

Negative aggregate accounting earnings and gross domestic product: A perspective of conditional accounting conservatism at the macroeconomic level

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ABSTRACT

This study explores the role of corporate accounting earnings in predicting GDP growth at a macroeconomic level. It investigates whether negative aggregate accounting earnings are more effective predictors of GDP growth than positive earnings and how macroeconomic uncertainty affects this predictive ability. The two main novelties introduced in this study are the integration of two distinct streams of research, namely, the usefulness of accounting earnings and conditional accounting conservatism at the macroeconomic level and the consideration of the moderating role of macroeconomic uncertainty. Data from 22 countries from 2008 to 2022 are analyzed using moderated regression analysis. The findings support the theory that negative earnings are better predictors of GDP than positive earnings, aligning with the conditional accounting conservatism perspective. Furthermore, this study also reveals that macroeconomic uncertainty specifically weakens the predictive strength of negative aggregate accounting earnings and aggregate operating income on GDP growth. This comprehensive insight underscores the critical importance of considering economic conditions when employing accounting earnings to forecast economic trends, emphasizing that negative earnings are particularly significant indicators during uncertain economic times.

Keywords: Macroeconomic Uncertainty; Conditional Accounting Conservatism; Gross Domestic Product; Negative Aggregate Accounting Earnings; Moderated Regression Analysis

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Introduction

Conditional accounting conservatism refers to accountants' tendency to prefer more rigorous forms of verification to recognize good news as profits, as opposed to bad news as losses in financial statements. This tendency leads to bad news being reflected more rapidly in earnings than good news (Basu, 1997). Previous studies have indicated the existence of conditional accounting conservatism at the firm level, even after the implementation of IFRS (Barth et al., 2008; Chua et al., 2012; Filipin et al., 2012; Madah Marzuki & Abdul Wahab, 2016). This implies that corporate accounting earnings reflect bad economic news more rapidly than good economic news. In other words, firm-level negative economic news exhibits a stronger association with accounting earnings than firm-level positive economic news. Further research documents the existence of conditional accounting conservatism at the aggregate and macroeconomic levels (Atmini, 2019; Crawley, 2015; Laurion & Patatoukas, 2016; Lim & Zheng, 2014). Specifically, it has been documented that aggregate accounting earnings tend to reflect more quickly on bad macroeconomic news than on good macroeconomic news. It suggests a more pronounced association between bad macroeconomic news and aggregate accounting earnings compared to the relationship between good macroeconomic indicators and aggregate accounting earnings (Gaertner et al., 2020).

Conditional accounting conservatism studies at the aggregate and macroeconomic levels were triggered by a “micro-to-macro” research stream on the usefulness of earnings information at both levels. This stream of research focuses on investigating the role of firm-level accounting numbers (micro-level data), such as corporate earnings, in influencing macroeconomic indicators (macro-level data), such as gross domestic product (GDP). Researchers draw the causal relationship between micro-level and macro-level numbers based on the theories of creative destruction (Foster et al., 2000; Foster et al., 2006; Schumpeter, 2003) and sectoral shift (Lilien, 1982; Lucas & Prescott, 1974). Specifically, regarding the relationship to GDP, researchers also develop arguments based on the income approach, one of the GDP estimation approaches (Nallareddy & Ogneva, 2017). Previous studies provide empirical evidence supporting the association between earnings and GDP in the context of developed and developing countries (Huang, 2015; Konchitchki & Patatoukas, 2014a; Konchitchki & Patatoukas, 2014b; Lalwani & Chakraborty, 2020; Min-Ho & Jeong, 2022; Sumiyana et al., 2019; Wang et al., 2015; Yoshinaga & Nakano, 2023).

Aggregate accounting earnings can predict GDP growth because earnings are more timely than other company performance measures (Konchitchki & Patatoukas, 2014a). Thus, if aggregate accounting earnings are more timely, they will be more useful for predicting GDP growth (Gaertner et al., 2020). Concerning the conditional accounting conservatism that exists at the macroeconomic level, negative aggregate accounting earnings, which are more timely than positive aggregate accounting earnings, are expected to have a higher ability to predict GDP growth. Gaertner et al. (2020) have provided the empirical evidence.

Gaertner et al. (2020) found negative aggregate accounting earnings are more effective than positive aggregate accounting earnings in predicting GDP growth. However, there is a notable interest in undertaking further investigations into this field of study. The empirical evidence gathered by him remains limited to the United States context. Further empirical evidence is required to account for diverse macroeconomic situations across various country contexts. Hence, the present study aims to undertake a comparative analysis across multiple countries.

Cross-country studies encompass various country-specific aspects. Therefore, cross-country studies must take into account these characteristics. This study considers the macroeconomic uncertainty factor, which was selected based on the importance of understanding factors operating at the macroeconomic level that influence firms' profitability (Binz, 2022). Previous research on the influence of macro-level factors on firms' profitability has primarily focused on macroeconomic growth expectations (Ball et al., 2009). In contrast, consumer and managerial behaviors are influenced more by the degree of macroeconomic uncertainty than by the expectations on how the macroeconomics grows (Baker & Bloom, 2013). The association between macroeconomic uncertainty and company profitability, which can be elaborated using the Real Business Cycle and New Keynesian models, is still ambiguous (Binz, 2022). Therefore, this study incorporates country-specific macroeconomic uncertainty and examines its moderating role on the ability of aggregate accounting earnings to predict GDP growth.

