

**Equity-Based Compensation for Executives
and Firm Performance: Evidence from Australia**

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A thesis submitted to fulfilment of the requirements
for the degree of Master of Philosophy

Discipline: Finance

**Business School
The University of Sydney**

2017

CERTIFICATE OF ORIGINALITY

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person, nor material which to a substantial extent has been accepted for the award of any other degree or diploma at the University of Sydney or any other educational institution, except where due acknowledgement is made in the thesis. Any contribution made to the research by colleagues, with whom I have worked at the University of Sydney or elsewhere, during my candidature, is fully acknowledged.

I also declare that the intellectual content of this thesis is the product of my own work, except to the extent that assistance from others in the project's design and conception or in style, presentation and linguistic expression is acknowledged.

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November. 2017

ACKNOWLEDGEMENTS

First and foremost, I would like to express my gratitude to my supervisor, Professor. Susan Thorp, who has supported me throughout my thesis with her patience and knowledge. I have been fortunate to have a supervisor who has cared so much about my work and provided constant feedback. Without her guidance, advice and encouragement, I would never have been able to complete my thesis. She has inspired me to become an independent researcher and steered me in the right the direction whenever she thought I needed it.

Further, I must express my deep and sincere gratitude to my family for providing me with unfailing support, and continuous and unparalleled love throughout my years of study and through the process of researching and writing this thesis. I am forever indebted to my parents for giving me the opportunities and experiences. Also, I would like to thank all my friends in Korea and Australia.

Finally, I would like to thank the University of Sydney Business School and Research Office for offering a great opportunity to take various academic courses with generous funding and a great research environment with excellent facilities.

ABSTRACT

This study examines the impact of Equity-Based Compensation (EBC) for executives and Key Management Personnel (KMP) on firm performance, and how 2009 tax legislation for EBC impacts on the use of EBC and the performance. EBC aims to align the incentives of shareholders and KMP in order to improve productivity. I construct a dataset of top 200 companies on the Australian Securities Exchange (ASX) during 2002-2013 and estimate the effects of EBC in several regression models. I measure performance in two ways: a market-based measure (Tobin's q) and an accounting-based measure (Return on Assets ROA).

I find that the current measure of EBC for executives and KMP is positively related to both Tobin's q and ROA. One-year lagged EBC impacts on Tobin's q but ambiguously on ROA. Also, the 2009 tax reform increases the use of EBC and improves firm performance. Besides the OLS estimates, I construct IV estimates to control for potential endogeneity of explanatory variables, capital, labour and EBC. The results of IV estimates are consistent with those of OLS estimates. Overall, the main findings of this study show that the EBC for executives and KMP can be an effective business strategy because it is likely to lead to better firm performance.

This thesis integrates and expands earlier studies of EBC, narrow-based EBC and firm performance. Investigation of the relation between the use of EBC and firm performance will contribute to practice and assist the Australian government and employers improve employee share ownership schemes.

1. INTRODUCTION

Australian companies have shown increasing interest in employee share ownership schemes. A fundamental objective of Employee Share Ownership Plans (ESOP) is to encourage mutual interest between employees and employers, and to increase employee participation in the operation of the business. The goal of ESOP is to increase productivity and firm performance through retaining and attracting more highly motivated employees.

The number of employees participating in ESOP, the number of employers providing the plans and the value of the plans have gradually increased. According to the Australian Bureau of Statistics (ABS) survey (Australian Bureau of Statistics 2005), employees who receive shares under the plans accounted for 1.3 per cent of the Australian workforce in 1979 but the proportion gradually increased to 5.9 per cent by 2004. In comparison with international data, the proportion in Australia is relatively low. The proportion is around 7 per cent in the U.K., 10 per cent in the U.S. and 23 per cent in France (Lenne *et al.* 2006). Also, although Australian companies increasingly provide equity-based incentives to all employees in more recent years, narrow-based ESOP for executives and Key Management Personnel (KMP) are a more common type of plan than the broad-based ESOP (TNS Social Research 2004). Generally, executives in prominent Australia companies have been encouraged to own a minimum number of company shares, to align their interests with shareholders. For example, since 1850, Westpac Banking Corporation has required the CEO and senior executives to build and hold a substantial parcel of Westpac shares within five years of commencing their role (Morningstar 2013a). Westpac has specifically reported the minimum value of shareholdings for the CEO and senior executives since 2010. The CEO is expected to hold the company shares at no less than five times her annual fixed remuneration package. The senior executives are expected to

hold a minimum shareholding valued \$1.2 million. Also, BHP Billiton Limited has a minimum shareholding requirements for the CEO, executives and KMP (Morningstar 2013b).

Equity-Based Compensation (EBC) for executives and KMP can increase productivity and efficiency, which can lead to increased shareholder wealth (Frye 2004).¹ However, there is little empirical evidence in Australian studies about the relation between the EBC for executives and KMP and firm performance. In this study, I provide evidence on the relation for Australian companies over the sample period 2002-2013. My empirical findings show that the EBC improves performance but there are a few differences related to the performance measures used. When I measure firm performance with Tobin's q, both current and one-year lagged EBC impacts on Tobin's q. When I use Return on Assets (ROA) as a proxy for firm performance, only current EBC impacts on performance. Besides the OLS estimates, I conduct Instrumental Variables (IV) estimation to control for potential endogeneity of explanatory variables.

I also examine how ESOP legislation reform, especially tax rule changes, impacts on the use of EBC and firm performance. The results show that the policy reform is likely to have different impacts on narrow and broad-based ESOP. Many earlier studies show that the policy reform I investigate has a negative impact on the use of ESOP. The studies generally fail to differentiate whether companies provide the ESOP to all employees, or executives and KMP. However, my empirical finding based on the narrow-based ESOP for executives and KMP provides a positive relationship between the policy changes and use of narrow-based ESOP.

My research is structured as follows: Section two provides a brief overview of ESOP in Australia, including existing Australian studies and types of equity offered under the plans. It also provides a summary of the regulation of ESOP in Australia, especially focusing on pre

¹ Under Employee Share Ownership Plans (ESOP), non-cash compensation is known as Equity-Based Compensation (EBC). Therefore, I use the two terms alternatively.

and post 2009 tax legislation reform. Section three presents a review of the literature that studies the relation between the ESOP and firm productivity/performance, impact of the plans on employee motivation and participation, impact on employee attraction and retention and impact on agency costs. In Section four, I introduce a basic empirical strategy based on the empirical model of Jones and Kato (1995) and data collection. Section five presents specifications in OLS estimates and IV estimates, and empirical results from the estimates. Section six provides the conclusions of the study.

2. BACKGROUND

2.1. Existing Australian Studies

Over the past decade, private consulting companies such as KPMG and Mercer Human Resource Consulting have conducted surveys of ESOP in Australian companies (Landau *et al.* 2009). They mainly observed the characteristics of companies that use the plans, the types of the plans, the perception of the plans and the effect of the plans on employee behaviour and attitudes. Also, the Commonwealth Department of Industrial Relations implemented the Australian Workplace Industrial Relations Survey (AWIRS) in 1990 and 1995. The AWIRS 95 is considered to be the main source of well-structured data on ESOP (Lenne *et al.* 2006).

Recently, the Australian government has collected more reliable and comprehensive data on ESOP. There are two major recent datasets published in 2004.

First, the Department of Education and Workplace Relation's Employee Share Ownership Development Unit (ESODU) assigned the ESOP research to TNS Social Research in 2004. TNS Social Research conducted research in three stages; a literature review, qualitative

research and a quantitative survey (TNS Social Research 2004). Key concepts and issues of the EBC were identified through the literature review. Next, they conducted in-depth interviews in companies with and without ESOP, and also included case studies of companies with the plans. Finally, they collected data from a sample of 1000 companies via telephone interviews with human resources managers or the owners, in a quantitative survey. The survey provides statistically reliable information on awareness and incidence of ESOP, attitudes and endorsement of the plans, and take-up of the plans. The second study was conducted by the ABS in 2004. This reports statistics on the incidence of ESOP and the characteristics of employees who receive shares by compiling data from the Employee Earnings, Benefits and Trade Union Membership Survey of the ABS.

Although these Australian studies have given important insights on the incidence of ESOP, the studies generally fail to differentiate between the narrow and the broad-based ESOP, and mainly rely on qualitative methods such as surveys and interviews. In this study, I focus on the narrow-based ESOP for executives and KMP by using a quantitative method.

2.2. Types of Equity Offered Under the ESOP

In terms of types of ESOP, TNS social research finds that offering shares is the most popular type (TNS Social Research 2004). They report that 62 per cent of Australian companies with the plans provide company shares, while 31 per cent provide options. However, according to data from KPMG in 2003, option based schemes are the most common type of the ESOP in Australia, accounting for 49 per cent of all plans (Landau *et al.* 2007). Different sample selection in each study would lead to the different figures. The various types of equity offered under the ESOP are described as follows:

- Performance Rights

Performance rights are a right to acquire a given number of fully paid ordinary shares if a specific performance hurdle is achieved during an applicable performance period at no cost to an executive or employee. Until the performance rights vest, the performance rights carry no legal or beneficial interest in the underlying shares, no dividends from the shares and no voting rights.

