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A Note from the Editor's Board

The YMC Management Review has been published for nine volumes since 2008. And the iFAIRS 2016 conference had been hold at Chiang Mai THAILAND on 5-6th June this year. I would like to thanks the Rajamangala University of Technology Lanna THAILAND which presented this international conference.

The YMC Management Review publishes two numbers each year. The first number publishes the cooperation of holding the iFAIRS international conference. The second number, discuss mainly in Chinese, publishes topics about practical management. The editor's board welcomes all articles ready for submission, regarding the practical management discussion or management cases study. Furthermore, we hope the YMC Management Review could be included as a member of the Social Science Citation Index (SSCI) in the near future.

I am pleased to show this number of the YMC Management Review contains three papers which is the most plentiful number of English issue of YMCMR. *ABank Intellectual Capital Model* discusses the intellectual capital not shown in accounting financial statement but critical to a company's long-term profitability. *An Empirical Study of Grey VAR on Interactive Structure between Stock Return of Investment and Technical Index* discusses the dynamic structure between stock return and a whiten technical index in Taiwan. *The Influence of Perceived Quality and Price on Consumer Purchases* discusses perceived quality and price relationship in cosmetic industry. *Good Products would not betrayal you* propose that consumers' perceived quality and brand image could reduce the negative effect of product betrayal, and provide useful implication for defensing product betrayal aversion.

Once again, we invite you to submit your paper to the YMC Management Review any time, and we are looking forward to seeing you in the iFAIRS conference every year in the future.

Editor-in-Chief

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A Bank Intellectual Capital Model

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ABSTRACT

Intellectual Capital can be said to constitute valuable factors not shown in accounting financial statements, but which are of critical importance to a company's long-term profitability. This study models the relationship between intellectual capital(IC hereafter) and various loans in bank lending. Method: Pioneering and exhaustive research by Yeh (2001) discusses operating free cash flows valuation model (FCFVM hereafter). This paper extends the FCFVM to derive mathematically the accounting items of IC for lending banks. The FCFVM analyses the relationship between market value of equity and accounting activities (investments) in the manufacturing firms. This study adds to the FCFVM literatures by applying it to lending banks where operating assets are various loans, which are of critical difference to a manufacturing firm. Result: We find that IC (the difference between market and book value of equity) is a function of fee income, performing loans and new loan investment. This implies that the most important assets of banking industry are reputation, honesty, and commitment. Conclusion: We conclude that the sales of fee-based services, performing loans and new loan investment are valuable factors in bank lending. With our mathematical model, the empirical analysis is more disciplined than that of many prior ad-hoc valuation studies. Our model could be extended to encompass other valuable factors in banks that are also likely to drive market and book values differently. Directions for Future Research: We suggest a number of value-driving activities of banks, including deposit taking, credit card services, mortgage servicing rights and trust activities. The combination of fee income and new deposit investments in our model will partially describe these activities. Nevertheless, it is potentially fruitful to use our model to incorporate these and other factors of value more explicitly. Within our modeling framework this would require identification of the investing activities that give generate these hidden values. These activities could take the form of new investments in social capital, that is, it is social capital that transforms human capital into producing positive career outcomes and increasing investors' perception of potential... Such an extension would likely result in a valuation model that contains more financial statements reports items, especially the profit/loss account and balance-sheet of the banks.

***Keywords**: Intellectual Capital Model, Free Cash Flows Valuation Model.*

1. Introduction

Most intellectual capital approaches have problems with meaningful measurement. Big differences often exist between a company's market value and its book value. Many of these are explained by intellectual capital assets not shown in the balance sheet. Assets like employee knowledge, expertise and creativity, customer confidence in the company and its products, brands and franchises, Information and knowledge management systems, administrative procedures, copyrights, patents and trademarks, the efficiency of company business processes and the effectiveness of company planning, forecaster and strategy-making. This has presented companies with a new challenge how to measure, account for, manage and develop intellectual capital. This paper of Intellectual Capital will help you do exactly that.

The rise of the "new economy", one principally driven by information and knowledge, has led to an increased interest in intellectual capital (IC). IC is an area of interest to numerous parties, such as shareholders, institutional investors, scholars, policymakers and managers.

However, there have been very few papers that have studied IC of banks. The implications of IC are more prominent in banks as banks have abundant human capital at their disposal. Therefore, it becomes necessary to understand what the factors of creating value in banks are. Banks happen to be one service sector that uses a huge amount of human capital and customer capital for its survival. Thus, this paper evaluates the intellectual capital model of bank lending using the residual income valuation model (FCFVM).

This paper provides a strong case for reporting of the value creation through intellectual capital in the financial statements. The paper would be a useful tool for benchmarking the performance of the banks across various countries. When in 1988 the Swiss food-products company Nestle bought the British confectionery group Rowntree, the price paid included well over $1 billion for something that had never appeared on Rowntree's balance sheet, this hidden value now recognized as intellectual capital.

With the advent of knowledge economy era, tangible assets are no longer the factors that companies rely on to create high value, while intangible assets and intellectual capital play more significant roles that even surpass tangible assets in determining companies' future competitiveness. Intellectual capital includes intellectual properties, intellectual assets and other information assets or intangible assets, such as human capital, capability of management team, relationships with customers and suppliers, employee devotedness and innovation ability. Most of these items are absent from or cannot be evaluated by traditional accounting, which is also the major cause of differences between corporate market value and book value. Therefore, assessment of intellectual capital is rather important for companies.

Value is decided by the quantitative analysts who work in the financial markets developing mathematical models to assist the activities of traders and risk managers within banks and other large corporate institutions, while price be affected by market conditions, then the quantity of the two are usually unequal. There are seven intellectual capital valuation models in the literature, including Tobin's Q, Market-to-book ratio (M/B ratio), Economic Value Added (EVA™), Calculated Intangible value (CIV), Knowledge Capital Earnings (KCE), Value Added Intellectual Coefficients (VAIC™) and Financial Method of Intangible Assets Measuring (FiMIAM). This paper will discuss a different model.

The next of our paper is the model. The paper concludes with Section 3.

2. Methodology

In finance, the discounted cash flow valuation describes a method to value a project, company, or asset using the concepts of the time value of money. All future cash flows are estimated and discounted to give them a present value. The discount rate used is generally the appropriate cost of capital, and incorporates judgments of the uncertainty (risk) of the future cash flows.

In this paper, we use the discounted cash flow valuation to describe the operating asset of a bank.

To see how a bank's future operating free cash flows can be tied back to its intrinsic value on date t we begin by defining market value of operating assets as the present value of all future operating free cash flows to operating assets. This is,

$$(1)\quad MVOA_t = \sum_{s=1}^{\infty} E_t\left[\frac{FCF_{t+s}}{R_{OA}^{s}}\right]$$

Formula (1) indicates that the market value of operating assets ($MVOA_t$) is the net present value of the expected operating free cash flows (FCF_{t+s}) available for that operating assets (OA_t) discounted at the required return on operating assets ($r_{OA} = R_{OA} - 1$). In formula (1), operating free cash flows are operating cash flows minus capital expenditures.

Given (1), we get that the following：

$$(2)\quad MVOA_t = R_{OA}^{-1} E_t\left[FCF_{t+1} + MVOA_{t+1}\right]$$

Given financial debt is negative financial asset, this paper assume that net financial assets are financial assets minus financial debts and use financial assets as net financial assets. Given the financial assets are marked to market value, the market value of financial assets ($MVFA_t$) is the book value of financial assets ($BVFA_t$). If the assumption is correct, then we get that the following： (3) $MVFA_t = BVFA_t$

Given that financial assets is net financial assets and does not use financial debts. Firm's equity is Firm's financial assets plus operating assets of the firm, so book value of equity is book value of operating assets ($BVOA_t$) plus book value of financial assets：(4) $BVE_t = BVOA_t + BVFA_t$

Market value of equity is market value of operating assets plus market value of financial assets (5) $MVE_t = MVOA_t + MVFA_t$

Substituting from equations (3) and (4) into equation (5) produces the equation (6).

$$MVE_t - BVE_t = MVOA_t - BVOA_t \quad (6)$$

For many authors, the difference between the market value of companies' shares and their book value is the consequence of intellectual capital (IC_t)

Substituting from equation (5) into equation (6) produces the equation (7).

$$IC_t = MVOA_t - BVOA_t \quad (7)$$

The following persistent value driver dynamic, PVDD, lays out the evolution of free cash flows:

$$I_{t+1}^{L} = r_L \theta_1 PL_t + FEE_{t+1} \quad (8)$$

$$PL_{t+1} = NLI_{t+1} + \theta_1 PL_t \quad (9)$$

$$NLI_{t+1} = C_{LL} NLI_t \quad (10)$$

$$NPL_{t+1} = (1-\theta_1) PL_t + \theta_2 NPL_t \quad (11)$$

$$FEE_{t+1} = C_{FF} FEE_t + C_{FL} NLI_t \quad .. \quad (12)$$

In equation (8) the mark, I^L_{t+1} takes the abbreviation of income from loans at t+1, superscript L refers loans. Interest income from loans at time t+1 is a fraction (θ_1) of current performing loans (PL_t) at time t multiplied by the stated interest rate on loans (r_L) plus fee income at time t+1(FEE_{t+1}). This implies the default rate on loans is ($1-\theta_1$).

In equation (9) the mark, PL_{t+1} takes the abbreviation of performing loans at t+1.Performing loans at t+1 is a fraction (θ_1) of current performing loans (PL_t)at time t plus new loan investments at t+1 (NLI_{t+1})

At time t+1, new loans investment, NLI_{t+1}, are invested (lent) that add to PL_{t+1}. They are subject to default and start paying interest at t + 1, one can think of lending as investment for banks, and θ_1 as the persistence of performing loans. Note that new loans are net of repayments. We do not take account of the maturities of existing loans because they are assumed to rollover. Any net repayments of loans would be reflected in NLI_{t+1}.

In equation (10) the mark, NLI_{t+1} takes the abbreviation of new loan investments at t+1. New loan investments at t+1 is a fraction (C_{LL}) of new loan investments at t (NLI_t). Growth in lending is described through the parameter C_{LL} , which is $\frac{NLI_{t+1}}{NLI_t}$. New loan investments in a lending bank are just like capital expenditures in a non-bank firm.

In equation (11) the mark, NPL_{t+1} takes the abbreviation of non-performing loans at t+1. Non-performing loans at t+1 is a fraction (θ_1) of current non-performing loans (NPL_t) at time t plus default rate on loans ($1-\theta_1$) multiplied by current performing loans (PL_t) at time t. The stock of non-performing loans includes a proportion (θ_2) of the prior period non-performing loan balance. Implicitly, ($1-\theta_2$) of the prior period non-performing loans are charged off the books completely. For the moment, non-loan net assets such as deposits or investment securities of the lending bank are assumed to be financial in nature, marked-to-market and are zero net present value. ($\theta_1 \in [0,1]$)

In equation (12) the mark, FEE_{t+1} takes the abbreviation of fee income from loaners at t+1. Fee income at time t+1 is a fraction (C_{FF}) of current fee income (FEE_t) at time t plus a fraction (C_{FL}) of new loan investments at t (NLI_t)

For the lending bank, each period's operating free cash flows (FCF_{t+s}) are equal to the interest received ($r_L\theta_1 PL_t$) on loans plus fee income (FEE_{t+1}) and minus new investments in loans (NLI_{t+1}). If the PVDD is correct, then we get that

$$FCF_{t+1} = I^L_{t+1} - NLI_{t+1} = r_L\theta_1 PL_t + C_{FF} FEE_t + C_{FL} NLI_t - NLI_{t+1} \quad (13)$$

Substituting from equation (13) into equation (10) produces the equation (14).

$$FCF_{t+1} = I^L_{t+1} - NLI_{t+1} = r_L\theta_1 PL_t + C_{FF} FEE_t + (C_{FL} - C_{LL}) NLI_t \quad (14)$$

In equation (1), we have showed that $MVOA_t$ is a function of FCF_{t+1}

Substituting from equation (14) into equation (1) produces the equation (15).

$$MVOA_t = C_{PL} PL_t + C_{FEE} FEE_t + C_{NLI} NLI_t \quad (15)$$

Substituting from equation (14) and (15) into equation (2) produces the equation (16), (17) and (18).

$$C_{PL} = (R_{OA} - \theta_1)^{-1} r_L\theta_1 \quad (16)$$

$$C_{FEE} = (R_{OA} - C_{FF})^{-1} C_{FF} \quad (17)$$

$$C_{NLI} = (R_{OA} - C_{LL})^{-1}[C_{LL}(C_{PL} - 1) + C_{FL}(C_{FEE} + 1)] \quad (18)$$

Proofs of this are in the Appendix.

In words, the market value of the lending bank's operating assets is a linear combination of the bank's performing loans, fee-based services and new loan investments.

Some implications of the model are described as follows.

The coefficient on performing loans, C_{PL} reflects the discounted future interests earned on PL_t, where discounting considers the persistence of current loans ($R_{OA}-\theta_1)^{-1}$). If performing loans never default (i.e., θ_1 =1) then the income the bank receives should be discounted as a perpetuity at rate r_{OA}

(i.e. $C_{PL}PL_t=\frac{r_L PL_t}{r_{OA}}$). Accordingly the numerator, $r_L PL_t$ is a fixed income and $C_{PL}>0$

The coefficient on fees, C_{FEE} reflects the discounted future fees earned on FEE_t, where discounting considers the persistence of current loans $\left(R_{OA}-C_{FF}\right)^{-1}$. If $C_{FF}=1$, then the fees income the bank receives should be discounted as a perpetuity at rate r_{OA} (i.e., $C_{FEE}FEE_t=\frac{FEE_t}{r_{OA}}$). Accordingly the numerator, $r_L PL_t$ is a fixed income and $C_{FEE}>0$.

The coefficient on net new loans C_{NLI} is positive when new loan investments are positive net present value investments, and when there is a potential for growth in these activities. To see this, we rewrite the equation (18) as follows:

(19) $C_{NLI}=(\mathrm{R_{OA}}-C_{LL})^{-1}\left[C_{LL}(C_{PL}-1)+C_{FL}(C_{FEE}+1)\right]$

(20) $C_{NLI}=(R_{OA}-C_{LL})^{-1}C_{LL}(C_{PL}-1)+(R_{OA}-C_{LL})^{-1}C_{FL}(C_{FEE}+1)$

Substituting from equations (16) and (17) into equation (20) produces the equation (21).

