

An Examination of the Accuracy of Economic Country Forecasts produced by the Economist Intelligence Unit (EIU)

Nick Falconer (FLCNIC002)

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ABSTRACT

This paper investigates the accuracy of Country-Level Forecasts for six variables: Real GDP Growth, Inflation (Consumer Price Index), Short-Term Interbank Rate, Budget Deficit (as % of GDP), Current Account Balance (as % of GDP) and the Unemployment rate. The data used in this analysis is produced by the Economist Intelligence Unit (EIU) and covers the period 1996-2013. The two forecast horizons of primary interest are Current-Year (t) and One-Year-Ahead (t+1) forecasts. A range of statistical methods are used to ascertain the accuracy of the EIU forecasts in 103 countries for most of the variables, while the accuracy of the Unemployment rate forecasts used data for 68 countries. Generally, the results confirm this paper's four primary hypotheses: (1) EIU forecasts are more accurate than No-Change-Forecasts; (2) EIU forecasts for higher income countries have smaller errors than forecasts for lower income countries; (3) The accuracy of EIU forecasts decreases as forecast horizon increases; and (4) The accuracy of EIU forecasts was relatively weaker during the period of the Global Financial Crisis (2008-2009) than in other periods.

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Table of Contents

I. Introduction	1
II. Literature Review	
2.1 Overview of Economic Forecasting	2
2.2 Errors in Economic Forecasting	4
2.3 Assessing Forecast Accuracy	6
2.4 Methods of Forecast Evaluation	7
2.4.1 Mean Squared Error (MSE)	7
2.4.2 Root Mean Squared Error (RMSE)	8
2.4.3 Mean Absolute Error (MAE)	8
2.4.4 RMSE vs. MAE	9
2.4.5 Mean Error (ME)	9
2.4.6 Theil's U-Statistic Technique	10
2.4.7 Enhanced Theil's U-Statistic Technique	10
III. Data & Methodology	
3.1 EIU Data Analysis	12
3.2 Imposed Rules of Data Exclusion	15
3.3 Methodology	16
IV. Results	
4.1 Forecast Errors – Mean Error (ME), Mean Absolute Error (MAE) & Root Mean Squared Error (RMSE)	23
4.1.1 All Variables Forecast Errors – ME	24
4.1.2 Real GDP Growth Forecast Errors – MAE & RMSE	26
4.1.3 Inflation (CPI) Forecast Errors – MAE & RMSE	28
4.1.4 Short-Term Interbank Rate Forecast Errors – MAE & RMSE	30
4.1.5 Current Account Balance Forecast Errors – MAE & RMSE	32
4.1.6 Budget Deficit Forecast Errors – MAE & RMSE	34
4.1.7 Unemployment Forecast Errors – MAE & RMSE	36
4.2 Variable Forecast RMSEs & Global Trends	38
4.2.1 Real GDP Growth – RMSE & Global Trend	38
4.2.2 Inflation (CPI) – RMSE & Global Trend	40
4.2.3 Short-Term Interbank Rate – RMSE & Global Trend	41
4.2.4 Current Account Balance – RMSE & Global Trend	42
4.2.5 Budget Deficit – RMSE & Global Trend	44
4.2.6 Unemployment – RMSE & Global Trend	46
4.3 Enhanced Theil U-Statistic ('Theil U-Statistic')	47
4.3.1 Average Theil U-Statistic	47
4.3.2 Theil U-Statistic Distribution	49

V. Conclusion	54
VI. Bibliography	56
VII. Appendix		
7.1	Appendix One: Raw Data	58
7.1.1	All Variables Raw Data (Excl. Unemployment).....	58
7.1.2	Unemployment Raw Data	81
7.2	Appendix Two: RMSE, MAE, ME & Enhanced Theil U ('Theil U').....	85
7.2.1	All Variables (Excl. Unemployment) – RMSE, MAE, ME & Theil U ...	85
7.2.2	Unemployment – RMSE, MAE, ME & Theil U.....	102
7.3	Appendix Three: F-Tests & t-Tests.....	105
7.3.1	RMSE F-Tests	106
7.3.2	MAE F-Tests	112
7.3.3	Theil U F-Tests	118
7.3.4	Theil U t-Tests.....	124

List of Tables & Figures

Tables

Table 1: All Countries by Income Category (Excl. Unemployment)	13
Table 2: Countries by Income Category - Unemployment	14
Table 3: Specific Exclusions (by Variable)	15
Table 4: Raw EIU Forecast Data (Turkey)	16
Table 5: EIU Forecast Error Data (Turkey)	17
Table 6: Forecast Accuracy Calculations (Turkey).....	19
Table 7: Current-Year (t) Forecasts – Average Mean Error (1996-2013)	24
Table 8: One-Year-Ahead (t+1) Forecasts – Average Mean Error (1996-2013)....	25
Table 9: Real GDP Growth – MAE & RMSE (1998-2013)	26
Table 10: Inflation (CPI) – MAE & RMSE (1998-2013)	28
Table 11: Relative Inflation (CPI) Forecast Errors	29
Table 12: Short-Term Interbank Rate – MAE & RMSE (1998-2013)	30
Table 13: Current Account Balance (%GDP) – MAE & RMSE (1998-2013)	32
Table 14: Budget Deficit – MAE & RMSE (1998-2013)	34
Table 15: Unemployment – MAE & RMSE (1998-2013).....	36
Table 16: Average Theil U (All Variables).....	47
Table 17: Theil U Distribution (All Variables).....	49

Figures

Figure 1: Turkey Real GDP Growth– Forecasts & Actual (1998-2013)	18
Figure 2: All Countries – Real GDP Growth, RMSEs vs. MEs (1997-2012)	20
Figure 3: Real GDP Growth – Forecast RMSEs & Global Trend (1997-2012).....	38
Figure 4: Inflation (CPI) – Forecast RMSEs & Global Trend (1998-2012).....	40
Figure 5: STIBR – Forecast RMSEs & Global Trend (1998- 2012)	41
Figure 6: CA Balance – Forecast RMSEs & Global Trend (2000-2012)	42
Figure 7: Budget Deficit – Forecast RMSEs & Global Trend (1997-2011).....	44
Figure 8: Unemployment – Forecast RMSEs & Global Trend (1998-2012).....	46
Figure 9: Theil U Distribution – Real GDP Growth.....	51
Figure 10: Theil U Distribution – Inflation (CPI).....	51
Figure 11: Theil U Distribution – Short-Term Interbank Rate	52
Figure 12: Theil U Distribution – Current Account Balance (%GDP).....	52
Figure 13: Theil U Distribution – Budget Deficit (%GDP).....	53
Figure 14: Theil U Distribution – Unemployment.....	53

I. Introduction

It is often said that the biggest enemy of market confidence and economic growth is uncertainty. Consequently, since the time there was economic data available there have also been economic forecasts made about the future. As Cairncross points out, economic forecasts provide both “a frame of reference for policy decisions” and “a base against which to judge how [effectively] policies are working out” (1969:798). This paper is concerned with the accuracy of economic forecasts, a pertinent consideration given the importance of forecasts in economic decision-making.

The importance of accurate economic forecasts is beyond doubt. Forecasts are produced and used by a range of economic institutions, governments and investors at an international and national level. Additionally, the reputations of the companies that produce these forecasts are inevitably tied to the accuracy of their predictions. (Diebold & Mariano, 1995:253). This paper will examine the accuracy of economic forecasts produced by the Economist Intelligence Unit (EIU), with the use of data that comprises both forecasts and realized values of economic variables. The data used was collected for a wide range of countries, of differing development levels and across a number of years. Through a thorough statistical analyses of the accuracy of these forecasts, this paper aims to evaluate some initial hypotheses.

The paper will aim to evaluate four major hypotheses, which are as follows.

1. EIU forecasts are more accurate than a No-Change-Forecast (a concept that will be defined and explained in due course).
2. EIU forecasts for higher income countries are more accurate than forecasts for lower income countries.
3. The accuracy of the EIU forecasts decreases as forecast horizon increases.
4. The accuracy of EIU forecasts was relatively lower in the period of the Global Financial Crisis (2008-2009) than in other periods.

II. Literature Review

2.1 Overview of Modern Economic Forecasting

Throughout the history of modern economic forecasting the central debate has been between the merits of relatively complex and relatively simple forecasting techniques. This chapter of the paper will aim to provide a brief overview of the academic literature of modern economic forecasting. The literature review will discuss the history of economic forecasting before examining the sources of forecasting errors and possible solutions. Evaluating the literature is a helpful starting point as it will aid in establishing the foundations of this paper's purpose, hypotheses and the methodology to be used in testing these predictions.

During the 1960s and 1970s it was argued that confidence in forecasting should be growing with more resources allocated to it, greater levels of data accumulation and increasingly sophisticated techniques led to major improvements in forecast accuracy (Burns, 1986). Research during this period appeared to show improvements in the accuracy of forecasts as several econometric techniques were developed (Steckler, 1970:2). During this period, it was argued that the increased use of formal models along with improvements in computing technology had allowed for more complete and accurate economic forecasts (Wallis, 1989:31). These claims are contestable though, with literature emerging in the 1980s and 1990s showing that much simpler trend extrapolation techniques performed better (or no worse) than highly complex econometric models based on hundreds of equations.

The development of these more complex models, often involving highly technical econometric methods, fell under the umbrella of so-called "causal models" which were concerned with identifying the mechanisms affecting economic variables and monitoring these mechanisms in an attempt to produce accurate forecasts (Holden et al., 1990:6). In the 1980s, despite the application of increasingly complex computational technologies, there was still the continuing presence of data lags and discrepancies that were pinpointed as the significant source of forecasting errors. As Wallis mentions, the 1980s also saw the rise of more forecast evaluation with the techniques that were developed, such as the use of Mean Absolute Error (MAE) and Root Mean Squared Error (RMSE), which remain in widespread use to evaluate the accuracy of economic forecasts (1989:43). These techniques for measuring forecast accuracy gave researchers the ability to effectively evaluate forecasts and promised to potentially help isolate the source of inaccuracies.

Throughout the academic literature in the 1980s, the findings showed that complex econometric techniques produced forecasts no more accurate than much simpler techniques using non-causal modelling methods. These findings arose from the increasingly effective application of statistical techniques to evaluate the accuracy of economic forecasts. Where there was enough reliable data regarding an economic variable, the simpler non-causal techniques could be employed, using time-series methods to produce relatively accurate results (Holden et al., 1990:43). The central pillars of these techniques saw the use of Moving Average (MA) models and Autoregressive Moving Average (ARMA) models, which utilized past data regarding economic variables to produce forward-looking forecasts (Granger, 1989:56). These techniques were shown to be as effective at predicting economic variables as the more complex causal models.

One recent area of focus for improving the accuracy of economic forecasts has been more research being conducted into the relationships that exist between economic variables. In 2011, Herve et al. conducted a study of the OECD's new macroeconomic forecasting model, which included previously absent variables such as the explicit modelling of domestic and international assets and liabilities, as well as including the effect of changes in the housing market (2011:590). There is constant development of methods claiming to improve forecasting accuracy, though significant forecast errors are still widespread. Anecdotally, this point could be evidenced by the high degree of economic forecast errors arising from the Global Financial Crisis, which was generally not foreseen. The following sub-section will look in more detail at the possible causes of forecasting errors and how they can be mitigated.

2.2 Errors in Economic Forecasting

There are numerous issues that arise when conducting economic forecasts which are detrimental to forecast accuracy. When the time-period of forecasts reaches beyond a few periods or years, these issues can become compounded and lead to a divergence of forecasted values from reality. Granger & Jeon attempt to promote realistic expectations about the accuracy of long-term forecasts, saying that when “one forecasts as far as thirty-three years ahead, it should not be expected that forecasts will be precise” (2007:539). They go on to argue that as the time-period of a forecast increases the forecast will become increasingly inaccurate and unusable (Ibid: 540). This suggests that to avoid large forecasting errors, forecasts should only be constructed for a few periods ahead.

Another issue that has been raised in the literature is the potential existence of bias in the data collected by Institutions. Zarnowitz suggests that the accuracy of forecasts is negatively impacted because such forecasts are produced using information from institutions that are subject to external or internal pressures. These institutions may incorporate their own policy or political agenda rather than wholly focussing on actual economic expectations (1985:293). In a thorough statistical evaluation, using a large panel dataset of economic variables, Zarnowitz was forced to reject the null hypothesis of unbiasedness (the assumption that the measured data value is equal to the true value) for all variables; namely GNP, inflation unemployment, private and public consumption (Ibid: 308). Therefore, the lack of accuracy in forecasts may be caused by systemic inaccuracies of raw data produced by a country’s own institutions, which yield inaccurate results when incorporated into forecasting models.

Some techniques have attempted to improve the accuracy of economic forecasts by bridging the common quarter-to-quarter gap in data availability. The presence of data lags creates difficulties in producing reliable and accurate economic forecasts. Baffigi, Golinelli & Parigi attempted to show how more effective forecasts for the Euro area’s GDP could be produced if the accuracy of individual GDP components could be improved (2004:447). Generally, the consequence of removing or solving issues such as data lags and discrepancies can increase forecast accuracy, a desirable objective for the producers and users of forecasts alike.

The ability to produce relatively accurate forecasts is valuable in an industry where reputation is important. Often though, other influences intrude on the forecasting process with one of these being the effect of rational bias. Laster, Bennett & Geoum argue that rational bias can lead forecasters to compromise the accuracy of their economic forecasts in order to gain publicity for their forecasting firm or agency (1999:293). This theory is based on two assumptions, that forecasters have perfect knowledge of the true probability distribution of forecasts and that the forecaster with the most accurate forecast will gain publicity and therefore generate value for their firm (Ibid:313). The idea that a forecaster might alter their economic forecast, even within a high confidence interval, suggests that the likelihood of forecasting errors is higher as a result.

When constructing structural or causal models, the largest challenge for forecasters is to source reliable and timely economic variables to use in their forecasting models. Creating effective time-series forecasts requires enough data-points, as well as data spaced over certain time periods (e.g quarters). Generally, forecasters will source their data from the economic institutions of the country such as the Central Bank or from international economic institutions with a presence in the country such as the International Monetary Fund (IMF) or the World Bank. A consequence of this is that producing forecasts for lower income countries can be fraught with more difficulty than forecasting for higher income countries, as there may be significantly less information available due to weak and under-resourced institutions or inherent difficulties in data collection. In a 2007 study on economic forecast accuracy, Durham found this to be true, with higher income countries displaying smaller errors in their economic forecasts relative to economic forecast errors for lower income countries (2007:65).

2.3 Assessing Forecast Accuracy

There are some clear reasons why we would want to measure the accuracy of economic forecasts. Firstly, if it is found that forecasting errors exist it can be an opportunity to figure out why these errors occurred and use this information to improve the forecasting models and thereby the accuracy of subsequent economic forecasts (Barot, 2004:250). Wallis highlights the second reason why we want to measure the accuracy of economic forecasts when he points out that it enables us to compare the accuracy of different forecasters against one another, with this information being important for the reputation of forecast producers (1989:43). So, the literature considers forecast accuracy to be inseparably tied to the existence of economic forecasting itself, making the measurement of this accuracy important.

There is not complete agreement in the academic literature about the best way to measure forecast accuracy and alternative methods have been proposed. Traditionally, the method of choice when measuring forecast accuracy is to measure the error occurring using the value of point forecasts, with the error size defined as the difference between the forecast and realized variable value. In contrast, Granger & Pesaran propose that measuring the accuracy of forecasts presented as predictive distribution functions would produce more accurate results than using point forecasts (2000:537). The authors argue that point forecasts are too simplistic and that using predictive distribution function forecasts allows for a clearer comparison of forecast accuracy. Forecasts produced with predictive distribution functions are used in meteorology, as well as areas of finance, and allow for alternate measures of forecast accuracy (Ibid:557). The major disadvantage to this approach is that it requires relatively large datasets, with forecasts produced using more laborious statistical techniques. Currently, the majority of economic forecast data consists of point forecasts and it follows that most econometric research focusses on statistical measures of point forecast accuracy.

Recent literature has focussed on applying different measures of forecast accuracy using point forecast values. Diebold suggests that one can create accuracy rankings from a group of forecasts, by comparing the 'expected loss' which is calculated from the error of the point value forecasts (2015:338). Further, Diebold & Shin have investigated the possibility of evaluating the accuracy of competing point forecasts using the relative 'stochastic loss distance' of these point forecasts, derived from the expected loss of a forecast error (2015:37). These proposed methods have not been tested extensively elsewhere in the literature and are still being developed.

2.4 Methods of Forecast Evaluation

There are a number of statistical techniques and methods that can be applied to measure the accuracy of economic forecasts. This sub-section will briefly detail those methods that appear most often in the academic literature.

2.4.1. Mean Squared Error (MSE)

The Mean Squared Error (MSE) is an established tool for assessing closeness to a target value and it is commonly used technique in forecast evaluation, giving equal weighting to under and over predictions (Holst & Thyregod, 1999:322). It should be noted that with this measure the error is squared, meaning that a bigger penalty is given to large errors.

$$MSE = \sum_{i=1}^n \frac{(F_i - A_i)^2}{n}$$

where

F: Forecast value of variable

A: Actual value of variable

n: Number of observations

i: Time period

2.4.2. Root Mean Squared Error (RMSE)

The Root Mean Squared Error (RMSE) is a variation of the MSE method, the positive value of the square root of the Mean Squared Error (Black, Hashimzade & Myles, 2017), used to preserve units at the same level and will be used as a method in this paper.

$$RMSE = \sqrt{\sum_{i=1}^n \frac{(F_i - A_i)^2}{n}}$$

where

F: Forecast value of variable

A: Actual value of variable

n: Number of observations

i: Time period

2.4.3. Mean Absolute Error (MAE)

Mean Absolute Error (MAE) is less popular than MSE as a technique, but is still widely used and doesn't require a square root to preserve units at the same level (Chai & Draxler, 2014:1247).

$$MAE = \sum_{i=1}^n \frac{|F_i - A_i|}{n}$$

where

F: Forecast value of variable

A: Actual value of variable

n: Number of observations

i: Time period

This paper will also use the MAE technique as a method to evaluate the accuracy of economic forecasts.

2.4.4. RMSE vs. MAE

There is an ongoing argument within the academic literature about whether it is better to use RMSE or MAE as a measure of accuracy. Willmott & Matsuura argue that the RMSE is an inappropriate measure of average error, with MAE representing a more natural measure (2005:79). This point is disputed by Chai & Draxler who argue that when the errors are expected to be normally distributed the RMSE is more appropriate to evaluate model performance (2014:1249). In a specifically economic context, Diebold argues that the accuracy of forecasts is best measured by the MAE which performs better when working with the idea of a loss function (2015:341). If the loss function is linear, then MAE is a better measure of accuracy. On the other hand, if the loss function is quadratic, with larger errors being disproportionately represented, then RMSE is a better measure of accuracy. As the relative merits of each method are disputed, this paper will use both methods and attempt to present the results of these two techniques in a concise and effective way.

2.4.5. Mean Error (ME)

Generally, the Mean Error (ME) measure (Prestwich, Steven et al., 2014:6785) has been overlooked in the literature in favour of more ‘complex’ measures of forecast accuracy, such as the Root Mean Squared Error (RMSE) and Mean Absolute Error (MAE). The general formula for the measure is:

$$ME = \sum_{i=1}^n \frac{F_i - A_i}{n}$$

When measuring forecast accuracy, the usefulness of the ME measure is that it can highlight if particular variables are being over-estimated or under-estimated over the period of interest. The ME measure, when combined when combined with statistical ‘t-tests’, quantifies any significant ‘bias’ of the EIU forecasts over the period 1996-2013. As such, this measure is used as a method for the paper’s analysis of the EIU forecast data.

2.4.6. Theil's U-Statistic Technique

A predictive R^2 statistic is a measure of how well a forecast model 'fits' the data. The literature recognises it as an effective measure of a forecast's accuracy and a predictive R^2 statistic can be constructed to measure forecast accuracy relative to a designated benchmark (Diebold, 2015:344). The Theil U-Statistic is a form of predictive R^2 , constructed by calculating the ratio of the RMSEs in the forecast with the RMSEs of a so-called 'No-Change-Forecast' which serves the purpose of being our benchmark (Barot, 2004:9). In its traditional form, the generalized Theil U-Statistic is calculated as follows (Theil, 1966):

$$U = \frac{\left(\sqrt{\sum_{i=1}^n \frac{(F - A_i)^2}{n}} \right)}{\left(\sqrt{\sum_{i=1}^n \frac{(A_i)^2}{n}} \right)}$$

where

F: Forecast value of variable

A: Actual value of variable

n: Number of observations

2.4.7. Enhanced Theil's U-Statistic Technique

A choice has been made in this paper to apply an Enhanced Theil U calculation using a 'naïve' forecast in calculating the denominator, therefore replacing the 'No-Change-Forecast'. The 'naïve' forecast assumes that the value in the forecasted period will be the same as the actual value from the One-Year-After (t-1) period. In this sense, it is naïve because it assumes that the value of the variable will not change from the previous period for Current-Year (t) forecasts or two periods prior for One-Year-Ahead (t+1) forecasts. The effect of this is to hold the Current-Year (t) and One-Year-Ahead (t+1) forecasts to a standard where an Enhanced Theil U-Statistic of $U < 1$ indicates that the produced forecast is better than a 'naïve' forecast, a $U = 1$ indicates the produced forecast is no better and $U > 1$ indicates that the produced forecast is worse than a 'naïve' forecast.

Enhanced Theil's U-Statistic for Current-Year (t) forecasts:

$$U = \frac{\left(\sqrt{\sum_{i=1}^n \frac{(F_i - A_i)^2}{n}} \right)}{\left(\sqrt{\sum_{i=1}^n \frac{(F_i - A_{i-1})^2}{n}} \right)}$$

where

F: Forecast value of variable

A: Actual value of variable

n: Number of observations

i: Time period

Modified Theil's U-Statistic for One-Year-Ahead (t+1) forecasts:

$$U = \frac{\left(\sqrt{\sum_{i=1}^n \frac{(F_{i+1} - A_{i+1})^2}{n}} \right)}{\left(\sqrt{\sum_{i=1}^n \frac{(F_{i+1} - A_{i-1})^2}{n}} \right)}$$

where

F: Forecast value of variable

A: Actual value of variable

n: Number of observations

i: Time period

It is relatively easy to interpret the U-statistic coefficients and these can be used to rank the accuracy of a number of forecasts. The Enhanced Theil U-Statistic applies a stricter test of whether the EIU forecasts are more accurate than 'naïve' forecasts. As such, this paper will use the Enhanced Theil U-statistic to measure the performance of country-level economic forecasts against a benchmark 'naïve' forecast, as well as using the findings to create rankings, which will allow a comparison of forecast performance between different countries.

III. Data & Methodology

3.1 EIU Data Analysis

The data used in this paper is produced by the Economist Intelligence Unit (EIU) which provides country forecasts for a number of different variables. The original data consisted of forecasts of economic variables for 181 countries, covering the period 1994-2014. In the interests of properly evaluating the accuracy of economic forecasts, this study chose to look at the period 1996-2013 and to exclude from analysis countries which had less than nine data points for this 18-year period. Other reasons that countries were excluded from analysis was the complete unavailability of forecasts for some variables (e.g Short Term Interbank Rate). Examples of countries that were excluded are Chad, Burkina Faso, Laos and North Korea.

