

The Changes of Bank Efficiency and the Reason of the Changes

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Abstract

In the recent year, the banks in Australia developing in a high speed. There are lots of changes happened on Australian bank, especially, the efficiency of bank. The bank efficiency is a key point of bank development. This report will analysis the changes of bank efficiency from there aspects: technical efficiency, cost efficiency and profit efficiency. The main reasons of bank efficiency changes are that scale inefficiency; the ability of transforming; the increase of per capital income; economics of scope; the increase amount of financial services; the development of new financial products and the wildy use of electronic commerce. What is more, the report also mentions the relationship between bank efficiency and stock return. Using the financial leverage ratio model to explain that bank efficiency has the positive effect on stock return of the bank.

1. Introduction

For all kinds of business, one of the most fundamental concern is efficiency, especially, financial institutions. To common assumption, the increase in efficiency means better financial performance, so that bank efficiency is an important part of the development of bank. Over the past decade, financial market has the significant change as a result of globalization and deregulation in Australia. The result of bank efficiency suggests that technical efficiency, cost efficiency and profit efficiency of bank in Australia have raised over the 1985 to 2008. The analysis of stock return of bank suggest that the improvement of bank efficiency contribute to the market value of bank, thus, the maximizing bank efficiency could be considered as the maximization of shareholders' wealth in the Australian context. The report seeks to explain the changes of bank efficiency from three parts: technical efficiency, cost efficiency and profit efficiency. Moreover, it pays attention on the reasons of those changes. In addition, the report also focusses on the influence of bank efficiency on bank stock return. The report includes two kinds of bank: big-four banks and regional banks. The big-four banks in Australia are Australia and New Zealand Banking Group (ANZ), Commonwealth Bank of Australia (CBA), National Australia Bank (NAB) and Westpac Banking Corp (WBC). The regional banks are the Bendigo Bank (BEN), Adelaide Bank (ADB), Suncorp-Met way Group (SUN), St. George Bank (SGS) and Macquarie Group (MQG).

2. Bank Efficiency Score

Over the likelihood ratio test, with a statistical significant level of 1%, 5% and 10%, respectively, the efficiency score: technical model is 64.3%; cost efficiency model is 61.8%; profit efficiency model is 28%. (Shamsuddin and Xiang, 2012, pp. 3569) The effect of time trend on an efficiency frontier is assessed by technical function, cost function and profit function. From 1985 to 2008, the average efficiency score of technical efficiency and profit efficiency was keeping raised for all banks, while cost efficiency suffers some fluctuation.