(21) $C_{NLI}=(R_{OA}-C_{LL})^{-1}C_{LL}\left((R_{OA}-\theta_1)^{-1}r_L\theta_1-1\right)+(R_{OA}C_{LL})^{-1}C_{FL}\left((R_{OA}-C_{FF})^{-1}C_{FF}+1\right)$

Continuing to reorganize, we get that the following(22)：

$$C_{NLI}=(R_{OA}-C_{LL})^{-1}(R_{OA}-\theta_1)^{-1}C_{LL}\left[\theta_1(1+r_L)-(1+r_{OA})\right]+(R_{OA}-C_{LL})^{-1}(R_{OA}-C_{FF})^{-1}C_{FL}R_{OA}...(22)$$

Inspection of the term in (22) reveals that because of $(R_{OA}-C_{LL})^{-1}(R_{OA}-\theta_1)^{-1}C_{LL}$ and

$(R_{OA}-C_{LL})^{-1}(R_{OA}-C_{FF})^{-1}C_{FL}R_{OA}$ are always positive, the sign of equation (22) and the term

($[\theta_1(1+r_L)-(1+r_{OA})]$)in brackets are the same.：Inspection of the term in (22) reveals that positive net present value occurs when $r_L > r_{OA}$. Accordingly $[(1+r_L)>(1+r_{OA})]$, we adjust $[(1+r_L)]$ to $[\theta_1(1+r_L)]$, which means if $[\theta_1(1+r_L)>(1+r_{OA})]$, then $C_{NLI}>0$. Zero net present value occurs if $C_{NLI}=0$. The valuation effect of a one dollar investment in positive net present value loans is increasing in the growth parameter C_{LL}, which is $\frac{NLI_{t+1}}{NLI_t}$. When loans are zero net present value investments, it is easy to show that the coefficient on current performing loans, C_{PL} equal one and $C_{FL}=0$.

3. Conclusion

Successfully implementing a method for the valuation or measurement of intellectual capital is not an easy task. Practitioners yet receive little support from the intellectual capital research community. Little research has been done into the factors that influence the success of a method. This paper is a first attempt at mathematically applying the residual income valuation model to bank's IC. For the purpose of developing our bank's IC model, we assume the major value creating activities are fee-based services, performing loans and new loans. In addition, we assume the major accounting bias is loan loss allowance. When we combine these assumptions we arrive at an IC valuation model that depends on loan, new loans, non-performing loans and fee income. Our model could surely be extended to include other value generating activities and accounting biases of banks. We have shed light on including other bank activities that are also likely to drive market and book values apart.

Appendix

Given (2), $MVOA_t = R_{OA}^{-1} E\left[FCF_{t+1} + MVOA_{t+1}\right]$

Substituting from equation (14) and (15) into equation (2) produces the following:

$$MVOA_t = R_{OA}^{-1} E\left[FCF_{t+1} + MVOA_{t+1}\right]$$

$$\Rightarrow C_{PL} PL_t + C_{FEE} FEE_t + C_{NLI} NLI_t = R_{OA}^{-1}\left[FCF_{t+1} + C_{PL} PL_{t+1} + C_{FEE} FEE_{t+1} + C_{NLI} NLI_{t+1}\right]$$

$$= R_{OA}^{-1}\begin{bmatrix} r_L \theta_1 PL_t + C_{FF} FEE_t + C_{FL} NLI_t - C_{LL} NLI_t + C_{PL}\left(C_{LL} NLI_t + \theta_1 PL_t\right) \\ + C_{FEE}\left(C_{FF} FEE_t + C_{FL} NLI_t\right) + C_{NLI} C_{LL} NLI_t \end{bmatrix}$$

Collecting variable PL_t

LHS of variable PL_t is C_{PL}

RHS of variable PL_t is $R_{OA}^{-1}\left(r_L \theta_1 + C_{PL} \theta_1\right)$

$$\Rightarrow C_{PL} = R_{OA}^{-1}\left(r_L \theta_1 + C_{PL} \theta_1\right) \qquad \Rightarrow C_{PL} = \left(R_{OA} - \theta_1\right)^{-1} r_L \theta_1$$

Collecting variable FEE_t

LHS of variable FEE_t is C_{FEE}

RHS of variable FEE_t is $R_{OA}^{-1}\left(C_{FEE}C_{FF}+C_{FF}\right)$

$$\Rightarrow C_{FEE}=R_{OA}^{-1}\left(C_{FEE}C_{FF}+C_{FF}\right) \quad \Rightarrow C_{FEE}=\left(R_{OA}-C_{FF}\right)^{-1}C_{FF}$$

Collecting variable NLI_t

LHS of variable NLI_t is C_{NLI}

RHS of variable NLI_t is $R_{OA}^{-1}\left[C_{NLI}C_{LL}+C_{LL}\left(C_{PL}-1\right)+C_{FL}\left(C_{FEE}+1\right)\right]$

$$\Rightarrow C_{NLI}=\left(R_{OA}-C_{LL}\right)^{-1}\left[C_{LL}\left(C_{PL}-1\right)+C_{FL}\left(C_{FEE}+1\right)\right]$$

$$C_{NLI}=\left(R_{OA}-C_{LL}\right)^{-1}\left\{C_{LL}\left[\left(R_{OA}-\theta_1\right)^{-1}r_L\theta_1-1\right]+C_{FL}\left[\left(R_{OA}-C_{FF}\right)^{-1}C_{FF}+1\right]\right\}$$

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An Empirical Study of Grey VAR on Interactive Structure between Stock Return of Investment and Technical Index – An Example of Taiwan Top 50 ETF

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ABSTRACT

Using the daily data of Taiwan Top 50 ETF from January 2011 to December 2015 as examples. Trying to improve the VAR on interactive structure between technical index and stock return by using Grey forecasting model GM(1, 1), and compare with the original technical index and stock return. First of all, we use GM(1, 1) to whiten the original data, and grey technical index are obtained. We choose traditional technical index such as KDJ, MACD, RSI, BIAS and W%R as agency index. And put the original data and whiten data into Granger causality test and VAR model to find out the Granger causality and interactive structure between technical index and stock return, and compare the Granger causality and interactive structure between the original data and the whiten data. We found:

Both of the original data and the whiten data shows Granger causality between technical index and stock return. However, the whiten data shows more two-way reaction than the original data. And Both of the original data and the whiten data shows interactive structure between technical index and stock return. But the whiten data improve the explanatory ability of technical index to stock return. And the whiten data also increase the width of impulse response. And result shows the technical index still work in Taiwan stock market. This study doesn't support a weak-form efficiency market hypothesis in Taiwan stock market.

Keywords: *GM(1,1),Taiwan Top 50 ETF, Technical Analysis, Granger Causality, Grey Vector Autoregression Model(GVAR)*

1.Introduction

One of the fact that the investor mostly concern is the efficiency of the stock market. Since 1900, Louis Bachelier discovered the randomness of stock price. And it became the basic concept of Efficiency Market. And Robert(1959) also found that American stock price is no difference with random sequence .And Fama (1970) publish the famous Efficient Markets Hypothesis.

But after Efficient Markets Hypothesis was showed up. There are many voices of skepticism. Especially after CAPM being published. There are many empirical study disprove the Efficient Markets Hypothesis. Like Rozeff&Kinney(1976); Mustafa&Gultekin(1983); Jaff&Westerfield(1985) all proved that seasonal effect existed in stock markets. And Sweeney(1988); Bailey&Stulz(1990); Brock(1992) also proved that investor can get abnormal return by using technical analysis. In other words, that means price of stocks can be effected by a lot of environment facts. Including human's weakness, greedy and fears (Likes Chang&Chang, 2007) or The effect of herd (Likes Lehmann, 1987; Tu, 2010; Chen, 2014) . That brings unusual changes in stock price. And these kind of actives are predictable.

As for investors, investing in stock markets is a indivisible part of investment. How to choose the most potential stock in so many of them become a big problem in investors' minds. Therefore, using a accurate predicting tool of stock markets is relatively important. The most popular tools we used in forecasting stock market are fundamental analysis and technical analysis. Fundamental analysis focus on three levels, marco, sector analysis and individual stock analysis. Basic concept is to calculate the real value of stock by analyzing the information that we mention about. But after all, fundamental analysis is focused on understanding and choosing the right stock. As for the influence between fundamental analysis and stock price, Chang, Tseng, Wu, Yang, Lin, Gao&Lai(2016)'s paper shows there are Granger causality and interactive structure between stock return and financial indices. In other words, we can forecasting stock price by analyzing financial indices. Accurately grasp the stock trend is the advantage of fundamental analysis. So it's a very nice tool for long-term investors. But because of it takes a lot of time in gathering and analyzing information. That makes investors harder to make decisions on the right time. So that you need the help from technical analysis.

Technical analysis is focused on the changes of stock price and quantities. By analyzing the trend, we can understand what time should we buy or sell the stock. Technical analysis only care about short-term changes of stock price. Using the information in historical stock price to forecast future stock price trends.Because there are too many facts can change stock price. And technical analysis doesn't concern the reason behind the stock price. Only analyzing by the changes of stock price. So it became a nice tool in analyzing short-term operation. That's why so many investors loves to use technical analysis in stock market.

The recent study shows that technical analysis is also suitable for Taiwan stock market. Except few papers support that Taiwan is a weak-form efficiency market.(Likes Chang, 2006; Chen, 2007) Most of the studies showing that Taiwan is not consist with weak-form efficiency market hypothesis.(Likes Chang, 2002; Wu, 2004; Lin,2005; Tung, 2010)And many researchers, such as Chan, 1990; Fang, 1991; Lai, 1997; Huang, 2002; Chen, 2004, proving that investors can get abnormal return by using technical analysis. But most of the papers tend to discuss the improvement of technical index (Likes Szakmary et al., 1999) or the combination of technical analysis. (Likes Lee, 2003; Han, 2009) Only Yeh (2005); Chang&Lu (2006) using grey theory improving technical index from stock price. And the result shows that using whiten technical index can make much more profit than the original technical index. Therefore, this study will last the method of Grey theory. And using the VAR model to analysis the original and whiten technical index and stock return. (Likes Chang&Wu, 1998; Wu&Chang, 1999; Chang, Wu&Lin, 2000)And to understand the Granger causality and interactive structure between them.

2.Methodology

Step 1: Gathering the original sequence

$$X^{(0)} = \left\{ X^{(0)}(1), X^{(0)}(2), \cdots, X^{(0)}(n) \right\}$$

Step 2: Let $X^{(1)}$ be an accumulated generating operation(AGO) of $X^{(0)}$

$$X^{(1)} = \left\{ X^{(1)}(1), X^{(1)}(2), \cdots, X^{(1)}(n) \right\}$$
$$= \left\{ \sum_{k=1}^{1} X^{(0)}(k), \sum_{k=1}^{2} X^{(0)}(k), \cdots, \sum_{k=1}^{n} X^{(0)}(k) \right\}$$

Frist-order differential equation of GM(1, 1):

$$\frac{dX^{(1)}}{dt} + aX^{(1)} = b$$

Step 3: Discretization and denotes the result of Grey differential equation

Step 4: Letα= 0.5

α is a horizontal-adjusting-factor, $0 < \alpha < 1$

Step 5: Denotes the result of GM modeling by GM($X^{(0)}$ (1); a, b),a is the development coefficient of GM, and b is the grey input, $X^{(0)}$ (1) is an initial value, if

It's said to be a sequence defined in set k {1, 2, ……, n}
Using inverse accumulated generating operation(IAGO) to get forecasting sequence.

The sequences after GM(1, 1) above is called whiten sequences. And we used whiten sequence to computing whiten stock price and whiten technical index.

3.Data

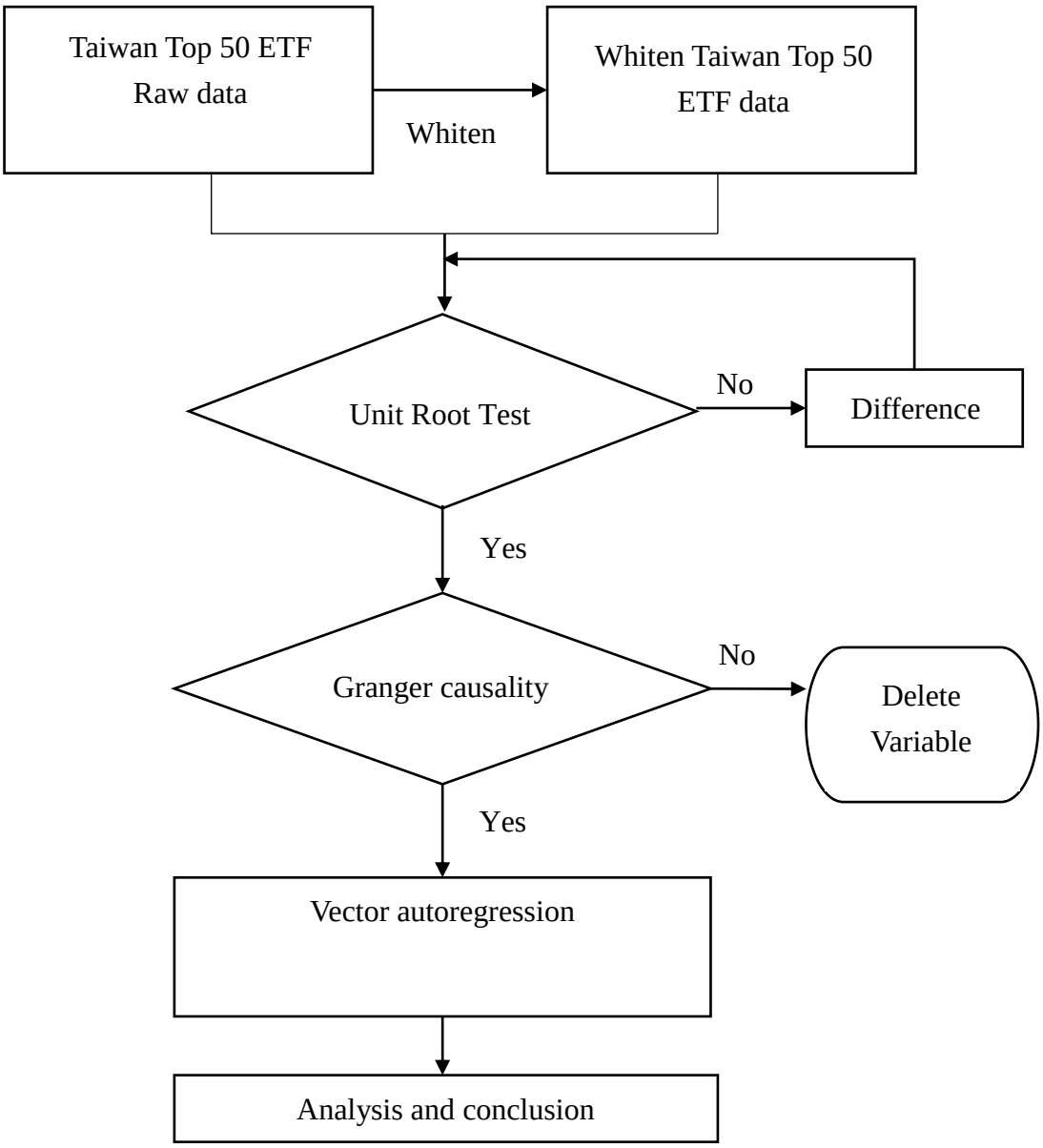
This study samples from the Taiwan Top 50 ETF from January 2011 to December 2015. Taiwan Top 50 ETF is based on Taiwan Top 50 Index. But turn into a tradable ETF. And the component stocks of Taiwan Top 50 Index were listed on the TWSE (Taiwan Stock Exchange).

