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ACCOUNTING INFORMATION IN THE FAMA AND FRENCH THREE-FACTORS MODEL

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Abstract

The purpose of this study is to reexamine the ability of the Fama-French Three Risk Factor Model to explain stock portfolio returns in countries with different economic levels, as well as examine the effect of accounting information derived from book-to-market on stock portfolio returns. The sample used was a manufacturing company on the Indonesia Stock Exchange and the Tokyo Stock Exchange from 2013-2018. The results show that the three risk factors of the Fama-French model apply consistently to explain the variation in stock portfolio returns in developed markets. For the portfolio of shares in the emerging market, model Fama-French does not consistently assess stock portfolio returns. This research also provides empirical evidence that accounting information contained in book-to-market risk factors is only retained earnings, which has a contribution to the valuation of stock portfolio returns. The results of this study indicate that investors in developed markets are more rational and knowledgeable than emerging markets.

Keyword: *Three-factor CAPM, Market-to-book ratio, Retained earnings, Contributed capital.*

Abstrak

Penelitian ini bertujuan untuk menguji kembali kemampuan model tiga faktor risiko Fama dan French (1992) dalam menjelaskan *return* portofolio saham di negara dengan level perekonomian yang berbeda, serta menguji pengaruh dari informasi akuntansi yang berasal dari *book-to-market* terhadap *return* portofolio saham dengan membagi faktor risiko *book-to-market* menjadi dua bagian, yaitu *retained earnings* dan *contributed capital*. Sampel yang digunakan adalah perusahaan manufaktur di Bursa Efek Indonesia dan *Tokyo Stock Exchange* dari tahun 2013-2018. Hasil penelitian menunjukkan bahwa model Fama dan French (1992) berlaku secara konsisten di *developed market* sementara di *emerging market* model Fama-French tidak memberikan hasil yang konsisten dalam menilai *return* portofolio saham. Penelitian ini juga menyediakan bukti empiris bahwa informasi akuntansi yang terkandung dalam faktor risiko *book-to-market* hanya *retained earnings* yang memiliki kontribusi terhadap penilaian *return* portofolio saham. Hasil penelitian ini mengindikasikan bahwa investor di *developed market* lebih *rasional* dan *knowledgeable* dibanding *emerging market*.

Kata kunci: Model tiga faktor risiko CAPM, Rasio *Market-to-Book*, Laba ditahan, Kontribusi Modal.

INTRODUCTION

Economic developments and increasingly advanced technology have an impact on the decline in the relevance of accounting information during the last half century. Baruch and Feng (2016) explain that accounting information, such as income and book value, began to decline over the last half century and has continued to decline since the late 1980s. The biggest impact appears when technological advances provide easy access to information by investors for decision making, which has an impact on decreasing accounting information asymmetry. Accounting information in this study is explained by using the Capital Asset Pricing Model (CAPM). The CAPM model was first proposed by Wilian Sharpe in 1964, and this model is a development of Markowitz's theory by introducing new terms, namely systematic risk and unsystematic risk.

The value of equity has two main components, namely retained earnings and contributed capital. Retained earnings are the accumulated earnings of the company since the establishment of the company and are not distributed in the form of dividends to shareholders, while contributed capital is the shares that have been paid up by the shareholders, either fully or partially. Retained earnings and contributed capital are accounting information in the asset pricing model which are considered as risk factors for stock portfolio returns.

The CAPM concept quantifies the relationship between return and risk. The model was initially developed with a single factor model, which later developed into Arbitrage Pricing Theory (APT) which was introduced by Stephen Ros in 1976, until in 1993, the CAPM model was introduced by Fama and French, that is a three-factor risk model. Fama and French's (1992) three-factor model of risk was made by considering the trading policies carried out by investors, namely the

buy-sell strategy, and formulated as a mimicking portfolio.

The first risk factor from Fama and French (1992) is the risk premium. The risk premium is measured by the return of the Indonesia Composite Index (ICI) and deducted by the monthly risk-free rate. The Indonesia Composite Index (ICI) is an index that measures the movement of all stocks listed on the Indonesia Stock Exchange. Two other risk factors are firm size (SMB) and book-to-market (HML). SMB and HML risk factors consider the trading policy carried out by investors, namely the buy-sell strategy. The SMB risk factor explains that companies with small market capitalization have a higher level of risk than companies with large market capitalization, in this case, investors will sell shares of companies with large market capitalization (growth stock) and buy shares in companies with market capitalization, which is small (value stock), so that the difference from the sale and purchase results in a premium value that is profitable for investors.

This study divides the risk factors of the return portfolio formed from book-to-market into two parts, namely the return portfolio formed from retained earnings and the return portfolio formed from contributed capital. According to research Ball et al. (2019), the predictive power of retained earnings arises from past earnings accumulated by showing that book-to-market predicts the rate of return because it is a proxy for returns. In the research of Ball et al. (2019), it is explained that contributed capital originating from book-to-market does not have the ability to explain returns because contributed capital does not contain information that is substantially able to explain portfolio returns compared to retained earnings, which contain information on the accumulation of company profits.

Contributed capital is information on the company's past, so it is less relevant to be

used as a risk factor to assess the volatility of stock portfolio returns, while retained earnings are part of the company's net profit each year, which is retained by the company and is not paid in the form of dividends to shareholders. The retained net profit is then reinvested into the company for use in the business, so it is risky.

Emerging markets are countries that have a level of income between low to middle and have economic growth that has not yet reached the level of maturity like developed countries. Based on the emerging market index issued by Morgan Stanley, Indonesia is included in the category of emerging market. The difference between developing countries and developed countries is in terms of the level of education, health, welfare, progress of science, and technology.

In developed countries, the quality of the population is supported by high levels of education, health, and welfare, which is also due to the developed country governments' providing guarantees to their residents with supporting facilities such as education or health, besides that, science and technology in developed countries are developing fast and rapidly due to the availability of many experts, while for developing countries, the level of education, public health, and mastery of technology can be said to be still low, so that there are not many experts available and causing the country's development to be slow.

Japan is included in the category of developed countries (developed market) because it has good population quality and knowledge and technology, so that investor behavior in Japan is more rational and knowledgeable compared to investor behavior in developing countries (emerging market), which is more irrational. The country of Indonesia was chosen because it was included in the G20 member countries by 2014, so it can be said that the level of the country's economy began to shift from developing

towards a developed market. The G20 consists of the countries with the largest economies. The G20 member countries are expected to have a systemic impact on the global economy and also be able to contribute to the world economy and financial stability. With the inclusion of Indonesia as a member of the G20, it has pushed the Indonesian economy to a more advanced economy. In this case, with the shift in the Indonesian economy from developing to a developed market, it is considered that changes in the behavior of Indonesian investors from previously irrational investors to rational investors in assessing investments can be followed. This study compares the contribution of the CAPM model to investor behavior in countries with economies that have begun to shift from developing to developed markets with countries that are already included in the developed market. Based on the basic concept used in the CAPM model, namely rational investors, this model is considered to have a greater contribution in developed market countries because rational investor behavior is more common in countries with developed economies.