After eliminating countries with missing data, the dataset comprised 103 countries with forecasts for Real GDP Growth, Inflation (CPI), Short Term Interbank Rate, Current Account Balance (as % of GDP) and Budget Deficit (as % of GDP) for the time-period 1996-2013. The data constraints were felt more keenly with Unemployment forecasts, with the result that only 68 countries were examined for the same time-period 1996-2013. These countries are separated into four income categories, as defined by the World Bank, with countries denoted as High Income (HI), Upper Middle Income (UMI), Lower Middle Income (LMI) or Low Income (LI). For the five forecasted variables examined for 103 countries there were 39 HI countries, 20 UMI countries, 27 LMI countries and 17 LI countries. For Unemployment forecasts, there were 31 HI countries, 15 UMI countries, 19 LMI countries and, unfortunately, 3 LI countries. The countries used in the analyses are shown overleaf in Table 1 and Table 2. It should be noted that the nature of the EIU's forecasting data means that a disproportionate number of countries excluded from the analyses were lower income countries.

Table 1: All Countries by Income Category (Excl. Unemployment)

HI	UMI	LMI	LI
Australia	Argentina	Angola	Bangladesh
Austria	Brazil	Azerbaijan	Cote d'Ivoire
Bahrain	Chile	Bolivia	Ethiopia
Belgium	Costa Rica	Cameroon	Ghana
Canada	Croatia	China	Kenya
Cyprus	Cuba	Dominican Rep.	Malawi
Czech Republic	Gabon	Ecuador	Mozambique
Denmark	Kazakhstan	Egypt	Myanmar
Equatorial Guinea	Latvia	El Salvador	Nigeria
Estonia	Lebanon	Guatemala	Pakistan
Finland	Lithuania	Honduras	Papua New Guinea
France	Malaysia	Indonesia	Senegal
Germany	Mauritius	Jordan	Tanzania
Greece	Mexico	Macedonia	Uganda
Hong Kong	Poland	Moldova	Vietnam
Hungary	Romania	Morocco	Yemen
Ireland	Russia	Namibia	Zambia
Israel	South Africa	Nicaragua	
Italy	Turkey	Paraguay	
Japan	Uruguay	Peru	
Kuwait		Philippines	
Netherlands		Sri Lanka	
New Zealand		Sudan	
Norway		Syria	
Portugal		Thailand	
Qatar		Tunisia	
Saudi Arabia		Ukraine	
Singapore			
Slovakia			
Slovenia			
South Korea			
Spain			
Sweden			
Switzerland			
Taiwan			
Trinidad and Tobago			
UK			
United Arab Emirates			
USA			
39 Countries	20 Countries	27 Countries	17 Countries

Table 2: Countries by Income Category – Unemployment

HI	UMI	LMI	LI
Australia	Argentina	Azerbaijan	Bangladesh
Austria	Chile	China	Pakistan
Belgium	Costa Rica	Dominican Rep.	Uganda
Canada	Croatia	Ecuador	
Cyprus	Cuba	Egypt	
Czech Republic	Kazakhstan	El Salvador	
Finland	Latvia	Honduras	
France	Lithuania	India	
Germany	Malaysia	Indonesia	
Greece	Mauritius	Morocco	
Hong Kong	Poland	Nicaragua	
Hungary	Romania	Paraguay	
Ireland	Russia	Peru	
Israel	Turkey	Philippines	
Italy	Uruguay	Sri Lanka	
Japan		Sudan	
Netherlands		Thailand	
New Zealand		Tunisia	
Norway		Ukraine	
Portugal			
Singapore			
Slovakia			
Slovenia			
South Korea			
Spain			
Sweden			
Switzerland			
Taiwan			
Trinidad and Tobago			
UK			
USA			
31 Countries	15 Countries	19 Countries	3 Countries

3.2 Imposed Rules of Data Exclusion

To be able to perform a competent and effective analysis of the EIU data it is necessary to exclude certain parts of the data from analysis. The main reasons for doing this are to focus on areas where there are enough data points to produce useful results and to exclude outliers that may skew the findings of the paper.

The first part of this process was deciding to focus on six variables of interest: Real GDP Growth (%), Budget Deficit (% of GDP), Inflation (CPI) measure, Current Account Balance (% of GDP), Short-Term Interbank Rate (%) and Unemployment Rate (%). It then seemed appropriate to restrict the data analysis to countries with at least 50% of the data points populated for the period of interest (1996-2013). For the first five variables, there were 103 countries meeting the threshold of at least eight data points for each variable across the 1996-2013 period. The exception was for Unemployment Rate (%) for which only 68 countries met the defined threshold.

Beyond the general exclusions, it was necessary to exclude data for some countries in particular variables. This was done by applying exclusion tests for each variable, designed to exclude countries with multiple forecast errors greater than a set point value. The purpose of this was to remove any outliers present for particular variables and the precise exclusions applied to each variable are shown in Table 3 below. These exclusions were limited to a handful of countries and in the paper's data analysis (Chapter 4), every effort is made to show the total number of countries used in producing the forecast accuracy results, as well as number of countries from each income category.

Table 3: Specific Exclusions (by Variable)

Variable	Exclusion Test	Total Countries	Countries Excluded	Example of Excluded Country
Real GDP Growth (%)	Multiple forecast error > 10(%)	103	0	-
Inflation (CPI) (%)	Multiple forecast error > 30(%)	100	3	Ethiopia (LI)
Short-Term Interbank Rate (%)	Multiple forecast error > 20(%)	100	3	Argentina (LMI)
Current Account Bal. (%GDP)	Multiple forecast error >20(%)	96	7	Qatar (HI)
Budget Deficit (%GDP)	Multiple forecast error >20(%)	98	5	Saudi Arabia (HI)
Unemployment Rate (%)	Multiple forecast error > 10(%)	68	0	-

3.3 Methodology

The EIU forecast data contained information for each of the six variables at four different ‘forecast horizons’ for each time-period. As an example, the format of the raw data is shown below in Table 4, with the country level forecasts for Turkey. Each of the forecasted variables contain data for Two-Year-After (t-2) values, One-Year-After (t-1) values, Current-Year (t) forecasts and One-Year-Ahead (t+1) forecasts. The Two-Year-After (t-2) values are not really forecasts, as they are measurements of the variable taken two annual periods after the year for which they are recorded. The level of forecast error for this horizon is generally regarded as being zero, and so these ‘forecasts’ should be considered as base reality. Subsequently, the Two-Year-Ahead (t-2) values are disregarded in analysing forecast accuracy.

Table 4: Raw EIU Forecast Data (Turkey)

Country	Category	Variable	Time	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Turkey	UM	Budget deficit (% of GDP)	t-2	-9.4	-7.7	-7.2	-11	-14.6	-16.1	-14.2	-11.2	-7	-2	-0.8	-1.6	-1.8					
Turkey	UM	Budget deficit (% of GDP)	t-1	-9.5	-9.7	-6.5	-12.3	-10.3	-21.4	-12.9	-12.1	-7.6	-3.2	-2	-2.5	-1.5	-6	-3.3	-1.7	-2	
Turkey	UM	Budget deficit (% of GDP)	t		-7.7	-9.2	-8	-12.8	-4.8	-20.8	-11.6	-9.9	-6.8	-3.6	-2.4	-2.9	-2.5	-5.8	-3.1	-2.2	-2.5
Turkey	UM	Budget deficit (% of GDP)	t+1			-6.7	-8.3	-6.5	-6	-5.5	-14	-9.2	-11.7	-6.8	-3.6	-2.2	-2.6	-2.2	-4.4	-2.6	-2.3
Turkey	UM	Cons Price Infl. (av)	t-2	80.4	85.7	84.6	65.1	54.9	54.4	45	25.3	8.6	8.2	10.5	8.7	10.4					
Turkey	UM	Cons Price Infl. (av)	t-1	80.4	85.9	84.6	65	54.9	54.4	45	25.4	10.6	8.2	9.6	8.8	10.8	6.3	8.6	6.5	8.9	
Turkey	UM	Cons Price Infl. (av)	t		77.4	98.3	85	49.6	29.1	51.2	28.7	17	9.2	8.8	8.6	8.1	8.6	7.8	7	9.2	6.4
Turkey	UM	Cons Price Infl. (av)	t+1			75	90.4	69.8	22.4	20.6	43	24.1	33.2	11	6.3	5.2	5	8.6	7.1	5.6	7
Turkey	UM	Curr Acc Bal (% of GDP)	t-2			0.9	-0.7	-4.9	2.3	-0.8	-3.3	-5.1	-6.4	-8.1	-5.8	-5.7					
Turkey	UM	Curr Acc Bal (% of GDP)	t-1				-0.8	-4.5	2.9	-0.3	-3.3	-4.5	-6.4	-8.3	-7.3	-6	-1.8	-5.9	-10.3	-6.2	
Turkey	UM	Curr Acc Bal (% of GDP)	t					-2	-3.1	1.1	-1.6	-3.9	-4	-4.5	-6.4	-7.1	-3.5	-2.7	-5.8	-8.8	-6.1
Turkey	UM	Curr Acc Bal (% of GDP)	t+1						-2.8	-3.2	-2.6	-1.9	-1.5	-2.8	-4.5	-5.3	-7	-3.5	-3.6	-5.7	-7.6
Turkey	UM	Real GDP	t-2	7.1	7.6	2.9	-5.1	7.4	-7.5	7.8	5.8	8.9	7.4	6.1	4.6	0.9					
Turkey	UM	Real GDP	t-1	7.1	6	2.8	-4.8	6	-8.2	6.2	5	7.8	5.8	5.2	3.9	2.3	-6	8	7.8	2.8	
Turkey	UM	Real GDP	t		5	4.9	0.4	4	3.5	2	3.6	2	5.3	3.8	4.5	3.8	0.4	3.2	5.3	2.5	3.9
Turkey	UM	Real GDP	t+1			4.2	4.5	5.4	4.2	4	4.4	4.2	1.3	3.9	5.3	5.5	5.2	0.9	4.2	5.2	4
Turkey	UM	Short-term Interbank rate	t-2				78.4	56.7	92	49.5	36.2	21.6	14.7	15.6	17.2	16					
Turkey	UM	Short-term Interbank rate	t-1					38.4	90	50.5	35.5	21.5	16	15.5	17.5	15.9	9.5	6.5	3	5	
Turkey	UM	Short-term Interbank rate	t						35.1	70	43	30	18.5	16	15.5	13	13.8	9.3	6.8	5.6	5.7
Turkey	UM	Short-term Interbank rate	t+1							26.6	60	42	50	22	15.8	11	10.5	13.5	9.5	7.5	6
Turkey	UM	Unemployment rate (av)	t-2				7.3	6.6	8.5	10.7	10.5	10.3	10.2	9.9	9.9	11					
Turkey	UM	Unemployment rate (av)	t-1					8.3	9	10.8	10.7	10.3	10	10.2	9.7	10.2	14.2	12.2	10.1	9.1	
Turkey	UM	Unemployment rate (av)	t						9	9.9	11.4	12.4	10.4	10.4	10.6	8.7	10.7	13.8	12.2	9.9	9
Turkey	UM	Unemployment rate (av)	t+1							9.5	12.2	12.8	12.7	11.3	9.9	10.4	8.6	11.3	13.8	12.2	10.5

Due to the nature of Two-Year-After (t-2) values, it is only helpful to look at One-Year-After (t-1) values, Current-Year (t) and One-Year-Ahead (t+1) forecasts. One-Year-After (t-1) values are used as the actual value, A_{t-1} . Forecast errors for Current-Year (t) forecasts are calculated as the difference between F_t and A_{t-1} ; and forecast errors for One-Year-Ahead (t+1) forecasts are calculated as the difference between F_{t+1} and A_{t-1} . Generalizing this process allows forecast errors to be produced for each country, variable and forecast horizon in the 1996-2013 period. This transformation of the raw data results in the output shown in Table 5, which again uses Turkey.

Table 5: EIU Forecast Error Data (Turkey)

Country	Category	Variable	Time	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Turkey	UMI	Budget deficit (% of GDP)	t		2	-2.7	4.3	-2.5	16.6	-7.9	0.5	-2.3	-3.6	-1.6	0.1	-1.4	3.5	-2.5	-1.4	-0.2	
Turkey	UMI	Budget deficit (% of GDP)	t+1			-0.2	4	3.8	15.4	7.4	-1.9	-1.6	-8.5	-4.8	-1.1	-0.7	3.4	1.1	-2.7	-0.6	
Turkey	UMI	Budget deficit (% of GDP)	t-1	-0.1	-2	0.7	-1.3	4.3	-5.3	1.3	-0.9	-0.6	-1.2	-1.2	-0.9	0.3					
Turkey	UMI	Cons Price Infl. (av)	t		-8.5	13.7	20	-5.3	-25.3	6.2	3.3	6.4	1	-0.8	-0.2	-2.7	2.3	-0.8	0.5	0.3	
Turkey	UMI	Cons Price Infl. (av)	t+1			-9.6	25.4	14.9	-32	-24.4	17.6	13.5	25	1.4	-2.5	-5.6	-1.3	0	0.6	-3.3	
Turkey	UMI	Cons Price Infl. (av)	t-1	0	0.2	0	-0.1	0	0	0	0.1	2	0	-0.9	0.1	0.4					
Turkey	UMI	Curr Acc Bal (% of GDP)	t					2.5	-6	1.4	1.7	0.6	2.4	3.8	0.9	-1.1	-1.7	3.2	4.5	-2.6	
Turkey	UMI	Curr Acc Bal (% of GDP)	t+1					-5.7	-2.9	0.7	2.6	4.9	5.5	2.8	0.7	-5.2	2.4	6.7	0.5		
Turkey	UMI	Curr Acc Bal (% of GDP)	t-1				-0.1	0.4	0.6	0.5	0	0.6	0	-0.2	-1.5	-0.3					
Turkey	UMI	Real GDP	t		-1	2.1	5.2	-2	11.7	-4.2	-1.4	-5.8	-0.5	-1.4	0.6	1.5	6.4	-4.8	-2.5	-0.3	
Turkey	UMI	Real GDP	t+1			1.4	9.3	-0.6	12.4	-2.2	-0.6	-3.6	-4.5	-1.3	1.4	3.2	11.2	-7.1	-3.6	2.4	
Turkey	UMI	Real GDP	t-1	0	-1.6	-0.1	0.3	-1.4	-0.7	-1.6	-0.8	-1.1	-1.6	-0.9	-0.7	1.4					
Turkey	UMI	Short-term Interbank rate	t						-54.9	19.5	7.5	8.5	2.5	0.5	-2	-2.9	4.3	2.8	3.8	0.6	
Turkey	UMI	Short-term Interbank rate	t+1						-23.9	24.5	20.5	34	6.5	-1.7	-4.9	1	7	6.5	2.5		
Turkey	UMI	Short-term Interbank rate	t-1					-18.3	-2	1	-0.7	-0.1	1.3	-0.1	0.3	-0.1					
Turkey	UMI	Unemployment rate (av)	t							-1.3	1.5	2.5	2.7	1.1	0.2	0.2	-5.6	-0.9	3.7	3.1	
Turkey	UMI	Unemployment rate (av)	t+1					0	-0.9	0.7	2.1	0.4	0.2	0.9	-1.5	-3.5	1.6	2.1	0.8		
Turkey	UMI	Unemployment rate (av)	t-1					1.7	0.5	0.1	0.2	0	-0.2	0.3	-0.2	-0.8					

Through the technique just discussed, the raw data is used to calculate the forecast error for each year for the three forecast horizons we are concerned with. For example, calculating to the forecast error for the Current-Year (t) forecast for Budget Deficit (as % of GDP) in the year 2000. The following formula is applied:

$$E_i = F_i - A_{i-1}$$

where

E: Forecast error

F: Forecast value

A: Actual value

i: Time period (e.g Current-Year (t))

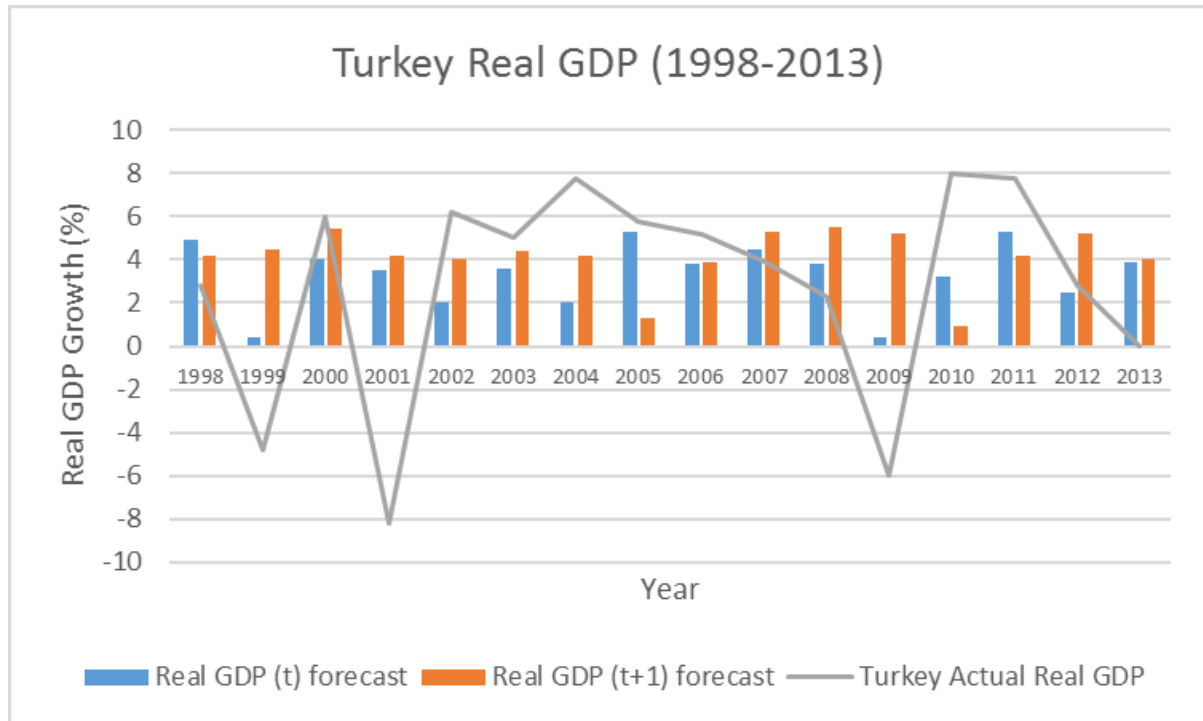
Applying this formula, using the two values circled in Table 4 above, yields the error value circled in Table 2:

$$-2.5 = -12.8 - -10.3$$

Table 5 above displays the forecast errors for Turkey for the six variables this paper is concerned with examining, covering the period 1996-2013 and the One-Year-After (t-1), Current-year (t) and One-Year-Ahead (t+1) forecast horizons. A cursory glance over the forecast errors shows large errors occurring for Inflation and the Short Term Interbank Rate in the One-Year-Ahead (t+1) forecast horizon. In Table 6, it can be seen how these errors pass through to the calculation of accuracy measures such as the Mean Absolute Error (MAE) and Root Mean Squared Error (RMSE).

It is useful to show visually how the different measures of forecast accuracy interact. This will highlight the differences between measures and help to explain how the results of this paper displays forecast accuracy.

Figure 1: Turkey Real GDP Growth, Forecasts and Actual (1998-2013)



The results shown in Figure 1 are created with the data shown in Table 2 above, graphically showing F_t , F_{t+1} and A_{t-1} . Applying the error formula, $E_i = F_i - A_{i-1}$, the difference between the forecast and actual value is the Real GDP Growth forecast error. Explaining this visually, it can be seen in Figure 1 above that the actual value of Real GDP Growth for the period 2002-2006 is consistently higher than both the Current-Year (t) and One-Year-Ahead (t+1) forecasts. This suggests that economic forecasts from 2002-2006 underestimate Turkey’s Real GDP Growth, which can be confirmed by examining the data for this period contained in Table 2. Similarly, Figure 1 shows that Turkey’s Real GDP Growth (%) forecasts overestimated growth in 2009 (during the Global Financial Crisis), a finding which can again be confirmed by an examination of the forecast error data in Table 2.

Table 6: Forecast Accuracy Calculations (Turkey)

Country	Category	Variable	Time	Obs.	St Dev	Sum(^2)	MAE	ME	Forecast RMSE	Naïve RMSE	Theils U
Turkey	UMI	Budget deficit (% of GDP)	t	16	5.28	417.53	3.32	0.06	5.11	4.45	1.15
Turkey	UMI	Budget deficit (% of GDP)	t+1	15	5.57	445.98	3.81	0.87	5.45	5.04	1.08
Turkey	UMI	Cons Price Infl. (av)	t	16	9.75	1433.65	6.08	0.63	9.47	8.87	1.07
Turkey	UMI	Cons Price Infl. (av)	t+1	15	16.31	3748.21	11.81	1.31	15.81	16.09	0.98
Turkey	UMI	Curr Acc Bal (% of GDP)	t	13	2.93	109.82	2.49	0.74	2.91	3.61	0.80
Turkey	UMI	Curr Acc Bal (% of GDP)	t+1	12	3.98	188.68	3.38	1.08	3.97	4.28	0.93
Turkey	UMI	Real GDP	t	16	4.48	301.74	3.21	0.23	4.34	7.51	0.58
Turkey	UMI	Real GDP	t+1	15	5.78	489.44	4.32	1.19	5.71	6.84	0.84
Turkey	UMI	Short-term Interbank rate	t	12	18.03	3582.80	9.15	-0.82	17.28	19.89	0.87
Turkey	UMI	Short-term Interbank rate	t+1	11	15.63	2915.36	12.09	6.55	16.28	20.39	0.80
Turkey	UMI	Unemployment rate (av)	t	12	1.60	28.83	0.24	0.24	1.55	4.31	0.36
Turkey	UMI	Unemployment rate (av)	t+1	11	2.64	74.24	0.65	0.65	2.60	5.35	0.49

Table 6, shown above, displays the calculations produced from an analysis of the forecast error data for Turkey (as previously shown in Table 2). Using the forecast error data from Table 2, the forecast accuracy calculations shown in Table 3 above present the number of observations (Obs.), the standard deviation (St Dev) and the sum of squares (Sum (^2)) for each variable in the respective forecast horizons. The Mean Average Error (MAE) and Mean Error (ME) are also produced from the forecast error data in Table 2, using the following formulas:

Current-Year (t) Forecast MAE:

$$MAE = \sum_{i=1}^n \frac{|F_i - A_{i-1}|}{n}$$

One-Year-Ahead (t+1) Forecast MAE:

$$MAE = \sum_{i=1}^n \frac{|F_{i+1} - A_{i-1}|}{n}$$

Current-Year (t) Forecast ME:

$$ME = \sum_{i=1}^n \frac{F_i - A_{i-1}}{n}$$

One-Year-Ahead (t+1) Forecast ME:

$$ME = \sum_{i=1}^n \frac{F_{i+1} - A_{i-1}}{n}$$

where

E: Forecast error

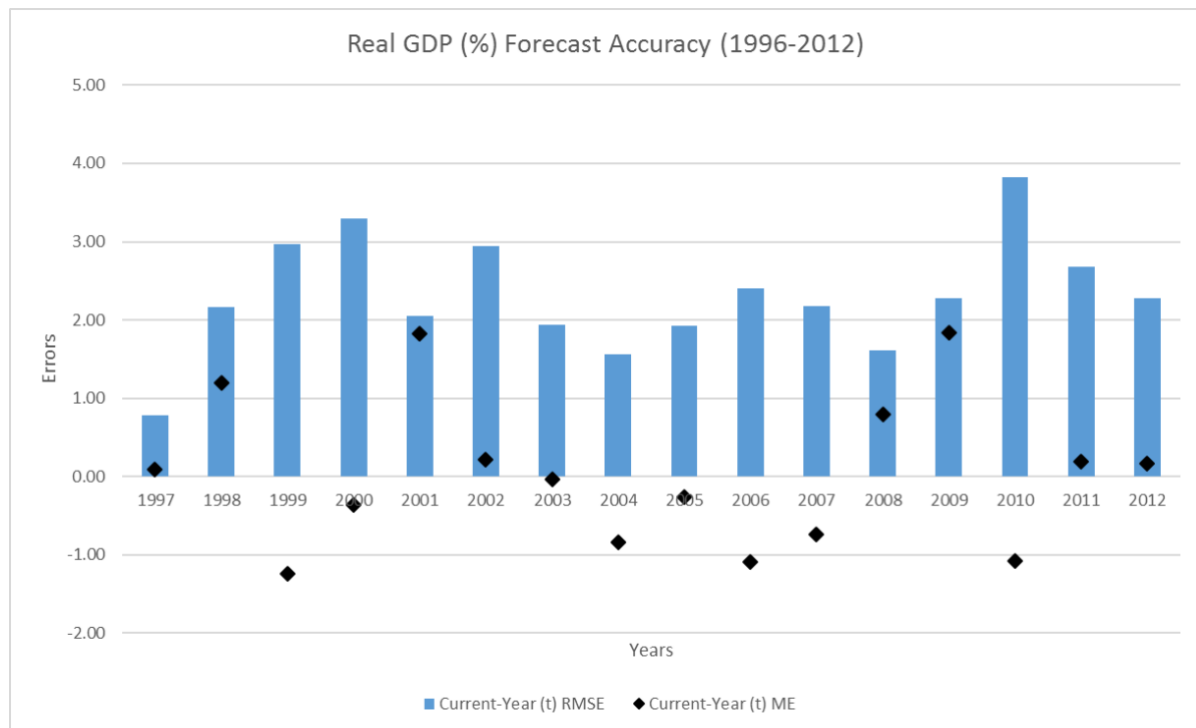
F: Forecast value

A: Actual value

i: Time period

Table 6 also contains a calculation for the Root Mean Squared Error (RMSE) of Turkey's forecasts. As a variation of the Mean Squared Error (MSE) measure, it should be noted that with the RMSE measure the error is squared, meaning that a bigger penalty is given to large errors. This can be presented visually, as below with Figure 2, using the Current-Year (t) Real GDP Growth (%) forecasts for all countries:

Figure 2: All Countries - Real GDP Growth (%) RMSEs vs. MEs



As discussed in Chapter 2 of this paper, the Enhanced Theil U-Statistic for Current-Year (t) Forecasts is calculated using the RMSE of the Current-Year (t) forecast errors as the numerator and the RMSE of the naïve forecast for the Current-Year (t) forecast period. The calculations for the respective RMSEs can be seen in Table 3 above and are produced using the forecast error data from Table 2. The Enhanced Theil U-Statistic is then calculated using the equation shown below:

$$U = \frac{\left(\sqrt{\sum_{i=1}^n \frac{(F_i - A_i)^2}{n}} \right)}{\left(\sqrt{\sum_{i=1}^n \frac{(F_i - A_{i-1})^2}{n}} \right)}$$

For example, applying the data from Table 6 it is possible to calculate the Enhanced Theil U-Statistic for Turkey's Real GDP Growth (%) Current-Year (t) forecasts:

$$U = \frac{4.34}{7.51} = 0.58$$

This U-Statistic value is less than 1, which confirms that the Current-Year (t) forecasts for Turkey's Real GDP Growth (%) are more accurate than naïve forecasts for the period 1996-2013.