This study aims to investigate and obtain empirical evidence that negative aggregate accounting earnings are better than positive ones in predicting GDP growth. This study also takes into account country-specific factors, specifically macroeconomic uncertainty. Therefore, this research seeks to gather empirical evidence about macroeconomic uncertainty's influence to moderate negative aggregate accounting earnings' ability to predict GDP growth. This study integrates two distinct research streams: the usefulness of

accounting earnings at the macroeconomic level and the conditional accounting conservatism at that level. Gaertner et al. (2020) conducted this particular type of research.

In contrast to Gaertner et al. (2020), which focused on a single country, this study employed cross-country data to investigate multiple countries. Furthermore, this study examines the moderating influence of macroeconomic uncertainty, a country-specific factor important in determining firms' profitability overlooked in prior studies. Thus, the novelty of this study includes these two key elements.

Literature Review

Aggregate Earnings and GDP

Accounting earnings are related both directly and indirectly to GDP. The direct relationship is explained through the income approach, one of the GDP estimation approaches (Nallareddy & Ogneva, 2017). The income approach estimates GDP based on employee compensation, rental income, corporate earnings and owner's income, taxes on production and imports minus subsidies, interest, and various other payments, as well as depreciation. Based on the direct relationship, corporate earnings are one of the main components that determine GDP (Landefeld, Seskin, & Fraumeni, 2008). On the other hand, the indirect relationship is supported by the theories of creative destruction (Foster et al., 2000; Foster et al., 2006; Schumpeter, 2003) and sectoral shift (Lilien, 1982; Lucas & Prescott, 1974). According to the theory of creative destruction, economic advancement arises when companies introduce new goods, production processes, and organizational methods. Resources are reallocated from low-productivity companies to high-productivity ones, potentially leading to greater output during the period of high-productivity dispersion. However, friction slows down this resource movement, resulting in temporary misallocation and a decrease in output (Foster et al., 2000; Foster et al., 2006; Schumpeter, 2003). Meanwhile, the sectoral shift theory asserts that greater performance disparities will lead to a labor shift from underperforming companies to those with better performance. Frictions, such as job-seeking costs and the need to acquire new skills, cause delays in this labor migration. Consequently, unemployment rises while aggregate consumption and output decline (Lilien, 1982; Lucas & Prescott, 1974). Both theories essentially assert that company-level productivity (micro-level) influences the fluctuations of productivity growth aggregations at the macroeconomic level. This means that corporate accounting earnings at the company level, as figures representing a company's productivity, are related to macro-level income reflected in GDP.

Numerous prior studies have provided empirical evidence supporting the association between aggregate earnings changes and prospective real GDP growth (Konchitchki & Patatoukas, 2014b), future nominal GDP growth, particularly within the timeframe of one quarter ahead (Konchitchki & Patatoukas, 2014a), as well as GDP growth for the next one to two quarters (Huang, 2015; Min-Ho & Jeong, 2022; Wang et al., 2015). Earnings at the macroeconomic level are useful not only in developed countries but also in developing countries. Sumiyana et al. (2019) conducted a cross-country data study and discovered supporting evidence of the usefulness of aggregate earnings and its elements at the macroeconomic level. In a more particular context, they present empirical findings that establish a relationship between various financial indicators, including aggregate profit, aggregate operating profit, aggregate operational cash flows, and aggregate accruals, and their predictive ability for GDP growth over the subsequent one and two-year periods for both developed and developing countries. Further empirical evidence from an international perspective reveals that changes in aggregate earnings can predict economic growth in eight countries, i.e., Australia, Canada, China, India, Japan, South Korea, the UK, and the USA (Lalwani & Chakraborty, 2020). Moreover, aggregate profitability is valuable for forecasting GDP growth. Nonetheless, utilizing these drivers in predicting GDP growth is pertinent for share valuation in developed countries but not in developing countries (Yoshinaga & Nakano, 2023).

Conditional Accounting Conservatism

As previously stated, conditional accounting conservatism is the tendency of accountants to exhibit more rigorous forms of verification to recognize good news as profits, in contrast to bad news as losses in financial statements. This tendency results in bad news being reflected more quickly in earnings than good news (Basu, 1997). The existence of conditional accounting conservatism has been subject to considerable scrutiny throughout its development, primarily because the Financial Accounting Standards Board (FASB) and the International Accounting Standards Board (IASB) have not included conservatism or prudence as a component of representational faithfulness. This skepticism is further compounded by the increasing adoption of International Financial Reporting Standards (IFRS) by many countries worldwide. IFRS allows for the application of various fair-value alternatives, which are generally considered to be less conservative or less prudent (André et al., 2015). These conditions have served as a driving force for researchers to examine the existence of conditional accounting conservatism at the firm level after adopting IFRS. The

studies document the existence, even an increase in the degree of conditional accounting conservatism at the firm level (Barth et al., 2008; Chua et al., 2012; Filipin et al., 2012; Madah Marzuki & Abdul Wahab, 2016).

The examination of the existence of conditional accounting conservatism has been undertaken not only at the firm level but has also extended to encompass aggregate and macroeconomic levels. Studies at aggregate and macroeconomic levels are driven by the “micro-to-macro” research stream focusing on the usefulness of accounting earnings at the macroeconomics level to predict GDP growth (Huang, 2015; Konchitchki & Patatoukas, 2014a; Konchitchki & Patatoukas, 2014b; Lalwani & Chakraborty, 2020; Min-Ho & Jeong, 2022; Sumiyana et al., 2019; Wang et al., 2015; Yoshinaga & Nakano, 2023). Evidence documenting the existence of conditional accounting conservatism at both the aggregate and macroeconomic levels is presented by Lim and Zheng (2014), Crawley (2015), Laurion and Patatoukas (2016), as well as Atmini (2019).