We collected daily data of closing price, highest price and lowest price of Taiwan Top 50 ETF. Totally 1235 samples. First of all, the raw trading data were whiten by using the grey forecasting. After that, we use the raw and whiten stock price to construct five technical indices. Such as KD, RSI, MACD, BIAS, W%R. Then we put all the series into unit root test to make sure they are stationary time series. Otherwise we delete the series. And we use the Granger causality analysis to find out whether each variables has Granger causality to another or not. If there is any variable doesn't Granger causeswithe any other, then we delete it. Then, we put rest of the data into VAR model to find out the interactive structure between stock return and technical indices. Finally we compare the Granger causality and interactive structure between raw data and whiten data. And three hypotheses are set as follows.

Hypothesis I: There are Granger causality between the raw and whiten stock return and technical indices separately.

Hypothesis II: There are differences in interactive structure between the raw and whiten stock return and technical indices.

Hypothesis III: Taiwan stock market is consist with the weak-form efficiency market hypothesis.



Graph 1- Research process

4.Result

4.1Unit root test

According to the result of unit root test, all the data pass the unit root test and showing all the data are stationary time series.

4.2Granger causality compare

According to table1, we can see the Granger causality test result of both the raw data and the whiten data.And we compare they as follows:

(1) In the raw data, only W%R doesn't Granger caused by stock return. The other technical indices do Granger caused by stock return in one-way influence.

(2) In the whiten data, only BIAS doesn't Granger caused by stock return. But stock return does Granger caused by BIAS.And there are three two-way influences within, such as RSI, MACD and W%R.

(3) Clearly, there are some improvements between the whiten data and the raw data.Grey forecasting remove some noise in raw data, and make the result of Granger causality test more significant.

4.3Variance decomposition

We use AIC to choose the suitable lag automatically. And it shows 2 would be the best result. And because in the raw data, W%R doesn't pass the Granger causality test. So we remove it in VAR model. According to table2 and 3, we can see the variance decomposition result of raw data and whiten data. And we compare them as follows:

(1) In the raw data, self-explanatory ability of stock return is locate on higher than 99% except phase one. And all the other explanatory ability of technical indices are lower than 0.2%.

(2) In the whiten data, self-explanatory ability of stock return is drop down to 89% - 91% except phase one. The explanatory ability of RSI is rise up to 3.8% - 4%.And the explanatory ability of W%R is rise up to 4.8% - 6.3%.

(3) There are significant improvements between the whiten data and the raw data. Grey forecasting lower the self- explanatory ability of stock return and make the explanatory ability of RSI and W%R higher than raw data.

4.4Impulse response

According to graph 2 and 3, we can see the impulse response graph of raw data and whiten data. And we compare them as follows:

(1) In the raw data, the highest response is from stock return itself. Closing to 100%. Second one is RSI. The highest point is at the phase 3, round 3%.And then all the variables converged to 0% at phase 10.

(2) In the whiten data, the highest response is from stock return itself. But it rise up to around 125%. W%R and RSI are very closing, they both comes with similar trends. The highest point is around 28% at phase 2, higher than the raw data. Then drop down to the lowest point at phase 4. And finally converged to around 0% at phase 10.

(3) Both the raw data and whiten data come with similar trend within. But clearly, the whiten data is more progressive than the raw data.

Table 1 –result of Granger causality test

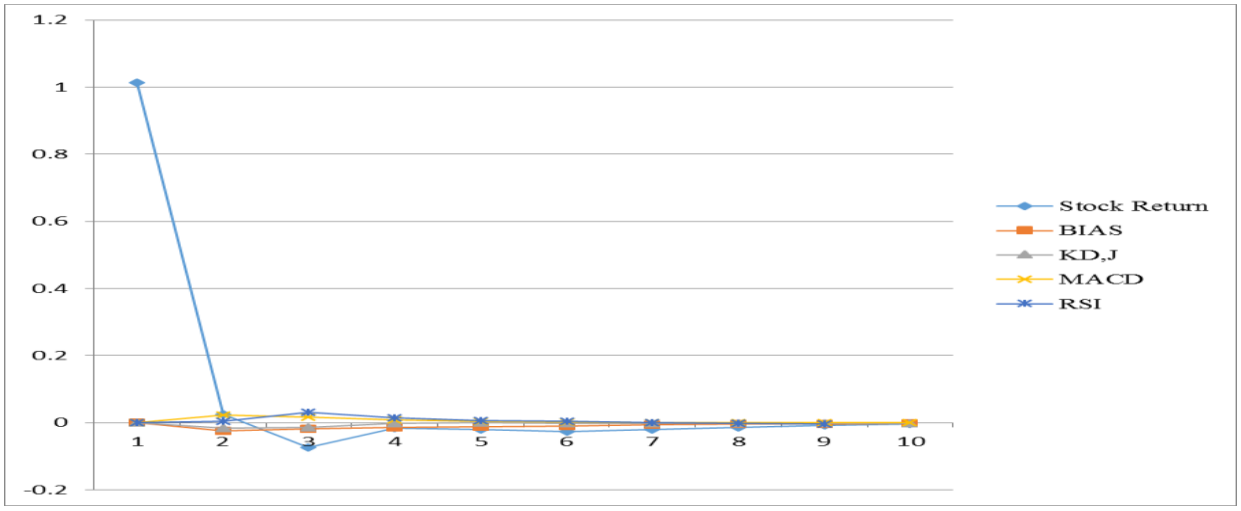
Null Hypothesis (H_0)	Raw data		Whiten data	
	F value	P value	F value	P value
KD doesn't Granger caused by Stock return	188.3690	0.000***	127.8110	0.000***
Stock return doesn't Granger caused by KD	0.5548	0.574	0.8931	0.410
RSI doesn't Granger caused by Stock return	3.2741	0.038**	2.4696	0.085*
Stock return doesn't Granger caused by RSI	0.0873	0.916	40.0658	0.000***
MACD doesn't Granger caused by Stock return	5.1044	0.006***	47.0266	0.000***
Stock return doesn't Granger caused by MACD	0.5271	0.591	14.8483	0.000***
BIAS doesn't Granger caused by Stock return	3.6843	0.025**	2.1958	0.112
Stock return doesn't Granger caused by BIAS	1.2632	0.283	22.1590	0.000***
W%R doesn't Granger caused by Stock return	1.6033	0.202	16.3926	0.000***
Stock return doesn't Granger caused by W%R	0.2394	0.787	22.7883	0.000***

Table 2 – result of Variance decomposition(raw data)

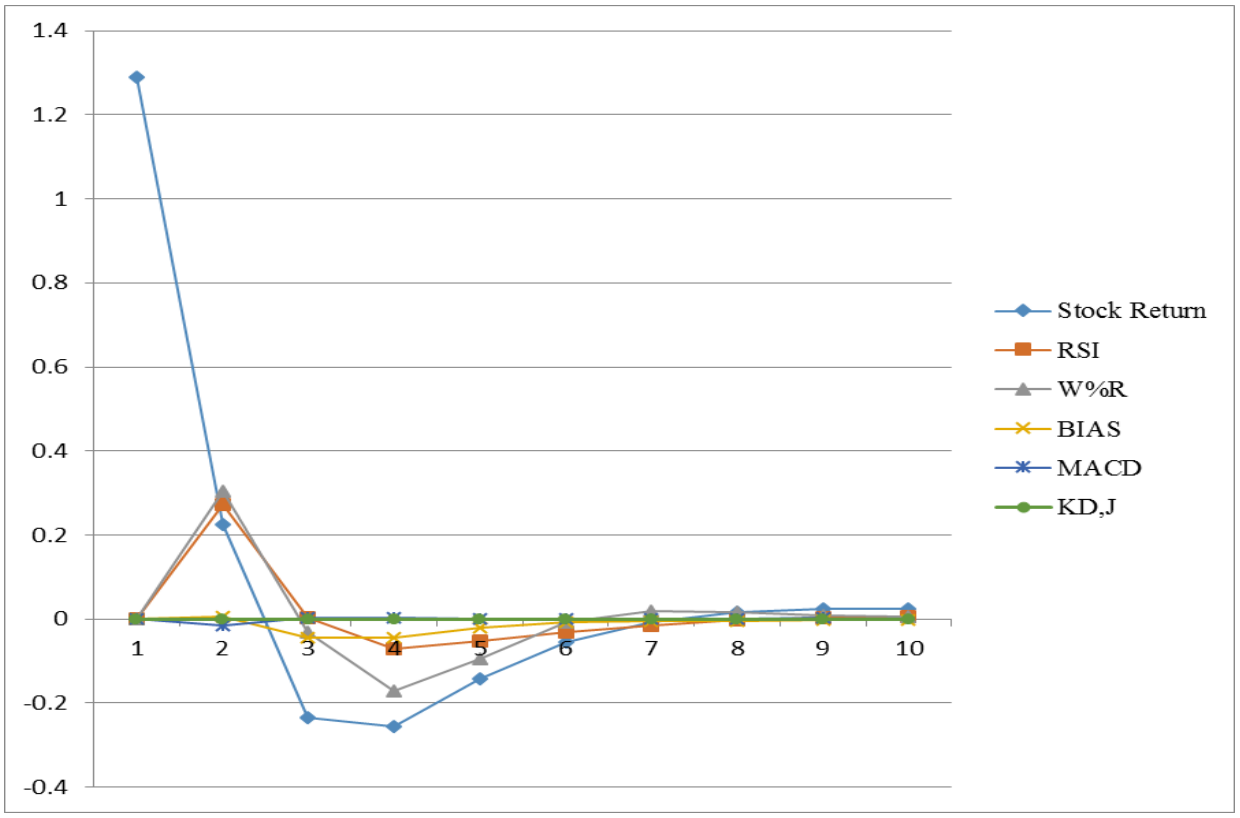
Phase	S.E.	Stock Return	BIAS	KD,J	MACD	RSI
1	1.0137	100.0000	0.0000	0.0000	0.0000	0.0000
2	1.0147	99.8659	0.0543	0.0219	0.0557	0.0022
3	1.0183	99.6895	0.0833	0.0407	0.0861	0.1004
4	1.0187	99.6396	0.1024	0.0410	0.0926	0.1244
5	1.0190	99.6195	0.1163	0.0410	0.0941	0.1292
6	1.0193	99.6097	0.1244	0.0411	0.0943	0.1306
7	1.0195	99.6053	0.1283	0.0414	0.0943	0.1307
8	1.0196	99.6031	0.1300	0.0418	0.0943	0.1308
9	1.0197	99.6012	0.1307	0.0423	0.0943	0.1316
10	1.0197	99.5992	0.1309	0.0426	0.0944	0.1329

Table 3 – result of Variance decomposition(whiten data)

Phase	S.E.	Stock Return	RSI	W%R	BIAS	MACD	KD,J
1	1.2899	100.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	1.3719	91.1028	3.9713	4.9139	0.0014	0.0105	0.0000
3	1.3928	91.2147	3.8532	4.8171	0.1045	0.0105	0.0000
4	1.4289	89.8659	3.9048	6.0221	0.1965	0.0106	0.0000
5	1.4403	89.4397	3.9715	6.3641	0.2143	0.0105	0.0000
6	1.4417	89.4108	4.0077	6.3550	0.2160	0.0104	0.0000
7	1.4419	89.3845	4.0175	6.3708	0.2167	0.0105	0.0000
8	1.4421	89.3749	4.0168	6.3803	0.2173	0.0107	0.0000
9	1.4424	89.3735	4.01630	6.3814	0.2177	0.0110	0.0000
10	1.4426	89.3733	4.01656	6.3808	0.2178	0.0114	0.0000



Graph 2- Graph of impulse response (raw data)



Graph 3- Graph of impulse response (whiten data)

5.CONCLUDING REMARKS

This paper use traditional technical indices like KD, RSI, MACD, BIAS and W%R as agency indices. We try to improve the VAR on interactive structure between technical index and stock return by using GM(1, 1), and compare with the original technical index and stock return. Using daily data of Taiwan Top 50 ETF from January 2011 to December 2015 as sample. Based on the empirical results we find:

(1) Granger causality exist both in the raw data and the whiten data. And grey forecasting enhance the Granger causality. Let whiten data shows more two-way Granger causality than the raw one.
(2) The interactive structure is more significant in the whiten data than raw data. It shows that by the help of grey forecasting, the information within stock price is clearer than before.
(3) Because of technical analysis is working in Taiwan stock market. It means Taiwan stock market is not consist with the weak-form efficiency market hypothesis.

The explanatory ability of technical indices to stock return increased significantly after using grey forecasting. It means that the accuracy of technical indices is rising after the data being whitened. Especially RSI and W%R improve the explanatory ability to stock return over 400% more. This study shows investors can use the whiten technical indices to forecast stock price better than the original technical indices.

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An Exploratory Study of Consumers' Organic Food Consumption through Storytelling

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ABSTRACT

Food safety issues led to the emergence of the organic food market. This study examines whether story types and contents related to organic food have an impact on consumer responses with storytelling perspective. Eight types of organic food stories were obtained from study 1. In study 2, not all the organic food stories had a positive impact on consumer responses, and the different stories had significantly different effects on consumer responses. In extended analysis, whether in terms quantity or influence level, storytelling is the approach that is most likely lead to greater consumer satisfaction/repurchase intention compared to promotional programs.

