularity of China Stock Markets and some collinear relationship between explaining variables, we choose average stock price, EPS and circulating value that may influence the stock liquidity to substitute into regression test. And the result is shown in table 6.

**Table-6: Regression results**

Factor (X)	coefficient	Std.Error	t-Statistic	Prob.
X <sub>1</sub>	0.426	0.119	3.593	0.001
X <sub>2</sub>	2.756	1.764	1.562	0.127
X <sub>4</sub>	0.027	0.004	6.918	0.000
C	6.505	2.456	2.648	0.012
R-squared	0.728			
Prob(F-statistic)	0.000			

We can obtain the multiple linear regression model that effects liquidity as follows:

$$L = 0.426X_1 + 2.756X_2 + 0.027X_4 + 6.505 \quad (16)$$

(3.593) (3.562) (6.918) (2.648)

$R^2=0.728$ , D.W.=2.203, F=0.015

From the equation 16, we can see that average stock price value changes in a unit and liquidity value change in 0.426 unit as EPS and circulating values remain. Similarly, EPS value changes in a unit and liquidity value changes in 2.756 units as average stock price and liquidity values remain. Circulating value changes in a unit each time and liquidity value changes in 0.027 unit on average as average stock price and EPS values remain. From this we can draw a conclusion that average stock price, EPS and circulating value are the most significant factors influencing the liquidity in China Stock Markets and we should improve their performance and influence.

## THE LIQUIDITY OF STOCK MARKET IN CHINA

### *The liquidity comparison between Shanghai and Shenzhen stock markets*

This part carries out the analysis mainly on the basis of turnover rate and spread index. Now, there are Shanghai Stock Exchange and Shenzhen Stock Exchange in Chinese market. Here, we focus on the turnover rate of two stock markets from 1998 to 2009.

Over some indicators alone, the liquidity of Chinese stock markets is pretty high. Through the turnover rate from year to year, the average turnover rates of Shanghai Stock Exchange and Shenzhen Stock Exchange were respectively 553 and 513.48 from 1998 to 2009. that were truly high. For instance, the average turnover rates of New York Stock Exchange was 76.83 during the same period, Tokyo 56.4. The table 7 shows the yearly turnover rates of Shanghai Stock Exchange and Shenzhen Stock Exchange from 1998 to 2009.

**Table-7: Turnover rate in Shanghai and Shenzhen stock market**

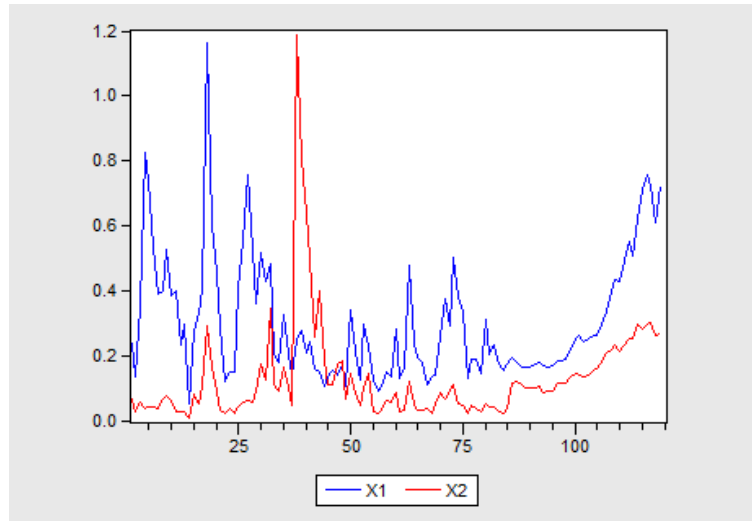
year	Shanghai stock exchange A shares	Shenzhen stock exchange A shares	Shanghai stock exchange B shares	Shenzhen stock exchange B shares
1998	355.3	411.14	57.3	45.88
1999	421.55	371.61	92.59	95.4
2000	504.07	396.47	151.24	89.09
2001	216.67	189.97	452.26	417.47
2002	208.74	200.65	95.99	89.98
2003	268.58	216.97	64.26	133.87
2004	308.31	311.78	59.41	110.04
2005	290.7	350.64	58.49	88.21
2006	564.5	671.34	149.81	154.65
2007	953.16	1062.04	351.6	280.12
2008	401.6	503.45	87.88	84.35
2009	511.46	814.65	165.79	177.18

