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DYNAMIC RESIDUAL INCOME MODEL AND EMPIRICAL STUDY BASED ON MARKET POSITION

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ABSTRACT: *Based on Feltham-Ohlson residual income model(Ohlson RIM model), this paper builds a dynamic market position RIM taking into account of important complementary role of market power to enterprises' value and domestic characteristic of enterprises' development, which using financial account, namely, unearned revenue to effectively express market position. Then this paper makes empirical analysis using data from 2001 to 2014 in China capital market. The empirical result shows that unearned revenue has an obvious effect on value of enterprises. However, an extreme value appears in its influence curve which performs as an inverted U shape. Overall, as an effective complement to valuation method, a dynamic market-position RIM built in this paper has important theoretical and practical significance in improving development of China's value investment theory.*

KEYWORDS: Market Power; Unearned Revenue; Dynamic Development; Residual Income Model

INTRODUCTION

Value investment theory originates from concept of intrinsic value proposed by Graham Benjamin in "smart investors" (1949). He argues that investment of stocks should focus on its value. Since then, a large numbers of western studies about computing intrinsic value have been developed. The main typical valuation model and method are discounted cash flow method (DCF), discounted dividend model (DDM), real option method and residual income model (RIM), *etc*.

Although China capital market starts later than the western countries, it has made great achievements after 20 years' development. At present, China capital market scale has reached top 2 in the world, A-share market has become one of the core elements of development of the socialist market economy in China, as well as the main driving force of optimizing allocation of resources. Increasing number of investors are attaching importance to value investment theory in order to realize principle of rationality. A large numbers of researches have proved that these models have certain applicability in China capital market to varying degrees.

However, each theory of value investment has its own applicability and scope, and there is no investment theory that can be applied to all markets. Especially in China, whose capital market is not completely free competitive market, and some theories mentioned above are not completely adaptable. In China capital market, market power has a significant impact on development of enterprises. Enterprises of high market position, can obtain more advantage of market competition in China than those of lower market position, and produce more of the excess profit. Generally, a higher market status means a stronger position when negotiating and a larger capability to require enterprises to pay in advance. Conversely, a lower market position often leads to some difficulty in collecting accounts receivable. Based on this situation, this paper studies the influence of market power on sustainable development of enterprise's intrinsic value.

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LITERATURE REVIEW

Unearned revenue can be thought of as a "deposit received", which one enterprise receive payment from customers in advance but still not provide goods or services.

Some original researches about unearned revenue have regarded it as an index measuring enterprises' business credit level according to its accounting meaning. A large numbers of papers have shown that business credit level positively affects enterprises' net profits. Zhang(2007) proves that business credit improves enterprises' operational performance demonstratively, which is more applicable in manufacturing industry with fierce competition. After an empirical study of 1260 listing companies in China, Gong(2007) proposes that a higher level of business credit can hence company's competitive position in industrial value chain.

Other papers have also shown that unearned revenue could reflect market position and improve net income. Zhang(2006) proves that more unearned revenue leads to more resources advantages and even monopoly position. Additionally, Wang(2008) uses empirical test to analyze listing companies with large unearned revenue generally possess monopoly position or resources advantages in industry. Besides, Tan(2012) puts forward that unearned revenue indicates supply-demand relations in industry and plays an important role in predicting companies' future profits level. Moreover, Wang(2012) shows a positive relation between unearned revenue and enterprises' operating level. In addition, both Liu(2009) and Tian(2004) draws a conclusion that business potential profit power can be shown by studying its unearned revenue. Meanwhile, Liu(2012) discovers that larger enterprise scales link with more amount of unearned revenue in her empirical study about 32 enterprises in China during 2007 to 2009.

Wang and Gan(2016) build market power adjusted RIM model and confirms significant effect of unearned revenue on enterprises' value by using statistics of China capital market from 2003 to 2011 based on these theories. However, their paper also shows that there are some results are not significant. The reason might be that enterprises' dynamic development situation is ignored. Thus ,this paper will focus on market power adjusted RIM model based on dynamic development.

