Foreseeable Changes and Business Adjustment:
A Case Study of the Media Sector in the Stock Exchange
of Thailand

Assoc. Prof. Pattaragit NETINIYOM, Ph.D.*

ABSTRACT

This study is a pilot study on Thai business adjustments that result from new circumstances. The empirical investigation aims to prove whether financial indicators can prove the efficiency and effectiveness of business strategy. The business cycle directly affects firms. The adjustment of environmental changes could relate to the Five Force model. Technological change is predictable for the media industry, leading to an increased threat of new entrants and substitute products.

The sample of this study is the media sector of the Stock Exchange of Thailand (SET). Multivariate analysis of panel data is applied through the Digital Economy Investment variable (DEI). DEI is defined by at least one category of the following activities; (1) investment in any fixed assets related to digital media (2) the acquisition of any companies related to technology products (3) the establishment of any digital media firm. DEI is the dummy variable that is classified as 1 if there are any transactions in these categories or 0 otherwise.

Although the model is not able to prove that DEI affects ROE, the findings confirm that for the listed companies in the media sector, the lower the debt ratio, the higher the total asset turnover and the price to earnings ratio in the media sector of the SET, the greater the wealth of shareholders, measured by ROE (Return on Equity). The model is limited to the small number of media companies as 2 companies had to be removed due to their abnormal financial figures, i.e. abnormal transactions leading to extraordinary profit or loss figures. However, the study contributes to industry structure analysis or the Five Force model from the financial perspective and the outcomes could impact the policy implications of Thailand 4.0. [ws1]

Key words: Five Force Model, Media Sector, SET, Digital Economy

*Associate Professor Doctor, Finance Department, Kasetsart University, Thailand
E-mail address: fbuspan@ku.ac.th

1. Background and Objectives

The announcement of the Thailand 4.0 national agenda focuses on a value-based economy, as the country has failed to develop beyond a middle income country. The policy aims to enhance the effectiveness and balance between the environment and society (Asian Institute Technology, 2016). The three components of Thailand 4.0 are;

Firstly, Thais need to improve their skills for a knowledge-based economy with an emphasis on research and development, science and technology, creative thinking, and innovation.

Secondly, the country will move toward an inclusive society with equitable access to the fruits of prosperity and development.

Finally, the country will focus on sustainable growth and development in order to achieve economic growth and sustainable development without destroying the environment.

To summarize Thailand 4.0, Thai economic development needs all business and people to apply modern technology to increase value.

Media businesses were amongst the most profitable between the 1980s and the 1990s. The development of technology and the emergence of smart phones accelerated the use of social media as modern media technology. The efficiency of social media is tremendous. For example, Facebook and Google can collect data on the behaviors of their clients, and they are the highest ranking in terms of media agency spending. Moreover, new media can find new customers through the linkages with existing customers, which significantly affects classical media such as print media. The instant feedback from the users of social media is also a threat to other media. In the U.S.A., the revenue of social media is expected to grow from 17.85 billion U.S. dollars in 2014 to 41 billion U.S. dollars in 2017 (www.statica.com). Moreover, the concept of content sharing lessens the cost of social media as there is no direct payment for copyright. Therefore, it is necessary for the media industry to change. Digital media have developed with the concept of lower cost and higher margins.

The objectives of the study are (1) to investigate the financial indicators of the media sector in the digital economy and, (2) to compare adjustments based on foreseeable changes in the media industry, especially in communication technology. The model is developed as an industry analysis model.

Porter (1979) proposed a framework for industry analysis based on the supply and demand analysis of individual markets in several ways. Porter proposed an industry with large numbers and homogenous competitors. The horizontal dimension is two-stage horizontal chains, each consisting of a supplier and a buyer, or three-stage chains made up of suppliers, rivals and buyers. The vertical dimension indicates potential entrants and substitutes as well as direct rivals.

Referring to Porter's industry analysis model (Porter, 1989, 1996), there are five forces in any industry. The details are summarized as follows:

1. The intensity of rivalry is the first consideration as it determines the extent to which the value created by an industry is divided amongst the players. The most valuable contribution of this issue may be its suggestion that rivalry is only one of several forces that determine industry attractiveness.