- Restricted Shares

Restricted shares are ordinary share-holdings locked in place until a specified vesting period ends. The vesting period could vary but is typically three to five years. During the period, the shares cannot be sold, transferred or used to hedge while the company can choose entitlement to dividends. If the executive or employee leaves the company, or employment is terminated for misbehaviour or inadequate performance during the vest period, the shares are lapsed. The market price of the company's shares at the time of grant and the company's dividend yields determine the fair value of restricted shares.

- Employee Share Purchase Plan (ESPP)

Employee share purchase plans allow an executive or employee to buy the ordinary shares of a company at discounted price below market value. The eligible executive or employee participates in a share purchase fund for a specified offering period through after-tax deductions from their fixed remuneration. The accumulated funds are used to buy the shares at the end of the offering period.

- Employee Share Option Plan

Employee share option plans provide an executive or employee a right to buy the ordinary shares of a company at a specified pre-determined price, usually equal to the market value of the shares on the grant date of the options. The options granted carry

no dividend or voting rights, and are generally exercisable after a certain vesting period. The eligible executive or employee exercises the options only when the share price is greater than the pre-determined price. This is because, the participant can buy the shares at a lower grant price and sell the shares at the current higher market price.

- Share Appreciation Rights (SARs)

Share Appreciation Rights (SARs) are similar to the employee share option plan, in that an eligible executive or employee receives a benefit from an increase in the share price over a certain vesting period. However, under the SARs, the participant receives a number of shares that are converted from an increase in share price. The participant is not required to pay the exercise price unlike the option plan.

- Phantom Shares

Phantom shares are similar to the SARs, in that an eligible executive or employee receives a number of ordinary shares equal to an increase in the price of the company shares. However, the phantom shares are purely a bonus issued at regular intervals based on the performance of company share price. The SARs are an option plan where the participants have a right to exercise over a certain vesting period. Also, the phantom shares can carry dividends unlike the SARs.

2.3. Pre and Post 2009 ESOP Legislation Reform

The employee share schemes have been implemented in Australia since the 1950s but specific federal legislation for the plans began in 1974 (House of Representatives 2000). The ESOP plans are regulated by corporate and taxation law. The Australian Securities & Investments Commission (ASIC) releases a Regulatory Guide and then provides to companies conditional

relief from obligations of disclosure, financial services licensing, advertising, hawking, incidental operation of managed investment scheme and the on-sale of financial products under the Corporations Act 2001 for the ESOP (ASIC 2015).² ASIC's policy objectives are to support interdependence between employer and its employees for mutual benefit and to ensure adequate protection of the participants, rather than fundraising. The ESOP in companies listed on the Australian Securities Exchange (ASX) is also regulated by the ASX listing rules.

However, the predominant regulation of the ESOP in Australia is taxation law. Some companies believed that the taxation regulation affects their decision to introduce and design ESOP (Landau *et al.* 2009). In 2009, the Australian government changed the rules on the taxation of the plans. Prior to the 2009 policy reform, participants in the ESOP could choose either to pay income tax upfront and receive a \$1,000 tax exemption, or defer paying income tax on the discount for up to 10 years (Brown *et al.* 2012). The 2009 reform introduces two major changes for the exemption concession and deferral concession (Landau *et al.* 2013). The exemption concession is that the \$1,000 tax exemption is available only if the participants in the ESOP have an adjusted taxable income of \$180,000 or less. It is designed to target the concession to low and middle income employees. Also, the deferral concession becomes more restricted after the policy reform. The shares and options are generally taxed on grant unless certain conditions are met. The deferral taxation is only available when there is a real risk of forfeiture or when there is an approved salary sacrifice employee share scheme for equity worth up to \$5,000.

Many studies report that the 2009 policy reform had negative impacts on the provision of equity under the employee share schemes (Brown *et al.* 2012; Landau *et al.* 2013; Employee

² The Corporations Act 2001 is an act of Australian government that sets out the laws dealing with business entities in Australia at federal and interstate level. The Corporations Act 2001 contains general requirements associated with disclosure, fundraising and licensing that are relevant to the initial implementation and ongoing administration of an ESOP (Landau *et al.* 2013).

Ownership Australia and New Zealand 2014). According to the Employee Ownership Australia and New Zealand's report (2013), over 90 percent of broad-based ESOP were suspended during the first year of policy reform. Also, there was a significant decrease in the use of employee share option plans, because having tax payable on grant of options can be greater than the difference between the market value of shares at exercise and the exercise price.

However, it is hard to investigate how the 2009 reform affects the narrow-based ESOP in Australia, because major surveys of the ESOP generally fail to distinguish between the narrow and the broad-based ESOP, and are mainly conducted before 2009. Therefore, I examine how the changes to the taxation treatment of employee share schemes impact on the use of ESOP for especially executives and KMP, and the firm performance.

3. LITERATURE REVIEW

In theory, one of the key policy objectives of ESOP is to better align the interest of employers and employees so as to encourage employee productivity and participation (House of Representatives 2000). This interest alignment would be more likely to promote overall business performance by mitigating a principal (the company's shareholders) – agent (the managers) problem and lowering monitoring costs. Higher profitability from an improvement of business performance provides higher returns to the employees who own company shares. Therefore, employees will want to increase the value of their equity and interests between shareholders and employees will be closer aligned.

However, several studies have reported that it is difficult to find an accurate and quantifiable relation between ESOP and organisational performance, especially absolute growth in

productivity, due to causal uncertainty (Sesil *et al.* 2001; TNS Social Research 2004; Lenne *et al.* 2006). Sesil *et al.* (2003) report that improvement in employee and business outcomes would be affected by other factors, not merely by implementing the ESOP, although companies with the ESOPs are 6.2 per cent more productive on average than non-ESOP companies. In spite of the major problem in unambiguously demonstrating that ESOP causes higher productivity, the authors recommend ESOP as an effective business strategy (Sesil *et al.* 2001; TNS Social Research 2004; Lenne *et al.* 2006).

3.1. Impact on Productivity/Performance

Firm productivity is an important determinant of firm performance (Palia and Lichtenberg 1999; Bulan *et al.* 2007). Landau *et al.* (2013) report that the ESOP is identified as a means of improving firm performance through promoting productivity.

Positive productivity/performance effects of ESOP have been identified in many international studies, although the employee share schemes are different in each country. According to Jones and Kato (1995), Japanese manufacturing companies that adopt ESOP boost their productivity by 4 – 5 per cent, although the productivity benefits take 3 – 4 years to be realised. Similarly in Korean manufacturing companies, Cin and Smith (2002) find that an increase in employee shares is associated with an increase in labour productivity. Also, U.S. companies with the ESOP have higher Return On Assets (ROA) during the years 1998-2004 (sample period), higher net profit over 5 years and better operating cash flows over 5 years than the non-EBC companies (Employee Ownership Australia and New Zealand 2014). In more recent research, the ESOP association and the Employee Ownership Foundation in the U.S. find that 84 per cent of respondents stated improved motivation and productivity with the ESOP in a 2010 survey, and 76 per cent of respondents also agreed there is a positive relationship between

overall productivity and ESOP in 2014 survey (The ESOP Association 2016). Frye (2004) also shows a positive relation between firm performance and the EBC plans in the earlier 1990s. He finds that the use of EBC for all employees increases Tobin's q and ROA that are measures of the firm performance.

In the context of the Australian companies, several studies have examined the impacts of ESOP on productivity despite data limitations. The Australian Workplace Industrial Relations Survey (AWIRS) 1995, as a primary source of data on employee share ownership schemes, does not directly collect data on actual levels of firm productivity (House of Representatives 2000). However, the survey finds positive managers' perceptions regarding improvements in productivity from the ESOP. According to the survey of Landau *et al.* (2009), 75 percent of companies agree that the ESOP encourages increased productivity. Also, McElvaney (2011) finds that 11 companies with the plans, on average, outperform the All Ordinaries Index of the ASX by more than 5 per cent. The companies have higher share prices, higher price-earnings ratios and stronger dividends.

The positive productivity/performance effects of the introduction of an ESOP are closely related to the impact of ESOP on employee attitudes and behaviours.