The Capability of Negative Aggregate Accounting Earnings to Predict GDP Growth

Both creative destruction (Foster et al., 2000; Foster et al., 2006; Schumpeter, 2003) and sectoral shift (Lilien, 1982; Lucas & Prescott, 1974) theories fundamentally assert that the productivity of individual companies (micro-level) impacts the patterns of overall productivity growth at the macro level. Additionally, according to the income approach, corporate earnings represent a significant factor in determining GDP (Landefeld et al., 2008). It implies that the accounting earnings of individual companies, reflecting a measure of company-level productivity, affect income at the macro level as indicated by GDP.

Aggregate earnings are capable of forecasting GDP growth because of their timeliness. Earnings serve as a more immediate measurement than alternative corporate financial performance indicators (Konchitchki & Patatoukas, 2014a). Aggregate accounting earnings that are more timely will be more useful in predicting GDP growth (Gaertner et al., 2020). When linked with conditional accounting conservatism that presents at the macroeconomic level (Atmini, 2019; Crawley, 2015; Laurion & Patatoukas, 2016; Lim & Zheng, 2014), negative aggregate accounting earnings, which are more timely than positive aggregate accounting earnings, are hypothesized to have a higher ability to predict GDP growth. The empirical evidence has been provided by Gaertner et al. (2020) for the context of the United States. Based on these arguments, this study formulates the following hypothesis.

H₁: Negative aggregate accounting earnings can better predict gross domestic product than positive aggregate accounting earnings.

The Moderating Role of Macroeconomic Uncertainty

Macroeconomic conditions frequently encounter uncertainty stemming from diverse sources. In theory, the effects of macroeconomic uncertainty remain inconclusive, as noted by (Binz, 2022). According to the Real Business Cycle model, managerial decision-making tends to favor the deferral and discouragement of investment activities during periods characterized by elevated levels of macroeconomic uncertainty. This may manifest through several measures, including reducing or postponing capital expenditures, hiring activities, and advertising efforts. This conduct gives rise to an inverse correlation between macroeconomic uncertainty and the expenses incurred by the company as a consequence of these investments. However, it is expected that consumers will foresee a decline in the rate of return on savings and will consequently utilize the surplus resources obtained through reduced investment to increase their consumption. Consequently, it will lead to a positive impact on the overall increase of corporate financial earnings. According to the Real Business Cycle theory, a decline in expenses and an increase in revenue will inevitably result in a notable increase in corporate earnings (Bloom et al., 2018).

Conversely, according to the New Keynesian model, consumers tend to curtail their consumption to increase their savings when confronted with macroeconomic uncertainty. Reducing consumption has a consequential effect on diminishing marginal income and serves as a motivating factor for corporations to engage in investment activities. The ultimate impact on a company's profitability is contingent upon the comparative magnitude of the resultant revenue and expense implications. The reduction in investment undertaken by corporate management exhibited a more pronounced magnitude compared to the decrease in consumer purchases. This phenomenon results in a reduction in expenses that surpasses the reduction in revenue (Basu & Bundick, 2017), which will further increase profitability. Nevertheless, in the context of sticky costs, managers typically face limitations in decreasing expenses in response to decreased sales. This phenomenon will induce a decline in the profitability level (Anderson et al., 2003).

The Real Business Cycle and New Keynesian models both present arguments suggesting that macroeconomic uncertainty's impact on company-level accounting earnings remains uncertain. Consequently, the impact on aggregate accounting earnings is also ambiguous. The ambiguity is anticipated to disrupt the predictive ability of aggregate accounting earnings for GDP. This disruption is particularly pronounced in the case of negative aggregate accounting profits, as both the Real Business Cycle and the New Keynesian model posit an upward trend

in earnings as a consequence of escalating macroeconomic uncertainty (Basu & Bundick, 2017; Bloom et al., 2018). Therefore, this study formulates the following hypothesis.

H₂: Macroeconomic uncertainty weakens the capability of negative aggregate accounting earnings to predict gross domestic product.

Figure 1 presents a diagram that illustrates the relationships between different variables in the study. The framework appears to be focused on understanding how changes in aggregate accounting earnings, influenced by macroeconomic uncertainty, impact future and current GDP growth.

Methods

This study is quantitative research that tests causality between independent and dependent variables. The population of this study consists of countries with primary stock markets listed in the Refinitiv database, totaling 242 countries. The study sample selection is conducted through purposive sampling under specific criteria of countries with complete data pertinent to this research. In line with the study objectives, the required data include firms' financial figures, GDP growth, and the degree of macroeconomic uncertainty. Moreover, the dataset employed in this study comprises the net profit after tax and total sales of all the companies listed on the primary stock exchange within the selected countries. The data source is the Refinitiv database, accessible at the Faculty of Economics and Business, Universitas Brawijaya. This study additionally utilizes per capita GDP growth data downloaded from the World Bank database, accessible via <https://data.worldbank.org/indicator/>. Meanwhile, data regarding the degree of macroeconomic uncertainty are obtained from the Economic Policy Uncertainty (EPU) Index, accessible through <http://www.policyuncertainty.com/>.