Keywords: *Storytelling Perspective, Story Categories, Promotional Programs, Organic Food, Consumer Response*

1.Introduction

Food safety issue has received considerable media attention over the last decade in Asia (e.g., China, Taiwan or Thailand). Meanwhile, it has raised consumer concern with regard to food production, and thus led to the growth of the organic food market (Poelman *et al.,* 2008). However, the high prices of such goods is a limiting factor to the further development of this market (Liang, 2013; Zanoli & Naspetti, 2002; Van Loo *et al.,* 2010). Therefore, both operators and scholars generally hold a cautious attitude towards the future of this market, and have attempted to evaluate the related purchasing behaviors through multi-dimensional approaches. For example, past studies used consumers as the target subjects explored their choices and preferences with regard to food production methods (organic vs. customary) (Pouta *et al.,* 2010), flavors, packaging information under the blind testing (Sester *et al.,* 2013; Silayoi and Speece, 2007), countries of origin (Cerviño, Sánchez, & Cubillo, 2005), food labelling with certification logos (Janssen & Hamm, 2012), the impact of food production processes (organic vs. standard chicken) on food quality, anticipation of flavor, and brand choices (Marian & Thøgersen, 2013).

Based on the phenomena outlined above, this study aims to find out whether storytelling has an influence on consumer behaviors in relation to the organic food market. First, however, why should consumer behaviors be discussed through a storytelling perspective? Organic food products have credence attributes (Janssen & Hamm, 2012), and consumer doubts about products are mainly due to information asymmetry. Therefore, when a story is used to connect the buyer and seller (Fog, Budtz, & Yakaboylu, 2005; Gilliam, Flaherty, & Rayburn, 2013; Polkinghorne, 1988), the use of a narrative can help to create a more memorable experience (McCabe & Foster, 2006; Mossberg, 2008), thereby enhancing consumer knowledge of organic food, and reducing the problem of information asymmetry.

In addition, a number of past studies have explored consumer behaviors through the storytelling perspective. For instance, Black and Kelley (2009) adopted the top 10 hotels in 10 major cities listed in Yahoo! Travel guides as the study samples to divide different story. Hsu, Rehung, and Woodside (2009) used a mapping method and explored the relationship between consumer behaviors and positive and negative travel blog stories. However, the related literature, based on qualitative interviews and stories on blogs (e.g., Gilliam *et al.,* 2013; Woodside & Megehee, 2009), only covers a small number of plots and specific objects (e.g., Fog *et al.,* 2005).

According to the empirical studies of storytelling mentioned above, we can understand that storytelling can be used to communicate and deliver details of business' core values in a comprehensive manner, and that such stories can become integrated in consumers' consumption activities, enabling them to explain or redesign individual organic food consumption experiences (Adamson, Pine, Van Steenhoven, & Kroupa, 2006; Denning, 2006; Olsson, Therkelsen, & Mossberg, 2013; Solnet, Kanampully, & Kralj, 2010; Woodside & Megehee, 2010). However, the related studies lack the following: (1) a simultaneous discussion of whether the operators and consumers have the same ideas about the focal stories; (2) a comparison among different story types; and (3) an examination of the impact of different story types/promotion programs on consumer responses. This study thus tries to explore the various types of stories that the businesses use to deliver the core concepts of organic food, and compares the influences of different types on consumer responses in order to address current gaps in the literature.

A number of researchers have adopted the storytelling perspective and this study thus combined qualitative interviews and quantitative questionnaires to better understand consumer responses to different types of storytelling. Therefore, this study, exploratory in nature, has the following main purposes: (1) To gain insights into whether the organic food industry uses different types of storytelling to promote its products. In Study 1, qualitative interviews were adopted with content analysis to obtain an overview of the types of storytelling in the organic food market. (2) To find out whether the different types of storytelling have different impacts on consumer response (e.g., repurchase intention). In Study 2, a questionnaire survey along with statistical analysis was adopted to examine the impact of different types of storytelling on consumer responses. (3) To examine whether the use of storytelling has a more profound influence on consumer responses compared to other marketing tools (such as promotional programs). A quantitative analysis method was thus used to compare the impact of the different storytelling types and promotional programs on consumer responses in this context.

1.1 The Definitions and Relevant Empirical Studies of Storytelling

What is storytelling? Bruner (1986) defined stories as narratives of chronological actions and results, with these constituting events, such as processes, scenarios, and statuses. The links and causal relationships among such events construct the plot of a story, and deliver its core meaning. Successful stories thus demonstrate professionalism and create a sense of reliability, which are regarded as crucial strategies in the field of marketing (Ebster & Neumayr, 2008). Shankar, Elliott, and Goulding (2001) noted that a story can help people understand the world, and that people tend to relate the stories that they hear to their own lives, a fact which can help business to comprehend how consumers construct their consumption experiences. Narratives can stay in our minds and make our lives more meaningful, and represent our backgrounds and histories (Connell, Klein, & Meyer, 2004).

Companies use storytelling in many different ways, such as to build brands, carry out advertising, and gather and retell consumer stories (Hsu *et al.*, 2009; Olsson et al., 2013). Many industries use stories to attract consumers, such as hotels, restaurants, theme parks, museums, and travel destinations (Black & Kelley, 2009; Mossberg, 2008; Woodside & Megehee, 2010). Black and Kelley (2009) found that potential customers read online stories regarding the hotel experiences of others to help make booking decisions. Olsson et al. (2013) claimed that the overall core values of a destination are communicated and conveyed through storytelling, which facilitates greater involvement in tourism activities, as well as helping to create new roles and events for destinations. Therefore, travel stories that reveal the nature of such things can lead to greater insights into what tourists do during the travel process, and their experiences at travel destinations. Woodside & Megehee (2010) stated that the perception of the visual narrative arts in relation to a destination can help tourism managers to redesign the destination experience, thus enriching the significance of stories for first-time visitors. Hsu et al. (2009) conducted a survey of tourists' experiences/stories, as well as the iconic myth implied in the first impression of a place. Solnet et al. (2010) noted that it is essential for hospitality organizations to elicit the service stories of customers concerning the interaction that occur between consumers and the situations they encounter in order to create trust and the subsequent formation of a positive image and reputation. Gilliam et al. (2013) adopted the storytelling perspective and qualitative interviews to explore the plots that occur in the stories that take place in a retail environment. The results showed that the following story dimensions included story relevance, story humor, and storytelling ability and that the key elements influenced consumers' consumption behavior.

Study 1: The Exploration of the Organic Food Market Storytelling Types

2. Research Methodology

2.1 Sampling Design

Qualitative interviews were adopted in this study to extract the various story types that are used by the organic food businesses to attract consumers, and this approach has been used in many marketing studies (e.g., Ramani & Kumar, 2008). This qualitative research method was used to carry out in-depth discussions of the design of organic food market stories and how they are currently used in Taiwan, thus gaining an insight into the related corporate concepts and beliefs (Wimmer & Dominick, 2003), a method that is also often used in tourism studies (Daugstad & Kirchengast, 2013). The top 10 organic food chain stores from the "2012 Taiwan Chain Store Yearbook" were adopted as the focal companies in this study, as well as three other companies with the longest histories of producing and retailing such goods, as recommended by members of the Association of Taiwan Organic Agriculture Promotion, in order to increase the comprehensiveness of the interviews and thus obtain a more diverse range of plots used in storytelling. Of these thirteen companies, seven agreed to take part in the interviews (as shown in Table I). Senior staff at the companies were the respondents, such as the chief executive officer (CEO), assistant manager, special assistant, or store's general manager, in accordance with the recommendations in the literature (e.g., Lytle & Timmer, 2006).

Table 1. The summary table of survey participants

Respondents	Job title	Age	Gender	Work years
A Buylocal	In-charge	41-50 years old	Male	11-15 years
B Health Biotechnology Co., Ltd.	Special assistant to the GM	41-50 years old	Male	Under 5 years
C 7net	Manager	41-50 years old	Male	11-15 years
D Uni-President Natural Corp.	CEO	51-60 years old	Male	Over 21 years
E Wheat Health Workshop	Store manager	51-60 years old	Female	Over 21 years
F Wudaohome (Sagittarius Life Science)	Assistant manager	41-50 years old	Male	11-15 years
G Fairytales Village Farm	In-charge	51-60 years old	Female	Over 21 years

2.2 The Development of Interview Questions

To investigate how various organic food vendors enable consumers to understand the core values and knowledge related to organic food through the use of stories, this study drew on the works of Vincent (2002), Fog et al. (2005), Mathews and Wacker (2008), as well as various newspapers and magazines, in order to design the questions. As a result, the following three questions were asked in the interviews: (1) What is the corporate philosophy, origin, and history of your company? (2) What is your most profound impression of a brand story and its occurrence, process, and outcome? (3) Which event or product do you think consumers were most impressed with? Why? Additionally, based on the respondents' answers, their personal experiences and views on the use of such stories were further explored. The interviews lasted for approximately 1-1.5 hours.

2.3 The Qualitative Interview Design

Each respondent was given details about the aims of this research and the related interview process before meeting with the researcher, and they were assured that their anonymity would be maintained (Veludo-de-Oliveira, Ikeda, & Campomar, 2006). The author, with 10 years of interview experience, conducted the interviews, which took place in a conference room at the respondents' companies to avoid interference and distractions. During the interviews the author first explained the research aims again. Questions were then asked to gain insights into the respondents' views on their companies' origins, corporate philosophies, and internal management practices. The respondents received vouchers worth NT$500 at the end of the interviews as a reward to their participation.

Data Analysis Process

First, the sample characteristics were examined to ensure the representativeness of the respondents' management positions in terms of number of years working in the organic food industry, department, and so on. Second, based on the results of interviews, the authors and two experts with ten years of work experience in the organic food industry designed the separation standards and defined the eight story types. Meanwhile, 225 DMs and newspaper advertisements were collected as the second source of such stories, following the suggestions of Hsu et al. (2009). Based on the contents of these 225 documents, the author and two managers in the organic food industry then separated these into the eight story types to confirm the comprehensiveness and exclusiveness of the categories used in this work. Third, the authors asked thirty organic food consumers (i.e., people who had bought organic food for at least three years) to confirm the different story types. The content analysis method was used to analyze the data, and thematic analysis method was applied to examine the content used in the interviews using systematic and objective standards (Liu & Chen, 2005; Srnka & Koeszegi, 2007). To ensure the reliability of the results, triangulation was applied, including the use of various different methods (literature reviews, interviews and documents), sources (business managers and consumers), analysts (three individuals), and theoretical -perspectives (based on content analysis and reliability) were adopted. A inter rater reliability test was conducted in accordance with the inter rater's mutual agreement and reliability formulae in Wimmer and Dominick (2003). The results showed that the mutual agreement among the three researchers regarding the story types was 0.85, and the reliability reached 0.92, which both met the related standards.

2.4 Analysis of the Results

The common story types were divided into eight categories based on the interviews, documents, and the comments of thirty organic food consumers. The first story type is "witness an illness being treated", and core value of this lies in the joy of receiving treatment. It highlights that organic products can be used to treat consumers' physical pain, and discusses the changes in them before and after using such items, which in turn triggers consumer empathy with regard to overcoming a condition disease, as exemplified by respondents E, below:

One young woman in her 30s was diagnosed with systemic lupus erythematosus. Due to her sense of inferiority, she lost her job, her husband left her, and her financial status was poor. I (respondent E) advised her to consume some organic food, and it turned out that she gradually got better after consuming just two cans of organic food. The best part is that she returned to thank me and told me the pathogen was gone. I was truly happy about it.

In the second story type the importance of personal health is stressed. The core theme of this type of story is an emphasis on personal matters, as no one can bear their own health problems, and thus a sufferer needs to take care of themselves. Respondents E, C, and D noted that:

People our age in the organic industry often tell our franchisees, members, friends, and employees during promotions what is the most important thing. Your body is all you have, not your wife or your son. This is reality, your body is the only thing you have left to worry about and take care of. If something goes wrong with your body, there is nothing others can do about it.

The third type of story is based on the idea that prevention is better than cure. The exchange of health-related information is thus very important, as it prompts consumers to focus more on their health in everyday life. Respondents B, E, F, and C noted the similar concept as follows:

Many people have found that surgery is more common, and cancer is prevalent. Because of many factors, people are often already critically ill when a disease is detected. Today a person may look fine, the next day he may get ill, and is diagnosed with terminal-stage lung cancer. At the moment, we are engaged in sharing with customers the idea that the body, in fact, needs regular care.

The fourth story type is giving reasons for high product costs, which was noted by respondents D and F. The core aim of such stories is to help consumers understand the reason for the high prices of organic products, as well as offering details of promotions or membership programs, and thus reduce negative feedback from them.

We also tell customers that high prices mean relatively higher purchase costs. Obviously, better raw materials are used and more time and effort are put in during the cultivation process. Now the question is how do organic vegetables differ from those you buy with pesticide residues? You can compare them by placing one pack of organic vegetables in your refrigerator for a week and one pack of vegetables bought from outside for a week to see which of the two rots faster. Organic plants are less likely to rot or lose moisture, thus the higher cost. Of course, being more expensive does not guarantee health, but unlike the great many unhealthy vegetables from outside, just consider it an investment.

The fifth type of story teaches consumers the right diet from a professional perspective. The core theme of such stories is that the diets most people follow are unhealthy, and thus the plots focus on the nutrition content of the organic products, in ways that consumers find convincing. Respondents A and C noted that:

Cooking in fact involves the use of less oil and water, and can be done at low heat. How do we go about doing this? Take cooking at a low heat, for instance. If you stir fry a dish at 100 degrees to make sure it is cooked, some nutrients in the food may also be destroyed. At 85 degrees, the dish will also cook, while retaining the nutrients. The same thing also applies to using less water, while using less oil can prevent excessive oil consumption, which hurts the body and can make it unhealthy.

The sixth type of story is based on the idea that "we are good friends to you, the community, and the environment". The core theme of the story lies in the creation of a head office that is interested in promoting personal health, as well as protecting the community and environment, to help consumers achieve a balance among their concerns with regard to health, work, personal life and the environment. In this way the organic food company can serve as a pioneer in terms of corporate social responsibility. These ideas expressed by respondents D, B, and F, as follows:

Some people think organic stores make a lot of money. As a matter of fact, most of them do not. When we promote our ideals that naturally form a healthy lifestyle, consumers will be drawn to us. If the Earth and environment are unhealthy, what is the point of eating healthy food? If you have to take medicine to achieve health, what is the use?

The seventh type of story emphasizes protecting the environment for future generations. Respondent A stated that the organic market is fiercely competitive, and organic cultivation is difficult to achieve compared to farming methods that use more chemicals. However, one of the aims of such work is to ensure the well-being of future generations, thus aiding rural development. Respondents C and E stated this, as follows:

Due to limited lands, the development of the organic food industry is subject to many restrictions. Because there is too much pollution around, organic certification is difficult to acquire. Why should organic agriculture and organic products be promoted? Organic cultivation is considered the best method for both society and the environment. It is one of the ways we can provide a safe environment for future generations.

