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by Sulastri Sulastri

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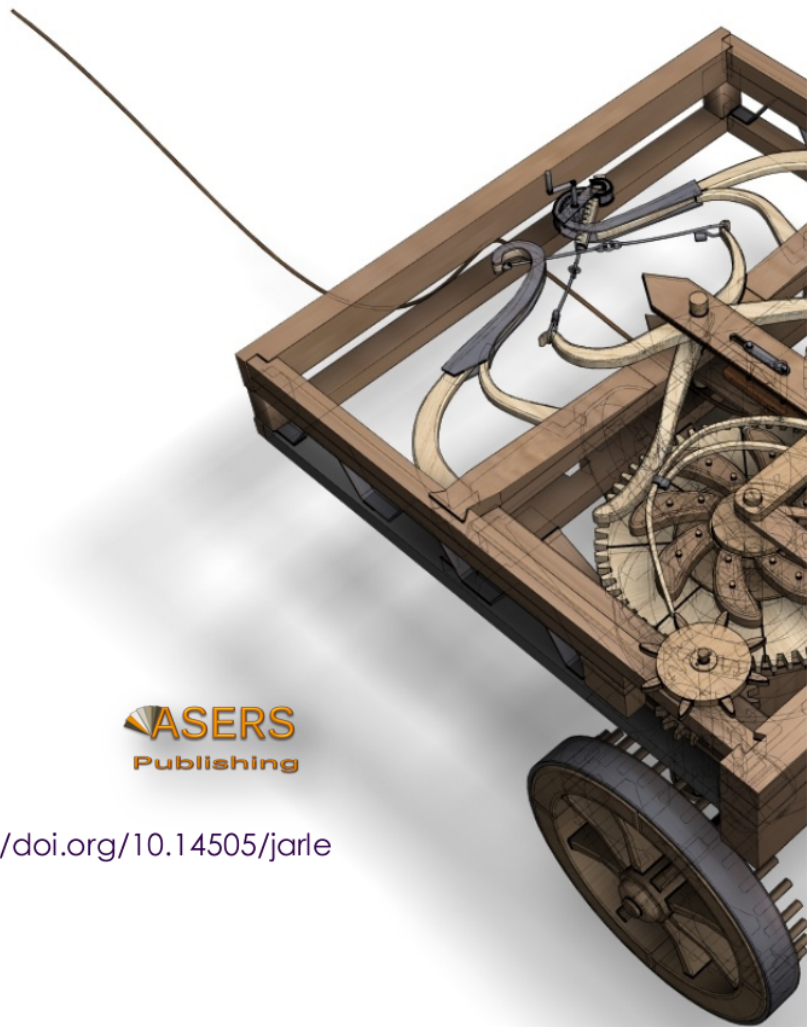
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Diversification: Complementary Assets and Super Additive Synergy

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Abstract

Diversification is a strategy choice at the corporate level for a variety of reasons, including the benefits of economies of scope or the exploitation of complementary assets synergies. Although the two concepts of economies of scope and synergy are different constructs, it will ultimately lead to how diversification through complementary assets that can create value. Empirical testing has been done with the event study method using 117 manufacturing companies listed in Indonesia Stock Exchange to answer how the availability of financial assets and operations before diversification is invested during the diversification and its impact on performance after diversification. The result of the test using the structural equation method after satisfying the assumption of goodness of fit measurement parsimony, proves that the use of complementary assets at the time of diversification creates no value, with the synergy sensitivity value <1 for leverage, retained earning and replacement cost of investment and still contributes negatively on profitability one year after diversification.

Keywords: diversification; complementary assets; synergy.

JEL Classification: G10; G30.

Introduction

Many literatures have mentioned that the diversification strategy is a business evolution to maintain, grow and develop in competitive environment (Ansoff 1965; Chandler 1962; Rumelt 1974; Prahalad and Hamel 1990; Peteraf 1993; Eisenhardt and Martin 2000; Winter 2003; Barney 2001; Gomez-Meija *et al.* (2011); Knecht and Diversifi 2014; Case and Crops 2015; Johnson 2016). Two main concepts in diversification strategy are synergy exploitation and economies of scope in which these two concepts are always overlapping to one another. Many studies point out that these concepts are different constructs as economies of scope is cost reduction mechanism (Zenger and Huang 2015; Bruder 2009; Wiliamson 1989), while synergy is super-additive or sub-additive concept

(Mikael Lindeberg, KlasHjort 2009; Damodaran, Aswath 2005; Foss and Iversen 1997) also mentions that synergy is represented with the increase in revenue and reduction in investment, while economies of scope focuses on production cost reduction, which show the differences in the two concepts.

Economies of scope that has been mentioned in theory of firm (Williamson 1989; Zenger and Huang 2015; Ansoff 1965, 1988) refers to average production cost reduction as the result of the increase of new products or new businesses. Meanwhile, other literatures mention that synergy is a result of joint effect (Ansoff 1965, 1988; Hofer and Schendels 1978: 25) that causes cost reduction that can be exploited through sales synergy, operation synergy, investment synergy and managerial synergy (Ansoff 1965: 80; Rumelt 1974). Barney (2012) states that synergy could be exploited by the company through diversification strategy in which categorizes operational of scope and financial of scope (Barney 2012; Hill 2015). Operational synergy could be done through excess capacity, internal market, anti competitive strategies and operational costs of risk. Meanwhile, financial synergy could be done through internal capital allocation and risk reduction as well as tax advantage (Barney 2001, 2012).

