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DISAGREGATING ACCOUNTING PROFITABILITY. THE EMPIRICAL RELATIONSHIP BETWEEN OPERATING PROFITABILITY AND CONTEMPORANEOUS STOCKS RETURN.

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Abstract

This paper studies the empirical relation between the cross-section of stock return and operating profitability that is derived explicitly from operating activities. To account only for profit from operating activities, I use financial statement reformulation and decompose profitability items into operating and financing profitability. Using Fama-MacBeth regression and univariate portfolio analysis, I find no significant evidence to suggest that operating profitability significantly predicts the cross-section of stock returns. Evidence indicates that operating profitability provides weaker predictive power of stock returns and is less robust common risk factors compared to profitability factors used in existing asset pricing literature.

1. Introduction

In a highly influential paper, Novy-Marx (2013) shows that profitability measure as firm's gross profit (sales less cost of goods sold) divided to its assets has significant power in predicting cross-section of average stock return. Earlier, Fama and French (2006) conclude that earnings measured by sales less cost of goods sold less selling general and administrative, have explanatory power in cross-section regressions of Fama and MacBeth (1973). While such profitability measures predict stocks return, it does not reflect the income available for the shareholders, as the latter is a bottom-line value in the income statement, after deductions of all expenses, taxes and other income are made. Therefore, from the shareholder's perspective, the profitability measure used in such an empirical asset pricing model is not realistic in terms of measuring income available to shareholders.

To correct such imperfections, financial statement analysis offers a comprehensive process of deriving a profitability measure that (1) reflects the real income available to shareholders after all deductions and adjustments are made, and (2) provide the framework for analyzing the source and sustainability of income. Such a framework calls for disaggregating the firm's operations into operating activities and financing activities to improve valuation analysis and enhance the accuracy of profitability forecast. For example, in a highly influential textbook, Penman (2013) proposes that analysts should focus on operating income when conducting business valuation analysis because it is an operating income that exhibits value-added activities through trading with customers and suppliers. FASB'S Staff Draft of an Exposure Draft on Financial Statement Presentation (2010) suggest disaggregating items from comprehensive income and equity statement and reformulating them into operating activities and financing activities. FASB assume that doing so will allow users of financial statement to analyze profitability and perform equity valuation more efficiently since the clear disaggregation between profitability arising from operating and financing activities is made.

The process of a financial statement profitability item disaggregation into operating and financing activities is called decomposition. Formulating decomposed variables into a "new" or reformulated financial statement is called reformulation. The reformulation separates operating income that originates from sales from operating income that does not arise from sales. Operating income that is derived from decomposition and reformulation and that is a result of an operating transaction with customers and suppliers, is called net operating income, for it comes from business operating activities. Financial income that is derived from decomposition and reformulation and that is a result of financing transactions with lenders and shareholders, is called net financial income (expense) for it comes from business financing activities.

From one perspective, the profitability measure used by Fama and French (2015) and Novy-Marx (2013) has both demonstrated the ability to explain the cross-section of stocks return in Fama and MacBeth (1973) cross-section regression and the power to predict the cross-section of stock return. On the other hand, any profitability measure is chosen by the researcher depending on the specific goal of a research and therefore is subjective. Term profitability is widely used in empirical asset pricing literature, yet the meaning of the term varies substantially across papers. The question arises whether changing any given subjective profitability measure (i.e., gross profit) to another subjective profitability measure (operating income) can result in stronger stock predictive ability, all else equal.

Subjectiveness and imperfection of defining profitability can be seen from a simple example. By looking at the gross profitability measure (sales minus cost of goods sold), one can conclude that the firm is profitable. However, when looking at the net income profitability measure (residual amount of earnings after all expenses are deducted from sales), one will conclude that the same firm is not profitable. This example shows the imprecision of term profitability that can result in different profitability conclusions depending on the definition.

Therefore, by combining clear profitability definition – net operating income – derived from financial statement analysis framework, that is argued to be the most accurate measure of profitability from shareholder's perspective (Penman, 2013), I test whether more accurate profitability measure from the shareholders perspective results in stronger cross-section predictive power of stock return. The question is, then, whether operating profitability and specifically, net operating income, derived from decomposition and reformulation of financial statement (1) predict cross-section of stock return and, (2) has higher stocks return predictive power compared to profitability measure used by Fama and French (2015) and Novy-Marx (2013).

The empirical relationship between net operating income derived on the comprehensive bases and cross-section of stock return has not been studied before. Papers that use operating profitability asses the value relevance of operating income information for equity valuation (i.e. Nissim and Penman (2003), Zhang (2005), Lim (2014), Penman and Yehuda (2019)). This is usually done by testing the extent to which operating income, in combination with other financial statement variables, can explain contemporaneous stocks return. While such papers show the explanatory power of operating income, it is not tested against asset pricing factors. It can be the case that the stock return explained by operating profitability is captured by a particular factor from asset pricing model, and thus is the manifestation of this risk factor. Besides, such papers do not present an explanation of why operating profitability should predict a stock return in an efficient market. In this paper, I address those questions.

Therefore, testing net operating income through Fama-MacBeth and portfolio analysis, as well as controlling for Fama and French (1993) three factors to understand the predictive power of net operating income in the efficient market, is the central topic of this paper. The analysis shows no significant evidence to suggest that net operating income significantly predict stock returns in time-series regression or has significant explanatory power in Fama-MacBeth regression.

The rest of the paper is structured as follows. Section 2 provides a theoretical explanation of an expectation that operating income predicts the cross-section of stock returns. Section 3 presents the data and methodology of decomposing and reformulating financial statements to derive net operating income. It presents regression, discusses its specification, and shows how variables for the main analysis are derived. Section 4 considers the performance of operating income factor relative to a three-factor model and shows that net operating income does not significantly predict stock return when controlling for Fama and French (1993) three factors. Section 5 concludes, discuss results, and offers arguments of why net operating income does not significantly predict stocks return compared to Fama and French (2015) and Novy-Marx (2013) profitability measure. Finally, further research is suggested.

2. Theoretical Framework

2.1. Theory: accounting perspective on business and operating income

In a simple term, operating profitability is the profit that is derived by distinguishing profit earned from financing activities from profit earned from operating activities. This way, operating profitability account only for profit coming explicitly from business operations and ignores profit coming from financial or any other type of business operations. To provide an intuition of why operating profitability can predict stock return, a good explanation from the accounting perspective of business structure, value creation, and value distribution to shareholders is required. When an investor contributes cash to acquire a share of a business, he does so in the expectation that such investment will deliver a higher amount of cash in the future. Because such cash contribution gives an investor a claim of the future business's earnings, an investor is willing to exchange cash for the shares of equity that will allow him to receive a payoff in the future. The difference between payoff and initial contribution to acquire shares is a return and arise from periodic dividends payment or sale of stock on the secondary market. The procedure of cash received from the sale of stock and the cash paid in dividends less the cash contributed to the business for an equity share is called net dividends to shareholders.

One can analyze a business from two perspectives – from the stockholder perspective and the business-level perspective. Let us assume that for the stockholder, the value of a business is measured by the present value of the total amount of net cash flow. Let us also assume that from the business perspective, the value of a business is the present value of the total amount of cash inflow from business operations less cash outflow for investments, assuming for an infinite number of years for a going concern. The latter is a well-known discounted cash flow (DCF) model. The business generates cash from value-added activities, and three such activities are generic to all firms. Those are operating activities, financing activities, and investing activities.

Operating activities generally include the use of assets and employment of labor to produce goods and services that firms later sell to the customers. Operating activities result in negative cash flow when trading with suppliers to purchase production recourses and in positive cash flow when trading with customers on the marketplace to collect cash. When operating activities organized successfully, the business generates positive cash flow to reinvest into assets or return to shareholders. Financing activities include the raise of cash in the capital market and the return of cash to shareholders in the form of dividends or loan payments. Financing activities result in positive cash flow when giving equity or loan claims to shareholders or stockholders, respectively, in the exchange of cash. Financing activities result is a negative cash flow when paying out the debt or returning cash in the form of dividends or stock repurchase to shareholders. Investing activities include the use of cash borrowed in financing activities to purchase assets used for production and operating activities. Investing activities result is negative cash flow when assets are purchased for production, and in positive cash flow when assets are sold.