This study is a replication of the research conducted by Ball et al. (2019), which explains that stock portfolio returns formed from book-to-market risk factors are divided into two main parts, namely retained earnings and contributed capital. This study is a development of previous research conducted by Ball et al. (2019) by testing the contribution of the CAPM model in countries with different economic levels, and the main focus of this research is to examine the contribution of accounting information contained in book-to-market risk factors, namely retained earnings and contributed capital on stock portfolio returns and to see the impact from economic and technological developments to the decline in the relevance of accounting information. This study will re-examine the ability of the three risk factor

model from Fama and French (1992) and the relevance of accounting information contained in the book-to-market risk factors, namely retained earnings and contributed capital, which are tested consistently in countries with different economic levels, namely Indonesia. (emerging market) and Japan (developed market). Japan was chosen to represent a developed country (developed market) compared to other developed countries because of the country's economy and the standard of living, which is already quite high in Japan. In the field of technology, Japan is a developed country in the fields of telecommunications, machinery, and robotics. The progress of Japan, in terms of technology, is one proof that the standard of education in this country is quite good, with the high standard of education allowing investors in this country to have good knowledge and analytical skills, so they tend to have investors with more rational behavior in assessing investments.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Literature Review

Accounting Information in the Asset Pricing Model

Rapid economic and technological developments have an impact on decreasing accounting information asymmetry. A study conducted by Baruch and Feng (2016) explained accounting information, especially income and book value information, which began to experience a steady decline from 90% in the 1950s down to 50% until now. The decrease in accounting information asymmetry is considered as the impact of the rapid and fast development of the economy and technology. One of the accounting information contained in the financial statements is equity.

Equity has two main components, namely retained earnings and contributed

capital. Ball et al.(2019) explain the fact that investors contributing to the company do not always disclose information about the company's risk, that the contributed capital does not contain important information that affects stock portfolio returns. Thus, Ball concludes the results of his research that contributed capital has no effect on stock portfolio returns.

In this study, the researchers focus on the effect of risk factors from retained earnings and contributed capital as accounting information on stock portfolio returns and are used as an indicator to predict the decline in accounting information asymmetry as a result of current technological developments.

Portfolio Theory

The theory developed by Hery Markowitz (1952) explains the combination of two or more stocks. This theory is called portfolio theory because it has the authority to estimate funds into securities. Portfolio theory is concerned with investors' estimates of risk and return expectations. Return on investment in the future is the expected return and is very likely to be different from the actual return received. In addition to estimating returns, investors also need to take into account the risk of deviations between the expected return and the actual return received. The greater the risk of investing in stocks, the higher the level of profit or known as the concept of "high risk high return".

According to Markowitz, portfolio theory is based on the fact that investors will invest their money in various types of securities, with the aim of reducing the risk that must be borne or by diversifying (forming a portfolio).

Concept of Risk and Return

Jones (1996) opines that, in general, everyone will avoid risk. High-risk investments will be taken if the results to be obtained are commensurate with the risks.

Investors who want a certain return will choose low-risk or no-risk investments, such as deposits and government bonds, because the return is certain or can be said to be of a fixed amount. Investment decisions also take into account the opportunity to earn much higher yields than income from deposits or government bonds, but the level of uncertainty in the results is also high.

Capital Asset Pricing Model (CAPM)

CAPM was first introduced by Sharpe, Lintner, and Mossin in the mid-1960s. CAPM is a model that relates the expected rate of return of a risky asset with the risk of the asset in a balanced market condition. The CAPM is based on the portfolio theory proposed by Markowitz. In the CAPM model, the risk that is considered relevant and affects the expected return on an asset is systematic risk (Ariff and Johnson 1990; Jones 1998).

This CAPM model introduces one risk factor, namely systematic risk, known as the beta coefficient. The higher the beta of a security, the more sensitive it is to market changes (Tandelilin 2010). This model then receives criticism, especially the use of CAPM in determining the amount of expected return. CAPM is considered inappropriate for calculating abnormal returns because this model is too dependent on beta. Seeing these weaknesses, a new model emerged, namely Arbitrage Pricing Theory (APT). In the APT model, stock portfolio returns are not only influenced by the market portfolio because of the assumption that the expected return of a security can be influenced by several other sources of risk (Tandelilin 2010). One of the criticisms of the APT model is the difficulty in determining the relevant risk factors because these factors are *ex ante* data. The APT model is not able to explain clearly what the relevant risk factors that affect stock returns.

Fama and French (1992, 1993, 1996) criticized beta's ability to explain cross-sectional

variation of equity returns. They concluded that beta was not an appropriate measure of risk. Then coming the CAPM model from research conducted by Fama and French (1993), which said that market beta alone was not able to explain stock portfolio returns, on the contrary, stock portfolio returns were explained by company size and B/M.

Fama and French's (1992) Three-factor Model

The Fama and French Three Factor model explains there are three factors that influence stock portfolio returns, namely market returns, size, and book-to-market (B/M). Market return, according to Jogiyanto (2015), is the market return, or market return is the rate of return based on the development of the stock price index. In this study, market return will be measured using the return data of the Indonesia Composite Index (ICI) and reduced by the risk free rate on a monthly basis. Risk premium can be measured by subtracting the current stock price index (CSPI) from the previous period's stock price index (CSPI-1), divided by the stock price index of the previous period (CSPI-1) and subtracting the risk free rate (R_{ft}).

Size in this study is measured by Small Minus Big (SMB). SMB is the difference between the average monthly return of small companies and the average monthly return of big companies. SMB is the difference between the monthly average of the returns on the three small stock portfolios or small companies (S/L, S/M, S/H) and the monthly average of the returns on the three big stock portfolios or big companies (B/L, B/M, B/H). SMB shows that if a portfolio consists of more small companies in it, it will outperform the market in the long run. This means that a good portfolio will produce a high stock portfolio return when the portfolio consists of small companies.

High Minus Low (HML) is also referred to as the value premium. HML is one

Figure 1

Fama and French's (1992) Model Portfolio Division Scheme

Source: Fama and French's (1992) three-factor model

of the three factors used in Fama and French's (1992) three-factor model. HML is measured by book-to-market, that a company with a high book-to-market value indicates a high level of risk, while a company with a low book-to-market indicates a low level of risk. HML is the monthly difference between the average returns on the two portfolios with high BE/ME (SH and BH) and the average returns on the two portfolios with low BE/ME (S/L and B/L).

The HML risk factor explains that companies with high B/M ratios will generate higher returns than companies with low B/M ratios. Figure 1 provides an overview of the Fama and French three-factor model.

Emerging market and Developed market

According to (Solnik, 2009) world capital markets are divided into two types, namely emerging markets and developed markets. In general, emerging markets are defined as capital markets that are experiencing growth both in terms of market size and sophistication. Emerging market countries usually have immature markets. Market maturity is determined by the condition of four main indicators: the

characteristics of the commodity, the behavior of market participants, the mechanism of goods being traded, and regulations. In this research, the researchers used one of the countries included in the emerging market, namely Indonesia, to compare the returns using the Fama and French's (1992) three-factor model. The country of Indonesia is currently included in the G20 member countries, so the Indonesian economy has begun to shift from developing towards a developed market. With the inclusion of Indonesia as a member of the G20, this has pushed the Indonesia's economy into a more advanced economy. Developed countries are countries that have a high standard of living. Generally, developed countries have high technology, a good economy, and equitable development. With the shift in the Indonesia's economy from developing towards a developed market, it is considered important because this shift proves that there has been improvement in terms of education, health, and equitable infrastructure development. This increase is considered to be followed by changes in the behavior of Indonesian investors, from

previously irrational investors to rational investors in assessing investments.

Countries that have exchanges included in developed markets have the opposite characteristics of emerging markets. If the characteristics of an emerging market are to have an immature market, then in a developed market, it has a mature market. This mature market is seen from four indicators, namely currency, market participants, developed market transactions which take place efficiently and fairly, strict rules in the developed markets. Japan has strict rules on their capital market, and also, Japan was chosen to represent countries with a developed economy compared to other developed countries because Japan has the advantage of technological progress. The progress of the Japanese state in terms of technology is one of the evidences that the education standard in this country is quite good, that a country with a good level of education standard is considered to have investors with good knowledge and analytical skills, so investors tend to behave more rationally in such a country in assessing investment. Thus, to compare stock portfolio returns, the researchers used emerging market countries represented by Indonesia and developed market countries represented by Japan.

