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Applied-Research Paper

A VAR Model for the Macroeconomic Indicators Restatements Predicting: Introduction to Macro Accounting Theory

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ABSTRACT

The emergence of a new theory of "macro accounting" with a new wave of accounting research over the last decade tries to explain and use the Aggregate information of interim accounting statements in economic forecasts. Macro accounting theory suggests that economists and macroeconomic forecasters use Aggregate accounting information at the macroeconomic level. For example, accounting earning is used to forecast GDP, cost stickiness is used to predict unemployment, and the ratio of book value to market value is used to predict inflation. Earnings growth dispersion contains information about trends in labor reallocation, unemployment change, and, ultimately, aggregate output. initial macroeconomic estimates released by the Central bank of Islamic Republic of Iran and Planning and Budget Organization and Statistical Center of Iran do not fully incorporate this information. Accordingly, the present study, based on macro accounting theory, has examined the Predicting Restatements in Macroeconomic Indicators using Accounting Information. The statistical population of this study includes all companies listed on the Tehran Stock Exchange. Due to the seasonality of the data and the fit of the models in a time series, the observations reach 40 times (2008:1to2018:4). The research method is based on time series data, VAR technique. The results suggest that earnings growth dispersion provides related data about final GDP growth. The results suggest that after considering the effect of other influential factors, specifically real initial GDP, earnings growth dispersion is useful in forecasting future GDP changes. The findings are important for economists and policymakers to have more accurate economic estimation and prediction by applying for accounting Information.

1 Introduction

Accounting information is provided by the Accounting Information System in a comprehensive and integrated manner. Financial markets, especially the capital market, can have a great deal of relevance to other sectors of the economy. How will accurate macroeconomic factors be predicted in the future? This important question's response is the objective of macroeconomists and a bunch of decision and policymakers. The current study examines the applicability of financial statement analysis based on

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accounting earnings data extracted from individual firms to take the Iran economy's pulse. The economic and finance researchers possess a long history of studying prices and earnings at the macroeconomic level; they mostly applied time series designs. Abstractly, ‘‘macroeconomic’’ variables include the meta-data of a region or nation, whereas practically the main indexes to measure them are prices and earnings provided by the capital market. In contrast, finance scholars have a long history of investigating the association between earnings and other financial variables, including the stock return and earning quality at the firm level. They mostly employed cross-sectional or pooled research designs. Abstractly, significant effective factors on earnings quality include timeliness, usefulness, conservatism, analyst forecast accuracy, value relevance, information asymmetry, trading volume, and liquidity at the firm level, mostly considered by a wide range of studies. The two kinds of literature have presented separately; but employing financial statement Information to forecast economic activities at the firm level is traditionally a topic of accounting literature [19, 22, 12, 1, 17,8,9,10,11,16].

We investigate whether real-time aggregate accounting information can be used to detect errors in early announcements of gross domestic product (GDP). Macroeconomic expectations shaped by these announcements affect a large spectrum of decisions by government agencies and economic agents. However, initial announcements are based on imprecise and incomplete information, and are routinely restated during several subsequent years as more information becomes available. Figure (1) shows the error in forecasting GDP.