3.2. Impact on Employee Motivation and Participation

The ESOP motivates employees to maximise shareholder value by improving their morale and increasing interest in company progress (House of Representatives 2000). Highly motivated employees generally increase their commitment to their company and facilitate self-development. This leads to higher productivity and efficiency, and fewer industrial disputes. TNS Social Research (2004) surveyed companies with and without the plans on the perceived key benefits of the ESOP on a scale of one (strongly disagree) to ten (strongly agree). The

companies are more likely to agree that the plans make employees more committed (agreement rated 7.1 out of 10), the plans increase employee loyalty and retention (rated 7.1 out of 10) and also increase employee motivation (rated 7 out of 10). Also, Blasi *et al.* (2008) report that the ESOP plays an important role in motivating employees. They use data from the National Bureau of Economic Research (NBER) survey which includes over 41,000 employees over the 2001-2006. The survey asks ‘To what extent would each of the following affect your motivation to improve the business success of the company?’ Approximately 75 per cent of the respondents agree that their motivation is improved to a great or very great extent by receiving stock options (76.9 per cent), ESOP stocks (69.4 per cent) and buying shares through an ESPP (62.8 per cent).

An increase in motivation would be more directly related to strong employee participation. The ESOP leads to greater attention to the performance of their company and make employees more directly involved in decision-making. The survey of Landau *et al.* (2009) shows that the employees receiving company shares have the same voting rights as ordinary shareholders in approximately 72 per cent of observed companies. Also, the AWIRS finds that higher employee participation in the ESOP is related to strong perceptions of productivity growth (House of Representatives 2000).

Therefore, the increase in employee motivation and participation is the key to improvements in company performance.

3.3. Impact on Employee Attraction and Retention

Many companies commonly use the ESOP to attract and retain key employees. Specifically, several studies show that the ESOP attracts certain types of employees. Core and Guay (2001) report that a company with risky growth options attracts employees that are relatively less risk

averse. This is because highly risk averse employees are likely to avoid the company to separate their wealth from possible fluctuations in share price. Also, a company with share option plans tends to attract optimistic employees (Oyer and Schaefer 2005). The options are valuable when the pre-determined share price is less than the market value. It means the share options would be an efficient ESOP to the employee that have optimistic beliefs in the company's prospects.

In terms of their impact on employee retention, high employee turnover is very expensive due to replacement costs. Hiring and training new employees are costly and time consuming. Also, it can decrease productivity and the company's reputation, and destroy employee morale. Core and Guay (2001) argue that firms use option plan vesting periods to retain employees. Also, the restricted share plans are forfeited if employment is terminated for any reason during the vesting period and there are trading restrictions on the plans. Therefore, the use of ESOP is strongly related to the employee retention objective. According to the surveys of the TNS Social Research (2004) and Landau *et al.* (2009), the plans increase employee loyalty and retention (agreement rated 7.1 out of 10) and 92 percent of respondents in Australian companies agree with the objective, respectively. The ESOP helps to maintain competitive advantages through the human capital of the key employees. Indeed, Ittner *et al.* (2003) find that the purpose is an important determinant of equity grants to newly hired employees. As the ESOP improves levels of employee satisfaction and motivation, the plans would also play a role in reducing voluntary labour turnover.

3.4. Impact on Agency Costs

ESOP help to reduce agency costs by mitigating the divergence of interests between employees and shareholders. Ang *et al.* (2000) test the relationship between equity agency cost and ownership structure in the U.S. companies. They find that agency costs are lower when the

company is managed by insiders such as directors and executives, rather than outsiders. Fleming *et al.* (2004) replicate and extend the agency cost examination of Ang *et al.* (2000) by using Australian company data. The result is consistent with the U.S. study, in that, the equity agency costs are positively related to the separation of ownership and control. The executives or managers mainly have discretion in the operation of the business. As the interests between the insiders and shareholders are aligned, the insiders are less likely to shirk their duties and overconsume unnecessary perquisites. The lower agency costs support higher firm value. Therefore, the impact of the ESOP on the reduction in the agency costs is important to maximise the firm value.

3.5. Equity-Based Compensation (EBC) for Executives and KMP

Section 3.1 generally describes the studies related to a broad-based ESOP that is open to all employees. My study especially focuses on a narrow-based ESOP that provides company equity to executives and KMP rather than all eligible employees. However, there are few studies that show a relationship between the EBC for executives and KMP and productivity/firm performance.

Mehran (1995) shows a positive relation between the firm performance and the EBC plans for executives by using Compustat database. The use of EBC increases Tobin's q and ROA that are measures of the firm performance. Frye (2004) extends Mehran's study and then finds that using EBC for executives is related to higher Tobin's q in the late 1990s. However, the result differs according to the performance measures used. He finds a negative relation using ROA in the same sample period. This would be because there is an earnings dilution effect when stock options are exercised rather than granted. The ROA, as an accounting-based measure, would capture the dilution effect that takes several years to realise.

Also, there are no specific Australian studies on the relation. Farrer and Ramsay (1998) find that the relation between directors' company shareholdings and firm performance exists through 180 listed Australian companies. However, the empirical results vary and depend on a number of factors such as the company size, the industrial classification and the performance measures used.

4. BASIC EMPIRICAL STRATEGY and DATA

4.1. Empirical Strategy

To test the effects of EBC for executives and KMP on firm performance, I establish a production function framework as a basic empirical strategy. Based on the empirical model of Jones and Kato (1995), the production function in general form is:

$$Q = f(K, L, E, Z) \quad (1)$$

where Q is the quantity of output, K is total capital stock and L is the total number of employees. E is the proportion of EBC for executives and KMP. The proportion of EBC is the sum of values of equity-based compensation divided by total compensation. Z is a vector of additional control variables for leverage, growth opportunities, business risk, S&P/ASX 200 total return, and changes to ESOP legislation. I convert all nominal variables in Equation (1) into real variables by deflating by the Producer Price Index (PPI) for each accounting year.³

³ Data for the Producer Price Indicators are from Australian Bureau of Statistics (ABC) Cat No. 6427.0. The reference period for the PPI is the accounting year 2011-2012 (2011-2012 = 100)

4.2. Data

The sample consists of the top 200 companies on the Australian Securities Exchange (ASX) ranked by market capitalisation, under 2016 September index lists. Based on the selected companies, I perform a cross-sectional study over the 2002-2013 (accounting year) period. The sample period starts from 2002 because of the limitations on data collection. The study is made up of four main datasets; compensation data, corporate financial data, ESOP legislation data and Australian market data.

4.2.1. Compensation Data

I collect **compensation data** for executives and KMP in each company by manual search of their remuneration reports and financial statements. I assemble the financial annual reports from the *MorningStar DatAnalysis* database. Annual reports generally disclose details of each value of EBC and total compensation for executives and KMP. Firms design the EBC arrangements as rewards delivered in equity to the nominated executives and KMP. However, several multinational companies such as Ansell Limited, BHP Billiton Limited and James Hardie Industries Plc report the remuneration values in U.S. dollars. I convert the U.S. dollar to the Australian dollar by using exchange rates that are shown in each firm's financial report. For the EBC, there are various types of executive/employee share ownership plans according to each company including performance rights, restricted shares, share acquisition plans and share options. Most non-executive directors in the observed companies do not receive shares, options or share rights as part of their remuneration and do not participate in any equity-based incentive plans.

4.2.2. Corporate Financial Data

I gather **corporate financial data** from the *Thomson Reuters Datastream* database, and I find data missing from the database by manual search of the company annual reports. Also, I use the *MorningStar DatAnalysis* database to find Global Industry Classification Standard (GICS) sector in each firm.

- Firm Performance Data:

Output is generally estimated by a measure of value-added. Value-added can usually be estimated as the sum of operating income and employee benefits expenses. However, employee benefits expenses data causes inconsistency since accounting reporting policy for the values have changed during the sample period. Productivity is an important indicator of the firm performance (Palia and Lichtenberg 1999; Bulan *et al.* 2007). High firm productivity leads to high firm performance. Tobin's q and Return on Assets (ROA) are widely used as measures of firm performance (Frye 2004; Maury 2006). Therefore, I use Tobin's q and ROA as the proxies for the quantity of output in Equation (1). Tobin's q is calculated by following formula:

$$\text{Tobin's } q = \frac{\text{Market value of Equity} + \text{Market value of Liabilities}}{\text{Book value of Equity} + \text{Book value of Liabilities}}$$

In *Thomson Reuters Datastream* database, both market value of liabilities and book value of liabilities are proxied by total liabilities (*Datastream* code WC03351). Market capitalisation (*Datastream* code WC08001) is used for market value of equity and common equity data (*Datastream* code WC03501) is used for book value of equity. According to *Datastream* database, ROA is estimated differently by sectors of industrials, banks, insurance companies and other financial companies (*Datastream* code WC08326).⁴

⁴ Appendix A contains details of data for Return on Assets in *Datastream*. I change an expression of ROA that is displayed as a percentage (%) to a proportion.

- Other Firm Data:

Following Jones and Kato (1995) and Frye (2004), other firm data include total capital stock, total number of employees, total debt to total equity ratio, price to earnings ratio and the standard deviation of the percentage change in operating income. A summary of other firm data is shown in Table 1.