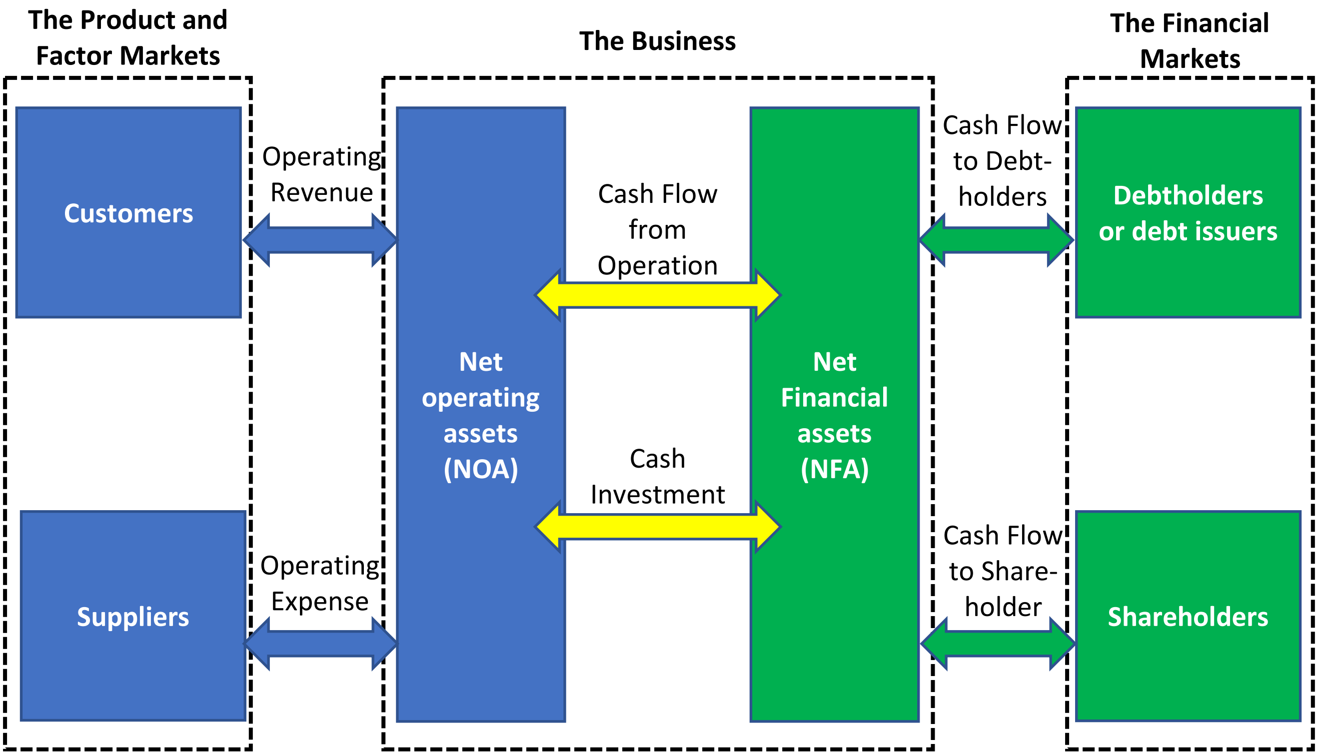
To provide an intuitive explanation of why net operating income can be relevant for predicting the cross section of stock return, a diagram is presented. Figure 1 provides a comprehensive overview of stocks and flows of business from an accounting perspective. The right-hand side of the diagram depicts financing activities and financial transactions with shareholders and debtholders. The lower-right part represents transactions with shareholders and shows that the business receives cash from shareholders, which it temporarily stores in financial assets to convert later into operating assets. When a business decides to liquidate financial assets, it makes a cash payment to shareholders. Such transactions with shareholders is represented by letter d and is called net cash flow to shareholders. The upper-right part shows identical transactions with debtholders, represented by letter F and is called net cash flow to debtholders. The left-hand side shows that proceeds from financial assets is used to employ operating assets that is used for transactions with suppliers (i.e. purchasing production recourses) and customers (i,e, selling goods and services). The former produce operating expense (OE) and the letter produce operating revenue (OR). The difference between the two is operating income (OI). The central part shows that cash proceeds from operating activities is used to buy back net financial assets (or decrease financial liabilities) at the end of business cycle and is represented by letter C. Letter I, in turn, represents financial asset liquidation (or financial obligation increase) and is represented by cash investment in operating assets at the beginning of business cycle.

The bottom part of the diagram shows that free cash flow is realized by subtracting cash outflows from investment I from cash inflows from business operations C. One can also realize free cash flow by focusing on accrual accounting items from income statement and balance sheet – operating income and change in net operating assets, represented by letters OI and $\triangle NOA$ respectively.

The bottom part of the diagram show that the difference between cash inflow from operations C and cash outflow from investment I generate free cash flow. But the generations of free cash flow can be also depicted in terms of accrual accounting items from income statement and balance sheet – operating income and change in net operating assets. The left-hand side of the bottom part of the figure represents the formation of free cash flow from an operating activity perspective. The key aspects of operating assets is that it generates operating income. Free cash flow is one portion of this operating income that remains as a residual after another portion of this income is reinvested back to net operating assets. Formally, this can be presented as $OI - \triangle NOA = C - I$. Likewise, the right-hand side of the diagram represents the distribution of free cash flow from a financing activities perspective. Business uses free cash flow realized from operations, together with net financial income, to repay dividends to shareholders and decrease net financial assets. Formally, this can be presented as $C - I + NFI = D + \triangle NFA$.

Finally, from the viewpoint of the shareholder, the business value is the present value of the aggregate of net cash flow (d), which one can derive by deducting change in net operating assets from operating income, as was argued above. Formally: $d = OI - \triangle NOA - NFE + \triangle NFO$.

Since common shareholder's equity is the difference between total assets and total liabilities, presented in Figure 1 as net operating assets (NOA) less net financial obligations (NFO), one can express a change in shareholder's equity as a change in NOA less change in NFO, formally $\triangle CSE = \triangle NOA - \triangle NFO$, when substituting to the preceding equation, it finally yields $CSE = OI - NFE - d$. That is, change in shareholder's equity is increased by operating income, decreased by the net financial expense, and decreased by dividends to shareholders. In other words, it is an operating income that increases shareholder's wealth.



$$OR - OE = OI$$

$$OI - \triangle NOA = C - I$$

$$C - I - \triangle NFA + NFI = D$$

Operating Activities

Financing Activities

Figure 1 Stock and Flows of a Firm Decomposed by Operating and Financing Activities

The explanations for the changes in NOA, NFO and CSE work only if profits refer to comprehensive income, that is, contains all appropriate components of operating income and financial expense. Empirical literature that studied how stock return in cross-section varies in response to change in profitability use earnings that are not referred to comprehensive earnings. For example, Fama and French (2015) used a profitability factor called RMW (Robust Minus Weak) that is defined as the difference between two robust operating profitability average returns and two weak operating profitability portfolios average returns. However, term operating profitability in Fama and French RMW factor is misleading from the perspective and goals of this paper. Fama and French defines operating profitability as the result of sales less cost of goods sold less selling, general and administrative less interest expense. Such calculation of operating profitability is not done on comprehensive basis. Comprehensive income discussed in more detail in the next section of this paper. However, the key characteristic of comprehensive income is that it combines net income and other income reported under dirty-surplus accounting in the equity statement. Similarly, Haugen and Baker (1996) use operating income as one of several measures of profitability as a predictive factor for stock return, which is not defined on comprehensive bases.

Therefore, I hypothesis that by deriving operating profitability on the comprehensive bases through reformulation of financial statement and decomposition of comprehensive income to operating and financing components, net operating income will predict cross-section of stock return:

Hypothesis 1: Net operating income, calculated on the comprehensive bases, will predict the cross-section of stock returns.

To explain why this hypothesis might be correct in the efficient market, I offer investor's limited attention and cognitive capacity theory as a possible explanation. The main objective of research on investor's limited attention, which is linked with research on investor sentiment, is to understand the underreaction of stock prices to relevant information documented by many papers (Ball and Brown (1968), Foster, Olsen, and Shevlin (1984), Bernard and Thomas (1990), Cutler, Poterba, and Summers (1991), Jegadeesh and Titman (1993)). However, compared to the literature on investor's sentiment, the literature on investor's attention relies specifically on investor's limited attention capability when searching for the explanation of stock underreaction effect. The origin of investor attention theory is cognitive psychology and precisely, the Kahneman and Tversky (1973) theory of attention, that was first to suggest that attention is a limited cognitive processing recourse.

Attention theory in financial markets suggests that scarcity of time and cognitive processing power brings restrictions on the speed and effectiveness with which an investor can process stock related information.

Current academic literature on investor's limited attention has demonstrated that limited cognitive processing power leads to stock information underreaction, causing stock prices to adjust slowly than one would expect in instantaneous and complete information processing. Hirshleifer and Teoh (2003) study the relationship between the degree of clarity with which the information is presented and the speed of stock price reaction. Hou, Xiong, and Peng (2009) suggested an equilibrium model in which investors optimally allocate their attention. They determined that investor's limited attention capacity cause investors to focus on market-level data and sector-level data and to overlook the firm-specific data. In combination with investor's overconfidence bias, the overlook of firm-specific information explains the stock price dynamic that is hard to explain empirically when one assumes complete and instantaneous information processing. The main conclusion of the above-mentioned academic research is that investor's limited attention capacity leads to delayed stock price reaction so that investors required more time to price value-related information than predicted by instantaneous information processing.

Several empirical papers confirm central predictions of research on investor's limited attention. Hirshleifer, Lim, and Teoh (2009) show that stock prices react to earnings announcement slower than predicted by instantaneous information processing. They also find that post-earnings announcement drift reported by Ball and Brown (1968), Foster, Olsen, and Shevlin (1984) and Bernard and Thomas (1990) is significantly stronger for days in which a large number of firms announce their earnings and investor's attention and processing capacity are particularly limited. Dellavigna and Pollet (2009) show that at the end of the week, when the investor's attention is likely to be lower, the investors react significantly slower to the firm-specific earnings news compared to comparable news at the beginning of the week. Da, Gurun and Warachka (2014) find that when information is released gradually, the tendency of investor's underreaction diminishes compared to the situation when information is released instantaneously. Bali, Peng, Shen, and Tang (2014) present further indication that the theory of investor's limited attention is essential in explaining stock market underreactions to liquidity shocks.

Because calculating comprehensive-based operating profitability involves financial statement reformulation and financial statement items decomposition, it requires extra cognitive, attention, and time recourses that are limited. Calculating profitability that involves no reformulation, decomposition, and comprehensive adjustments is easier and do not require extra attention and time recourses. Therefore, if reformulation and decomposition of financial statement items is beneficial as proposed by fundamental analysis, it should result not only in predictive power of stocks return, but the predictive power should be stronger compared to profitability factor derived by non-comprehensive adjustments basis, such as in Fama and French (2015) profitability factor and Novy-Marx (2013) gross profitability factor. Novy-Marx (2013) provides a clear argument that "gross profit is the cleanest accounting measure of true economic profitability, since farther down the income statement one goes, the more polluted profitability measures become, and the less related they are to true economic profitability" (p. 2). I challenge this statement and hypothesis that operating income derived through comprehensive financial statement reformulation and decomposition while requiring more cognitive and time resources, result in the stronger predictive power of stock returns compared to Fama and French (2015) and Novy-Marx (2013) profitability factors:

Hypothesis 2: Operating profitability factor deriver through financial statement reformulation and decomposition is the cleanest accounting measure of true economic profitability, and therefore, results in higher cross-section predictive power of stocks return compared to Fama and French (2015) and Novy-Marx (2013) profitability factors.

2.2. Financial statement reformulation and operating income derivation

In this paper, I use Penman (2013) framework to decompose profitability in operating and financing profitability. Current literature provides mixed evidence on the benefits of decomposition of bottom-line profitability to its components. For example, Esplin, Hewitt, Plumlee, and Yohn (2014) find that disaggregating financial statement items into operating and financial variables provide no significant benefits when explaining the stock return. Nissim and Penman (2003), on the opposite, find that the relationship between operating activities items and future stock return is more persistent compared to financial activities items. Similarly, Lim (2014) reports that financial activities profitability has a weaker effect on annual stock return compared to operating activities profitability.