THEORETICAL BASIS OF RIM AND MODEL BUILDING

Theoretical Basis of RIM

Residual income model (RIM)

Based on definition of residual income, Edwardshe Bell(1961) puts forward the RIM theory.

$$V_t = BV_t + \sum_{i=t+1}^{\infty} \frac{E[NI_i - r_f BV_{i-1}]}{(1+r_f)^{i-t}} = BV_t + \sum_{i=t+1}^{\infty} \frac{E[X_i]}{(1+r_f)^{i-t}} \quad (1)$$

Where,

V_t *is e*quity value in the t[th] period for company;

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BV_t is book value in the t[th] period for company;

NI_i is net profit in the i[th] period for company;

$X_i = NI_i - r_f BV_{i-1}$ is residual income in the i[th] period for company;

r_f is risk-free discount rate;

Based on formulation (1), Feltham and Ohlson (1995) puts forward following hypothesis: residual income of any adjacent period exists fixed linear relation, namely:

$$\begin{aligned} V_t &= BV_t + \sum_{i=t+1}^{\infty} \frac{E[X_i]}{(1+r_f)^{i-t}} \\ X_{i+1} &= mX_i + \upsilon_{i+1} + \varepsilon_{1i+1} \\ \upsilon_{i+1} &= n\upsilon_i + \varepsilon_{2i+1} \end{aligned} \tag{2}$$

Where,

υ_i is other factors effecting residual income in the i[th] period;

ε_1、ε_2 are random variables with zero mean;

m、n are coefficients, as the known constants;

Based on formulation (2), Wang and Gan(2016) argue that not only previous residual income, but also corporation's market power, can affect enterprises' residual income of current period. So they put forward following two market-power adjusted RIM model by using unearned revenue to effectively demonstrate market position

$$\begin{aligned} V_t &= BV_t + \sum_{i=t+1}^{\infty} \frac{E[X_i]}{(1+r_f)^{i-t}} \\ X_{i+1} &= mX_i + \alpha_1 Y_{i+1} + \upsilon_{i+1} + \varepsilon_{1i+1} \\ Y_{i+1} &= \beta Y_i + \varepsilon_{2i+1} \\ \upsilon_{i+1} &= n\upsilon_i + \varepsilon_{3i+1} \end{aligned} \tag{3}$$

$$\begin{aligned} V_t &= BV_t + \sum_{i=t+1}^{\infty} \frac{E[X_i]}{(1+r_f)^{i-t}} \\ X_{i+1} &= mX_i + \alpha_1 Y_{i+1} + \alpha_2 Y_{i+1}^2 + \upsilon_{i+1} + \varepsilon_{1i+1} \\ Y_{i+1} &= \beta Y_i + \varepsilon_{2i+1} \\ \upsilon_{i+1} &= n\upsilon_i + \varepsilon_{3i+1} \end{aligned} \tag{4}$$

Where,

α_1、α_2、β are respectively coefficient of variation Y_{i+1}、Y_{i+1}^2、Y_i , as the known constants.

The significance of other symbols are the same as above.

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Based on Feltham-Ohlson RIM model, formula (3) shows that market position also affect company's residual income. Formula(4) demonstrates that the correlation line between two variables is not unlimited, but an inverted U-distribution that has a maximum value.

At the same time, Wang(2016) further extends study of unearned revenue. He finds when company divides net assets into net operating assets and net financial assets, the degree of influence to intrinsic value is different. He puts forward following valuation model.