Data: DRCNET Statistical Database System. <http://edu.drcnet.com.cn/www/edu/>

We draw the monthly turnover rate of Shanghai stock market into a graphic as shown in table 4. In the graph, X<sub>1</sub> refers to A shares in Shanghai stock exchange, X<sub>2</sub> B shares. We can see that both A and B shares fluctuate dramatically. The maximum is more than 100% while the minimum is

less than 10%. Obviously, in terms of the turnover rate, A shares is better than B shares. However, in some special period, B shares rise much higher than A shares. On the whole, the turnover rates of two are ordinary. The rate has been rising in recent years.

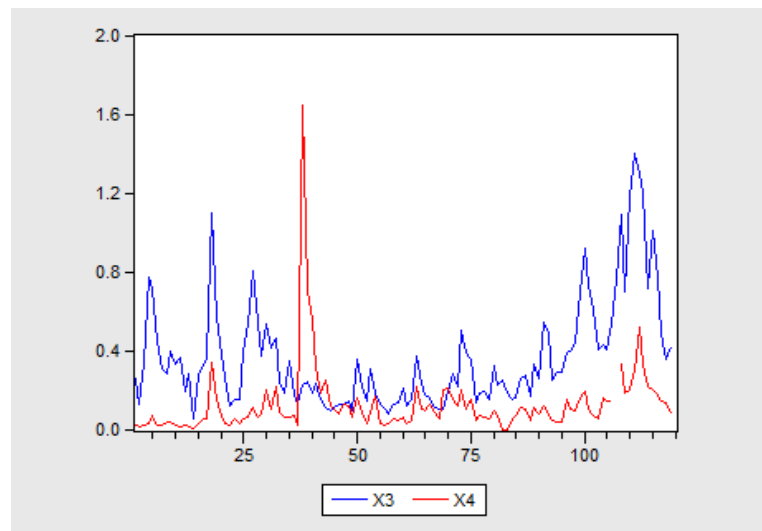




**Fig-4: Monthly turnover rate of Shanghai stock market**

The graphic of monthly turnover rate of Shenzhen stock market is shown in figure 4. In the graph,  $X_3$  refers to A shares in Shenzhen stock exchange,  $X_4$  B shares. From figure 4, we can see that except for some special period, A shares performs better than B shares

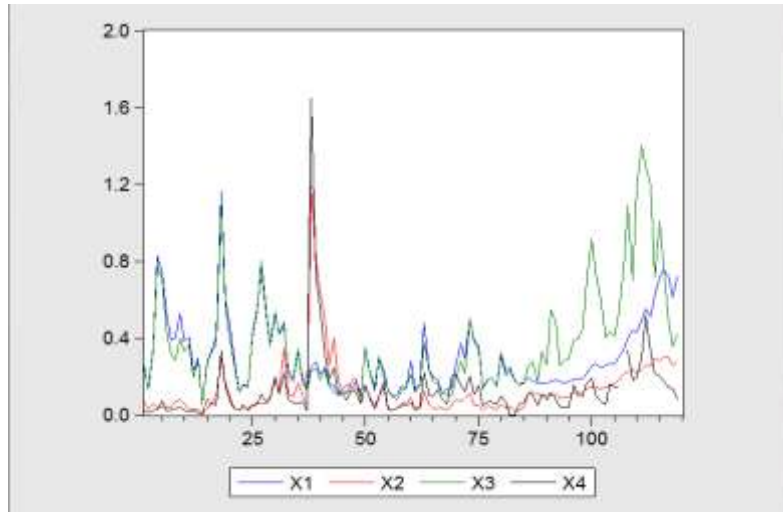
obviously in terms of the turnover rate. A shares fluctuate more dramatically than B shares. On the whole, the turnover rates of two shares are ordinary. The rate in Shenzhen stock market has been first rising and then dropping in recent years.