I use the total debt to total equity ratio to proxy for leverage. I also use the price to earnings ratio to proxy for growth opportunities while Frye (2004) uses research and development (R&D) expenditures divided by sales. This is because, financial firms do not have R&D expenditures. The proxy for business risk is the standard deviation of the percentage change in operating income for a five-year period. It is measured over 1997-2013. I also include two-digit GICS codes to control for industry effects. The GICS consists of 11 sectors: Energy, Materials, Industrials, Consumer discretionary, Consumer Staples, Health care, Financials, Information technology, Telecommunication services, Utilities and Real estate. I manually find each company's GICS sector in the *MorningStar DatAnalysis* database. I include net sales and total assets are included as the instruments for possibly endogenous labour and capital stock.

TABLE 1. Summary of Other Firm Data

| Other Firm Data | Estimated by | Datastream Code |
|------------------------------|--|---------------------|
| Total Number of Employees | Full time + Part time employees (excludes seasonal and emergency employees) | WC07011 |
| Total Capital Stock | Net Property, Plant and Equipment + Net Intangible Assets | WC02501, WC02649 |
| Leverage | Total Debt to Equity Ratio | WC08231 |
| Growth Opportunities | Price to Earnings Ratio | WC09104 |
| Business Risk | Standard deviation of the percentage change in Operating Income for a five-year period | WC01250 |
| Industry Fixed Effect | Two-digit GICS codes | - |
| Instruments for IV estimates | Net sales and Total Assets | WC01001, WC02999 |

Note: Missing data in the *Datastream* is found manually in each company's annual reports.

4.2.3. *ESOP Legislation Data*

I obtain **ESOP legislation data** from Australian Government institutions and several other sources. The Australian Taxation Office (ATO) provides an overview of taxation rules for the ESOP. They give information related to the changes to the tax treatment of the plans, eligibility rule for each tax scheme such as taxed-upfront/deferred scheme and start-up concession, and market valuation of shares or rights under the plans. The Australian Securities and Investments Commission (ASIC) gives a regulatory guide for the employee incentive schemes. Also, The University of Melbourne Law School is a major research institute for the ESOP. Their research papers provide a brief outline of the ESOP history and existing regulatory regimes in Australia. My study also examines how the 2009 ESOP legislation reform impacts on the executive share scheme and firm performance.

4.2.4. *Australian Market Data*

I collect monthly data on the **S&P/ASX 200 Total return** from an online publisher of Australian stock market information, named the Market Index. I annualise monthly data to maintain consistency with other data. The total return to the market index captures current trends in the share market, and share market reactions to global shocks or global business cycle changes that are common to all firms.

A limitation of my study is that Australian companies are not legally obliged to report the total number of their employees in their annual reports. The insufficient data for this figure leads me to exclude a total of 133 companies. In addition, I exclude another four companies because details of remuneration are not reported in their annual reports. I exclude another four companies because they changed their accounting years during the sample period. The change

in the accounting years creates data inconsistencies. Therefore, the final sample consists of 708 firm-year observations over the financial years 2002-2013.

5. SPECIFICATIONS and EMPIRICAL RESULTS

5.1. Specifications

I start with the simple regression:

$$Q_{it} = \beta_K \ln K_{it} + \beta_L \ln L_{it} + \beta_E EBC_{it-j} + \beta_C X_{it} + \alpha_i + \varepsilon_{it} \quad (2)$$

where Q_{it} is the output of firm i in year t , K_{it} is the capital stock, L_{it} is the total number of employees, EBC_{it} is the proportion of EBC for executives and KMP, X_{it} is a set of other control variables, α_i is industry fixed effects and ε_{it} is an independent and identically distributed error term.

I measure output by Tobin's q and ROA, respectively. Firm productivity is highly correlated with firm performance, measured by Tobin's q and ROA, because productivity is a key determinant of performance (Palia and Lichtenberg 1999; Bulan *et al.* 2007; Landau *et al.* 2013). Tobin's q is a market-based measure and ROA is an accounting-based measure. Mehran (1995) and Frye (2004) use Tobin's q and ROA to examine the relation between the use of EBC and firm performance. The use of these two measures helps to capture different aspects of firm performance and to compare the results of regressions.

Tobin's q is a forward looking measure and more directly related to long-term performance, while ROA is a backward looking measure and more directly related to short-term performance (Ullah and Zhang 2016). As a market-based measure, Tobin's q can be influenced by events

beyond the control of the firm. ROA is constrained by accounting standards and can be biased due to ineffectual disclosure of performance. Therefore, I measure the firm performance in two ways: Tobin's q and ROA.

The capital stock is the sum of net property, plant and equipment, and net intangible assets of the firm. Labour is the total number of employees excluding seasonal employees and emergency employees. I include the proportion of EBC in each accounting year and also up to four years' lagged proportion of EBC (EBC_{-1} , EBC_{-2} , EBC_{-3} and EBC_{-4}). I use lagged EBC variables to show whether the EBC affects the firm's productivity with a lag. Jones and Kato (1995) report that the positive effects of ESOP on the productivity of Japanese manufacturing firms take 3-4 years to emerge. Frye (2004) also finds that the past year values of EBC have positive and statistically significant impacts on the current firm performance. The variables, X_{it} , contain the total debt to total equity ratio, price to earnings ratio, the standard deviation of percentage change in operating income, and total return of S&P/ASX 200. All variables, except for labour, are deflated by the PPI.

I also include industry fixed effects in equation (2). The fixed effects model helps to measure the net effect of EBC on firm performance by removing unobserved heterogeneity such as differences in the quality of management and policy across industries.

5.2. Descriptive Statistics

Table 2 reports the sample descriptive statistics for corporate financial and market data in panel A and compensation data in panel B, during the sample period 2002-2013.

TABLE 2. Descriptive Statistics on Key Variables

Panel A: The table shows the summary statistics of corporate financial data and market data during 2002-2013. All variables are real valued variables, except for L.

| Variable | Mean | Q1 | Median | Q3 | Standard Deviation |
|---|--------|--------|--------|--------|--------------------|
| Tobin's q | 2.427 | 1.279 | 1.765 | 2.838 | 2.008 |
| ROA | 0.093 | 0.033 | 0.086 | 0.147 | 0.131 |
| K ('000,000) | 4,580 | 218 | 1,250 | 4,540 | 10,100 |
| L | 13859 | 1051 | 3610 | 12655 | 30000 |
| Debt to Equity ratio | 1.203 | 0.258 | 0.532 | 1.008 | 2.141 |
| Price to Earnings ratio | 15.796 | 12.358 | 17.290 | 23.086 | 78.889 |
| Std. of per. change in operating income | 1.062 | 0.164 | 0.350 | 1.035 | 2.068 |
| S&P/ASX200 Total Return | 0.098 | -0.064 | 0.129 | 0.276 | 0.184 |

Panel B: The table shows the summary statistics of compensation data for executives and KMP during 2002-2013. The proportion of EBC is the sum of values of equity-based compensation (EBC) divided by total compensation. All variables are real valued variables.

| (Unit: AUD) | | | | | |
|-----------------------------|------------|-----------|------------|------------|--------------------|
| Variable | Mean | Q1 | Median | Q3 | Standard Deviation |
| Total value of EBC | 4,220,431 | 520,462 | 1,785,782 | 5,212,183 | 6,424,685 |
| Total value of Compensation | 16,100,000 | 4,981,178 | 11,200,000 | 19,700,000 | 18,100,000 |
| Proportion of EBC | 0.209 | 0.090 | 0.179 | 0.303 | 0.193 |

In panel A of Table 2, the mean (median) market-based measure of firm performance, Tobin's q, is 2.427 (1.765). This can be compared to the accounting-based measure of performance, ROA. The mean (median) of ROA is 9.3 per cent (8.6 per cent) with an interquartile range of 11.4 per cent, suggesting substantial sample cross-sectional variability. I also compute the mean and standard deviation of other corporate financial data. The capital stock and labour are greatly skewed to the right where the mean is greater than median. The mean of price to earnings ratio is 15.796 with the standard deviation 78.889 and interquartile range 10.728 that indicate considerable sample variation of the ratio.

Panel B of Table 2 shows that executives and KMP received, on average, \$4,220,431 in equity-based compensation. Also, the average (median) for total compensation of executives and KMP is \$16.1 million (\$11.2 million). These variables are substantially skewed to the right. However, the skewness is mitigated when using proportion of EBC, with a mean of 0.209 and median of 0.179.