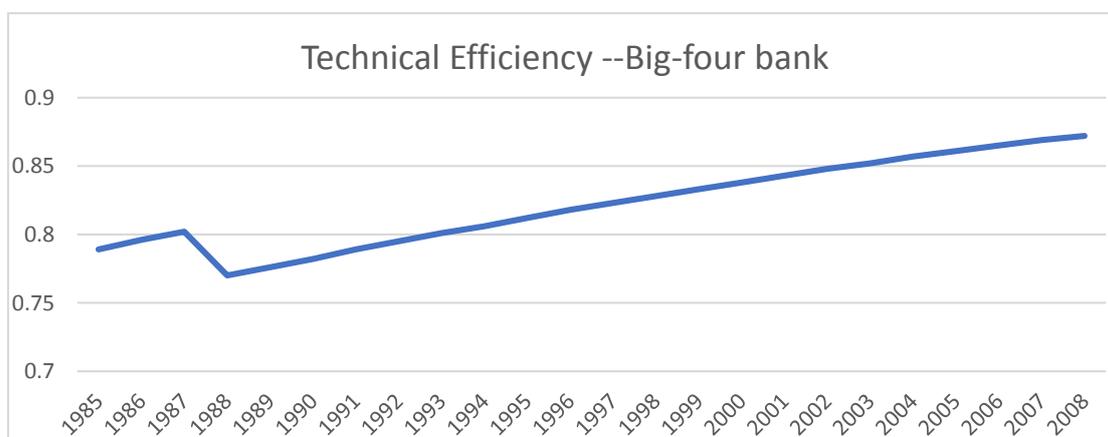
Year	Large banks			Small banks			All banks		
	TE	Cost efficiency	Profit efficiency	TE	Cost efficiency	Profit efficiency	TE	Cost efficiency	Profit efficiency
1985	0.789						0.789		
1986	0.796						0.796		
1987	0.802						0.802		
1988	0.770	0.933	0.773				0.770	0.933	0.773
1989	0.776	0.934	0.796	0.931			0.807	0.934	0.796
1990	0.782	0.935	0.817	0.934			0.812	0.935	0.817
1991	0.789	0.937	0.836	0.898			0.825	0.937	0.836
1992	0.795	0.938	0.853	0.901			0.830	0.938	0.853
1993	0.801	0.939	0.869	0.904	0.899	0.943	0.835	0.931	0.884
1994	0.806	0.940	0.884	0.930	0.868	0.906	0.860	0.909	0.893
1995	0.812	0.941	0.897	0.866	0.856	0.898	0.844	0.890	0.898
1996	0.818	0.942	0.908	0.870	0.858	0.910	0.849	0.892	0.909
1997	0.823	0.944	0.919	0.873	0.861	0.920	0.853	0.894	0.920
1998	0.828	0.945	0.928	0.877	0.863	0.929	0.858	0.896	0.929
1999	0.833	0.946	0.936	0.881	0.866	0.938	0.862	0.898	0.937
2000	0.838	0.947	0.944	0.884	0.868	0.945	0.866	0.900	0.945
2001	0.843	0.948	0.950	0.888	0.871	0.951	0.870	0.902	0.951
2002	0.848	0.949	0.956	0.891	0.873	0.957	0.874	0.903	0.957
2003	0.852	0.950	0.961	0.894	0.876	0.962	0.877	0.905	0.962
2004	0.857	0.951	0.966	0.897	0.878	0.967	0.881	0.907	0.967
2005	0.861	0.952	0.970	0.900	0.880	0.971	0.885	0.909	0.971
2006	0.865	0.953	0.974	0.903	0.882	0.974	0.888	0.910	0.974
2007	0.869	0.954	0.977	0.906	0.885	0.977	0.891	0.912	0.977
2008	0.873	0.955	0.980	0.845	0.881	0.973	0.861	0.923	0.977
Mean	0.822	0.944	0.909	0.894	0.873	0.945	0.845	0.912	0.911
AEC	0.006	0.001	0.010	0.003	0.002	0.007	0.004	0.002	0.008

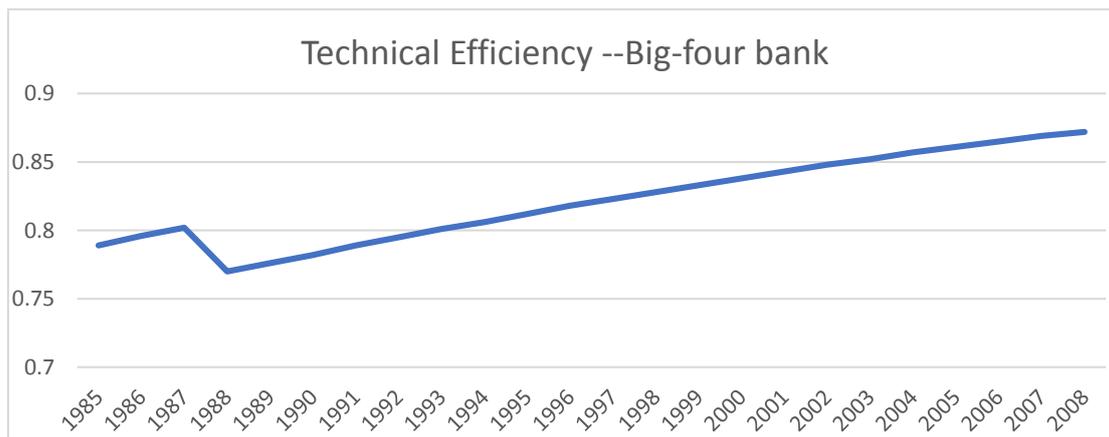
Note: AEC, Average Efficiency Change.