Hypothesis Development

Market Return as a Risk Factor for Stock Portfolio Return

The single factor model of the Capital Asset Pricing Model explains that there is one risk factor, namely beta, which affects stock portfolio returns. Beta shows the sensitivity of security returns to changes in market returns. The market return that is different from the risk free rate will result in a risk premium. Research conducted by Tandelilin (2010) and Rusliati (2011) found that the higher the beta value or market return, the higher the level of return required by investors. The movement of the market return

will be followed by the movement of the return of the stock portfolio. This means that if the market return increases, it will be followed by an increase in stock portfolio returns proportionally according to the beta value.

H₁: Market return ($R_m - R_f$) has a positive effect on stock portfolio returns

Company Size (SMB) as a Risk Factor for Stock Portfolio Return

The Fama and French's (1992) three-factor model explains that firm size as a risk factor has an influence on stock portfolio returns. The risk factor derived from company size (SMB) indicates that if a portfolio consists of more small companies in it, it will outperform the market in the long run. This means, a portfolio produces a high stock portfolio return when the portfolio consists of small companies (value stocks). In their research, Fama and French (1992) show evidence that stock portfolio returns in small companies are superior to large companies, so that the size of the company (size) proxied by SMB has a positive and significant effect on stock portfolio returns. Research by Beigi et al. (2016) also shows the same results in this case, that companies with small market capitalization have a high level of risk.

H₂: The risk factor that comes from the size of the company (SMB) has a positive effect on stock portfolio returns

Book-to-market as a Risk Factor for Stock Portfolio Return

Fama and French's three-factor model also explains other risk factor, namely book-to-market (HML), which has an effect on stock portfolio returns. In this model, the risk factor derived from book-to-market (HML) indicates companies with high book-to-market will generate higher returns than companies with low book-to-market. This is because companies with high book-to-market have a high level of risk, so they will generate a higher rate of return. In a study conducted

Figure 2
Research Framework

Source: Hypothesis Development and Previous Research

by Febriansyah (2016) and Beigi et al. (2016), it is explained that the Fama and French's three-factor model is better at predicting stock portfolio returns than the capital asset pricing model, after testing the three factors in the Fama and French's model shows a positive and significant direction of influence on stock portfolio returns.

H₃: Risk factors from book-to-market have a positive effect on stock portfolio returns

Accounting Information in HML Risk Factors

Ball et al. (2019) in his research explained that there are two additional risk factors from book-to-market (HML) which are divided into two, namely retained earnings and contributed capital. In the research of Ball et al. (2019), it is explained that contributed capital originating from book-to-market does not have the ability to explain returns because contributed capital does not contain information that is substantially able to explain returns compared to retained earnings, which contain information on the company's profit accumulation. Ball et al. (2019) explains the predictive power of retained earnings arising from accumulated past earnings

by showing that book-to-market predicts the rate of return because it is a proxy for returns.

H₄: Accounting information derived from retained earnings provides a greater contribution as a risk factor than accounting information derived from contributed capital.

RESEARCH METHOD

Data and Research Sample

The sample of this study uses manufacturing companies listed on the Indonesia Stock Exchange and the Tokyo Stock Exchange from the period 2013 to 2018. Manufacturing companies were chosen as research objects due to the contribution of technology, that technology is more widely used in the business activities of manufacturing companies, so that there is technological development, and the economy has more direct impact on the manufacturing sector. With the aim of seeing the impact of technological and economic developments on the movement of decreasing relevance of accounting information in the CAPM model, the researchers used the number of sample years for 5 years starting from 2013 to 2018. The research sample data were obtained from the Osiris database and from the official

website of the Indonesia Stock Exchange and the Japan Stock Exchange. The sampling used in this study used a purposive sampling method, namely the selection of samples based on several predetermined criteria. The criteria for the research sample were manufacturing companies listed on the Indonesia and Japan Stock Exchanges, which have sufficient data to be used for the measurement needs of each dependent variable and independent variable. The sample company must meet information from all required data and companies with book value positive. Companies with a positive book value become one of the important criteria in selecting the sample because a positive book value reflects the amount of value held by shareholders.

Variable Measurements

Dependent Variable

The dependent variable used in this research is stock portfolio return. According to Markowitz (1952), stock portfolio return is a weighted average of the realized returns of each single security in the portfolio. Accounting information is used by potential users, especially investors, in making decisions. Accounting information is predicted to have value relevance because accounting information is statistically related to stock market values (Beaver 2002). To find out the return on a portfolio, it is necessary to first know the return of each single security in the portfolio. Thus, it is necessary to first calculate the stock return. Stock return is measured by the following formula:

$$R_{it} = \left(\frac{P_{it} - P_{it-1}}{P_{it-1}} \right) - R_f$$

In this case:

- R_{it} = The company's stock return in month t
- P_{it} = The company's stock price in month t
- P_{it-1} = The company's stock price in month t-1
- R_f = Risk free rate

Independent Variables

Fama and French's three-factor Model

In this study, the model from Fama and French (1992) was used to compile a portfolio which explains that there are three risk factors that affect stock returns, namely market return, size, and book-to-market (B/M).

Return Market ($R_m - R_f$)

The first independent variable used in this study is market return ($R_m - R_f$). Market return is measured using the price movement of all shares as measured by the return of the Indonesia Composite Index (ICI) on a monthly basis and is reduced by the risk free rate. The ICI can be measured by subtracting the current stock price index (CSPI) from the previous period's stock price index (CSPI-1), and then divided by the stock price index for the previous period (CSPI-1). Risk free rate is the rate of return on risk-free assets taken from the difference in interest rates for Bank Indonesia Certificates (SBI). Market return is calculated as follows:

$$R_{mt} = \left(\frac{P_{mt} - P_{mt-1}}{P_{mt-1}} \right) - R_f$$

In this case:

- R_{mt} = Market return and or market index in month t
- P_{mt} = Stock price and or market index in month t
- P_{mt-1} = Stock price and or market index in month t-1
- R_f = Risk free rate.

Small Minus Big (SMB)

The second risk factor in this model is size. Size variable can be measured by multiplying the number of shares outstanding with the share price. In this model, size divides the company's stock portfolio into two parts with the median value as a break point, so that it will produce a portfolio consisting of companies with a small market capitalization (value stock) and a portfolio consisting of companies with a large market capitalization (growth stock). Size is calculated by the following formula:

$$MVE = LbSmt \times Pmt$$

In this case:

MVE = Market Value of Equity

LbSmt = Number of shares outstanding in year t

Pit = The closing share price in year t.

High Minus Low (HML)

The third risk factor used in this model is a risk factor derived from book-to-market (B/M). B/M shows the comparison between the company's book value and its market value. In this study, the B/M variable is measured by comparing the company's book value with its market value. According to Fama and French (1992), companies with high B/M ratios will generate higher returns than companies with low B/M ratios. To measure the B/M, monthly stock portfolio return data with a cutoff period of June 30 are used. Book-to-Market is calculated by the following formula:

$$B/M = \frac{BVt}{MVt}$$

In this case:

B/M = Book-to-Market

BVt = Company book value in year t

MVt = The market value of the company in year t.

Accounting Information in HML Risk Factors

Based on this latest asset pricing model, a new measurement from the Fama and French's (1992) model emerges, namely the risk factors originating from book-to-market which are divided into two main parts, namely retained earnings and contributed capital. The book-to-market risk factor originating from retained earnings is calculated based on the company's accumulated retained earnings minus dividends distributed to shareholders and reduced by accumulated other comprehensive income, while book-to-market originating from contributed capital is calculated as common/ordinary stock plus capital surplus/share premium reserve and minus repurchased shares (treasury stock).