2. The threat of new entries affects the industry as both potential and existing competitors can influence average industry profitability. The barriers to new entries can take diverse forms and are used to prevent an influx of firms into an industry. Normally, entry barriers exist whenever it is difficult or not economically feasible for an outsider to replicate the incumbents' position. The most common forms of entry barrier, except for intrinsic physical or legal obstacles, are usually the scale and the investment required to enter an industry as an efficient competitor.

3. The threat of substitutes affects an industry's profitability. The comparison could measure the relative price-to-performance ratios of the different types of product or service to which customers can turn to satisfy the same basic need. The threat of substitution is also affected by switching costs – that is, the costs in areas such as retraining, retooling and redesigning that are incurred when a customer switches to a different type of product or service. The substitution process follows an S-shape curve. It starts slowly as a few trend-setters risk experimenting with the substitute, picks up steam if other customers follow suit, and finally levels off when nearly all the economical substitution possibilities have been exhausted.

4. The bargaining power of buyers is one of the two horizontal forces that influence the appropriation of the value created by an industry. The most important determinants of buyer power are the size and the concentration of customers. Other factors are the extent to which the buyers are informed, and the concentration or differentiation of the competitors. It is often useful to distinguish potential buyer power from the buyer's willingness or incentive to use that power.

5. The bargaining power of a supplier is the mirror image of buyer power. As a result, the analysis of supplier power typically focuses on (1) the relative size and concentration of suppliers relative to industry participants and, (2) the degree of differentiation in the inputs supplied. The ability to charge customers different prices in line with differences in the value created for each of those buyers usually indicates that the market is characterized by high supplier power and, at the same time, by low buyer power.

Porter's arguments about the new economy (Porter, 2001) provide a useful starting point in the analysis of the environment in a rapidly changing world. According to Porter *"internet technology provides buyers with easier access to information about products and suppliers, thus bolstering buyer bargaining power".* The fact that buyers have access to information regarding products and suppliers does not mean that they will receive the product on time and in proper condition. Information about products does not prevent customers from buying useless things or products that do not meet their needs. The capability of shops to provide consulting services can ensure additional safety for their customers and thus impairs the shops' bargaining power.

Porter argued (Porter, 2001), *"the internet reduces the barriers to entry".* This argument can be true; however, the major cost centers which determine the level of barriers to entry are the same as for physical products. According to Shapiro and Varian (1998), informational products such as software are costly to produce at first, but cheap to reproduce, and have a high fixed cost and a low marginal cost. This means that the barriers to entry are higher for companies that produce informational products.

Porter (2001) also indicated the threat of substitute products, stating that *"by enabling new approaches to meeting needs and performing functions, it creates new substitutes".* Substitute proliferation is the outcome of distorted market signals. If a company is able to raise capital without having to demonstrate the customer's intention to pay for the product it produces, this would cause the production of a great magnitude of substitutes. On the other hand, when a need is fulfilled with a number of products, there is no real marginal cost to produce substitutes. In this case, the existence of substitutes makes no difference to the market structure.

Porter (2001) expressed the opinion about the digital economy that *"internet technologies tend to reduce variable costs and tilt cost structures toward fixed costs, creating significantly greater pressure for companies to engage in destructive price competition".* When a company produces physical products, variable costs are significant in

proportion to fixed costs. The internet can reduce all the unnecessary costs that burden the product cost, which the consumer is not willing to pay for. On the other hand, for informational products, the reproduction cost is at zero. It is not the internet that decreases the reproduction cost of informational products to zero, but the nature of the products.

Porter, when discussing industry structure in the new era, reached the conclusion that *"the great paradox of the internet is that its very benefits – making information widely available; reducing the difficulty of purchasing, marketing, and distribution; allowing buyers and sellers to find and transact business with one another more easily – also make it more difficult for companies to capture those benefits".* Porter's view seems logical and justifiable; however, an established sales force or other professionals inside a company is still very much needed. Not all difficult questions can be answered through the internet. The information flow through the internet tends not only to answer questions, but to raise them as well. Human contact seems important in problematic situations; the internet is not very capable of providing customers with professional opinions (Hallowell, 2001). The creation of true economic value is the final arbiter of business success (Porter, 2001).