Figure 1. Research Framework

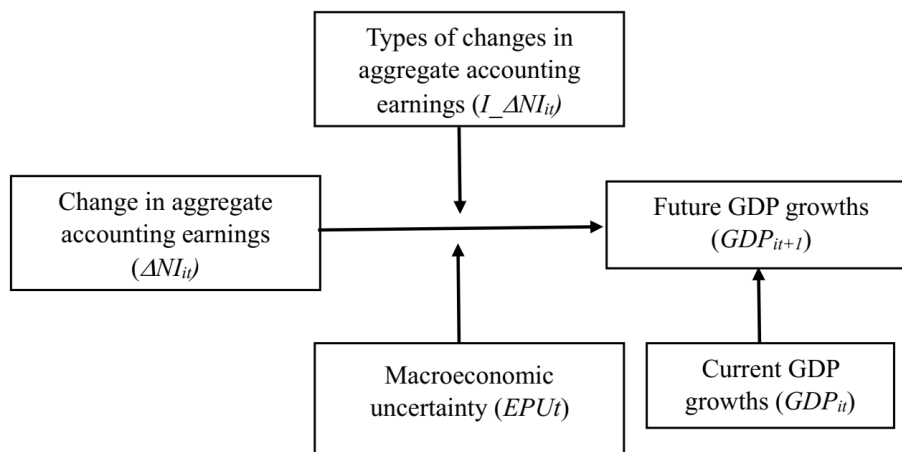


Table 1. Variable Measurements

	Variables	Measurements	Scale
GDP_t	The annual GDP growth	A percentage of the annual GDP growth at constant local currency-based market prices	Ratio
NI_t	Aggregate accounting earnings	Aggregate net earnings after tax are deflated by the aggregate total sales	Ratio
ΔNI_t	Change in aggregate accounting earnings	The difference between aggregate accounting earnings year t with year $t-1$	Ratio
$I_{\Delta NI_t}$	Types of changes in aggregate accounting earnings	A value of 1 when ΔNI_t is negative and 0 otherwise	Nominal
EPU_t	Macroeconomic uncertainty	The average monthly EPU for each country for one year	Ratio

This study employs a research period from 2008 to 2022, with country-year as the unit of analysis. Unfortunately, EPU data are unavailable for 217 countries at <http://www.policyuncertainty.com/>. In addition, the EPU data for three countries (Denmark, Pakistan, and New Zealand) are available but incomplete. This unavailability caused this study to exclude a total of 220 countries from the research sample due to data incompleteness. Therefore, this study utilizes a sample of 22 countries (Australia, Belgium, Brazil, Canada, Chile, China, Colombia, Croatia, Greece, Hong Kong, India, Ireland, Japan, Mexico, Netherlands, Russia, Singapore, South Korea, Spain, Sweden, the United Kingdom, and the United States) and a total of 286 country-years as observations for research purposes.

The dependent variable in this study is GDP growth, while the independent variable is changes in aggregate earnings. Additionally, the study includes moderating variables, such as the type of change in aggregate accounting earnings and macroeconomic uncertainty. A control variable is also considered, specifically the growth of GDP in the preceding year. In this study, GDP growth (GDP_t) refers to the annual GDP growth, which the World Bank database measures as a percentage of the annual GDP growth at constant local currency-based market prices. Also, this study computes aggregate accounting earnings (NI_t) by aggregating the net earnings after tax of all companies listed on the primary stock exchange

of the selected country deflated by the aggregate total sales. Change in aggregate accounting earnings (ΔNI_t) is the difference between aggregate accounting earnings year t with year $t-1$. Types of changes in aggregate accounting earnings ($I_ \Delta NI_t$) is whether the change in aggregate accounting earnings is positive or negative. If the change in aggregate accounting earnings exhibits a negative value, it is assigned a binary code of 1; otherwise, it is assigned a code of 0. Meanwhile, macroeconomic uncertainty (EPU_t) refers to an index that describes economic uncertainty in a particular country. This variable is measured using a newspaper-based index of Economic Policy Uncertainty (EPU) (Baker et al., 2016). The national EPU index for each country is calculated monthly as the percentage of articles containing the term uncertainty or uncertain, economics or economy, as well as at least one of a series of country-specific political terms published in a series of popular newspapers in that country. This research measures the EPU_t of countries by calculating the average monthly EPU for each country for one year. Table 1 presents the variable measurements.

Furthermore, this study examines the usefulness of negative aggregate accounting earnings changes as a predictor of future GDP growth and explores the influence of macroeconomic uncertainty in weakening the predictive power of negative aggregate accounting earnings changes. The regression model developed is a moderated regression analysis (MRA) model, as follows.

$$GDP_{it+1} = \beta_0 + \beta_1 \Delta NI_{it} + \beta_2 I_ \Delta NI_{it} + \beta_3 EPU_{it} + \beta_4 I_ \Delta NI_{it} * \Delta NI_{it} + \beta_5 I_ \Delta NI_{it} * \Delta NI_{it} * EPU_{it} + \beta_6 GDP_{it} + \varepsilon_{it} \quad \dots\dots\dots (1)$$

In the MRA model (Model Equation 1), ΔNI_{it} is the change in aggregate accounting earnings of country i in year t , $I_ \Delta NI_{it}$ is a dummy variable that has a value of 1 when ΔNI_{it} is negative and 0 otherwise. Afterward, EPU_{it} is the level of macroeconomic uncertainty in country i in year t . Meanwhile, GDP_{it} and GDP_{it+1} are the GDP growths of country i in years t and $t+1$, respectively. This research supports hypothesis 1, which states that negative changes in aggregate accounting earnings can predict future GDP growth better than positive changes in aggregate accounting earnings, which is indicated by β_4 being positive and statistically significant. Meanwhile, hypothesis 2 is supported if macroeconomic uncertainty weakens the ability of negative aggregate accounting earnings changes in predicting future GDP growth.