3. Technical Efficiency

3.1. The Changes of Bank Technical Efficiency

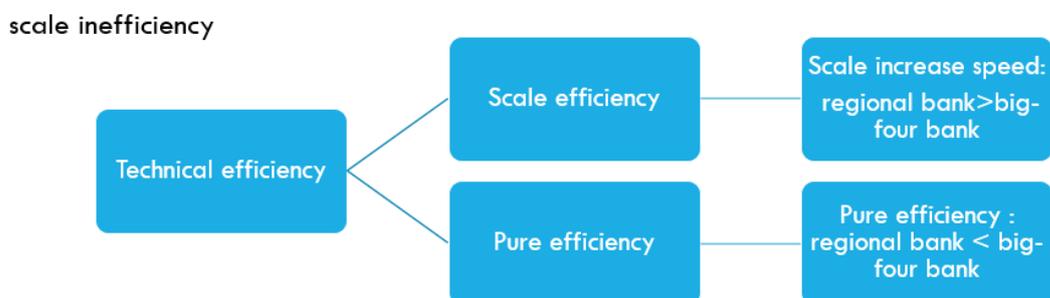
The average score of technical efficiency is 84.5% over the period 1985 to 2008. The big-four banks' average technical efficiency score is 82.2% and the regional banks' average technical efficiency score is 89.4%. The trend of big-four banks and regional banks are quite different. From 1985 to 2008, the technical efficiency score of big-four banks increased from 78.9% to 87.3% and it of regional banks decreased from 93.1% to 84.5%. (Paul and Kourouche, 2008, PP. 267)

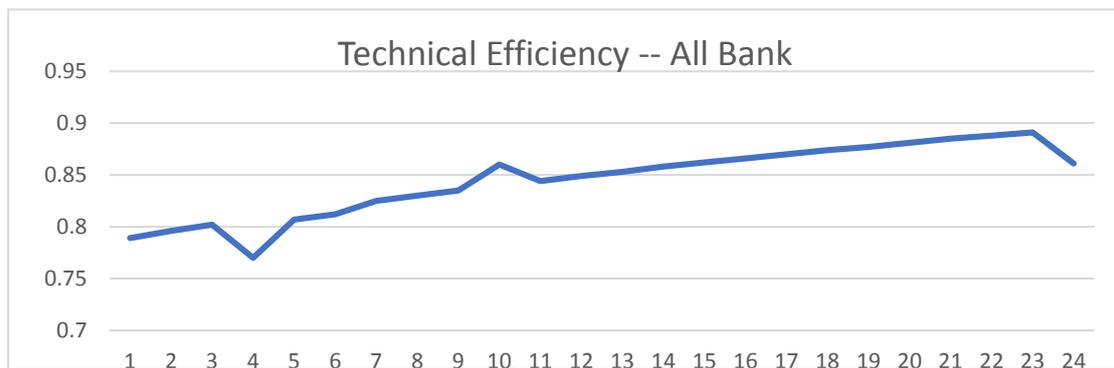
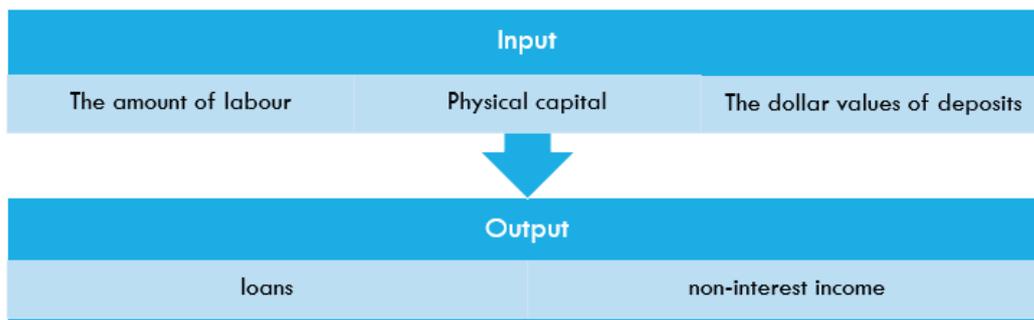