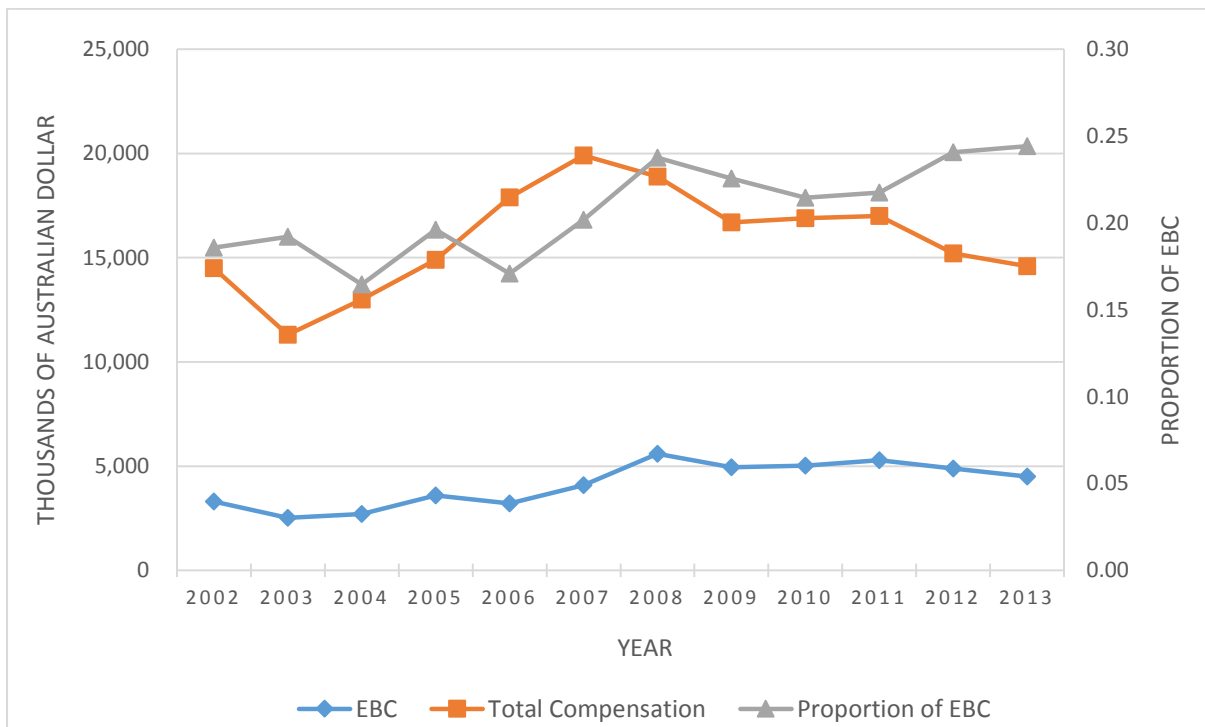


FIGURE 1. Mean of EBC, Total Compensation and Proportion of EBC for Executives and KMP during 2002-2013

Figure 1 displays the trend in EBC, total compensation and proportion of EBC for executives and KMP from 2002 to 2013. Over the 12 year period, the values, on average, have fluctuated. The mean of total compensation increases from \$14.5 million in 2002 to \$19.9 million in 2007 and then gradually decreases to \$14.6 million in 2013. Although the values of total compensation are similar in 2002 and 2013, the proportion of EBC (EBC/Total compensation) is much higher at 0.24 in 2013 than at 0.19 in 2002 because companies provide more equity-based incentives in 2013.

The proportion of EBC, on average, steadily decreases after the Global Financial Crisis (GFC) but rebounds from 0.21 in 2010 to 0.24 in 2013. Over the sample period, the proportion of EBC reaches a peak in 2013. Specifically, in 2003, 2008, 2012 and 2013, the proportion of EBC increases although total compensation decreases. This is because, EBC accounts for high proportion in total compensation during the periods.

5.3. Impact of EBC on Firm Performance

Table 3 reports the fixed effect OLS estimates of equation (2).⁵ I adjust for heteroskedasticity with robust standard errors.⁶ Table 3 shows the results of regressing Tobin's q on the EBC and control variables and the results of regressing ROA on the EBC and control variables. The proportion of EBC is the sum of values of equity-based compensation divided by total compensation.

TABLE 3. OLS Estimates – Firm Performance and EBC during 2002-2013

The table shows the results of a fixed-effects OLS regression with robust standard errors. The dependent variables are Tobin's q in Table 3.A and Return on Assets (ROA) in Table 3.B. The independent variables are the log of capital stock, the log of total number of employees, the proportion of EBC for executives and KMP, leverage, growth opportunities, business risk and S&P/ASX 200 total return. All models include industry fixed effects. I use contemporaneous EBC in columns (i) of Table 3. A and 3.B and use one-year lagged EBC in those of column (ii). Columns (iii) in Table 3.A and 3.B also show the distributed-lag regressions to examine the lagged effects of the proportion of EBC for executives and KMP with one-year lag.

⁵ I also test the relation between broad-based ESOP and firm performance. Appendix B reports the fixed effect OLS estimates of equation (2) with using broad-based ESOP dummy, instead of the proportion of EBC for executives and KMP.

⁶ In order to test for heteroskedasticity, OLS regressions for Tobin's q and ROA in equation (2) are performed respectively and then White's Test is implemented. The null hypothesis for the White's Test is homoskedasticity. In both empirical results for Tobin's q and ROA, heteroskedasticity appears since the null hypothesis is rejected at 1-percent significant level. The White's Test shows that P-value is 0.0000 for Tobin's q and 0.0014 for ROA. Therefore, I use robust standard errors.

| A. Dependent variable: <i>Tobin's q</i> | | | |
|---|------------------------|------------------------|------------------------|
| Independent Variable | Regression | | |
| | (i) | (ii) | (iii) |
| Intercept | 6.529*** (8.54) | 6.506*** (7.99) | 6.337*** (8.24) |
| ln K | - 0.149*** (- 3.37) | - 0.140*** (- 2.98) | - 0.139*** (- 3.13) |
| ln L | - 0.207*** (- 3.78) | - 0.217*** (- 3.88) | - 0.219*** (- 3.93) |
| EBC | 1.216*** (3.16) | | 0.996*** (3.12) |
| EBC ₋₁ | | 0.906** (2.28) | 0.535** (1.97) |
| Debt to Equity ratio | - 0.093*** (- 2.62) | - 0.087** (- 2.46) | - 0.089** (- 2.47) |
| Price Earnings ratio | - 0.002 (- 1.00) | - 0.002 (- 0.93) | - 0.002 (- 1.01) |
| Std. of per. change in operating income | 0.010 (0.34) | 0.004 (0.14) | 0.018 (0.58) |
| S&P/ASX200 Total Return | 1.578*** (4.98) | 1.511*** (4.55) | 1.682*** (5.19) |
| R^2 | 0.354 | 0.337 | 0.355 |
| Regression p -value | 0.000 | 0.000 | 0.000 |
| Number of Obs. | 618 | 612 | 594 |

| B. Dependent variable: <i>Return on Assets (ROA)</i> | | | |
|--|------------------------|------------------------|------------------------|
| Independent Variable | Regression | | |
| | (i) | (ii) | (iii) |
| Intercept | 0.298*** (5.76) | 0.290*** (5.45) | 0.286*** (5.33) |
| ln K | - 0.009*** (- 3.09) | - 0.009*** (- 0.27) | - 0.009*** (- 2.88) |
| ln L | - 0.001 (- 0.22) | - 0.001 (- 0.27) | - 0.001 (- 0.25) |
| EBC | 0.050*** (2.59) | | 0.038** (2.17) |
| EBC ₋₁ | | 0.046 (1.58) | 0.036 (1.29) |
| Debt to Equity ratio | - 0.005* (- 1.72) | - 0.005* (- 1.65) | - 0.005 (- 1.59) |
| Price Earnings ratio | 0.000* (1.71) | 0.000* (1.81) | 0.000* (1.72) |
| Std. of per. change in operating income | - 0.004 (- 1.40) | - 0.004 (- 1.44) | - 0.003 (- 1.21) |
| S&P/ASX200 Total Return | 0.076*** (3.19) | 0.075*** (3.15) | 0.079*** (3.26) |
| R^2 | 0.117 | 0.113 | 0.112 |
| Regression p -value | 0.000 | 0.000 | 0.000 |
| Number of Obs. | 613 | 607 | 589 |

Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. T-statistics are in parentheses.

Column (i) in Table 3 shows that the coefficient on the proportion of EBC for executives and KMP is positive and statistically significant at the 1-percent level when lags are not included. The estimated coefficient on EBC, 1.216, means that a one percentage point increase in the proportion of EBC leads to a 1.216 percentage point increase in Tobin's q. The finding indicates that aligning interests between shareholders and executives/KMP are more likely to improve the firm performance. The increase in the Tobin's q with the EBC would reflect both immediate increase in cash flow and long-term improvements, such as an expanding investment opportunity set and growth opportunities.