If economies of scope gives cost reduction with resulting in cost advantage due to joint effect or joint cost, therefore, it can be written as $C(a,b) < C(a) + C(b)$ (Mikael 2009; Teece 1982; and Rumelt, Schendel and Teece 1994). Moreover, potential synergies can also occur through sharing activities and transferring core competencies as complementary resources called strategic fit. It is possible that marginal revenue is greater than marginal cost so as to generate increasing value, therefore the potential for synergies can be formulated as $(ROI)(a, b) > (ROI)(a) + (ROI)(b)$, in which, synergy is not only a source of cost advantage but also as a source of distinctive advantage, especially derived from strategic assets synergy (Barney, Masterly, William 2012; McNamara 2012; Markides and Williamson 1994; Holcomb, Holmes 2006; Mikael 2009; Markides and Willimason 1994) have also introduced dynamic synergy as a corporate competence by building new assets with strategic fit for sustainable resource growth opportunities, it also distinguishes between static synergy and dynamic synergy with respect to the sharing assets of competencies and accumulated new assets.

Our study places synergy concept in both tangible asset complementary and intangible asset complementary that gives joint effect that resulting in sub-additive and super-additive as an indicator of value creation. Economically, complementary resources will increase higher return (Markides and Williamson 1994). However, only a handful of literatures that focus on how synergy exploitation of complementary asset is done through diversification that results in superadditive return ($1+1>2$) as complementary resources (Weiss 2016). Bertin *et al.* (2015) mentions that diversification strategy does not create value however, many studies show that synergy exploitation as the source of competitive advantage (Beneer, Tushman 2003; Teece, Pisano, Suen 1997), such as sharing cost of innovation, reducing time-to-market with external partners (Sabidussi 2014; Hynes, Mollenkopf 2008) can create value. Moreover, Upadhyayula (2015) points out the difference performance of diversification based on firm's size. This result is inline with Benito *et al.* (2012) that value creation through diversification is based on the environment and time period.

The framework of this study is started with an assumption that a company that develops new business as a form of diversification needs a big amount of investment that can be used as fixed asset and working capital as well as cash flow. Investment activity will need financing from debt (financing cash flow), retained earnings (operating cash flow) and replacement cost (investing cash flow). Therefore, this study tries to investigate empirically how complementary asset sources such as, debt, retained earnings and replacement cost as diversification financing sources is allocated in form of assets, working capital and cash flow as well as its effect on profitability. This study also tries to find out whether diversification strategy able to produce synergy from asset improvement and asset accumulation as a process of asset complementary in causing the effect of synergy in form of profitability. The source of synergy may be from financial (leverage) and operational (retained earnings), investment (replacement cost and asset accumulation).

1. Literature Review

1.1. Diversification as a Strategic Choice in Increasing Performance

Diversification is a taxonomy that has been widely discussed as a mid-range theory in the domain of economics, management and finance, which has links to economic and industrial performance (Ansoff 1957; Chandler 1962; Rumelt 1991; Meija 2011; Knecht, Diversifi 2014; Ruf 2015; Johnson, Omotunde 2016), firm value creation, sustainable competitive advantage (Rumelt 1984; Prahalad and Hamel 1990; Amit and Schoemaker 1993; Eisenhardt and Martin 2000; Winter 2003; Barney 1991; Peteraf 1993; Barney 2011; Teece, Pisano and Shuen 1997) business success (Kenny, Graham 2009), risk reduction (Markowitz 1952; Palich, Cardinal and Miller 2000;

Mansi and Reeb 2002; Ramanujam and Varadarajan 1989; Cyriac, Koller and Thomsen 2012) both in public sector and business sector as well as social sector. This is inline with Barrets *et al.* (2000) that points out economic diversification is reflected as a strategy to improve the stability between expected income, risks and other constraints.

In strategic management literature, it is explained that diversification is a strategic choice in responding the changes in external environment to gain competitive advantage (Barney 2012; Hill 2015). Diversification itself can be categorized as limited, related and unrelated diversification (Rumelt *et al.* 1996; Barney 2011; Hitt *et al.* 2006; Hill 2015). Diversification creates value if there is an increase of profitability or the reduction of costs as a result of economies of scope as an addition of new product/businesses. Many literature states that the choice of diversification strategy is aims to reduce risk when there is a declining trend in an industry (Sulastrri *et al.* 2016; Bertin *et al.* 2015). This is what distinguishes the company's argument for choosing related and unrelated diversification.

Holcomb *et al.* (2015) shows that there is a difference in the performance of related and unrelated business diversification that there is a relationship between resources and transfer reputation and competence in related business. Barney (2012) explains that company does related business with the intention of economies of scope through utilization of synergy to gain cost advantage and distinctive advantage. Meanwhile, those companies that do unrelated business diversification is oriented to improve financial position and market share. Study by Stimpert and Duhaime (1997); Matsusaka (2001); and Barney (2012) conducts study on diversification with managerial approach to explain how the company can exploit diversification synergy as the source of sustainable competitive advantage.

1.2. Synergy Concept

Synergy concept is an interesting topic to many researchers and practitioners especially in the issue of measurement tool and mechanism measurement on the value of real synergy exploitation. Synergy is an interesting issue from firm's activities that are related to corporate strategy such as integration, acquisition, merger and diversification (Ansoff 1965, 1988; Hofer and Schendels 1978: 25; Foss, Iversen 1997; Damodaran, Aswath 2005; Bruder 2009; Barney 2012; Hill 2015; Garzella 2014; Kamal 2014; Weiss, Martin 2016). Furthermore, synergy concept gives wide contribution into the management literatures including the aspect of finance, strategy, human resource, production and marketing that derived from fit-strategic concepts for complementary assets in multi-business companies.