3.2. The Reason of Bank Technical Efficiency Change

There are 3 reasons lead to the changes of Australia bank technical efficiency: scale inefficiency, transforming ability and per capita income (PCI). Firstly, scale inefficiency is the main reason of bank technical efficiency change. The technical efficiency could be divided into 2 parts: pure technical efficiency and scale efficiency. Kirkwood & Nahm (2006, pp. 254) hold the view that the main contributor of the change on technical efficiency is scale efficiency. In the past decade, the scale regional bank in Australia have a higher increase speed than big-four banks. Moreover, the development of big-four banks also has lower scale efficiency and higher pure technical efficiency. So that it explains that technical efficiency shows a decline trend on regional bank and an increase trend on big-four banks. On the other hand, the ability of transforming input into output is also the main reason of the change of bank technical efficiency. The input of banks includes the amount of labor (STF), the dollar values of deposits and other borrowings (DEP) and physical capital (PHC). The output of the banks is loans (LOA) and non-interest income(NII). Xiang et al (2015, pp. 331) suggest that compared with big-four banks, the regional banks have the better ability in transforming the input to output. So that the regional banks always have a higher technical efficiency score than big-four banks from 1985 to 2008. In addition, per capita income (PCI) has the significant influence on technical efficiency. Xiang et al (2015, pp. 332) have found that with a competitive pricing mechanism, Australia as a country have a high PCI. The PCI have the positive effect on bank efficiency. Thus, the average technical efficiency in Australia is higher than the result of the likelihood ratio test.