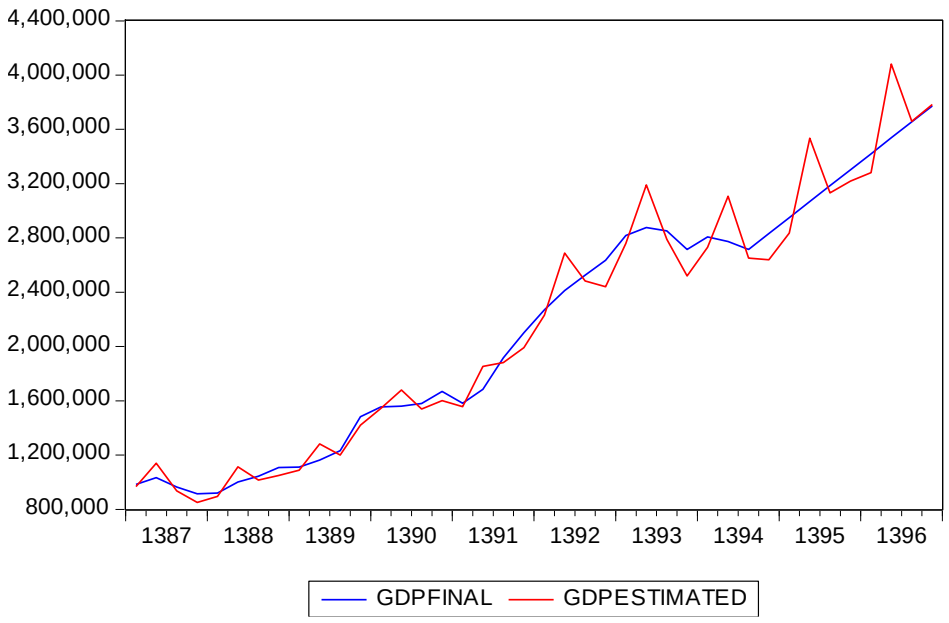

Fig. 1: GDP and error in GDP
Source: Researcher Findings

The blue lines indicate real GDP and the red lines indicate GDP estimates. We find that earnings growth dispersion can predict GDP restatements, as it contains macroeconomic information that is not fully impounded by economists. When estimating GDP, the Central Bank of Islamic Republic of Iran and Planning and Budget Organization and Statistical Center of Iran relies on multiple sources of information, some of which are not available when the initial estimates are produced. The unavailable components of GDP are imputed using trend estimates that extrapolate information from prior months, quarters, or years. Thus, the precision of early GDP estimates can be improved by applying more accurate trend assumptions, which can be achieved by incorporating information on other macroeconomic

variables that co-vary with the GDP. According to Okun's Law [18], aggregate unemployment change and GDP growth move in opposite directions. A change in the unemployment rate should, therefore, provide information about contemporaneous GDP growth. However, early unemployment estimates are also imprecise and are regularly restated [6]. Therefore, information sources that help produce more accurate unemployment estimates should also help improve GDP figures. According to [9,10,11], accounting Earning has the ability to replace the Corporate Profit, which is one of the main components of measuring GDP. As a result, accounting Earning growth rate can be an alternative to the Corporate Profit growth rate, which is the main driver of economic growth rate. [16,8,9,10,11], believe that the Corporate profit information is available with a time delay. As a result, they suggest using accounting Earning instead of corporate profits. Because accounting Earning are available on a quarterly, semi-annual, nine-month basis at the appropriate time. Accounting Earning prepared based on Generally Accepted Accounting Principles (GAAP) is one of the timely data and a suitable source in predicting economic variables that can be a good indicator of Corporate profit. Macro accounting, despite its emergence in recent years, has good theoretical underpinnings.

In this paper, we focus on earnings growth dispersion as such an information source. Sectoral shift theory links increases in performance dispersion to higher unemployment [15]. Poorly performing firms downsize and lay off workers, while well-performing firms grow and extend their labor force. Therefore, greater dispersion in performance should lead to greater reallocation of workers across firms. Due to labor reallocation frictions related to job search, retraining, or physical relocation, changing jobs takes time, which leads to higher unemployment in the interim. If historical earnings growth dispersion contains information related to labor reallocation and such information is not fully incorporated by macroeconomists, then it can be used to improve early unemployment and GDP estimates. Importantly, it is unlikely that economists do not take into account any information related to friction-induced unemployment. We only suggest that accounting information is not fully incorporated. While we are not the first to note that earnings dispersion fits well into the sectoral shift theory [7], the efforts to document the information content of aggregate accounting dispersion are very recent [8]. Prior macroeconomic research does not use accounting figures to infer impending labor reallocation and instead uses across-sector dispersion in employment changes [13] or stock returns [14, 2].

We suggest that the across-firms dispersion in earnings growth has several advantages as a labor reallocation proxy. Unlike sectoral employment changes, accounting information is available on a firm-level basis, it is timely, and it is less likely to be restated. Unlike stock returns, accounting earnings are better aligned with cash flow (rather than discount rate) news. Whether these benefits translate into incremental usefulness of earnings growth dispersion for inferring labor reallocation or improving the accuracy of early macroeconomic estimates is ultimately an empirical question. Overall, our paper provides empirical evidence on two related questions. First, does earnings growth dispersion contain information that is incrementally useful for predicting labor reallocation and, hence, unemployment and aggregate output? Second, does the Central bank of Islamic Republic of Iran that compiles GDP estimates fully incorporate this information? Iranian capital markets, as emerging markets, require native research to answer these questions and issues [24]. The paper proceeds as follows: Section 2 reviews the literature and develops the hypothesis. Section 3 describes the sample, data collection, and research design. Section 4 presents the main results. Section 5 results and concludes.

