

**Effects of IFRS implementation on China publicly listed companies: Evidence using
Tobin's Q**

By

Ying Wang, DBA, CPA *
Assistant Professor
Accounting Department
College of Business
Montana State University-Billings
Billings, MT 59101
E-mail: ywang@msubillings.edu
Phone: 406-657-2273
Fax: 406-657-2327

Michael Campbell, CPA
Professor
Accounting Department
College of Business
Montana State University-Billings
Billings, MT 59101
E-mail: mcampbell@msubillings.edu
Phone: 406-657-1651
Fax: 406-657-2327

*contact author

ABSTRACT

China mandated a change in financial reporting from Chinese GAAP to IFRS as of January 1, 2007. This research uses financial information from Chinese publicly listed companies for the years 1998-2010 to analyze the effect of this change to IFRS on Chinese publicly listed companies. We use Tobin's q as the research tool. A total of 1,329 firms are included in the study. We do not find significant differences in the mean and median of Tobin's q after the implementation of IFRS, but the standard deviation of Tobin's q post IFRS is significantly greater. A year by year analysis of the variance does not support the conclusion that IFRS caused the increase in the standard deviation.

Key words: Tobin's Q, IFRS

Application of the Modified Tobin's Q: the China Evidence

INTRODUCTION

According to the IASB, over 100 countries have adopted the international accounting standards, officially known as International Financial Reporting Standards or IFRS.ⁱ The United States is scheduled to decide soon whether to incorporate IFRS into the financial reporting system for U.S. issuers as well. With the possibility of global adoption of IFRS imminent, this seems an opportune time to investigate whether IFRS actually improves the quality of accounting information and provides benefits to investors. Various researchers have approached this topic from several different angles, e.g., IFRS's impact on earnings management; the relationship between IFRS and information asymmetry (Leuz, 2003); how IFRS affects the cost of equity capital (Daske, 2006; Lambert , et al., 2007); whether IFRS improves market liquidity (Daske et al. 2008); and how IFRS affects Tobin's q, which measures effects beyond the cost of capital and market liquidity (Daske et al., 2008).

IFRS implementation in China

China mandated IFRS conversion for publicly traded companies starting 1/1/2007.ⁱⁱ China's approach is a principles-based approach to translate the new rules into its own code, the Chinese Accounting Standards System. The revisions bring Chinese standards closer to the IFRS benchmark of internationally recognized quality, but the new standards will not be word-for-word translations of IFRS, though they will be founded on similar principles.

Tobin's Q Analysis

Tobin's q was first introduced by James Tobin as a predictor of a firm's future investments (Tobin, 1978; Turner, 1983). It is essentially a market-to-book ratio for the entity. Firms will invest as long as the measure is bigger than one. Since then, it has been used to study different phenomenon. Lindberg and Ross (1981) used Tobin's q as a measure of monopoly power of a firm. Wernerfelt and Montgomery (1998) show that Tobin's q incorporates a capital measure of firm rents, thus it "implicitly uses the correct risk-adjusted discount rate, imputes equilibrium returns, and minimizes distortions due to tax laws and accounting conventions." Bharadwaj et al. (1999) found that IT expenditures were related and useful in explaining variance in Tobin's q . Swafford and Henderson (2009) show that firms can gain long term financial benefits by investing in e-commerce. Tobin's q could capture effects beyond cost of capital and market liquidity (Daske et al., 2008).

The above are just a few reasons why Tobin's q is preferred in many applications over traditional accounting measures.

This research is to analyze the effect of IFRS implementation on China publicly listed companies using Tobin's q .

PREVIOUS RESEARCH

There have been a great many studies on the impact of IFRS on a variety of issues. A good number of studies have focused on the impact on cost of equity capital. Lee et al. (2008) did an early study using 2005 and 2006 IFRS data for 17 European countries. Daske (2006) studied a

group of German firms. Karamanou (2009), Li (2010) and Pine (2010) also studied the impact of IFRS and Daske et al. (2008) looked at companies in 26 countries. Daske et al., (2008) found an increase in cost of capital and a decrease in Tobin's q in the year in which IFRS reporting became mandatory.