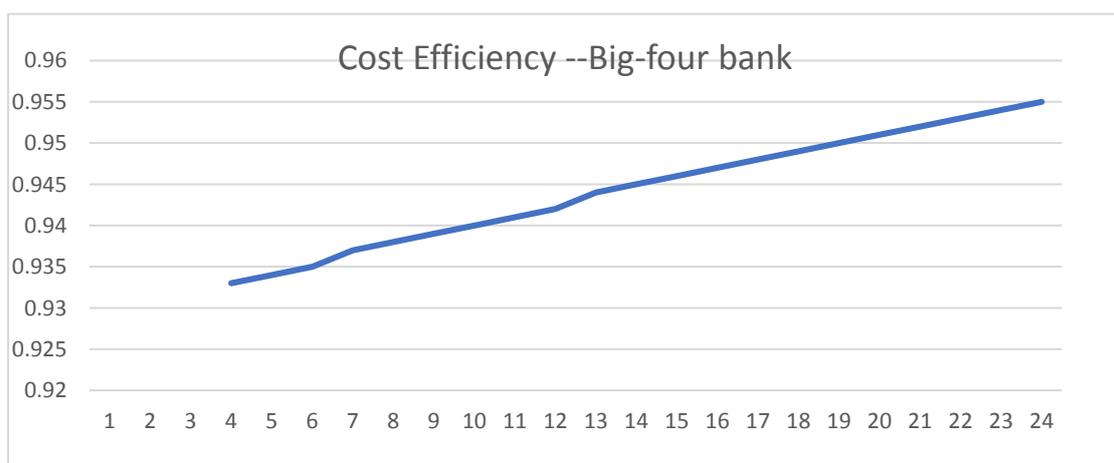


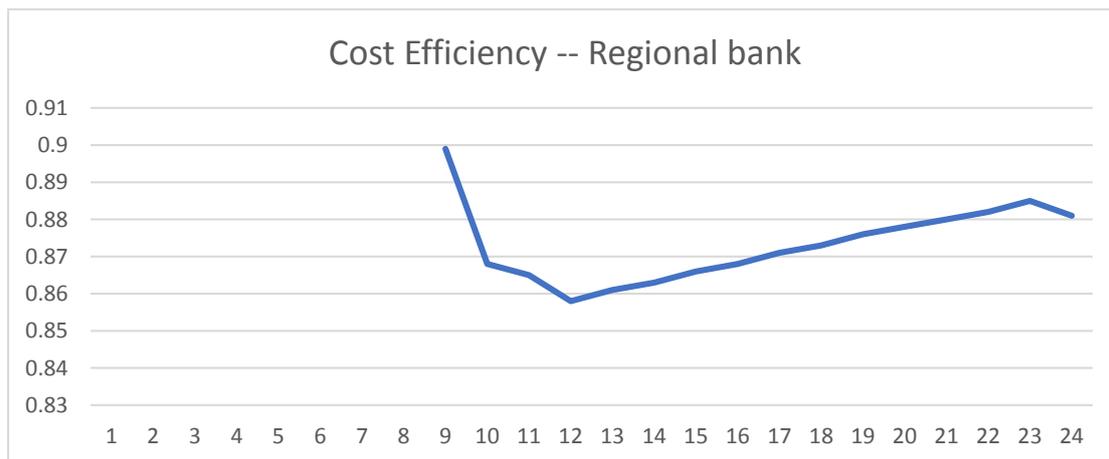


4. Cost Efficiency

4.1. The Changes of Bank Cost Efficiency

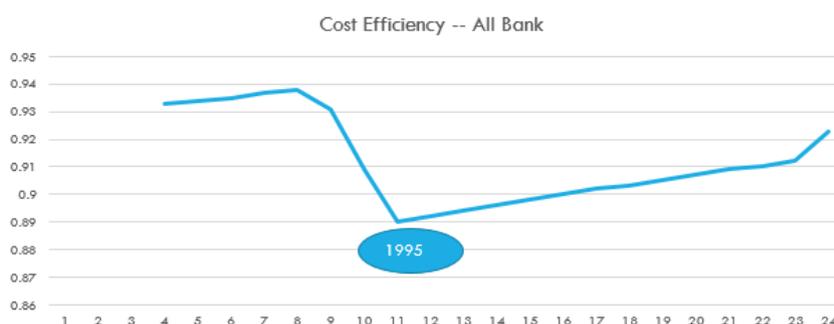
The average score of cost efficiency is 91.2% over the period 1985 to 2008. The big-four banks' average cost efficiency score is 94.4% and the regional banks' average cost efficiency score is 87.3%. Compared with technical efficiency, the cost efficiency shows a tendency from 1985 to 2008. There is an 1.1% increase happened on big-four banks and 2.6% decrease on regional banks. (Shamsuddin and Xiang, 2012, pp. 3569)





4.2. The Reason of Bank Cost Efficiency Change

The reasons of cost efficiency change are output change, economic of scope and the increase of the financial service range. Frist of all, the output of bank has changed a lot from 1985 to 2008. Kirkwood & Nahm (2006, p. 257) found out that the output of bank altered from interest-bearing assets and non-interest income to profit before tax and abnormal items. Vu and Turmell (2011, p.530) suggested that bank’s cost could be influence by the output of the banks. This change has the positive impact on cost efficiency, so that total average cost efficiency improves a lot. Furthermore, economics of scope is one of the reason of cost efficiency change. As Shamsuddin and Xiang (2012, pp.3069-3070) and Innocenti et al (2017, p.192) points out, the big-banks have the benefits of economics, because those banks have the diversification of geographic. So that big-four banks could assess the widely rage of funding source around the world. Compared with regional banks, big-four banks have the higher cost efficiency score from 1985 to 2008. The last, financial services also play a significant role in cost efficiency change. Duncan and Elliott (2004, pp.320-321) defines it as that the range of financial services was keeping raise in past decade. This kind of increase could lead to a positive effect on revenue. The raise of revenue could be regarded as the increased in cost efficiency. It could explain the reason why cost efficiency score increases a lot during 1985 to 2008.