One argument that Porter invoked is that (Porter, 2001) *"… the openness of the internet makes it difficult for a single company to capture the benefits of the network effect. To have network effects, it is needed to have a critical mass of customers. Network effect is a self-limiting mechanism and after meeting the needs of a great magnitude of customers, it becomes less effective in meeting the needs of the remaining customers in the market. Finally the experience curve advantage proved disastrous in many industries."*

Porter (2001), also said that *"as partnering proliferates within the internet, companies tend to become more alike, which heats up rivalry. Companies, instead of focusing on their own strategic goals, are forced to balance the many potentially conflicting objectives of their partners while educating them about their business. Rivalry often becomes more unstable, and since producers of complements can be potential competitors, the threat of entry increases."* It may be true that the vertical integration of companies is less favorable nowadays, especially for companies that produce and sell informational products. The ease to search, coordinate, contract and transact enables companies to have a greater number of potential suppliers. Suppliers know that there are other specialized suppliers around the world who are keen to replace them. Companies do not have high switching costs, so they can exert pressure and finally reduce the bargaining power of suppliers. In this partnering business model, the crucial point for each company is to find out what their respective core competencies are and let the partners do the rest.

New technologies trigger rampant experimentation by both companies and customers, and the experimentation is often economically unsustainable (Porter, 2001). As a result, market behavior is distorted, giving an upward trend to market prices.

Before the advent of the internet, every industry consisted of a physical part and an informational set. In this period, the industry constraints were the high cost of communicating, gathering and processing information, and accomplishing transactions. Expensive customized informational systems were needed for this period. That is precisely why many pre-existing industries had difficulties in expanding and gaining value (Maitra, 1996)

The use of the internet has not changed basic economic laws but has changed the way the world does business, which is the way that information is digitalized, packaged and transferred (Evans and Wurster, 1997). Established companies that produced and merchandised physical products managed to digitize the information that is valuable to the consumer and use the internet to transfer it. This digitization not only produced more value for the consumer, but also decreased costs for the company. These types of company should stop deploying the internet on a stand-alone basis but use it instead to enhance the distinctiveness of their strategies.

On the other hand, companies that produce and merchandize products that could be digitalized (CDs, movies, books, newspapers, etc.) are in a different position. They have difficulties in creating and acquiring the economic value that information has. The economics of information are quite different from the economics of physical products that customers are accustomed to (Whipple, 1999). The cost of producing informational products is structured in a different way. Information is costly to produce but cheap to reproduce. It contains high fixed cost but low marginal cost.

Informational products are also empirical products, which means that the customer has to use them in order to understand their value and finally buy them (Shapiro and Varian, 1998); for example, when buying music (CD, mp3, etc.), listening to the songs leads to the decision to purchase. Thus, the digital economy has drawbacks in creating economic value as the value chain has to be widened to encompass other activities besides those conducted over the internet, or to develop other assets, including physical ones. As a result, dot–com companies should focus on creating benefits that customers will pay for, rather than pursuing advertising and click–through revenues from third parties.

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Moreover, by using the internet, manufacturers can sell directly to customers and provide customer support online. In this sense, traditional intermediaries are eliminated. This new phenomenon is called *"dis–intermediation"*. However, by using new technology, intermediaries regain value; they are transformed into electronic intermediaries and participate in a new phenomenon called *"reintermediation"*. These new intermediaries add value to products, increasing the difficulty of purchasing, marketing, and distribution, and making it easier for companies to capture some additional benefits (Turban et al., 2000).