Tobin's q has been used in studies on a wide variety of topics including corporate governance, capital and labor, E-commerce, institutional ownership and firm performance, corporate social responsibility, CEO compensation, stock market value and many more (Sami et al., 2011; Mollick et al. 2010; Swafford et al. 2009; Charfeddine et al. 2010; Choi et al. 2010; Griffith et al. 2011; Wright, 2004). Wright (2004) finds advantages of using a simplified version of q termed "equity q " and defined as $qE = \text{market value of equities/net worth}$. It is simpler to compute, immune to changes in the definition of capital and yields results very similar to standard q , especially when q is near 1. Eklund (2010) mentions that, "... due to difficulties in measuring marginal q , most studies use market-to-book measures of Tobin's Q ...". For example, Lin et al. (2010) used the equity q calculation for assessing the effect of family ownership on firm value in Taiwan.

Our study was to investigate the possible effect of switching to IFRS on the value of firms on the Chinese stock exchanges. We used the equity q calculation of Tobin's q as a proxy for firm value.

METHODOLOGY

Tobin's Q

Tobin's q has been measured in different ways. Wernerfelt and Montgomery (1998) described Tobin's q as, "the capital market value of the firm divided by the replacement value of its

assets.” Linderberg and Ross (1981) calculate Tobin’s q based on the ratio of market value to replacement cost. Chung and Pruitt (1994) simplified Linderberg and Ross (1981).

The standard definition, following Tobin, and hence usually termed “Tobin’s q ” or “Tobin’s average q ” is:

$$q = (\text{market value of equities} + \text{liabilities}) / \text{total assets}$$

This research employs measures of Tobin’s q calculated by Laitner and Stolyarov (2003) and subsequently adjusted by Wright (2004). This measure has been employed by other research such as Mollick and Faria (2010), Lin et al. (2010) and many other studies according to Eklund (2010).

The adjusted Tobin’s q (equity q) is defined as:

$$qE = \text{market value of equities} / \text{net worth}$$

Where net worth = total assets - liabilities.

Tobin’s q has the desirable feature that it is unaffected by methods of funding. In contrast, adjusted Tobin’s q is not invariant to methods of funding. On the other hand, adjusted Tobin’s q has the advantage that it is immune to changes in the definition of capital (Wright 2004).

We will simply divide the data into two groups, China GAAP observations (1998-2006) and IFRS observations (2007-2010) and calculate adjusted Tobin’s q for each group. If IFRS makes a positive impact on the market, we should see an increase in Tobin’s q .

RESULTS

Data Collection

We recruited students fluent in Chinese to manually collect data from sina.com.cn. Data were collected for all companies listed on the two major Chinese stock exchanges over 13 year period. This included a total of 1329 publicly listed companies, and 13,209 company years. We included all industries in our data collection. We then grouped our observations into China GAAP observations (1998-2006) and IFRS observations (2007- 2010) and calculated adjusted Tobin's q for the entire population and for both groups.

Tobin's Q

Our Tobin's q has a mean of 3.65 and a median of 2.92 for the overall data, which is comparable to US data. Tobin's q for the US market has a mean of 2.0 from 1991-2010.ⁱⁱⁱ

IFRS

A simple t-test does not show any significant difference in Tobin's q after the implementation of IFRS. Tobin's q of the post IFRS observations has a mean and median of 3.67 and 3.41, respectively. Tobin's q of the China GAAP observations has a mean and median of 3.64 and 2.69, respectively. However, the standard deviation of Tobin's q increased from 22.42 to 85.91 after the implementation of IFRS. T-test shows a significant difference in the variances of the two groups. Since Tobin's q is basically a market to book ratio, the dramatic increase of its variance after IFRS implementation could suggest a more unpredictable market. Of course, this could be due to other factors and have little or nothing to do with implementation of IFRS. China's market could be influenced by international instability, such as the 2007–2012 global financial crisis. The 2007-2012 global financial crisis is considered by many economists to be the worst financial crisis since the Great Depression of the 1930s.^{iv} The timing of IFRS

implementation coincides with the crisis. It is possible that world financial market instability was the major cause of the significantly higher post IFRS variance in Tobin's q and that implementation of IFRS had little or nothing to do with the increased volatility. A year by year calculation of Tobin's q is shown in table 1. The highest variance happened in 2007, the first year IFRS was implemented in China, but also the first year of the current financial crisis.