Portfolio Forming Procedure

This study forms a stock portfolio based on the classification of firm size (SMB) and the book-to-market ratio (HML) according to the three-factor model from Fama and French (1992). The median of the entire sample is used as a breakpoint to establish the difference between the two categories. Stock classification based on the B/M ratio will also divide stocks into two categories based on the median value of the overall samples per year, namely the high B/M category and the low B/M category. The difference of this study with previous research is that this study divides HML factors into two categories, namely HML risk factors originating from retained earnings and HML risk factors originating from contributed capital.

Classification of stocks based on these two categories is also based on the median value of the overall samples per year, namely the categories of high retained earnings, low retained earnings, high contributed capital, and low contributed capital. Samples that have a negative book value of equity (BE) are not included in the breakpoint calculation for portfolio classification in the four proxies (SMB, HML, HMLRE, and HMLCC). With this classification, it is possible to form eight portfolios, namely P1, P2, P3, P4, P5, P6, P7, and P8. The following table shows the procedure for forming a portfolio.

Table 1
Statitis Model Portfolio Formation Procedure

Size	Book-to-Market	Portfolio
Small Size	High Book-to-Market	P1
	Low Book-to-Market	P2
Big Size	High Book-to-Market	P3
	Low Book-to-Market	P4

Source: Data Processing Results (2019)

The portfolio formed in Table 1 is used to calculate the SMB and HML variables, as follows:

$$\text{SMB} = \frac{1}{2} \times ((\text{P1}-\text{P3})+(\text{P2}-\text{P4}))$$

$$\text{HML} = \frac{1}{2} \times ((\text{P1}-\text{P2})+(\text{P3}-\text{P4}))$$

Table 1 shows the procedure for forming a portfolio that groups portfolios based on three factors, namely market returns, SMB, and HML. Thereby, it will produce four portfolio groups consisting of P1, P2, P3, and P4. The portfolio that has been formed is then separated, and the average SMB and HML is calculated using the formula as above.

Table 2
Statistical Model Portfolio Formation
Procedure 2

Size	CC	RE	Portfolio
Small Size	High CC	High RE	P1
		Low RE	P2
	Low CC	High RE	P3
		Low RE	P4
Big Size	High CC	High RE	P5
		Low RE	P6
	Low CC	High RE	P7
		Low RE	P8

Source: Data Processing Results (2019)

The portfolio formed above is used to calculate the variables SMB, HMLRE, and HMLCC as follows:

$$\text{SMB} = \frac{1}{4} \times ((\text{P1}-\text{P5})+(\text{P2}-\text{P6})+(\text{P3}-\text{P7})+(\text{P4}-\text{P8}))$$

$$\text{HML}_{\text{CC}} = \frac{1}{4} \times ((\text{P1}-\text{P3})+(\text{P2}-\text{P4})+(\text{P5}-\text{P7})+(\text{P6}-\text{P8}))$$

$$\text{HML}_{\text{RE}} = \frac{1}{4} \times ((\text{P1}-\text{P2})+(\text{P3}-\text{P4})+(\text{P5}-\text{P6})+(\text{P7}-\text{P8}))$$

In the second portfolio formation, risk factors originating from book-to-market are divided into two parts, namely book-to-market originating from retained earnings and book-to-market originating from contributed capital as shown in Table 2. Based on the formation, the portfolio will produce eight portfolio categories consisting of P1, P2, P3, P4, P5, P6, P7, and P8. The results of the classification are then calculated as above.

Small Minus Big (SMB)

Small Minus Big (SMB) is measured by the size of the company or size. Size divides the company's stock portfolio into two parts with the median value as a break point, so it will produce a portfolio consisting of companies with small market capitalization and a portfolio consisting of companies with large market capitalization. In this study, the SMB is the difference between the average monthly return of companies with small market capitalization and the average monthly returns of companies with large market capitalization. In Table 2, it can be seen that the measurement of risk factors derived from company size (SMB) is measured using the following formula:

$$\text{SMB} = \frac{1}{4} \times ((\text{P1}-\text{P5})+(\text{P2}-\text{P6})+(\text{P3}-\text{P7})+(\text{P4}-\text{P8}))$$

In this case:

SMB = Small Minus Big

P1,P2,P3,and P4 = Return on the stock portfolio of small companies.

P5,P6,P7,and P8 = Return on the stock portfolio of big companies.

High Minus Low (HML)

B/M is the ratio used to compare the book value of the company with its market value. In this study, B/M is measured using High Minus Low (HML) or also referred to as value premium. The risk factor originating from book-to-market (HML) divides the stock portfolio into two parts with the median value as a break point, so that it will produce a portfolio consisting of companies with a high ~~(high)~~ book-to-market and a portfolio consisting of companies with a low book-to-market (low). The B/M proxied by HML (see Table 1) is measured using the following formula:

$$\text{HML} = \frac{1}{2} \times ((\text{P1}-\text{P2})+(\text{P3}-\text{P4}))$$

In this case:

HML = High Minus Low

P1 dan P3 = Return of the company's stock portfolio is high

P2 dan P4 = Return of the company's stock portfolio is low

HML (*Retained Earnings*)

In the latest three-factor model, Fama and French (1992) divide the components of the risk factors originating from book-to-market into two main parts, namely retained earnings and contributed capital. Retained earnings are the accumulation of the company's income during the company's existence until now, minus the dividends distributed to shareholders. Ball et al. (2019) found a positive and significant relationship between HML originating from retained earnings and stock returns. Ball et.al (2019) also explained that retained earnings affect stock returns because they contain information on the accumulation of corporate earnings and are a relevant variable in predicting stock returns because they do not depend on the annual economy. Book-to-market risk factors derived from retained earnings (see Table 2) are measured using the following formula:

$$HML_{RE} = 1/4*((P1-P2)+(P3-P4)+(P5-P6)+(P7-P8))$$

In this case:

HML_{RE} = HML derived from retained earnings

P1,P3,P5,and P7 = Return of the company's stock portfolio high retained earnings

P2,P4,P6,and P8 = Return of the company's stock portfolio low retained earnings

HML (*Contributed Capital*)

In the latest model Fama and French (1992), three factors apart from book-to-market are derived from retained earnings. Risk factors from book-to-market also come from contributed capital. Contributed capital is shares that have been paid up by the shareholders, either fully or partially paid, and is the main component in the company's equity.

Ball et al. (2019) explain in his research that book-to-market originating from contributed capital has no effect on stock returns. This is because contributed capital does not have information, which is so important, that

affects the company's stock returns. Therefore, there is no book-to-market effect from contributed capital on the company's stock returns. Book-to-market risk factors derived from contributed capital (see Table 2) are measured using the following formula:

$$HML_{CC} = 1/4*((P1-P3)+(P2-P4)+(P5-P7)+(P6-P8))$$

In this case:

HML_{CC} = Book-to-market originating from contributed capital

P1,P2,P5,and P6 = Return of the company's stock portfolio of high contributed capital

P3,P4,P7,and P8 = Return of the company's stock portfolio is low contributed capital

Research Design

The preparation of the portfolio begins with making the framework of the three-factor model from Fama and French (1992) which can be seen from Figure 1, which is then formed into several risk factors to assess the return of the stock portfolio. Several stages were carried out, namely, first, the companies that were used as samples would be classified into several risk factors, namely Small Minus Big (SMB), High Minus Low (HML), HML originating from retained earnings, and HML originating from contributed capital in accordance with the framework of thought which can be seen from Figure 1. The grouping resulted in 8 portfolios consisting of P1, P2, P3, P4, P5, P6, P7, and P8. This initial portfolio test uses a statistical model 1. The expected result is a positive and significant beta.