Penman (2013) suggests that one should use operating profitability for valuing a business because it is the former that is responsible for value creation from core business activities. Besides, he suggests that value-creating for shareholders comes from operating activities, and not from transactions with shareholders and debtholders arising from financial activities. However, operating income is not readily available in income statement build according to Generally Accepted Accounting Principles (GAAP). What is available is net income items, that does not capture the whole economic picture of a firm. The reason for that is dirty-surplus accounting - the GAAP common practice of reporting part of profitability in equity statement instead of in income statement. Clear-surplus accounting, in comparison, report all profitability in the income statement exclusively, and so has no income reported in equity statement since one can find entire income under net income item in the income statement. Penman (2013) argues that due to the GAAP practice of dirty-surplus accounting, the analyst cannot perceive the full picture of the profitability of business from income statement exclusively since the income statement does not capture the total value of business earnings. The solution that Penman propose is including dirty-surplus items into analysis that are fully captured in comprehensive income item – that is the sum of net income and dirty-surplus items. Therefore, Penman suggests that reformulating income statements and decomposing operating income that explicitly distinguishes between income generated by financing activities from income generated by operating activities improves forecast analysis. If that statement is true, the better forecast analysis should lead to better valuation and, ultimately, to higher stock return. Therefore, I test this statement in my paper. The comprehensive overview of financial statement reformulation to derive operating income on a comprehensive basis with the real-world example can be found in Appendix A.

2.3. Empirical analysis: profitability factors in empirical asset pricing

The cross-sectional properties of profitability to predict stock returns is a popular topic in financial literature. Basu (1977) was first to tests the return predictability of earnings numbers relative to price. While in empirical textbooks, such factor is considered the value premium factor, rather than profitability factor, Basu was the first to include earnings as a predictor for long-run stock returns. His paper attracted considerable attention, and the evidence from earnings anomalies called for the development of multi-beta CAPM models, most know of which are Fama and French (1993) three-factor model and Carhart (1997) four-factor model. Further research in the capital market examines whether other effects, in addition to earning anomalies effect, can be used to predict future abnormal stocks return. Lakonishok, Shleifer, Vishny (1994) study the effect of earnings growth and cash flow yield on stock returns while LaPorta (1996) and Dechow and Sloan (1997) study the effect of market overreaction due to analyst's tendency to make over-optimistic earnings forecast and extrapolate past earnings performance when making future projections.

Haugen and Baker (1996) and Cohen, Gompers, and Vuolteenaho (2002) find significant evidence of the relationship between return on equity and cross-section of stock return. Bali, Demirtas, and Tehranian (2008) find significant evidence to suggest the cross-sectional relationship between the ratio of earnings to total assets and stock return. Novy-Marx (2013) finds similar results when he uses the ratio of gross profit to assets as a predictive variable for the cross-section of average stocks return.

While Fama and French (2008) find that there is a significant positive correlation between profitability and average cross-section of stocks return when they control for size and book-to-market (B/M) effect. Novy-Marx (2013) argued that, compared to the profitability factor used by Fama and French (2008), the gross profitability factor proposed in his paper has significantly higher cross-section stocks return predictive power. As a response, (Fama and French, 2015) include a profitability factor called RMW (Robust Minus Weak) that is defined as the difference between two robust operating profitability average returns and two weak operating profitability portfolios average returns. They found that the RMW factor has significant stock return predictive power with t-statistics of 5.45 on a 2x3 factors sort and that including the RMW factor capture the cross-sectional variation of stocks returns to a higher degree compared to the three-factor model.

Haugen and Baker (1996) assumed that profitable firms today have a higher chance for growth tomorrow and used several measures of profitability, including, among other, operating income to total assets (where operating income was measured not on comprehensive bases) as a predictive variable for stock return. Among others, they used ratios of operating income to total revenue, total revenue to total assets, and revenue to book value of equity for the analysis. They find that the cumulative average payoff of all profitability factors is equal to 1.57% over the period from 1979 to 1983. However, for the purpose of this research, it should be noted that according to GAAP standards (standards, according to which Compustat fundamental variables are reported), profitability measure used in the study mentioned above is classified as net income (income after all expenses were derived), rather than operating income. Lack of specification when using term operating income cause misunderstanding. Therefore, to avoid such misconceptions, I formulate a clear definition and test of operating income in this paper.

The empirical literature that studies the cross-section predictive power of a particular factor is broad. However, many studies exaggerate the predictive ability of a tested factor, including profitability factors. Hou, Xue and Zhang (2015) systemized all most popular anomalies reported in the empirical literature and focused on the significance of profitability effect anomaly stated in such empirical research. They took a wide array of 72 variables, including 14 variables that are categorized as profitability anomalies, and computed value-weighted decile returns. They found that the average return on the portfolios formed on previously reported anomalies factors is insignificant at the 5% significance level for about half of anomalies factors. Based on this finding, they suggest that many claims in the anomalies literature, including profitability anomaly, is exaggerated. For example, the revenue surprise anomaly proposed by Jegadeesh and Livnat (2006) and failure probability anomaly proposed by Campbell, Hilscher and Szilagyi (2008) is captured by the return on equity (ROE) factor suggested by Haugen and Baker (1996). The main take away from this literature is, therefore, to avoid the exaggeration of the predictive ability of net operating income in my paper that is correlated to well-known common risk factors. Thus, in my analysis, I control for factors that shown strong explanatory power of stocks return. Specifically, I control for size factor to avoid excessive weighting on microcap that would provide strong predictive power related to size factor rather than profitability factor, as well as control for common risk factors.

3. Data and Methodology

3.1. Data selection

To calculate the firm-specific fundamental variables, I obtain the annual fundamental information for each company from the CRSP-Compustat merge (CCM) file stored in Wharton Research Data Services (WRDS) database that contains fundamental information for the U.S listed stocks and security-specific code LPERMNO for merging with stock-level data. Monthly stock data, such as return, prices, and shares outstanding, is collected from The Center for Research in Security Prices (CRSP) monthly file. I use the sample of all U.S. firms for any of the years from 1962 to 2018 that have available Compustat data. I reserve the first year for the lag to calculate fundamental variables. Therefore the examination period is from 1963 to 2019. Besides, to be included in the sample, I set up the following criteria: (1) the stock is traded on the NYSE, NASDAQ or AMEX; (2) the stock is not represented by the financial company (SIC codes 6000–6999) where financial assets and financial liabilities are used in core operations; (3) the share class of a financial security is 10 or 11; (4) the book value of common equity is no lower than $10 million; and (5) the average of beginning and ending operating assets is positive.

Following the regular procedure find in empirical asset pricing literature, I merge monthly stock data from July in year t to June in year $t + 1$ with fundamental annual data of year $t - 1$, by which time the company should report annual accounting information for the fiscal year. Therefore, any CRSP stock data for months 1 to 6 (7 to 12) of year t is merged with Compustat fundamental data of year $t - 2$ $(t - 1)$. I remove the upper and lower 1% of monthly cross-sectional regression variables distribution to minimize the undesired influence of outliers. The qualitatively indistinguishable results are realized when I substitute 1% removal with 1% winsorization. These criteria result in a sample of 1,220,753 firm-month level observations for any of the 56 years from 1963 to 2019. Finally, the control factors for the primary analysis are obtained from Kenneth French's Library and include Fama and French (1993) three factors - market (MKTRF), size (SMB) and value (HML).

3.2. Variables specification

Using the data extracted from Compustat fundamental dataset, I calculate the profitability variables. To estimate operating income, I use accounting relations shown in Exhibit 1. As discussed, operating income is presented by the following equation:

$$Operating\ Income = Operating\ Revenue - Operating\ Expense \quad (1)$$

Exhibit 1 Summary of Accounting Relations from Reformulated Income Statement

Operating Revenue		OR
Operating Expense		(OE)
Operating Income		**OI**
Financial Expense	XX	
Financial Income	(XX)	**(NFE)**
Comprehensive Income		**CI**

Note. Adapted from "Financial statement analysis and security valuation", by Penman, S. H., 2013, 5th ed, p. 243

Equation 1 represents a top-down approach to operating income calculation. The top-down approach deducts operating expenses from operating revenue to get operating income. However, one cannot easily obtain those variables from Compustat. The better alternative is to use the bottom-up approach that begins from the bottom row - comprehensive income - and go upwards to calculate operating income by deducting the difference between financial income and financial expense, as shown in Exhibit 1. The difference between financial income and financial expense result either to net financial income (if the former is higher than financial expense) or to net financial expense (if the letter is higher than financial income). As discussed in the previous section, comprehensive income contains dirty-surplus accounting items, while deductions of net financial income result in operating income. The bottom-up operating income calculations is presented in Equation 2,

$$Operating\ Income = Comprehensive\ Income - Net\ Financial\ Income \quad (2)$$

where financial income is higher than financial expense, or by Equation 3 if the opposite is true, resulting to net financial expense.

$$Operating\ Income = Comprehensive\ Income + Net\ Financial\ Expense \quad (3)$$

I adapt variables for calculating operating income and its components from Nissim and Penman (2003). Net financial expense is calculated as the product of after-tax interest expense (Compustat item XINT), preferred dividends (DVP) and minority interest in income (MII) minus after tax interest income (IDIT) and minus the changes in marketable securities adjustment (MSA),

$$Net\ Financial\ Expense = XINT(1-\tau) + DVP - IDIT(1-\tau) + MII - \triangle MSA \qquad (4)$$

where τ is top statutory federal tax rate in addition to 2 % average state tax rate used for calculating the marginal tax rate. Historically, the top federal statutory corporate tax was as following: 52 % in 1963, 50 % in 1964, 48 %in 1965–1967, 52.8 % in 1968–1969, 49.2 % in 1970, 48 % in 1971–1978, 46 % in 1979-1986, 40 % in 1987, 34 % in 1988–1992, 35 % in 1993–2017 and 21 % in 2018–2019.