Some literature indicates that synergy is the occurrence of economies of scope as a result of joint effects, arising from the company's ability to eliminate the costs of operating two or more business units within the same company. Chang and Choi (1988).states that the source of synergy from economies of scope is obtained by cost saving from replacement cost. Some literature in general explains that the effect of synergy is the occurrence of economies of scope due to a joint effect expressed by $C(a,b) < C(a) + C(b)$ (Mikael 2009; Teece 1982; and Teece, Rumelt, Dosi and Winter 1994). However, many researcher states that synergy is a greater results of two parts than the sum of them combined, for instance, $2 + 2 = 5$. This is an indication that the economies of scope perspective on reducing cost does not consider the possibility of increasing income from the existence of externalities of the procurement of complementary products / assets. Although externalities ultimately serve as a concept to explain the reduction of transaction costs that have an impact on increasing utilities for the consumer in turn, it will increase profitability for firms. Therefore, the potential for synergy can be formulated as $(ROI)(a, b) > (ROI)(a) + (ROI)(b)$ which has more synergy than just cost advantage (Mikael 2009). Although it can be expressed by $ROI = R - C / I$, in which the increase in income can be due to the effect economies of scope that are part of the cost reduction used for price reduction, this is called cost advantage as the source of economies of scope. While in synergy concept, the opportunity to get cost saving is obtained by the existence of strategic fit relationship between value chain of company, so that company can reach competitive advantage (Thomson *et al.* 2004).

In some literatures, synergies are also defined as 'potential cost saving arising from economies of scope that can be exploited' and value creation (Besanko, Dranove Shanley 2000; Holcomb, Holmes Jr and Hitt 2015). Previously, Martin and Eisenhardt and Martin (2002) concludes '*cross-business synergy are the value that is created and capture, over time, by the sum of businesses together relative to what it would be separately*'. The concept of synergy is pointed out by Ansoff (1965, 1988) by categorizing characteristics of strategic fit between the companies and new product-market entries. This concept is actualized by many ways, such as (a) sales synergy; (b) operating synergy; (c) investment synergy; (d) management synergy (Ansoff 1965, 1988). Other

literatures mention that there are three sources of synergy in multi business such as: economies of scope, market power and internal governance advantage (Eisenhardt and Martin 2002). In the perspective of economies of scope, it focuses on how company can obtain advantage in form of efficiency through the utilization of both tangible and intangible resources among business unit. In market power perspective, diversification does not cause costs to be efficient but it allows company to have bigger access to the market so that it is easier for them to maintain higher price relative to costs. The third perspective argues that company does diversification to create efficient transaction between multi business as compared to market environment.

Many research points out that synergies a process of additive, superadditive and interaction (Comring 1995, 2000; Markides and Williamson 1994) states that diversification synergy can be done from asset amortization, asset improvement, asset creation and assets fission as the concepts to explain the formation of complementary assets as dynamic competences and capacity utilization (Markides and Williamson 1994; Prahalad and Bettis 1986). Meanwhile, Gimeno (1999) states that economies of scope can be more efficient depends on the multimarket interaction and economies of scope that can creates synergy and advantage through opportunity sharing.

Barney (2012) and Hill (2015) state that synergy can be exploited when the company does diversification into operational synergy and financial synergy. Operational synergy can be done through excess capacity, internal markets, anti competitive strategies and operational costs of risks, meanwhile, financial synergy can be done through internal capital allocation, risk reduction, tax advantage, limited liability and distress cost (Barney 2001, 2012; Bruder 2009). Similarly, Damodaran Aswath (2005) also mentions that diversification can be done through operational and financial synergy, however, Damodaran Aswath (2005) points out different sources of such synergy. He explains that operating synergy may be obtained from cost saving, growth synergy of free future cash flow, growth synergy of return on capital, reinvestment, and the length of growth period. Meanwhile, he also mentions that financial synergy may be in form of cost of capital and value of firm, which may be sourced from cash slack, tax benefit and debt capacity. Furthermore, study conducted by Nayyar (1992) differentiates synergy that is created from the transfer of material resources utilization and immaterial, such as the distribution of technological system that based on immaterial sources, namely, knowledge and management capability. Therefore, it is apparent that the concept of economies of scope and synergy is different. An economy of scope is a joint effect mechanism that results in cost reduction, which is also known as the source of synergy and not an additive process. Meanwhile, literatures on synergy state that it is an additive process that is expressed as $2 + 2 \geq 5$, as an explanation of superadditive synergy.

1.3. Complementary Assets

The concept of complementary assets has been widely developed and applied in the study of organization on strategy, organizational structure and managerial process (Milgrom and Roberts 1990, 1995). It also has been used to investigate the shift from mass production to modern manufacturing (*ibid.*). Complementary assets is an important concept in strategic management domain especially on strategic decisions such as acquisition strategy, merger, diversification or investment as well as its relation to management value chain in gaining sustainable competitive advantage (Halldorsson, Arni, Kotzab, Herbert 2007) intangible complementary resources able to generate value through intellectual capital, knowledge capital or intangible assets from management process (Lidio, Tomas, Lopes 2010).