$$\begin{aligned} &Val_t = FA_t + OA_t + \alpha X_t + \beta Y_t + \gamma U_t \\ &\alpha = \frac{1}{R_f - \omega} \\ &\beta = \frac{R_f \xi}{(R_f - \omega)(R_f - m)} \\ &\gamma = \frac{R_f \varphi}{(R_f - \omega)(R_f - \varphi)} \end{aligned} \tag{5}$$

$$\begin{aligned} &Val_t = FA_t + OA_t + \alpha X_t + \beta_1 Y_t + \beta_2 Y_t^2 + \gamma U_t \\ &\alpha = \frac{1}{R_f - \omega} \\ &\beta_1 = \frac{R_f \xi_1}{(R_f - \omega)(R_f - m)} \\ &\beta_2 = \frac{R_f \xi_2}{(R_f - \omega)(R_f - m^2)} \\ &\gamma = \frac{R_f \varphi}{(R_f - \omega)(R_f - \varphi)} \end{aligned} \tag{6}$$

Where,

ξ、ξ_1、ξ_2 represent coefficient of the corresponding parameter.

ω、m and φ represent abnormal surplus、market position and other information's sustainability. The values of these three variables range from 0 to 1.

The significance of other symbols are the same as above.

Dynamic assumptions and presenting propositions

Both formulation (3) and (4) imply an important assumption that enterprises develop statically, that is, production and operation of company maintain at existing level. However, in practice, enterprises' operation is developing dynamically. Compared with current period basis, next period volume of operation could increase or decrease. Obviously, next term of residual income will be inevitably affected by changes of the previous period production. Based on this consideration, this paper puts forward following assumption:

Assumption (a): Enterprises keep dynamical development, but not be static. The main indicators of development of dynamic management are capital investment or recovery of current period.

Based on assumption (a), net cash outflow (or inflow) under company's investment activities indicates capital investment (or withdrawal) under dynamic operation of the company, this paper puts forward following proposition:

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Proposition 1: In dynamic development, intrinsic value of company's equity has a positive significance with net outflow of capital. Formulation is as follows;

$$Val_t = BV_t + \omega X_{t+1} + \phi OA_{t+1} + \varphi CF_{t+1} + \delta Y_{t+1} + U_{t+1} + \varepsilon_{t+1} \quad (7)$$

Where,

Val_t is equity value per share in the t[th] period for company;

X_t is residual income per share in the t[th] period for company;

OA_t is net operating assets per share in the t[th] period for company;

CF is net cash outflow of investment activities in the t[th] period for company;

Y_t is unearned revenue per share in the end of t[th] period;

U_t is other factor that influence equity value per share in the t[th] period;

ε_t is random variables with zero mean .

ω、ϕ、φ、δ are coefficients, as known constant respectively.

The significance of the other symbols are the same as above.

Proposition 2: Although intrinsic value of enterprises' equity is positively correlated with unearned revenue, it is negative correlated with unearned revenue per share's quadratic, namely there is a maximum, inverted u-shaped relationship. Formula is follows:

$$Val_t = BV_t + \omega X_{t+1} + \phi OA_{t+1} + \varphi CF_{t+1} + \delta_1 Y_{t+1} + \delta_2 Y_{t+1}^2 + U_{t+1} + \varepsilon_t \quad (8)$$

Where,

δ_1、δ_2 are coefficients of variables Y_{t+1}、Y_{t+1}^2, as known constant respectively;

The significance of the other symbols are the same as above.

Model Reasoning and building

Based on assumption of RIM model, according to assumption (a) in this paper, residual income can be showed as follows:

$$\begin{aligned}
X_{i+1} &= m_1 X_i + m_2 OA_i + m_3 CF_i + m_4 Y_i + a_{i+1} + \varepsilon_{1i+1} \\
OA_{i+1} &= n_1 OA_i + n_2 CF_i + b_{i+1} + \varepsilon_{2i+1} \\
CF_{i+1} &= pCF_i + d_{i+1} + \varepsilon_{3i+1} \\
Y_{i+1} &= qY_i + e_{i+1} + \varepsilon_{4i+1} \\
a_{i+1} &= s_1 a_i + \varepsilon_{5i+1} \\
b_{i+1} &= s_2 b_i + \varepsilon_{6i+1} \\
d_{i+1} &= s_3 d_i + \varepsilon_{7i+1} \\
e_{i+1} &= s_4 e_i + \varepsilon_{8i+1}
\end{aligned} \quad (9)$$

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Where,

a、b、d、e are other factors affecting variation X、OA、CF、Y respectively;

m_1、m_2、m_3、m_4、n_1、n_2、p、q、s_1、s_2、s_3、s_4 are coefficients, as known constant respectively,(m_1、n_1、p、q、s_1、s_2、s_3、s_4 are persistent coefficients of residual income、net operating assets、net cash outflows of investment activities、market position and other affecting factors，which range from 0 to 1)

The significance of the other symbols are the same as above.