Similarly, the Enhanced Theil U-Statistic for One-Year-Ahead (t+1) Forecasts is calculated using the RMSE of the One-Year-Ahead (t+1) forecast errors as the numerator and the RMSE of the naïve forecast for the One-Year-Ahead (t+1) forecast period as denominator. The formula is:

$$U = \frac{\left(\sqrt{\sum_{i=1}^n \frac{(F_{i+1} - A_{i+1})^2}{n}} \right)}{\left(\sqrt{\sum_{i=1}^n \frac{(F_{i+1} - A_{i-1})^2}{n}} \right)}$$

So, calculating the Enhanced Theil U-Statistic for Turkey's Real GDP Growth (%) One-Year-Ahead (t+1) forecasts:

$$U = \frac{5.71}{6.84} = 0.84$$

As with the Current-Year (t) result, the U-Statistic value is less than 1 and the One-Year-Ahead (t+1) forecasts for Turkey's Real GDP Growth (%) are more accurate than naïve forecasts for the period 1996-2013.

IV. Results

4.1 Forecast Errors – Mean Error (ME), Mean Absolute Error (MAE) & Root Mean Squared Error (RMSE)

This set of results will attempt to summarize the accuracy of the EIU forecasts in the period 1996-2013, for all 103 countries with sufficient data on forecasts of Real GDP Growth, Inflation (CPI measure), Short Term Interbank Rate, Current Account Balance (% GDP) and Budget Deficit (% GDP). In addition, the accuracy of EIU forecasts of Unemployment is examined across the same period for the 68 countries with sufficient data.

To simplify this general analysis of the forecast accuracy for all six economic variables, the countries are split into four national income categories: High Income (HI), Upper Middle Income (UMI), Lower Middle Income (LMI) and Low Income (LI). The results are separated by the forecast horizons, thereby allowing comparisons of accuracy. The two forecast horizons examined within this analysis are the Current-Year (t) forecasts and One-Year-Ahead (t+1) forecasts.

The general measures of accuracy presented in this section of the results are Mean Absolute Error (MAE), Mean Error (ME) and the Root Mean Squared Error (RMSE). Taken together, these measures offer a holistic illustration of the absolute and relative accuracy of EIU forecasts for the six economic variables. Additionally, the Enhanced Theil U-Statistic is calculated to provide a comparison of EIU forecasts with naïve forecasts.

4.1.1. All Variables Forecast Errors – ME

Table 7: Current-Year (t) Forecasts: Average Mean Error (1996-2013)

Average Mean Error (ME): Current-Year (t) Forecasts¹						
	Real GDP	Inf. (CPI)	STIBR	CA Bal.	Budget Def.	Unemp.
HI	0.015	-0.160*	0.245**	-0.916*	-0.548*	0.064
UMI	-0.120	-0.624	0.171	-1.757	0.354	0.075
LMI	0.042	-0.818	0.604	-0.488	-0.448	0.246
LI	0.025	-0.968	-0.374	-2.434	-0.152	
Total Avg.	-0.010	-0.642	0.161	-1.399	-0.198	0.128

¹ N.B. The significance of the Average Mean Error results was ascertained using a t-test, with the null hypothesis that the Average Mean Error will be equal to zero. Significant results are highlighted as follows:

* t-statistic is significant at the 5% level.

** t-statistic is significant at the 1% level.

The average Mean Error (ME), defined as $ME = \sum_{i=1}^n \frac{F_i - A_i}{n}$, of EIU forecasts for the six variables over the Current-Year (t) and One-Year-Ahead (t+1) forecast horizons are presented in Table 7 and Table 8 respectively. These ME values are the average ME for this paper's time period of interest, namely 1996-2013. A negative ME value indicates an under-estimate of the true outcome, while a positive ME value indicates an over-estimate. The average ME figures for both forecast horizons were subjected to t-tests for significance and are marked as such.

For Current-Year (t) forecasts (shown above in Table 7) there are significant results for the average ME values of high-income (HI) countries with regard to a number of variables. For high-income countries, the average ME for Inflation (CPI) (significant at the 5% level) shows that Current-Year (t) forecasts under-estimate the actual value. In contrast, the average ME for Short-Term Interbank Rate (significant at the 1% level) shows that in the period 1996-2013, EIU forecasts over-estimated the actual values. Current-Year (t) forecasts for the Current Account Balance (CA Bal.) have an average ME result which indicates a significant (5% level) and large under-estimation of the actual value for high-income countries. Finally, the high-income country ME for Budget Deficit (Budget Def.) over the period 1996-2013 also shows an under-estimation (significant at 5% level) of the actual value by Current-Year (t) forecasts.

Table 8: One-Year-Ahead (t+1) Forecasts: Average Mean Error (1996-2013)

Average Mean Error (ME): One-Year-Ahead (t+1) Forecasts¹						
	Real GDP	Inf. (CPI)	STIBR	CA Bal.	Budget Def.	Unemp.
HI	0.597**	-0.162	0.874**	-1.395*	-0.331	-0.123
UMI	0.504	-1.051	0.833	0.624	0.624	0.322
LMI	0.313	-0.499*	0.699*	-2.509	0.323	0.407
LI	-0.300	-1.700	-0.482	-2.177	-0.193	
Total Avg.	0.278	-0.853	0.481	-1.364	0.106	0.202

¹ N.B. The significance of the Average Mean Error results was ascertained using a t-test, with the null hypothesis that the Average Mean Error will be equal to zero. Significant results are highlighted as follows:

* t-statistic is significant at the 5% level.

** t-statistic is significant at the 1% level.

Considering the average Mean Error (ME) for One-Year-Ahead (t+1) forecasts, there are again a number of significant results regarding forecasted variables for high-income (HI) countries. Additionally, there are significant ME results for Inflation (CPI) and Short-Term Interbank Rate forecasts produced for lower-middle-income (LMI) countries, over the period 1996-2013. As one would expect the significant results for the One-Year-Ahead (t+1) period show larger under-estimates or over-estimates of actual values, relative to results for Current-Year forecasts.

Firstly, the average ME for HI countries Real GDP Growth (significant at 1% level) shows that forecasts for the One-Year-Ahead (t+1) forecast horizon over-estimate the actual values. This result is interesting and the significant over-estimation of Real GDP Growth over the period 1996-2013 could be due to the global economic downturns that occurred in 2000 and 2009. One-Year-Ahead (t+1) forecasts for HI countries Short-Term Interbank Rate over-estimate the actual values, in fact to an even larger degree (significant at 1% level). In addition, the HI countries average ME for One-Year-Ahead (t+1) Current Account Balance forecasts, similar to Table 4, shows a significant (5% level) under-estimation of the actual values.

Looking at average ME of forecasts for LMI countries, the One-Year-Ahead (t+1) forecasts of Inflation (CPI) under-estimate the actual values (significant at 5% level). Also, the forecasts for LMI countries are shown to significantly (5% level) over-estimate Short-Term Interbank Rate over the period 1996-2013.

4.1.2. Real GDP Growth Forecast Errors – MAE & RMSE

Table 9: Real GDP Growth – MAE & RMSE (1998-2013)

Real GDP						
Category	Horizon	n	Avg. MAE	Median MAE	Avg. RMSE	Median RMSE
HI	t	39	1.40	1.11	1.92	1.64
UMI	t	20	2.16	2.05	2.79	2.46
LMI	t	27	1.74	1.39	2.30	1.90
LI	t	17	1.20	1.12	1.64	1.49
p value (F Test)						
			0.002**		0.006**	
Average (weighted)	t		1.61	1.37	2.15	1.85
Category	Horizon	n	Avg. MAE	Median MAE	Avg. RMSE	Median RMSE
HI	t+1	39	2.11	1.91	2.94	2.59
UMI	t+1	20	3.17	2.97	4.28	4.26
LMI	t+1	27	2.50	1.98	3.57	2.55
LI	t+1	17	1.54	1.31	2.09	1.59
p value (F Test)						
			0.000**		0.001**	
Average (weighted)	t+1		2.34	2.04	3.24	2.75

N.B. The significance of the Average Mean Absolute Error (MAE) and Average Root Mean Squared Error (RMSE) results, as presented by country income category, were ascertained using F-tests. The null hypothesis of the F-tests conducted for Average MAE in each forecast horizon was that Average MAE (HI) = Average MAE (UMI) = Average MAE (LMI) = Average MAE (LI). The same convention was used for the F-tests conducted for Average RMSE in each forecast horizon. Significant results are highlighted as follows:

* F-statistic is significant at the 5% level.

** F-statistic is significant at the 1% level

The results for Real GDP Growth forecast errors are shown above in Table 9. The F-statistics for average MAE and average RMSE, concerning both the Current-Year (t) and One-Year-Ahead (t+1) forecasts, are significant at the 1% level. As a result, the null hypothesis (that the measures of forecast accuracy are equal across income categories) can be rejected and the alternate hypothesis, that there are significant differences in forecast accuracy between the four country income categories, is accepted.

When considering the Current-Year (t) forecasts, the lowest median MAE is attributed to forecasts for high-income countries, though the average MAE is higher than that for LI countries. Therefore, a handful of high-income countries have relatively large forecast errors in comparison to all other countries. Interestingly, the Real GDP Growth forecasts for low-income countries over the Current-Year (t) forecast horizon are more accurate (with all measures of MAE and RMSE) than the forecasts for upper-middle income and lower-middle income countries. One possible reason for this is that high income and low-income countries have more accurate forward-looking Real GDP Growth forecasts during economic turbulence than upper-middle income or lower-middle income countries. This is supported by the results

for Real GDP Growth forecast accuracy in Figure 3, shown later in this paper, with large increases in One-Year-Ahead (t+1) forecast errors during global economic downturns in 1998 and 2009.

The One-Year-Ahead (t+1) forecasts show similar differences in forecast accuracy between the different country income categories. The One-Year-Ahead (t+1) forecasts are much less accurate (approximately 45%), across both MAE and RMSE measures, than their Current-Year (t) counterparts. Again, the Real GDP Growth forecasts for upper-middle and lower-middle income countries are the least accurate over the period 1998-2013.

4.1.3. Inflation (CPI) Forecast Errors – MAE & RMSE

Table 10: Inflation (CPI) – MAE & RMSE (1998-2013)

Inflation (CPI)						
Category	Horizon	n	Avg. MAE	Median MAE	Avg. RMSE	Median RMSE
HI	t	39	1.01	0.78	1.34	1.08
UMI	t	19	2.15	1.57	3.67	2.06
LMI	t	27	3.57	2.07	5.84	2.81
LI	t	15	4.33	3.67	5.59	4.76
<hr/>						
p value (F Test)			0.012*		0.050*	
Average (weighted)	t		2.47	1.75	3.69	2.34
<hr/>						
Category	Horizon	n	Avg. MAE	Median MAE	Avg. RMSE	Median RMSE
HI	t+1	39	1.51	1.09	1.91	1.33
UMI	t+1	19	3.52	2.53	5.28	3.04
LMI	t+1	28	4.70	3.19	6.62	4.08
LI	t+1	15	5.06	4.44	6.46	5.25
<hr/>						
p value (F Test)			0.004**		0.005**	
Average (weighted)	t+1		3.33	2.48	4.57	3.04

N.B. The significance of the Average Mean Absolute Error (MAE) and Average Root Mean Squared Error (RMSE) results, as presented by country income category, were ascertained using F-tests. The null hypothesis of the F-tests conducted for Average MAE in each forecast horizon was that Average MAE (HI) = Average MAE (UMI) = Average MAE (LMI) = Average MAE (LI). The same convention was used for the F-tests conducted for Average RMSE in each forecast horizon. Significant results are highlighted as follows:

* F-statistic is significant at the 5% level.

** F-statistic is significant at the 1% level

The results shown above in Table 10 exhibit the accuracy of forward-looking (t & t+1) forecasts for inflation. The inflation data are produced using the ‘consumer price index’ (CPI) measure and the forecast errors are over the period 1998-2013. The F-statistics for average MAE and average RMSE for the current-year (t) forecasts are significant at the 5% level, while the F-statistics for the one-year-ahead (t+1) forecasts are significant at the 1% level.

Across both forecast horizons (t & t+1), the most accurate inflation forecasts are those produced for high income countries, then upper-middle income countries, followed by forecasts for lower-middle income countries and low income countries. The statistical significance of these results clearly illustrates that the higher income countries have more accurate inflation forecasts than lower income countries over this fifteen-year period. It should be noted that the median MAE and median RMSE measures of forecast error are much higher than the average MAE and average RMSE measures of forecast error for both lower-middle income and low-income countries. This suggests that there are some lower income countries with particularly high rates of inflation.

One reason for these differences is the comparative strength of economic institutions between country income categories. I would argue that a lower inflation rate trend, as is generally the case in higher income countries, makes it easier to forecast inflation and results in lower forecast errors. This makes intuitive sense, as generally higher inflation rates will give rise to larger forecast errors. It is possible to analyse this by producing a relative error term with the quotient:

$$\text{Relative Inflation (CPI) Error} = \frac{\text{MAE}}{\text{Average Inflation}}$$

When calculating this quotient Relative Inflation (CPI) Error, as in Table 11 below, it becomes clear that the differences between forecast accuracy of higher and lower income countries are not as large as simply looking at Table 10 would suggest.

Table 11: Relative Inflation (CPI) Forecast Errors

Current-Year (t) Relative Inflation Measure				
Category	Horizon	Avg. Inflation (CPI)	Avg. MAE	Relative Inflation Measure
HI	t	2.73	1.01	0.37
UMI	t	7.84	2.15	0.27
LMI	t	7.82	3.57	0.46
LI	t	9.41	4.33	0.46

One-Year-Ahead (t+1) Relative Inflation Measure				
Category	Horizon	Avg. Inflation (CPI)	Avg. MAE	Relative Inflation Measure
HI	t+1	2.71	1.51	0.56
UMI	t+1	6.71	3.52	0.52
LMI	t+1	6.99	4.70	0.67
LI	t+1	8.44	5.06	0.60

4.1.4. Short-Term Interbank Rate Forecast Errors – MAE & RMSE

Table 12: Short-Term Interbank Rate – MAE & RMSE (1998-2013)

STIBR						
Category	Horizon	n	Avg. MAE	Median MAE	Avg. RMSE	Median RMSE
HI	t	39	0.74	0.66	1.17	1.02
UMI	t	18	2.56	1.36	4.16	1.95
LMI	t	26	1.83	1.60	2.69	2.21
LI	t	17	1.97	1.76	2.74	2.65
<hr/>						
p value (F Test)			0.001**		0.003**	
Average (weighted)	t		1.84	1.27	2.82	1.85
<hr/>						
Category	Horizon	n	Avg. MAE	Median MAE	Avg. RMSE	Median RMSE
HI	t+1	39	1.57	1.32	2.01	1.87
UMI	t+1	18	4.07	2.33	5.66	2.92
LMI	t+1	26	3.00	2.24	3.97	2.95
LI	t+1	17	2.54	2.17	3.30	3.22
<hr/>						
p value (F Test)			0.009**		0.007**	
Average (weighted)	t+1		1.84	1.25	2.83	1.81

N.B. The significance of the Average Mean Absolute Error (MAE) and Average Root Mean Squared Error (RMSE) results, as presented by country income category, were ascertained using F-tests. The null hypothesis of the F-tests conducted for Average MAE in each forecast horizon was that Average MAE (HI) = Average MAE (UMI) = Average MAE (LMI) = Average MAE (LI). The same convention was used for the F-tests conducted for Average RMSE in each forecast horizon. Significant results are highlighted as follows:

* F-statistic is significant at the 5% level.

** F-statistic is significant at the 1% level

Table 12 describes the accuracy of forward-looking (t & t+1) forecasts for short-term interbank rate (STIBR) over the period 1998-2013. All F-statistics for this variable are significant at the 1% level.

For the Current-Year (t) forecasts, high-income (HI) countries having the smallest median MAE and median RMSE and low-income (LI) countries having the largest median error measures. The average MAE and RMSE measures for this forecast horizon show upper-middle-income (UMI) countries as having the least accurate forecasts. This could be due to large forecast errors in a handful of UMI countries, such as Latvia with a Current-Year (t+1) forecast errors of 11 percentage points in 2009.

One-Year-Ahead (t+1) forecasts errors are largest for UMI countries by the median MAE measure, as well as average MAE and average RMSE measures. A possible reason for this is central banks of UMI countries taking an active role in varying interest rates as part of their monetary policy, with the aim of either controlling inflation or stimulating the economy. Two examples of this are Costa Rica, where the STIBR was lowered from 35.5% (2003) to 21.5%

(2004), and Turkey, where the STIBR was lowered from 22.8% (2006) to 13.9% (2007). These large changes in the Short-Term Interbank Rate directly cause large forecast errors.

4.1.5. Current Account Balance Forecast Errors – MAE & RMSE

Table 13: Current Account Balance (%GDP) - MAE & RMSE (1998-2013)

CA Bal (%GDP)						
Category	Horizon	n	Avg. MAE	Median MAE	Avg. RMSE	Median RMSE
HI	t	37	2.85	1.81	3.77	2.23
UMI	t	18	3.91	2.49	7.83	3.17
LMI	t	26	3.23	2.57	4.67	3.21
LI	t	15	6.38	4.24	13.85	4.30
<hr/>						
p value (F Test)			0.124		0.202	
Average (weighted)	t		3.76	2.56	6.48	3.04
<hr/>						
Category	Horizon	n	Avg. MAE	Median MAE	Avg. RMSE	Median RMSE
HI	t+1	37	4.06	2.45	5.26	2.79
UMI	t+1	18	2.61	1.97	4.21	2.45
LMI	t+1	26	5.68	2.98	10.51	3.73
LI	t+1	15	6.92	4.24	13.12	5.43
<hr/>						
p value (F Test)			0.587		0.640	
Average (weighted)	t+1		4.70	2.81	7.80	3.43

N.B. The significance of the Average Mean Absolute Error (MAE) and Average Root Mean Squared Error (RMSE) results, as presented by country income category, were ascertained using F-tests. The null hypothesis of the F-tests conducted for Average MAE in each forecast horizon was that Average MAE (HI) = Average MAE (UMI) = Average MAE (LMI) = Average MAE (LI). The same convention was used for the F-tests conducted for Average RMSE in each forecast horizon. Significant results are highlighted as follows:

* F-statistic is significant at the 5% level.

** F-statistic is significant at the 1% level

Table 13 describes the accuracy of EIU forecasts for Current Account Balance (%GDP) over the period 1998-2013. The F-statistics for this variable are not significant. One observation is that by all measures, the One-Year-Ahead (t+1) forecasts have much larger errors than the Current-Year (t) forecasts, as one would expect. Comparing the average MAE values, One-Year-Ahead (t+1) forecast errors were 25% larger than Current-Year (t) forecast errors.

Notably, the large differences between the average and median measures of MAE and RMSE across both Current-Year (t) and One-Year-Ahead (t+1) forecasts show that a small number of countries in each country income category have relatively large forecast errors. Current Account Balance is linked closely to the wider economic cycle, so forecast accuracy was particularly affected by the Global Financial Crisis (2008-09). Examples of large Current-Year (t) forecast errors are as follows: Italy (HI) forecast error of 32.5% (2009), Gabon (UMI) forecast error of 20.1% (2009), Jordan (LMI) forecast error of 11.1% (2008) and Nigeria (LI) forecast error of 20.6%. This is as much the case for One-Year-Ahead (t+1) Current Account Balance (%GDP) forecasts. Therefore, in times of wider economic volatility (such as 2008-09) there can be large changes in a country's Current Account Balance (%GDP) which pass

through to large forecast errors. This occurs across all country income categories and is represented visually in Figure 6 of this paper.

4.1.6. Budget Deficit Forecast Errors – MAE & RMSE

Table 14: Budget Deficit (%GDP) - MAE & RMSE (1998-2013)

Budget Deficit (%GDP)						
Category	Horizon	n	Avg. MAE	Median MAE	Avg. RMSE	Median RMSE
HI	t	36	1.78	1.14	2.43	1.58
UMI	t	21	1.91	1.23	3.35	1.74
LMI	t	27	1.85	1.23	3.10	1.70
LI	t	17	1.36	1.33	1.84	1.67
p value (F Test)			0.772		0.692	
Average (weighted)	t		1.71	1.18	2.63	1.62
Category	Horizon	n	Avg. MAE	Median MAE	Avg. RMSE	Median RMSE
HI	t+1	36	4.06	1.93	5.26	2.41
UMI	t+1	21	2.61	1.97	4.21	2.45
LMI	t+1	27	5.68	1.78	10.51	2.23
LI	t+1	17	6.92	1.65	13.12	2.13
p value (F Test)			0.225		0.290	
Average (weighted)	t+1		4.55	1.81	7.54	2.27

N.B. The significance of the Average Mean Absolute Error (MAE) and Average Root Mean Squared Error (RMSE) results, as presented by country income category, were ascertained using F-tests. The null hypothesis of the F-tests conducted for Average MAE in each forecast horizon was that Average MAE (HI) = Average MAE (UMI) = Average MAE (LMI) = Average MAE (LI). The same convention was used for the F-tests conducted for Average RMSE in each forecast horizon. Significant results are highlighted as follows:

* F-statistic is significant at the 5% level.