Comprehensive net income is calculated as net income (NI) minus preferred dividends (DVP) plus the changes in marketable securities adjustment (MSA) plus the change in cumulative translation adjustment (TRANSA) plus derivative gains and losses (CIDERGL) plus minimum pension adjustments (CIPEN), plus other adjustments (CIOTHER) following Nissim and Penman (2003):

$$Comprehensive\ Net\ Income = \qquad (5)$$
$$NI - DVP + \triangle MSA + \triangle TRANSA + CIDERGL + CIPEN + CIOTHER$$

Due to SFAS #130, Reporting Comprehensive Income, Compustat also provide comprehensive income data. This item contains dirty-surplus adjustments described above, specifically marketable securities adjustments, cumulative translation adjustments, minimum pension liability adjustments, derivative adjustments and any other adjustments listed under a heading of accumulated other comprehensive income. Therefore, when in any observation the variables for dirty-surplus accounting are missing, I calculate comprehensive income as total comprehensive income (item CI) minus noncontrolling interest comprehensive income (item CIMII) minus preferred dividends (item DVP). When available, such computation brings identical measure of comprehensive income as in Equation 5.

$$Comprehensive\ Net\ Income = CI - CIMII - DVP \qquad (6)$$

In my analysis I also include profitability variables used by Novy-Marx (2013) and Fama and French (2015). Novy-Marx profitability variables is computed as sales (item SALE) minus cost of goods sold (item COGS). Fama and French (2015) profitability variable is computed as sales (item SALE) minus cost of goods sold (item COGS) minus selling, general, and administrative expense (item XSGA) minus interest expense item XINT). The formulas for calculating such profitability variables are:

$$NovyMarx\ Income = SALE - COGS \qquad (7)$$

$$Fama\&French\ Income = SALE - COGS - XSGA - XINT \qquad (8)$$

It should be noticed that it is possible to derived operating income variable directly from Fama an French (2015) income formula. Such computation, firstly, clarifies the method that is used to compute operating income in this paper and secondly, shows the clear difference between Fama and French Income factor used in their five-factor asset pricing model and operating income factor that is used in this paper. The formula for operating income derived from Fama and French Income is shown below.

$$\begin{aligned} Operating\ Income & \qquad (8) \\ &= Fama\&French\ Income + Dirty\ Surplus\ Adjustments \\ &- Net\ Financial\ Income \end{aligned}$$

Or, when written using Compustat items mnemonics:

$$\begin{aligned} Operating\ Income & \qquad (9) \\ &= (SALES - COGS - XSGA) \\ &- (DVP - \triangle MSA - \triangle TRANSA - CIDERGL - CIPEN \\ &- CIOTHER) - (XINT(1-\tau) + DVP - IDIT(1-\tau) + MII \\ &- \triangle MSA) \end{aligned}$$

Each of above formulas for operating income yields identical results with insignificant difference due to Compustat precision variance for some items. In my main analysis I use Equation 4 for computing *Net Financial Expense*, Equation 5 for computing *Comprehensive Net Income* or Equation 6 is dirty-surplus items are not available and Equation 3 for computing *Operating Income*.

3.3. Profitability factors calculations

To obtain operating profitability (Op_Prof) factor, primary operating income variable is scaled by market value of operations (MV_Op), and is calculated for stock i in month t as operating income for stock i in month t divided by market value of operations for the same stock i for the last fiscal year end in $t-1$. Formally,

$$Op\_Prof_{i,t} = \frac{Operating\ Income_{i,t}}{MV\_Op_{i,t-1}} \tag{10}$$

The market value of operations calculation is adapted from Nissim and Penman (2003) and is calculated as market value of equity ($MktCap$) plus Net Financial Obligations (NFO) at the end of fiscal-year t-1, which is calculated as the difference between Financial Obligations and Financial Assets. Financial Obligation is calculated as Debt in Current Liabilities (item DLC) plus Long-Term Debt (item DLTT) plus Preferred Stock (item UPSTK) minus Preferred Treasury Stock (item TSTKP) plus Preferred Dividends in Arrears (item DVPA) Financial Assets is calculated as Cash and Short-Term Investments (item CHE) plus Other Investment and Advances (item IVAO) plus short-term investments (item IVST), Formally:

$$Financial\ Assets = CHE + IVAO + IVST \tag{11}$$

$$Financial\ Obligation = DLC + DLTT + PSTK - TSKTP - DVPA + MIB \tag{12}$$

$$Net\ Financial\ Obligation = Financial\ Obligation - FInancial\ Assets \tag{13}$$

$$MV\_Op = MktCap + NFO \tag{14}$$

where

$$MktCap_{i,t} = \frac{[SHROUT_{i,t} \times abs(PRC)_{i,t}]}{1000} \tag{15}$$

CRSP item SHROUT is the number of shares outstanding at the end of month t, and CRSP item PRC is the price of the stock, taken from the same file on the same date. The SHROUT field in CRSP is recorded in thousands of shares, the division by 1000 results in *MktCap* measuring the market capitalization of the stock in Equation 12 in millions of dollars. The absolute value is taken to account for the fact that CRSP reports a negative price when the reported value is calculated as the average of a bid and ask price. When either the SHROUT or PRC fields are missing or set to zero, the *MktCap* is taken as missing.

To obtain Fama and French Profitability (FF_Prof) factor, Fama and French Income variable is scaled by book value of common equity (BE), and is calculated for stock i in month t as operating income for stock i in month t divided by book equity for the same stock i for the last fiscal year end in $t-1$. Formally,

$$FF\_Prof_{i,t} = \frac{Fama\&French\ Income_{i,t}}{BE_{i,t-1}} \tag{16}$$

The book value of common equity (BE) calculation is adapted from Fama and French (2015) and is calculated as the book value of stockholder's equity (item SEQ) plus deferred taxes (item TXDB) plus investment tax credit (item ITCB) for adjusting the value for tax effect. From this, the book value of preferred stock (item BVPS) is subtracted. The book value of preferred stock is taken to be the redemption value (item PSTKRV), the liquidating value (item PSTKL), or the par value (item PSTK), taken in the given order, as available. If either the stockholders equity (SEQ) or the deferred taxes field (TXDB) is missing in the Compustat database, the book value of common equity is not calculated and calculation of $Op\_Prof_{i,t}$ fails. If investment tax credit (item ITCB) is missing, it is taken to be zero. Finally, if all of the values for preferred stock are missing, the book value of preferred stock is taken to be zero. Therefore, the book value of stockholder's equity is defined as

$$BE = SEQ + TXDB + ITCB - BVPS \quad (17)$$

where

$$BVPS = \begin{cases} \boldsymbol{PSTKRV}, \text{if available} \\ \boldsymbol{PSTKL}, \text{if available and } \mathbf{PSTKRV} \text{ not available} \\ \boldsymbol{PSTK}, \text{if available and } \mathbf{PSTKRV}, \boldsymbol{PSTKL} \text{ not available} \\ \mathbf{0}, \text{otherwise} \end{cases}$$

To obtain Novy-Marx Profitability ($Novy\_Marx\_Prof$) factor, Novy-Marx income variable is scaled by total assets, and is calculated for stock i in month t as income for stock i in month t divided by total asset for the same stock i for same fiscal year end in t. Formally:

$$Novy\_Marx\_Prof_{i,t} = \frac{NovyMarx\ Income_{\ i,t}}{AT_{i,t}} \quad (18)$$

For the Fama-MacBeth (1979) cross section regression analysis, the control for size ($Size$) and book-to-market (BM) is included. The size and book-to-market variables are adopted from Fama and French (2015) and is calculated as

$$Size_{i,t} = ln\ (MktCap_{i,t}) \quad (19)$$

$$BM_{i,t} = \frac{BE_{i,t-1}}{ME_{i,t-1}} \quad (20)$$

where $BM_{i,t}$ is the book-to-equity calculated for stock i at the month June for year t, $BE_{i,t}$ is book value of equity calculated for stock i at the end of last fiscal year at $t-1$, divided over $ME_{i,t}$ (market value of equity) for stock i at the month December at the same year $t-1$.

3.4. Regression specification

To examine the cross-sectional relation between operating profitability and return and to determine whether operating return predict future stock returns I use Fama-MacBeth regression analysis and univariate portfolio analysis approaches. For the portfolio analysis, I firstly calculate the breakpoints to be used for dividing the sample into portfolio. I then use these breakpoints to form the portfolios and calculate the average value of variable return within each portfolio for each period t. Each year, the first, the second, the third, the fourth and the fifth breakpoints for portfolios sorter on Op_Prof are calculated as the 20th, 40th, 60th, 80th and 99th percentile respectively of the cross-sectional distribution of Op_Prof. Finally, I examine variation in average values of return across the different portfolios.

To validate the cross-sectional relation between operating profitability and return I used Fama-MacBeth regression analysis. Regression includes controls for the size and is computed in a following form:

$$r_{i,t} = \alpha_{o,t} + \beta_1 Op\_Prof_{i,t-1} + \beta_2 Size_{i,t-1} + \beta_3 ln\,(BM)_{i,t-1} + \varepsilon_{i,t-1} \qquad (21)$$

where $Op\_Prof_{i,t-1}$ denotes the operating profitability of a firm i lagged by 1 year, $Size_{i,t-1}$ represents a control variable for size of a firm i lagged by 1 year and $ln\,(BM)_{i,t-1}$ represents a control variable for book-to-market ratio, where the natural log of BM is taken to minimize the effect of positive skewedness of the former. I then calculate time-series average of the outcome variable and examine its variation across different portfolios. Finally, I use Newey-West (1987) standard error correction to calculate time-series average of each estimated coefficient. If operating profitability factor has significant stocks return predictive power, I expect positive $\beta_1$coefficient and significant positive t-statistic.

3.5. Summary statistics

Table 1 reports the summary statistics of profitability variables, control variables and three Fama and French (1993) asset pricing factors. The result in Panel A shows that in the average month, the mean operating profitability (Op_Prof) value is 0.076 million of dollars and the median value is 0.072 million of dollars, suggesting the normal cross-sectional distributions of operating income factor. At the 1st percentile, operating profitability has average value of negative 0.923 million of dollars, while at the 99th percentile the average value is 1.030 million of dollars. The Novy-Marx profitability ($Novy\_Marx\_Prof$) has the highest mean of 0.362 million of dollars among all three profitability variables, as expected due to smaller value of expense deductions in gross profit calculations. The Fama and French profitability (FF_Prof) has mean value of 0.165 million of dollars, which is larger than operating profitability but lower than Novy-Marx profitability. As expected, operating profitability has the smallest mean value due to largest amount of expense deductions during calculations. Finally, the table demonstrates that there are 1,220,753 stocks for which a valid value of operating profitability factor is calculated.