The eight type of story is based on lifestyle marketing, which aims to guide consumers to make better choices (respondent A). In stories of this type, company events of all sorts that take place in rural settings are used in marketing strategies. With these stories older consumers will be able to recall their earlier lives, while younger consumers will be able to imagine living in a different way. Consumer trust and sense of recognition will thus be enhanced by learning about details of the company's actions and what it sees as important. As respondents A stated:

We do not have to tell stories by ourselves. Storytelling involves access to all processes, so that consumers can follow us to harvest and distribute vegetables on the farm. Like traditional farmhouses, once a field crop matures, all the neighbors will gather to help. Consumers will be able to experience a mutually beneficial and traditional lifestyle through the interaction (e.g., planting) process. Consumers will be led to believe we do not exist for the sole purpose of making money. Lifestyle marketing is about everyone being special, about life being great.

Study 2: The Impact Of Different Types Of Organic Food Market Storytelling On Consumer Responses

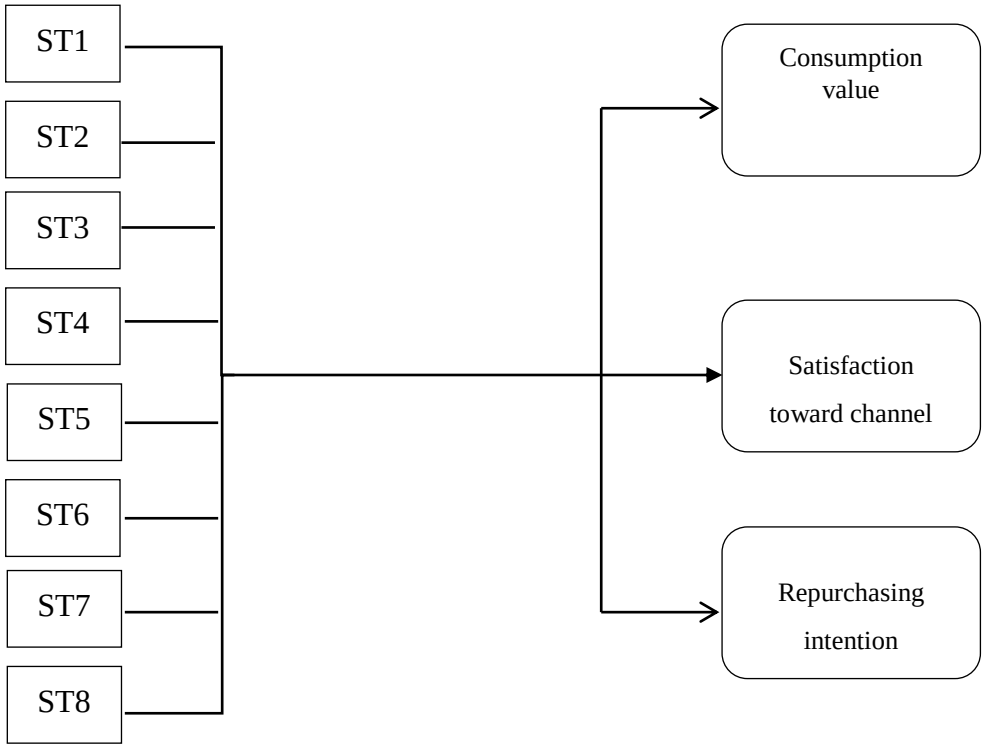
3. Research Methodology

Hypotheses Development

If a product can utilize stories successfully then this can show expertise and establish credibility, and thus foster positive customer experiences (Verhoef et al., 2009), and thus this study proposed hypotheses one, two and three based on past studies. Holbrook (1999) claimed that consumer value is an "interactive relativistic preference experience". Solomon, Marshall, and Stuart (2008) stated that that the term "value" refers to the benefits arising from the interactions between a customer and a company representative during the purchase of a product or service. Baker (2006) noted that the degree to which consumers' perceive value is based on the feelings of participation, control, and belongingness that occur in the purchase and consumption process. Based on the arguments proposed in Mossberg (2008), storytelling can be used to create extraordinary customer experiences. Eide and Lindbergt (2014) carried out a qualitative study of experience in the tourism field, and found out that different forms of storytelling can be used to create an excellent atmosphere and convey interesting messages, and thus produce various forms of value (e.g., emotional, epistemic, and identity value) in the consumption process.

Bolton and Drew (1991) stated that consumers develop emotional responses (e.g., satisfaction) after purchasing a product, which will in turn affect their post-purchase behaviors. Meanwhile, Woodside and Megehee (2009) claimed that the stories can be used to arouse the audience's emotions and energy. Gilliam et al. (2014) argued that storytelling can improve brand evaluations (Lundqvist et al., 2013), and demonstrated that specific dimensions of storytelling (e.g., storytelling ability and relevance) are positively related to consumers' intentions toward certain delivery channels (e.g., retailers). In addition, Black and Kelly (2009) stated that storytelling elements (e.g., the level of detail or tone of superiority) influence the decision whether or not to stay at a hotel for the first time, such as by motivating potential guests to learn more about the hotel or increase their desire to stay there. This study thus infers that consumer perceived value is affected by the content of the story or stories that are received during the interactive consumption process. In short, if a consumer can relate to a story, then this will enhance their perceived value, satisfaction and repurchase intention. Based on these ideas, the following hypotheses are proposed:

H1. Consumers' perceived story type has a positive impact on personal consumption value.
H2. Consumers' perceived story type has a positive impact on satisfaction toward channel
H3. Consumers' perceived story type has a positive impact on repurchasing intention.



ST1: witnessing the sick being cured; ST2: emphasis on personal health; ST3: prevention is better than a cure; ST4: explanations for the high prices of organic products; ST5: the correct diet from the perspective of food safety; ST6: I am a good friend to you, the community, and the environment; ST7: the preservation of the environment for future generations; ST8: lifestyle (rural) marketing

Fig 1. The research framework

3.1 Sampling Design

The author focused on the largest cities in Taiwan, as there are more organic consumers in metropolitan areas (Liang, 2013). Therefore, from October to November 2013 the questionnaires were distributed in Taipei City, Taichung City, and Kaohsiung City. Based on the organic store distribution list (including organic specialty stores, supermarket organic sections, and farmers' markets) compiled by the author, random sampling was conducted to select 20 locations from each of the three cities and a total of 360 questionnaires were distributed in each city (95% confidence level, with ±3% error, as the standard for the 1,080 distributed questionnaires). Based on the argument in Wu and Liang (2010), the four research assistants used the judgment sampling method and asked consumers who were about to leave after making an organic food purchase to fill out the questionnaire, offering a gift voucher worth NTD$50 as a reward for participating. Finally, after eliminating incomplete and invalid questionnaires, 351 valid copies were obtained from Taipei City, 318 from Taichung City, and 348 from Kaohsiung, giving a total of 1,017.

3.2 Questionnaire Survey Design

The questionnaire was divided into six parts, as follows: (1) Organic story types: This study defines storytelling as when a business uses a chronological series of events, such as processes, scenarios, and statuses, to describe and deliver specific messages or core concepts to consumers with regard to organic food (e.g., in relation to personal health), and thus helps consumers to understand or establish their organic food consumption experience. In addition, the author developed the eight story types based on the core concepts of organic food (as seen Appendix A), and two pilot studies were carried out to test the content validity and reliability of the scenarios. In the first pilot study the author invited ten EMBA students studying tourism to confirm the consistency between the core concepts and contents of the stories, and adjusted the sentences based on their suggestions. In the second pilot study, the author asked thirty consumers who had purchased organic food in the previous three month to read the scenarios without the core concepts. After they read each scenario the consumers then needed to answer eight questions (e.g., what core concept do you think this scenario is trying to express?). The chi-square (χ^2) test results indicated no significant difference between the scenarios and the consumer perceptions regarding the core concepts ($\chi^2<3.84$), which means the design of the core concepts and scenarios was successful. (2) Promotional programs[1]: These programs are short-term actions to increase product value (Kotler, 2003). This part had four questions, one each for the discount category, membership category, gift category, and limited time offer category (all items were answered using a five-point Likert scale, ranging from 1: highly unwilling to 5: highly willing). (3). Consumption value: Five questions were used to assess the consumers' perceived preferences for and evaluation of organic food attributes, attribute performance, and the outcomes of organic food consumption, designed with reference to Liang (2013). (4). Satisfaction: This part included five questions that examined the consumers' perceived degree of pleasure when choosing an organic food channel, such as retail store or supermarket, and these were developed with reference to Kotler (2003) and Liang (2013). (5). Repurchase intention: This part had one question that assessed the consumers' repurchase intention, designed based on Kim et al. (2013). Apart from the items on promotional programs, all dimensions were measured with a five-point Likert scale (ranging from 1: strongly disagree to 5: strongly agree). Finally, the sixth part of the questionnaire collected the respondents' demographic details, such as gender, educational attainment, age, marital status, number of years in employment, occupation, and monthly income.

[1] Based on the in-store POP, and magazines and newspapers of the top 10 chain organic distributors for the period 2013/1/1-5/1, giving a total of 225 documents, the following items were excluded: (1) discounts; (2) member discounts; (3) free shipping for purchases above a specified amount; (4) free giveaways; (5) spokespersons for organic food; and (6) store values. This research focuses on the following four categories: (1) discount promotions: products are sold in larger quantitates at lower prices than they normally would be (e.g., price, quantity, limited edition, and additional purchase price; (2) Member promotion: such as member discounts; (3) Gift promotion: gifts or buy more and get more for free, such as free giveaways, gifts for purchases reaching a specific amount, raffle draws, and buy a specific number of items and get one free; (4) limited time offers: Discounts within a limited time period, such as pre-orders, weekly/monthly discounts. After the classification, written descriptions were sent to organic food experts for them to assess. The correctness and content validity of the promotion programs were confirmed according to their expert opinions, and the interviewed experts all agreed with this type of classification.

4. Analysis of the Results

First, most of the respondents were women, accounting for 60.7% of the total, and 56.5% had a college/university degree. The largest group of respondents were aged 36-45 (31.5%), followed by those aged 26-35 (27.5%). As for marital status, the largest group were single (39.9%), closely followed by those who were married with children (37.6%). In terms of number of years in employment, more than half the respondents had worked for more than 10 years (50.1%), followed by those who had done so for less than three years (28.5%),

The measurement model assessment method proposed by Anderson and Gerbing (1988) was adopted for confirmatory factor analysis, with the results shown in Table II. The overall fit index has to be able to test different dimensions, rather than a small number of indicators, and the results were as follows, $\chi^2_{(df=149)}$=9.54, RMSEA=.09, NFI=.96, NNFI=.96, CFI=.97, IFI=.97, RFI=.96, RMR=.05, SRMR=.052, GFI=.87, thus indicating the good fit of the measurement model in this study. Fornell and Lacker (1981) stated that the standard load, Square Multiple Correlation (SMC), and errors can be used to analyze the composite reliability of the dimensions. The composite reliabilities of the dimensions in this study all exceeded 0.6, and the average variance extracted exceeded 0.5, thus indicating the good construct validity of all the dimensions (Hu and Bentler, 1999).

Table 2. Measurement model analysis results

Dimension	Item				
	Organic food consumption	Standard load	Error	CR	AVE
Story type	1. is very important in "witnessing the sick being cured".	0.61	0.63	89	.50
	2. is very important in the emphasis on personal health.	0.77	0.41		
	3. is very important in the learning and dialogue related to "prevention is better than cure".	0.75	0.44		
	4. Explanations for high organic product prices are very important.	0.62	0.6		
	5. It is very important to communicate the correct diet from the perspective of food safety.	0.75	0.43		
	6. that emphasizes "I am a good friend to you, the community, and the environment" is very important.	0.72	0.48		
	7. that emphasizes the preservation concept of future generations is very important	0.74	0.46		
	8. that emphasizes lifestyle (rural) marketing is very important.	0.69	0.52		
	Choosing organic food	Standard load	Error	CR	AVE
Consumption value	1. is an act of responsibility towards family.	0.62	0.52	.90	.64
	2. is an act of responsibility towards oneself.	0.81	0.34		
	3. enhances family happiness.	0.86	0.26		
	4. enhances self-satisfaction.	0.82	0.30		
	5. satisfies my ideals for taking care of my family.	0.82	0.33		
	I am satisfied with	Standard load	Error	CR	AVE
Satisfaction	1. the organic food knowledge provided by the channel.	0.75	0.42	.89	.62
	2. the organic food quality provided by the channel.	0.76	0.42		
	3. sales clerks in the channel.	0.81	0.36		
	4. the service quality in the channel.	0.84	0.29		
	5. Overall, I am satisfied with the channel.	0.78	0.39		

$\chi^2_{(149)}$=9.54, RMSEA=.09, NFI=.96, NNFI=.96, PNFI=.84, CFI=.97, IFI=.97, RFI=.96, RMR=.05, SRMR=.052, GFI=.87, AGFI=.84, PGFI=.68

We examined discriminant validity using a procedure suggested by Jöreskog and Sörbom (1989) and used widely by other researchers (e.g., Wu & Liang, 2011). This computation is based on a standard error of 1.96 to derive the lower and upper bounds. None of the confidence intervals obtained in this study were close to 1.0, and thus there were no problems related to discriminant validity. In addition, based on the suggestion in Fornell and Larcker (1981), we computed the average variance extracted by the indicators corresponding to each of the three factors, and compared it with the highest variance that each factor shared with the other factors in the model. The average variance extracted for each factor was always greater than the highest shared variance, as shown in Table III.

Table 3. Discriminant validity analysis

	Mean	Standard deviation	Story type	Value	Satisfaction
Story type	3.734	.753	.50[a]	.02	.02
Value	3.693	.856	.60	.66 [a]	.03
Satisfaction	3.647	.737	.56	.66	.62 [a]

a: Average variance extracted (AVE)

In addition, regression analysis was conducted using the mean values of the variables to further confirm the impact of different stories on consumer decision-making. As shown in Table IV, (1) witnessing the sick being cured (β=.14~.18), (2) personal health (β=.11~.16), (3) You are a good friend to me, the community, and the environment (β=.08~22), and (4) lifestyle marketing (β=.13~.23) all had significantly positive impacts on various consumption values. However, the reason for high organic food prices only had a significantly positive impact on "enhance family happiness" (β=.08) and "enhance personal satisfaction" (β=.10). Meanwhile, satisfaction was affected by "witnessing the sick being cured" (β=.20), "correct dietary habits" (β=.15), "lifestyle marketing" (β=.11), and "You are a good friend to me, the community, and the environment". Obviously only certain types of stories have an impact on consumer decision-making, and this will considered in more detail in the follow-up discussions, as it has significant implications for practical operations in the organic food sector.