2 Theoretical foundations and Hypothesis Development

The Central bank of Islamic Republic of Iran and Planning and Budget Organization and Statistical Center of Iran retains the responsibility of collecting and reviling periodical macroeconomic data.The preparation of national accounts, after the Second World War, began on a case-by-case basis and based on special needs in Iran, including in 1958 H. Sh. and 1959 H. Sh., respectively, "Iran's GDP for 1955" and "Iran's national production for 1957 ", respectively. Foreign experts estimated. Then, the Program and Budget Organization estimated and published the national income of the country for the period 1958 H. Sh. to 1961 H. Sh. in detail for different economic sectors. The National Bank also made another preliminary estimate for 1959 H. Sh. With the establishment of the Central Bank of Iran in 1959 H. Sh., due to the lack of an official statistical organization, the preparation of national accounts was entrusted to this bank and after that, according to the law of 1974 H. Sh., this task was officially assigned to the Statistics Center of Iran. In this regard, we obtain applicable information from the official website of Central bank of Islamic Republic of Iran. The accuracy and efficiency of early GDP estimates are incorporated with news and noise among macroeconomics. The news interpretation states that restatements are unpredictable at the initial estimate and occur only because of incorporating new information. In contrast, the noise interpretation suggests that restatements reflect information available at the initial estimate time. Thus, initial estimates are not rationally reliable.

Early GDP estimates are based, in part, on trend-extrapolated information from prior periods. The accuracy of trend estimates and, therefore, early GDP figures, can be improved by incorporating trend information on any indicators that co-vary with aggregate output. One such indicator is unemployment. Unemployment changes are robustly negatively correlated with GDP growth [18]. However, employment figures for recent quarters are also imprecise and regularly restated [6]. Therefore, improving unemployment trend estimates can help improve GDP growth trend estimates, which can lead to more accurate early GDP figures. The unemployment estimate's accuracy can be improved by taking into account recent labor reallocation. In the presence of frictions associated with job search, new skills acquisition, and physical relocation, the turnover of workers across employers takes time and leads to unemployment in the interim [15]. The pace of reallocation and the associated unemployment level varies over time and across the business cycle [5]. Prior research on sectoral shift theory uses various proxies to capture the extent of labor reallocation associated with unemployment. [13] measures the dispersion in employment changes across sectors and infers friction-caused unemployment from a positive association between such dispersion and unemployment.

Alternatively, [14,2] employ dispersion in sectoral stock returns that proxy for shocks to firms' labor demand and subsequent labor reallocation. They document a positive association between dispersion in lagged stock returns and unemployment. These studies do not use accounting profitability as a predictor of changes in firm-specific labor demand and subsequent worker reallocation. However, it is reasonable to expect that firms' layoff and hiring decisions are affected by changes in profitability. Further, accounting-based performance measures offer distinct advantages as predictors of changes in employment. First, unlike sectoral employment changes, generally accepted accounting principles (GAAP) earnings are available at the firm level and are more precise, i.e., less likely to be restated compared to macroeconomic employment figures that are based on limited-size surveys. Second, unlike stock returns that, to a significant extent, capture market-wide discount rate news [23], innovations in firms' profits are better aligned with firm-specific cash flow news related to firm performance. Whether these properties of accounting-based profitability measures translate into incremental information about labor reallocation is ultimately an empirical question.

In accounting literature, [7] suggest (conceptually) a link between earnings dispersion and unemployment, while [8] document an association between the dispersion in earnings forecast revisions (one of their measures of firm-level uncertainty) and unemployment. Our paper differs from [8] in two respects. First, the objective of our paper is different. [8] investigate how different types of uncertainty interact and influence the macroeconomic conditions. We investigate whether real-time aggregate accounting information can be used to detect errors in early announcements of macroeconomic estimates and whether these estimates can be significantly improved in real time using accounting information. This difference in objectives drives the differences in the research design and inferences.

Specifically, we focus on the real-time prediction of restatements in initial estimates of GDP growth and unemployment change, and hence use only publicly available information that should be impounded into initial macroeconomic estimates. In contrast, [8] document the contemporaneous association between different types of uncertainty and macroeconomic variables, relying on the final estimates of unemployment, industrial production, and investment. Second, [8] rely on multiple theories, including a modified version of sectoral shift theory, into which they introduce uncertain hiring rates. We rely only on a traditional sectoral shift theory that has no parameter uncertainty, and provide new firm-level and industry-based evidence that ties earnings dispersion to reallocation of labor. Based on this, the research hypothesis is as follows. Hypothesis: The innovation in aggregate earnings changes and growth dispersion has the ability to predict GDP restatement. The present study examines the informative nature of aggregate accounting earning to predict GDP growth, and presents a new wave of accounting research entitled Explanation of Accounting in Macroeconomics as Macro Accounting Abbreviation. The new link between accounting and economics is called macro accounting. Using the explanatory power of accounting earning, the present study believes that the fundamental accounting variables can be used to predict macroeconomic indicators.