Various thoughts on complementary assets have been referred to by different approaches, in the view of resources based theory, complementary assets is as an asset integration that has strategic fit to create value through the effect of synergy (King, David 2014), which is also supported by Nadler and Thusman (1999) that states complementary assets as related to fit congruence or synergy. Previously, Chandler (1962); Rumelt (1974); Miller (1986, 1988) explain that complementary assets may be in form of technology, knowledge capability (intangible assets), financial resources (tangible assets) and has relation to strategy and organization factor (Miller, Friesen 1986; Miles, Snow 1978, Siggelkow, Rivkin 2005). Other study also mention strategic fit in complementary assets that may be inform of commitment based, productivity based, compliances based, and collaborative based and suitability and complementary with several types of organization such as knowledge work, job based employment contract work and alliance (partnership) (Lepak and Snell 2002). This is also inline with Patia and Habir (2016) that mention complementary assets as the process of reconfiguring between the company's internal capabilities with the level of heterogeneity as a trigger for external market performance.

Complementary assets can be developed from technology resources resulting from R & D investment sourced from a combination of knowledge sharing (Cross, Baird 2000). This is also supported by McGrath, Mac Millan (2001) that develop multiple sequential investments to face opportunity uncertainty. Resources can be

sourced from internal development through alliances and acquisitions or through market transactions involving the learning process through a combination of existing knowledge in new ways (Vermeulen, Bakema 2001). In consistent with other studies, Zollo and Winter (2002) mentions that complementary assets are also seen as a way to overcome uncertainty and require higher corporate investment. This is also an idea that can relate resources as first mover advantage by developing limited resources to be imitated (Ketchen, Snow, Hoover 2004; Tanriverdi, Venkatraman 2005). Furthermore, King, David (2014) states that complementary resources can also be made through R & D technology where alliances can impact on reduced risk through the exploitation of internal resources to explore the combined value of complementary resources and learning process through acquisitions with complementary resources sourced from multiple suppliers.

1.4. Development of Empirical Model

Diversification is the development of new business from existing products or markets by issuing a number of investments (Hitt, Hokisson 2001), so diversification activities require a certain amount of investment. Furthermore, the motives of diversification among others are to optimize assets, reduce risk, financial benefits and market power, which can be interpreted as a potential synergy. Synergy effects can occur through complementary assets due to strategic fit between resources (production fit, fit management, market fit, administration fit). Our study assumes that companies diversify to gain strategic fit benefits so may be used to clarify whether the complementary assets is utilized to generate synergies from the diversification process. Complementary assets may be sources of tangible assets, whose processes occur through the sharing assets of a holding company (corporation) to a new business, in the form of asset improvement, asset creation, asset fission, assets accumulation, financial resources in the form of cost of capital savings, sharing funds or tax advantages (Markides and Williamson 1994; Prahalad and Ramaswamy 2004).

1.5. Leverage

Leverage is measured by debt to equity ratio that is reflected as the source of financing when companies diversify. The combination of capital structure between debt and equity is available before the company diversifies. Utilization of debt or capital itself is a way to exploit financial synergy at the time of diversification as a financial fit, or financial complementary assets. This argument is supported by Barney (2012); Jensen (1986); and Hill (2015) that explain financial synergy is a savings that can be done through the use of financial for example with the utilization of taxes, free cash flow (internal capital), or debt (external capital). Other study also mentions that companies that do diversify may utilize debt to avoid inefficiency of internal cash flow (Palich, Cardinal, Miller 2000). Therefore a significant increase in debt before the company diversifies is a signal that the source of investment funding is derived from debt, while a negative cash free relationship with a number of investments indicates the use of funds from the internal market (Rumelt 1974; and Jensen 1986). Although some studies also indicate differences in the use of funding sources between related and unrelated diversification in which unrelated diversification tends to gain the benefits from financial synergy and related diversification may utilizes operational synergy (Sulastri *et al.* 2016).

In order to understand the debt and equity financing decisions, two theoretical approaches often mentioned are trade-off and pecking order theory. the trade-off model shows how much margin value between the additional debt benefit as a tax deduction from the interest rate compared to the cost of bankruptcy risk, meanwhile the pecking order theory explains that the selection in a funding source dominated by consideration of the hierarchy of trade-off proceeds obtained from the first funding source from internal financing to debt if equity can no longer be used. An important implication of both these theories is that the trade-offs of the firm model can gain enough margin from any additional debt used for the investment plan. The relationship between marginal cost as a tax deduction with marginal bankruptcy risk as an implication of agency cost (indirect cost) in the case of insolvency, although this is still a debate in the measurement. But the important implication is how the relationship between debt, profitability and investment and cash flow. The trade off model assumes that debt or leverage will increase profitability, which can be explained by three arguments: (a) Debt increases interest expense (tax deductibility), which results in an increase in profits. Increased profits will impact on increasing cash flow that causes bankruptcy cost lower; (b) Asymmetric against the profit tax has the potential to make treatment of earnings so that the impact on greater profitability because it expects greater tax as a benefit of tax saving from debt; (c) The agency model shows that an additional cash flow can cover agency costs, as the company has a commitment to pay interest in case of excess cash. Therefore, it can be concluded that debt has a positive effect on profitability and cash flow.