Table 4. The regression analysis results of different story types on consumer responses

Dependent variable	Responsibility for family	Responsibility for self	Enhance family happiness	Enhance self-satisfaction	Satisfy and take care of family	Consumption value	Satisfaction
A. Witnessing the sick being cured	.15(4.4)	.14(3.9)	.15(4.2)	.17(4.9)	.16(4.5)	.18(5.3)	.20(5.9)
B. Personal health	.11(2.4)	.14(3.1)	.15(3.4)	.11(2.5)	.16(3.5)	.15(3.6)	.02(.5)
C. Prevention is better than cure	.08(.2)	-.03(-.7)	.01(.3)	.02(.4)	.03(.7)	.01(.2)	.06(1.4)
D. Reasons for high product prices	.01(.3)	-.01(-.2)	.08(2.3)	.10(2.9)	.02(.6)	.05(1.4)	.04(1.2)
E. Correct diet habit	.09(.2)	.04(1.1)	-.06(-1.5)	-.06(-1.4)	.01(.3)	-.01(-.3)	.15(3.7)
F. I am a good friend to you, your family, and the environment	.22(5.5)	.11(2.8)	.08(2.2)	.11(2.8)	.08(1.9)	.14(3.6)	.08(2.1)
G. Future generations	.01(.1)	.02(.5)	.03(.67)	.03(.5)	.02(.6)	.02(.5)	.05(1.1)
H. Lifestyle marketing	.17(4.4)	.23(6.1)	.21(5.3)	.15(3.9)	.13(3.3)	.20(5.5)	.11(2.9)
F-value	46.07	43.09	39.89	36.71	35.55	57.28	47.86
R^2	.263	.250	.236	.221	.215	.308	.271
DW	1.859	1.810	1.681	1.627	1.738	1.637	1.687

Extended Analysis: Storytelling Categories, Promotional Programs And Consumer Responses

To further compare the impact of organic food stories and promotional programs on consumer responses, the variables' mean values were adopted for the regression analysis (Table V). With regard to channel satisfaction, the explanatory power of the promotional programs was 11.2%, while the membership category (β＝.199) and the limited time offer category (β=.082) had a significantly positive impact on channel satisfaction (Model 1). The explanatory power of different stories on channel satisfaction reached 27.7%, with "witnessing the sick being cured" (β=.201) having the most positive impact on channel satisfaction, followed by "correct dietary concepts" (β=.147), "rural lifestyle marketing" (β=.108), and "You are a good friend to me, the community and the environment" (β=.084) (Model 2). When the two independent variables were taken into account at the same time, the level of consumer satisfaction that they explained with regard to the channels reached 29.8%. In addition, "witnessing the sick being cured" had the greatest impact on channel satisfaction (β=.180), followed by "correct dietary habits" (β=.128), "member category promotional activities" (β=.111), "lifestyle marketing" (β=.091), and "You are a good friend to me, the community and the environment" (β=.084) (Model 3).

As for repurchase intention, the explanatory power of promotional programs on repurchase intention reached 9.2%. The member category (β＝.143) and limited time offer category (β=.119) had significantly positive impacts on purchase intention (Model 1). The explanatory power of different stories on repurchase intention reached 20.6%, and "witnessing the sick being cured" (β=.180) had the greatest impact, followed by "rural lifestyle marketing" (β=.108), "reasons for high organic food prices: (β=.101), and "You are a good friend to me, the community and the environment " (β=.079) (Model 2). With the two independent variables taken into account at the same time, the explained consumer purchase intention reached 22.5%, with "witnessing the sick being cured" having the highest impact (β=.156), followed by "reasons for high organic food prices" (β=.106), "lifestyle marketing" (β=.091), "member category promotional programs" (β=.081), and "You are a good friend to me, the community and the environment" (β=.077) (Model 3).

Table 5. The regression analysis results of promotional activity types and story contents on consumer responses

Dependent variable	satisfaction			Repurchase intention		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
	B value (t, p)	B value (t, p)	B value (t, p)	B value (t, p)	B value (t, p)	B value (t, p)
Discount category	.060 (1.47, .14)		.002(.05, .96)	.049 (1.20, .23)		-.007 (-.17, .86)
Member category	.199 (5.05, 00)		.111(3.05, .00)	.143 (3.59, .00)		.081 (2.14, .03)
Gift category	.062 (1.44, .15)		.004 (.11, .91)	.055 (1.28, .20)		.003 (.07, .94)
Limited time offer category	.082 (2.20, .03)		.062 (1.82, .07)	.119 (3.15, .00)		.100 (2.82, .00)
A.		.201 (5.09, .00)	.180 (5.29, .00)		.180 (5.07, .00)	.156 (4.41, .00)
B.		.020 0.46, .643)	.015 (.34, .74)		.021 (.46, .65)	.017 (.37, .71)
C.		.056 (1.36, .17)	.044 (1.08, .28)		.054 (1.26, .21)	.044 (1.04, .29)
D.		.040 (1.17, .24)	.047 (1.40, .16)		.101 (2.83, .00)	.106 (2.99, .00)
E.		.147 (3.72, .00)	.128 (3.25, .00)		.062 (1.50, .14)	.044 (1.07, .28)
F.		.084 (2.14, .03)	.080 (2.05, .04)		.079 (1.96, .05)	.077 (1.96, .05)
G.		.045 (1.12, .26)	.042 (1.06, .29)		.020 (.49, .63)	.018 (.43, .66)
H.		.108 (2.89, .00)	.091(2.45, .015)		.108 (2.76, .00)	.091 (2.33, .02)
F-value	32.01	47.86	35.28	25.32	33.83	25.48
R^2	.112	.277	.298	0.09	0.206	0.225
DW	1.571	1.687	1.710	1.529	1.597	1.629

* The VIF in all the models is smaller than 5.

5. Discussion

Qualitative interviews and content analysis were adopted in this study to find the eight common story types in the organic food market. The stories all inspired consumer confidence, as well as the concepts of health and environment. These findings are similar to those of past researchers (e.g., Mathews & Wacker, 2008; Olsson *et al.*, 2013; Woodside & Megehee, 2009) who attempted to link the various events and experiences that attract consumers or convey professional food information, thereby establishing an effective sales platform. Furthermore, this study confirmed that not all organic food stories had a significant and positive impact on consumer responses. Operators should thus provide different stories plots targeting different consumer responses, such as greater consumer value and satisfaction.

Overall, story contents that are better able to project ideas about the future (such as those concerning disease prevention or future generations) will attract less consumer attention. By contrast, stories about producing instant results (such as curing an illnesses or improving personal health), related to the environment ("You are a good friend to me, the community and the environment"), or memories (life marketing) will receive greater attention from consumers. Furthermore, explaining the reason for high organic food prices will enhance the sense of family happiness and personal satisfaction. From the perspective of the fairness theory, consumers are likely to feel greater unfairness due to higher prices, which will in turn lead them to seek psychological compensation for lower levels of family happiness and personal satisfaction.

As for the impact of different types of promotional activities and stories on satisfaction towards organic channel (i.e., repurchase intention), the results show that stories the provided by distributors can help to convince customers of the benefits of organic food and increase their satisfaction/repurchase intention, thus making them functionally superior to promotional activities. In terms of quantity or influence level, why is it that such stories are best able to promote consumer satisfaction and repurchase intention? The results of this work have an important implication for organic food promotion, and this is that consumer trust in the organic food market is an issue that cannot to be ignored (Jahn, Schramm, & Spiller, 2005). Golan, Kuchler, and Mitchell (2001) also stated that consumer trust has an important position in terms of the integrity of trusted products, especially with regard to organic food. Therefore, if the stories that are told can raise consumer trust (Black & Kelley, 2009), then they can also positive influence consumer attitudes and behaviors towards the focal products (Holt, 2003). In view of this, the storytelling perspective can help increase consumer trust, and is more effective at eliciting positive responses from consumers than promotional programs, which may seem exciting in the short run, but lack long-term effectiveness.

Conclusions and Future Suggestions

The development of the organic food market in Asia has been developed from a consumer niche to the general public (Cadilhon, 2009). The question of how to construct a detailed and trusted mechanism that promotes customers' sense of satisfaction, value, and repurchase intention is thus a pressing research issue. This study explored the impact of consumer responses (such as purchases) to the stories organic food retailers tell from a storytelling perspective. From the marketing viewpoint, storytelling (Fog *et al.,* 2005) is the basis for consumers' professional knowledge of organic foods, and their insights into personal health and social care issues. Meanwhile, unlike past studies that only used qualitative analysis to discuss how stories had impacts on consumers, the current study also used a quantitative method, a questionnaire survey, to examine different story types (depth) and their impact, along with that of promotional programs (breadth) on consumer responses.

In terms of academic contributions, this study adopts the storytelling perspective to explore consumers' organic food consumption value, satisfaction towards channels, and repurchase intention. In addition to echoing the claims of Pouta et al. (2010), the use of stories helped the focal companies obtain unique marketing ability to attract consumers. Unlike studies that only adopted qualitative interviews or mapping (Hsu *et al.,* 2009; Woodside & Megehee, 2009), by using both qualitative and quantitative methods a series of organic food stories were designed to study consumer responses. However, previous scholars failed to mention whether different story plots have the same degree of impact on consumers. To make up for this deficit, this study demonstrated that consumers pay more attention to the stories with themselves (e.g., health), the story about the environment, and stories about consumers' wonderful lives in the past. Finally, compared to promotional programs, stories are better able to elicit positive feedback from consumers. Therefore, this study concludes that stories imply both corporate values and principles (Connell *et al.*, 2004), as well as the message of why the company should be trusted (Black & Kelley, 2009). Empirical studies of products with trusted features show that the use of stories can significantly reduce information asymmetry-related problems (Janssen & Hamm, 2012), and this finding can serve as the basis for marketing scholars when devising effective marketing strategies for these types of products.

Concerning this work's practical contributions, the use of limited resources to maximize benefits is the first and most important strategy in company development. In this study, a platform is provided to reach this end. The results suggests that organic food operators should try to understand their consumers' personal needs, environmental needs, and memories of their lives to develop stories that better cater to and reflect their needs. Moreover, short-term promotional plans or tools that focus only on membership systems should be minimized. In addition, in targeting urban consumers who lead hectic and stressful lives, organic food operators should create stories related to the consumption of organic foods that reduce stress or improve health, such as by promoting the daily intake of organic mixed juices or health supplements. At the same time, membership grading systems (e.g., VIP members have more membership rights and member bonuses or VIP plans for regular customers) will also contribute to increased consumer satisfaction and the maintenance of long-term relationships with customers.

This study has the following four limitations: (1) Sampling scope: The author adopted Taiwan as the location for sampling, mainly because Taiwan has long been known as "the kingdom of agriculture" due to its ecological diversity. However, Taiwan faces severe pest problems that have results in the heavy use of pesticides. These factors mean that operators from Asia can use the examples presented in this work to reflect on how to develop an organic culture and convince consumers that still have doubts about buying organic food. In the future, scholars may adopt the same research design steps and target different countries to further verify the results of this work. (2) Questionnaire questions: The organic food story dimensions were obtained through qualitative interviews and content analysis, and were then developed into questionnaire questions that are in line with the question development methods in Churchill (1979), and the reliability standards recommended by scholars (Fornell & Larcker, 1981; Hu & Bentler, 1999). Follow-up studies may refer to the recommendations of Brunsø and Grunert (2007) to compare differences in organic food story dimensions between different subjects or cultures. At the same time, the scenarios were also used to help consumers understand the story types and test the effects of these on consumer responses when they purchased organic food. The use of scenarios with a questionnaire to test consumer responses has been applied in other food-related research (e.g., Janssen & Hamm, 2012); however, future studies may adopt surveys (e.g., Dekhili, Siriex, & Cohen, 2011) or experiments to discuss the food consumption behaviors of consumers. In addition, as this exploratory research only focuses on the responses of consumers to different stories, only one question was used to measure consumer repurchase intentions through the organic channels. In the future, studies may adopt multiple questions to measure consumer repurchase intentions. (3) Sampling method: Non-random sampling was adopted to collect the respondents. Due to the possibility of sampling errors, random sampling was adopted to chose the sampling place and more samples of organic specialty stores and supermarkets were taken to reduce errors. It is suggested that follow-up studies conduct surveys through the random sampling method. (4) Variable restrictions: Only organic food stories, promotional programs, and consumer responses were discussed in this research, and thus many variables were excluded. Follow-up studies may include more diverse variables and issues, such as the relationships among organic certification marks, organic food clues (Marian & Thøgersen, 2013), consumer trust (Albersmeier, Schulze, & Spiller, 2010), and the prices that people are willing to pay for such foods (Van Loo *et al.*, 2011).

Appendix A

At the weekend you have free time to purchase organic food, and you go to the organic food store near your house to buy vegetables and fruits for the coming week. You talk with the service employees during the shopping process, and they share with you their knowledge and stories about organic foods, which they learned from other customers or during a training program.

ST1-Core concept: witnessing the sick being cured A few days ago, a customer told to service employee about his experience. This customer was sick, and because of this was fired by his company. After the employee's suggestions, the customer decided to eat organic food to improve his health. Now he is getting better, and this information is worth sharing with others.	ST2-Core concept: emphasis on personal health Nowadays people live with a lot of pressure, and this can harm their health. The service employee told me that you need to take care of your health, and that no one else can do this for you. Eating organic food is one way to do this, and not became a burden for your family.
ST3-Core concept: prevention is better than a cure Many people have bad constitutions (e.g., hyperlipidemia, hyperglycemia, and hypertension). The service employee told me how to avoid these risks, such as that by eating organic oats and organic oil I can reduce my cholesterol. The most important thing is to prevent disease by taking early action.	ST4-Core concept: explanations for the high prices of organic products Organic food is more expensive than convenience food, and sometimes, I wonder if it is worth it. The service employee told me that organic food growers do not use pesticides, chemical fertilizers or herbicides. Therefore, the farmers need to hire more workers to kill the pests, in order to keep a natural environment to grow organic food. So, of course it will be more expensive.
ST5-Core concept: the correct diet from the perspective of food safety Chinese people always cook with a lot of oil and smoke, and this is bad for your health. The service employee told me there are regular lectures about cooking, in which a professional teacher will show healthier ways to prepare food. I think that going to such lectures could help improve people's ideas about food.	ST6-Core concept: I am a good friend to you, the community, and the environment Recently there have been many media reports about unsafe food products. The service employee told me that organic food is a way that everyone in society can eat safe food, with farmers benefiting by growing and selling such products, creating a win-win situation for everyone.
ST7-Core concept: the preservation of the environment for future generations The inappropriate use of fertilizers destroys the environment by causing soil acidification. The service employee told me that organic farming can change the PH-value of the land, and encourage beneficial microorganisms to grow. By using these methods we can help keep a beautiful environment for the next generation.	ST8-Core concept: lifestyle (rural) marketing Today's lifestyles tend to be very hectic, but the rural life is slower. You can see animals everywhere in a village. The service employee told me that if you buy organic food then can support farmers in their traditional rural ways, and you can enjoy this kind of life too.