Plugging equation (7) into equation (1) independently, the following transforms can be obtained after iterative calculation:

$$\begin{aligned} Val_t = BV_t &+ \frac{X_{t+1}}{(R-m_1)} + \frac{m_2 OA_{t+1}}{(R-n_1)(R-m_1)} + \frac{[m_2 n_2 + (R-n_1)m_3]CF_{t+1}}{(R-m_1)(R-n_1)(R-p)} \\ &+ \frac{m_4 Y_{t+1}}{(R-q)(R-m_1)} + \frac{s_1 a_{t+1}}{(R-s_1)(R-m_1)} + \frac{m_2 s_2 b_{t+1}}{(R-s_2)(R-n_1)(R-m_1)} \\ &+ \frac{[m_2 n_2 s_3 + (R-n_1)m_3 s_3]d_{t+1}}{(R-s_3)(R-n_1)(R-p)(R-m_1)} + \frac{m_4 s_4 e_{t+1}}{(R-s_4)(R-q)(R-m_1)} \end{aligned} \tag{10}$$

Where,

R is discount rate, that is $R = 1 + r_f$;

The significance of the other symbols are the same as above.

Based on assumption (a), residual income can be showed as :

$$\begin{aligned} X_{i+1} &= m_1 X_i + m_2 OA_i + m_3 CF_i + m_4 Y_i + m_5 Y_i^2 + a_{i+1} + \varepsilon_{1i+1} \\ OA_{i+1} &= n_1 OA_i + n_2 CF_i + b_{i+1} + \varepsilon_{2i+1} \\ CF_{i+1} &= pCF_i + d_{i+1} + \varepsilon_{3i+1} \\ Y_{i+1} &= qY_i + e_{i+1} + \varepsilon_{4i+1} \\ a_{i+1} &= s_1 a_i + \varepsilon_{5i+1} \\ b_{i+1} &= s_2 b_i + \varepsilon_{6i+1} \\ d_{i+1} &= s_3 d_i + \varepsilon_{7i+1} \\ e_{i+1} &= s_4 e_i + \varepsilon_{8i+1} \end{aligned} \tag{11}$$

Plugging equation (11) into equation (1) independently, the following transform can be obtained after iterative calculation:

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$$
\begin{aligned}
Val_t = {} & BV_t + \frac{X_{t+1}}{(R-m_1)} + \frac{m_2}{(R-n_1)(R-m_1)} OA_{t+1} + \frac{m_2 n_2 (R-n_1) m_3}{(R-m_1)(R-p)(R-n_1)} CF_{t+1} \\
& + \left[\frac{m_4}{(R-m_1)(R-q)} + \frac{2qm_5 s_4 e_1}{(R-m_1)(R-q^2)(R-qs_4)} \right] Y_{t+1} \\
& + \frac{m_5 (R-qs_4)}{(R-m_1)(R-q^2)(R-qs_4)} Y_{t+1}^2 \\
& + \frac{s_1 a_{t+1}}{(R-m_1)(R-s_1)} + \frac{m_2 s_2 b_{t+1}}{(R-s_2)(R-n_1)(R-m_1)} \\
& + \frac{[m_2 n_2 s_3 + (R-n_1) m_3 s_3] d_{t+1}}{(R-m_1)(R-s_3)(R-p)(R-n_1)} + \frac{m_4 s_4 e_{t+1}}{(R-m_1)(R-s_4)(R-q)} \\
& + \frac{m_5 (R-qs_4) s_4^2 + 2qm_5 e_1 R (s_4^2)^2}{(R-m_1)(R-s_4^2)(R-q^2)(R-qs_4)} e_{t+1}^2
\end{aligned}
\tag{12}
$$