Although various foreign studies have suggested accounting information to improve the forecast of macroeconomic indicators, but in Iran, clear evidence of the reaction of macroeconomic indicators to accounting information has not been found so far and the results on whether the information Accounting of the financial statements of companies listed on the Tehran Stock Exchange in estimating macroeconomic indicators will increase the accuracy of forecasts or not, is not available.

3 Research Method

In the research methodology, the type of research, statistical population, data collection and research method have been studied.

3.1 Research Type

The present study is a developmental research in terms of results. In terms of implementation process, it is a quantitative study and in terms of research purpose, it is a descriptive study. It is a quantitative study in terms of implementation process and a descriptive study in terms of research purpose. In terms of implementation, it is an inductive research and in terms of time dimension, it is a longitudinal research. It is analytical in terms of causal method and practical in terms of purpose. The method of data collection is library and statistics and information related to the variables used in the research model is extracted as a seasonal time series from the codal site and the Statistics Center of Iran. The econometric tools used in the Eviews software research and the estimation method used, the Johansen & Juselius method and the time domain of the research, the time interval of 2008-2018 and the spatial realm of the research are also Iran.

3.2 Data Collection

The data required to collect accounting information is the Codal website and the economic information is the website of the Central Bank of the Islamic Republic of Iran. In other words, the information on the aggregate accounting earnings using the interim financial statements of companies listed in the Tehran Stock Exchange during the period 2008-2018 and the the GDP using the data of the first quarter of 2008 to the fourth quarter of 2018 (2008: Q1- 2018: Q4) has been collected.

3.3 Statistical Population

The statistical population of this research includes all companies listed in the Tehran Stock Exchange. Data collection was done seasonally. With respect to this fact that on 25 July 2007, stock exchange publishers were obliged to submit financial statements in the form of audited periods, the research period has started since 2008. Pursuant to paragraph 4 article 7 of the Guidelines for Exchange Publishers in Presenting Audited Financial Statements, listed publishers are required to prepare and disclose financial statements within the audited six-month periods. As a result, due to the seasonality of the data and the fit of the models in a time series, the observations reach 44 times (2008: Q1 to 2018: Q4).

3.4 Vector Autoregression (VAR) Model

we run a vector autoregression (VAR) model, a generalization of a single-variable time-series autoregression (AR) model. I form proxies for aggregate corporate sector news using [3] return decomposition framework. [3] return decomposition framework is advantageous in my setting because it distinguishes between aggregate cash flow news and aggregate discount rate news. [23] demonstrates that firm-level returns are driven primarily by cash flow news. Therefore, bifurcating returns into cash flow and discount rate news may not be critical within firm-level conservatism studies. However, prior research demonstrates that cash flow news explains less than one-third of the variation in returns at the aggregate level [3, 4]. This suggests that cash flow news is largely idiosyncratic and diversified away in the aggregate [23]. Thus, failing to distinguish between cash flow news and discount rate news at the aggregate level could significantly reduce the power of the empirical tests. Because revisions in investors' expectations about future cash flows and discountrates in Equation (1) are not directly observable, [3] forms empirical proxies using a vector autoregression (VAR).

A vector autoregression is an econometric model that generalizes univariate auto regressive (AR) models and captures the interdependencies between multiple time series. Each variable within the system is allowed to evolve in an unrestricted fashion as a linear function of its own lags and the lags of all the other variables in the model. As a result, vector autoregressions can be estimated without the specification of a structural model which can require multiple identification restrictions. [3] first-order vector autoregression assumes the following functional form.

Equation (1):

$$z_t = \alpha + \Gamma z_{t-1} + u_t$$

Where z_t is an mx1 vector of macroeconomic state variables observable to the market by the end of period t, a is an mx1 vector of constant parameters, Γ is an mxm matrix of coefficient estimates, and ut is an mx1 vector of independent and identically distributed residuals. we investigate whether such publicly available information is fully incorporated into initially announced GDP estimates. The initially announced estimate represents a forecast of the final estimate plus error.

Equation (2):

$$Macroeconomic\ Indicators\_Final_t = a + \beta_I nitial\_Est_t + \varepsilon_t$$

If the initially announced estimate is an unbiased predictor of the final estimate, then the coefficients from estimating Equation (2) using ordinary least squares (OLS) should be: a=0 and β=1. To test whether the initial estimate fully incorporates information about earnings dispersion, we can estimate the following regression.