The literature review encourages the development of this study. The conceptual model is shown in Figure 1. Porter (2001) suggested that the change of industry structure and the adjustment of business strategy are necessary for a business to exist. Thus, the media sector of the Stock Exchange of Thailand should observe the trends in developed countries. There are foreseeable threats to the classical media business i.e. hard copy printing or analog broadcast. The financial indicator – Digital Economy Investment – should be investigated with regard to the reaction of firms ahead of events.
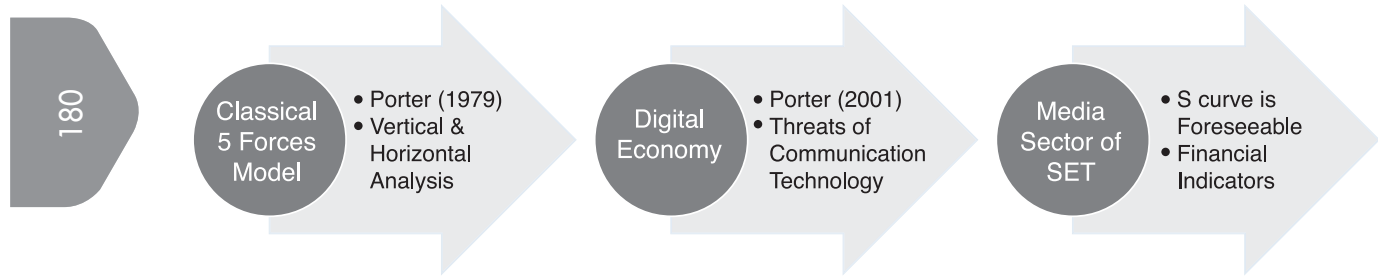
Classical 5 Forces Model
- Porter (1979)
- Vertical & Horizontal Analysis

Digital Economy
- Porter (2001)
- Threats of Communication Technology

Media Sector of SET
- S curve is Foreseeable
- Financial Indicators

Figure 1: Conceptual model

Thus, the research proposal is that the investment in the digital economy would increase shareholders' wealth through the shareholders' return on equity (ROE).

2. Research Methods

The sample data are collected from quarterly financial statements on the media sector of the Stock Exchange of Thailand (SET). There are in total 25 firms in the sample, whose businesses are diverse, including newspapers, television, sports entertainment, golf club services, advertising, public relations, creative out-of-home media solutions ranging from billboards, street furniture, transit, ambient advertising to made-to-order jobs. The quantitative variables are collated from quarterly financial statements from 2010 to 2015, in total 23 quarters. The observations of negative figures for net income are not excluded while the qualitative variable, DEI – Digital Economy Investment – is evaluated based on financial statement notes. However, two companies had to be removed from the sample as there were abnormal figures due to extraordinary transactions leading to extreme profit and loss figures.

To develop the model, the study applies the multicollinearity test with a Variance Inflation Factor (VIF). If the correlation value is greater than 0.8, only the most theoretically related variables are retained.

The model is tested for the stationary effect between random effects and fixed effects through the Hausman Test to obtain the most powerful model prediction. The observation of Durbin-Watson statistics is for autocorrelation with the Breusch-Godfrey Lagrange multiplier test (LM test), which is also applied. The test of heteroskedasticity in this study is White's Test where the p-value of Obs*R-squared is greater than 0.05.

3. Results

The outcome of the model is developed on the variables with stationarity after transforming to log variables. The definitions and expected signs of the variables in this paper are shown in Table 1.

Table 1: Variable Definitions and expected sign

Variable	Definition	Reference and Explanation	Expected Sign
ROE	The ratio of net profit to total equity that is collected from quarterly financial statements.	ROE is the dependent variable in this model.	
DE	The ratio of total debt to total equity that is collected from quarterly financial statements.	The sign of DE on the ROE is expected to be negative as higher debt usage would lessen shareholder wealth (Modigliani and Miller, 1963)	-
TAT	The ratio of total revenue to total assets that is collected from quarterly financial statements.	The sign of TAT is expected to be positive as higher asset usage would lead to higher ROE (Easley and O'hara, 2004)	+
DEI	DEI is defined on at least one category of these activities; (1) the investment in any fixed assets related to digital media (2) the acquisition of any companies related to technology products (3) the establishment of any digital media firms.	The sign of DEI on the ROE in the media sector is expected to be negative as higher Digital Economy Investment would lead to higher expense in the current period, which lowers the ROE (Larcker, 1983)	-
PE	The ratio of share closing price to earnings per share i.e. the calculation of net profit divided by the number of shares outstanding.	The sign of PE on the ROE is expected to be positive as PE reflects future expectations (Bannister et al.,1997)	+

3.1 Formula and Equation

$$ROE = \beta_0 + \beta_1 DE_{i,t} + \beta_2 TAT_{i,t} + \beta_3 DEI_{i,t} + \beta_4 PE_{i,t} \tag{1}$$

Equation (1) describes the forecasting power of the effects of Digital Economy Investment. The model is a development of the Five Forces model for the new era. Environment changes in the media sector are foreseeable.

