

## 摘要

本研究旨在探討企業研發活動對股東權益報酬率(ROE)的影響，企圖了解研發能量強的高科技公司，是否真的有較好的財務績效表現？

為探討此研究問題，本研究採杜邦恆等式之概念，以修正後ROE作為衡量財務績效的主體，並將其組成要素--營業利益率、資產週轉率及權益乘數作為財務績效指標的影響因子。另外，高科技公司的定義上，可採用研發密集度、核准專利數量、是否位於科學園區做為企業研發活動的評估指標。選定前述指標後，即可進一步分析研發費用率、核准專利數量及是否位於科學園區是如何影響營業利益率、資產週轉率及權益乘數，進而影響企業的修正後ROE。

本研究採一般多元迴歸及Tobit迴歸進行實證研究，並針對台灣2007年所有上市、上櫃之公司進行研究，在篩選不符合研究目的之資料後，共得到1409家樣本公司，用以探討研發創新活動與財務績效的關聯性，其實證結果發現：

- 一、研發密集度越高的公司，可透過提高營業利益率(不顯著)，增加未來修正後ROE，然而研發密集度對資產週轉率、權益乘數(不顯著)皆為負向影響。
- 二、2006年及2007年度核准專利數量多寡，不影響修正後ROE，然而可提高營業利益率(不顯著)及資產週轉率，但卻降低權益乘數。
- 三、位於科學園區的公司，當期修正後ROE較差。由杜邦恆等式的分析中可看出，其資產週轉率及權益乘數(不顯著)皆提高，而營業利益率(不顯著)卻降低。

本研究亦評估此三種研發活動指標的適切性，發現採研發密集度做為指標時，應避免以含有營業收入淨額的財務比率做為績效連結，以免彼此間的連動關係降低解釋能力。當採研發產出與財務績效做連結，較不會受連動性影響，解釋能力更好。而採是否位於科學園區做為指標，除了可避免像研發密集度與財務績效間產生的相關性，還可納入政府在篩選高科技事業時考量的條件，讓變數包含更多資訊。

關鍵字：股東權益報酬率、營業利益率、資產週轉率、權益乘數、杜邦恆等式

## **Abstract**

The purpose of this thesis is to explore how research and development activities of hi-tech firms affect their return on equity (ROE). This thesis focused on the research question-do hi-tech companies have better financial performance indeed?

The thesis adopted the concept of “Dupont formula” demonstrating that modified ROE is composed of modified operating profit margin, total asset turnover rate and equity multiplier. These four financial indexes were all included in research objective.

Besides, this thesis employed three variables to measure research & development activities in hi-tech firms. These three indexes contained research & development intensity, quantity of approved patent and location of the company whether it is in Science park or not.

This thesis used empirical research to explore that how research & development ratio, quantity of approved patents and if the company located in Science Park or not affected modified ROE through influencing modified operating profit margin, total asset turnover rate and equity multiplier.

In addition, this thesis used OLS ( ordinary least squares ) and Tobit regression as empirical research methodology. Furthermore, the research samples covered 1,409 firms listed on Taiwan Stock Exchange and GreTai Securities Market (OTC) in 2007. Three empirical results were acquired from this thesis :

1. Companies with higher R&D intensity have higher modified ROE. These companies improved their modified ROE through the benefit of higher operating profit margin. However, these companies have lower total asset turnover rate and equity multiplier.
2. Companies with more approved patents in year 2006 and year 2007 did not influence their modified ROE. This empirical analysis showed that the more approved patents a company owned the higher operating profit margin and asset turnover rate it had. However, Companies with more approved patents had lower equity multiplier.

3. Companies located in Science Park have lower modified ROE. These companies have higher total asset turnover rate and equity multiplier but lower operating profit margin.

This thesis also revealed that if we tried to connect companies' R&D ratio with financial performance, we should avoid using the financial ratios including net sales. Otherwise, the coefficients in statistical models could not explain how companies R&D activities affect their financial performance. However, using the quantity of approved patents to evaluate R&D activities is a better index. Without the influence of having the same factor- net sales -in independent variables and dependent variables simultaneously, we would not be caught in the trap depicted before. At last, the companies should meet a number of criteria set by government to establish their factories in Science Park. Therefore, if we used the definition that companies located in Science Park are hi-tech companies, this index contains government's viewpoint that the other two variables do not have.

Keywords : ROE 、 Operating profit margin 、 Total asset turnover rate 、 Equity multiplier 、 Dupont formula