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Good Products Will Not Betray You

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ABSTRACT

Product betrayal is defined as consumers being harmed directly by the function designed to provide benefits or protection. Consumers are concerned about even a slight risk of product betrayals; therefore, they avoid choosing any kinds of products that present this risk. Betrayal aversion implies that none of products could earn consumers' trust. However, we propose that consumers' perceived quality and brand image could reduce the negative effect of product betrayal. Two experiments were conducted to test our argument. The empirical results also provide useful implication for defensing product betrayal aversion.

Keywords: *Product betrayal, Betrayal aversion, Perceived quality, Brand image*

1. Introduction

In the past, the betrayal research was usually focused on people's response to human betrayal, such as psychological contract violation (Robinson, 1996; Robinson and Wolfe Morrison, 2000), customer betrayal (Grégoire and Fisher, 2008), betrayals of trust in an organization (Elangovan and Shapiro, 1998; Reina, 2009), and salvaging a relationship that has been betrayed (Schweitzer et al., 2006). Besides, Koehler and Gershoff (2003) proposed that consumers have a likelihood of being betrayed by products. The relationship between the consumer and products is asymmetric; the consumer relies on the benefits of a product. When consumers are harmed by a product designed to protect them, they feel betrayed by the product (Gershoff and Koehler, 2011). For example, a driver is harmed by an air bag that deploys instead of by the crash.

When consumers perceive any betrayal risks of the product, even slim risk, they avoid it. This propensity is called " betrayal aversion" (Koehler and Gershoff, 2003) and aversive behavior leads consumers to make irrational decision. When the product exhibits excellent performance, even one product betrayal case could cause consumers to abandon it. For example, Koehler and Gershoff (2003) demonstrated that consumers prefer an inferior smoke detector (with 2% risk of death) to a superior one (with 1% risk of death and 0.01% betrayal risk).

Even though Gershoff and Koehler's experiments (2011) focused on safety products, their product betrayal theory implied that consumers do not trust any kinds of product; they are afraid that the product betrayal case occurs to them in the future; those negative emotions, such as anger, fear, and anxiety, lead them to make an irrational decision. However, we believe that some of specific products or brands with a slight betrayal risk still earn consumers' trusts. In other words, some characteristics or signals of a product or a brand could persuade consumers that the product betrayal case never occur to them. In this research, we proposed that two signals, perceived quality and brand image, of a product could efficiently reduce the effects of betrayal aversion. Moreover, our findings could provide useful suggestions to marketers and managers about responding to consumers' betrayal aversion.

2. Product Betrayals and Betrayal Aversion

A "betrayal" occurs when a trustee violates the mutually known pivotal expectation of the trustor (Elangovan and Shapiro, 1998; Jones and Burdette, 1994). In general, the trustor's positive expectation comes from dependence on the trustee. When the trustee betrays the trustor's expectation, it may threaten the well-being of the trustor (Koehler and Gershoff, 2003; Rousseau et al., 1998). Likewise, consumers have similar expectation for products. They expect that the product attributes could bring benefits or solve problems (Babin et al., 1994; Batra and Ahtola, 1991; Dhar and Wertenbroch, 2000). Nevertheless, the relationship between the consumer and the product is asymmetric; the consumer relies on the functions provided by the product (Koehler and Gershoff, 2003). Once consumers have been harmed by the function designed to provide the benefits, they will see the product as having betrayed them. For instance, a consumer may gain weight after consuming a diet product that is supposed to result in weight control or weight loss. That is a typical case of product betrayal.

There is a difference between "product betrayal" and "product dissatisfaction." When the product does not meet expectations, the consumer is dissatisfied with the product (Oliver, 1980, 1981). However, when the consumer is harmed by the attributes of product, he or she feels betrayed (Koehler and Gershoff, 2003). Consumers are highly sensitive to risks of product betrayals. When perceiving any possibility of a product future betrayal, however slim, consumers tend to avoid buying that product. This propensity is called "betrayal aversion" (Gershoff and Koehler, 2011; Koehler and Gershoff, 2003). Apparently, betrayal aversion leads consumers to make an irrational decision; that is, they might reject a high quality product with a slight betrayal risks, but choose a normal product without betrayal risks. Moreover, companies also suffer from consumers' irrational decision. Only one case of product betrayal, even a rumor, could change consumers' purchasing decision.

3. The Moderated Effects of Perceived Quality and Brand Image

Prior research basically assumed that consumers naturally avoid selecting the products with betrayal risks; however, we believe that a truly good product or brand could always earn consumers' trust. Processing the information about product betrayal, people rely on an automatically experiential or emotional system about risks, instead of deliberatively analytical or rational system (Chaiken and Trope, 1999; Gershoff and Koehler, 2011; Slovic et al., 2004; van Gelder et al., 2009). Indeed, anger, fear, anxiety, and resentment are similar to feelings of betrayal (Morrison and Robinson, 1997; Robinson, 1996; Robinson and Wolfe Morrison, 2000), lead people to averse the betrayal risk options (Gershoff and Koehler, 2011). In other words, people are afraid that a product will betray them in the future. Hence, eliminating the negative emotions from a potential betrayal could significantly decrease betrayal aversion behavior (Gershoff and Koehler, 2011). Therefore, we proposed that a really good product that has high quality and/or well brand image could efficiently reduce consumers' concerns of product betrayal. In other words, when consumers perceive a product with high quality or well brand image, their fear and uncertainty from future risk of betrayals would be eliminated; they believe that the product will not betray them in the future.

3.1 Perceived quality

"Perceived quality" is a consumer's judgment of a product's excellence or superiority (Zeithaml, 1988). Some scholars have suggested that perceived quality is a global assessment similar to an attitude (Bitner, 1990; Parasuraman et al., 1988; Zeithaml, 1988). As Zeithmal (1988) mentioned, perceived quality is (1)different from objective quality, (2) more abstract, (3)a global assessment, and (4)a judgment made within a consumer's evoked set. Accordingly, consumers base their perception of quality on a high level abstraction rather than on a specific product attribute.

Accordingly, while consumers perceive high quality of a product, they identified the product as excellent or superior. Because consumers usually use experiential and emotional system to consider product betrayal risk, this impression would be important information for decision-making. Specifically, high perceived quality might lead consumers to attribute slim betrayal risks to one or two specific cases; the quality of the product is still superior, reducing the concerns about fear and uncertainty for the betrayal option. We therefore posited the following hypothesis:

H1: Consumers show lower betrayal aversion to the potential betrayal product with high perceived quality than to one with average perceived quality.

3.2 Brand image

"Brand image" consists of the perceptions about a brand as reflected by the brand associations held in consumer memory (Keller, 1993). Brand image not only long has been recognized as an important concept in marketing but also plays an important role in determining the purchasing decision (Aaker, 1991; Brown and Dacin, 1997; Keller, 1993; Park et al., 1986).

There are two reasons that a good brand image could dilute the effect of betrayal aversion. First, strength brand associations usually accompany the halo effect. It might cover the drawbacks or negative rumors about the product. Second, a good brand image is hardly built in the short-term; in fact, it is the consequences of the long-run efforts (Aaker, 1991; Keller, 1993). The consumer will believe that a product with a good brand image will never betray them (Cretu and Brodie, 2007). Therefore, we propose the following hypothesis:

H2: Consumers show lower betrayal aversion to the potential betrayal product with good brand image than to one with an average brand image.

To examine our hypotheses, two experiments were conducted. The manipulation of product betrayals was based on Koehler and Gershoff's design (2003). The subjects have to evaluate the preference of two products: an inferior product with no betrayal risk, and a better product with some betrayal risk. Moreover, we used a non-safety product in the second experiment to see if product betrayal aversion was limited to safety products.

4. Experiment 1: The Effect of Perceived Quality

Experiment 1 investigated the effect of perceived quality on product betrayals. The study employed a 2 (betrayals: mere risk, no risk) x 2 (perceived quality: high, average) between-subject design. In experiment 1, we used safety product, smoke detector, as the experimental stimulus by two reasons. First, safety products are the typical product type of object betrayal (see Koehler & Gershoff, 2003; Gershoff & Koehler, 2011). Second, and more importantly, a smoke detector is not a common utilitarian product. People rarely use them. In addition, the subjects in experiment 1 were undergraduates. Most of them were unfamiliar with smoke detectors. The use of an unfamiliar product could reduce the biases of prior experience on the target product.

4.1 Process

Ninety-two undergraduates were selected from a university in northern Taiwan. They were randomly assigned to one of four conditions. In all conditions the subjects were instructed to read a short fictional scenario and then had to evaluate two smoke detectors. In high perceived quality condition, the subjects had to read a description of quality of focal products, and then answer two questions about manipulation check. The scenario in the high perceived quality condition is as follows:

ABC Company and XYZ Company both are smoke detector manufacturers. Also, both companies are the leaders in smoke detector industry. According to the third party reports, most users satisfied these two companies products. In particular, the smoke detectors of both companies are assessed as durable and reliable. Most users believe that they can be protected by ABC and XYZ smoke detectors from the damages of fire. Overall, the quality of ABC smoke detector and XYZ smoke detector are both rated "excellent."

After reading this scenario, the subjects have to answer two 7-scale questions about using experience, such as "Overall, ABC smoke detector and XYZ smoke detector are both very good products." and "Overall, the quality of ABC smoke detector and XYZ smoke detector are superior" Next, the subjects were asked to read the following scenario about product betrayals. In average quality conditions, the subjects read the following description of two smoke detectors.

You recently considered purchasing a new smoke detector for your house (smoke detector is a kind of fire detector. It could actively detect the fire occurred, and then gives alarm and starts the sprinkler). In the smoke detector industry, ABC Company and XYZ Company are the market leaders. The smoke detector of two companies not only have same price, but also have similar quality and are compatible with any security system.

A report of product performance from a third survey apparatus has indicated the performance of ABC smoke detector and XYZ smoke detector. The house with ABC smoke detector has a 1% chance of house fire. On the other hand, the house with XYZ smoke detector has a 2% chance of house fire. However, the report also indicates that some of ABC users encountered an electrical fire due to the alarm wiring (encountered collapsed ceiling from the position of smoke detector). The possibility of the additional accident of electrical fire (collapsed ceiling) is 0.01% (i.e., one case in 10,000).

After reading, all of subjects should provide their evaluation (dislike-like, unfavorable-favorable) for two smoke detectors.

4.2 Results

Manipulation check. Two 7-Likert scale items about using experience of ABC Company (1 for completely disagree, 7 for completely agree) would be examined. The results of t-test show that two check items are significantly larger than 4 (m_1=5.27, $t_{(44)}$=7.61, p<.001; m_2=5.56, $t(44)$=12.03, p<.001). The manipulation of high perceived quality was successful.

Hypothesis testing. We not only measured the evaluation of ABC smoke detector, but also the difference of evaluation between ABC and XYZ smoke detector. It could provide clearer pattern of product betrayal aversion. Therefore, we aggregated two measures of each product (α_{ABC}=.90, α_{XYZ}=.92) to represent the preference of two smoke detectors. Table 1 presents the means and standard deviation of two dependent variables.

To test hypothesis 1, we performed analysis of variance (ANOVA) to test two dependent variables. An ANOVA of preference for ABC smoke detector revealed a main effect for betrayal ($F(1,88)=11.10$, $p<.005$) and for perceived quality ($F(1,88)=3.95$, $p<.05$); there was also a significant interaction effect of betrayal and perceived quality ($F(1,88)=5.25$, $p<.05$). The following contrasts analysis showed that perceived quality has a significant effect on betrayal condition, but not on no betrayal condition. In the betrayal condition, the preference of ABC smoke detector with perceived quality ($M=4.42$) was significantly higher than average perceived quality ($M=3.50$, $F(1,88)=8.20$, $p<.005$); in the no betrayal condition, there was no difference between high perceived quality condition ($M=4.64$) and average perceived quality condition ($M=4.67$, $F(1,88) = .01$, $p=.93$).

In terms of difference between ABC smoke detector and XYZ smoke detector (DIFF), we performed the same procedures as preference for ABC smoke detector. The results of the ANOVA showed a significant effect of betrayal ($F(1,88)=4.37$, $p<.05$), a significant effect of perceived quality ($F(1,88)=4.27$, $p<.05$), and an interaction between betrayal and perceived quality ($F(1,88)=4.95$, $p<.05$). Further contrast analysis revealed that in the betrayal condition, the subjects with high perceived quality preferred the ABC smoke detector to the XYZ smoke detector ($M_{DIFF}=.17$), however, the subjects with average perceived quality preferred the XYZ smoke detector to the ABC smoke detector ($M_{DIFF}=-1.17$, $F(1,88) = 8.99$, $p<.005$). In contrast, there was no difference of DIFF between high perceived quality ($M_{DIFF}=.13$) and average perceived quality condition ($M_{DIFF}=.17$, $F(1,88) = .03$, $p=.91$) in no betrayal condition. Accordingly, H1 was supported.

Table 1. The Preference and DIFF for ABC Smoke Detectors

		Perceived quality	
		Yes	No
Preference of ABC smoke detector	Betrayals	4.42 (.90)	3.50 (1.21)
	No betrayals	4.64 (.97)	4.67 (1.20)
Difference between ABC and XYZ	Betrayals	.17(1.13)	-1.17 (1.97)
	No betrayals	.13 (.77)	.17 (1.74)

4.3 Discussion

The results of experiment 1 appear to be consistent with Koehler and Gershoff's findings (2003). The subjects prefer the higher-risk smoke detector (2% chance of house fire) to the lower-risk option (1.01% chance of house fire), when they perceived the mere betrayal risk on the product. However, when the product with slim betrayal risk has high perceived quality, subjects still showed a high preference for it. In other words, this experiment demonstrated that consumers really hate to be betrayed by products, but perceived quality could reduce the fear of future betrayal.

5. Experiment 2: Brand Image

In experiment 2, we test the effect of positive brand image on betrayal aversion and to show that product betrayal aversion occurs in a non-safety product. The experimental stimulus in experiment 2 was diet food. We believe that common products also suffer from betrayal aversion.