Equation (3):

$$Macroeconomic\ Indicators\_Final_t = a + \beta_1 Accounting\ Information\_Disp_{t-1} + \beta_2 Initial\_Est_t + \varepsilon_t$$

If the error in the initially announced estimate is related to earnings growth dispersion, then the coefficient β_1 should be significantly different from zero. Finally, to test whether earnings growth dispersion contains information about the final GDP estimate that is also incremental to other known GDP expectation benchmarks, labor reallocation proxies, or restatement predictors, we can estimate a full regression specification.

Equation (4):

$$Macroeconomic\ Indicators\_Final_t = a + \beta_1 Accounting\ Information\_Disp_{t-1} + \beta_2 Initial\_Est_t + \sum \beta_i Control_i + \varepsilon_t$$

where labor reallocation proxies include Accounting Information-$Disp_{t-1}$ (earnings growth dispersion for fiscal $quarter_{t-1}$ earnings that are released in $quarter_t$) and the final GDP growth expectation benchmarks include $Initial\_Est_t$ (the initially announced real or nominal GDP growth for quarter $_t$). Control variables include $EmpG\_Disp_{t-1}$ (employment growth dispersion for year t-1) and Ret_Disp_{t-1} (dispersion in year t-1 returns).

To be consistent with prior research on macro restatement prediction, we report the results of a regression that is equivalent to Equation (4), but has the GDP restatement[1] on the left-hand side.

Equation (5):

$$Restatement_t = a + \beta_1 Accounting\ Information\_Disp_{t-1} + \beta_2^* Initial\_Est_t + \sum \beta_i Control_i + \varepsilon_t$$

where $Restatement_t$ is the restatement in GDP growth for $quarter_t$. All coefficient estimates in Equation (5) equal their counterparts in Equation (4), except for the coefficient on $Initial\_Es_t$, β_2*, which is equal to (β_2-1).

we study the macroeconomic information content of aggregate earnings using vector auto-regressions (VAR). This approach addresses potential endogeneity in inter-related macroeconomic variables and allows us to investigate the information content of aggregate earnings for future innovations to earnings. GDP is modeled as a function of other variables in the system and their lags in addition to its own lags, which allows for analysis of the effects of shocks to one or more variables in the system [22]. We build on Stock and Watson (2001), who estimate a VAR model in which the evolution of the GDP follows Okun's Law and Taylor's rule [18]. we estimate the following recursive VAR system.

Equation (6):

$$AZ_t = \phi Z_{t-k} + \varepsilon_t$$

where Z_t = ($Restatement_t$, Accounting Information-$Disp_{t-1}$, $Initial\_Est_t$) is a vector of variables.

[1] Restatement = (Macroeconomic Indicators_Final) - (Initial_Est)

3.5 Research Variables

The measurement of variables is in Table 1 presented.

Table 1: Definitions of Variables

Variable	Rol in model	Definition
GDP	Dependent variable	Growth of income and gross national product in terms of economic activities reported by the Central Bank of Iran. Equation (7): $$\Delta GDP_t = \frac{GDP_t - GDP_{t-1}}{GDP_{t-1}}$$ Source: https://www.cbi.ir/category/EconomicTrends_fa.aspx
Seasonal Earnings Changes (ChEarn)	Independent variable	we estimate seasonal earnings changes (ChEarn) for each firm i and quarter t as follows. Equation (8): $$ChEarn_{it} = \frac{(Earn_{it} - Earn_{it-4})}{BV_{it-1}}$$ where $Earn_{it}$ ($Earn_{it-4}$) is realized earnings for firm i in quarter t (t-4); and BV_{it-1} is the book value of equity for firm i at the end of quarter t-1[16].
Aggregate Earnings Changes (AggChEarn)	Independent variable	we estimate aggregate earnings changes (AggChEarn) for quarter t as an equal-weighted average of firm-level earnings changes. Equation (9): $$AggChAccInfo_t = \frac{1}{N_t}\sum_{i=1}^{N_t} ChAccInfo_{it}$$ where $ChEarni,_t$ is as previously defined and N_t is the number of firms in quarter t [16].
Aggregate Earnings Changes Dispersion (AggEarDisp)	Independent variable	we estimate aggregate earnings changes dispersion (AggEarDisp) for quarter t as. Equation (10): $$AggAccInfoDisp_t = \sqrt{\frac{1}{N_t}\sum_{i=1}^{N_t}(ChAccInfo_{it-}AggChAccInfo_t)^2}$$ where $AggChEarn_t$, $ChEarni,_t$, and N_t are as previously defined [16].
Innovation in Aggregate Earnings Changes Dispersion	Independent variable	our earnings growth dispersion measure, Ear_Dispt, is the innovation in aggregate earnings changes dispersion. We estimate it as a residual from the AR (2) model. Equation (11): $$AggAccInfoDisp_t = \alpha_0 + \beta_1 AggAccInfoDisp_{t-1} + \beta_2 AggAccInfoDisp_{t-2} + \varepsilon_t$$ where $AggEarDisp_t$, $AggEarDispt_1$, and $AggEarDispt_2$ are aggregate earnings changes dispersion estimates for quarters t, t_1, and t_2, respectively; Ear_Disp_t is equal to the residual et. To avoid any look-ahead bias, we estimate the model on a rolling basis, using all observations prior to and including quarter $_t$ [16].