Lastly, as this study employs the MRA Model, it requires tests to determine the most suitable model among the common, random, and fixed effect models. These tests, performed using the Chow, Hausman, and Lagrange Multiplier Test, indicate that the fixed effect model is the most appropriate, as shown in Table 2.

Table 2. Chow, Hausman, and Lagrange Multiplier Tests

		Statistic	Prob.	Decision
Chow Test	Cross-section Chi-square	73.367	0.000	Fixed-Effect Method
Hausman Test	Cross-section random	73.073	0.000	Fixed-Effect Method
Lagrange				
Multiplier Test	Breusch-Pagan Cross-section	14.743	0.000	Random Effect Method

Table 3. Multicollinearity Test

Variables	VIF	Threshold	Decision
ΔNI_{it}	3.604	<10	No Issues of Multicollinearity
$I_ \Delta NI_{it}$	1.806	<10	No Issues of Multicollinearity
EPU_{it}	1.462	<10	No Issues of Multicollinearity
$I_ \Delta NI_{it} * \Delta NI_{it}$	7.642	<10	No Issues of Multicollinearity
$I_ \Delta NI_{it} * \Delta NI_{it} * EPU_{it}$	6.926	<10	No Issues of Multicollinearity
GDP_{it}	1.123	<10	No Issues of Multicollinearity

ensures that the independent variables are not highly correlated, which could distort the regression analysis results, while the heteroscedasticity test checks for non-constant variance in the residuals, affecting the reliability of the regression coefficients. The results of the White Test indicate no heteroscedasticity issues (*Obs*R-squared* 23.140, *prob. Chi-Square* 0.282). Additionally, multicollinearity is not a concern in the model, as indicated by VIF values less than 10 (Hair et al., 2019), as presented in Table 3. Unfortunately, this study encounters issues with the normality test results. However, given the 286 country-year observations, the study argues that the non-normal distribution does not affect the hypothesis testing results. According to the Central Limit Theorem, a normal distribution is achieved when the sample size is relatively large (Lumley et al., 2002; Wooldridge, 2013). Schröder and Yitzhaki (2017) and Lumley et al. (2002) conducted simulations, providing evidence that normality cannot be rejected with high confidence levels when the sample size exceeds 100 (Schröder & Yitzhaki, 2017) or even with as few as 65 observations (Lumley et al., 2002).

Result and Discussion

Table 4 displays the descriptive statistics. The presented descriptive statistics indicate that, in general, the countries included in the sample exhibited a favorable increase in their

GDP, reflecting a positive growth of the national economy. Similarly, it can be observed that, on average, all countries had an increase in aggregate accounting earnings, aggregate operating income, aggregate non-operating income, and aggregate other comprehensive income. The growth that was observed in aggregate other comprehensive income was notably minimal. It implies that, in general, public companies in those countries experience positive financial performance growth, which subsequently aggregates to drive positive national economic growth. Nevertheless, several countries also document a decrease in GDP growth alongside declines in aggregate accounting earnings.

This study applied dummy variables as surrogates to determine the direction (negative or positive) of changes in aggregate accounting figures. Table 5 displays the frequencies of negative and positive changes in aggregate accounting earnings. Aggregate operating income. Aggregate non-operating income. and aggregate other comprehensive income across all research observations (country-year). According to the data presented in Table 5, it can be observed that the occurrence of positive changes in aggregate accounting earnings is more often than negative changes. It suggests that publicly listed firms in those nations undergo positive growth in financial performance, consistent with the findings indicated in descriptive statistics.

Table 4. Descriptive Statistics

Variables	Mean	Minimum	Maximum	Standard Deviation
GDP_{it+1}	2.608	-11.325	24.371	3.993
ΔNI_{it}	0.002	-0.707	0.351	0.063
EPU_{it}	148.119	27.001	687.616	78.701

Notes: $N = 286$; GDP_{it+1} is the GDP growth of country i year $t+1$. ΔNI_{it} is the change in aggregate accounting earnings of country i in year t . EPU_{it} reflects the level of macroeconomic uncertainty in country i in year t , while GDP_{it} is the GDP growth of country i in year t .

Table 5. Frequency of Negative and Positive Changes

Variables	Frequencies of Changes		Percentage of Changes	
	Negative	Positive	Negative	Positive
$I_{\Delta NI_{it}}$	137	149	47.90%	52.10%

Notes: $N = 286$; $I_{\Delta NI_{it}}$ is a dummy variable with 1 if the change in aggregate accounting earnings is negative and 0 otherwise

Table 6. Hypotheses Test Results

MRA Model				
$GDP_{it+1} = \beta_0 + \beta_1 \Delta NI_{it} + \beta_2 I_ \Delta NI_{it} + \beta_3 EPU_{it} + \beta_4 I_ \Delta NI_{it} * \Delta NI_{it} + \beta_5 I_ \Delta NI_{it} * \Delta NI_{it} * EPU_{it} + \beta_6 GDP_{it} + \varepsilon_{it}$				
Variables	Expectation	Coefficients	t-stat.	Decision
Constant		4.048	5.982	
ΔNI_{it}		3.874	0.496	
$I_ \Delta NI_{it}$		-1.074	-2.007**	
EPU_{it}		-0.007	-1.955*	
$I_ \Delta NI_{it} * \Delta NI_{it}$	+	62.849	3.410***	H ₁ Supported
$I_ \Delta NI_{it} * \Delta NI_{it} * EPU_{it}$	–	-0.480	-3.896***	H ₂ Supported
GDP_{it}		-0.038	-0.613	
<i>R-squared</i>	0.302			
<i>Adjusted R-squared</i>	0.229			
<i>F-stat.</i>	4.137***			

