

APPLICATION OF THE MODIFIED TOBIN'S Q: THE CHINA EVIDENCE

*Ying Wang, College of Business, Montana State University-Billings, Billings, MT 59101, 406-657-2273
ywang@msubillings.edu*

*Michael Campbell, College of Business, Montana State University-Billings, Billings, MT 59101, 406-657-1651,
mcampbell@msubillings.edu*

ABSTRACT

This research uses Chinese publicly listed companies' financial information from 1998-2010 to analyze factors affecting Tobin's q . A total of 1,329 firms are included in the study. The change to IFRS has increased the standard deviation of Tobin's q , which we believe indicates either increased volatility or reduced stability of the market.

INTRODUCTION

IFRS Implementation in China

China mandated IFRS conversion for publicly traded companies starting 1/1/2007. 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.

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

Tobin's Q Analysis

Tobin's q was first introduced by James Tobin as a predictor of a firm's future investments [18] [19]. 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 (6).

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

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 [16] [14] [17] [2] [3] [8] [21]. 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:

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

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 [21].

Model Development

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

Tobin's q could also be related to other factors, such as the basic financial ratios and log of market value of equity. We thus construct our model:

Adjusted Tobin's q= industry, year, IFRS, log market value of equity, log sales, state share percentage, independent BOD/log sales, total BOD members/log sales, debt/equity, debt/asset, CA/CL, NI/asset, NI/sales, NI/equity sales/assets. (model 1)

CONCLUSION

The change to IFRS has increased the standard deviation of Tobin's q from 21.56 to 152.66, which we believe indicates either increased volatility or reduced stability of the market. This is an area that may deserve more study. Debt to equity ratio is the most important factor in determining Tobin's q. It explains roughly 64% of Tobin's q. The market responds positively to a higher debt to equity ratio. We are not able to explain the reason for this preference for a high debt to equity ratio.

REFERENCES

- [1] 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.
- [2] 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.
- [3] 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.
- [4] 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.
- [5] 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.
- [6] 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.
- [7] Ekland, J. E. (2010) 'Q-theory of investment and earnings retentions--evidence from Scandinavia', *Empirical Economic*, Vol. 39, pp.793-813.

- [8] 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.
- [9] 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.
- [10] Laitner, J. and Stolyarov, D. (2003) 'Technological change and the stock market', *American Economic Review*, Vol. 93, pp.1240-67.
- [11] 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.
- [12] 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.
- [13] Linderberg, E.B., Ross, S.A. (1981) 'Tobin's q ratio and industrial organization', *Journal of Business*, Vol. 54 No.1, pp.1-32.
- [14] 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.
- [15] 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.
- [16] 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.
- [17] 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.
- [18] Tobin, J. (1978) 'Monetary policies and the economy: the transmission mechanism', *Southern Economic Journal*, Vol. 44 No.3, pp.421-431.
- [19] Turner, J. (1983) 'Organizational performance, size and the use of data processing Resources', (online). Available at: <http://hdl.handle.net/2451/14588>.
- [20] 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.
- [21] 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.