Economics of scope



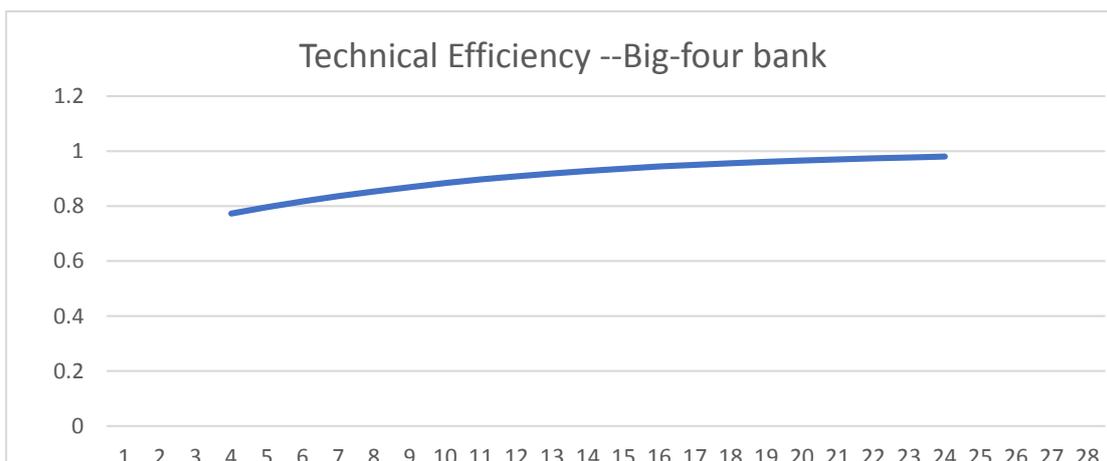
Financial services

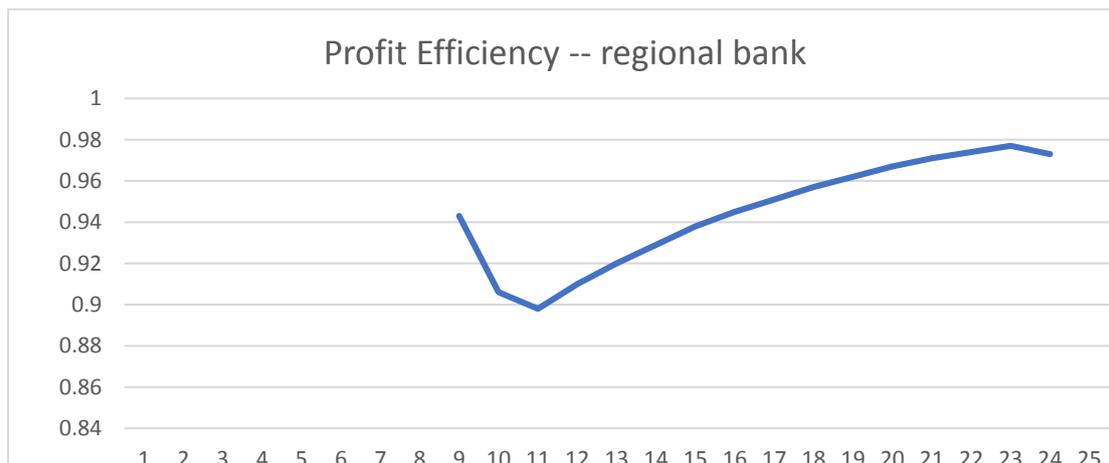


5. Profit Efficiency

5.1. The Changes of Bank Profit Efficiency

The average score of profit efficiency is 91.1% over the period 1985 to 2008. The big-four banks' average cost efficiency score is 90.9% and the regional banks' average cost efficiency score is 94.5%. Both big-four banks and regional banks' profit efficiency score have an increase trend from 1985 to 2008. While, the data of regional bank always higher than big-four banks. (Shamsuddin and Xiang, 2012, pp. 3569)