TABLE 1
Summary Statistics of Profitability Factors, Control Variables and Asset Pricing Factors

Table 1 presents summary statistics (number of observations, mean, standard deviation, 1st, 25th. 50th, 75th, 99th percentiles) for key variables. Panel A presents profitability variables measuring Operating Profitability (Op_Prof), Novy-Marx Profitability ($Novy\_Marx\_Prof$), Fama and French Profitability (FF_Prof) measuring in millions of dollars for a period from 1963 to 2018. Panel B shows control variables and include *Size*, which is the natural log of *MktCap* and *BM,* which is the book-to-market ratio. Panel C displays three Fama and French (1993) asset pricing factors where MKTRF denotes excess market return over the risk-free return, SMB (Small Minus Big) is the average return on the nine small stock portfolios minus the average return on the nine big stock portfolios and HML (High Minus Low) is the average return on the two value portfolios minus the average return on the two growth portfolios.

				Percentile				
Variable	Obs.	Mean	SD	1st	25th	Median	75th	99th
Panel A. Profitability Variables								
Op_Prof	1220753	0,076	0,297	-0,923	0,024	0,072	0,136	1,030
$Novy\_Marx\_Prof$	1220753	0,362	0,239	-0,130	0,187	0,330	0,498	1,040
FF_Prof	1220753	0,165	0,378	-1,100	0,055	0,131	0,245	1,584
Panel B. Control variables								
$Size$	1220753	5,819	1,928	2,590	4,300	5,644	7,097	10,876
BM	1220753	0,666	1,170	-0,265	0,286	0,511	0,832	3,502
Panel C. Asset Pricing Factors								
MKTRF	1122	0,667	5,322	-13,61	-1,970	1,045	3,630	12,600
SMB	1122	0,198	3,179	-6,660	-1,570	0,070	1,720	8,620
HML	1122	0,355	3,479	-8,350	-1,330	0,135	1,740	10,510

Table 2 displays the annual cross-sectional Spearman Rank and Pearson Product Moment Correlations between variables. The correlation coefficients are calculated as means of time-series estimations from the cross-section for each year. Operating profitability is strongly positively correlated with Fama and French profitability with the coefficient of 0.79 in the Spearman rank correlation and 0.66 is Pearson product moment correlation. Operating profitability is also positively correlated with Novy-Marx profitability, although the correlation coefficients of 0.09 in the Spearman and 0.06 in Pearson correlation respectively is weaker compared to Fama and French profitability correlation coefficient. Fama and French and Novy-Marx profitability coefficients are positively but weakly correlated with each other at the coefficients value of 0.163 in the Spearman and 0.102 in Pearson correlation respectively.

All three profitability factors correlations with return is positive as expected and is stronger for Fama and French profitability at the coefficient value of 0.032, followed by operating profitability at the coefficient value of 0.027 and by Novy-Marx profitability at the coefficient value of 0.016 for Spearman correlation. However, one must be cautious not to overinterpret Spearman correlation strength between profitability and return. Compared to Spearman rank correlation, Pearson product moment correlation does require the linear relationship between variables. When the latter is used, correlation between profitability and return is much weaker at 0.01 for Novy-Marx profitability, followed by 0.007 for Fama and French profitability and 0.004 for operating profitability. As expected, $Size$ and BM are positively correlated with return at the coefficient value of 0.062 and 0.025 respectively for Spearman rank and 0.025 and 0.024 respectively for Pearson product moment correlation, suggesting that control for $Size$ and BM factors is required to isolate profitability effect on stocks return.

TABLE 2
Annual Cross-Sectional Spearman Rank and Pearson Product Moment Correlations

Table 2 displays the averages of annual cross-sectional correlation coefficients between variables measuring Operating profitability (Op_Prof), Novy-Marx profitability ($Novy\_Marx\_Prof$), Fama and French Profitability (FF_Prof), Size and return (ret) for the period 1963 to 2018. Spearman rank correlation coefficients are presented in the upper diagonal and Pearson product moment correlation coefficients are presented in the lower diagonal.

	1	2	3	4	5	6
1 Op_Prof		0,0937	0,7905	-0,0422	0,3874	0,0274
2 $Novy\_Marx\_Prof$	0,0615		0,163	-0,047	-0,2178	0,0164
3 FF_Prof	0,6609	0,102		-0,0028	0,3768	0,0317
4 $Size$	0,0021	-0,0345	-0,0016		-0.3591	0,0623
5 BM	0,0489	-0,0863	-0,0206	-0.1812		0.0246
6 Ret	0,0044	0,0103	0,0068	0,0246	0.0236	

Table 3 displays yearly average values of breakpoints for *Op_Prof* - sorted portfolios and shows how profitability factors are related to return and other explanatory variables.

Each month, depending on the value of operating profitability (*Op_Prof*) factor, all stocks are divided to five quantiles at the 20th, 40th, 60th, 80th and 99th percentile respectively. While more comprehensive test is conducted in the next section of this paper, Table 3 shows initial evidence of the positive relation between *Op_Prof* factor and stocks return. However, it should be noticed that the *Size* factor also increases from bottom to top portfolios sorted on operating profitability. Therefore, the control for Size factor is required before drawing convincing conclusion of relationship between operating profitability and return.

TABLE 3
Yearly Average of Operating Profitability-Sorted Portfolios Values and Other Explanatory Variables

Table 3 displays yearly average of breakpoints value for Op_Prof -sorted portfolios. Each year, the first, the second, the third, the forth and the fifth breakpoints for portfolios sorter on Op_Prof are calculated as the 20th, 40th, 60th, 80th and 99th percentile respectively of the cross-sectional distribution of Op_Prof. Operating Profitability (Op_Prof) factor is used to sort cross-section of stocks by quantiles.

Variable	1	2	3	4	5
Op_Prof	0,0061	0,0542	0,0920	0,1609	1,0301
Ret	-0,0732	-0,0154	0,0290	0,0924	0,4430
$Novy\_Marx\_Prof$	0,1563	0,2732	0,3900	0,5466	1,0404
FF_Prof	0,0343	0,1014	0,1651	0,2898	1,5840
$Size$	4,0235	5,1086	6,1964	7,4605	10,8764
$ln(BM)$	-1,3529	-0,8498	-0,4672	-0,0498	1,2626

4. Results

The process of sorting stock on operating profitability shows first evidence that operating profitability can predict stock returns. Section 2 of this paper hypothesized that net operating income, calculated on the comprehensive bases, will predict the cross-section of stock returns. To test this hypothesis, I use operating profitability (Op_Prof) factor as a proxy predicting the stocks return. To ensure that financial statement information and in particular, operating income is publicly available, I lag the profitability factor by 18 months, by which time the fundamental information must be publicly available according to Securities Exchange Committee (SEC) regulations. I use Fama-MacBeth (1973) regression analysis and time-series regression analysis of univariate independent-sort portfolios sorted on operating profitability to test my hypothesis.

4.1. Fama-MacBeth Regression Test

Table 4 presents Fama-MacBeth (1973) regression analysis of the cross-sectional relation between operating profitability and stock return. Examination of the result in Panel A in the specification that uses only Op_Prof as an independent variable (specification (1)), show significant relation between Op_Prof and stock return, as the average slope coefficient ($\times\ 10^2$) of 0.23 on Op_Prof (β_1) is statistically distinguishable from zero. The corresponding t-statistic of 2.46 with p-value of 0.014 suggest significant cross-sectional relation between Op_Prof and stock return at 5% significance level. In the specification that include $Size$ as an independent variable to control for size effect (specification (2)), the average coefficient on Op_Prof increases to 0.27 with the corresponding t-statistic of 3.10 and p-value of 0.002. In the specification that include BM as an independent variable to control for value effect (specification (3)), the average coefficient on Op_Prof decreases to 0.24 with the corresponding t-statistic of 3.37 and p-value of 0.001 suggesting that the effect of operating profitability is robust to value effect.

TABLE 4
Fama-MacBeth Regression Analysis

Table 4 presents summarized results of Fama-MacBeth (1973) regression analysis of the cross-sectional relation between operating profitability and stock return in the following form:

$$r_{i,t} = \alpha_{o,t} + \beta_1 Op\_Prof_{i,t-1} + \beta_2 Size_{i,t-1} + \beta_3 ln(BM)_{i,t-1} + \varepsilon_{i,t-1}$$

where $Op\_Prof_{i,t-1}$ denotes the operating profitability of a firm i lagged by 1 year and $Size_{i,t-1}$ represents a control variable for size of a firm i lagged by 1 year. The column labeled (1) in the table presents results for univariate specification using only $Op\_Prof_{i,t-1}$ factor. The column labeled (2) presents results of a multivariate regression specification using $Size_{i,t-1}$ as a control variable. Similarly, Panel B presents Fama-MacBeth (1973) regression analysis for $Novy\_Marx\_Prof_{i,t-1}$ factor and Panel C presents Fama-MacBeth (1973) regression analysis for $Fama\&French\_Prof_{i,t-1}$ factor. Standard errors, t-statistics and p-valued is computed with the Newey-West (1987) standard errors with six lags.