Insert table 1 here

Chart 1 created using table 1 shows a vivid picture of IFRS implementation and Tobin's Q. The mean and median do not show a change of pattern while standard deviation surged after the IFRS implementation.

Insert chart 1 here

The above analysis included every industry as we mentioned before. A closer examination of the data shows that the sudden increase in variance in 2007 is caused by one industry, the finance and insurance industry. This industry has a variance of 1,259 in 2007. After excluding the finance and insurance sector, our 2007 variance for other industries is only 31.84 (Table 2).

Insert table 2 here

Chart 2 shows the mean, median, and standard deviation by year after excluding the finance and insurance industry. T test still shows a significant difference of variance before and after IFRS implementation data. But we cannot conclude that IFRS caused the tremendous change in variance by year to year chart analysis. The variance can very well be caused by other factors.

Insert chart 2 here

CONCLUSION

The mean and median of pre and post IFRS observations are rather consistent. The chart analysis by year and t test verified the consistency. The standard deviation of Tobin's q increased from 22.42 to 85.91 for the pre and post IFRS observations. However, after excluding finance and insurance sectors from the analysis, the standard deviations are 22.49 and 52.93, respectively. The variance is still significantly higher for post IFRS observations even after exclusion of the finance and insurance sector. However, chart analysis shows that the increased variance could very well be caused by factors other than IFRS implementation.

In sum, we do not believe IFRS implementation has caused convincing changes on China publicly listed companies using Tobin's q as the measurement tool. This could be a positive finding in that it seems to demonstrate that IFRS implementation is not detrimental to the economy using China data as evidence.

REFERENCES

- Bharadwaj, A.S., Bharadwaj, S.G., and Konsynski, B.R. (1999) 'Information technology effects on firm performance as measured by Tobin's q', *Management Science*, Vol. 45 No. 6, pp.1008-1024.
- Charfeddine, L., and Elmarzougui, A. (2010) 'Institutional ownership and firm performance: evidence from france', *The IUP Journal of Behavioral Finance*, Vol. 7, No. 4, pp. 35-46.
- Choi, J.S., Kwak, Y.M. and Choe, C. (2010) 'Corporate social responsibility and corporate financial performance: Evidence from Korea', *Australian Journal of Management*, Vol. 35 No. 3, pp. 291-311.
- Chung, K.H., and Pruitt, S.W. (1994) 'A simple approximation of Tobin's q', *The Journal of the Financial Management Association*, Vol. 23 No. 3, pp. 70-74.
- Daske, H. (2006) 'Economic benefits of adopting IFRS or US-GAAP – have the expected cost of equity capital really decreased', *Journal of Business Finance & Accounting*, Vol. 33 No. 3/4, pp. 329–373.
- Daske, H., Hail, L., Luez, C., and Verdi, R. (2008) 'Mandatory IFRS reporting around the world: early evidence on the economic consequences', *Journal of Accounting Research*. Vol. 46 No. 5, pp.1085-1142.
- Ekland, J. E. (2010) 'Q-theory of investment and earnings retentions--evidence from Scandinavia', *Empirical Economic*, Vol. 39, pp.793-813.
- Griffith, J. M., Najand, M. and Weeks, H. S. (2011) 'What influences the changes in REIT CEO compensation? Evidence from panel data', *Journal of Real Estate Research*, Vol. 33 No. 2, pp. 209-232.