Formula (10) proves proposition 1, that is:

$$
\begin{aligned}
& Val_t = BV_t + \omega X_{t+1} + \varphi OA_{t+1} + \phi CF_{t+1} + \delta Y_{t+1} + U_{t+1} + \varepsilon_{t+1} \\
& \omega = \frac{1}{(R-m_1)} \\
& \varphi = \frac{m_2}{(R-n_1)(R-m_1)} \\
& \phi = \frac{m_2 n_2 + (R-n_1) m_3}{(R-m_1)(R-n_1)(R-p)} \\
& \delta = \frac{m_4}{(R-q)(R-m_1)} \\
& U_{t+1} = \frac{s_1 a_{t+1}}{(R-s_1)(R-m_1)} + \frac{m_2 s_2 b_{t+1}}{(R-s_2)(R-n_1)(R-m_1)} \\
& \quad + \frac{[m_2 n_2 s_3 + (R-n_1) m_3 s_3] d_{t+1}}{(R-s_3)(R-n_1)(R-p)(R-m_1)} + \frac{m_4 s_4 e_{t+1}}{(R-s_4)(R-q)(R-m_1)}
\end{aligned}
\tag{13}
$$

Similarly, formula (12) proves proposition 2,shows as following:

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$$Val_t = BV_t + \omega X_{t+1} + \phi OA_{t+1} + \varphi CF_{t+1} + \delta_1 Y_{t+1} + \delta_2 Y_{t+1}^2 + U_{t+1} + \varepsilon_t$$

$$\omega = \frac{1}{(R - m_1)}$$

$$\phi = \frac{m_2}{(R - n_1)(R - m_1)}$$

$$\varphi = \frac{m_2 n_2 (R - n_1) m_3}{(R - m_1)(R - p)(R - n_1)}$$

$$\delta_1 = \frac{m_4}{(R - m_1)(R - q)} + \frac{2qm_5 s_4 e_1}{(R - m_1)(R - q^2)(R - qs_4)} \tag{14}$$

$$\delta_2 = \frac{m_5 (R - qs_4)}{(R - m_1)(R - q^2)(R - qs_4)}$$

$$U_{t+1} = \frac{s_1 a_{t+1}}{(R - m_1)(R - s_1)} + \frac{m_2 s_2 b_{t+1}}{(R - s_2)(R - n_1)(R - m_1)}$$
$$+ \frac{[m_2 n_2 s_3 + (R - n_1) m_3 s_3] d_{t+1}}{(R - m_1)(R - s_3)(R - p)(R - n_1)} + \frac{m_4 s_4 e_{t+1}}{(R - m_1)(R - s_4)(R - q)}$$
$$+ \frac{m_5 (R - qs_4) s_4^2 + 2qm_5 e_1 R (s_4^2)^2}{(R - m_1)(R - s_4^2)(R - q^2)(R - qs_4)} e_{t+1}^2$$

Formula (13) and (14) demonstrate that both proposition 1 and 2 are feasible theoretically.

The Setting of Empirical Model

In practice, because other factors can't be described by quality, for other factors of formula (13) and formula (14) above, namely variable U, in the actual empirical research, this paper references methods proposed by Myers (1999) on empirical research, namely ignoring "other information", and add an intercept. It is an equivalent conversion in mathematics. Meanwhile, intrinsic value of variable Val in equations mentioned above can be substituted by corresponding share price P in following empirical test.Thus, the formula (13) and formula (14) above can be converted into following empirical models respectively:

(1) Formula (13) can be changed to following empirical model based on proposition 1:

$$P_t = BV_t + \alpha_t + \omega X_{t+1} + \varphi OA_{t+1} + \phi CF_{t+1} + \delta Y_{t+1} + \varepsilon_{t+1}$$

$$\omega = \frac{1}{(R - m_1)}$$

$$\varphi = \frac{m_2}{(R - n_1)(R - m_1)} \tag{15}$$

$$\phi = \frac{m_2 n_2 + (R - n_1) m_3}{(R - m_1)(R - n_1)(R - p)}$$

$$\delta = \frac{m_4}{(R - q)(R - m_1)}$$

(2) Formula (14) can be changed to following empirical model based on proposition 2:

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$$
\begin{aligned}
&P_t = BV_t + \alpha_t + \omega X_{t+1} + \phi OA_{t+1} + \varphi CF_{t+1} + \delta_1 Y_{t+1} + \delta_2 Y_{t+1}^2 + \varepsilon_t \\
&\omega = \frac{1}{(R - m_1)} \\
&\phi = \frac{m_2}{(R - n_1)(R - m_1)} \\
&\varphi = \frac{m_2 n_2 (R - n_1) m_3}{(R - m_1)(R - p)(R - n_1)} \\
&\delta_1 = \frac{m_4}{(R - m_1)(R - q)} + \frac{2 q m_5 s_4 e_1}{(R - m_1)(R - q^2)(R - q s_4)} \\
&\delta_2 = \frac{m_5 (R - q s_4)}{(R - m_1)(R - q^2)(R - q s_4)}
\end{aligned}
\tag{16}
$$

Where,

α_t is intercept coefficient;

The significance of the other symbols are the same as above.

The Empirical Test

Based on practical significance of accounting, all kinds of predicted ranges of the correlation coefficients are follows (table 1):

Table 1: Predicted range of coefficient

Coefficient	Range
m_1	（0，1）
m_2	（0，+∞）
m_3	（0，+∞）
m_4	（0，+∞）
m_5	（-∞，0）
n_1	（0，1）
n_2	（0，+∞）
p	（0，1）
q	（0，1）
δ	（0，+∞）

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δ_1	（0，+∞）
δ_2	（-∞，0）
s_1	（0，1）
s_2	（0，1）
s_3	（0，1）
s_4	（0，1）

Empirical data in this paper extract from consolidate corresponding annual data (annual report) in WIND database. Each variable is explained as below:

P is price of per share (no restoration of rights);

OA is book value per share of net operating assets on balance sheet date;

EPS is earning per share, namely, net profit of the t^{th} period / total stock shares in the end of the t^{th} period;

R_f is discount rate, which equals to 1 plus risk-free rate r, particularly, r is calculated with one-year interest rate of one year bank deposit;

X is residual income per share, which equals to net profit per share this period minus multiple book value of net asset per share in the end of previous period times risk-free rate, namely: residual income per share of the t^{th} period = net profit of the t^{th} period r*equity of the $(t-1)^{th}$ period;

CF is cash outflow per share from investment activities;

Y is unearned revenue per share.

This paper selects listing companies,excluding financial industries such as bank companies, insurance companies and investment companies, in Shanghai and Shenzhen stock market from 2001 to 2014 as empirical samples. All empirical data are relevant financial data and stock prices are all from Wind database system. According to regulation of security exchange , annual reports of listing companies must be disclosed before April 30^{th} next year, this paper selects closing price on April 30^{th} every year as amount of variable P. If April 30 is closed for stock exchange, then closing price of previous trading day will be replaced.

Samples Selection and Variable Description

Samples Selection (see table 2).

Table 2. Samples Selection

Listing companies (excepting financial industry)	2775

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Subtract: lack of book value	-14
Subtract: lack of operating assess	-87
Subtract :lack of unearned revenue	-144
Subtract:lack of unearned revenue	-123
Subtract: lack of stock price	-138
Subtract: lack of cash outflow of investment activities	-2
Subtract: lack of ultimately controllers	-0
Samples:	2267

Descriptive Statistic Analysis (see table 3)