Bannister et al. (1997) found that ROE and PE are significantly positive under an executive compensation plan. Larcker (1983) revealed that when there is a profitable project, capital expenditure would lead to higher performance, which is supported by the study of Easley and O'hara (2004) . Thus, the variables TAT and DEI are expected to be positive for ROE. Modigliani and Miller (1963) proposed that the valuation of a firm would decrease when the level of debt is greater than the optimal level. Thus, the DE variable has a negative effect on the ROE.

Normally, the media sector is classified as a service industry, so investment in fixed assets is small. The DEI and TAT in this study are assumed to support the return to shareholders because investment in new assets on DEI could generate income in the short term. The PE variable is the control variable because of investor behavior.

3.2 Tables

Table 2: Descriptive Statistics of Variables

Variables	Mean	Std. Dev.	Max	Min
ROE	4.12	24.41	75.71	-34.12
DE	1.44	4.24	81.22	0.02
TAT	0.75	0.40	3.54	0.018
DEI	0.39	0.44	1.00	0.00
PE	-327	5414.72	189	-231
Total Observation	452	452	452	452

ROE is the ratio of net profit to total equity that is collected from quarterly financial statements; DE is the ratio of total debt to total equity that is collected from quarterly financial statements; TAT is the ratio of total revenue to total assets that is collected from quarterly financial statements; DEI is defined on at least one category of the following activities; (1) investment in any fixed assets related to digital media (2) the acquisition of any companies related to technology products (3) the establishment of any digital media firms; PE is the ratio of the closing price of a share to earnings per share i.e. the calculation of net profit is divided by the number of outstanding shares.

The total sample of the study for the media companies from SET and MAI has to be downsized from 575 observations to 452 due to the outliers. The extraordinary financial figures lead to the extreme figures of the variables.

Table 2 shows the descriptive statistics of the sample. As the businesses in the media sector are greatly diversified, ranging from hard copy journalism, e.g. newspapers, to digital media such as online game providers, the standard deviation figure of the PE variable is high. This is because of the diversity of businesses in the media sector, which leads to significant differences in terms of profit margin. The media sector includes both classical and modern media, so the average ROE variable is quite low compared with other industries.

Table 3: Correlation matrix of the variables

Correlation	ROE	lnDE	lnTAT	DEI	PE
ROE	1.00000	-0.34142	0.06117	0.11614	0.00423
lnDE	-0.34142	1.00000	-0.04116	0.03062	0.01076
lnTAT	0.06117	-0.04116	1.00000	0.04272	0.06180
DEI	0.11614	0.03062	0.04272	1.00000	0.03111
PE	0.00423	0.01076	0.06180	0.03111	1.00000

ROE is the ratio of net profit to total equity that is collected from quarterly financial statements: lnDE is the natural logarithm ratio of total debt to total equity that is collected from quarterly financial statements: lnTAT is the the natural logarithm ratio of total revenue to total asset that is collected from quarterly financial statements: DEI is defined in at least one category of these activities; (1) investment in any fixed assets related to digital media (2) the acquisition of any companies related to technology products (3) the establishment of any digital media firms: PE is the ratio of share closing price to earnings per share i.e. the calculation of net profit divided by the number of shares outstanding.

Table 3 presents the correlation of variables that pass the asymptotic test of multivariate regression. There are no significant correlations between the variables with the maximum correlation figure between the variables at -0.34142. The VIF figures also show no threats of a multicollinearity problem as no VIF figure is greater than 5.47.