- Karamanou, I., & Nishiotis, G. P. (2009) 'Disclosure and the cost of capital: Evidence from the market's reaction to firm voluntary adoption of IAS', *Journal of Business Finance & Accounting*, Vol. 36 No.7/8, pp.793-821.
- Laitner, J. and Stolyarov, D. (2003) 'Technological change and the stock market', *American Economic Review*, Vol. 93, pp.1240-67.
- Lee, E., Walker, M., and Christensen, H. B. (2008) 'Mandating IFRS: Its impact on the cost of equity capital in Europe', ACCA Report No. 105, London.
- Lin, F.L. (2010) 'A panel threshold model of institutional ownership and firm value in Taiwan', *International Research Journal of Finance and Economics*, Vol. 42, pp.54-62.
- Linderberg, E.B., Ross, S.A. (1981) 'Tobin's q ratio and industrial organization', *Journal of Business*, Vol. 54 No.1, pp.1-32.
- Mollick, A. V., Faria, J. R. (2010) 'Capital and labor in the long-run: evidence from Tobin's q for the US', *Applied Economics Letters* Vol. 17, pp.11-14.
- Pine, K. W. (2010) 'Lowering the Cost of Rent: How IFRS and the convergence of corporate governance standards can help foreign issuers raise capital in the United States and abroad', *Northwestern Journal of International Law & Business*, Vol. 30 No. 2, pp.483-504.
- Sami, H., Wang, J., and Zhou H. (2011) 'Corporate governance and operating performance of Chinese listed firms', *Journal of International Accounting, Auditing and Taxation*, Vol. 20, pp.106-114.
- Swafford, P. and Henderson, S.C. (2009) 'Assessing the impact of e-commerce investment on Tobin's q and other financial performance metrics', *B>Quest*, pp.1-18.
- Tobin, J. (1978) 'Monetary policies and the economy: the transmission mechanism', *Southern Economic Journal*, Vol. 44 No.3, pp.421-431.

Turner, J. (1983) 'Organizational performance, size and the use of data processing Resources', (online). Available at: <http://hdl.handle.net/2451/14588>.

Wernerfelt, B., Montgomery, C.A. (1998) 'Tobin's q and the importance of focus in firm Performance', *The American Economic Review*, Vol. 78 No.1, pp.246-250.

Wright, S. (2004) 'Measures of stock market value and returns for the US nonfinancial corporate sector, 1900–2002', *Review of Income and Wealth*, Vol. 50, pp.561–84.

Table 1: Year by year analysis of Tobin's q

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Pre IFRS	Post IFRS
Mean	4.20	4.70	6.81	6.37	2.69	3.29	2.45	2.08	2.34	3.40	1.91	4.12	5.26	3.64	3.67
Median	3.71	3.87	5.47	3.94	2.86	2.30	1.83	1.41	1.97	4.80	1.75	3.84	3.58	2.69	3.41
Standard Deviation	2.93	6.33	7.38	33.22	34.33	9.33	5.94	7.31	36.78	139.21	9.75	23.70	97.17	22.42	85.91

Note: Year to year observations are mostly from the same companies, although the observations have increased over the years as more companies are listed.