Furthermore, debt has a relationship inversely proportional to high investment. Companies with higher investments in conditions of large cash flow require less debt, because to limit interest payments. This is supported by Myers and Majluf (1984) in the pecking order theory that considers the hierarchy of source of funds. Thus the issue of selection of sources of funding occurs when retained earnings provide greater marginal benefits for equity than debt financing. As a result, companies will have greater preference for using external funding sources than external ones, which provide greater risk premium to equity than debt. The implication of the pecking order approach is that the firm does not have a target on the level of debt, but rather responds to how the difference in investment caused by retained earnings. This model implies that with low leverage, companies can increase investment through cash flow or profitability through retained earnings. Thus, retained earning is positively associated with investment meanwhile; leverage is negatively related to investment.

The above explanation is important in the process of assessing investment growth, in this context, the company may wish to maintain its debt capacity with a larger investment, implying the importance of controlling investment opportunities. Growth opportunities will increase demand for funding, which can be sourced from internal and external funds. Some researchers use investment opportunity growth measured by Tobin's Q ratio, which shows a negative relationship between debt with growth investment opportunities. But contrary to some researchers who point out that high growth opportunities depend on future investment policies. Investment policy is related to the company's capital structure policy as shareholders can perceive that future profit can be used to repay debt, in which debt can increase market value. In this context the company decides to invest in using debt so that the relationship between investment opportunities and debt has a positive relationship. Therefore, it can be concluded that the relationship between debt and investment opportunities can be negative or positive. The concept of this study will focus on testing how leverage impacts on the growth of fixed asset investment and working capital, and cash flow as complementary assets and its impact on profitability under the event study of diversification.

1.6. Retained Earning

At the period where a company diversifies, the company will need some funds for investment that may be sourced from external funds (debt) and internal funds (retained earnings or additional shareholder capital). Our study assumes that the source of internal funds only from retained earnings as not all the sample companies do right issue at the time of diversification.

The company determines the retained earnings policy for shareholders for investment purposes, however the retained earnings allocation can be used for fixed asset investment, working capital or increasing cash flow. Some researchers use retained earning as an indicator of opportunity evaluation, but if there is an indication of earnings management (where accounts receivables securitizations are transferred in the form of securities and delay payments to suppliers), high earnings will negatively impact profitability and over investment in the future, which explained by agency theory (Jensen 1986; Blanchard *et al.* 1995; Richardson 2006). On the other hand, companies with high-retained earnings, having high cash flow, with high cash hand, will motivate managers to make optimal investments with lower costs and higher profitability (rational theory and pecking order theory) (Myers and Majluf 1984).

Distributed earning is cash distributed to the debt holder for principal payments and distributed to shareholders as dividends. In terms of division sometimes managers decide to reduce dividends by means of stock repurchase, for the purpose of signaling a higher earning performance in the future (Fenn *et al.* 1995), but sometimes a lower dividend also sends a negative signals to the market.

1.7. Replacement Cost

The reason companies diversify is to optimize assets, or add new assets in the hope of increasing the additional income from which funding sources can come from external funds or internal funds. One of the internal funds is the replacement cost that comes from the cash inflow of depreciation value. Replacement cost or replacement value is the value of the investment issued for asset replacement (Stelan, Thomas 2012). Some studies show that replacement cost is related to market value that distinguishes between cost and value concept, which is useful for valuation method based on market value such as sales comparison, income capitalization and replacement cost (Wyatt 2009). Some researchers point out that replacement cost is related to depreciation value and market value because placing new asset with market value. Replacement cost is also associated with Life Cycle Costing, which is related to the decision in replacement of equipment age, cost optimization that is related to long time run, the optimization of age and policy against asset repair cost limits as well as depreciation and values of valuation standards on market value (Seldon 1979; French 2007; Yu-Hung Chiec 2010).

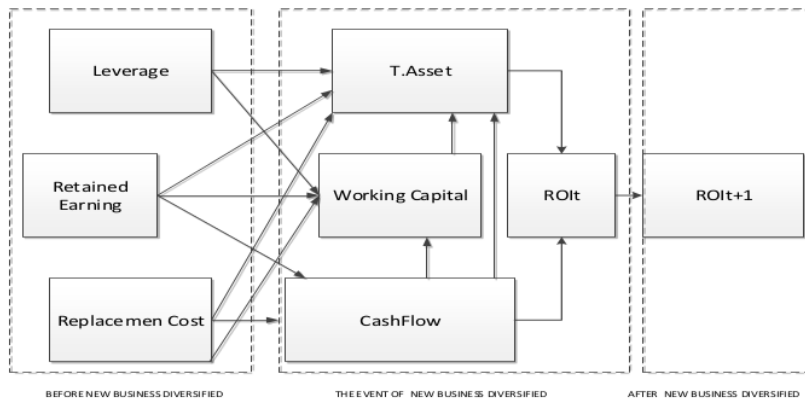
Replacement cost can be used as a predictor of opportunity investment that can be calculated using Tobin's Q ratio as an assessment of market value, for asset valuation and related to life cycle cost in asset management (Andrew and Pitt 2000; Selman 2005). To measure a number of investments made the company can be seen from the amount of replacement cost in the year. Lawellen and Badrinath (1997) also argue that replacement cost can be used as a proxy to measure the amount of investment invested in the year with Tobin's index.

1.8. Cash Flow

Cash Flow may be sourced from operational activities, funding activities and investment activities (Jackowicz, Mielcarz, Wnuczak 2017). Cash flow from operational activities is available funds from net income plus depreciation. Cash flow from financing activities can be in the form of loans (debt) or additional equity (stock repurchase) minus repayment of matured debt and dividends. Cash flow from investment activities is in the form of asset sales and depreciation. In this study, the proxies for cash flow are those from operational activities.