Second, the researcher compiles a portfolio and examines the second portfolio, which explains the relationship between risk factors from market returns ($R_m - R_f$), SMB, HML, HML originating from retained earnings and HML originating from contributed capital on stock portfolio returns on stock exchanges in both countries. namely Indonesia and Japan. At the economic level, countries with stock exchanges included in the developed market have different characteristics

from emerging markets. While the characteristics of an emerging market are to have an immature market, a developed market has a mature market. This mature market is seen from four indicators, namely currency, market participants, developed market transactions which take place efficiently and fairly, and developed markets which have strict rules. In this case, to represent countries with advanced economic levels, researchers used companies on the Japan Stock Exchange because compared to other developed countries, Japan has the advantage of technological progress. The progress of Japan, in terms of technology, is one proof that the education standard in this country is quite good, that countries with a good level of education standards are considered to have investors with good knowledge and analytical skills, while to represent emerging market countries, researchers used companies on the Indonesia Stock Exchange.

In the second test, the difference is the addition of two independent variables, namely retained earnings and contributed capital. Portfolio testing using Fama and French's (1992) three-factor model was conducted on manufacturing companies listed on the Indonesian and Japanese Stock Exchanges. The hypothesis in this study was analyzed using multiple linear regression to test the hypothesis.

Research Model

The hypothesis in this study was tested with the following statistical model.

Statistical Model 1

$$R_{pt} - R_{ft} = \alpha_{pt} + \beta_1 (R_{mt} - R_{ft}) + \beta_2 SMB_t + \beta_3 HML_t + \epsilon_{pt}$$

The hypothesis is supported if: $\beta_1, \beta_2, \beta_3 > 0$ and significant

In this case:

R_{pt} = Stock portfolio return in year t
 R_{ft} = Risk free rate at the end of each month
 α_{pt} = Regression constant

β = Regression coefficient
 R_{mt} = Market return in month t
 SMB_t = Return small is bigger than big
 HML_t = Return high is greater than low
 ϵ_{pt} = Error

Statistical Model 2

$$R_{pt} - R_{ft} = \alpha_{pt} + \beta_1 (R_{mt} - R_{ft}) + \beta_2 SMB_t + \beta_3 HML_{REpt} + \beta_4 HML_{CCpt} + \epsilon_{pt}$$

The hypothesis is supported if: $\beta_1, \beta_2, \beta_3, \beta_4 > 0$ and significant

In this case:

R_{pt} = Stock portfolio return in year t
 R_{ft} = Risk free rate at the end of each month
 α_{pt} = Regression constant
 β = Regression coefficient
 R_{mt} = Market return in month t
 SMB_t = Return small is bigger than big
 HML_t = Return high greater than low
 HML_{REpt} = HML derived from retained earnings
 HML_{CCpt} = HML originating from contributed capital
 ϵ_{pt} = Error

RESULTS AND ANALYSIS

Research Sample

In this study, the samples were manufacturing sector companies listed on the Indonesia Stock Exchange (IDX) and the Tokyo Stock Exchange (TSE) taken using purposive sampling method. The data used are monthly period data for the years of 2013-2018. For Indonesia, the samples used in this study were as many as 80 companies from 199 manufacturing companies listed on the Indonesia Stock Exchange, while for Japan, 1,048 companies were used from 1,570 companies listed on the Tokyo Stock Exchange, so that the overall number of companies studied was 1,128 companies during the years of 2013-2018.

For Indonesia, the formation of a portfolio based on firm size (SMB) and book-to-market (HML) risk factors resulted in 4 types of portfolios (see Table 3), namely portfolio categories P1, P2, P3, and P4, each of which consists of 20 companies' shares during the period from June 2013 to June 2018, while

Table 3
Sampling Results

Sample Criteria	Number of Companies
Sample companies 2013-2018	1.769
Companies with negative book value	-49
Companies with incomplete stock price data	-227
Companies with incomplete financial data	-365
Number of companies that meet the criteria	1.128
Observation years 2013-2018	5
Number of observations (company x years)	5.640

Source: Data Processing Results (2019)

Table 4
Sampling Results for Indonesia and Japan

Description	Number of Indonesian Companies	Number of Japan Companies
Sample company 2013-2018	199	1.570
Companies with negative book value	-12	-37
Companies with incomplete stock price data	-40	-187
Companies with incomplete financial data	-67	-298
Number of companies studied	80	1.048
Years of observation (2013-2018)	5	5
Number of observations studied (company x years)	400	5.240

Source: Data Processing Results (2019)

Table 5
Statitis Model Portfolio Formation Procedure 1

Size	Book-to-Market	Portfolio
Small Size	High Book-to-Market	P1
	Low Book-to-Market	P2
Big Size	High Book-to-Market	P3
	Low Book-to-Market	P4
Indonesia : Each portfolio contains 20 companies		
Japan : Each portfolio contains 262 companies		

Source: Data Processing Results (2019)

Table 6
Statitis Model Portfolio Formation Procedure 2

Size	CC	RE	Portofolio
Small Size	High CC	High RE	P1
		Low RE	P2
	Low CC	High RE	P3
		Low RE	P4
Big Size	High CC	High RE	P5
		Low RE	P6
	Low CC	High RE	P7
		Low RE	P8

Indonesia : Each portfolio contains 10 companies

Japan : Each portfolio contains 131 companies

Source: Data Processing Results (2019)

Table 7
Variable Descriptive Statistics for Forming Indonesia and Japan Stock Portfolios

Variable	Minimum	Maximum	Mean	Standard Deviation
Indonesia				
<i>LN_Size</i>	7,032	26,825	18,651	4,878
B/M	0,000	22,876	2,008	3,126
RE/M	0,000	8,905	0,812	1,310
CC/M	0,000	16,987	1,210	2,189
Japan				
<i>LN_Size</i>	11,451	24,346	17,242	1,831
B/M	0,033	36,253	1,591	1,777
RE/M	0,005	32,198	0,913	1,060
CC/M	0,001	27,319	0,678	1,027

N Indonesia = 80 companies x 5 years = 400 companies years (observation)

N Japan = 1,048 companies x 5 years = 5,240 companies years (observation)

Sources = Data Processing Results (2019)

Table 8
Descriptive Statistics of Risk Factors for Testing Statistical Model 1

Variable	Minimum	Maximum	Mean	Standard Deviation
Indonesia				
Rm-Rf	-0,126	0,149	0,006	0,047
SMB	-1,321	41,418	0,063	1,333
HML	-41,871	1,370	-0,073	1,330
Rpt	-0,095	2,239	0,067	0,314
Japan				
Rm-Rf	-0,556	0,525	0,002	0,155
SMB	-0,645	5,329	0,005	0,119
HML	-1,972	5,346	0,003	0,117
Rpt	-0,615	0,439	0,000	0,143

N Indonesia = 20 companies x 12 months x 5 years = 1,200 companies month of the year (observation)

N Japan = 262 companies x 12 months x 5 years = 15,720 companies month of the year (observation)

Source = Data Processing Results (2019)

the second portfolio grouping based on SMB, HMLRE, and HMLCC resulted in 8 types of portfolios (see Table 4) consisting of P1, P2, P3, P4, P5, P6, P7, and P8, each of which consists of 10 company shares during the period from June 2013 to June 2018.