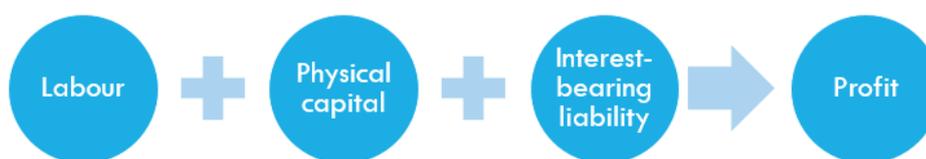




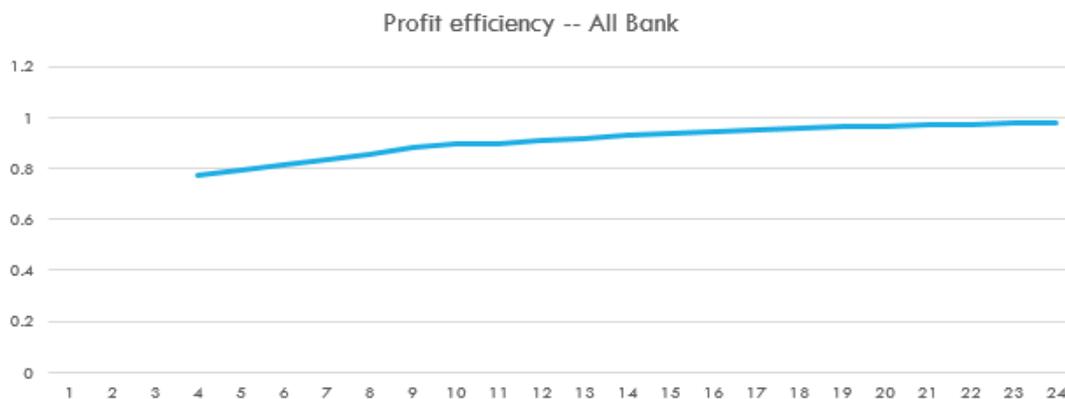
5.2. The Reason of Bank Profit Efficiency Change

The ability of transforming profit, bank service efficiency and innovation in financial products are the three main reasons to profit efficiency increase in Australia bank during 1985 to 2008. The definition of profit efficiency is the ability of transforming labor, physical capital and interest-bearing liabilities into profit. Sahoo et al (2014, pp. 927) hold the views that the bank in Australia have good quality of transforming profit in past decade. In fact, it means that the bank in Australia could earn higher profit and more efficiency in profit. Then, the improvement of bank profit efficiency from 1985 to 2008 could be explained well. What is more, the financial products innovation also has the significant impact on the change of profit efficiency. As Shamsuddin and Xiang (2012, pp.3069-3070) points out, the banks in Australia develop large number of new financial products and have a wildly use of electronic commerce, especially, big-four banks. So that profit efficiency in Australia keep increasing and the raising speed of big-four banks is higher than regional banks. Besides, bank service efficiency is an important part of profit efficiency. Duncan and Elliott (2004, p. 322) have found that customer services influence on financial performance and the performance of financial have the impact on profit efficiency. In past decade, the bank in Australia pay attention on customer service improvement. Thus, the profit efficiency is raising with the development of customer service from 1985 to 2008.