Notes: $N = 286$; ΔNI_{it} is the change in aggregate accounting earnings of the country I in year t , $I_ \Delta NI_{it}$ is a dummy variable with 1 if the change in aggregate accounting earnings is negative and 0 otherwise, EPU_{it} is an indicator of macroeconomic uncertainty in country i in year t , and GDP_{it} is the GDP growth of country i in year t . Meanwhile, $I_ \Delta NI_{it} * \Delta NI_{it}$ is the interaction between changes in aggregate accounting earnings for country i in year t and its dummy variable, which, if the regression coefficient is positive, indicates that negative changes of aggregate accounting earnings are better predictors of GDP growth than positive changes in aggregate accounting earnings. Next, $I_ \Delta NI_{it} * \Delta NI_{it} * EPU_{it}$ is the interaction between changes in aggregate accounting earnings of country i in year t with its dummy variable and macroeconomic uncertainty in country i in year t . Suppose the coefficient of $I_ \Delta NI_{it} * \Delta NI_{it} * EPU_{it}$ is smaller than that of $I_ \Delta NI_{it} * \Delta NI_{it}$. In that case, macroeconomic uncertainty plays a role in weakening the ability of negative aggregate accounting earnings changes in predicting GDP growth. The signs ***, **, and * indicate significance at 1%, 5%, and 10%, respectively.

This research also tests the MRA model without EPU interaction. The model yields an Adjusted R-squared of 17.77%, lower than the Adjusted R-squared in the MRA model with an EPU interaction of 22.91%. The increase in Adjusted R-Squared after the model includes interaction with EPU indicates that EPU has a moderating effect.

The results from the Hypotheses Test using the MRA Model, as shown in Table 6, reveal several important findings. The model's constant coefficient is significant at 4.048 with a t-statistic of 5.982, indicating a robust baseline impact on GDP growth. The coefficient for ΔNI_{it} is 3.874, though its t-statistic of 0.496 suggests that changes in aggregate earnings alone are not statistically significant in predicting GDP growth. On the other hand, the interaction term $I_ \Delta NI_{it}$ has a coefficient of -1.074 and a t-statistic of -2.007**, indicating a significant

negative moderating effect on GDP growth. This implies that certain conditions represented by I_ANI_{it} negatively influence the relationship between changes in aggregate earnings and GDP growth. Further analysis of the interaction terms highlights more nuanced effects. The interaction coefficient between changes in aggregate accounting earnings and the dummy variable ($\beta_4 I_ANI_{it} * \Delta NI_{it}$) is positive (62.849), with significance at the level of 1%. These test results provide empirical evidence to support Hypothesis 1. Specifically, the findings suggest that negative aggregate accounting earnings have a stronger predictive power for GDP than positive aggregate accounting earnings.

This finding aligns with Gaertner et al. (2020) and offers additional evidence in a larger context due to its cross-country research design, encompassing data from 22 countries. The predictive power of accounting earnings found in this study indicates that changes in firm-level accounting earnings can lead to changes in aggregate productivity at the macro level as reflected in GDP, consistent with the substance of creative destruction and sectoral shift theories. It is also consistent with previous empirical findings. As reported in previous studies, a considerable body of empirical research has produced results concerning the predictive power of aggregate accounting earnings to GDP growth (Huang, 2015; Konchitchki & Patatoukas, 2014a; Konchitchki & Patatoukas, 2014b; Lalwani & Chakraborty, 2020; Min-Ho & Jeong, 2022; Sumiyana et al., 2019; Wang et al., 2015; Yoshinaga & Nakano, 2023).

Typically, more timely accounting information has better predictive power for future outcomes. In the context of this study, timely aggregate accounting earnings are shown to be effective in predicting GDP growth (Gaertner et al., 2020). According to the framework of conditional accounting conservatism, timely aggregate accounting earnings are often negative. This means timely financial reporting reflects losses or negative earnings more quickly than gains, capturing economic downturns or financial difficulties more rapidly than positive earnings. As a result, negative aggregate accounting earnings have a greater ability to predict GDP growth. The findings of this research support the idea that conditional accounting conservatism, which emphasizes the importance of timely and often negative earnings information, can be applied at the macroeconomic level to predict economic growth.

Lastly, the interaction coefficient between changes in aggregate accounting earnings, dummy variables, and macroeconomic uncertainty ($\beta_5 I_ANI_{it} * \Delta NI_{it} * EPU_{it}$) is negative (-0.480), with significance at the levels of 1%, supporting hypothesis 2. This study provides empirical evidence that macroeconomic uncertainty weakens the capability of negative

aggregate accounting earnings to predict GDP. This finding aligns with the propositions of the Real Business Cycle and New Keynesian models, which suggest that increased macroeconomic uncertainty tends to stimulate profitability (Basu & Bundick, 2017; Bloom et al., 2018). The Real Business Cycle model posits that during heightened macroeconomic uncertainty, firms are likely to delay or halt investment activities, resulting in reduced associated expenses. Meanwhile, consumers, anticipating a decline in saving returns, use the resources freed from reduced investment to boost consumption, leading to increased firm income. Reduced expenses and increased income ultimately result in higher firm profitability (Bloom et al., 2018).