**Fig-5: Monthly turnover rate of Shenzhen stock market**

For comparison, we overlay figure 4 with figure 5. In figure 6,  $X_1$  represents Shanghai's A-share,  $X_2$  Shanghai's B-share,  $X_3$  Shenzhen's A-share,  $X_4$  Shenzhen's B-share. We can see that the turnover rate of Shanghai's A-share is in general accord with Shenzhen's A-share and Shanghai's B-share is largely similar to Shenzhen's B-share. But in recent years, the

turnover rate of Shenzhen's B-share is distinctly superior to Shanghai's B-share, and the turnover rate of B-share is obviously lower than A-share's. Clearly, turnover rate has been rising in recent years. Table 8 is the descriptive statistics about the turnover rate of Shanghai and Shenzhen stock markets.



**Fig-6: Monthly turnover rates of Shanghai and Shenzhen stock markets**

Then, it's the analysis of two markets' turnover rates (as shown in table 8 and table 9). From table 8, the average turnover rate A-share exceeds B-share's and it means that A-share's liquidity is better than B-share's. Meanwhile, the turnover rate's standard deviation of A-share exceeds the B-share's and it means that the fluctuation of A-share's liquidity is greater than B-share's. Nevertheless, the average turnover rates of A-share and B-share in Shanghai stock market is lower than that in Shenzhen stock market and it means that the liquidity in Shenzhen stock market is greater than that in Shanghai stock market.

Although recent years witness the reform of equity division, through the figures above, we can see that these reforms is useless to market's liquidity. On the contrary, the liquidity has been reduced in a short time. Anyhow, there is reason to believe that the liquidity in our stock markets will increase gradually.

The Table 8 is just about the analysis of the stock turnover rate, but the stock market's stationarity is not immediately clear. We can test the stability through the unit root test of turnover rate. And the result is shown in Table 9.

**Table 8. The descriptive statistics about the turnover rate of Shanghai and Shenzhen stock markets**

arket	Statistical magnitude	A-share	B-share
Shanghai	Average	0.30	0.13
	Standard deviation	0.19	0.16
	Maximum	1.16	1.19
	Minimum	0.05	0.01
Shenzhen	Average	0.36	0.12
	Standard deviation	0.28	0.18
	Maximum	1.40	1.65
	Minimum	0.05	0.00

**Table-9: Unit root inspection results**

Market category	ADF statistics	Level critical value (1%)	Level critical value (1%)	Level critical value (1%)
Shanghai A-share	-4.133	-4.038	-3.448	-3.149
Shanghai B-share	-4.88	-4.038	-3.448	-3.149
Shenzhen A-share	-3.914	-4.038	-3.448	-3.149
Shenzhen B-share	-6.777	-4.038	-3.448	-3.149

Through table 9, except Shenzhen A-share, other three markets' ADF exceed the critical value of significance level 1%, so it means that the turnover rate of Shanghai and Shenzhen stock markets is relatively stable.

#### **Liquidity comparison of industries and stocks' size**

In order to make the comparison, we utilize the different industry indicators as the samples mainly including industry, business, real estate, utilities and integration index. And we choose the data section between 2007 and 2009 as shown in table 10.

**Table-10: Different industries' liquidity comparison**

	Industry	Business	Real estate	Utilities	Integration
2007	22.45	26.24	32.42	35.12	23.24
2008	19.12	20.45	23.35	34.25	17.09
2009	22.51	28.55	30.12	33.47	16.37
Average	21.36	25.08	28.63	34.28	18.90

From table 10 we can see that the most liquid stock is related to utilities, the next is real estate and the worst is integrate stock.