It is important to measure the continuing impacts of having the EBC in previous years in addition to the current impact. The effects of EBC on Tobin's q are not expected to be only contemporaneous. In other words, the effects can occur over time rather than all at once. This may be because, interests between shareholders and executives/KMP are highly unlikely to be closer aligned immediately, with the introduction of EBC. The impact of EBC on employee motivation and participation is also expected to take a while. The preceding effects of EBC would be inaccurately measured if the intervening lags are omitted. Therefore, I use one-year lagged EBC rather than contemporaneous EBC. Also, I use a distributed-lag model that includes the current values of EBC and the one-year lagged values of EBC.⁷

Column (ii) in Table 3.A shows that the lagged impact of the proportion of EBC on the firm performance. I regress Tobin's q on one-year lagged EBC and other control variables without contemporaneous EBC to alleviate simultaneity bias. One-year lagged EBC has statistically positive impact on Tobin's q, similar to contemporaneous EBC.

⁷ I also use a distributed-lag model including the current values of EBC and the four lagged values of EBC (EBC_{-1} , EBC_{-2} , EBC_{-3} and EBC_{-4}) for Tobin's q, although not reported here. The estimated coefficient on EBC is only positive and statistically significant at the 1-percent level. The estimated coefficient on EBC_{-1} , EBC_{-2} , EBC_{-3} and EBC_{-4} are statistically insignificant even at the 10-percent level. Also, the lagged variables of EBC are jointly insignificant under the Wald test.

Column (iii) in Table 3.A shows that joint significance of current and one-year lagged EBC on the firm performance. The estimated coefficient on EBC and EBC_{-1} are positive and statistically significant at the 1-percent level and at 5-percent level, respectively. I use a Wald test to test the joint significance of these two variables. The computed F-statistic's p-value is 0.0008 which is lower than the 1-percent significance level. The result means that the null hypothesis is rejected and these two variables are jointly significant for the firm's performance. Also, the values of the estimated coefficients on the current values of EBC decrease when the lagged effects introduce. However, total impact of EBC on Tobin's q with the lagged value is greater than without lag. According to Table 3.A, the use of contemporaneous and lagged EBC has unambiguously positive impacts on Tobin's q.

Table 3.B report results of estimations where ROA is the dependent variable. The estimated coefficients on EBC are positive and statistically significant at the 1-percent level when lags are not included. I also include one-year lagged values of EBC and re-estimate the OLS regressions.⁸ One of notable finding using ROA is that the lagged variables of EBC in columns (ii) and (iii) of Table 3.B have no impacts on ROA – in other words, the one-year lagged values of EBC are still positive but insignificant when using ROA. An important similarity between Tobin's q and ROA in Table 3 is that the current year value of EBC has the greatest impact on the current year firm performance. Also, I conduct the Wald test for ROA and then the test shows that the current and past year of EBC are jointly significant, similar to Tobin's q.

The effects of other control variables are mostly consistent between Tobin's q and ROA in terms of signs and statistical significance of estimated coefficients, regardless of whether the lagged variables of EBC are included. The capital stock and labour have negative impacts on

⁸ I also use a distributed-lag model including the current values of EBC and the four lagged values of EBC (EBC_{-1} , EBC_{-2} , EBC_{-3} and EBC_{-4}) for ROA, although not reported here. The lagged variables of EBC with up to three-year are still positive but insignificant when using ROA. The estimated coefficient on EBC_{-4} is negative and insignificant. Also, the lagged variables of EBC are jointly insignificant, similar to Tobin's q.

both Tobin's q and ROA although the impact of labour on ROA is statistically insignificant. Also, leverage, proxied by the debt to equity ratio, is negatively related to both Tobin's q and ROA. The total return of S&P/ASX 200 has a positive impact on both measures of firm performance at the 1-percent significance level.

5.4. Impact of 2009 Employee Share Schemes Change on EBC and Determinants of the EBC

I modify Equation (2) to test how the Employee Share Scheme change in 2009 impacts on the proportion of EBC, and what the determinants of the EBC are. The proportion of EBC is the sum of values of equity-based compensation divided by total compensation. I specify the following equation (3):

$$EBC_{it} = \beta_Q Q_{it-1} + \beta_K \ln K_{it-1} + \beta_L \ln L_{it-1} + \beta_C X_{it-1} + \alpha_i + \tau_{2009} + \varepsilon_{it} \quad (3)$$

The proportion of current use of EBC is regressed on the one-year lagged variables of firm performance, capital stock, labour, proxies for leverage, growth opportunities, business risk and S&P/ASX 200 total return, and industry fixed effects. I also include a year 2009 dummy variable to indicate the time when the policy changes. Years before 2009 have a value of 0 and 1 otherwise. Table 4 reports the OLS estimates of equation (3).

TABLE 4. OLS Estimates – Impact of 2009 Employee Share Schemes Change on EBC

The table shows the results of a fixed-effects OLS regression with robust standard errors. The dependent variables are the proportion of EBC for executives and KMP. All independent variables are one-year lagged variables: either Tobin's q or Return on Assets (ROA), the log of capital stock, the log of total number of employees, leverage, growth opportunities, business risk and S&P/ASX 200 total return. Also, I include year 2009 dummy variable where years before 2009 have a value of 0 and 1 otherwise. All models include industry fixed effects. One-year lagged values of Tobin's q are used as the measure of firm performance in columns (i), and those of ROA used in columns (ii).

| Dependent variable: <i>Proportion of EBC</i> | | |
|---|------------------------|------------------------|
| Independent Variable | Performance Measure: | Performance Measure: |
| | <i>Tobin's q</i> | <i>ROA</i> |
| | (i) | (ii) |
| Intercept | - 0.333*** (- 4.51) | - 0.279*** (- 4.10) |
| Performance Measure ₋₁ | 0.016*** (4.38) | 0.161*** (2.70) |
| ln K ₋₁ | 0.020*** (5.73) | 0.019*** (5.61) |
| ln L ₋₁ | 0.009** (2.10) | 0.006 (1.42) |
| Debt to Equity ratio ₋₁ | 0.016*** (3.07) | 0.015*** (2.91) |
| Price to Earnings ratio ₋₁ | 0.000 (1.55) | 0.000 (1.40) |
| Std. of per. change in operating income ₋₁ | - 0.001 (- 0.30) | - 0.001 (- 0.24) |
| S&P/ ASX200 Total Return ₋₁ | 0.065 (1.46) | 0.072 (1.57) |
| Year 2009 Dummy | 0.053*** (3.32) | 0.049*** (3.02) |
| R^2 | 0.189 | 0.180 |
| Regression p -value | 0.000 | 0.000 |
| Number of Obs. | 610 | 607 |

Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. T-statistics are in parentheses.

Firstly, the results of OLS estimates show the impact of the 2009 policy change on EBC. For both Tobin's q and ROA, companies are more likely to offer EBC to their executives and KMP after the change in policy. The estimated coefficients on the year 2009 dummy are positive and statistically significant at the 1-percent level. Many Australian studies report that the 2009 legislation reform led the companies to decrease employee equity plans due to unfavourable change in taxation treatment of the plans (Brown *et al.* 2012; Landau *et al.* 2013; Employee

Ownership Australia and New Zealand 2014). The tax change in 2009 significantly decreases the popularity of share option plans because the option is taxed at grant or vesting, rather than at exercise. The participants in the option plans have to pay tax before they realise any gain. Also, they face the possibility of paying tax that is greater than the tax on the difference between the market value of shares at exercise and the exercise price. However, performance rights and restricted shares are the dominant equity incentive plans for executives and KMP in Australia. The unfavourable option plan increased preferences for performance rights and restricted shares. The rights and restricted shares carry no risk of having tax payable on grant or vesting of options. Some multinational companies also have extended their global option plans in spite of the punitive tax treatment on the option plans. Therefore, the 2009 policy reform has a positive impact on the EBC for the executives and KMP. Landau et al. (2013) report that the legislation change is still more advantageous for executives and KMP than other employees who participate in broad-based ESOP.

I also use the OLS estimates in Table 4 to examine the determinants of EBC. The estimated coefficients on the one-year lagged values of performance measures are positive and statistically significant at the 1-percent level. The higher values of past Tobin's q and past ROA have positive impacts on the use of EBC and greater use of EBC has positive impacts on the current values of Tobin's q and ROA. The results from the previous year of performance measures are consistent with several international studies for performance-related pay. The international studies support the importance of lagged performance on the EBC. Buck et al. (2008) observe the statistically significant relationship between Chinese top executives' compensation and past firm performance by using all four different measures of performance. Merhebi et al. (2006) find that changes in current compensation of Australian CEO are increased by changes in both current and lagged firm performance. They also show that one-year lagged performance has greater impacts on the CEO compensation than current

performance. Zhou (2000) also finds that an increase in executive compensation of Canadian firms is linked to current and past shareholder wealth, and the result is largely similar to previous U.S. studies.