Table 3: Descriptive Statistic Analysis

Variables		**Price**	**BV**	**OA**	**ICF**	**X**	**Y**	**Y2**
FY 2001	**Mean**	15.6604	2.85564	2.9054	-0.43083	-0.05968	0.16200	0.14855
	Media	14.39	2.75215	2.77626	-0.264 19	0.01407	0.05233	0.00273
FY 2002	**Mean**	11.2643	2.92034	2.99827	-0.42532	0.02988	0.18378	0.17882
	Media	10.34	2.81976	2.87906	-0.27019	0.04927	0.06048	0.00365
FY 2003	**Mean**	8.63289	2.93620	3.01424	-0.41814	0.01137	0.22125	0 .34456
	Media	7.8	2.74381	2.85080	-0.23691	0.02471	0.07024	0.00493
FY 2004	**Mean**	7.66410	2.75159	2.90854	-0.42178	-0.09089	0.24146	0.25339
	Media	6.55	2.6583	2.79943	-0.23025	0.00926	0.09977	0.00995
FY 2005	**Mean**	4.92339	2.76849	2.96160	-0.38743	-0.03445	0.26566	0.31980
	Media	3.92	2.64512	2.79239	-0.20117	0.02582	0.11214	0.01257

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FY 2006	**Mean**	15.0498	2.85173	3.04705	-0.46102	0.12335	0.30378	0.50976
	Media	12.29	2.82878	2.98052	-0.23201	0.11574	0.10936	0.01196
FY 2007	**Mean**	14.7146	3.45424	3.68482	-0.51432	0.26902	0.42624	1.13504
	Media	11.21	3.24765	3.40658	-0.31800	0.21336	0.12636	0.01597
FY 2008	**Mean**	11.4087	3.38377	3.62082	-0.59048	0.13221	0.38442	1.12898
	Media	8.63	3.19469	3.35996	-0.35861	0.08503	0.09249	0.00855
FY 2009	**Mean**	17.2324	3.67552	3.91944	-0.52459	0.30364	0.48485	1.52749
	Media	12.46	3.39943	3.49931	-0.28889	0.23082	0.11359	0.01290
FY 2010	**Mean**	19.0368	4.8625	5.0995	-0.72976	0.38556	0.52078	1.90332
	Media	15.6	3.98118	4.26371	-0.44778	0.29570	0.12073	0.01457
FY 2011	**Mean**	13.1265	5.02951	5.35651	-0.83059	0.30006	0.52417	2.43209
	Media	10.855	4.4243	4.73677	-0.47183	0.21741	0.11767	0.01385
FY 2012	**Mean**	10.9914	4.64093	5.08820	-0.72748	0.19714	0.51615	2.17198
	Media	8.4	4.20216	4.50884	-0.46834	0.13259	0.10695	0.01144
FY 2013	**Mean**	11.4089	4.58235	5.04468	-0.66726	0.15070	0.51896	2.47310
	Media	9.165	4.12964	4.43603	-0.44687	0 .09721	0.10654	0.01135
FY 2014	**Mean**	22.1099	4.61591	5.16883	-0.63092	0.11692	0 .47838	2.42647
	Media	18.405	4.17242	4.57424	-0.42738	0.08034	0.09458	0.00895
TOTAL	**Mean**	13.9135	3.97658	4.27826	-0.60123	0.16599	0.42072	1.55245

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	Media	10.765	3.49043	3.70789	-0.35861	0.11618	0.10006	0.01001

RESULTS OF EMPIRICAL TEST

Results of Empirical Test of Proposition 1 (see table 4)

Table 4: Results of Empirical Test of Proposition 1

Variables	Results
intercept	5.93288 (<.0001) ***
OA	-1.84245 (<.0001) ***
CF	-0.39469 (0.002) ***
X	2.87275 (<.0001) ***
Y	0.19405 (0.001) ***
N	8432
F-value	407.16 ***
R-Square	0.2751

P-value statistics in parenthesis; *** means that the variable is significant at 1% level; ** means the that the variable is significant at 5% level; * means that the variable is significant at 10% level.