Coefficient	Value	(1)	(2)	(3)
Panel A. Operating Profitability				

β_1	Average	0,0023	0,0027	0,0024
	Standard Error	0,0009	0,0009	0,0007
	t-statistic	2,46	3,10	3,37
	p-value	0,014	0,002	0,001
β_2	Average		-0,0020	-0,0017
	Standard Error		0,0003	0,0004
	t-statistic		-6,04	-5,04
	p-value		0,000	0,000
β_3	Average			0,0009
	Standard Error			0,0007
	t-statistic			1,36
	p-value			0,173
R^2		0,0023	0,0158	0,0260
Adj. R^2		0,0023	0,0151	0,0246
Obs.		1,220,753	1,220,753	1,220,753

Panel B. Novy-Marx Profitability

β_1	Average	0,0057	0,0049	0,0064
	Standard Error	0,0015	0,0015	0,0015
	t-statistic	3,89	3,30	4,20
	p-value	0,0000	0,0010	0,0000
β_2	Average		-0,0020	-0,0017
	Standard Error		0,0003	0,0003
	t-statistic		-5,93	-4,72
	p-value		0,000	0,000
β_3	Average			0,0016
	Standard Error			0,0007
	t-statistic			2,25
	p-value			0,025
R^2		0,0061	0,0202	0,0304
Adj. R^2		0,0061	0,0196	0,0290
Obs.		1,220,753	1,220,753	1,220,753

Panel C. Fama and French Profitability

β_1	Average	0,0021	0,0026	0,0024
	Standard Error	0,0007	0,0007	0,006
	t-statistic	2,90	3,73	4,36
	p-value	0,004	0,000	0,0000
β_2	Average		-0,0021	-0,0018
	Standard Error		0,0003	0,0004
	t-statistic		-6,06	-5,08
	p-value		0,000	0,000
β_3	Average			0,0009
	Standard Error			0,0007
	t-statistic			1,30
	p-value			0,194
R^2		0,0022	0,0158	0,0260

Adj. R^2	0,0022	0,0151	0,0246
Obs.	1,220,753	1,220,753	1,220,753

To examine the economic magnitude of the relation between Op_Prof and stock return I asses the effect of one standard deviation change in Op_Prof on return by multiplying the average coefficient with the standard deviation. By multiplying multivariate specification results (specification (3)) from Table 4 and standard deviation value for Op_Prof from Table 1 yield 0.07% ($0.24\% \times 0.297$), indicating that one standard deviation difference in Op_Prof is associated with an increase of 0.07% per month difference of stock return. Similarly, I compute the difference in stock return between stocks whose Op_Prof falls at the 75th and 25th percentiles. This exercise shows that the average difference of return of such stock is 0.03% ($0.24\% \times (0.136 - 0.024)$, see Table 1) per month. Finally, when examining the difference in returns for very profitable firms (high Op_Prof value) compared to very unprofitable firms (low Op_Prof value) by multiplying average coefficient on Op_Prof by the difference between stocks in 99th percentile and stocks in 1st percentile on Op_Prof, the average difference of return of 0.47% ($0.24\% \times (1.03 - (-0.923))$, see Table 1) per month is realized.

Although results suggest that there is statistically significant ($p < 0.05$) relation between operating profitability (Op_Prof) and stock return, it is difficult to conclude the economic importance of such results. The result is economically important when average difference between stocks in 99th percentile and stocks in 1st percentile on Op_Prof is examined, providing 0.47% return per month when controlled for $Size$ and BM. However, the result is not economically important when average difference between stocks in 75th percentile and stocks in 25st percentile on Op_Prof is examined or when effect of one standard deviation difference in Op_Prof is examined with the average monthly return of 0.07% and 0.03% respectively. Therefore, no definite conclusion regarding economic importance of Op_Prof can be made at that point.

My second hypothesis is that operating profitability measured on the comprehensive bases provide stronger predictive power of stock return compared to Novy-Marx profitability and Fama and French profitability. Therefore, in Panel B and Panel C in Table 4, I begin testing this hypothesis. Examination of the result in Panel B in the specification that uses only $Novy\_Marx\_Prof$ as an independent variable (specification (1)), show significant relation between $Novy\_Marx\_Prof$ and stock return, as the average slope coefficient ($\times 10^2$) of 0.57 on $Novy\_Marx\_Prof$ (β_1) is statistically distinguishable from zero. The corresponding t-statistic of 3.89 with p-value of 0.000 suggest significant cross-sectional relation between $Novy\_Marx\_Prof$ and stock return at 5% significance level. In the specification that include $Size$ and BM as an independent variable to control for size effect (specification (3)), the average coefficient on $Novy\_Marx\_Prof$ increases to 0.64 with the corresponding t-statistic of 4.20 and p-value of 0.000. Compared to the case with operating profitability, the effect of Novy-Marx profitability increases when controlling for size and value effects and therefore suggest that it relatively more robust to control factors compared to operating profitability.

The economic significance of the relation between $Novy\_Marx\_Prof$ and stock return yield: (1) monthly stock return of 0.15% ($0.64\% \times 0.239$) per month when assessed using the effect of one standard deviation difference in $Novy\_Marx\_Prof$ on stock return; (2) 0.2% (0.64% ($0.498 - 0.187$)) per month when assessed using difference in return between stocks whose $Novy\_Marx\_Prof$ falls at the 75th and 25th percentiles; and (3) 0.75% (0.64% ($1.04 - (-0.13)$)) per month when examining using the difference in returns for very profitable firms (high $Novy\_Marx\_Prof$ value) compared to very unprofitable firms (low $Novy\_Marx\_Prof$ value). Those results suggest that: (1) one standard deviation difference in $Novy\_Marx\_Prof$ is associated with an increase of 0.15% per month difference of stock return; (2) the difference in stock return between stocks whose $Novy\_Marx\_Prof$ falls at the 75th and 25th percentiles is 0.2% per month; and (3) the difference in returns for very profitable firms (high $Novy\_Marx\_Prof$ value) compared to very unprofitable firms (low $Novy\_Marx\_Prof$ value) is 0.75% per month.

The result in Panel B shows clearly that apart from providing a statistically significant ($p < 0.05$) relation between Novy-Marx profitability ($Novy\_Marx\_Prof$) and stock return, results for $Novy\_Marx\_Prof$ provides relatively higher magnitude of economic importance compared for Op_Prof by providing 0.15% (using standard deviation return difference), 0.2% (using stocks return difference in 75th and 25th percentile) and 0.75% (using stock return difference in 99th and 1th percentile) of stock returns per month compared to 0,07%, 0.03% and 0.47% respectively for Op_Prof.

As expected, examination of the result in Panel C in the specification that uses only FF_Prof as an independent variable (specification (1)), show significant relation between FF_Prof and stock return, as the average slope coefficient ($\times 10^2$) of 0.21 on FF_Prof (β_1) is statistically distinguishable from zero. The corresponding t-statistic of 2.9 with p-value of 0.004 suggest significant cross-sectional relation between FF_Prof stock return at 5% significance level. In the specification that include $Size$ and BM as an independent variable to control for size and value effect (specification (3)), the average coefficient on FF_Prof decreses slightly to 0.24 with the corresponding t-statistic of 4.36 and p-value of 0.000. Thus, the effect of Fama and French profitability is robust to size and value effect.

The economic significance of the relation between FF_Prof and stock return yield: (1) monthly stock return of 0.09% ($0.24\% \times 0.378$) per month when assessed using the effect of one standard deviation difference in FF_Prof on stock return; (2) 0.05% (0.24% ($0.245 - 0.055$)) per month when assessed using difference in stock return between stocks whose FF_Prof falls at the 75th and 25th percentiles; and (3) 0.64% (0.24% ($1.584 - (-1.1)$) per month when examining using the difference in returns for very profitable firms (high FF_Prof value) compared to very unprofitable firms (low FF_Prof value). Those results suggest that: (1) one standard deviation difference in FF_Prof is associated with an increase of 0.09% per month difference of stock return; (2) the difference in stock return between stocks whose FF_Prof falls at the 75th and 25th percentiles is 0.05% per month; and (3) the difference in returns for very profitable firms (high FF_Prof value) compared to very unprofitable firms (low FF_Prof value) is 0.64% per month.

The result in Panel C shows that apart from providing a statistically significant ($p < 0.05$) relation between Fama and French profitability (FF_Prof) and stock return, results for FF_Prof provides relatively higher, although only marginally so, magnitude of economic importance compared for Op_Prof by providing 0.09% (using standard deviation return difference), 0.05% (using stocks return difference in 75th and 25th percentile) and 0.64% (using stock return difference in 99th and 1th percentile) of stock returns per month compared to 0,07%, 0.03% and 0.47% respectively for Op_Prof.

Based on Fama-MacBeth regression analysis of the cross-sectional relation between operating profitability (Op_Prof) and stock return, and based on comparing slope coefficients and economic importance of operating profitability between Novy-Marx profitability and Fama and French profitability I conclude that, while being statistically significant (at 5% significance level), operating profitability does not provide relatively stronger statistical significance or relatively stronger magnitude of economic importance compared to Novy-Marx and Fama and French profitability. While the average R^2 for operating, Novy-Marx and Fama and French profitability is equal 2.60%, 3.04% and 2.60% respectively, based on Fama-MacBeth cross-sectional regression analysis, decomposing and reformulating operating income on the comprehensive basis provide no significant evidence to suggest significantly better predictive power of stock return compared to simple Novy-Marx and Fama and French profitability factors. Therefore, on the bases of Fama-MacBeth regression analysis, I reject both hypothesis that (1) operating profitability, derived on comprehensive basis can significantly predict stock return and that (2) operating profitability can predict cross section of stocks return better than Novy-Marx and Fama and French profitability.

4.2. Portfolio Analysis

The alternative way of analyzing the predictive power of operating profitability on stocks return is to use portfolio analysis that will allow to determine whether there is significant cross-sectional relationship between the sort variable Op_Prof and outcome variable return. For such analysis, each month, I allocate all stocks to the portfolio based on their Op_Prof value, so that all stocks with the lowest value of Op_Prof are allocated to portfolio one, and all stocks with the highest value of Op_Prof are allocated to the portfolio five, with values of Op_Prof increasing with the increase in the portfolio number. I use univariate equal-weigh portfolio return to calculate the average value of return for each of the portfolios in each time period t sorted on Op_Prof.

Table 5 presents the average equal-weighted portfolio returns for each of the five portfolios and for the difference between portfolio five and portfolio one (Portfolio High – Low). The standard errors are adjusted following Newey and West (1987) correction. The portfolio that holds stock in the lowest decile (Portfolio 1) generates average return of 1.53% during time period of 1963 to 2019. The highest decile portfolio (Portfolio 5) generates average return of 1.66% for the same time period. Similarly, portfolios two through four generate return of 1.09%, 1.21% and 1.32% respectively. The difference between Portfolio 5 and Portfolio 1 is equal to 0.13%. Each of these five portfolios generate statistically significant return, as the corresponding t-statistic ranges from 4.56 to 6.62 from lowest-decile portfolio to highest-decile portfolio with p-values close to zero. Such result is expected because stocks are known to generate positive return on profitability. However, the difference between return in highest and lowest portfolio deciles is not significant and is not statistically distinguishable from zero at the t-statistic of 1.09 with the corresponding p-value of 0.278. Therefore, according to portfolio analysis, the significant cross-sectional relation between Op_Prof and return cannot be determined, and thus the null hypothesis that operating profitability does not significantly predict stock price is not rejected.

TABLE 5
Average Equal-Weighted Portfolio Returns Sorted on Op_Prof

Table 5 presents the average monthly returns of portfolios and their corresponding standard error, t -statistics and p-value for equal-weighted portfolios, sorted by Op_Prof into quantiles. The last column presents the average portfolio return corresponding to the difference between average return in the fifth quantile portfolio and in the first quantile portfolio. The sample period is from 1963 to 2019. The standard errors are adjusted following Newey and West (1987).