Table 4: Model Outcomes

Dependent Variable: ROE
Method: Panel Least Squares

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-22.52484	14.62172	-1.024883	0.3074
lnDE	-5.031378	0.255997	-2.947816	0.0038*
lnTAT	5.031378	2.827709	2.399729	0.0167*
DEI	3.181904	3.567230	0.891982	0.3728
PE	0.097855	0.035513	2.755436	0.0064*
R-squared	0.248036	Durbin-Watson stat		1.846532
Adjusted R-squared	0.230789			

ROE is the ratio of net profit to total equity that is collected from quarterly financial statements: lnDE is the natural logarithm ratio of total debt to total equity that is collected from quarterly financial statements: lnTAT is the the natural logarithm ratio of total revenue to total asset that is collected from quarterly financial statements: DEI is defined in at least one category of these activities; (1) investment in any fixed assets related to digital media (2) the acquisition of any companies related to technology products (3) the establishment of any digital media firms: PE is the ratio of share closing price to earnings per share i.e. the calculation of net profit divided by the number of shares outstanding.

The outcomes with p-values less than 5% from Table 4 are summarized and discussed. The [s2] outcomes of the analysis imply that for the media sector on the SET, the observation could summarize their effects on the valuation of shareholders through the return on equity (ROE) as follows:

1. The usage of debt could lead to lower return on equity although the cost of debt is lower than the cost of capital (Raheel and Chen, 2016). However, the Earnings per Share (EPS) for the media sector is average but negative [s3] . This implies that the companies could not gain a sufficient return to cover the cost of debt. Thus, the greater the debt usage, the greater the probability of a loss, leading to lower ROE.

2. The total asset turnover increase leads to higher ROE. The descriptive statistics show the mean value of TAT is 0.75. This result was expected as most companies in the media sector invest small amounts on new business or technology so their profit margin is slim. Thus, the companies with greater margins (higher TAT) would lead to higher ROE.

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3. The outcome of PE variable complies with theoretical expectations. The price to earnings ratio (PE) is a guide to higher ROE. This could explain investor behavior as investors prefer higher premiums when they expect more ROE (Narendra, 2016).

4. Although the DEI statistic is not significant as its mean value is only 0.39, it could imply that the investment in the digital economy for the media sector is too lagged compared with foreign companies.

4. Conclusion and Policy Implication

Industry structure analysis is one of the most employed practices in from business theory. The product life cycle normally moves from developed country markets to developing country markets. The rapid change of telecommunication technology follows Moore's law, which significantly threatens the media sector. The wide spread of social media brings a new era of the *"Digital Economy"*. Investment in new business could envigorate the diminishing hard copy or analog business.

Thailand has been classified as a middle income country for decades. The national agenda of Thailand 4.0 aims on creating a value-based economy. Technology plays an important role in the changes. The growth of e-commerce businesses with no country boundaries would directly affect the Thai media industry. The limitations of variables obtained from financial statements relating to research and development expenditure hinders the empirical investigation of this issue. The employment of public funds to support Thailand 4.0 must be carefully considered. Only the talent of specific sectors that have great potential to gain ahe market share, not only in the local market, should be considered.

The financial indicators were obtained from quarterly financial statements from 2010 to 2013 with 452 observations. It is uncertain whether these measures can prove the efficiency and effectiveness of business strategy. Businesses need to update themselves on time, with reference to the Five Force model. New technological change is foreseeable for the media industry, which may lead to the increasing threat of new entrants and substitute products.

In this paper, the DEI is defined in at least one category of these activities; (1) investment on any fixed assets related to digital media (2) the acquisition of any companies related to technology products (3) the establishment of any digital media firms. The DEI is the dummy variable that is classified as 1 if there are transactions in these categories or 0

otherwise. The average value of DEI at 0.39 implies that investment in the digital economy is underestimated. However, the dichotomous variable of DEI is limited to quantify the amount of money that is invested in the digital economy. Thai financial statement standards do not require figures for research or technology investment so the data are unavailable.

The model is not able to clarify whether DEI affects the ROE. The explanation could be only true for the small number of media companies on the SET during the short period of data collection.

A repeat study covering a longer time period would be a challenge, and further application of the Five Force model would add to the field of study.

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