Dependent variable

GDP: Economic growth has been considered as a dependent variable and a criterion in the economic

growth forecasting model using accounting conservatism, which has been collected by using income growth and gross national product in terms of economic activities at constant prices in 2011.

Independent variable

Aggregate Earnings: Dispersion in aggregate earnings growth is measured in four steps, similar to [8,16].

1.First, we estimate seasonal earnings changes (ChEarn) for each firm i and quarter t as Equation (4).

2.Second, we estimate aggregate earnings changes (AggChEarn) for quarter t as an equal-weighted average of firm-level earnings changes as Equation (4).

3.Third, we estimate aggregate earnings changes dispersion (AggEarDisp) for quarter t as Equation (4).

4.Fourth, we are interested only in the new information contained in earnings dispersion that is not fully incorporated into macroeconomic estimates. Therefore, our earnings growth dispersion measure, Ear_Dispt, is the innovation in aggregate earnings changes dispersion. We estimate it as a residual from the AR (2) model as Equation (4).

4 Empirical Results

The research findings are divided into two parts: descriptive statistics and inferential statistics.

4.1 Descriptive statistics

Table 2 reports descriptive statistics.

Table 2: Descriptive Statistics

Variable	Mean	Median	Min	Max
Final GDP	33/39	6/6	-34/6	546/9
Restatemen	-27/26	-15	-870	760
Initial	60/73	-7/5	-217/2	811/2
EarnDisp	-1/127	0	-17/785	400/763

The Table suggests that the mean (median) of final GDP growth are respectively 33.39 (6.6). Furthermore, these indexes of GDP_Restatemen are -27.26 (-15). Finally, the initial GDP growth are respectively 60.73 (-7.5). Both the mean and median of all variables are statistically significant. The results are economically significant. The accounting earnings dispersion is shown in Figure (2).

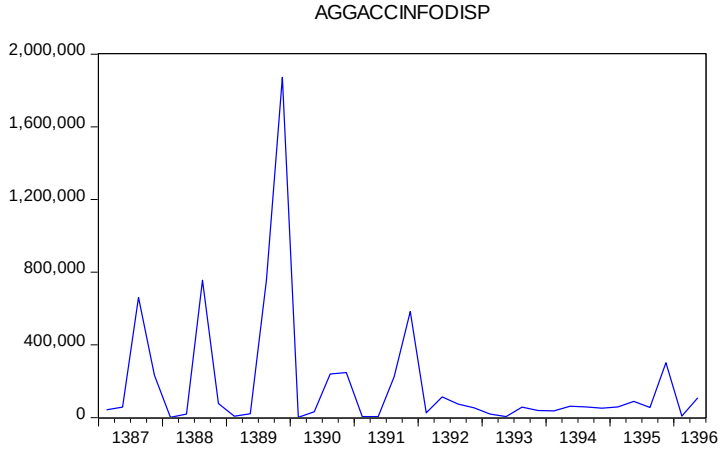

Fig. 2: Accounting earnings distribution

Source: Researcher Findings

The results for the accounting earnings dispersion are presented in Figure (3).