Portfolio	1	2	3	4	5	High - Low
Ret	0,0153	0,0109	0,0121	0,0132	0,0166	0,0013
Standard Error	0,0030	0,0024	0,0020	0,0022	0,0025	0,0012
t-statistic	(5,05)	(4,56)	(5,93)	(6,08)	(6,62)	(1,09)
p-value	0,000	0,000	0,000	0,000	0,000	0,278

To examine whether return on Op_Prof-sorted portfolio is sensitive to the common risk factors, I use standard approach for risk-adjustment that are common in financial literature to control for systematic risk factors. Table 6 presents the results of time-series regression analysis of the relation between operating profitability and stock return where Jensen's alpha and time-series regression coefficients estimates are reported. The t-statistics is presented in the parentheses and the sample period is from 1953 to 2019. Column 1 to Column 3 presents CAPM risk adjusted portfolio return and Column 4 to Column 6 presents Fama and Frech (1993) three common risk factors (MKTRF, SMB, HML) adjusted portfolio return.

Column 1 to Column 3 on the Panel A of Table 6 presents returns on Op_Prof portfolios adjusted for the Capital Asset Pricing Model (CAPM) market factor risk exposure (MKTRF) of Sharpe (1964), Lintner (1965), and Mossin (1966). The results indicate that high minus low portfolio sorted on operating profitability generate no abnormal return that is statistically distinguishable from zero at the moderate t-statistic value of 2.69. When Op_Prof portfolios are adjusted for the Fama and Frech (1993) three-factor common risk (MKTRF, SMB, HML) factors (Column 4 to Column 6), the t-statistic value decreases to 1.78, indicating no significant risk-adjusted return. This means that stock return generated by the Op_Prof-sorted portfolio is the manifestation of its exposure to the market factors.

TABLE 6
Op_Prof Portfolio Time-Series Regression

Table 6 presents the time-series regression analysis results of the relation between operating profitability and stock return where Jensen's alpha and time-series regression coefficients estimates are reported. The t-statistics is presented in the parentheses and the sample period is from 1953 to 2019. Column 1 to Column 3 presents Capital Asset Pricing Model (CAPM) of Sharpe (1964), Lintner (1965), and Mossin (1966) risk adjusted portfolio return and Column 4 to Column 6 presents Fama and Frech (1993) three-factor common risk (MKTRF, SMB, HML) adjusted portfolio return. The former and latter have the following form respectively:

$$r_{Op\_Prof,t} = \alpha + \beta_{MKTRF} MKTRF_t + \varepsilon_i$$

$$r_{Op\_Prof,t} = \alpha + \beta_{MKTRF} MKTRF_t + \beta_{SMB} SMB_t + \beta_{HML} HML_t + \varepsilon_i$$

Portfolio	Low 1	High 2	High - Low 3	Low 4	High 5	High - Low 6
Panel A. Operating Profitability						
α	0,855	1,117	0,262	0,696	0,846	0,150
	(5,89)	(9,82)	(2,69)	(7,34)	(12,36)	(1,78)
MKTRF	1,340	1,0870	-0,253	1,168	1,025	-0,143
	(41,38)	(42,78)	(-11,60)	(52,12)	(63,32)	(-7,19)
SMB				0,948	0,697	-0,251
				(29,95)	(30,51)	(-8,89)
HML				0,130	0,479	0,349
				(3,79)	(19,36)	(11,45)
Panel B. Novy-Marx Profitability						
α	0,617	0,986	0,369	0,429	0,889	0,460
	(5,38)	(9,96)	(3,55)	(5,17)	(14,01)	(4,64)
MKTRF	1,013	1,156	0,143	0,962	1,032	0,070
	(43,03)	(52,26)	(6,17)	(48,93)	(68,73)	(2,98)
SMB				0,515	0,656	0,141

				(18,54)	(30,92)	(4,25)
HML				0,324	0,057	-0,267
				(10,78)	(2,48)	(-7,45)
Panel C. Fama and French Profitability						
α	0,810	1,119	0,310	0,676	0,844	0,168
	(5,48)	(9,99)	(2,81)	(7,23)	(12,65)	(1,83)
MKTRF	1,321	1,076	-0,245	1,129	1,020	-0,109
	(40,00)	(42,99)	(-9,94)	(51,05)	(64,62)	(-5,06)
SMB				0,985	0,681	-0,305
				(31,54)	(30,54)	(-9,97)
HML				0,055	0,494	0,439
				(1,63)	(20,47)	(13,26)

For comparison, Panel B of Table 6 presents returns on $Novy\_Marx\_Prof$ portfolios, similarly adjusted for the Capital Asset Pricing Model (CAPM) market factor risk (MKTRF) exposure (Column 1 to Column 3) and for the Fama and Frech (1993) three-factor common risk (MKTRF, SMB, HML) exposure (Column 1 to Column 3). The results indicate that high minus low portfolio sorted on Novy-Marx profitability generate abnormal return that cannot be explained by MKTRF factor (corresponding t-statistic of 6.17) or by Fama and French 3 factors (corresponding t-statistic of 4.64). This suggest that $Novy\_Marx\_Prof$ is not sensitive to the common risk factors exposure, as in fact was reported by Novy-Marx (2013).

Finally, Panel C of Table 6 presents returns on FF_Prof portfolios, identically adjusted for the Capital Asset Pricing Model (CAPM) market factor risk (MKTRF) exposure (Column 1 to Column 3) and for the Fama and Frech (1993) three-factor common risk (MKTRF, SMB, HML) exposure (Column 4 to Column 6). The moderate t-statistic value of 2.81 of abnormal return coefficient of high minus low FF_Prof-sorted portfolio indicates moderate sensitivity of FF_Prof to MKTRF factor. However, the t-statistic value of 1.83 for the Fama and Frech (1993) three-factor common risk (MKTRF, SMB, HML) exposure suggest that FF_Prof is sensitive to common risk factors.

To summarize, according to portfolio analysis, I find that there is no significant cross-sectional relation between Op_Prof and return, as the unadjusted t-statistic value of 1.09 suggest. In addition, portfolio formation based on lagged Op_Prof factor is correlated with common risk factors and while adjusting for Fama and French (1993) three-factor common risk factors improve t-statistic value to 1,78, it is still not significant to reject the null hypothesis that operating profitability does not predict stock return. Therefore, by using portfolio analysis I found no enough evidence to suggest that operating profitability significantly predict cross section of stock returns and therefore, I reject the first hypothesis. Also, $Novy\_Marx\_Prof$ shows significantly higher predictive power of stock return at the t-statistic of 4,64 adjusted for common risk factors and proves to be uncorrelated to the common risk factors. Also, operating profitability does not show better stocks predictive power compared to Fama and French profitability at risk-adjusted t-statistic of 1.78 compared to 1.89 respectively. Therefore, using the portfolio analysis, I reject my second hypothesis that operating profitability can predict stock returns better than Novy-Marx and Fama and French profitability.

5. Conclusion

This study examines whether profitability reformulation to operating income, calculated on the comprehensive basis, can predict cross section of stocks return. The bases for such analysis were claims by fundamental analysis textbook that comprehensive process of financial statement reformulation and decomposition of its components lead to more precise stock valuation (i.e. Penman (2013)). While focusing on profitability from the shareholders perspective, that is, the profitability that is available to shareholders after all expenses and non-operating income were deducted seems plausible, it is not supported by the empirical finding presented in this paper. By combining Fama-MacBeth regression analysis and portfolio analysis I did not find evidence consistent with my hypothesis that operating profitability, calculated on the comprehensive bases, predict cross section of stock return. Fama-MacBeth analysis resulted in t-statistic of 2.46 with corresponding p-value of 0.014 suggest significant cross-sectional relation between operating profitability and stock return at 5% significance level. However, this result is not economically significant when compared with well-known Novy-Marx (2013) gross profitability factor or Fama and French (2015) profitability factor.

Allocating stock to high minus low portfolios sorted on operating profitability results in t-statistic value of 1.09 and corresponding p-value of 0.278, suggesting statistically insignificant result at 5% significance level. Using quantiles portfolios based on operating profitability yields monthly risk-adjusted return of 0.2%, compared to 0.46% monthly risk-adjusted return of portfolio sorted on Novy-Maxy profitability. Operating profitability is relatively not robust to the common risk factors, as the t-statistic decreases significantly from 2.69 to 1.78 when controlling for Fama and French (1993) there factors model. This can suggest that operating profitability is the manifestation of one or more common risk factors. Therefore, I reject both hypothesis that (1) operating profitability can predict cross section of stocks return and that (2) operating profitability deriver through financial statement reformulation and decomposition results to higher cross section predictive power of stocks return compared to Fama and French (2015) and Novy-Marx (2013) profitability factors.

The possible explanation of relative weak evidence of the ability of operating profitability to predict the cross-section of stock returns can be the insignificant effect of dirty-surplus items, and therefore, the difference between comprehensive income and net income, when one looks within the whole universe of the cross-section of stocks available. Essentially, financial statement analysis offers a framework to analyze individual stock to derive the value of a business. To perform such a task, an analyst looks for possible weak and strong points within the business to understand the value that equity of business offers. For such purposes, allocating cognitive capabilities and time recourses for reformulating income statement and shareholder's statement seems rational since in-depth analysis and understanding of business is required. However, when one analyzes the cross-section of stocks universe, the effect of a particular aspect (such as a large amount of dirty-surplus items) of a specific company is neglectable. Therefore, due to the very different nature of analyzing individual company and analyzing the cross-section of companies, the operating profitability effect can be insignificant in the later, but important for a particular company in the former.

Another explanation can be the fact that separating operating activities from financing activities is the manifestation of leverage effect, which is adequately captured and priced-in by the market. The fact that Novy-Marx (gross) profitability and Fama and French (net) profitability provided the stronger predictive power of cross-section of stock returns, even after controlling for common risk factors, suggests that known common risk factors do not capture gross or net profitability effect. Both profitability factors use simple profitability, without disaggregating income earned on operating activities from income earned on financing activity. When one uses operating profitability, such disaggregation is made.

Therefore, it might be the case that the benefit of disaggregation is, in fact, the manifestation of leverage effect, captured by some other common risk factor.