** F-statistic is significant at the 1% level

Table 14 describes the accuracy of forward-looking (t & t+1) forecasts Budget Deficit (%GDP) over the period 1998-2013. As with Table 12, the F-statistics for this variable are not significant. Like other examined variables, the One-Year-Ahead (t+1) forecasts perform worse than Current-Year (t) forecast, with errors on average more than twice as large according to the weighted total MAE values.

While the Current-Year (t) forecasts have similar average and median measures of forecast accuracy, over the One-Year-Ahead (t+1) forecast horizon there are large differences. Forecast accuracy declined due large increases in many countries' Budget Deficit (%GDP) during the economic crisis of the period 2008-09. As highlighted, this is much more the case with One-Year-Ahead (t+1) forecasts and examples can be provided for each country income category. These examples are: South Korea (HI) with forecast error of 11.3% (2009), Latvia (UMI) with forecast error of 9.10% (2009), Moldova (LMI) with forecast error of 8.50% (2009) and Vietnam (LI) with forecast error of 6.4% (2009). The period 2008-09 saw the governments of many countries increasing their budget spending to provide bailouts or guarantees to financial institutions, one well-documented example being the United States where Budget Deficit

(%GDP) increased from 2.2% (2008) to 9.9% (2009). As stated, this was the case in many countries across income categories, a fact expressed visually in Figure 7.

4.1.7. Unemployment Forecast Errors – MAE & RMSE

Table 15: Unemployment - MAE & RMSE (1998-2013)

Unemployment						
Category	Horizon	n	Avg. MAE	Median MAE	Avg. RMSE	Median RMSE
HI	t	39	1.04	0.74	3.23	1.54
UMI	t	21	1.40	1.32	2.83	1.94
LMI/LI	t	28	2.21	1.79	3.66	2.09
<hr/>						
p value (F Test)			0.002**		0.93	
Average (weighted)	t		1.33	1.07	2.98	1.63
<hr/>						
Category	Horizon	n	Avg. MAE	Median MAE	Avg. RMSE	Median RMSE
HI	t+1	39	1.42	1.34	1.80	1.42
UMI	t+1	21	2.34	2.46	3.46	2.61
LMI	t+1	28	2.05	2.25	3.07	2.34
<hr/>						
p value (F Test)			0.053		0.31	
Average (weighted)	t+1		2.38	1.69	3.37	2.58

N.B. The significance of the Average Mean Absolute Error (MAE) and Average Root Mean Squared Error (RMSE) results, as presented by country income category, were ascertained using F-tests. The null hypothesis of the F-tests conducted for Average MAE in each forecast horizon was that Average MAE (HI) = Average MAE (UMI) = Average MAE (LMI) = Average MAE (LI). The same convention was used for the F-tests conducted for Average RMSE in each forecast horizon. Significant results are highlighted as follows:

* F-statistic is significant at the 5% level.

** F-statistic is significant at the 1% level

Table 15 shows Current-Year (t) and One-Year-Ahead (t+1) measures of forecast error for Unemployment Rate (%) over the period 1998-2013. Only the F-statistic for Current-Year (t) average RMSE is significant, at the 1% level.

The One-Year-Ahead (t+1) forecast errors are 42% larger than Current-Year (t) forecast errors, according to the average MAE measure. For Current-Year (t) forecasts, the average MAE shows that Unemployment forecasts are significantly more accurate for high-income (HI) countries than upper-middle-income (UMI) and even more so than lower-middle-income/low-income (LMI/LI) countries. As with other variables, the differences between median and average measures of forecast accuracy across all forecast horizons and income categories suggest that a small group of countries have large forecast errors. This appears to be driven by large increases in forecast errors (especially for One-Year-Ahead (t+1) forecasts) around the time of the 2008-09 global financial crisis, as shown visually in Figure 8. Wider economic volatility saw increases in the Unemployment Rate, for example Czech Republic (HI) where the Unemployment Rate in a two-year period rose from 5.9% (2008) to 9% (2010). These large proportional increases lead directly to larger forecast errors, One-Year-Ahead (t+1) examples

being Lithuania (UMI) with forecast error of 8.3% (2009) and Pakistan (LI) with forecast error of 9.1% (2010). Figure 8 gives a clear view of how the trend of increasing unemployment corresponded to these larger forecast errors.

4.2 Variable Forecast RMSEs & Global Trends

4.2.1. Real GDP Growth – RMSE & Global Trend

Figure 3: Real GDP Growth – Forecast RMSEs & Global Trend (1997-2012)

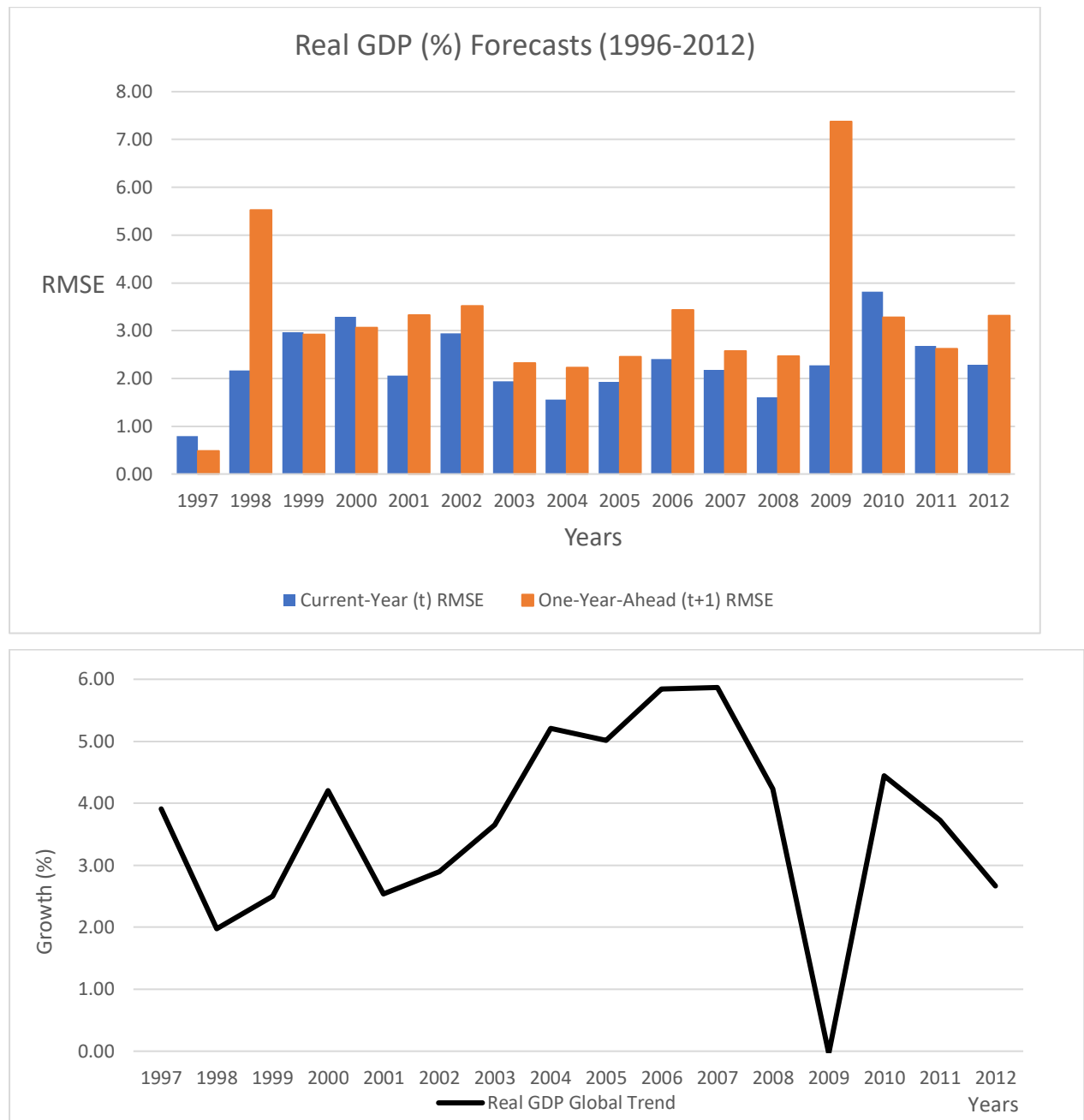


Figure 3 displays the Current-Year (t) and One-Year-Ahead (t+1) RMSEs for Real GDP Growth (%), as well as Real GDP Growth (%) global trend, for the period 1997-2012. As discussed in the analysis of Table 9, the Real GDP Growth forecast errors increase across all countries during the global financial crisis. Figure 3 clearly shows that the EIU did not see recessions and relative economic turbulence (e.g. 1998 and 2009) coming. During both of these

global economic downturns there were large increases in forecast errors, but especially for One-Year-Ahead ($t+1$) forecasts.

4.2.2. Inflation (CPI) – RMSE & Global Trend

Figure 4: Inflation (CPI) – Forecast RMSEs & Global Trend (1998-2012)

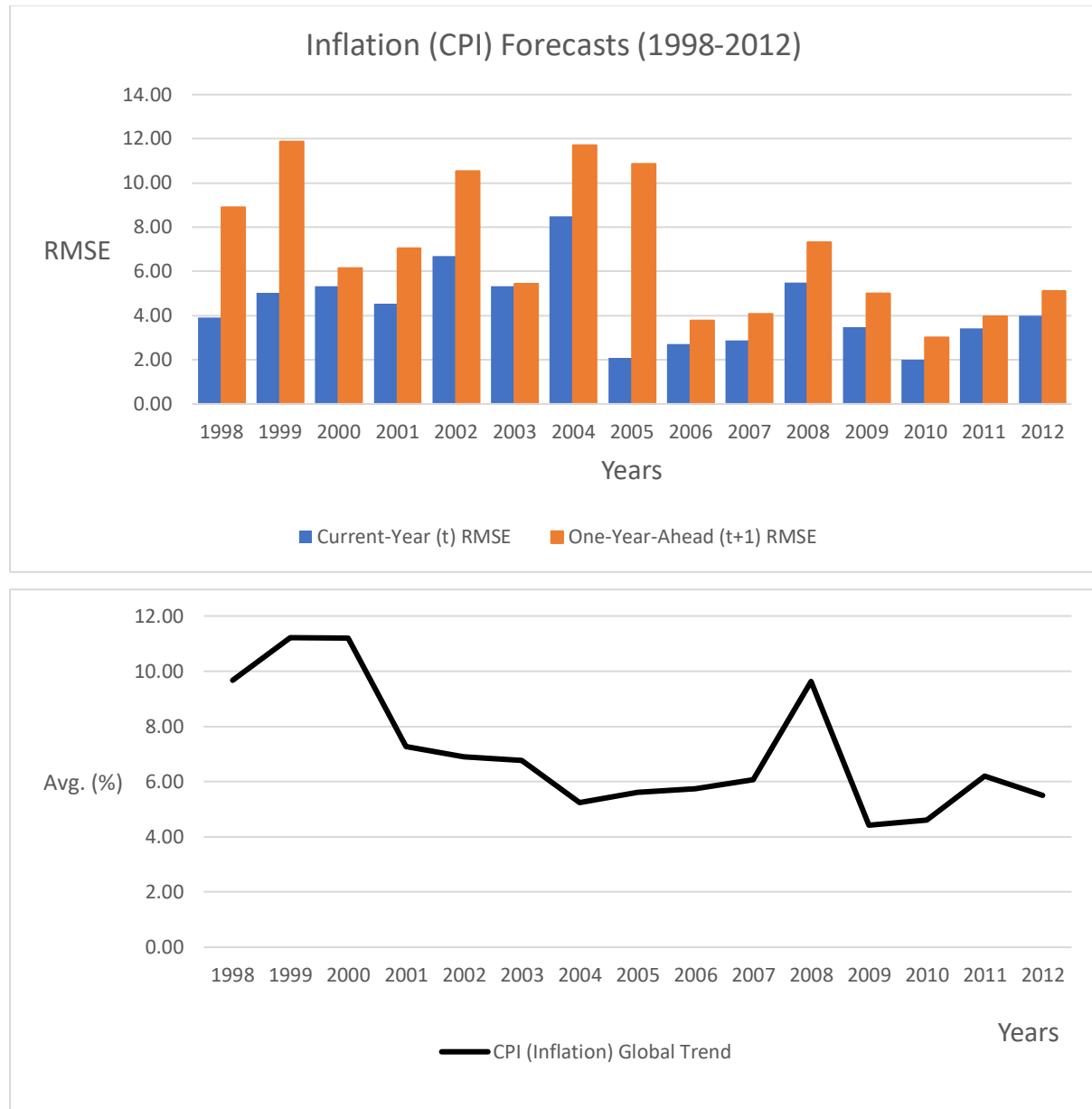


Figure 4 displays the Current-Year (t) and One-Year-Ahead (t+1) RMSE forecast errors for Inflation (CPI) over the period 1998-2012. Comparing the RMSEs against the Inflation (CPI) global trend shows that even during periods of stable average global inflation (e.g. 2002-2006) there are large forecast errors, especially for One-Year-Ahead (t+1) forecasts. This is due to significantly larger forecast errors among lower income (LMI and LI) countries, as discussed in the analysis of Inflation (CPI) forecast errors in Table 10. Notably, the large increase in global inflation in 2008 is matched by a large increase in Current-Year (t) and One-Year-Ahead (t+1) forecast errors for the same year.

4.2.3. Short-Term Interbank Rate – RMSE & Global Trend

Figure 5: Short-Term Interbank Rate – Forecast RMSEs & Global Trend (1996-2012)

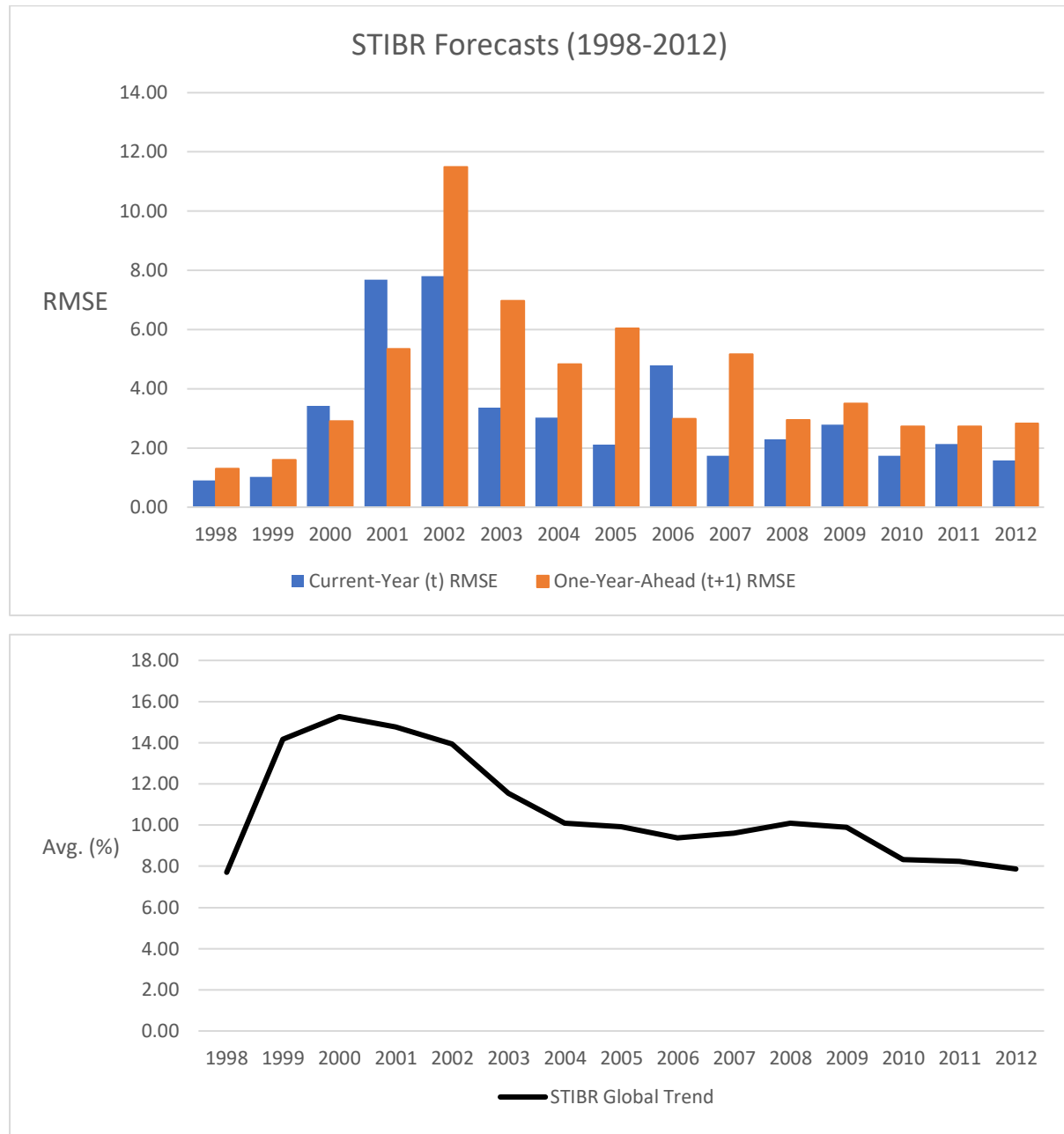
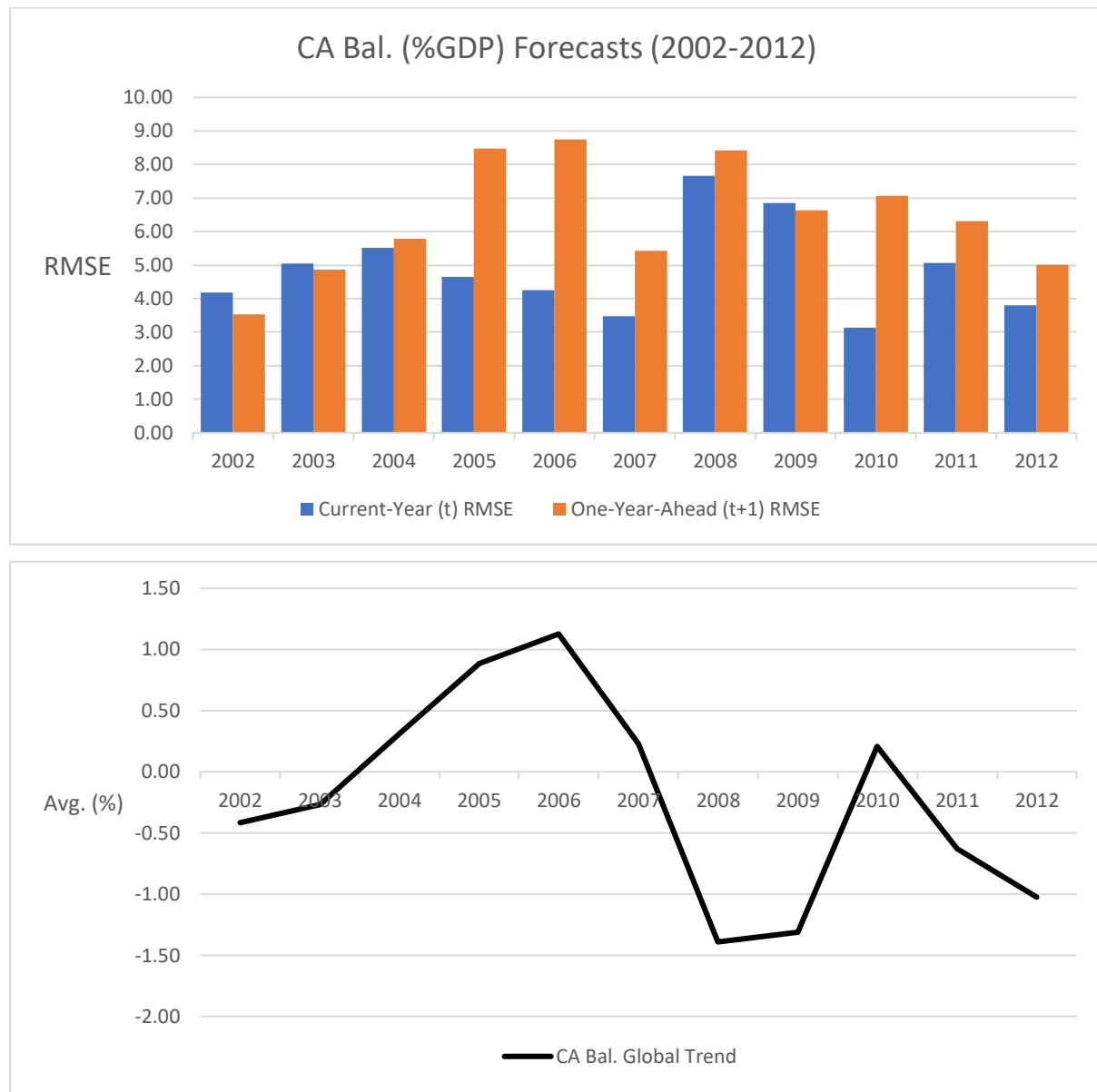


Figure 5 displays the Current-Year (t) and One-Year-Ahead (t+1) RMSEs for Short-Term Interbank Rate (STIBR) over the period 1998-2012. Comparing these forecast errors to the STIBR global trend over the same period shows that higher global average STIBR is correlated with higher forecast errors. This is evident for the period 1999-2003 when volatility in global STIBR was concurrent with large forecast errors for both forward-looking forecast horizons (t & t+1). As discussed in Table 11, forecasts for UMI countries (e.g. Costa Rica) were particularly affected as Central Banks took an activist approach to monetary policy.

4.2.4. Current Account Balance (%GDP) – RMSE & Global Trend

Figure 6: CA Bal. (%GDP) – Forecast RMSEs & Global Trend (2002-2012)



The results shown in Figure 6 are the forecast errors of forward-looking (t & t+1) EIU forecasts for Current Account Balance (%GDP) for the period 2002-2012, with the global trend for the variable shown for the same period. Theoretically, global Current Account Balance (%GDP) should be equal to zero, but at country level it is pro-cyclical and so deviations of the global trend from zero are likely just the data reflecting wider economic activity. Figure 6 shows increases in forecast errors during the 2008-09 period, with Current-Year (t) forecasts performing as badly as One-Year-Ahead (t+1) forecasts, are correlated with a large decrease in average global Current Account Balance (%GDP). Therefore, as with other variables, the

EIU forecast errors for Current Account Balance (%GDP) are much higher during global economic downturns such as the Global Financial Crisis (2008-09).