Some researchers have conducted various empirical studies of the investment relationship with cash flow in the investment-sensitivity cash-flow model (Marwa Samet and Anis Jarboui 2017; Kim and Kim 2014; Fazzari *et al.* 1988; Kaplan and Zingales 1997). In the agency cost theory, asymmetric information theory, and the theory of trade offs, it is explained that capital market limitations can reduce the sensitivity of investment-cash flow (Jensen 1986; Stigliz and Weiss 1981; Myers and Majluf 1984). The cash flow relationship with the investment can also be explained when the company is in the introduction stage of a life cycle business trend. At the introduction stage the company will have a small amount of free cash flow because retained earning is used for investment, this is supported by pecking order theory, in which the company prioritizes the use of internal funds for investment. So that the cash flow and retained earning relationship is a concept of financial behavior, because retained earnings can be used for investment or in the form of securities or delay in payment of debt called earning management.

The relationship between endogenous and exogenous variables is seen when companies diversify (event study) and its impact after diversification, therefore it is able to explain how complementary assets produce super additive synergies in the form of return on investment. Conceptually, it is illustrated in the graph below.



Source: Authors' calculation.

Figure 1. Synergy complementary assets of business diversification

The synergy of complementary assets can occur as the company develops a new business (diversification), which is a superadditive function. Complementary assets can be exploited from financial and operational sources. At a corporate level, fund-sharing activities can occur as the company diversifies, as indicated by the increase in leverage to finance investment activities and working capital as well as a reduction in cash availability for the financing of the company's operations. Meanwhile, the source of funds from operational activities can come from retained earning and replacement cost, to finance investment activities during the diversification. This is in line with the opinion of Markidess and Wiliamson (1994) that diversification synergies

can be derived from asset amortization, asset improvement, asset creation, assets fission, as a concept to explain the existence of complementary assets as dynamic competences, (Prahalad and Ramaswamy 2004).

2. Methodology and Results

The unit of analysis in this study is manufacturing companies that listed in Indonesia Stock Exchange. The total sample of this study is 142 companies that diversify from 1990 to 2005. This period is taken with the assumption that there is a period of economic condition that is very stable between 1990 to 1995, where most companies diversify, and period of unstable economic condition during the monetary crisis between 1997 and 2000, where most of the companies do debt restructuring and divestment, but there are also some companies that diversify and during the recovery period of 2000 to 2005. However, in the discussion there is no different results between the three periods, this is only done for the purpose of random sampling in different periods through the event study. The data is analyzed using structural equation modeling with Amos 22 software to test recursive effect of financial and operational synergy as complementary assets as well as its effect on the performance as super additive.

Assumption:

Super additive synergy occurs when $\beta_{1,2,3} > 1$

Sub-additive synergy occurs when $0 < \beta_{1,2,3,4,5} < 1$

Negative synergy occurs when $\beta_{1,2,3,4,5} < 0$

2.1. Operational Variable Definition

The table below explains variables and the measurement used in this study.

Table 1. Operational Variable Definition

Variable	Operational Definition	Measurement	Source
Leverage (Capital Structure)	An indicator of financing source from debt on the total assets (external capital)	$LEV = \frac{Debt}{TotalEquity}$	Modigliani and Miller 1958; Ross 1977; Jensen 1986
Lg_R_Earning Retained Earning	Retained earnings after dividend distribution as internal capital before diversification (financial synergy)	Net Income after Tax-Dividend	Damodaran 2005
Lgrepcos Replacement Cost	The amount of investment invested at the time company diversify	Method Tobin Q $REPCOST_t = NetFixedAsset_t - NetFixedAsset_{t-1} + Depreciation_t$	Lawellen, Badrinath 1997
Lgfcashf Free Cash Flow	Total cash available for the Company's operational activities after the payment of dividends and current liabilities upon diversification	Net income + Depreciation & Amortization- Dividend-short term liabilities	Barney 2002; Emery, Ross 1997; Finnerly and Stone 2004; Moyer, McGuigan, Kretlow 2003
lgC_Asset (Working Capital)	Current Asset used at the time of diversification as a reflection of complementary assets of operational synergy (working capital/working capital)	All components of current assets	Damodaran 2005
lgasset1	Total asset upon diversification	All components of fixed assets	Damodaran 2005
ROI t+1 Return On Investment (first year)	First year's performance after diversification	$ROI_{t+1} = \frac{NetIncomeafterTax_{t+1}}{TotalInvestment_{t+1}}$	Damodaran 2005)

Variable	Operational Definition	Measurement	Source
ROI t+2 Return On Investment (second year)	Second year's performance after diversification	$ROI_{t+2} = \frac{NetIncomeafterTax_{t+2}}{TotalInvestment_{t+2}}$	

Source: from various sources.

2.2. Data Outlier Test and Distribution of Normality

In accordance with the assumption of multiple regression equation, several assumptions are tested such as univariate outlier, univariate normality, multivariate outlier and multivariate normality. Outlier data are excluded from the observation sample, for the purpose of generalizing results and random data (Hair *et al.* 1998). Detection of outlier is done by box blot method and standardize Z_Score with critical value = ± 2.5 . Multivariate detection outlier with Mahalanobis Distance method, can be used to see how much distance the values of each observation from the overall variable (Hair *et al.* 1998; Tabachnick, Fidell 1996). Testing of data normality is done to give better generalization of results, which is done using the normal distribution test of the Kolmogorov-Smirnov one-sample Test method, and the multivariate normality was performed in each sample group (Tabachnick, Fidell 1996). Some of the data are transformed in to logarithm such as retained earning, free cash flow, replacement costs, current assets and total fixed assets (Tabachnick, Fidell 1996; Hair *et al.* 1998). Of the 142 samples of companies that have diversified from 1990 to 2005, 117 companies are selected as sample for further analysis.