Table 4 shows that unearned revenue substitution for market position has significance at 1% level with intrinsic value of enterprises' equity under dynamic investment. Thus, proposition 1 is verified and model proposed in formula 13 conforms to Chinese market.

Results of Empirical Test of Proposition 2(see table 5)

Table 5: Results of Empirical Test of Proposition 2

Variables	Results
Intercept	5.85406 (<.0001) ***
OA	-1.85377 (<.0001) ***

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CF	-0.38348
	(0.003) ***
X	2.87647
	(<.0001) ***
Y	0.33221
	(0.001) ***
Y^2	-0.01010
	(0.028) **
N	8432
F-value	366.31 ***
R-Square	0.2777

P-value statistics in parenthesis; *** means that the variable is significant at 1% level; ** means the that the variable is significant at 5% level; * means that the variable is significant at 10% level.

Obviously, table 5 shows that unearned revenue substitution for market position and its quadratic have significance at 1% level and 5% respectively. It can be concluded that unearned revenue substitution for market position has positive influence on company's equity value while its quadratic has negative influence. So, the relation between unearned revenue and intrinsic value of equity is relation of inverted U-shape. The results confirm proposition 2 and applicability of model developed in formula 14 in China capital market.

Robustness test

This paper uses one-year bond rate to replace interest rate of one year bank deposit, then regress results are showed in model 1 on following table 6 and table 7. At the same time, earnings per share is replaced by fully diluted earning per share, regress results are showed in model 2 on following table 6 and table 7.

Robustness Test of Proposition 1

Table 6: Robustness test results for proposition 1

Variables	Model 1	Model 2
Intercept	5.93506	5.93524
	(<.0001) *** -	(<.0001) *** -
OA	1.89286	1.89251
	(<.0001) ***	(<.0001) ***
CF	-0.39377	-0.39380
	(0.002) ***	(0.002) ***
X	2.92191	2.92146
	(<.0001) ***	(<.0001) ***

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Y	0.19698	0.19691
	(0.001) ***	(0.001) ***
N	8432	8432
F-value	411.21***	429.63***
R-Square	0.2753	0.2766

P-value statistics in parenthesis; *** means that the variable is significant at 1% level; ** means the that the variable is significant at 5% level; * means that the variable is significant at 10% level.

It is obvious that unearned revenue positively relates with intrinsic value of equity at 1% significance level whether in model 1 or model 2, which indicates that a higher market position improves intrinsic value, and proposition 1 is further confirmed.

Robustness Test of Proposition 2

Table 7: Robustness test results for proposition 2

Variables	Model 1	Model 2
Intercept	5.85603	5.85622
	(<.0001) ***	(<.0001) *** -
OA	-1.90419	1.90383
	(<.0001) ***	(<.0001) ***
CF	-0.38253	-0.38256
	(0.003) ***	(0.003) ***
X	2.92562	2.92516
	(<.0001) ***	(<.0001) ***
Y	0.33553	0.33546
	(0.001) ***	(0.001) ***
Y^2	-0.0101 (0.033)**	-0.01013 (0.033) **
N	8432	8432
F-value	500.33***	486.99***

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R-Square	0.2351	0.2517

P-value statistics in parenthesis; *** means that the variable is significant at 1% level; ** means the that the variable is significant at 5% level; * means that the variable is significant at 10% level.

Table 7 shows that unearned revenue has positive influence with intrinsic value at 1% significant level, but its quadratic has negative influence with intrinsic value at 5% significant level, which indicates a inverted U-shape relation between market position and intrinsic value of equity in dynamic investment. As a result, proposition 2 is further consolidated.

CONCLUSIONS

In China capital market, a higher market position means a larger influential power in market and enterprises' equity value would be improved due to increasingly strengthened attention and recognition by market under situation of dynamic investment. However, the relation between market position and intrinsic value is not completely linear relation, but a inverted U-shape with an extreme value. It might be a reality. An overwhelming height of market position would bring company into an extreme of monopoly which is a lure for government to classify this business as "anti-monoply" object, and eventually diminish its positive effects on enterprise value.

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