We did not use real brands as experiment 2 stimulus. It could prevent biases from the subjects' prior brand knowledge. Moreover, using fictional brands design could be easier to create the scenario of different level of brand image. Avoiding any associated biases of brand names, we simply use one letter (e.g., A, B, C, D, E) to represent the fictional brand names.

5.1 Procedure

Ninety-six undergraduates from two universities in north Taiwan were recruited into experiment 2 and each participant could earn the extra credit. Experiment 2 used a 2 (betrayal: yes, no) x 2 (brand image: good, average) between-subjects design. All of subjects were assigned randomly into one of four conditions.

The brand image was manipulated by hypothetical market indices to five fictional brands (Brands A-E). We did not describe which brand image was good or bad; rather, we provided several charts for the subjects (see Appendix).

In good brand image condition, we made Brand A outstanding. Brand A and Brand E were set as the target brand and the control brand, respectively. We expect that the subjects in good brand image condition could easily perceive that image of Brand A is better than others. In average brand image condition, Brand A was similar to other brands. The subjects in this condition were aware of that none of brands were stronger than the others. The subjects needed to answer two questions after reading brands information to confirm whether they recognized the difference among the brands. Next, the subjects sequentially read the scenario of product betrayal or no betrayal.

The manipulation of betrayal risk was similar to experiment 1. Subjects in experiment 2 still have to evaluate two brands of diet food (Brand A and Brand E). Brand A is superior but has betrayal risk but Brand E is inferior without betrayal risk. Between the two brands of diet food, the subjects were told that "consumer reports" indicated 1% of consumers gain weight after using Brand A and 2% of consumers gain weight after using Brand E. Moreover, the consumer report also indicated that some consumers gained weight after eating Brand A diet food (because of using another diet food simultaneously) and this additional risk is 0.01% (one chance in 10,000). Then, the subjects should evaluate both brands by answering in two questions (dislike-like).

5.2 Results

Manipulation check. We first check whether subjects perceived had different brand images pf Brands A and E. The subjects were asked to answer two 5-points scale items of brand image (1 = *strongly disagree*; 5 = *strongly agree*), such as "I think that Brand A is the leader of diet food industry" and "I think that Brand A is a great brand in diet food industry."

Two ANOVA were conducted to check the manipulation of brand condition. In the first check question, the results showed that the main effect of brand image was significant (M_{good} =4.04 vs. $M_{average}$=2.90, F(1, 92)=30.85, p<.001), but no significant effect of betrayal (F(1,92)=3.06, p=.06) and interaction effect (F(1,92)=.01, p=.90). There was a similar pattern in the second check question. ANOVA showed that the main effect of brand image was significant (M_{good} =4.26 vs. $M_{average}$=3.43, F(1, 92)=25.46, p<.001), but no effect of betrayal (F(1,92)=.10, p=.76) and interaction of brand by betrayal (F(1,92)=.01, p=.91). The manipulation of different level of brand image was confirmed.

Hypothesis testing. As with experiment 1, we aggregated two items of evaluation to represent the preference for Brand A (α=.87) and Brand E (α=.76) and examined the effect of betrayal and brand image on preference for Brand A and difference between brand A and Brand E (DIFF). The means and S.D. of preference of Brand A and DIFF are presented in table 2.

The results of ANOVA on the preference of Brand A showed a significant main effect of betrayal (F(1, 92)=9.31, p<.005) and a significant main effect of brand image (F(1,92)=19.87, p<.001), however, no significant interaction effects betrayal-by-brand image were found (F(1,92)=.09, p=.77). Additional contrast analysis revealed that in the betrayals condition, the preference for product with good brand image (M=4.62) was significantly higher than the average brand image (M=3.70, F(1,92)=10.43, p<.005). In the no betrayals condition, the results showed a similar pattern: the product with good brand image (M=5.15) was higher than the product with the average brand image (M=4.35, F(1,92)=9.45, p<.005).

Next, the results of ANOVA with DIFF indicated a significant main effect for betrayals (F(1,92)=6.50, p<.05), and brand image (F(1,92)=10.37, p<.005). However, there was no significant interaction effect between betrayals and brand image (F(1,92)=.15, p=.71). Then, the simple mean comparison showed that the DIFF for good brand image in betrayals condition (M=.00) was not significantly different from average brand image (M=-.65, F(1,92)=3.72, p=.057); on the contrary, in no betrayals condition, DIFF with good brand image (M=.67) were higher than with average brand image (M=--.15, F(1,92)=7.08, p<.05). Therefore, H2 was partially supported.

Table 2. Preference of Brand A and Difference between Brand A and Brand E

		Brand Image	
		Good	Average
Preference of Brand A	Betrayals	4.62 (.92)	3.70 (1.10)
	No betrayals	5.15 (.91)	4.35 (.96)
Difference between Brand A	Betrayals	.02 (1.16)	-.65 (.98)
and Brand E	No betrayals	.67 (1.19)	-.15 (1.13)

5.3 Discussion

Experiment 2 demonstrated that betrayal aversion occurs in non-safety products. Beside the main effect of betrayals, a simple main effect analysis also indicated that in average brand image condition, the preference of Brand A with no betrayal situation (M=4.35) was higher than with betrayal situation (M=3.70, F(1,92)=5.75, p<.05). Nevertheless, in good brand image condition, there was no difference of preference of Brand A between betrayal (M=4.62) and no betrayal (M=5.15, F(1,92)=3.70, p=.06). It also implies that a good brand image could dilute the effect of betrayal aversion.

However, comparing the difference of preference between Brand A and Brand E, only the good brand image condition DIFF with no betrayals (M=.67) was higher than betrayals (M=02, F(1,92)=4.19, p<.05). In the average brand image condition, the DIFF between no betrayals (M=-.15) and betrayals (M=-.65) was the same (F(1,92)=2.41, p=.12). In other words, the effect of betrayal aversion on average brand condition was not significant. Some possible reasons may result from the manipulation of product betrayal. In the no betrayal condition, the consequence of gaining extra weight was due to using another diet food at the same time. It may lead the subjects to associate a potential betrayal risk with Brand E, decreasing their preference of it.

6. General Discussion and Implication

Consumers are concerned with any risk of product betrayals, and are averse to products with some betrayal risks. However, betrayal aversion might lead consumers to make an irrational decision by choosing inferior products without betrayal risks and rejecting superior products with betrayal risks. Furthermore, companies that provide superior products are suffered from consumers' irrational decision as well. In this study, two experiments demonstrated that perceived quality and brand image could significantly decrease the effect of betrayal aversion. Experiment 2 also showed that product betrayal occurred with a non-safety

product. In other words, consumers can be betrayed by any kind of product.

The empirical results provide important implications for managers and marketers. First, companies need to pay attention to the issue of product betrayal. A single betrayal case might damage the company. Second, the best defense against product betrayal aversion is a high-quality product. Developing high quality strategy both increases consumers' perception of quality, but also builds a good brand image in the long-term. In addition, striving for high quality product means that the likelihood of case of product betrayal occurring is relatively low. Finally, managers and marketers should realize that the strategies of developing perceived quality and brand image really need time and effort. That is, preparing defenses against product betrayal aversion is not a short-run investment. However, once there has been a betrayal case, those investments might cover the damage for the betrayal scandal. Customers are willing to give another opportunity to the product with high quality and good brand image.

7. Limitation and Future Research

First, all of product qualities were experience or credence products; we did not examine the effect of betrayal aversion on search qualities. Consumers can understand every detail of their target products before purchasing. An information search may reduce the effect of betrayal aversion. Future searches could focus on product betrayal.

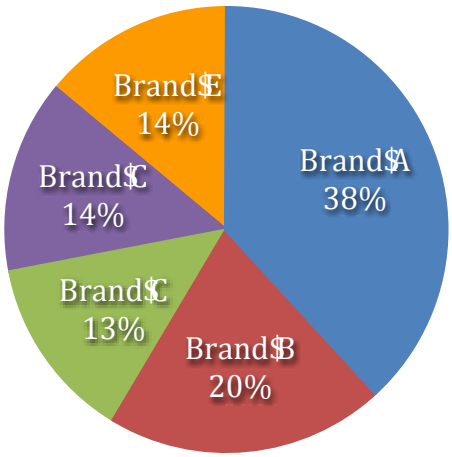
Second, this study did not discuss any short-term recoveries from product betrayal, such as discount, replacement or extra credits. Whether the short-term recoveries could make up for the losses from product betrayal and more importantly, could reduce the effect of betrayal aversion. Future research could investigate the effects of recoveries. Finally, future research could discuss whether loyal customers generate more negative emotions than normal customers when they are betrayed by the products. Loyal customers usually have more using experiences, satisfaction with and trust in the products. Once loyal customers have been betrayed by the product, their responses could be a future direction; whether they accept this betrayal or have strong negative emotions against it.

Appendix

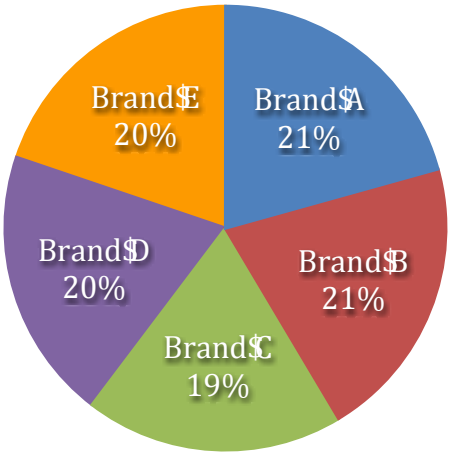
Brand manipulation in experiment 2

1. Market share

Good brand

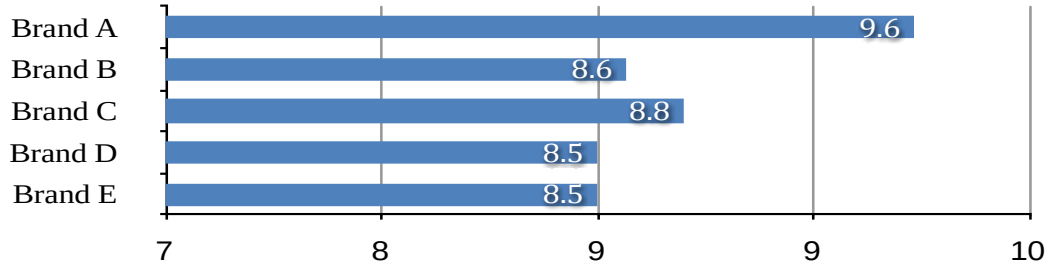


Average brand

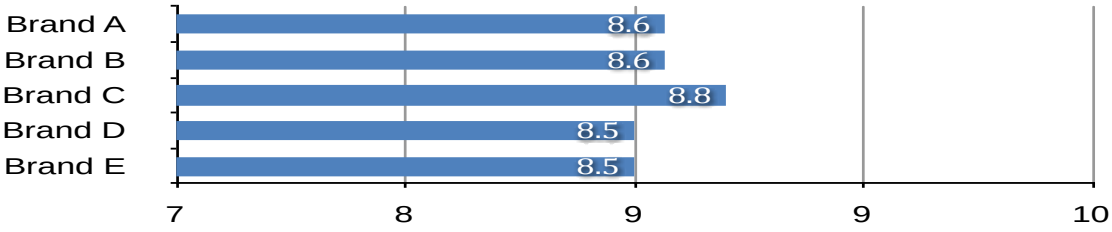


2. Service Satisfaction

Good brand

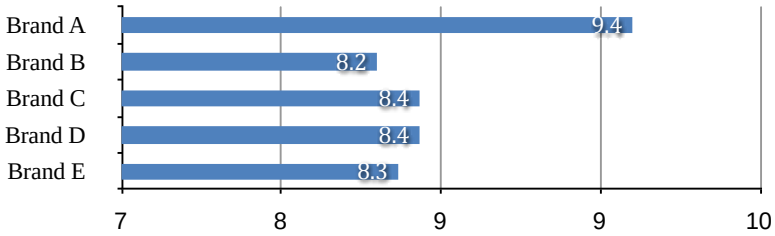


Average brand

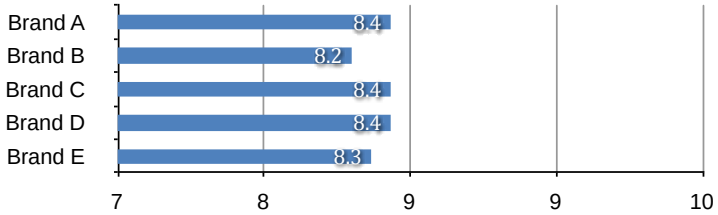


3. Satisfaction of using experience

Good brand

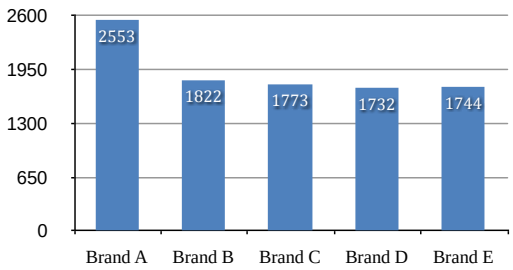


Average brand

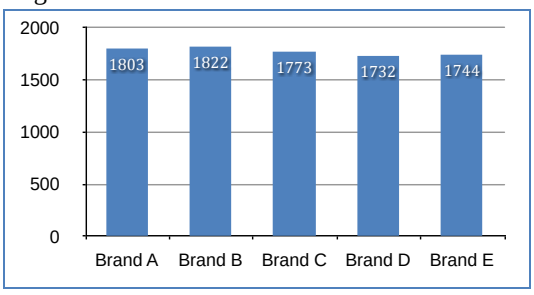


4. Consumers Vote on the Brand of Diet Food

Good Brand



Average Brand



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1. The YMC Management Review is hosted by the Young Men Business Club of R.O.C.. Articles about management, practical discussions and management cases are all welcome for submission. Three areas are especially encouraged for the paper:
   - The discussion and innovation about management thinking.
   - The discussion about practical management.
   - A case study about the management.
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3. There is a limit of 20 pages for the manuscript. Please type in a Word 2000 document or a later version. Please submit your paper to myifairs@gmail.com.
4. Once you submit your paper it will be blind reviewed by two referees. According to the international conventions, all papers published are not to be paid when your paper is accepted.
5. Your paper should contain: a topic, abstract, article, reference, and appendix. The first page should contain the author's name(s), titles, address, phone number, and e-mail address only.
6. The abstract of your submission should contain: the research topic, the purpose, methodology, and main finding. (Limited to 300 words, with only five key words at the most)

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