4.2.5. Budget Deficit (%GDP) – RMSE & Global Trend

Figure 7: Budget Deficit – Forecast RMSEs & Global Trend (1998-2012)

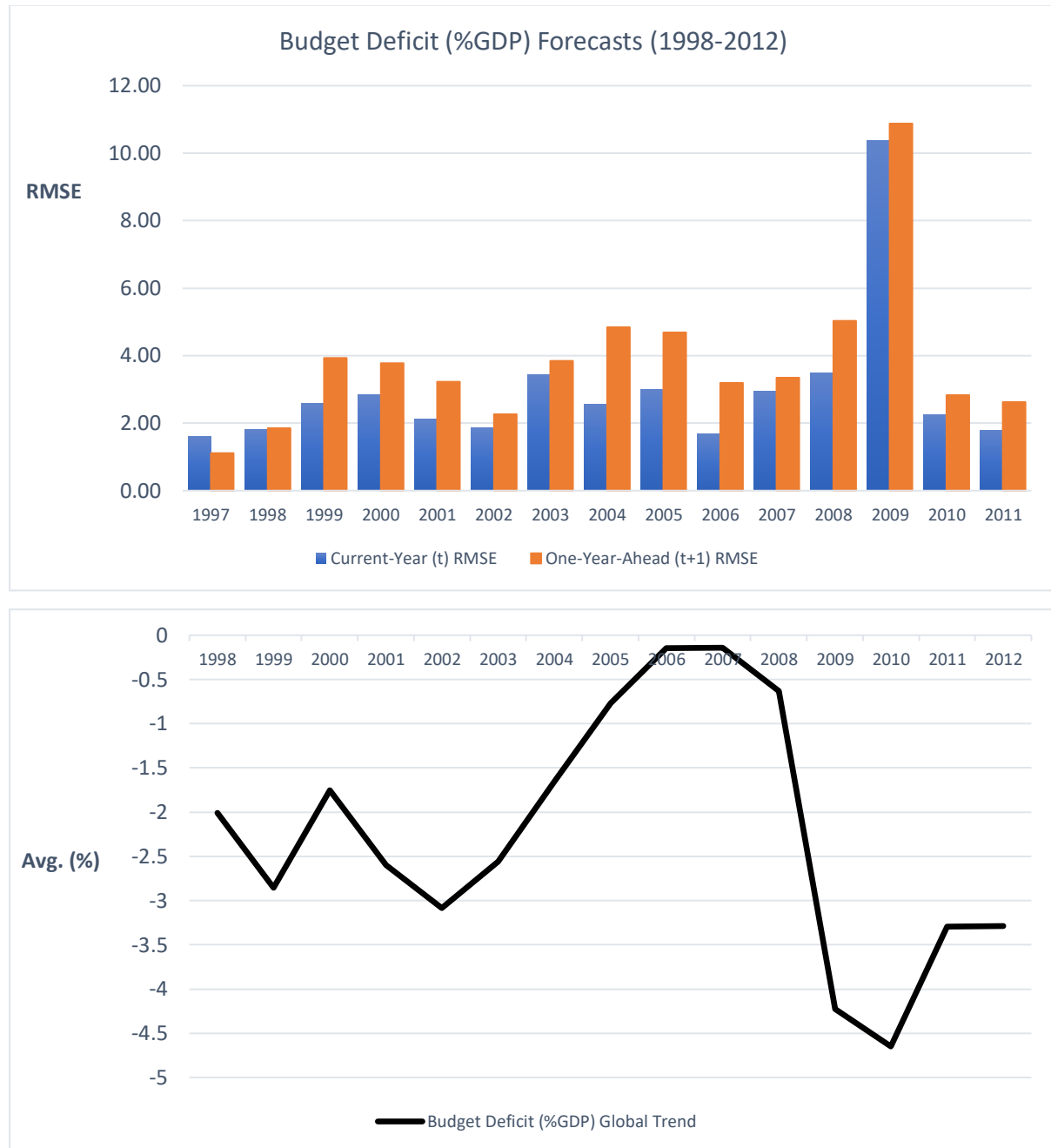
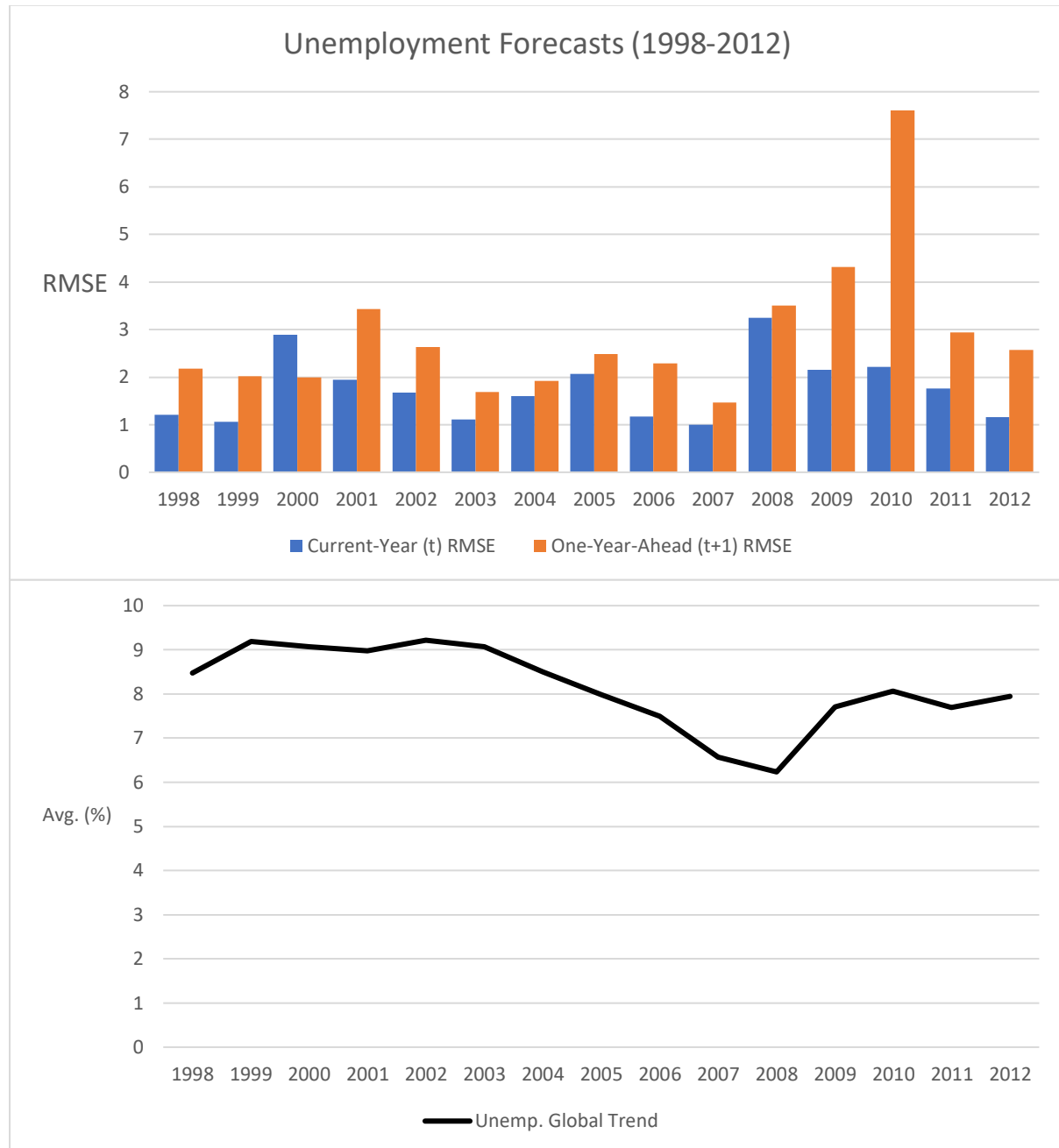


Figure 7 displays the forecast accuracy of both Current-Year (t) and One-Year-Ahead (t+1) forecasts for Budget Deficit (%GDP) over the period 1998-2011. The most striking thing about these results is the correlation of large increases in the Budget Deficit (%GDP) global trend in 2009, with much higher forecast errors in the same year. The analysis of Table 14 highlighted that Budget Deficit (%GDP) increased in many countries during the global financial crisis as a result of governments providing bailouts and guarantees to financial institutions in an attempt to mitigate the crisis. The EIU forecasts did not predict this and, as Figure 7 clearly shows,

during the Global Financial Crisis (2008-09) the EIU forecasts for Budget Deficit (%GDP) were highly inaccurate.

4.2.6. Unemployment – RMSE & Global Trend

Figure 8: Unemployment – Forecast RMSEs & Global Trend (1996-2012)



The results in Figure 8 show the EIU forecast errors for Unemployment Rate over the period 1998-2012. It is clear from these results that when the global trend for Unemployment rate increased in 2008-09, Unemployment forecast errors increased hugely. Interestingly, while Current-Year (t) forecast errors decreased after 2008, the One-Year-Ahead (t+1) forecast errors continued to increase until 2010. As introduced in the discussion of Table 14, this is the result of an under-estimation of the scale of the Global Financial Crisis and unemployment being a lagged indicator in relation to Real GDP Growth.

4.3 Enhanced Theil U-Statistic ('Theil U')

4.3.1 Average Theil U-Statistic

Table 16: Average Theil U (All Variables)

Average Theil U: Current-Year (t) Forecasts ¹							
	n	Real GDP	Inf. (CPI)	STIBR	CA Bal.	Budget Def.	Unemp.
HI	38	0.58**	0.65**	0.72**	0.95	0.81**	0.81**
UMI	20	0.69**	0.66**	0.89	1.00	0.88*	0.92
LMI	27	0.65**	0.71**	0.94	0.86**	0.90*	1.02
LI	16	0.82	0.87*	1.04	1.03	0.88**	
F Test (p value)²		0.086	0.000**	0.936	0.135	0.386	0.603
Weighted Average		0.66	0.71	0.86	0.95	1.14	0.89
Average Theil U: One-Year-Ahead (t+1) Forecasts ¹							
	n	Real GDP	Inf. (CPI)	STIBR	CA Bal.	Budget Def.	Unemp.
HI	38	0.79**	0.82**	0.94	1.01	0.90**	0.91**
UMI	20	0.83**	0.75**	1.02	1.02	0.93*	1.01
LMI	27	0.83**	0.85**	1.06	0.94	0.95	1.02
LI	16	0.96	0.89**	0.94	0.97	0.95	
F Test (p value)²		0.049*	0.000**	0.788	0.129	0.149	0.627
Weighted Average		0.84	0.82	0.99	0.99	0.93	0.97

¹ N.B. The significance of the individual Average Theil U results was ascertained using a t-test, with the null hypothesis that the Average Theil U will be U = 1. Significant results are highlighted as follows:

* t-statistic is significant at the 5% level.

** t-statistic is significant at the 1% level.

² N.B. The significance of the Average Theil U-Statistic results, as presented by country income category, was ascertained using F-tests. The null hypothesis of the F-tests conducted for Average Theil U in each forecast horizon was that Average Theil U (HI) = Average Theil U (UMI) = Average Theil U (LMI) = Average Theil U (LI). Significant results are highlighted as follows:

* F-statistic is significant at the 5% level.

** F-statistic is significant at the 1% level.

Table 16 shown above displays the Average Theil U statistics for both Current-Year (t) and One-Year-Ahead (t+1) forecasts over the time period of interest (1996-2013). As discussed in the paper's methodology the Theil U Statistic tells us whether the EIU forecasts are better than naïve forecasts – where it is assumed that the actual value from the previous time period (t-1) will occur again. As such, any Theil U \geq 1 means that the EIU forecast performs no better than a naïve forecast.

For Current-Year (t) forecasts, some of the best performing forecasts are for Real GDP Growth and Inflation (CPI) with significant results indicating that the average Theil U < 1 for all country income categories, with the exception of Real GDP Growth for LI countries. Forecasts for Short-Term Interbank Rate for HI countries are shown to be significantly better than naïve forecasts (at 1% level), with the same being said for Current Account Balance (%GDP) forecasts for LMI countries. Current-Year (t) forecasts for Budget Deficit (%GDP) performed well, being significantly better than naïve forecasts across all country income categories. In contrast, Unemployment did not perform as well, with only forecasts for HI countries performing significantly better than naïve forecasts. Finally, the F-statistic for Inflation (CPI) is significant at the 1% level. This highlights that Current-Year (t) Inflation (CPI) forecasts for higher income countries are significantly more accurate than lower income categories, relative to naïve forecasts.

Considering One-Year-Ahead (t+1) forecasts, Table 15 shows that the EIU forecasts which consistently performed significantly better than naïve forecasts are those for Real GDP Growth and Inflation (CPI), with the repeated exception of Real GDP Growth for LI countries. The F-statistic for Real GDP Growth is significant at the 5% level and the results show that forecasts for higher income countries are more accurate than lower income countries, relative to naïve forecasts. The F-statistic for Inflation (CPI) is significant at the 1% level, with results showing that the lowest average Theil U values are for upper-middle-income (UMI) countries and that forecasts for higher-income countries have smaller Theil U values than those for lower-income countries. The results in Table 15 shows that over the One-Year-Ahead (t+1) forecast horizon, EIU forecasts for Short-Term Interbank Rate and Current Account Balance (%GDP) all fail to perform significantly better than naïve forecasts. On the other hand, HI country forecasts for Current Account Balance (%GDP) and Unemployment Rate do perform significantly better than naïve forecasts (at the 1% level), as well as Current Account Balance (%GDP) forecasts for UMI countries (significant at the 5% level).

4.3.2 Enhanced Theil U-Statistic ('Theil U') Distribution

Table 17: Theil U Distribution (All Variables)

Theil U Distribution (by variable)											
Variable	Horizon	n	0<U<0.2	0.2≤U<0.4	0.4≤U<0.6	0.6≤U<0.8	0.8≤U<1	1≤U<1.2	1.2≤U<1.4	1.4≤U<1.6	U≥1.6
Real GDP	t	105	0	4	42	39	13	5	1	0	1
Inflation (CPI)	t	103	1	4	28	42	16	10	2	0	0
ST Interbank Rate	t	98	0	6	9	23	40	11	6	0	3
CA Balance (%GDP)	t	103	1	0	2	23	40	25	9	3	0
Budget Deficit (%GDP)	t	98	0	0	9	31	38	12	5	1	2
Unemployment	t	66	0	0	4	15	34	9	1	2	1
Totals			2	14	94	173	181	72	24	6	7
Variable	Horizon	n	0<U<0.2	0.2≤U<0.4	0.4≤U<0.6	0.6≤U<0.8	0.8≤U<1	1≤U<1.2	1.2≤U<1.4	1.4≤U<1.6	U≥1.6
Real GDP	t+1	105	0	1	2	51	38	8	4	1	0
Inflation (CPI)	t+1	103	0	2	4	46	36	11	3	0	1
ST Interbank Rate	t+1	100	1	3	6	23	38	12	9	1	7
CA Balance (%GDP)	t+1	106	0	0	2	15	43	32	8	4	2
Budget Deficit (%GDP)	t+1	101	0	0	1	21	48	26	3	1	1
Unemployment	t+1	66	0	1	0	8	32	17	5	2	1
Totals			1	7	15	164	235	106	32	9	12

Table 17 displays the distribution of the Theil U-Statistic, by number of countries, for all six examined variables across both the Current-Year (t) and One-Year-Ahead (t+1) forecast horizons. These Theil U-Statistic distributions are replicated graphically for each variable in Figures 10 through 15, displayed overleaf. The general comment can be made that for the total for all variables shows that One-Year-Ahead (t+1) forecasts on average perform worse relative to naïve forecasts than Current-Year (t) forecasts.

For both Real GDP Growth and Inflation (CPI), the Current-Year (t) distribution of Theil U values shows that the centre of the distribution has Theil U-Statistics between 0.4 and 0.8, indicating that EIU forecasts perform much better than naïve forecasts. The One-Year-Ahead (t+1) distribution of Theil U values for these variables is more skewed to the right, but is still centred between 0.6 and 1 and therefore most of these EIU forecasts also perform better than naïve forecasts.

For the remaining variables, namely Short-Term Interbank Rate, Current Account Balance (%GDP), Budget Deficit (%GDP) and Unemployment Rate, the Theil U distributions for both forecast horizons are centred between 0.8 and 1. With the exception of Current Account Balance (%GDP) the Current-Year (t) Theil U distribution for these variables are skewed to the left, with the majority of countries having EIU forecasts performing better than naïve forecasts. The equivalent Current Account Balance (%GDP) forecasts are skewed to the right, with majority of countries having forecasts worse than naïve forecasts. The One-Year-Ahead (t+1) Theil U distribution for all four of these variables is centred between 0.8 and 1, but unlike

for Current-Year (t) forecasts these variable's distributions are all skewed to the right. To illustrate this, 38% of EIU forecast observations for the One-Year-Ahead (t+1) forecast horizon performed worse than naïve forecasts, compared to 23% of EIU forecast observations for the Current-Year (t) forecast horizon.

Figure 10: Theil Distribution- Real GDP Growth

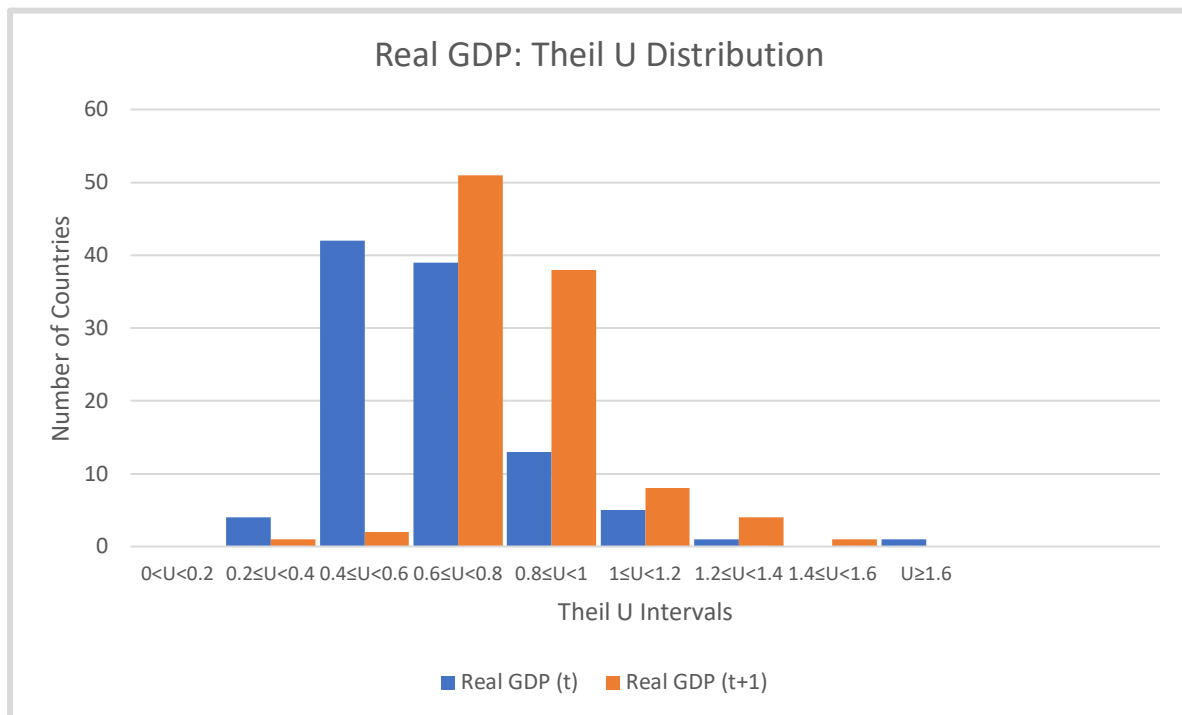


Figure 11: Theil U Distribution- Inflation (CPI)

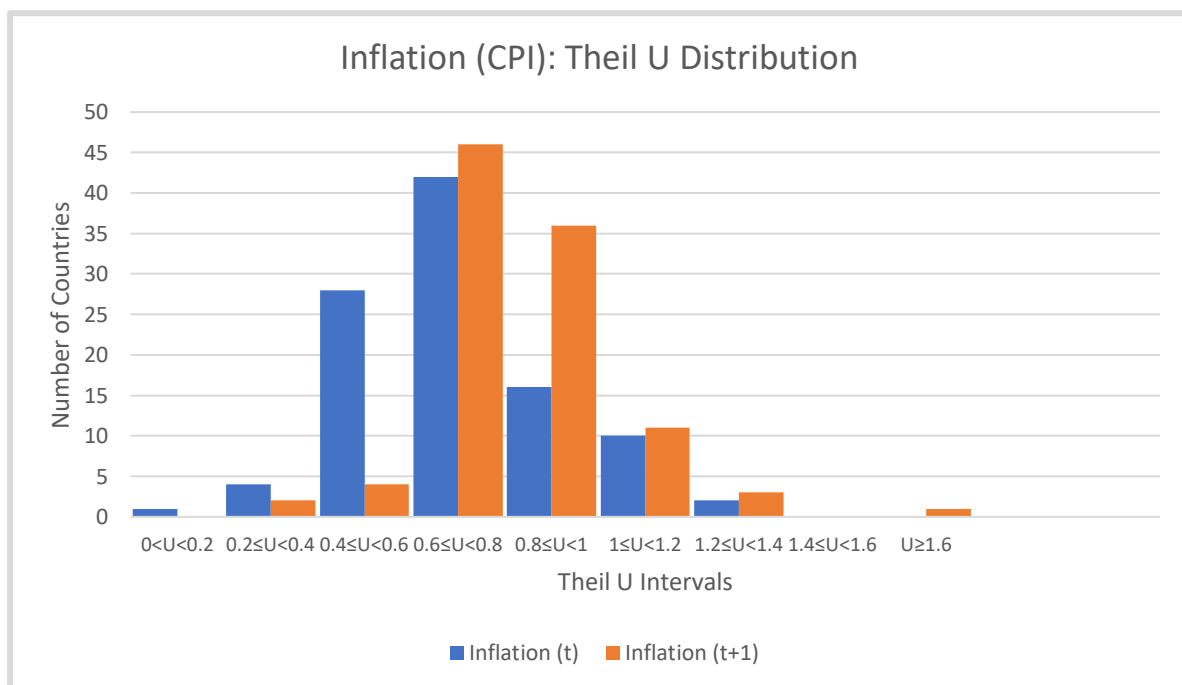


Figure 12: Theil U Distribution- Short Term Interbank Rate

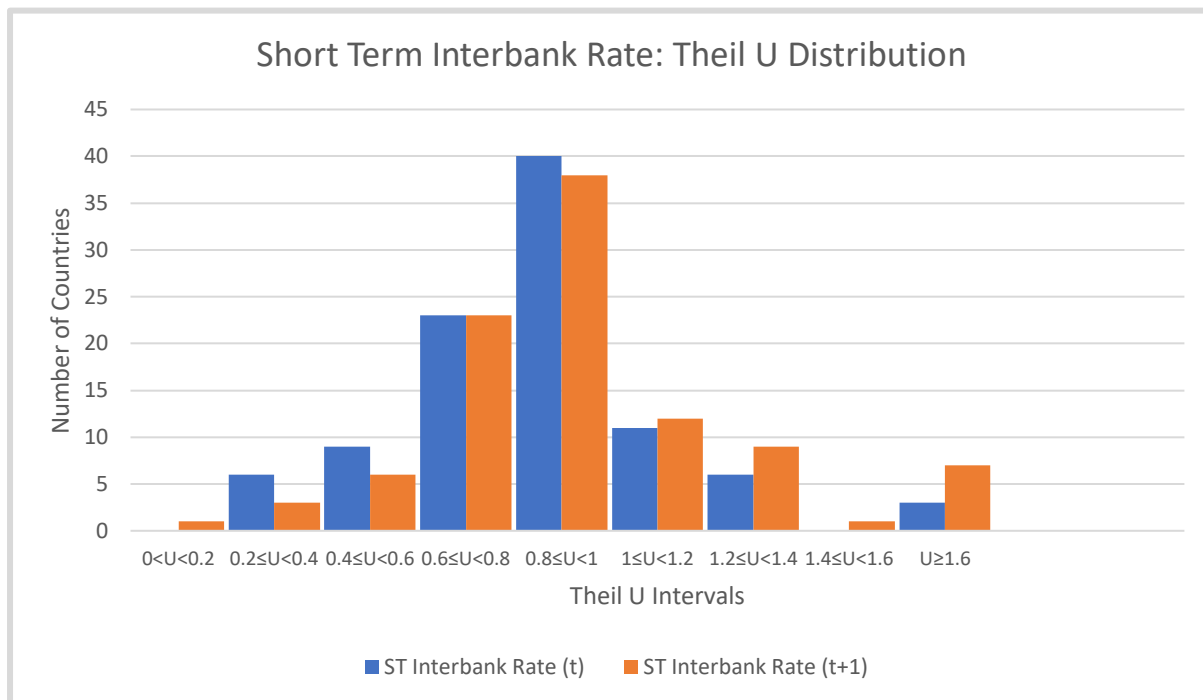


Figure 13: Theil U Distribution- Current Account Balance (%GDP)