Formation of portfolios in Japan based on statistical model 1 resulted in 4 types of portfolios, each of which contains 262 company shares during the period from June 2013 to June 2018, while for portfolio formation based on statistical model 2, the number of companies in each portfolio is reduced to 131 companies during the period from June 2013 to June 2018. It can be seen that the number of samples that meet the criteria in Indonesia

are 80 companies, when included in the portfolio according to statistical model 2, it produces a portfolio containing 10 company shares.

Based on the descriptive statistics in Table 7, it can be seen that the RE/M variable in Indonesia has a mean value of 0.812. This shows that the average comparison of retained earnings and market value in Indonesia is 0.812, which value is much smaller than Japan with a mean value of 0.913. In addition, it can be seen that the CC/M variable in Indonesia has a mean value of 1.210, which value is greater than Japan with a mean value of 0.678. This shows that the average comparison of the value of contributed capital

Table 9
Descriptive Statistics of Risk Factors for Testing Statistical Model 2

Variable	Minimum	Maximum	Mean	Deviasi Standar
Indonesia				
Rm-Rf	-0,126	0,149	0,006	0,047
SMB	-0,775	20,688	0,063	0,929
HML _{RE}	-20,201	11,596	-0,033	0,934
HML _{CC}	-21,369	1,302	-0,061	0,948
Rpt	-0,095	2,239	0,067	0,314
Japan				
Rm-Rf	-0,556	0,525	0,002	0,155
SMB	-0,344	2,623	0,005	0,085
HML _{RE}	-2,678	2,282	0,001	0,083
HML _{CC}	-1,033	2,665	0,001	0,083
Rpt	-0,615	0,439	0,000	0,143

N Indonesia = 10 companies x 12 months x 5 years = 600 companies month years (observation)

N Japan = 131 companies x 12 months x 5 years = 7,860 companies month of the year (observation)

Source = Data Processing Results (2019)

with the company's market in Indonesia has a greater value than of Japan. Based on Table 7, it is shown that the minimum and maximum values for the RE/M and CC/M variables are in the mean $\pm$ 8x standard deviation range, so it can be said to be well distributed.

Based on Table 8, the risk factor has a minimum value of -1.321, which shows that the stock portfolio return formed from the company size risk factor (SMB) in Indonesia has a minimum value of -1.321, while the maximum value of stock portfolio return formed from the SMB risk factor has a maximum return value of 41.418 with a mean value of 0.063.

Based on Table 9, the risk factors for HMLRE in Indonesia have a minimum and maximum value of -20.201 and 11.596, with a mean value of -0.033. This shows that the average stock portfolio return formed from the book-to-market risk factor derived from retained earnings has a negative average stock portfolio return of -0.033, while it has a mean value of 0.001 for Japan. In this case, the risk factor of retained earnings in Japan has a positive rate of return and is greater in value than that of Indonesia. The risk factor for HMLCC in Indonesia has a mean value of

-0.061, which value is greater compared to that of Japan, which has a mean value of 0.001, but the difference is not too significant. This shows that the average stock portfolio return formed from the risk factor of contributed capital in Japan has a higher average value than Indonesia.

Empirical Results

Hypothesis testing begins with testing statistical model 1 using pooled data, which can be seen in Table 10. Based on the results of the regression test in Table 10 using pooled data during the period June 2013 to June 2018, it was obtained from a comparison of testing using three models, namely the pooled least square approach, fixed effects, and random effects. Based on the test results using Chow gave significant results, this shows that the correct model used is the fixed effect, then based on the Hausman test results, it is also shown a significant value, thus, the test model chosen to explain the results of the regression test is the fixed effects.

The fixed effect model assumes that the intercept and slope of the regression equation (model) are considered constant, both between cross-sectional units and between time-series units. The fixed effect model uses

Table 10
Statistical Model 1 Regression Test Results using Fixed Effect Model

Variable	Indonesia	Japan
Constant	0,065*** (7,582)	-0,002*** (-6,247)
Rm-Rf	-0,316 (-1,610)	0,849*** (317,770)
SMB	0,226*** (9,477)	0,066*** (17,812)
HML	-0,171*** (-7,438)	-0,030*** (-8,047)
<i>R-squared</i>	0,150	0,874

The number in brackets is the value of t

N Indonesia : 20 companies x 12 months x 5 years = 1,200 companies a year (observation)

N Japan : 262 companies x 12 months x 5 years = 15,720 companies a year (observation)

Dependent variable : Return Share Portofolio (Rpt)

Source : Data Processing Results (2019)

a dummy, so that it assumes that the difference between times is considered constant, so the decision making of the test results using this model does not consider the difference between times. Based on the fixed effect model test presented in Table 10, it can be seen that the Rm-Rf risk factor in Indonesia has a negative coefficient value of -0.316 and is not significant. When compared with Japan at the same risk factor, namely the Rm-Rf is positive at 0.849 and significant at the level of = 1%. The pooled test results in Table 10 show that the risk factor Rm-Rf is used in Japan as a risk factor in assessing stock portfolio returns.

In Table 10, the test results for the firm size risk factor (SMB) in Indonesia obtained a positive coefficient value of 0.226 and significant at the level = 1%, while for Japan, the SMB risk factor was also positive at 0.066 and significant at the level = 1 %. These results indicate that the risk factor derived from company size (SMB) is consistently used in countries with different economies, namely Indonesia (the emerging market) and Japan (the developed market).

The third risk factor according to Fama and French's (1992) model of three risk factor, namely book-to-market (HML) in Indonesia, HML has a negative coefficient

value of -0.171 and is significant at the level of = 1%, while for Japan, it has a negative coefficient of -0.030 and significant at the level of = 1%. The results of this pooled test show that the risk factor from book-to-market is used in Indonesia and Japan, but the resulting effect is negative. Based on the Adjusted R Square value in the two countries, namely Indonesia and Japan, Indonesia has an Adjusted R Square value of 0.150 or 15%, while for Japan, the Adjusted R Square value is much larger than Indonesia, which is 0.874 or 87.4%. Thus, the three-factor model from Fama and French (1992) is more valuable in Japan as a country with a developed economy (developed market). In this case, to obtain more in-depth test results, the researchers continued the annual testing.

Based on the results of the annual regression test in Table 11, in the column of the variable Rm-Rf, the country of Indonesia has a significant effect on stock portfolio returns, but does not consistently show a positive or negative direction in assessing stock portfolio returns. The results obtained are significant negative coefficient values in 2015 and 2017 of -0.417 and -2.795, significant at the level of = 1%, while in 2016 and 2018, the positive coefficient value of

Table 11
Statistical Model 1 Regression Test Results Annually

Year	Constant	Rm-Rf	SMB	HML	Adj. R Square
Indonesia					
2014	-0,019*** (-6,760)	0,010 (0,203)	0,057** (2,584)	-0,047* (-1,851)	0,047
2015	0,008*** (4,916)	-0,417*** (-8,551)	0,030* (1,815)	-0,003 (-0,212)	0,192
2016	0,094*** (4,684)	0,941** (2,101)	0,167*** (4,297)	-0,116*** (-3,018)	0,025
2017	0,208*** (5,991)	-2,795*** (-3,327)	0,364*** (5,066)	-0,303*** (-4,369)	0,101
2018	0,031*** (7,954)	0,285*** (2,997)	0,036* (1,890)	0,075*** (3,801)	0,008
Japan					
2014	0,006*** (15,606)	-0,218*** (-25,747)	0,051*** (13,089)	0,008** (2,157)	0,161
2015	-0,000 (-0,029)	0,002 (0,034)	1,022*** (7,334)	0,072*** (3,933)	0,011
2016	-0,004*** (-2,641)	-0,258*** (-13,896)	0,278*** (11,728)	-0,132*** (-7,635)	0,077
2017	-0,009*** (-9,941)	0,925*** (298,877)	0,079*** (9,763)	-0,083*** (-10,174)	0,963
2018	0,002*** (3,067)	0,908*** (132,587)	0,047*** (7,129)	-0,026*** (-3,911)	0,849