Table 2. The Results of Normal Distribution Test

Item	roi1	roi2	lgrepcos	leverage	lgfcashf	lgasset1	lgC_Asset	lg_R_Earning
Sample	117	117	117	117	117	117	117	117
Mean	4.84	3.47	5.11	.54	5.06	5.97	5.45	4.77
Std. Deviation	6.31	6.21	.70	.18	.65	.68	.79	.72
Test Statistic	.061	.075	.064	.064	.053	.058	.066	.042
Asymp. Sig. (2-tailed)	.200	.144	.200	.200	.200	.200	.200	.200

Source: Processed Data.

Table 3. Assessment of Univariate and Multivariate Normality Test

Variable	Min	max	Skew	c.r.	kurtosis	c.r.
Lgrepcos	3.196	6.788	.195	.861	-.225	-.496
Lg_R_Eaming	3.090	6.590	.063	.278	-.079	-.175
Lgfcashf	3.772	6.661	.249	1.100	-.323	-.714
Leverage	.130	.930	-.234	-1.035	-.397	-.877
lgC_Asset	3.960	7.165	.149	.658	-.815	-1.799
lgasset1	4.673	7.741	.211	.930	-.572	-1.263
roi1	-13.310	21.760	-.022	-.098	.423	.933
roi2	-14.780	17.410	-.241	-1.064	.566	1.250
Multivariate					7.034	3.007

Source: Processed Data.

The technique of structural equation model analysis is an analysis based on causality between variables (Hair 1998, et al). Fit test model of structural equation model is done with Maximum Likelihood Estimation (ML) which is run in AMOS 22 program. Fit test model is performed to assess the feasibility of structural models with their assumptions. Overall the criteria used to measure the appropriateness of the observed input (covariance or correlation matrix) with the prediction of the proposed model can be performed with the goodness-of fit criterion. Hair (1998) explains there are three measurements of *goodness-of fit* that is (1) *absolute fit measure* (2) *incremental fit measures* and (3) *parsimonious fit measure*.

The structural equation model consists of endogenous and exogenous variables. Endogenous variable is a variable determined by the previous variable, while the exogenous variable is a variable not determined by the previous variable. Exogenous variables include Leverage, Retained Earning, and Replacement Investment, Return On Investment during diversification, while endogenous variables include Total Assets and Free Cash Flow after diversification and ROI₂ after second year diversification. The result of structured equation model can be written as follows:

$$Lg\ Assets_{t1} = 0.917 + 0.404\ leverage + 0.269LgR_{Earning} + 0.258\ lgrepcos \pm 0,015 \quad .(1)$$

Sig:(0.000) (0.000) (0.000) (0.000) (0.000)

$$lgfcashf = 0.572 + 0.682\ Lg_R_Earning + 0.240\ lgrepcos \pm 0.019 \quad (2)$$

Sig: (0.000) (0.0000) (0.0000) (0.0000)

$$lg\ C_{Asset} = 0.917 + 0.517\ leverage + 0.694\ LgR_{Earning} + 0.819\ lgrepcos - 0.650\ lgfcashf \pm 0.18 \quad (3)$$

Sig: (0.003) (0.031) (0.0000) (0.0000)(0.026) (0.000)

$$roi_1 = 15.818 + 7.313\ lgfcashf - 4.940\ lgrepcos - 3.936\ lgasset1 \pm 31.488 \quad (4)$$

Sig: (0.001) (0.0000) (0.009) (0.052) (0000)

$$roi2 = 0.976 + 0.515\ roi1 \pm 27.812. \quad (5)$$

Sig: (0.114) (0.000) (0.0000)

The following shows the results of parameter estimation on the causality relationship of total effect, direct effect and indirect effect (Table 5). Some goodness of fit index criteria can be seen in the output of structural equation model. Output test of goodness of fit as a whole is compared with the criteria value as cut value (Hair 1998; Ferdinand 2002) as presented in table

Table 4. Goodness-Of Fit Index

Goodness of fit index	Cut Off Value	Output Model	Conclusion
Chi-square	Expected to be small	14.912	fit
Significance Probability	> 0.05	0.187	fit
RMSEA	< 0.08	0.055	fit
CMIN/DF	< 2.00	1.356	fit
RFI	> 0.90	0.965	fit
IFI	> 0.90	0.996	fit
TLI	> 0.95	0.991	fit
CFI	> 0.95	0.996	fit
NFI	> 0.90	0.986	fit

Source: Processed Data.