On the other hand, the New Keynesian model suggests that increased macroeconomic uncertainty causes consumers to reduce consumption and increase saving. This reduction in consumption leads to a decline in marginal income, which should incentivize companies to invest more. However, companies tend to reduce investments due to the heightened uncertainty. The reduction in corporate investment outweighs the decline in consumer consumption, resulting in greater cost savings than the decrease in income (Basu & Bundick, 2017). Both models indicate increased macroeconomic uncertainty leads to higher profits (Basu & Bundick, 2017; Bloom et al., 2018). Consequently, this increased uncertainty often coincides with a rise in aggregate earnings, diminishing the predictive ability of negative aggregate accounting earnings.

Conclusion and Suggestion

This research successfully demonstrated that negative aggregate accounting earnings are better predictors of GDP growth compared to positive aggregate accounting earnings. The findings show that when companies report financial losses quickly, these negative earnings can more accurately forecast changes in GDP. Additionally, the study found that macroeconomic uncertainty, such as economic policy uncertainty (EPU), weakens the predictive power of these negative earnings for GDP growth. Therefore, when using aggregate accounting earnings to predict GDP, it is crucial to focus on negative earnings. The research findings theoretically confirm the "micro-to-macro" research stream. From a practical perspective, academicians and professionals engaged in forecasting macroeconomic performance, such as GDP, can utilize company-level (micro-level) accounting figures as leading predictors. This research suggests that researchers and practitioners should pay particular attention to negative aggregate earnings, consistent with the findings that negative aggregate earnings have better predictive power than positive ones.

However, this analysis is limited due to the restricted dataset, primarily relying on the EPU index to measure macroeconomic uncertainty. The limited availability of data restricts the selection of countries and the number of observations that can be included in the research. This constraint reduces the findings' robustness and limits the results' generalizability. Future researchers are strongly encouraged to address this limitation by obtaining a larger dataset, possibly through the use of quarterly data, to increase the number of observations and enhance the reliability of the results. Researchers and practitioners should also be cautious in utilizing aggregate earnings components in predictive models, as negative aggregate operating income is the only component with better predictive power. Additionally, they should carefully consider country-specific factors and differences in macroeconomic uncertainty among countries when developing and implementing “micro-to-macro” prediction models. By overcoming these limitations, future studies can further validate the findings and contribute to a deeper understanding of the relationship between corporate accounting earnings and macroeconomic outcomes.

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References

- Anderson, M. C., Banker, R. D., & Janakiraman, S. N. (2003). Are selling, general, and administrative costs “sticky”? *Journal of Accounting Research*, 41(1), 47-63 <https://doi.org/10.1111/1475-679X.00095>
- André, P., Filip, A., & Paugam, L. (2015). The effect of mandatory IFRS adoption on conditional conservatism in Europe. *Journal of Business Finance & Accounting*, 42(3-4), 482-514. <https://doi.org/10.1111/jbfa.12105>
- Atmini, S. (2019). Pengujian terhadap konservatisme akuntansi bergantung berita: Studi pada level perusahaan, agregat, dan makro. *Disertasi., Program Studi Doktor Ilmu Akuntansi, Fakultas Ekonomika dan Bisnis, Universitas Gadjah Mada*.
- Baker, S. R., & Bloom, N. (2013). Does uncertainty reduce growth? Using disasters as natural experiments. <https://www.imf.org/external/np/seminars/eng/2014/lic/pdf/Baker-Bloom.pdf>.

- Baker, S. R., Bloom, N., & Davis, S. J. (2016). Measuring economic policy uncertainty. *The Quarterly Journal of Economics*, 131(4), 1593-1636. <https://doi.org/10.1093/qje/qjw024>
- Ball, R., Sadka, G., & Sadka, R. (2009). Aggregate earnings and asset prices. *Journal of Accounting Research*, 47(5), 1097-1133. <https://doi.org/10.1111/j.1475-679X.2009.00351.x>
- Barth, M. E., Landsman, W. R., & Lang, M. H. (2008). International accounting standards and accounting quality. *Journal of Accounting Research*, 46(3), 467-498. <https://doi.org/10.1111/j.1475-679X.2008.00287.x>
- Basu, S. (1997). The conservatism principle and the asymmetric timeliness of earnings. *Journal of Accounting and Economics*, 24(1), 3-37. [https://doi.org/10.1016/S0165-4101\(1097\)00014-00011](https://doi.org/10.1016/S0165-4101(1097)00014-00011).
- Basu, S., & Bundick, B. (2017). Uncertainty shocks in a model of effective demand. *Econometrica*, 85(3), 937-958. <https://doi.org/10.3982/ECTA13960>
- Binz, O. (2022). Managerial response to macroeconomic uncertainty: Implications for firm profitability. *The Accounting Review*, 97(5), 89-117. <https://doi.org/10.2308/TAR-2020-0342>
- Bloom, N., Floetotto, M., Jaimovich, N., Saporta-Eksten, I., & Terry, S. J. (2018). Really uncertain business cycles. *Econometrica*, 86(3), 1031-1065. <https://doi.org/10.3982/ECTA10927>
- Chua, Y. L., Cheong, C. S., & Gould, G. (2012). The impact of mandatory IFRS adoption on accounting quality: Evidence from Australia. *Journal of International Accounting Research*, 11(1), 119-146. <https://doi.org/10.2308/jiar-10212>
- Crawley, M. J. (2015). Macroeconomic consequences of accounting: The effect of accounting conservatism on macroeconomic indicators and the money supply. *The Accounting Review*, 90(3), 987-1011. <https://doi.org/10.2308/accr-50998>
- Filipin, R., Teixeira, S. A., Bezerra, F. A., & Cunha, P. R. (2012). Analysis of conditional conservatism level of Brazilian companies listed on Bm&fbovespa after IFRS adoption. *Revista de Contabilidade & Controladoria*, 4(2), 24-36.
- Foster, L., Haltiwanger, J., & Krizan, C. J. (2000). Aggregate Productivity Growth: Lessons from Microeconomic Evidence. In *New Developments in Productivity Analysis*: NBER, University of Chicago Press.