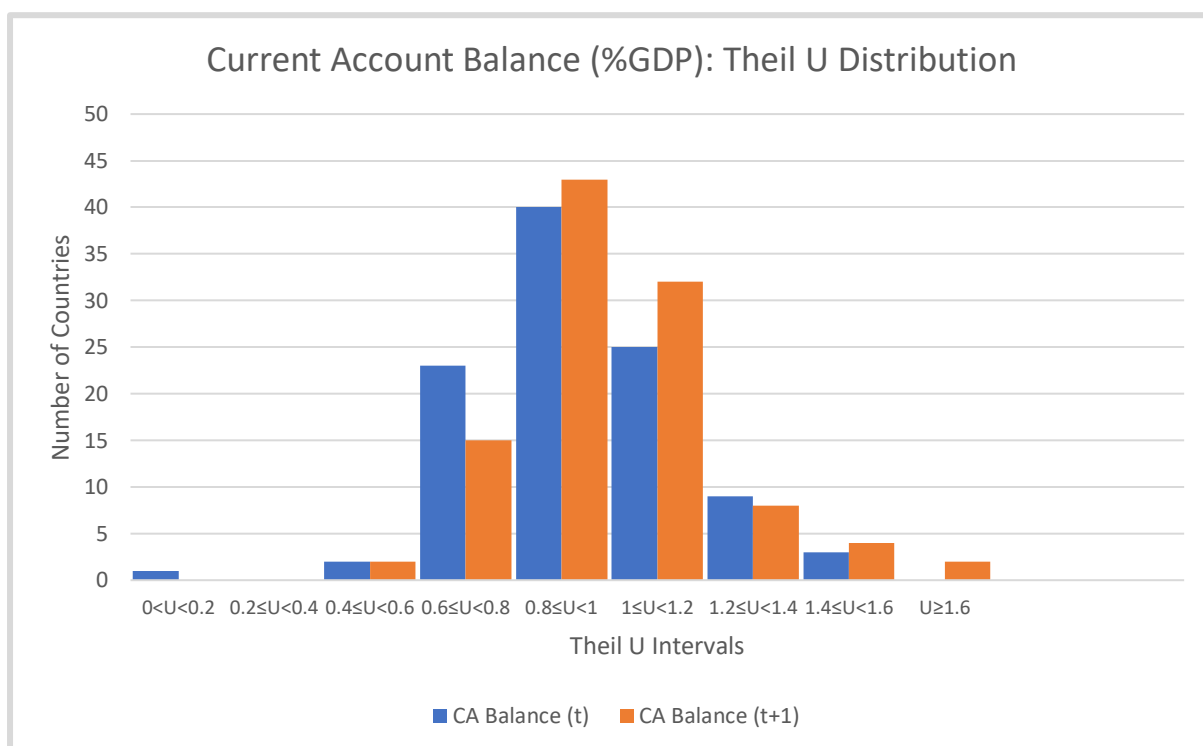


Figure 14: Theil U Distribution- Budget Deficit (%GDP)

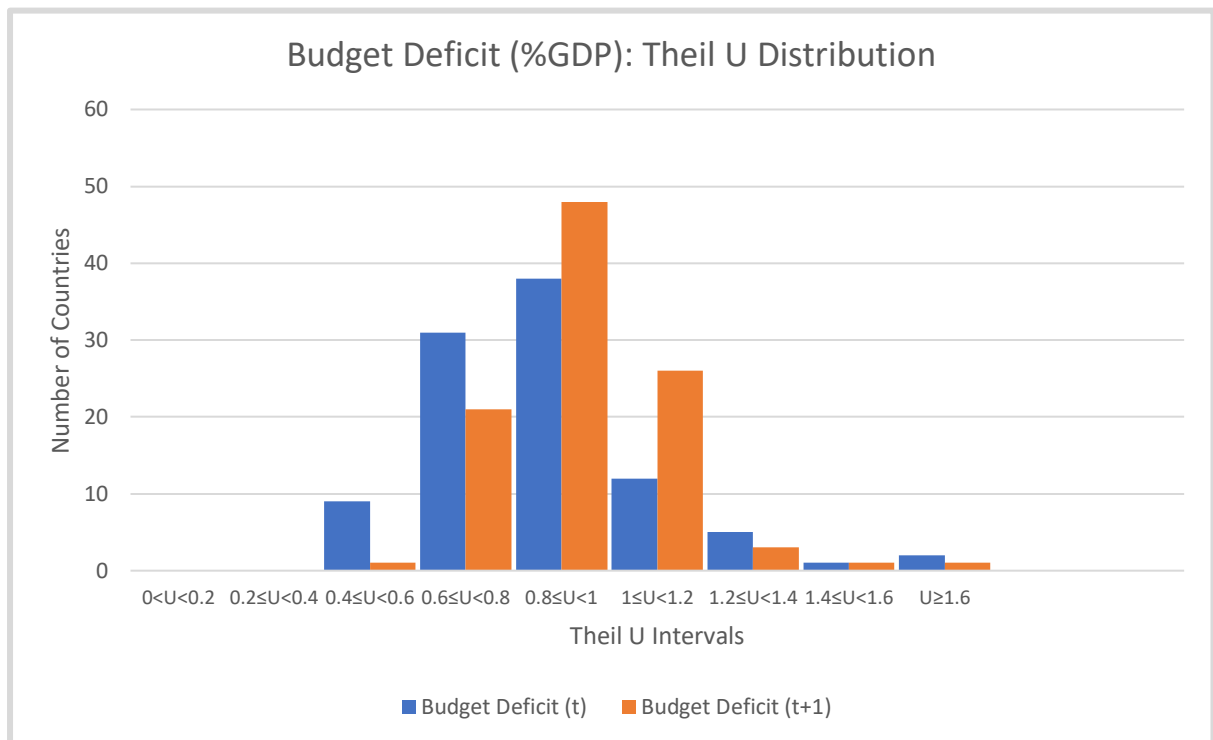
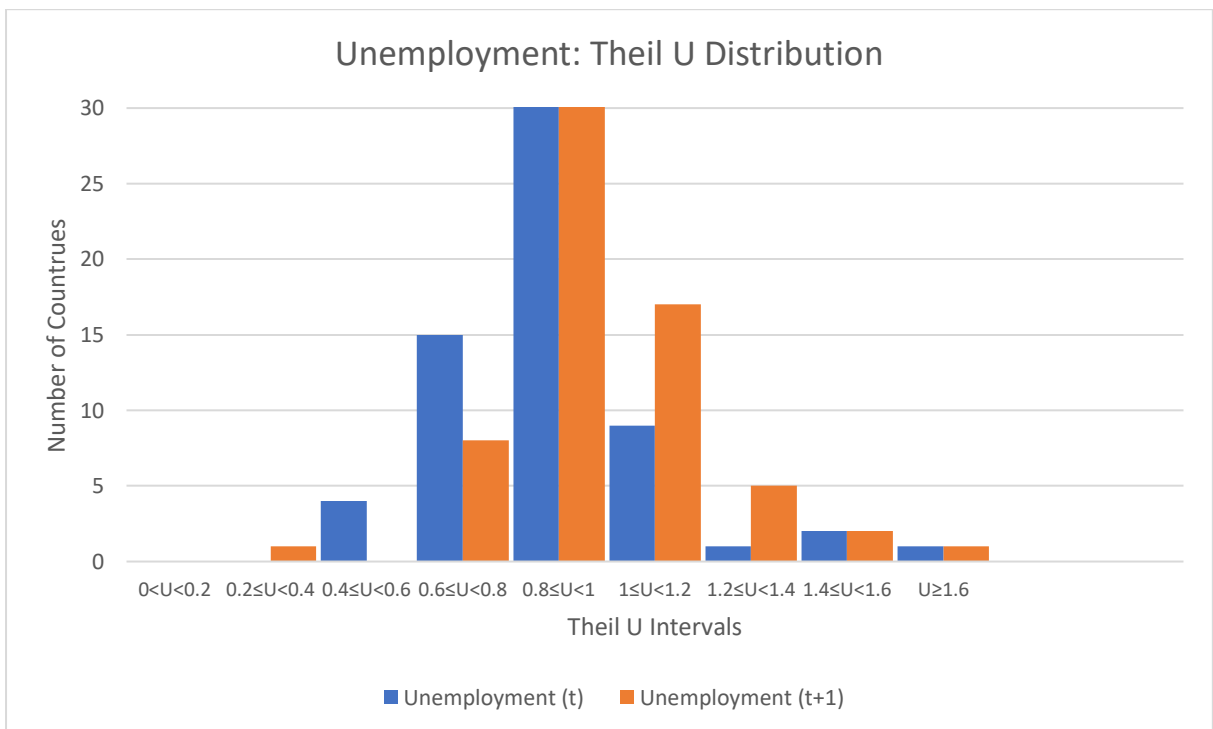


Figure 15: Theil U Distribution- Unemployment



V. Conclusion

In conclusion, this paper set out to investigate the accuracy of country-level EIU forecasts, regarding six economic variables (Real GDP Growth, Inflation (CPI), Short-Term Interbank Rate, Budget Deficit, Current Account Balance and Unemployment). Four major hypotheses were identified and a range of methods were used to measure the accuracy of the economic variables during the period 1996-2013.

The first *a priori* hypothesis was that EIU forecasts would be more accurate than No-Change-Forecasts. This paper considered the No-Change-Forecast to be a naïve forecast replicating the previous time period (i.e. 't-1') and the hypothesis was tested using Modified Theil U-Statistics ('Theil U'). Generally, this hypothesis was shown to be true across all countries at the Current-Year (t) forecast horizon for Real GDP Growth, Inflation and Budget Deficit. The Current-Year (t) forecasts for Short-Term Interbank Rate, Current Account Balance and Unemployment performed less well but on average were not significantly worse than naïve forecasts. On the One-Year-Ahead (t+1) horizon, Short-Term Interbank Rate, Current Account Balance, Budget Deficit and Unemployment were variables where a high proportion of countries with Theil $U > 1$. Therefore, generally the hypothesis that EIU forecasts would perform better than No-Change-Forecasts was true for all variables over the Current-Year (t) forecast horizon, but over the One-Year-Ahead (t+1) forecast horizon the same could only be said for Real GDP Growth and Inflation (CPI) forecasts.

The second *a priori* hypothesis of this paper was that EIU forecasts for higher income countries are more accurate than those for lower income countries. Generally, the results suggest this to be the case, with Average MAE and Average RMSE values significantly higher for lower income countries (LMI and LI) than for higher income countries (HI and UMI) for Inflation (CPI), Current Account Balance and Unemployment. The major exception to this was Short-Term Interbank Rate forecasts, where UMI countries' forecasts performed significantly worse than other country income categories.

The third major hypothesis stated at the beginning of this paper was that the accuracy of EIU forecasts decreases as forecast horizon increases. For the five economic variables measured using data from 103 countries, the values of median and average MAE, median and average

RMSE and average Theil U Statistic showed that this prediction was uniformly correct. Using these three different accuracy measures, the One-Year-Ahead (t+1) forecasts were shown to be less accurate than the Current-Year (t) forecasts. The same results occurred during the analysis of Unemployment forecasts, using data from 68 countries, with the median MAE and RMSE, average MAE and RMSE measures and average Theil U Statistic showing that One-Year-Ahead (t+1) forecast errors were significantly larger than Current-Year (t) forecast errors.

The fourth and final *a priori* hypothesis of this paper was that the accuracy of EIU forecasts was relatively lower during the period of the Global Financial Crisis (2008-2009) than in other periods. By graphically illustrating the average RMSE of each variable over the period 1996-2013, shown against global trends regarding the variable, the results showed this prediction to be true for all six economic variables. While forecast errors for all variables was shown to be correlated with that variable's volatility, the largest relative increases in forecast errors in 2008-2009 were for Real GDP Growth, Current Account Balance, Budget Deficit and Unemployment Rate. This finding is significant as it suggests that at times of economic volatility, when economic forecasts are regarded as being most important, these forecasts are at their most inaccurate.

Further findings of this paper's analysis, not based on any *a priori* hypotheses, came from Mean Error (ME) results for EIU forecasts over the period 1996-2013. For Current-Year (t) forecasts, HI countries had Short-Term Interbank Rate forecasts significantly overestimating the actual values, while Inflation (CPI), Current Account Balance and Budget Deficit had higher-income countries forecasts significantly underestimating the actual values. For One-Year-Ahead (t+1) forecasts, higher income countries had Real GDP Growth and Short-Term Interbank Rate forecasts that significantly overestimated the actual values, while Current Account Balance (%GDP) forecasts significantly underestimated the actual values. LMI countries also had significant underestimates of Inflation (CPI) and overestimates of Short-Term Interbank Rate over the One-Year-Ahead (t+1) forecast horizon, between 1996 and 2013.

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VII. Appendices

7.1. Appendix One: Raw Data

7.1.1. All Variables Raw Data (Excl. Unemployment)

7.1.2. Unemployment Raw Data

7.2. Appendix Two: RMSE, MAE, ME & Enhanced Theil U ('Theil U')

7.2.1. All Variables- RMSE, MAE, ME & Theil U (Excl. Unemployment)

Country	Cat.	Variable	Time	Obs.	St Dev	Sum(^2)	RMSE	Theils U	MAE	ME
Angola	LMI	Budget deficit (% of GDP)	t	12.00	3.85	218.49	4.27	0.95	3.58	-2.14
Angola	LMI	Cons Price Infl. (av)	t	11.00	74.91	58118.68	72.69	1.09	39.22	-13.47
Angola	LMI	Curr Acc Bal (% of GDP)	t	12.00	7.14	1296.01	10.39	0.72	8.79	-7.83
Angola	LMI	Real GDP	t	13.00	4.44	237.09	4.27	0.74	3.56	-0.08
Angola	LMI	Short-term Interbank rate	t	10.00	15.62	2251.88	15.01	0.87	9.04	2.34
Angola	LMI	Budget deficit (% of GDP)	t+1	11.00	5.44	424.85	6.21	1.05	4.88	-3.43
Angola	LMI	Cons Price Infl. (av)	t+1	10.00	58.56	32121.99	56.68	0.57	39.89	11.21
Angola	LMI	Curr Acc Bal (% of GDP)	t+1	11.00	15.48	4017.74	19.11	0.95	17.95	-12.15
Angola	LMI	Real GDP	t+1	12.00	6.10	429.49	5.98	0.73	5.18	-1.31
Angola	LMI	Short-term Interbank rate	t+1	9.00	27.79	6180.77	26.21	1.24	19.97	-0.21
Argentina	UMI	Budget deficit (% of GDP)	t	13.00	1.04	13.00	1.00	0.65	0.75	-0.03
Argentina	UMI	Cons Price Infl. (av)	t	16.00	4.19	267.39	4.09	0.51	2.67	0.51
Argentina	UMI	Curr Acc Bal (% of GDP)	t	13.00	1.91	56.81	2.09	0.75	1.64	-1.01
Argentina	UMI	Real GDP	t	16.00	3.33	173.59	3.29	0.51	2.76	-0.66
Argentina	UMI	Short-term Interbank rate	t	13.00	11.95	1714.65	11.48	0.67	7.50	-0.27
Argentina	UMI	Budget deficit (% of GDP)	t+1	12.00	1.90	39.87	1.82	0.77	1.56	-0.02
Argentina	UMI	Cons Price Infl. (av)	t+1	15.00	7.67	824.59	7.41	0.75	4.70	-0.29
Argentina	UMI	Curr Acc Bal (% of GDP)	t+1	12.00	3.09	136.90	3.38	0.76	2.40	-1.63
Argentina	UMI	Real GDP	t+1	15.00	6.32	558.49	6.10	0.76	5.10	-0.02
Argentina	UMI	Short-term Interbank rate	t+1	12.00	19.35	4178.94	18.66	0.77	11.30	-2.27
Australia	HI	Budget deficit (% of GDP)	t	12.00	1.33	22.99	1.38	0.94	0.98	0.54
Australia	HI	Cons Price Infl. (av)	t	16.00	0.87	11.52	0.85	0.56	0.66	0.08
Australia	HI	Curr Acc Bal (% of GDP)	t	12.00	1.21	16.06	1.16	0.81	1.05	0.08
Australia	HI	Real GDP	t	17.00	1.01	17.17	1.00	0.79	0.89	-0.23
Australia	HI	Short-term Interbank rate	t	12.00	0.91	9.87	0.91	0.57	0.54	0.26
Australia	HI	Budget deficit (% of GDP)	t+1	11.00	1.95	47.67	2.08	1.01	1.46	0.94
Australia	HI	Cons Price Infl. (av)	t+1	15.00	1.24	22.03	1.21	0.74	0.94	-0.18
Australia	HI	Curr Acc Bal (% of GDP)	t+1	11.00	1.69	29.41	1.64	0.91	1.48	0.30
Australia	HI	Real GDP	t+1	16.00	1.12	18.82	1.08	0.96	0.91	0.07
Australia	HI	Short-term Interbank rate	t+1	11.00	1.31	19.05	1.32	0.70	0.92	0.41
Austria	HI	Budget deficit (% of GDP)	t	16.00	0.68	7.28	0.67	0.53	0.55	-0.16
Austria	HI	Cons Price Infl. (av)	t	16.00	0.73	9.81	0.78	0.67	0.66	-0.33
Austria	HI	Curr Acc Bal (% of GDP)	t	16.00	1.30	27.11	1.30	0.72	1.06	-0.34
Austria	HI	Real GDP	t	17.00	0.91	13.32	0.89	0.42	0.73	-0.01
Austria	HI	Short-term Interbank rate	t	16.00	0.41	2.60	0.40	0.36	0.34	-0.04
Austria	HI	Budget deficit (% of GDP)	t+1	15.00	1.46	30.11	1.42	0.80	1.01	0.17
Austria	HI	Cons Price Infl. (av)	t+1	15.00	1.11	18.36	1.11	0.77	0.93	-0.25
Austria	HI	Curr Acc Bal (% of GDP)	t+1	15.00	2.08	63.40	2.06	1.05	1.63	-0.44
Austria	HI	Real GDP	t+1	16.00	1.90	56.91	1.89	0.71	1.37	0.41
Austria	HI	Short-term Interbank rate	t+1	15.00	1.17	24.80	1.29	0.78	1.12	0.61
Azerbaijan	LMI	Budget deficit (% of GDP)	t	10.00	4.56	235.86	4.86	1.21	3.42	2.20
Azerbaijan	LMI	Cons Price Infl. (av)	t	10.00	4.77	212.98	4.61	0.62	3.78	-0.92
Azerbaijan	LMI	Curr Acc Bal (% of GDP)	t	10.00	8.97	733.11	8.56	0.53	7.55	-0.91
Azerbaijan	LMI	Real GDP	t	10.00	5.30	279.17	5.28	0.72	4.69	-1.63
Azerbaijan	LMI	Short-term Interbank rate	t	10.00	1.71	33.84	1.84	1.67	1.36	-0.86
Azerbaijan	LMI	Budget deficit (% of GDP)	t+1	8.00	4.04	240.52	5.48	0.78	4.25	3.98
Azerbaijan	LMI	Cons Price Infl. (av)	t+1	9.00	7.20	465.65	7.19	0.77	5.92	-2.37
Azerbaijan	LMI	Curr Acc Bal (% of GDP)	t+1	8.00	16.37	1938.38	15.57	0.64	14.23	-2.78
Azerbaijan	LMI	Real GDP	t+1	8.00	9.00	857.10	10.35	0.80	7.20	-6.03
Azerbaijan	LMI	Short-term Interbank rate	t+1	9.00	2.04	80.05	2.98	2.03	2.32	-2.28
Bahrain	HI	Budget deficit (% of GDP)	t	10.00	4.64	340.06	5.83	1.72	4.32	-3.82
Bahrain	HI	Cons Price Infl. (av)	t	10.00	1.63	27.04	1.64	0.77	1.38	-0.56
Bahrain	HI	Curr Acc Bal (% of GDP)	t	10.00	6.00	466.49	6.83	1.43	5.55	-3.77
Bahrain	HI	Real GDP	t	10.00	1.20	13.13	1.15	0.68	0.83	-0.11
Bahrain	HI	Short-term Interbank rate	t	10.00	1.33	17.28	1.31	0.98	0.96	0.38
Bahrain	HI	Budget deficit (% of GDP)	t+1	9.00	7.32	663.27	8.58	1.44	6.01	-5.10
Bahrain	HI	Cons Price Infl. (av)	t+1	9.00	2.11	39.26	2.09	0.86	1.56	-0.64
Bahrain	HI	Curr Acc Bal (% of GDP)	t+1	9.00	9.06	1130.01	11.21	1.55	8.03	-7.26
Bahrain	HI	Real GDP	t+1	9.00	1.76	25.70	1.69	0.89	1.33	0.33
Bahrain	HI	Short-term Interbank rate	t+1	9.00	1.68	39.83	2.10	0.91	1.81	1.39