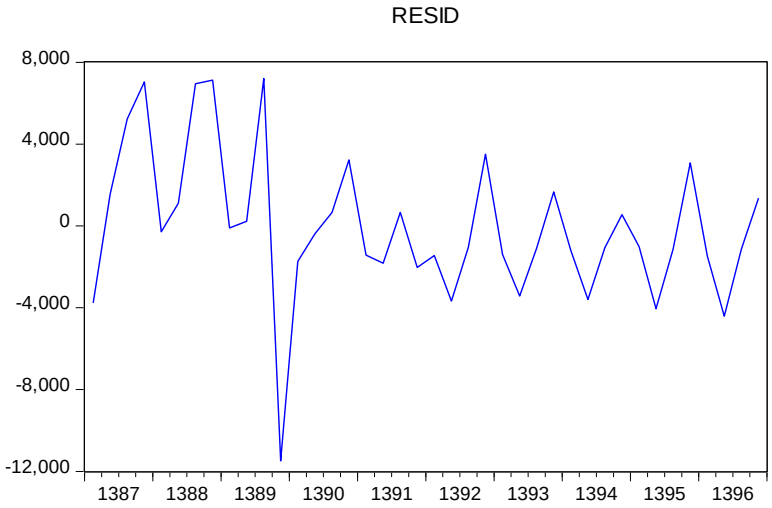

Fig. 3: Innovation in Accounting Earnings Dispersion
Source: Researcher Findings

4.2 The Regression Results for Earnings Growth Dispersion and GDP Restatement

The results of stationary test (the unit root) and Co-integration test are reported in Table 3. Phillips Prone (PP) test was used for stationarity test. Johansen test was also used for the Co-integration test.

Table 3: stationary Test & Co-Integration Test

Test	Statistics	P-value	H0 Hypothesis	Results
Phillips Prone	-28/827	0/01	Non-durable	Durable
Co-integration Trace/ Max	1/688	0/19	Non- Co-integration	Unrestricted VAR
AIC Test	-74036/06	-	Number of logs	Logs of 1
BIC Test	-73964/76	-	Number of logs	Logs of 1
LogLik Test	37032/02	-	Number of logs	Logs of 1

The results of model estimation using the VAR are described in Table 4.

Table 4: Estimation of Short-Term Relationships Between Earnings Growth Dispersion and GDP Restatement

Variable	$Restatement_t$	$EarnDisp_t$
$Restatement_{t-1}$	0/154 (0/214) [0/718]	0/019 (0/263) [0/072]
$EarnDisp_{t-1}$	0/423 (0/203) [2/083]	-0/062 (0/249) [-0/248]
$Initial\_GDP_t$	0/254 (0/584) [4/874]	0/985 (0/741) [3/951]
$EmpGDisprr_{t-1}$	0/785 (0/951)	0/125 (0/654)

Table 4: Estimation of Short-Term Relationships Between Earnings Growth Dispersion and GDP Restatement

Variable	$Restatement_t$	$EarnDisp_t$
	[1/993]	[2/985]
$RetDisptrrr_{t-1}$	0/843 (0/792) [3/033]	0/258 (0/587) [2/005]
C	0/070 (0/036) [1/920]	0/046 (0/044) [1/046]
R-squared	0/23	0/004
Adj. R-squared	0/14	-0/12
F-statistic	2/517	0/03

The significance of the EarnDispt-1 coefficient (0.423) in the first relation indicates the short-term excitement of the earnings growth dispersion to GDP restatement. The forecast trend of GDP using accounting earnings is reported in Figure (4).

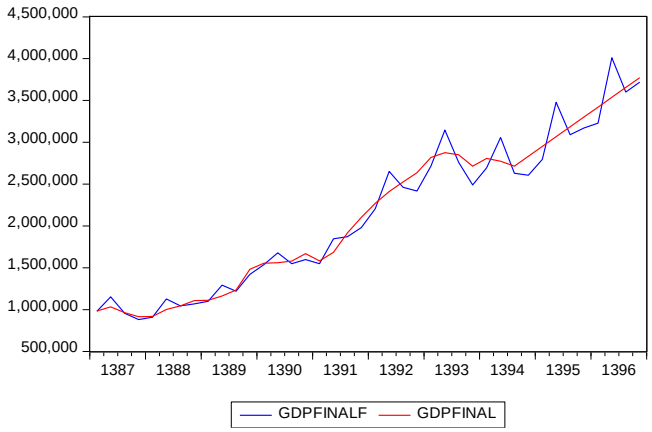

Fig. 4: GDP Forecast Using Accounting Earnings

Figure (5) shows the accuracy of GDP forecasting using accounting earnings.