- Negative aggregate accounting earnings and gross domestic product: A perspective of conditional accounting conservatism at the macroeconomic level by Sari Atmini, Arum Prastiwi
- Foster, L., Krizan, C. J., & Haltiwanger, J. (2006). Market Selection, Reallocation, and Restructuring in the U.S. Retail Trade Sector in the 1990s. *Review of Economic Statistics*, 88, 748-758. <https://doi.org/10.1162/rest.88.4.748>
- Gaertner, F. B., Kausar, A., & Steele, L. B. (2020). Negative accounting earnings and gross domestic product. *Review of Accounting Studies*, 25, 1382-1409. <https://doi.org/10.1007/s11142-020-09536-x>
- Hair, J. F. J., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate data analysis* (Eighth ed.). Hampshire, United Kingdom: Cengage Learning EMEA.
- Huang, M. (2015). Predictive power of aggregate accounting earnings growth for growth of future GDP. *Masters' Theses, Graduate School, Eastern Illinois University*.
- Konchitchki, Y., & Patatoukas, P. N. (2014a). Accounting earnings and gross domestic product. *Journal of Accounting and Economics*, 57(1), 76-88. <https://doi.org/10.1016/j.jacceco.2013.10.001>
- Konchitchki, Y., & Patatoukas, P. N. (2014b). Taking the pulse of the real economy using financial statement analysis: Implications for macro forecasting and stock valuation. *The Accounting Review*, 89(2), 669-694. <https://doi.org/10.2308/accr-50632>
- Lalwani, V., & Chakraborty, M. (2020). Aggregate earnings and gross domestic product: International evidence. *Applied Economics*, 52(1), 68-84. <https://doi.org/10.1080/00036846.2019.1640859>
- Landefeld, J. S., Seskin, E. P., & Fraumeni, B. M. (2008). Taking the Pulse of the Economy: Measuring GDP. *Journal of Economic Perspectives*, 22(2), 193-216. <https://doi.org/10.1257/jep.22.2.193>
- Laurion, H., & Patatoukas, P. N. (2016). From micro to macro: Does conditional conservatism aggregate up in the national income and product accounts? *Journal of Financial Reporting*, 1(2), 21-45. <https://doi.org/10.2308/jfir-51619>
- Lilien, D. M. (1982). Sectoral Shifts and Cyclical Unemployment. *Journal of Political Economy*, 90(4), 777-793. <https://doi.org/10.1086/261088>
- Lim, D., & Zheng, K. (2014). Conditional conservatism of aggregate accounting earnings. *Accounting and Finance Research*, 3(4), 115-131. <http://dx.doi.org/10.5430/afr.v3n4p115>

- Lucas, R. E., & Prescott, E. C. (1974). Equilibrium Search and Unemployment. *Journal of Economic Theory*, 7(2), 188-209. [https://doi.org/10.1016/0022-0531\(74\)90106-9](https://doi.org/10.1016/0022-0531(74)90106-9)
- Lumley, T., Diehr, P., Emerson, S., & Chen, L. (2002). The Importance of the Normality Assumption in Large Public Health Data Sets. *Annual Review of Public Health*, 23(1), 151-169. <https://doi.org/10.1146/annurev.publhealth.23.100901.140546>
- Marzuki, M. M., & Wahab, E. A. A. (2016). Institutional factors and conditional conservatism in Malaysia: Does international financial reporting standards convergence matter? *Journal of Contemporary Accounting & Economics*, 12(3), 191-209. <https://doi.org/10.1016/j.jcae.2016.09.004>
- Min-Ho, S., & Jeong, K. (2022). The informational role of aggregate accounting earnings and their components in predicting GDP growth – Evidence from Korea. *Cogent Business & Management*, 9(1), 2096800. <https://doi.org/10.1080/23311975.2022.2096800>
- Nallareddy, S., & Ogneva, M. (2017). Predicting Restatements in Macroeconomic Indicators Using Accounting Information. *The Accounting Review*, 92(2), 151-182. <https://doi.org/10.2308/accr-51528>
- Schröder, C., & Yitzhaki, S. (2017). Reasonable Sample Sizes for Convergence to Normality. *Communications in Statistics - Simulation and Computation*, 46(9), 7074-7087. <https://doi.org/10.1080/03610918.2016.1224347>
- Schumpeter, J. A. (2003). *Socialism and Democracy*: Taylor & Francis e-Library.
- Sumiyana, S., Atmini, S., & Sugiri, S. (2019). Predictive power of aggregate corporate earnings and their components for future GDP growths: An international comparison. *Economics and Sociology*, 12(1), 125-367. <https://doi.org/10.14254/2071-789X.2019/12-1/7>
- Wang, H., Cao, F., Li, S., & Liu, X. (2015). Can accounting earnings predict future GDP growth? Evidence from China. *Frontiers of Business Research in China*, 9(1), 30-43. <https://doi.org/10.3868/s070-004-015-0002-5>
- Wooldridge, J. M. (2013). *Introductory Econometrics: A Modern Approach* (Fifth ed.). Mason, Ohio: South-Western Cengage Learning.
- Yoshinaga, Y., & Nakano, M. (2023). Aggregate earnings informativeness and economic shocks: international evidence. *Asia-Pacific Journal of Accounting & Economics*, 30(1), 196-211. <https://doi.org/10.1080/16081625.2021.1952084>

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