The number in brackets is the value of t

Test results from : Fixed effect model

N Indonesia : 20 companies x 12 months = 240 companies month (observation)

N Japan : 262 companies x 12 months = 3,144 companies month (observation)

Sumber : Data Processing Results (2019)

0.941, significant at the level of = 5% and 0.285, significant at the level of = 1% and not significant in 2014, while in Japan, the coefficient value was significant negative in 2014 and 2016, but in 2017 and 2018, the coefficient value changed to positive and significant at the level of = 1%. Based on the results of testing the Rm-Rf variable in both countries, namely Indonesia and Japan, the direction of the influence is inconsistently positive or negative on stock portfolio returns. The expected expectation for the results of the Rm-Rf test on stock portfolio returns is the direction of the positive and significant influence, but the test results show the direction of the relationship is inconsistent, but still significant. This shows that market return (Rm-Rf) has an effect on stock portfolio returns, but is not consistent in assessing stock portfolio returns.

The Adjusted R Square values obtained by Japan in 2017 and 2018 were 96.3% and 84.9%, which showed a positive and

significant coefficient, so the hypothesis is supported that the market return risk factor (Rm-Rf) is used as a risk factor for stock portfolio returns. These results are comparable to the results of research from Tandelilin (2010) and Rusliati (2011), which prove that the higher the beta value or market return, the higher the level of return implied by investors. Thus, the first hypothesis in this study is supported, that market return (Rm-Rf) has an effect on stock portfolio returns.

Based on the results of the regression test in Table 11, in Indonesian SMB column, the SMB risk factor has a consistently significant positive coefficient from 2014 to 2018. The same thing is found in Japan that the SMB risk factor is also consistently significant positive at the level $\alpha = 1\%$. This shows that firm size (SMB) is consistently used as a risk factor to measure the volatility of stock portfolio returns in countries with different economic levels, namely Indonesia (the emerging market) and Japan (the

Table 12
Statistical Model Regression Test Results 2

Variable	Indonesia	Japan
Constant	0,061*** (5,034)	-0,002*** (-5,110)
Rm-Rf	-0,126 (-0,461)	0,853*** (228,374)
SMB	0,351*** (6,288)	0,142*** (19,129)
HML CC	-0,024 (-0,399)	-0,082*** (-10,835)
HML RE	-0,255*** (-3,114)	0,009 (1,331)
<i>R-squared</i>	0,184	0,877

The number in brackets is the value of t

N Indonesia : 10 companies x 12 months x 5 years = 600 companies month years (observation)

N Japan : 131 companies x 12 months x 5 years = 7,860 companies month of the year (observation)

Source : Data Processing Results (2019)

developed market). These results support the model from Fama and French (1992) which states that SMB is a risk factor for stock portfolio returns. Thus, the second hypothesis in this study is supported.

The test results of book-to-market (HML) risk factor in Indonesia in 2014, 2016, and 2017 had a significant negative coefficient value, but in 2018, it changed to a positive coefficient value of 0.075 and significant at the level of = 1%, while in 2018 in Japan, the HML coefficient value was significant negative at the level of = 1% in 2016, 2017, and 2018, but in 2014 and 2016, the HML was positive at 0.008 and significant at the level of = 5% and of 0.072, significant at the level of = 1%. When viewed from the Adjusted R Square value in Japan, the ability of risk factors from the Fama and French's (1992) model to have a greater contribution in 2017 and 2018, so it can be concluded that the effect of the HML risk factor is negative and significant on stock portfolio returns in Japan, while for Indonesia, the coefficient value does not consistently have positive or negative values every year. Thus, the hypothesis in this study is not supported because the effect resulting from the HML risk factor is negative on stock portfolio returns.

In this case, the negative effect is caused by the use of the fixed effect model, which assumes that changes between times are considered constant, so this study only explains the CAPM model with a constant expected return and not time-varying expected return, so this study does not consider additional risk factors, such as economic changes that affect investment from time to time. The larger Adjusted R Square value in Japan indicates that the three-factor model of risk from Fama and French (1992) has a greater contribution in Japan.

Statistical model 2 testing began with testing pooled data during the period from June 2013 to June 2018. Testing of statistical model 2 was also carried out by comparing three test models, namely the pooled least square approach, fixed effect, and random effect. Based on the results of the Chow test, it is shown a significant value, so that the correct model used is the fixed effect, then the comparison between the fixed effect model and the random effect model using the Hausman test also shows a significant value. Thus, the test model used to explain the results of the regression test in statistical model 2 is the fixed effect model.

Based on the results of the fixed effect test presented in Table 12, it can be seen that the Rm-Rf and SMB risk factors in Indonesia

Table 13
Statistical Model 2 Regression Test Results Annually

Year	Constant	Rm-Rf	SMB	HML CC	HML RE	Adj. R Square
Indonesia						
2014	-0,018*** (-4,437)	0,067 (0,921)	0,145*** (3,083)	-0,022 (-0,497)	-0,114*** (-2,619)	0,013
2015	0,008*** (3,433)	-0,412*** (-5,844)	0,064* (1,875)	0,026 (0,774)	0,012 (0,384)	0,196
2016	0,085*** (3,128)	0,963 (1,581)	0,324*** (3,964)	-0,237** (-2,193)	0,003 (0,030)	0,107
2017	0,294*** (4,233)	-2,854*** (-2,431)	0,672*** (3,330)	0,230 (1,242)	-0,864*** (-2,839)	0,123
2018	0,031*** (5,751)	0,290** (2,226)	0,108*** (2,414)	0,140*** (3,476)	0,039 (0,896)	0,074
Japan						
2014	0,005*** (10,741)	-0,207*** (-17,423)	0,097*** (12,340)	0,005 (0,638)	0,010 (1,290)	0,201
2015	0,003*** (10,144)	-0,190*** (-17,503)	0,032*** (7,190)	-0,007* (-1,682)	-0,010*** (-2,326)	0,130
2016	0,030*** (19,889)	0,661*** (58,265)	0,269*** (11,256)	-0,034 (-1,353)	0,125*** (4,958)	0,657
2017	-0,009*** (-7,275)	0,928*** (216,234)	0,159*** (9,686)	-0,119*** (-7,387)	-0,081*** (-4,651)	0,965
2018	0,001* (1,648)	0,910*** (94,186)	0,092*** (7,207)	0,000 (0,055)	-0,050*** (-3,895)	0,839

The number in brackets is the value of t

Test results from : Fixed effect model

N Indonesia : 10 companies x 12 months = 120 companies month (observation)

N Japan : 131 companies x 12 months = 1,572 companies month (observation)

Dependent variable : Stock Portfolio Return (Rpt)

Source : Data Processing Results (2019)

and Japan obtained the same results as shown in the results of the statistical model regression test 1. The next test was carried out by looking at the test results of the HML risk factors, divided into HMLCC and HMLRE. Based on the test results in Table 12, the HMLCC risk factor in Indonesia has a negative coefficient value of -0.024 and is not significant, while compared to Japan, for the same variable, the HMLCC risk factor has a negative coefficient of -0.082 and significant at the level of $\alpha = 1\%$. It can be seen that the HMLRE risk factor in Indonesia has a negative coefficient value of -0.255 and is significant at the level of $\alpha = 1\%$, while in Japan, the HMLRE coefficient value is positive at 0.009, but not significant.