Although this research reveals that there is no significant cross-sectional relation between operating profitability and return, there are still some areas for the further research in this topic. In particular, the examination of the effect of operating profitability among the companies that have substantial dirty-surplus accounting items or substantial net financial expense, as well as control for leveraging effect in operating profitability factor provides an area for future research.

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Appendix A

To provide a comprehensive overview of what operating income is and how the income statement is reformulated to calculate operating income, the real-word example is presented. Exhibit A1 and Exhibit A2 present the GAAP common shareholders' equity statement and consolidated income statement respectively for Nike Inc., the designer, developer and worldwide seller of athletic footwear, apparel, equipment, accessories, and services.

Exhibit A1 shows that one can explain the change in common shareholder's equity by comprehensive income (positive effect), issuance of stock (positive effect), stocks repurchase (negative effect), and dividends paid (negative effect). To calculate total comprehensive income, one begins with the comprehensive income as reported in the shareholder's equity statement and adds net income, as stated in the income statement. Exhibit 2 presents the consolidated income statement and shows how one calculates net income from such income statement by subtracting the product of cost of sales, selling, general and administrative expenses, interest expenses, and income tax expenses from total revenues.

Exhibit A3 presents the process of reformulation of financial statements, specifically, reformulation of common shareholder's equity statement. Reformulation procedure include several steps. First, it consists of a restatement of balances for items that are not included in the GAAP shareholder's equity statement, but that still affects the value of shareholder's equity. Example of such items is the issuance of preferred stocks (GAAP include this accounting item into shareholder's equity, but one should restate it because it is a liability from a shareholder perspective) or noncontrolling interest (one should deduct it from the balance since it is not part of equity holder interest). The second step involves determining comprehensive income, which consists of net income and income arising from dirty-surplus accounting in the equity statement in Exhibit A1, so the comprehensive income is the product of net income reported and dirty-surplus accounting items reported in shareholder's equity. It should be noted that all items in other comprehensive income section of reformulated shareholders' equity section in Exhibit A3 are after-tax. The list of dirty-surplus items that are most likely to be seen in U.S. income items are presented in Exhibit A5.

One will notice the difference between GAAP statement of shareholder's equity in Exhibit A1 and the reformulated statement of shareholder's equity in Exhibit A3. The letter separates the effect of operating activities and financing activities into a comprehensive income component. Comprehensive income section consists of net income that one can find in GAAP income statement (Exhibit A2), other comprehensive income reported outside the income statement, that consist of net translation gain (loss), and net hedging gain (loss), and preferred dividends. The letter is excluded from the reformulated statement because from the equity holder outlook, preferred dividends are debt and should be treated as expenses when used for comprehensive income computation.

Exhibit A4 presents the process of reformulation of the income statement. The key component of this process is that one restates the GAAP income statement in Exhibit A2 into income coming from operating activities (the difference between operating revenue and operating expense) and income coming from financing activities (the difference between financial income and financial expense). The reformulation procedure includes several steps. First, one should add dirty-surplus items into the calculation to be able to use comprehensive income derived from reformulated shareholder's statement (Exhibit A3). Second, one should distinguish the operating income that comes from core business activities from operating income that does not. Third, when an analyst made clear disaggregation between two, he will get a precise measure of profit margin that comes exclusively from the core business activities of a firm. The clean measure of profitability that, on the one hand, contains dirty-surplus items from equity statement and, on the other hand, distinguish operating activities from financing activities and return associated with such profitability measure is the focus of this paper.

Exhibit A1 GAAP Statement of Common Shareholders' Equity for Nike Inc.

	Common Stock				Capital in	Accumulated		
	Class A		Class B		Excess of	Other		
					Stated	Comprehensive	Retained	
	Shares	Amount	Shares	Amount	Value	Income	Earnings	Total
(In millions, except per share data)								
Balance at May 31, 2009	95.3	$ 0.1	390.2	$ 2.7	$ 2,871.4	$ 367.5	$ 5,451.4	$8,693.1
Stock options exercised			8.6		379.6			379.6
Conversion to Class B Common Stock	(5.3)		5.3					—
Repurchase of Class B Common Stock			(11.3)		(6.8)		(747.5)	(754.3)
Dividends on Common stock ($1.06 per share)							(514.8)	(514.8)
Issuance of shares to employees			1.3		40.0			40.0
Stock-based compensation (Note 11):					159.0			159.0
Forfeiture of shares from employees			(0.1)		(2.6)		(0.3)	(2.9)
Comprehensive income (Note 14):								
Net income							1,906.7	1,906.7
Other comprehensive income:								
Foreign currency translation and other (net of tax benefit of $71.8)						(159.2)		(159.2)
Net gain on cash flow hedges (net of tax expense of $27.8)						87.1		87.1

Net gain on net investment hedges (net of tax expense of $21.2)						44.8		44.8
Reclassification to net income of previously deferred net gains related to hedge derivatives (net of tax expense of $41.7)						(121.6)		(121.6)
Reclassification of ineffective hedge gains to net income (net of tax expense of $1.4)						(3.8)		(3.8)
Total Comprehensive income						(152.7)	1,906.7	1,754.0
Balance at May 31, 2010	90.0	$ 0.1	394.0	$ 2.7	$ 3,440.6	$ 214.8	$ 6,095.5	$9,753.7

Note. Reprinted from "Financial statement analysis and security valuation", by Penman, S. H., 2013, 5th ed, p. 261

Exhibit A2 GAAP Consolidated Statement of Income for Nike Inc.

	Year Ended May 31,		
	2010	**2009**	**2008**
(In millions, except per share data)			
Revenues	$19,014.0	$19,176.1	$18,627.0
Cost of sales	10,213.6	10,571.7	10,239.6
Gross margin	8,800.4	8,604.4	8,387.4
Selling and administrative expense	6,326.4	6,149.6	5,953.7
Restructuring charges (Note 16)	—	195.0	—

Goodwill impairment (Note 4)	—	199.3	—
Intangible and other asset impairment (Note 4)	—	202.0	—
Interest expense (income), net (Notes 6, 7 and 8)	6.3	(9.5)	(77.1)
Other (income) expense, net (Notes 17 and 18)	(49.2)	(88.5)	7.9
Income before income taxes	2,516.9	1,956.5	2,502.9
Income taxes (Note 9)	610.2	469.8	619.5
Net income	$ 1,906.7	$ 1,486.7	$ 1,883.4
Basic earnings per common share (Notes 1 and 12)	$ 3.93	$ 3.07	$ 3.80
Diluted earnings per common share (Notes 1 and 12)	$ 3.86	$ 3.03	$ 3.74
Dividends declared per common share	$ 1.06	$ 0.98	$ 0.875

Note. Reprinted from “Financial statement analysis and security valuation”, by Penman, S. H., 2013, 5th ed, p. 310

Exhibit A3 Reformulated Statement of Common Shareholders’ Equity for Nike Inc.

Balance at May 31, 2009		$8,814.5
Transactions with shareholders:		
Stock issued for stock options	482.2	
Stock issued to employees (net)	37.1	
Stock repurchased	(754.3)	
Cash dividends	(505.5)	(740.5)
Comprehensive income		
Net income reported	1,906.7	

Net translation gain (loss)		(159.2)	
Net hedging gains (loss)		6.5	1,754.0
Loss on the exercise of stock options (after-tax)	102.6		159.0
Less after-tax stock compensations expense in net income	159.0	56.4	1,810.4
Balance at May 31, 2010			$9,884.4

Note. Reprinted from “Financial statement analysis and security valuation”, by Penman, S. H., 2013, 5th ed, p. 262

Exhibit A4 Reformulated Income Statement for Nike Inc.

		2010		**2009**		**2008**
Operating revenue		19,014.0		19,176.1		18,627.0
Cost of sales		10,213.6		10,571.7		10,239.6
Gross margin		8,800.4		8,604.4		8,387.4
Operating expenses						
Administrative expenses		3,970.0		3,798.3		3,645.4
Advertising		2,356.4		2,351.3		2,308.3
Other expenses (income)		(49.2)		(88.5)		68.5
Operating income from sales (before tax)		2,523.3		2,543.3		2,365.2
Taxes						
Taxes as reported	610.2		469.8		619.5	
Tax on financial items and other operating income	2.3	612.5	213.1	682.9	(50.2)	569.3
Operating income from sales (after tax)		1,910.7		1,860.4		1,795.9

Other operating income (before tax item)					
Gains on divestitures				60.6	
Restructuring charges		(195.0)			
Goodwill impairment		(199.3)			
Intangible asset impairment		(202.0)			
		596.3			
Tax on other operating income		216.5	(379.8)	22.1	38.5
Other operating income (after tax items)					
Currency translation gain (losses)	(159.2)		(335.3)		165.6
Hedging gains (losses) and other	6.5		451.4		(117.3)
Effect of stock option exercise	56.4		126.4		30.9
Operating income (after tax)	1,814.4		1,723.1		1,913.6
Financing income (expense)					
Interest income	30.1		49.7		115.8
Interest expense	36.4		40.2		38.7
Net interest income (expense)	(6.3)		9.5		77.1
Tax effect (at 36.3%)	2.3		3.4		28.1
Net interest income (expense)	(4.0)		6.1		49.0
Preferred dividends	0.0		0.0		0.0
Net financing income (expense)	(4.0)		6.1		49.0
Comprehensive income	1,810.4		1,729.2		1,962.6

Note. Reprinted from “Financial statement analysis and security valuation”, by Penman, S. H., 2013, 5th ed, p. 311

Exhibit A5 Dirty-Surplus Accounting Items: U.S. GAAP

Operating Income Items
Changes in accounting for contingencies (FASB Statement No. 11)
Additional minimum pension liability (FASB Statement No. 87)
Unrealized gain and losses on equity securities available for sale (FASB Statement No. 115)
Foreign currency translation gains and losses (FASB Statement No. 52)
Gains and losses on derivative instruments designated as cash-flow hedges (FASB Statement No. 133)
Change in funding status of pension plan (FASB Statement No. 158)
Restatements of prior years' income due to a change in accounting principles (FASB Statement No. 154)
Financing Income (or Expense) Items
Preferred dividends
Unrealized gains and losses on debt securities available for sale (FASB Statement No. 115)

Note. Reprinted from "Financial statement analysis and security valuation", by Penman, S. H., 2013, 5th ed, p. 264