We can adopt the Mega-cap, Mid cap and small cap Index announced by SSE as the price variables of liquidity indicator. These three indexes respectively

represent overall changes of large, medium and small listed companies in Shanghai market and it's more typical than sampling results. The sample's section is chosen between January 2007 and December 2009 and it's shown in table 11. From this we can see that the bigger the size, the better the stock liquidity accordingly.

**Table-11: Liquidity comparison classified by size**

	broader cap	mid cap	Small cap
2007	33.45	25.32	15.32
2008	30.27	13.24	8.72
2009	32.64	10.19	9.65
Average	32.12	16.25	11.23

#### **CONCLUSIONS AND SUGGESTIONS**

This article covers daily, monthly and yearly trade data of 40 listed companies, and combining Chinese stock market situation, our market's model mainly construct by average price, EPS, circulation value and the shareholding ratio of top ten controlling shareholders . The study proves that the factors influencing our market's liquidity are average price, EPS and circulation value. Also, Shenzhen stock market's liquidity is better than Shanghai's.

As the emerging market, the basic market transaction mechanism in China is order-driven system. Because the establishment time is not long enough, our market has its own characteristic. Comparing with relative mature stock markets abroad, the key feature of Chinese stock market is the implement of order-driven system at present in which investment structure focus on the retail investors and the information asymmetry occurs. Therefore, it's necessary to perfect the liquidity in the stock market and suggestions are as follows:

a. Complete the stock offering system. During the system construction of whole capital market, stock-issuance system, the most basic link, plays an very important role in protecting investors' interests. Following the market development, the homologous

adjustment is needed to guard their interests better. This system staring from transition of the issuance approval mechanism, then pathway system and now the sponsor system. The market carries much more risk offering lots of permission simultaneously. And so it is necessary to perfect the stock offering system.

First, improving the sponsor system. Under this system, government might intensify the regulation or transfer the responsibility through sponsor. Therefore, we should strengthen the responsibility of sponsor institution and also make issuing registration as a basic target of sponsor institution in order to solve the problems in sponsor's non-standard work and depending on personal experience alone.

Second, coordinating the relationship between primary and secondary market to balance the market structure. We should eliminate the overlage price spread and deal with the barriers against liquidity. What's more, promoting two markets' sustainable coadaptation, and development. If primary market stubbornly pursuit volume rather than quality, its investment value will be underrated.

b. Consummating the information disclosure institution. This system indicates that when issuing and

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circulating stock, the listed company will publish all reliable information related to the stock to investors aiming to guard their interests. In the stock market, if failing to protect the investors' interests, their initiatives will be weakened and liquidity of market will decrease.

First, perfecting the information distribution pathway. We can ensure that investors acquire the information of comprehension, promptness and credibility through disclosing information on the network which is low cost and convenient for investors to obtain relevant information so as to preserve their rights and interests.

Second, improving civil compensation liabilities system. Though we has established information disclosure institution of stock market, the fraudulent behavior by listed company is not under control mainly ascribing to the ignorance of investors' rights and interests protection. Consequently, we should set up class litigation system to elevate the work's efficiency. At the same time, altering the listed company's burden of proof and the companies should put forward the evidence as the demonstration of their innocence.

c. Completing the tick size system. Considering our stock market is still in its infancy, any empirical study and theoretical research to the stock liquidity shall be raised and perfected. The tick size in our market maintains 0.01 yuan. The lower the price spread, the few investors' transaction costs when they buy or sell the stock. In this way, the market's liquidity will enhance. However, the decrease of bid-ask spread might reduce the depth of stock market and conversely slow down the market liquidity. So, the tick size is not the lower the better and the definite value is determined by different market separately.

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