Country	Cat.	Variable	Time	Obs.	St Dev	Sum(^2)	RMSE	Theils U	MAE	ME
Bangladesh	LI	Budget deficit (% of GDP)	t	12.00	0.90	19.04	1.26	1.22	1.00	-0.92
Bangladesh	LI	Cons Price Infl. (av)	t	13.00	2.00	50.24	1.97	1.02	1.54	-0.42
Bangladesh	LI	Curr Acc Bal (% of GDP)	t	13.00	1.31	23.99	1.36	1.03	0.93	-0.52
Bangladesh	LI	Real GDP	t	13.00	0.35	2.80	0.46	0.66	0.38	-0.32
Bangladesh	LI	Short-term Interbank rate	t	12.00	1.23	19.25	1.27	1.36	0.96	0.48
Bangladesh	LI	Budget deficit (% of GDP)	t+1	11.00	1.60	36.48	1.82	1.16	1.16	-1.00
Bangladesh	LI	Cons Price Infl. (av)	t+1	12.00	2.48	80.41	2.59	0.97	2.13	-1.04
Bangladesh	LI	Curr Acc Bal (% of GDP)	t+1	12.00	1.35	25.37	1.45	0.88	1.09	-0.66
Bangladesh	LI	Real GDP	t+1	12.00	0.89	10.18	0.92	1.19	0.72	-0.35
Bangladesh	LI	Short-term Interbank rate	t+1	11.00	1.52	32.15	1.71	1.11	1.39	0.90
Belgium	HI	Budget deficit (% of GDP)	t	16.00	1.18	21.14	1.15	0.75	0.69	-0.11
Belgium	HI	Cons Price Infl. (av)	t	16.00	1.07	18.80	1.08	0.67	0.84	-0.31
Belgium	HI	Curr Acc Bal (% of GDP)	t	16.00	2.29	79.70	2.23	1.03	1.74	0.26
Belgium	HI	Real GDP	t	17.00	1.37	31.90	1.37	0.60	0.99	0.33
Belgium	HI	Short-term Interbank rate	t	16.00	0.48	3.50	0.47	0.41	0.39	0.00
Belgium	HI	Budget deficit (% of GDP)	t+1	15.00	1.84	48.32	1.79	0.85	1.15	0.21
Belgium	HI	Cons Price Infl. (av)	t+1	15.00	1.22	22.95	1.24	0.76	0.93	-0.37
Belgium	HI	Curr Acc Bal (% of GDP)	t+1	15.00	2.68	107.45	2.68	0.95	1.65	0.66
Belgium	HI	Real GDP	t+1	16.00	2.20	80.82	2.25	0.90	1.68	0.71
Belgium	HI	Short-term Interbank rate	t+1	15.00	1.20	25.96	1.32	0.77	1.16	0.63
Bolivia	LMI	Budget deficit (% of GDP)	t	12.00	3.54	186.81	3.95	1.01	3.08	-2.03
Bolivia	LMI	Cons Price Infl. (av)	t	16.00	1.87	57.24	1.89	0.45	1.38	0.54
Bolivia	LMI	Curr Acc Bal (% of GDP)	t	12.00	2.23	120.80	3.17	0.94	2.57	-2.35
Bolivia	LMI	Real GDP	t	16.00	1.65	40.70	1.59	1.11	1.20	0.06
Bolivia	LMI	Short-term Interbank rate	t	12.00	5.46	390.97	5.71	0.98	3.14	2.29
Bolivia	LMI	Budget deficit (% of GDP)	t+1	11.00	4.50	295.22	5.18	1.05	4.31	-2.91
Bolivia	LMI	Cons Price Infl. (av)	t+1	15.00	3.93	220.01	3.83	0.76	3.05	0.49
Bolivia	LMI	Curr Acc Bal (% of GDP)	t+1	11.00	4.44	350.49	5.64	1.05	4.77	-3.74
Bolivia	LMI	Real GDP	t+1	15.00	1.98	58.88	1.98	1.25	1.59	0.52
Bolivia	LMI	Short-term Interbank rate	t+1	11.00	5.65	462.04	6.48	0.95	4.35	3.60
Brazil	UMI	Budget deficit (% of GDP)	t	13.00	2.26	61.17	2.17	0.84	1.50	-0.10
Brazil	UMI	Cons Price Infl. (year-end)	t	16.00	4.35	296.19	4.30	1.06	2.72	0.89
Brazil	UMI	Curr Acc Bal (% of GDP)	t	13.00	1.32	24.58	1.38	0.95	1.15	-0.54
Brazil	UMI	Real GDP	t	16.00	2.26	77.09	2.20	0.65	1.64	-0.12
Brazil	UMI	Short-term Interbank rate	t	0.00	#DIV/0!	0.00	N/A	N/A	#DIV/0!	N/A
Brazil	UMI	Budget deficit (% of GDP)	t+1	12.00	3.10	106.33	2.98	0.92	2.14	-0.26
Brazil	UMI	Cons Price Infl. (year-end)	t+1	15.00	4.65	305.43	4.51	0.94	3.13	-0.42
Brazil	UMI	Curr Acc Bal (% of GDP)	t+1	12.00	2.30	70.82	2.43	1.02	1.90	-1.03
Brazil	UMI	Real GDP	t+1	15.00	2.71	114.54	2.76	0.82	2.48	0.88
Brazil	UMI	Short-term Interbank rate	t+1	0.00	#DIV/0!	0.00	N/A	N/A	#DIV/0!	N/A
Cameroon	LMI	Budget deficit (% of GDP)	t	9.00	1.78	26.57	1.72	0.86	1.50	-0.39
Cameroon	LMI	Cons Price Infl. (av)	t	9.00	1.50	18.25	1.42	0.75	1.21	0.19
Cameroon	LMI	Curr Acc Bal (% of GDP)	t	9.00	2.36	52.63	2.42	0.82	2.03	-0.94
Cameroon	LMI	Real GDP	t	9.00	1.38	15.33	1.31	0.59	1.01	0.03
Cameroon	LMI	Short-term Interbank rate	t	7.00	0.94	6.25	0.94	0.98	0.36	0.36
Cameroon	LMI	Budget deficit (% of GDP)	t+1	8.00	2.80	54.93	2.62	0.86	2.44	-0.06
Cameroon	LMI	Cons Price Infl. (av)	t+1	8.00	1.48	15.36	1.39	0.76	1.03	-0.08
Cameroon	LMI	Curr Acc Bal (% of GDP)	t+1	8.00	3.36	84.39	3.25	1.00	2.16	-0.81
Cameroon	LMI	Real GDP	t+1	8.00	2.27	39.17	2.21	0.89	1.34	0.64
Cameroon	LMI	Short-term Interbank rate	t+1	6.00	1.43	18.61	1.76	1.07	1.18	1.18
Canada	HI	Budget deficit (% of GDP)	t	15.00	0.86	10.89	0.85	0.70	0.74	0.19
Canada	HI	Cons Price Infl. (av)	t	16.00	0.64	6.11	0.62	0.66	0.49	0.01
Canada	HI	Curr Acc Bal (% of GDP)	t	15.00	1.21	20.63	1.17	0.80	0.89	-0.13
Canada	HI	Real GDP	t	16.00	1.16	20.18	1.12	0.54	0.83	0.01
Canada	HI	Short-term Interbank rate	t	15.00	0.73	8.22	0.74	0.65	0.49	0.21
Canada	HI	Budget deficit (% of GDP)	t+1	14.00	1.48	37.62	1.64	0.80	1.26	0.81
Canada	HI	Cons Price Infl. (av)	t+1	15.00	0.86	10.53	0.84	0.78	0.62	0.13
Canada	HI	Curr Acc Bal (% of GDP)	t+1	14.00	1.78	43.42	1.76	0.79	1.36	-0.39
Canada	HI	Real GDP	t+1	15.00	1.84	49.38	1.81	0.84	1.25	0.37
Canada	HI	Short-term Interbank rate	t+1	14.00	1.14	34.15	1.56	0.89	1.28	1.11

Country	Cat.	Variable	Time	Obs.	St Dev	Sum(^2)	RMSE	Theils U	MAE	ME
Chile	UMI	Budget deficit (% of GDP)	t	13.00	1.97	63.23	2.21	0.69	1.58	-1.13
Chile	UMI	Cons Price Infl. (av)	t	16.00	1.35	27.44	1.31	0.56	0.84	-0.05
Chile	UMI	Curr Acc Bal (% of GDP)	t	13.00	3.12	118.45	3.02	1.06	2.24	-0.39
Chile	UMI	Real GDP	t	16.00	1.37	29.69	1.36	0.43	1.11	0.31
Chile	UMI	Short-term Interbank rate	t	13.00	2.23	60.49	2.16	0.79	1.58	0.21
Chile	UMI	Budget deficit (% of GDP)	t+1	12.00	3.91	181.59	3.89	0.78	2.93	-1.04
Chile	UMI	Cons Price Infl. (av)	t+1	15.00	1.87	49.07	1.81	0.65	1.18	0.14
Chile	UMI	Curr Acc Bal (% of GDP)	t+1	12.00	2.38	70.28	2.42	0.82	2.15	-0.82
Chile	UMI	Real GDP	t+1	15.00	2.77	129.27	2.94	0.74	2.30	1.21
Chile	UMI	Short-term Interbank rate	t+1	12.00	3.07	128.58	3.27	0.84	2.77	1.45
China	LMI	Budget deficit (% of GDP)	t	12.00	0.87	9.40	0.89	0.69	0.67	-0.30
China	LMI	Cons Price Infl. (av)	t	16.00	2.77	125.32	2.80	0.91	2.05	0.81
China	LMI	Curr Acc Bal (% of GDP)	t	12.00	1.88	54.32	2.13	1.01	1.82	-1.13
China	LMI	Real GDP	t	16.00	1.00	21.87	1.17	1.04	0.97	-0.66
China	LMI	Short-term Interbank rate	t	12.00	0.88	9.51	0.89	1.04	0.54	0.29
China	LMI	Budget deficit (% of GDP)	t+1	11.00	1.55	23.97	1.48	0.85	1.17	-0.05
China	LMI	Cons Price Infl. (av)	t+1	15.00	4.60	349.80	4.83	1.20	3.53	1.89
China	LMI	Curr Acc Bal (% of GDP)	t+1	11.00	3.69	185.35	4.10	1.15	3.39	-2.12
China	LMI	Real GDP	t+1	15.00	1.64	46.95	1.77	1.14	1.39	-0.78
China	LMI	Short-term Interbank rate	t+1	11.00	1.00	15.11	1.17	1.12	0.97	0.68
Costa Rica	UMI	Budget deficit (% of GDP)	t	10.00	1.05	10.53	1.03	0.59	0.95	-0.25
Costa Rica	UMI	Cons Price Infl. (av)	t	10.00	2.15	43.36	2.08	0.77	1.58	-0.42
Costa Rica	UMI	Curr Acc Bal (% of GDP)	t	10.00	1.49	29.32	1.71	0.63	1.28	0.96
Costa Rica	UMI	Real GDP	t	8.00	2.47	48.24	2.46	0.83	2.05	-0.83
Costa Rica	UMI	Short-term Interbank rate	t	10.00	4.29	176.90	4.21	0.97	3.16	1.06
Costa Rica	UMI	Budget deficit (% of GDP)	t+1	9.00	2.29	42.83	2.18	0.91	1.97	0.28
Costa Rica	UMI	Cons Price Infl. (av)	t+1	9.00	3.17	83.19	3.04	0.81	2.68	-0.57
Costa Rica	UMI	Curr Acc Bal (% of GDP)	t+1	9.00	2.69	78.38	2.95	0.95	2.47	1.51
Costa Rica	UMI	Real GDP	t+1	8.00	3.46	85.35	3.27	0.74	2.49	-0.46
Costa Rica	UMI	Short-term Interbank rate	t+1	9.00	6.51	375.07	6.46	1.03	5.39	2.01
Cote d'Ivoire	LI	Budget deficit (% of GDP)	t	11.00	2.42	58.36	2.30	0.86	1.56	-0.05
Cote d'Ivoire	LI	Cons Price Infl. (av)	t	9.00	2.04	33.24	1.92	0.69	1.47	-0.07
Cote d'Ivoire	LI	Curr Acc Bal (% of GDP)	t	11.00	4.15	203.03	4.30	0.86	3.95	-1.68
Cote d'Ivoire	LI	Real GDP	t	11.00	3.47	130.02	3.44	0.64	2.13	0.93
Cote d'Ivoire	LI	Short-term Interbank rate	t	8.00	0.62	2.84	0.60	2.27	0.33	-0.13
Cote d'Ivoire	LI	Budget deficit (% of GDP)	t+1	10.00	2.51	58.53	2.42	0.95	1.57	0.43
Cote d'Ivoire	LI	Cons Price Infl. (av)	t+1	8.00	1.75	27.03	1.84	0.83	1.51	-0.84
Cote d'Ivoire	LI	Curr Acc Bal (% of GDP)	t+1	10.00	5.35	295.62	5.44	0.84	4.24	-1.94
Cote d'Ivoire	LI	Real GDP	t+1	10.00	4.58	200.42	4.48	1.22	2.92	1.08
Cote d'Ivoire	LI	Short-term Interbank rate	t+1	6.00	0.22	0.34	0.24	0.71	0.17	0.13
Croatia	UMI	Budget deficit (% of GDP)	t	12.00	0.94	11.03	0.96	1.12	0.84	0.33
Croatia	UMI	Cons Price Infl. (av)	t	16.00	1.39	28.91	1.34	0.74	0.98	0.07
Croatia	UMI	Curr Acc Bal (% of GDP)	t	14.00	1.78	41.58	1.72	0.86	1.50	0.11
Croatia	UMI	Real GDP	t	16.00	2.19	86.58	2.33	0.77	1.70	0.96
Croatia	UMI	Short-term Interbank rate	t	12.00	1.42	26.87	1.50	1.26	1.14	-0.63
Croatia	UMI	Budget deficit (% of GDP)	t+1	11.00	1.01	16.99	1.24	1.05	1.03	0.79
Croatia	UMI	Cons Price Infl. (av)	t+1	15.00	1.68	39.81	1.63	0.73	1.23	-0.07
Croatia	UMI	Curr Acc Bal (% of GDP)	t+1	13.00	3.17	122.33	3.07	0.99	2.78	-0.33
Croatia	UMI	Real GDP	t+1	15.00	3.36	219.71	3.83	0.94	2.75	2.02
Croatia	UMI	Short-term Interbank rate	t+1	11.00	1.82	47.90	2.09	1.96	1.56	-1.16
Cuba	UMI	Budget deficit (% of GDP)	t	12.00	1.27	22.97	1.38	0.93	0.91	0.66
Cuba	UMI	Cons Price Infl. (av)	t	13.00	2.87	100.55	2.78	1.21	2.04	-0.38
Cuba	UMI	Curr Acc Bal (% of GDP)	t	13.00	92.14	110129.16	92.04	1.23	26.83	-25.18
Cuba	UMI	Real GDP	t	13.00	2.17	56.91	2.09	0.96	1.73	0.15
Cuba	UMI	Short-term Interbank rate	t	0.00	#DIV/0!	0.00	N/A	N/A	#DIV/0!	N/A
Cuba	UMI	Budget deficit (% of GDP)	t+1	11.00	1.71	40.37	1.92	1.03	1.21	1.01
Cuba	UMI	Cons Price Infl. (av)	t+1	12.00	2.30	60.81	2.25	0.70	1.91	-0.48
Cuba	UMI	Curr Acc Bal (% of GDP)	t+1	12.00	118.50	168468.21	118.49	1.52	35.49	-34.18
Cuba	UMI	Real GDP	t+1	12.00	3.19	119.57	3.16	0.81	2.73	0.81
Cuba	UMI	Short-term Interbank rate	t+1	0.00	#DIV/0!	0.00	N/A	N/A	#DIV/0!	N/A

Country	Cat.	Variable	Time	Obs.	St Dev	Sum(^2)	RMSE	Theils U	MAE	ME
Cyprus	HI	Budget deficit (% of GDP)	t	10.00	2.02	36.70	1.92	0.76	1.74	-0.12
Cyprus	HI	Cons Price Infl. (av)	t	10.00	0.76	5.14	0.72	0.40	0.54	0.02
Cyprus	HI	Curr Acc Bal (% of GDP)	t	10.00	3.56	116.74	3.42	0.92	2.70	0.52
Cyprus	HI	Real GDP	t	10.00	0.94	11.52	1.07	0.62	0.84	0.60
Cyprus	HI	Short-term Interbank rate	t	10.00	1.13	13.02	1.14	0.68	0.78	0.38
Cyprus	HI	Budget deficit (% of GDP)	t+1	9.00	3.15	79.67	2.98	0.75	2.66	-0.12
Cyprus	HI	Cons Price Infl. (av)	t+1	9.00	1.24	12.43	1.18	0.73	0.83	0.10
Cyprus	HI	Curr Acc Bal (% of GDP)	t+1	9.00	5.21	311.65	5.88	1.70	4.01	3.23
Cyprus	HI	Real GDP	t+1	9.00	1.68	43.39	2.20	0.91	1.77	1.52
Cyprus	HI	Short-term Interbank rate	t+1	9.00	1.56	40.21	2.11	0.86	1.72	1.52
Czech Republic	HI	Budget deficit (% of GDP)	t	10.00	1.50	20.55	1.43	0.74	0.95	-0.13
Czech Republic	HI	Cons Price Infl. (av)	t	16.00	1.10	21.46	1.16	0.38	0.76	0.45
Czech Republic	HI	Curr Acc Bal (% of GDP)	t	13.00	1.83	40.27	1.76	0.75	1.55	-0.08
Czech Republic	HI	Real GDP	t	16.00	1.98	66.46	2.04	0.63	1.44	0.69
Czech Republic	HI	Short-term Interbank rate	t	12.00	0.45	3.33	0.53	1.08	0.36	0.31
Czech Republic	HI	Budget deficit (% of GDP)	t+1	10.00	2.37	50.94	2.26	0.80	1.88	0.20
Czech Republic	HI	Cons Price Infl. (av)	t+1	15.00	2.87	122.82	2.86	0.83	2.04	0.72
Czech Republic	HI	Curr Acc Bal (% of GDP)	t+1	12.00	1.99	45.15	1.94	0.76	1.68	-0.34
Czech Republic	HI	Real GDP	t+1	15.00	3.29	186.25	3.52	0.84	2.31	1.51
Czech Republic	HI	Short-term Interbank rate	t+1	11.00	0.70	9.29	0.92	1.39	0.72	0.63
Denmark	HI	Budget deficit (% of GDP)	t	16.00	1.66	43.87	1.66	0.95	1.11	-0.41
Denmark	HI	Cons Price Infl. (av)	t	16.00	1.17	22.40	1.18	0.64	0.73	-0.35
Denmark	HI	Curr Acc Bal (% of GDP)	t	16.00	2.59	107.53	2.59	1.06	2.13	-0.67
Denmark	HI	Real GDP	t	16.00	1.80	49.69	1.76	0.56	1.11	0.26
Denmark	HI	Short-term Interbank rate	t	16.00	1.34	26.95	1.30	0.92	0.76	0.11
Denmark	HI	Budget deficit (% of GDP)	t+1	15.00	2.37	78.66	2.29	0.83	1.72	-0.09
Denmark	HI	Cons Price Infl. (av)	t+1	15.00	1.33	26.44	1.33	0.77	0.80	-0.33
Denmark	HI	Curr Acc Bal (% of GDP)	t+1	15.00	3.56	198.23	3.64	1.10	2.90	-1.18
Denmark	HI	Real GDP	t+1	15.00	2.10	66.76	2.11	0.78	1.49	0.59
Denmark	HI	Short-term Interbank rate	t+1	15.00	1.87	59.29	1.99	0.96	1.59	0.83
Dominican Rep.	LMI	Central govt bal (% of GDP)	t	12.00	1.30	25.16	1.45	0.80	1.08	0.73
Dominican Rep.	LMI	Cons Price Infl. (year-end)	t	16.00	9.02	1360.31	9.22	0.88	4.68	-2.97
Dominican Rep.	LMI	Curr Acc Bal (% of GDP)	t	12.00	3.32	123.75	3.21	0.65	2.36	0.48
Dominican Rep.	LMI	Real GDP	t	16.00	2.74	136.06	2.92	0.87	2.38	-1.21
Dominican Rep.	LMI	Short-term Interbank rate	t	12.00	3.24	123.79	3.21	0.79	2.24	-0.84
Dominican Rep.	LMI	Central govt bal (% of GDP)	t+1	11.00	1.50	38.99	1.88	0.79	1.52	1.23
Dominican Rep.	LMI	Cons Price Infl. (year-end)	t+1	15.00	11.10	1970.22	11.46	0.76	5.91	-4.04
Dominican Rep.	LMI	Curr Acc Bal (% of GDP)	t+1	11.00	5.21	274.46	5.00	0.79	4.13	0.51
Dominican Rep.	LMI	Real GDP	t+1	15.00	3.57	192.64	3.58	0.80	3.05	-0.96
Dominican Rep.	LMI	Short-term Interbank rate	t+1	11.00	3.83	154.48	3.75	0.60	2.80	-0.85
Ecuador	LMI	Budget deficit (% of GDP)	t	12.00	1.42	25.79	1.47	0.81	1.21	-0.54
Ecuador	LMI	Cons Price Infl. (av)	t	13.00	9.83	1287.83	9.95	0.49	3.81	-3.15
Ecuador	LMI	Curr Acc Bal (% of GDP)	t	13.00	32.93	14204.74	33.06	0.18	11.11	-9.57
Ecuador	LMI	Real GDP	t	13.00	1.61	39.89	1.75	0.42	1.45	-0.82
Ecuador	LMI	Short-term Interbank rate	t	12.00	2.12	66.74	2.36	0.87	1.42	1.20
Ecuador	LMI	Budget deficit (% of GDP)	t+1	11.00	1.59	25.39	1.52	0.55	1.25	-0.03
Ecuador	LMI	Cons Price Infl. (av)	t+1	12.00	7.51	686.13	7.56	0.28	3.76	-2.34
Ecuador	LMI	Curr Acc Bal (% of GDP)	t+1	12.00	213.17	546959.74	213.49	1.08	63.93	-62.67
Ecuador	LMI	Real GDP	t+1	12.00	1.93	44.18	1.92	0.42	1.65	-0.50
Ecuador	LMI	Short-term Interbank rate	t+1	11.00	1.91	74.42	2.60	0.82	2.07	1.85
Egypt	LMI	Budget deficit (% of GDP)	t	13.00	1.34	21.96	1.30	0.88	1.05	0.15
Egypt	LMI	Cons Price Infl. (av)	t	16.00	3.72	217.70	3.69	0.97	2.40	-0.80
Egypt	LMI	Curr Acc Bal (% of GDP)	t	13.00	2.17	59.43	2.14	1.39	1.56	-0.45
Egypt	LMI	Real GDP	t	16.00	1.34	27.07	1.30	0.86	0.82	0.08
Egypt	LMI	Short-term Interbank rate	t	12.00	0.41	1.98	0.41	0.86	0.28	0.10
Egypt	LMI	Budget deficit (% of GDP)	t+1	12.00	1.94	58.01	2.20	0.94	1.71	1.18
Egypt	LMI	Cons Price Infl. (av)	t+1	15.00	4.91	382.73	5.05	1.14	3.87	-1.73
Egypt	LMI	Curr Acc Bal (% of GDP)	t+1	12.00	3.09	106.42	2.98	1.15	2.47	-0.32
Egypt	LMI	Real GDP	t+1	15.00	2.19	77.02	2.27	0.96	1.85	0.81
Egypt	LMI	Short-term Interbank rate	t+1	11.00	0.75	5.62	0.71	1.11	0.49	-0.04