The log of one-year lagged capital stock is positive and statistically significant for both Tobin's q and ROA. The log of one-year lagged total number of employees is also positively related to the use of EBC for both performance measures although it is statistically insignificant for ROA. The capital stock and labour can be considered as proxy for firm size. Prior research supports the positive relationship between the firm size and the EBC (Core and Guay 2001 and Ittner et al. 2003). For both Tobin's q and ROA, the higher values of one-year lagged debt to equity ratio are related to the higher use of EBC. The result is consistent with Bryan et al. (2000). They find a positive relation between CEO restricted stock awards and firm leverage. Core and Guay (2001) also show that stock option compensation of non-executive employees is positively related to the firm leverage. The impact of past growth opportunities, past business risk and past total return on the EBC is ambiguous because of statistical insignificance in the OLS estimates.

5.5 Impacts of 2009 Employee Share Schemes Change on Firm Performance

Equation (2) is modified to test how the Employee Share Scheme change in 2009 impacts on the firm performance. It is specified by following equation (4):

$$Q_{it} = \beta_K \ln K_{it} + \beta_L \ln L_i + \beta_E EBC_{it} + \beta_C X_i + \alpha_i + \tau_{2009} + \beta_D (EBC_{it} * \tau_{2009}) + \varepsilon_{it} \quad (4)$$

I use the Difference in Differences (DID) estimator as a tool to test the effects of the policy change. As can be seen from equation (4), I create an interaction term between the proportion of EBC and the year 2009 dummy variable.

Table 5 reports the OLS estimates of equation (4) by using the DID estimation.

TABLE 5. OLS Estimates – Impacts of 2009 Employee Share Schemes Change on Firm Performance during 2002-2013

The table shows the results of a fixed-effects OLS regression with robust standard errors. I use Difference in Differences (DID) estimation to test the impacts of 2009 policy reform on firm performance. The dependent variables are Tobin's q and Return on Assets (ROA). The independent variables are the log of capital stock, the log of total number of employees, the proportion of EBC for executives and KMP, leverage, growth opportunities, business risk and S&P/ASX 200 total return. Also, I include year 2009 dummy variable that years before 2009 have a value of 0 and 1 otherwise, and an interaction term between EBC and year 2009 dummy variable. All models include industry fixed effects.

| Independent Variable | Dependent variable: | Dependent variable: |
|---|------------------------|------------------------|
| | <i>Tobin's q</i> | <i>ROA</i> |
| | (i) | (iii) |
| Intercept | 7.015*** (9.87) | 0.316*** (6.49) |
| ln K | - 0.151*** (- 3.74) | - 0.009*** (- 3.22) |
| ln L | - 0.199*** (- 3.95) | - 0.000 (- 0.10) |
| EBC | 0.773* (1.78) | 0.044** (2.13) |
| Debt to Equity ratio | - 0.122*** (- 3.45) | - 0.006** (- 2.00) |
| Price Earnings ratio | - 0.002 (- 1.03) | 0.000* (1.80) |
| Std. of per. change in operating income | - 0.019 (- 0.64) | - 0.005* (- 1.84) |
| S&P/ASX200 Total Return | 0.940*** (2.86) | 0.043* (1.83) |
| 2009 Year Dummy | - 1.078*** (- 5.90) | - 0.045*** (- 3.36) |
| EBC * 2009 Year Dummy | 1.602*** (2.78) | 0.034 (0.80) |
| R^2 | 0.393 | 0.147 |
| Regression p -value | 0.000 | 0.000 |
| Number of Obs. | 618 | 613 |

Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. T-statistics are in parentheses.

The estimated coefficients on the year 2009 dummy are negative and statistically significant at the 1-percent level for both firm performance measures. On average, companies experienced

below-sample-average performance in 2009, probably because of turbulent economic conditions during the Global Financial Crisis (GFC).

The coefficient on the interaction variable captures how the 2009 policy change affects firm performance, among the companies offering the EBC. According to column (i) in Table 5, the coefficient on the interaction between the indicator for 2009 when the legislation reform occurred and the level of EBC is positive for Tobin's q at the 1-percent level. The result corresponds with results from regressions reported in Table 4. I conclude that the increase in EBC encouraged by the policy change helps the executives and KMP to align their interests with shareholders, and therefore, it has a positive impact on the Tobin's q. However, the coefficient on the interaction in the ROA equation is positive but insignificant. This may be because, market values of equity responds more quickly to changes in incentives to executives than net income.

The coefficients on the EBC for Tobin's q and ROA are positive and statistically significant at the 10-percent level and at the 5-percent level, respectively, showing that offering more EBC leads to the higher firm performance, confirming results reported in Table 3. In other words, the coefficients on EBC for both Tobin's q and ROA are still positive and statistically significant after including the year 2009 dummy and the interaction term.

5.6. IV estimates – Firm performance and EBC during 2002-2013

I conduct Instrumental Variables (IV) estimation of equation (2) to control for potential endogeneity for explanatory variables, capital, labour and proportion of EBC. The proportion of EBC is the sum of values of equity-based compensation divided by total compensation.

TABLE 6. IV Estimates – Firm Performance and EBC during 2002-2013

These tables show the results of a fixed-effects IV regression with robust standard errors. The dependent variables are Tobin's q and Return on Assets (ROA). The variables of ln K, ln L and proportion of EBC are instrumented by using the first lags of the ln K and ln L, the log of net sales, the log of total assets, the year 2009 dummy and the first lag of proportion of EBC. All models include industry fixed effects.

| Independent Variable | Dependent variable: | Dependent variable: |
|---|------------------------|------------------------|
| | <i>Tobin's q</i> | <i>ROA</i> |
| | (i) | (ii) |
| Intercept | 6.907*** (7.56) | 0.352*** (5.47) |
| ln K | - 0.173*** (- 3.09) | - 0.014*** (- 3.17) |
| ln L | - 0.242*** (- 4.01) | - 0.000 (- 0.11) |
| EBC | 2.940** (2.50) | 0.214** (2.06) |
| Debt to Equity ratio | - 0.100*** (- 2.65) | - 0.006* (- 1.78) |
| Price Earnings ratio | - 0.002 (- 1.04) | 0.000 (1.51) |
| Std. of per. change in operating income | 0.033 (1.03) | - 0.002 (- 0.67) |
| S&P/ASX200 Total Return | 1.763*** (5.02) | 0.085*** (3.32) |
| R^2 | 0.319 | 0.046 |
| Regression p -value | 0.000 | 0.000 |
| Number of Obs. | 590 | 585 |
| Shea's partial R^2 : | | |
| ln K | 0.645 | 0.646 |
| ln L | 0.869 | 0.870 |
| EBC | 0.058 | 0.058 |
| Exogeneity Test (p-value): | | |
| Wooldridge's score test | 0.013** | 0.279 |
| Regression F-test | 0.022** | 0.403 |

Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. T-statistics are in parentheses.

Table 6 includes the following predetermined instruments: the first lags of ln K and ln L, the log of net sales, the log of total assets, the year 2009 time dummy and the first lag of the proportion of EBC. Based on the empirical model of Jones and Kato (1995), Barnhart and Rosenstein (1998) and Bond and Söderbom (2005), I construct the instruments based on the

internal pre-determined regressors.⁹ The values of net sales and total assets are also deflated by PPI. I also adjust for heteroskedasticity using robust standard errors.

The values, signs and statistical significances of estimated coefficients in the IV estimates are not very different from the OLS estimates in columns (i) and (iii) of Table 3. I focus on the estimated coefficient on the EBC to examine the impact on the firm performance.

The IV estimates in columns (i) of Table 6 show that the estimated size of Tobin's q gains from one unit increase in the proportion of EBC is about twice as large than the OLS estimates. The positive effect of current EBC on Tobin's q is supported by both OLS and IV estimates. The key result of IV estimates for ROA is consistent with that of Tobin's q. According to columns (i) of Table 3.B and (ii) of Table 6, the estimated coefficients on the proportion of current EBC are 0.05 in the OLS estimates and 0.214 in the IV estimates, respectively. Both OLS and IV estimates support that the EBC has positive effects on ROA at the 1-percent and at the 5-percent significance level, respectively.

In order to check whether the IV estimates are a more appropriate measure than the OLS estimates, checking for the instrument relevance and instrument exogeneity are essential.

I check for instrument relevance by testing for weak instruments. The weak instrument problem appears when the instruments are less likely to explain the variation in the variables of $\ln K$, $\ln L$ and proportion of EBC. I test for weak instruments with Shea's partial R-squared rather than the first-stage F-statistic since there are multiple endogenous regressors (Baum 2006). A simple rule of thumb is that the instruments lack sufficient relevance (that is, this indicates the weak instruments) if the Shea's partial R-squared are low. As can be seen in Table 6, I find high values of the estimated Shea's partial R-squared for $\ln K$ and $\ln L$ both Tobin's q and ROA.