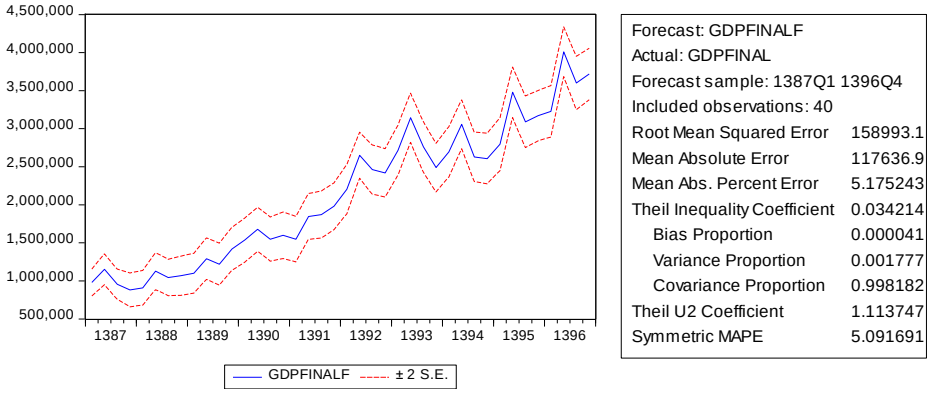

Fig. 5: Accuracy of GDP Forecasting Using Accounting Earnings

5 Conclusion

Economists regard that one of the most indicative economic indexes for an economy's health is GDP growth. Because GDP fluctuation predictions, directly or indirectly, are recognized as a decision-making indicator by public institutions, private entities, stock market investors and analyzers, and governments' bodies, importantly. The only information provider, in this regard, in which publishing credible and reliable forecasts is the Statistic Center of Iran organization as part of the survey of professional forecasters, presenting the consensus required by professional macroeconomic experts-extending the unexplored line of literature linking Financial Statements Information to the macroeconomy and, more specifically, upon the paper of [8,9,10,11,16]. This article provides an innovative way of forecasting the aggregate GDP growth by Iranian companies by investigating the predictive information in listed firms' earnings data in the Tehran stock exchange market.

Since the idea of investigating the association between firms' profitability variables to macroeconomic performance has only been developed in recent years, existing literature on this issue is still limited. Notably, such a study has not been conducted in Iran's economy. Therefore, this article is the first to investigate this geographical area. Furthermore, provided findings contribute to governmental bodies to provide more accurate estimations by considering firm-level information. Therefore, accounting Information may lead to practical and useful information for meta-programming of countries' futures. We find that, at the firm level, accounting-based earnings growth estimates have incremental ability to predict employment changes relative to employment reallocation predictors used in macroeconomic research. At the macro level, earnings dispersion is incrementally useful in predicting future unemployment and GDP growth. Central bank of Islamic Republic of Iran and Planning and Budget Organization and Statistical Center of Iran do not fully incorporate this information in early GDP estimates. As a result, earnings growth dispersion predicts restatements in both real and nominal GDP growth estimates. The restatement predictability results are robust to various research design changes and can be replicated in an out-of sample setting using information available in real time. Importantly, accounting information predicts restatements even after controlling for other known restatement predictors. Additional analyses show that incorporating earnings growth dispersion information into early GDP estimates has economically significant policy implications in the monetary policy and banking regulation settings. The notion that accounting earnings contain macroeconomic information is widely recognized. However, the efforts to uncover the macroeconomic content of accounting disclosures have mostly been focused on aggregated earnings, with relatively little attention devoted to other measures, such as earnings dispersion. Our paper complements recent efforts in this direction.

Our hope is that this unexplained macroeconomic content of earnings dispersion would spur further research into the interplay between accounting disclosures and the macroeconomy. Opportunities for future works emerge from the limitations of this study. The unexplained macroeconomic content of firm-level details would further scrutinize the association between accounting disclosures and the macroeconomic indicators, including employment allocation. This paper only provides evidence about the effect of firm-level information on the macro-level economy. However, the correlation might be applicable in the opposite direction, with the GDP growth estimate as an indicator of predicting entities' profitability. Pursuant to paragraph 4 Article 7 of the Guidelines for Exchange Publishers in Presenting Audited Financial Statements, stock exchange publishers are required to prepare and disclose only the financial statements between the audited 6-month periods. Therefore, the main limitation of the present study is the use of some quarterly unaudited financial statements of companies listed on the Tehran Stock Exchange.

Using a time series pattern in forecasting, especially with higher intervals, requires historical information for several periods. The more information available, the more reliable the template estimation

results are. Due to the use of interim financial statements in data collection, access to information before 2008 was impossible. Therefore, in order to spread the results, it is necessary to consider this important issue. It is suggested that economists in economic forecasting pay attention to the future nature of earnings accounting information. This issue can also be covered in future accounting studies. Some suggestions are as follows.

1. Assess the accuracy of GDP forecasting using aggregate stock returns, aggregate profitability, conservative aggregate accounting, aggregate stock market value to stock book value, and aggregate labor force growth in Company level.
2. Assess the accuracy of unemployment rate forecasting using aggregate inflation stickiness of costs and deflationary aggregate accounting earnings.
3. Assess the accuracy of inflation forecasting using aggregate accounting earnings and the aggregate ratio of stock market value to stock book value.

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