Chart 1: Year by year analysis of Tobin's q

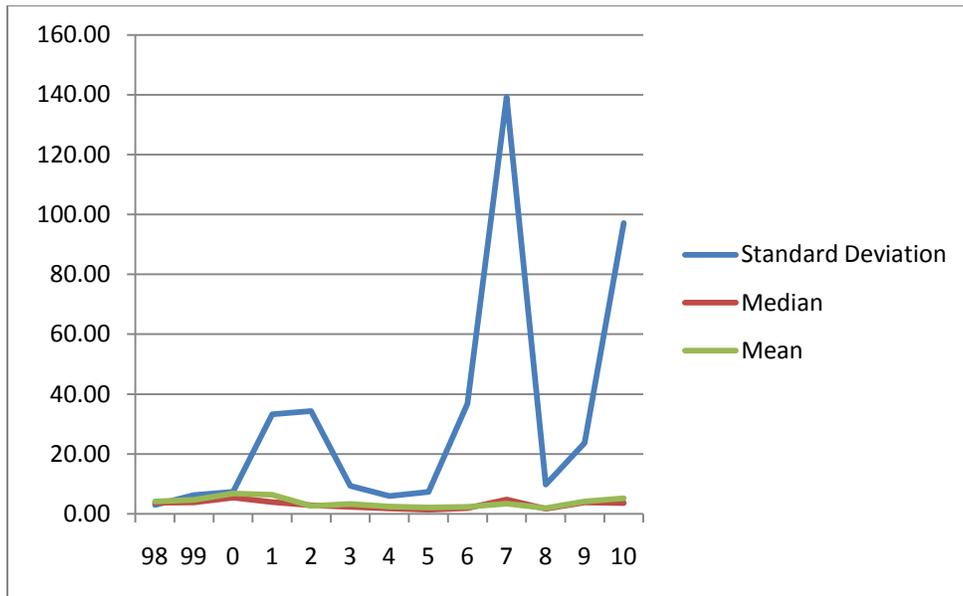
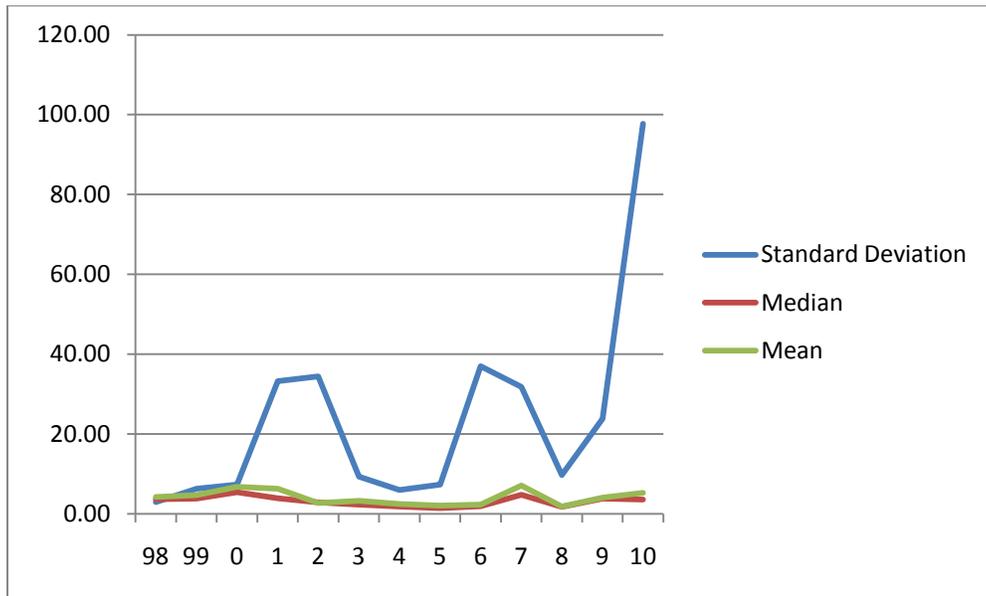


Table 2: Year by year analysis of Tobin's q excluding insurance and finance sector

Year	98	99	0	1	2	3	4	5	6	7	8	9	10	Pre IFRS	Post IFRS
Mean	4.20	4.68	6.776058	6.31	2.68	3.29	2.45	2.08	2.32	7.11	1.86	4.09	5.29	3.63	4.59
Median	3.71	3.86	5.46	3.93	2.85	2.29	1.82	1.40	1.96	4.78	1.75	3.85	3.61	2.68	3.40
Standard Deviation	2.94	6.34	7.341452	33.27	34.44	9.36	5.97	7.34	36.97	31.84	9.75	23.83	97.71	22.49	52.93

Note: Year to year observations are mostly from the same companies, although the observations have increased over the years as more companies are listed.

Chart 2: Year by year analysis of Tobin's q excluding insurance and finance sector



ⁱ IASB. 2009. Who we are and what we do. International Accounting Standards Board, IASC Foundation, July 13. Available at: <http://www.iasb.org/About+Us/International+Accounting+Standards+Board+-+About+Us.htm>.

ⁱⁱ Taub, Stephen. 2/16/2006. Today in Finance: China to adopt IFRS.

ⁱⁱⁱ Hovhannisyan, Ruben. 2011. Understanding Fixed Income: Tobin's Q Ratio. TCW financial analysis available at: https://www.tcw.com/News_and_Commentary/Market_Commentary/Insights/04-13-11_Tobins_Q_Ratio.aspx

^{iv} Wikipedia. http://en.wikipedia.org/wiki/2007%E2%80%932012_global_financial_crisis.