Table 5.The direct, indirect and total effect (endogen and exogenous variables)

Variables effect	Direct Effect	Indirect Effect	Total Effect
leverage → lgasset1	.404	.211	.615
lgREarn → lgasset1	.269	.102	.372
lgrepcos → lgasset1	.258	.271	.530
lgC_Asset → lgasset1	.409		.409

Variables effect	Direct Effect	Indirect Effect	Total Effect
Lgfcashf→lgasset1		-266	-266
Lgrepcos→lgC_Asset	.819	-.156	.663
lgR_Earning→lgC_Asset	.694	-.444	.250
Lgfcashf→lgC_Asset	-.650		-.650
Leverage→lgC_Asset	.517		.517
lgREarn→Lgfcashf	.682		.682
lgrepcos→Lgfcashf	.240		.240
lgrepcos→roi1	-4.940	-.326	-5.266
lgfcashf→roi1	7.313	1.046	8.359
lgasset1→roi1	-3.936		-3.936
lgR_Earning→roi1		3.527	3.527
Leverage→roi1		-2.422	-2.422
lgC_Asset→roi1		-1.609	-1.609
roi1→roi2	.515		.515
lgrepcos→roi2		-2.712	-2.712
lgR_Earning→roi2		1.816	1.816
lgfcashf→roi2		4.304	4.304
Leverage→roi2		-1.247	-1.247
lgasset1→roi2		-2.027	-2.027
lgC_Asset→roi2		-.829	-.829

Source: Processed data.

3. Discussions

The research method used event study with period of condition before diversification, at the time of diversification and after diversification, to test empirically potency of diversification synergy. Equations (1), (2) and (3) are equation models that indicate the conditions prior to diversification and their impact at the time of diversification. As has been explained above that business diversification is the process of adding business with new investment, with the source of debt fund or own capital, retained earnings or by replacement cost from accumulated depreciation. The impact of this activity is recorded in the consolidated balance sheet as an increase in total assets or cash flow. Some literature also shows that the company motives to diversify to utilize debt to increase cash flow that can be used for its business portfolio.

The results show that there is a significant direct effect of leverage (DER); Retained Earning; and Replacement Cost on asset growth, as an indication of diversification of assets that are financed by both external and internal sources of funds, and the use of debt is higher than that of internal funds (retained earning and replacement cost). Simultaneously retained earning and replacement cost also have an impact on increasing cash flow. In addition to the use of funds to increase investment during diversification, it can also be proven how leverage, retained earnings, replacement cost and cash flow impact on additional working capital. The results also prove that the source of funding for working capital financing comes from debt, retained earnings, replacement cost and cash flow. But the most dominant source of funding used for working capital comes from replacement cost, retained earning and cash flow, and debt is the last source of funding. This is certainly in line with the pecking order theory, in which interestingly, at the time of diversification there is a significant negative

relationship between cash flow to working capital. This means that the higher working capital, the lower is the cash flow, which means that cash flow is also used as a source of funding for working capital operations.

Of the three structured equations, it can be concluded that the source of investment funding, especially for fixed assets is more dominated by external funding sources. Meanwhile, for working capital is financed by internal fund sources. Therefore, it can be explained that diversification utilizes financial synergies and synergy operations of complementary assets: financial assets (leverage) and operational assets (retained earning, replacement cost and operational cash flow), in which, the results support pecking order and agency theory.

This study also simultaneously examines the impact of external and internal funds use on profitability by using ROI as the indicator. The empirical result shows that the increase of assets, replacement cost has a negative impact on profitability, while the use of cash flow has a positive impact on profitability. Likewise, there is an indirect negative effect between leverage and working capital, on ROI through the addition of assets. This indicates that the potential of financial synergy is not achieved, including achieving super additive synergy. It is found that only cash flow usage generates super additive synergy. However, the source of cash flow is net profit after tax plus depreciation, and directly has a significant positive effect on profitability but it is directly and negatively affects working capital.

Indirect influence can be explained that the use of larger debt does not improve the performance shown by significant negative causality relationship between DER to ROI, and there is also a significant negative influence between replacement costs to ROI. However, the relation of causality between retained earnings to ROI showed a significant positive effect. This conceptual empirical phenomenon can be explained by higher DER that will impact the higher the cost of capital such as the interest rate, which affects the reduction of profit, or the increase of investment will be very large because the company develops new business that has not been compensated by the rate of profit. This is possible when investing in a new business, where the business is still in the introductory stage. Theoretically there is a negative relationship between investment and profit at the time of the product life cycle during the introduction stage.

Furthermore, there is a significant negative causality relationship between replacement cost and profit, conceptually it can be explained that replacement cost represents the amount of depreciation value reinvested into assets, the same can be explained by the influence of investment at the beginning of new business development. However, this concept does not explicitly divide between new business investment and old business. Furthermore, if seen from the causality relationship between retained earnings to ROI, there is a significant and positive effect, indicating that retained earnings before diversification has an impact in improving profitability performance. Retained earnings may be allocated for fixed asset investment or in the form of current assets. The results show that there is a positive influence between retained earnings before diversification to performance at the time of diversification as an indication that retained earning has the potential to be used on current assets or corporate operations that have an impact on increasing profitability. This is different compared to debt and replacement cost that are used for fixed assets that have not been able to generate profitability at the time of diversification.

Overall, it can be concluded that there is no effect of synergy as a super-additive of complementary assets of both operational and financial assets. This contradicts the findings of Markidess and Wiliamson (1994) that diversification synergies can be derived from asset amortization, asset improvement, asset creation, assets fission, as a concept to explain the existence of complementary assets as dynamic competences (Prahalad, Ramaswamy 2004). However, the results support Barney (2012) thatpoints out diversification to exploit financial and operational synergies cannot be proven.

Conclusion

It is believed that diversification strategy may create firm's value through complementary assets. We test whether both operational and financial assets of the company can create super-additive synergy. However, we find that diversification creates no super-additive synergy from both operation and financial assets. This finding supports the results from Barney (2012) that explain financial nad operational synergies cannot be made through diversification.

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