The pooled test in Table 12 shows that the accounting information contained in the book-to-market, namely retained earnings, has a negative effect on stock portfolio returns in Indonesia, while in Japan, retained earnings has no effect on stock portfolio

returns. Based on the Adjusted R Square value, Indonesia has an Adjusted R Square value of 0.184, which is smaller in value than that of Japan at 0.877. Thus, the accounting information in book-to-market (HML) that provides a greater contribution as a risk factor for assessing stock portfolio returns is accounting information derived from retained earnings.

Furthermore, testing was carried out in more depth by looking at the test results on an annual basis. Based on the results of the regression test in Table 13, the results obtained for the HMLCC and HMLRE variables give different results when compared to the pooled data test in Table 13 because there are differences in the results of the pooled data and annual tests. Whether the conclusion of the hypothesis is accepted or rejected will be seen from annual test that has contributed the largest value of Adjusted R Square. In this case, the annual test which has the largest value of Adjusted R Square

indicates the largest contribution of the independent variable in explaining the dependent variable. The HMLCC risk factor in Indonesia had a significant negative effect in 2016 and 2018, but the results of the pooled test showed insignificant results.

Based on the results of the regression test in Table 13, the risk factors for HMLCC are not significant in either Indonesia or Japan. This shows that this risk factor does not contain information that can affect stock portfolio returns in countries with different economic levels, namely Indonesia (the emerging market) and Japan (the developed market).

In 2014 and 2017, subsequent testing of HMLRE risk factors in Indonesia had a significant negative coefficient value of -0.114, significant at the level of $\alpha = 1\%$ and -0.864 significant at the level of $\alpha = 1\%$, while in 2015, 2016, and 2018, this risk had no effect on stock portfolio returns, but when viewed from the Adjusted R Square value, the HMLRE risk factor is not consistently used in Indonesia as a risk factor for stock portfolio returns, while in Japan, the HMLRE is consistently significant at the level $\alpha = 1\%$ in 2015, 2017, and 2018. Thus, this research hypothesis is supported.

The supported hypothesis shows that accounting information derived from retained earnings has a greater contribution to stock portfolio returns than accounting information derived from contributed capital. These results are comparable to the study conducted by Ball et al. (2019), which stated that retained earnings are accounting information in book-to-market risk factors that have a greater contribution to stock portfolio returns than the contributed capital.

In Table 13, the coefficient value generated for the risk factor for HMLRE in Japan has decreased starting from 2016 to 2018, namely in 2016, the resulting coefficient value was 0.125, which then decreased in 2017 to -0.081, until 2018 decreased to -

0.050. This proves that accounting information has begun to decrease in relevance, but is still relevant to use, which is evidenced by significant test results in Japan in 2017 and 2018.

The results of this study support the statement in the research by Baruch and Feng (2016) that the economy develops and accounting information technology begins to experience a decline in relevance. These results confirm the research of Ball et al. (2019) that retained earnings contain important information that affects stock portfolio returns compared to contributed capital. Based on the results of testing the CAPM model, the three risk factors from Fama and French (1992) apply consistently to explain variations in stock portfolio returns in Japan, namely country with developed market, while for Indonesia as an emerging market country, the Fama and French's model does not provide consistent results in assessing the return of stock portfolios in that country.

The CAPM model is an asset pricing model based on the concept of a rational investor. Based on rational investor behavior, investors will tend to assess the expected portfolio return using the basic principle of stock investment, namely high risk high return. The basic principle of high risk high return is that when someone invests in a company or portfolio with a high level of risk, it will produce a high return that is also in accordance with the risk he bears from the investment and vice versa. In this case, developed countries have investors with rational and knowledgeable behavior, so this model has a greater contribution and is consistently used in Japan in assessing variations in stock portfolio returns compared to Indonesia as a developing country, which has investors with irrational behavior.

The test results in this study also show that the accounting information contained in the HML risk factor, which has a greater contribution to stock portfolio returns, is

accounting information derived from retained earnings. Retained earnings are a component of the company's book value which contains information on accumulated retained earnings during the company's existence, minus dividends distributed to shareholders, while contributed capital is information on initial capital contributions by shareholders, which is information about the company's past, so it has no effect on stock portfolio returns. Research conducted by Ball et al. (2019) also states the same thing, in this case, that contributed capital does not contain important information that can affect the expected return.

The HML risk factor testing in this study shows the opposite direction, which is a negative direction on stock portfolio returns and has a significant effect. This is due to the weakness of the use of the fixed effect model, which assumes that changes over time are considered constant, so the limitation of this study is only using the CAPM with the assumption of constant expected returns. Thus, the HML risk factor does not always show a positive direction, but is able to turn negative due to the time-varying expected return by investors, so that additional risk factors in the form of economic changes, from time to time, are not considered in this research model.

Based on the test results, the coefficient value of the HMLRE risk factor in Japan has consistently decreased from 2016 to 2018. The development of the economy and increasingly advanced technology make investors easier to access a lot of information, including other information besides accounting information. The decline in the relevance of accounting information is also caused by the current reporting system, which does not adequately reflect the information needed by investors in making investment decisions.

By linking the risk factors of accounting information and the returns expected by investors in this study, this study provides evidence that along with increasingly advanced

economic development and technological advances, accounting information begins to lose its relevance to investment decisions. The results of this study support the statement of Baruch and Feng (2016) in their research that accounting information has lost its relevance to investors rapidly over the last half century.

The usefulness of accounting information, especially retained earnings and book value, is getting worse because the impact of changes in company operations and changes in economic conditions are not adequately reflected in the current reporting system (Lev and Zarowin 1999). Investors will access a lot of other information besides accounting information. This causes the asymmetry of the accounting information to decrease in line with technological advances. This study presents empirical evidence that accounting information begins to decrease its relevance to investment decisions. The development of the economy, industry, and increasingly advanced technology has an impact on the loss of relevance of accounting information, so it is assumed that one day, accounting information will become less relevant or be no longer useful for investment decisions.

CONCLUSIONS

Based on the results of the data that have been analyzed, the results obtained show that risk factors derived from market returns ($R_m - R_f$), firm size (SMB), and risk factors from book-to-market (HML) are consistently used to assess stock portfolio returns in Japan (developed market), while in Indonesia (emerging market) it does not provide consistent results in assessing stock portfolio returns. The accounting information derived from retained earnings contained in the risk factor book-to-market (HML) provides a greater contribution to stock portfolio returns than accounting information derived from contributed capital. Based on the

examination of the accounting information contained in the HML risk factors, it is shown that accounting information has begun to decrease its relevance to investment, but is still relevant to use today. There are several limitations in this study, namely, first, this study only formed a portfolio by dividing the risk factors of SMB and HML into two parts; the next researchers are to develop a portfolio division into three parts. Second, this study only used the Fama and French's (1992) model, so that there are only three risk factors considered. Suggestions are provided for future researchers who can use the latest model, namely the five risk factor model from Fama and French.

Third, the CAPM model in this study used the assumption of constant expected return, so that the risk factors generated in this study do not always show a positive direction towards stock portfolio returns, possibly due to the time-varying expected return by investors. Fourth, modeling pooled data in this study used a fixed effect model, in this case, the weakness of fixed effects using a dummy, and this model assumes the difference between times is considered constant, thus, disturbing the degree of freedom. Fifth, the number of samples for the country of Indonesia is too small, so that it affects the assumption of CLT in the formation of its portfolio using the assumption of time-varying expected return; suggestions for future research are to be able to take samples from other emerging markets for comparison. Sixth, the use of the sample of Japan, which is considered a country with a more developed economy (developed market) because of the quality of the population and the better progress of science and technology in Japan, so that investors in Japan have rational and knowledgeable behavior.

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