⁹ Lagged independent control variables (one-year lagged variables of $\ln K$, $\ln L$ and EBC) are treated as predetermined variables, not strictly exogenous. I test serial correlation whether the predetermined variables are uncorrelated with current disturbance term, by using a test described by Wooldridge (2012 p. 420). From the test, I fail to reject the null hypothesis that there is no serial correlation at any reasonable significance level for both Tobin's q and ROA. Therefore, I use the lagged independent control variables as instruments.

However, the estimated Shea's partial R-squared for EBC is low with the predetermined instruments, because of limitations in data collection. It is difficult to find other instruments for EBC because each firm has different equity based incentive schemes. Also, some companies provide significant details on their employee share ownership schemes while other companies only provide basic information of the schemes. Therefore, the instrument relevance condition in the IV estimates is considered as to be satisfied for both Tobin's q and ROA.

I also test whether any regressors (ln K, ln L and proportion of EBC) are exogenous. If the test statistic is significant, at least one variable of ln K, ln L and proportion of EBC is considered as endogenous. According to columns (i) of Table 6, Wooldridge's score test and regression-based F-test do reject the null hypothesis at the 5-percent level. It indicates that the OLS estimates for Tobin's q would not be consistent since there are endogenous regressors. I also test for exogeneity in the ROA regressions. Both Wooldridge's score test and regression-based F-test applied to the regression in column (ii) of Table 6 fail to reject the null hypothesis at any reasonable significance level. The IV estimates are still consistent although the variables of ln K, ln L and proportion of EBC are exogenous. However, the OLS estimates are preferred since it is more efficient than the IV estimates for ROA.

6. CONCLUSION

Many existing studies focus on broad-based ESOP and fail to differ between broad and narrow-based ESOP. Especially, this study focuses on the narrow-based ESOP for executives and KMP by constructing a dataset of top 200 companies on the Australian Securities Exchange (ASX) during 2002-2013. I provide empirical evidence of how EBC impacts on firm performance and

how EBC tax legislation reform impacts on the use of EBC and firm performance. In order to show these relationships, I report four fixed-effects regression models. The relationships exist in my empirical study but the results differ according to the performance measures used. The firm performance is proxied by market-based measure of Tobin's q and accounting-based measure of ROA.

The first OLS regression model for impact of EBC on firm performance show that the use of EBC for executives and KMP is positively related to both Tobin's q and ROA when lags are not included. I also include one-year lag of EBC and find a significant positive relation between the lagged EBC and Tobin's q. However, the lagged variables of EBC have no impacts on ROA.

In addition, my second OLS regression model tests how 2009 employee share schemes change, especially tax legislation change, on EBC. Based on many Australian studies (Brown *et al.* 2012; Landau *et al.* 2013; Employee Ownership Australia and New Zealand 2014), the 2009 legislation reform was expected to decrease the use of EBC because share options are taxed at grant or vesting, rather than at exercise. However, the year 2009 dummy variable that captures the policy changes is positively related to the use of EBC for both Tobin's q and ROA. Therefore, I find that the 2009 tax reform has a favourable impact on the narrow-based EBC plans for executives and KMP. This would be because, the unfavourable option plans increases preferences for performance rights and restricted shares that are the dominant plans for executives and KMP in Australia. From the regression, I also investigate whether better firm performance has a positive impact on the use of EBC. The results are same for both Tobin's q and ROA, in that, higher levels of previous Tobin's q and ROA increases the current year of EBC.

I also find a positive relationship between 2009 policy reform and Tobin's q. An increase in the use of EBC by the policy reform leads firms to expect higher levels of Tobin's q. However, there is no significant relation between the policy change and ROA because accounting values of equity may respond relatively slowly to changes in equity incentives. The higher levels of EBC are still expected to lead the higher firm performance after including an interaction term between the year 2009 policy reform and the proportion of EBC.

Besides the OLS estimates, I construct IV estimates to control for potential endogeneity of explanatory variables, capital, labour and EBC. The results of IV estimates are consistent with those of OLS estimates. Under the IV regression models, the use of EBC for executives and KMP is still positively related to both Tobin's q and ROA. However, the IV estimates are consistent for Tobin's q and ROA but are inefficient for ROA.

Overall, the main findings of this study show that the EBC for executives and KMP can be an effective business strategy because it is likely to lead better firm performance.

Despite of positive impacts of EBC on firm performance and productivity, the participation rate in the EBC plan remains lower in Australia than the U.S. and the U.K. I think possible areas for future research include why the rate is relatively lower in Australia compared to other countries. One of reasons for lower participation in EBC for executives and KMP would be strict regulation to prevent abuse of equity-based incentives for tax avoidance purpose. Also, risk-averse employees would be likely to avoid to receiving company shares. This is because, their income and gain on company shares are aligned with company's wealth. If the company experiences a downturn in their operation, employees would suffer from a decrease in their income and lower return on company shares.

APPENDIX A.

Details of Data for Return on Assets (ROA) in *Datastream*

(*Datastream* code WC08326)

Annual Time Series

Industrials:

$$\frac{\text{Net income} - \text{Bottom line} + ((\text{Interest exp. on debt} - \text{Interest capitalised}) * (1 - \text{Tax rate}))}{\text{Average of Last year's and Current year's Total assets} * 100}$$

Banks:

$$\frac{\text{Net income} - \text{Bottom line} + ((\text{Interest exp. on debt} - \text{Interest capitalised}) * (1 - \text{Tax rate}))}{\text{Average of Last year's (Total assets} - \text{Customer liabilities on Acceptances)} \\ \text{and Current year's (Total assets} - \text{Customer liabilities on Acceptances)} * 100}$$

Note: Customer liabilities on Acceptances only subtracted when included in Total assets

Insurance Companies:

$$\frac{(\text{Net income} - \text{Bottom line} + ((\text{Interest exp. on debt} - \text{Interest capitalised}) * (1 - \text{Tax rate}))) \\ + \text{Policyholders' Surplus}}{\text{Average of Last year's and Current year's Total assets} * 100}$$

Other Financial Companies:

$$\frac{\text{Net income} - \text{Bottom line} + ((\text{Interest exp. on debt} - \text{Interest capitalised}) * (1 - \text{Tax rate}))}{\text{Average of Last year's (Total Assets} - \text{Custody Securites)} \\ \text{and Current year's (Total assets} - \text{Custody Securites)} * 100}$$

Interim Time Series

All industries:

$$\frac{((\text{Trailing 12 months Net profit} + (\text{Trailing 12 months Interest exp. on debt} \\ * (1 - \text{Tax rate}/100))))}{\text{Average of Last year's and Current year's Total assets} * 100}$$

APPENDIX B.

Besides models related to EBC for executives and KMP, I test how broad-based ESOP impacts on firm performance. I create an ESOP dummy variable that takes on a value of 1 if the company provides EBC to all eligible employees and 0 otherwise. This is because, there are insufficient data for details of broad-based ESOP in each company's annual financial report. I also adjust for heteroscedasticity with robust standard errors. Following Table 7 reports the results of regressing Tobin's q and ROA on the broad-based ESOP dummy, respectively.

TABLE 7. OLS Estimates – Firm Performance and Broad-based ESOP during 2002-2013

The table shows the results of a fixed-effects OLS regression with robust standard errors. The dependent variables are Tobin's q and Return on Assets (ROA). The independent variables are the log of capital stock, the log of total number of employees, broad-based ESOP dummy, leverage, growth opportunities, business risk and S&P/ASX 200 total return. All models include industry fixed effects.

| Independent Variable | Dependent variable: | Dependent variable: |
|---|------------------------|------------------------|
| | <i>Tobin's q</i> | <i>ROA</i> |
| | (i) | (iii) |
| Intercept | 6.531*** (8.22) | 0.286*** (5.75) |
| ln K | - 0.153*** (- 3.24) | - 0.008*** (- 2.92) |
| ln L | - 0.184*** (- 3.33) | - 0.002 (- 0.55) |
| Broad-based ESOP | 0.191 (1.13) | 0.025* (1.85) |
| Debt to Equity ratio | - 0.091*** (- 2.62) | - 0.005* (- 1.82) |
| Price Earnings ratio | - 0.002 (- 0.92) | 0.000 (1.61) |
| Std. of per. change in operating income | - 0.033 (- 1.07) | - 0.004* (- 1.89) |
| S&P/ASX200 Total Return | 1.304*** (4.05) | 0.070*** (3.04) |
| R^2 | 0.327 | 0.117 |
| Regression <i>p</i> -value | 0.000 | 0.000 |
| Number of Obs. | 655 | 650 |

Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. T-statistics are in parentheses.

Column (i) in Table 7 shows that the coefficient on the broad-based ESOP dummy for Tobin's q is positive but statistically insignificant at any reasonable significance level. In contrast, the broad-based ESOP dummy has positive and statistically significant impacts on ROA. However,

the dummy variable would be likely to fail to capture an accurate relation between the use of broad-based ESOP and firm performance, because it only takes values of 0 and 1.

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