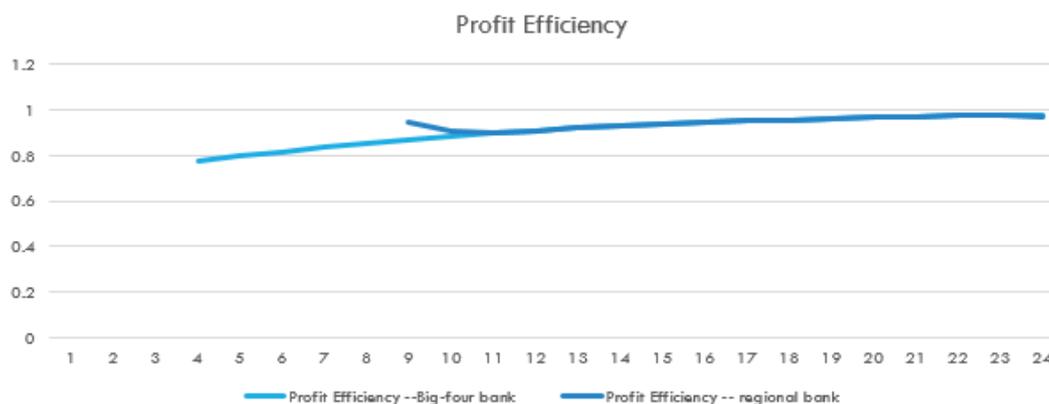
The ability of transforming profit



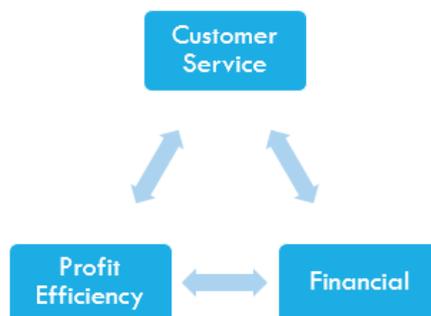
The ability of transforming profit



innovation in financial products



bank service efficiency



6. Bank Efficiency and Stock Return

From 1985 to 2008, the average of bank efficiency keep increasing and this kind of increasing have the positive influence on bank stock performance. According to Shamsuddin,A and Xiang,D (2012, pp.3568-3570), bank efficiency have deep relationship with the performance of stock return. This impact is a kind of positive correlation. Because of the financial leverage, the effect

of agency cost will raise the ownership interest. Thus, the financial leverage ratio model explain that bank efficiency have the positive impact on stock return. Moreover, bank efficiency changes variable and bank-specific factor also could support that the stock performance of bank is effected by bank efficiency. In addition, the change of bank efficiency means the change of capital adequacy ratio (CAR), the bank concentration ratio (CNR) and average profit margin for the banking sector (APM). Capital adequacy ratio, the bank concentration ratio and average profit margin for the banking sector all have the directly influence on the bank stock. (Xiang, D et al, 2015, pp. 330-335)

7. Conclusion

The report analysis the changes of bank efficiency from there aspects: technical efficiency, cost efficiency and profit efficiency. And then explain the reasons of those changes. For technical efficiency, big-four banks have the opposite trend with regional banks. The reasons are that scale inefficiency, the ability of transforming input to output and the increase of per capital income. For cost efficiency, the score of big-four bank always higher than regional bank and big-four bank show an increase trend, while, regional banks show a decrease one, that is due to the change of bank output from 1995, economics of scope and the increase amount of financial services. For profit efficiency, the trend of big-four banks and regional banks are keep raised. The reasons of raised trend are better ability of profit transforming, the development of new financial products and the wildly use of electronic commerce. Moreover, bank service efficiency also a very important reason.

In addition, the report also mentions the relationship between bank efficiency and stock return. Over the financial leverage ratio model, it is clear to understand that bank efficiency has the positive effect on stock return of the bank. The bank efficiency change variable and bank-specific factor are the explanations of the relationship between bank efficiency and stock return.

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