Country	Cat.	Variable	Time	Obs.	St Dev	Sum(^2)	RMSE	Theils U	MAE	ME
El Salvador	LMI	Budget deficit (% of GDP)	t	12.00	1.13	14.09	1.08	0.84	0.79	0.07
El Salvador	LMI	Cons Price Infl. (av)	t	13.00	1.25	19.70	1.23	0.44	1.00	-0.26
El Salvador	LMI	Curr Acc Bal (% of GDP)	t	12.00	1.24	21.43	1.34	0.75	1.16	0.61
El Salvador	LMI	Real GDP	t	13.00	1.38	27.67	1.46	0.76	1.16	0.61
El Salvador	LMI	Short-term Interbank rate	t	12.00	1.34	24.31	1.42	0.84	1.03	0.61
El Salvador	LMI	Budget deficit (% of GDP)	t+1	11.00	1.71	29.75	1.64	0.83	1.32	0.21
El Salvador	LMI	Cons Price Infl. (av)	t+1	12.00	2.36	61.58	2.27	0.69	1.87	-0.22
El Salvador	LMI	Curr Acc Bal (% of GDP)	t+1	11.00	1.86	48.83	2.11	1.07	1.77	1.14
El Salvador	LMI	Real GDP	t+1	12.00	1.95	49.85	2.04	0.83	1.46	0.81
El Salvador	LMI	Short-term Interbank rate	t+1	11.00	1.68	52.47	2.18	0.76	1.81	1.48
Equatorial Guinea	HI	Budget deficit (% of GDP)	t	8.00	5.45	217.23	5.21	0.79	4.06	-1.06
Equatorial Guinea	HI	Cons Price Infl. (av)	t	9.00	2.00	32.08	1.89	0.92	1.36	-0.09
Equatorial Guinea	HI	Curr Acc Bal (% of GDP)	t	9.00	9.39	707.98	8.87	0.53	7.78	-0.49
Equatorial Guinea	HI	Real GDP	t	9.00	4.75	187.21	4.56	0.50	2.57	0.86
Equatorial Guinea	HI	Short-term Interbank rate	t	8.00	0.96	7.37	0.96	1.00	0.39	0.34
Equatorial Guinea	HI	Budget deficit (% of GDP)	t+1	7.00	10.49	679.64	9.85	0.85	8.29	1.66
Equatorial Guinea	HI	Cons Price Infl. (av)	t+1	8.00	1.77	25.63	1.79	1.17	1.44	-0.69
Equatorial Guinea	HI	Curr Acc Bal (% of GDP)	t+1	8.00	11.03	854.84	10.34	0.62	8.85	-0.58
Equatorial Guinea	HI	Real GDP	t+1	7.00	5.09	155.74	4.72	0.49	3.83	0.00
Equatorial Guinea	HI	Short-term Interbank rate	t+1	7.00	1.85	24.44	1.87	1.22	1.31	0.74
Estonia	HI	Budget deficit (% of GDP)	t	10.00	1.75	31.44	1.77	0.83	1.52	-0.62
Estonia	HI	Cons Price Infl. (av)	t	10.00	2.21	45.53	2.13	0.54	1.75	-0.41
Estonia	HI	Curr Acc Bal (% of GDP)	t	10.00	4.29	165.43	4.07	0.73	3.15	-0.01
Estonia	HI	Real GDP	t	10.00	5.11	237.44	4.87	0.63	3.88	0.52
Estonia	HI	Short-term Interbank rate	t	10.00	1.52	21.27	1.46	0.85	0.95	-0.23
Estonia	HI	Budget deficit (% of GDP)	t+1	8.00	2.56	45.85	2.39	0.76	1.94	0.06
Estonia	HI	Cons Price Infl. (av)	t+1	9.00	3.28	104.40	3.41	0.76	2.64	-1.42
Estonia	HI	Curr Acc Bal (% of GDP)	t+1	8.00	7.65	448.39	7.49	0.87	4.91	-2.21
Estonia	HI	Real GDP	t+1	9.00	7.90	531.16	7.68	0.66	4.93	1.87
Estonia	HI	Short-term Interbank rate	t+1	9.00	1.83	31.51	1.87	0.84	1.23	-0.72
Ethiopia	LI	Budget deficit (% of GDP)	t	7.00	0.49	6.26	0.95	0.94	0.83	-0.83
Ethiopia	LI	Cons Price Infl. (av)	t	11.00	11.95	1832.88	12.91	0.76	10.05	-6.07
Ethiopia	LI	Curr Acc Bal (% of GDP)	t	10.00	7.22	486.93	6.98	1.05	5.63	1.33
Ethiopia	LI	Real GDP	t	11.00	2.17	50.31	2.14	0.39	1.59	-0.54
Ethiopia	LI	Short-term Interbank rate	t	6.00	2.92	55.89	3.05	1.00	1.48	-1.48
Ethiopia	LI	Budget deficit (% of GDP)	t+1	6.00	1.09	17.97	1.73	1.04	1.45	-1.42
Ethiopia	LI	Cons Price Infl. (av)	t+1	10.00	12.24	2526.74	15.90	0.80	12.02	-10.86
Ethiopia	LI	Curr Acc Bal (% of GDP)	t+1	9.00	7.35	438.67	6.98	0.96	5.74	0.83
Ethiopia	LI	Real GDP	t+1	10.00	4.42	179.63	4.24	0.72	3.05	-0.59
Ethiopia	LI	Short-term Interbank rate	t+1	5.00	3.23	87.90	4.19	1.01	3.04	-3.04
Finland	HI	Cons Price Infl. (av)	t	16.00	0.89	12.80	0.89	0.76	0.66	-0.25
Finland	HI	Curr Acc Bal (% of GDP)	t	16.00	1.50	34.16	1.46	0.85	1.30	0.18
Finland	HI	Real GDP	t	16.00	2.26	76.71	2.19	0.54	1.66	0.01
Finland	HI	Short-term Interbank rate	t	16.00	1.22	22.42	1.18	0.77	0.69	0.04
Finland	HI	Cons Price Infl. (av)	t+1	15.00	1.12	18.60	1.11	0.69	0.89	-0.25
Finland	HI	Curr Acc Bal (% of GDP)	t+1	15.00	1.79	48.41	1.80	0.90	1.46	0.50
Finland	HI	Real GDP	t+1	15.00	3.42	168.98	3.36	0.74	2.48	0.57
Finland	HI	Short-term Interbank rate	t+1	15.00	1.44	35.36	1.54	0.98	1.17	0.65
France	HI	Budget deficit (% of GDP)	t	16.00	0.81	9.86	0.79	0.53	0.54	0.05
France	HI	Cons Price Infl. (av)	t	16.00	0.50	4.27	0.52	0.49	0.44	-0.17
France	HI	Curr Acc Bal (% of GDP)	t	16.00	0.80	9.86	0.79	0.93	0.56	0.14
France	HI	Real GDP	t	16.00	0.62	5.84	0.60	0.33	0.44	-0.04
France	HI	Short-term Interbank rate	t	16.00	0.50	3.75	0.48	0.44	0.41	0.03
France	HI	Budget deficit (% of GDP)	t+1	15.00	1.86	52.50	1.87	0.79	1.37	0.53
France	HI	Cons Price Infl. (av)	t+1	15.00	0.83	9.64	0.80	0.77	0.63	-0.07
France	HI	Curr Acc Bal (% of GDP)	t+1	15.00	1.15	23.37	1.25	1.01	0.94	0.57
France	HI	Real GDP	t+1	15.00	1.42	31.56	1.45	0.78	1.01	0.47
France	HI	Short-term Interbank rate	t+1	15.00	1.19	26.47	1.33	0.80	1.18	0.67
Gabon	UMI	Budget deficit (% of GDP)	t	10.00	4.16	171.04	4.14	1.00	3.56	-1.24
Gabon	UMI	Cons Price Infl. (av)	t	10.00	2.10	41.42	2.04	0.91	1.52	0.42
Gabon	UMI	Curr Acc Bal (% of GDP)	t	10.00	6.72	868.36	9.32	1.27	6.80	-6.80
Gabon	UMI	Real GDP	t	10.00	2.56	59.92	2.45	0.85	1.86	-0.28
Gabon	UMI	Short-term Interbank rate	t	8.00	0.27	1.34	0.41	1.67	0.38	0.33
Gabon	UMI	Budget deficit (% of GDP)	t+1	9.00	6.42	371.68	6.43	1.22	5.80	-2.16
Gabon	UMI	Cons Price Infl. (av)	t+1	9.00	2.47	48.98	2.33	0.72	1.78	0.00
Gabon	UMI	Curr Acc Bal (% of GDP)	t+1	9.00	10.10	2164.96	15.51	1.47	14.38	-12.24
Gabon	UMI	Real GDP	t+1	9.00	2.99	83.53	3.05	0.88	2.48	-1.14
Gabon	UMI	Short-term Interbank rate	t+1	7.00	0.50	7.91	1.06	1.91	0.96	0.96

Country	Cat.	Variable	Time	Obs.	St Dev	Sum(^2)	RMSE	Theils U	MAE	ME
Germany	HI	Cons Price Infl. (av)	t	16.00	0.51	4.91	0.55	0.56	0.47	-0.26
Germany	HI	Curr Acc Bal (% of GDP)	t	16.00	1.42	36.69	1.51	1.03	1.19	-0.64
Germany	HI	Real GDP	t	16.00	1.29	24.92	1.25	0.44	0.94	0.01
Germany	HI	Short-term Interbank rate	t	16.00	0.46	3.11	0.44	0.39	0.34	0.01
Germany	HI	Cons Price Infl. (av)	t+1	15.00	0.84	9.98	0.82	0.65	0.72	-0.12
Germany	HI	Curr Acc Bal (% of GDP)	t+1	15.00	1.78	60.01	2.00	0.93	1.65	-1.02
Germany	HI	Real GDP	t+1	15.00	2.36	84.36	2.37	0.75	1.71	0.67
Germany	HI	Short-term Interbank rate	t+1	15.00	1.20	25.94	1.32	0.79	1.15	0.63
Ghana	LI	Budget deficit (% of GDP)	t	13.00	1.92	44.40	1.85	0.63	1.43	-0.08
Ghana	LI	Cons Price Infl. (av)	t	13.00	6.84	661.03	7.13	0.80	5.30	-2.78
Ghana	LI	Curr Acc Bal (% of GDP)	t	13.00	150.74	294831.30	150.60	0.69	45.86	-41.29
Ghana	LI	Real GDP	t	13.00	1.89	43.20	1.82	0.60	1.09	-0.15
Ghana	LI	Short-term Interbank rate	t	10.00	6.21	385.90	6.21	0.82	4.64	-1.96
Ghana	LI	Budget deficit (% of GDP)	t+1	12.00	2.91	93.89	2.80	0.80	2.34	0.26
Ghana	LI	Cons Price Infl. (av)	t+1	12.00	7.14	752.11	7.92	0.90	5.08	-3.99
Ghana	LI	Curr Acc Bal (% of GDP)	t+1	12.00	125.93	189802.17	125.77	0.55	41.24	-35.78
Ghana	LI	Real GDP	t+1	12.00	0.95	10.14	0.92	0.32	0.75	-0.12
Ghana	LI	Short-term Interbank rate	t+1	9.00	6.84	375.66	6.46	0.65	5.71	0.38
Greece	HI	Budget deficit (% of GDP)	t	16.00	2.45	99.54	2.49	0.83	1.50	0.78
Greece	HI	Cons Price Infl. (av)	t	16.00	1.02	19.46	1.10	0.65	0.84	-0.50
Greece	HI	Curr Acc Bal (% of GDP)	t	16.00	3.32	177.54	3.33	1.07	2.41	0.86
Greece	HI	Real GDP	t	16.00	1.29	25.27	1.26	0.88	0.91	0.13
Greece	HI	Short-term Interbank rate	t	16.00	2.28	78.71	2.22	0.80	1.46	-0.19
Greece	HI	Budget deficit (% of GDP)	t+1	15.00	3.32	188.15	3.54	0.91	2.34	1.50
Greece	HI	Cons Price Infl. (av)	t+1	15.00	1.23	26.72	1.33	0.74	1.09	-0.61
Greece	HI	Curr Acc Bal (% of GDP)	t+1	15.00	3.66	231.47	3.93	1.10	3.13	1.71
Greece	HI	Real GDP	t+1	15.00	2.81	138.85	3.04	1.19	1.98	1.38
Greece	HI	Short-term Interbank rate	t+1	15.00	3.47	169.55	3.36	0.96	2.31	0.30
Guatemala	LMI	Budget deficit (% of GDP)	t	12.00	0.65	4.62	0.62	0.79	0.47	0.05
Guatemala	LMI	Cons Price Infl. (av)	t	13.00	2.11	54.02	2.04	0.60	1.58	-0.22
Guatemala	LMI	Curr Acc Bal (% of GDP)	t	12.00	2.33	59.79	2.23	0.86	1.58	0.16
Guatemala	LMI	Real GDP	t	13.00	1.12	14.98	1.07	0.55	0.77	-0.03
Guatemala	LMI	Short-term Interbank rate	t	12.00	2.47	95.19	2.82	1.05	1.68	1.53
Guatemala	LMI	Budget deficit (% of GDP)	t+1	11.00	0.54	3.36	0.55	0.68	0.40	0.20
Guatemala	LMI	Cons Price Infl. (av)	t+1	12.00	3.67	150.06	3.54	0.97	2.80	-0.37
Guatemala	LMI	Curr Acc Bal (% of GDP)	t+1	11.00	2.37	63.59	2.40	0.88	2.10	0.83
Guatemala	LMI	Real GDP	t+1	12.00	2.23	58.01	2.20	0.83	1.66	0.54
Guatemala	LMI	Short-term Interbank rate	t+1	11.00	3.08	203.19	4.30	0.95	3.14	3.14
Honduras	LMI	Budget deficit (% of GDP)	t	12.00	1.76	34.79	1.70	0.86	1.18	0.28
Honduras	LMI	Cons Price Infl. (av)	t	13.00	1.98	48.81	1.94	0.78	1.50	0.35
Honduras	LMI	Curr Acc Bal (% of GDP)	t	12.00	3.71	163.00	3.69	0.71	2.88	1.00
Honduras	LMI	Real GDP	t	13.00	2.39	70.77	2.33	0.60	1.64	0.42
Honduras	LMI	Short-term Interbank rate	t	12.00	3.31	137.74	3.39	1.21	2.33	1.20
Honduras	LMI	Budget deficit (% of GDP)	t+1	11.00	2.19	54.51	2.23	1.00	1.74	0.77
Honduras	LMI	Cons Price Infl. (av)	t+1	12.00	2.80	93.07	2.78	0.92	2.21	0.76
Honduras	LMI	Curr Acc Bal (% of GDP)	t+1	11.00	4.08	192.67	4.19	0.86	2.54	1.54
Honduras	LMI	Real GDP	t+1	12.00	3.30	125.96	3.24	0.73	2.05	0.72
Honduras	LMI	Short-term Interbank rate	t+1	11.00	4.34	229.00	4.56	1.51	3.31	1.93
Hong Kong	HI	Budget deficit (% of GDP)	t	12.00	2.71	80.52	2.59	0.94	2.23	0.00
Hong Kong	HI	Cons Price Infl. (av)	t	16.00	1.80	58.16	1.91	0.80	1.40	0.78
Hong Kong	HI	Curr Acc Bal (% of GDP)	t	12.00	4.54	260.88	4.66	1.17	3.83	-1.68
Hong Kong	HI	Real GDP	t	16.00	3.56	191.72	3.46	0.60	2.40	-0.26
Hong Kong	HI	Short-term Interbank rate	t	12.00	0.81	10.26	0.92	0.72	0.65	0.50
Hong Kong	HI	Budget deficit (% of GDP)	t+1	11.00	4.12	169.64	3.93	1.00	3.62	-0.11
Hong Kong	HI	Cons Price Infl. (av)	t+1	15.00	3.40	216.25	3.80	1.05	2.94	1.90
Hong Kong	HI	Curr Acc Bal (% of GDP)	t+1	11.00	4.92	310.23	5.31	1.11	4.46	-2.48
Hong Kong	HI	Real GDP	t+1	15.00	5.33	399.56	5.16	0.76	4.25	0.41
Hong Kong	HI	Short-term Interbank rate	t+1	11.00	1.32	46.24	2.05	0.98	1.87	1.62
Hungary	HI	Budget deficit (% of GDP)	t	13.00	2.57	80.19	2.48	0.78	1.65	0.25
Hungary	HI	Cons Price Infl. (av)	t	16.00	1.30	26.16	1.28	0.46	1.06	-0.24
Hungary	HI	Curr Acc Bal (% of GDP)	t	14.00	2.15	61.16	2.09	1.02	1.81	-0.30
Hungary	HI	Real GDP	t	16.00	1.39	29.78	1.36	0.44	1.04	0.25
Hungary	HI	Short-term Interbank rate	t	13.00	1.59	32.45	1.58	0.70	1.27	-0.41
Hungary	HI	Budget deficit (% of GDP)	t+1	12.00	2.91	109.57	3.02	0.82	2.26	1.16
Hungary	HI	Cons Price Infl. (av)	t+1	15.00	1.75	54.04	1.90	0.46	1.71	-0.87
Hungary	HI	Curr Acc Bal (% of GDP)	t+1	13.00	3.29	135.53	3.23	1.01	2.72	-0.65
Hungary	HI	Real GDP	t+1	15.00	3.03	154.13	3.21	0.89	1.94	1.31
Hungary	HI	Short-term Interbank rate	t+1	12.00	1.54	39.42	1.81	0.68	1.23	-1.05

Country	Cat.	Variable	Time	Obs.	St Dev	Sum(^2)	RMSE	Theils U	MAE	ME
Slovenia	HI	Budget deficit (% of GDP)	t	12.00	1.60	28.58	1.54	0.71	0.90	0.22
Slovenia	HI	Cons Price Infl. (av)	t	16.00	1.05	17.40	1.04	0.57	0.81	-0.25
Slovenia	HI	Curr Acc Bal (% of GDP)	t	16.00	2.07	65.47	2.02	0.92	1.51	-0.24
Slovenia	HI	Real GDP	t	16.00	2.50	97.95	2.47	0.64	1.33	0.52
Slovenia	HI	Short-term Interbank rate	t	16.00	2.51	94.46	2.43	0.87	1.41	0.09
Slovenia	HI	Budget deficit (% of GDP)	t+1	11.00	2.36	64.29	2.42	0.90	1.72	0.88
Slovenia	HI	Cons Price Infl. (av)	t+1	15.00	1.73	42.27	1.68	0.68	1.42	-0.10
Slovenia	HI	Curr Acc Bal (% of GDP)	t+1	15.00	2.80	111.11	2.72	0.95	2.18	-0.34
Slovenia	HI	Real GDP	t+1	15.00	3.32	172.60	3.39	0.76	1.91	1.11
Slovenia	HI	Short-term Interbank rate	t+1	15.00	3.78	205.15	3.70	0.89	2.90	0.55
South Africa	UMI	Budget deficit (% of GDP)	t	12.00	1.82	36.29	1.74	0.85	1.23	-0.03
South Africa	UMI	Cons Price Infl. (av)	t	16.00	1.78	55.04	1.85	0.77	1.21	-0.68
South Africa	UMI	Curr Acc Bal (% of GDP)	t	12.00	1.56	26.97	1.50	0.99	1.33	0.11
South Africa	UMI	Real GDP	t	16.00	0.90	13.18	0.91	0.73	0.78	0.25
South Africa	UMI	Short-term Interbank rate	t	12.00	1.30	18.65	1.25	0.63	0.91	0.01
South Africa	UMI	Budget deficit (% of GDP)	t+1	11.00	2.86	85.39	2.79	0.97	2.15	0.55
South Africa	UMI	Cons Price Infl. (av)	t+1	15.00	2.26	82.53	2.35	0.67	1.63	-0.85
South Africa	UMI	Curr Acc Bal (% of GDP)	t+1	11.00	2.34	57.73	2.29	0.92	2.05	0.52
South Africa	UMI	Real GDP	t+1	15.00	1.41	42.16	1.68	0.96	1.31	0.97
South Africa	UMI	Short-term Interbank rate	t+1	11.00	2.10	46.42	2.05	0.63	1.78	0.47
South Korea	HI	Budget deficit (% of GDP)	t	12.00	1.55	30.99	1.61	0.70	1.28	-0.63
South Korea	HI	Cons Price Infl. (av)	t	16.00	0.90	18.30	1.07	0.48	0.86	-0.63
South Korea	HI	Curr Acc Bal (% of GDP)	t	12.00	1.91	44.66	1.93	0.75	1.48	-0.62
South Korea	HI	Real GDP	t	16.00	3.32	169.40	3.25	0.54	2.24	-0.48
South Korea	HI	Short-term Interbank rate	t	12.00	1.11	16.38	1.17	1.08	0.72	0.48
South Korea	HI	Budget deficit (% of GDP)	t+1	11.00	2.24	51.56	2.17	0.71	1.60	-0.36
South Korea	HI	Cons Price Infl. (av)	t+1	15.00	1.91	55.25	1.92	0.85	1.37	-0.51
South Korea	HI	Curr Acc Bal (% of GDP)	t+1	11.00	2.12	61.89	2.37	0.80	1.81	-1.25
South Korea	HI	Real GDP	t+1	15.00	4.72	318.62	4.61	0.74	2.96	0.67
South Korea	HI	Short-term Interbank rate	t+1	11.00	1.00	16.25	1.22	1.22	0.88	0.75
Spain	HI	Budget deficit (% of GDP)	t	16.00	1.91	54.85	1.85	0.69	1.31	0.16
Spain	HI	Cons Price Infl. (av)	t	16.00	0.72	11.01	0.83	0.59	0.77	-0.44
Spain	HI	Curr Acc Bal (% of GDP)	t	16.00	1.46	35.08	1.48	0.93	1.23	0.43
Spain	HI	Real GDP	t	16.00	0.56	5.03	0.56	0.33	0.48	-0.16
Spain	HI	Short-term Interbank rate	t	16.00	0.55	4.49	0.53	0.40	0.44	0.03
Spain	HI	Budget deficit (% of GDP)	t+1	15.00	3.35	162.65	3.29	0.77	1.94	0.59
Spain	HI	Cons Price Infl. (av)	t+1	15.00	1.16	22.45	1.22	0.78	1.05	-0.50
Spain	HI	Curr Acc Bal (% of GDP)	t+1	15.00	2.21	82.54	2.35	0.89	2.04	0.97
Spain	HI	Real GDP	t+1	15.00	1.70	42.67	1.69	0.72	1.09	0.39
Spain	HI	Short-term Interbank rate	t+1	15.00	1.31	33.26	1.49	0.75	1.32	0.79
Sri Lanka	LMI	Budget deficit (% of GDP)	t	12.00	1.22	19.99	1.29	1.24	0.89	0.54
Sri Lanka	LMI	Cons Price Infl. (av)	t	13.00	5.02	342.75	5.13	0.79	4.05	-1.76
Sri Lanka	LMI	Curr Acc Bal (% of GDP)	t	12.00	1.67	36.13	1.74	0.83	1.56	0.68
Sri Lanka	LMI	Real GDP	t	13.00	1.77	37.52	1.70	0.65	1.08	-0.06
Sri Lanka	LMI	Short-term Interbank rate	t	12.00	3.09	106.24	2.98	0.74	2.48	-0.32
Sri Lanka	LMI	Budget deficit (% of GDP)	t+1	11.00	1.19	23.24	1.45	1.31	1.05	0.91
Sri Lanka	LMI	Cons Price Infl. (av)	t+1	12.00	6.37	591.93	7.02	0.83	5.01	-3.48
Sri Lanka	LMI	Curr Acc Bal (% of GDP)	t+1	11.00	2.09	47.26	2.07	0.87	1.67	0.58
Sri Lanka	LMI	Real GDP	t+1	12.00	2.18	55.36	2.15	0.72	1.62	0.52
Sri Lanka	LMI	Short-term Interbank rate	t+1	11.00	4.28	198.78	4.25	0.74	3.33	-1.18
Sudan	LMI	Budget deficit (% of GDP)	t	11.00	3.15	107.02	3.12	1.56	2.42	0.85
Sudan	LMI	Cons Price Infl. (av)	t	11.00	6.49	509.07	6.80	1.23	4.41	-2.83
Sudan	LMI	Curr Acc Bal (% of GDP)	t	11.00	5.63	322.53	5.41	1.23	4.19	0.68
Sudan	LMI	Real GDP	t	11.00	2.16	56.56	2.27	0.54	1.55	0.95
Sudan	LMI	Short-term Interbank rate	t	0.00	#DIV/0!	0.00	N/A	N/A	#DIV/0!	N/A
Sudan	LMI	Budget deficit (% of GDP)	t+1	10.00	3.14	106.74	3.27	1.15	2.46	1.34
Sudan	LMI	Cons Price Infl. (av)	t+1	10.00	7.65	664.05	8.15	1.09	6.03	-3.71
Sudan	LMI	Curr Acc Bal (% of GDP)	t+1	10.00	5.23	251.87	5.02	0.99	3.57	0.73
Sudan	LMI	Real GDP	t+1	10.00	5.14	264.00	5.14	0.80	3.12	1.62
Sudan	LMI	Short-term Interbank rate	t+1	0.00	#DIV/0!	0.00	N/A	N/A	#DIV/0!	N/A
Sweden	HI	Budget deficit (% of GDP)	t	16.00	0.93	16.28	1.01	0.53	0.70	-0.45
Sweden	HI	Cons Price Infl. (av)	t	16.00	0.84	12.51	0.88	1.03	0.63	0.34
Sweden	HI	Curr Acc Bal (% of GDP)	t	16.00	1.05	22.42	1.18	1.09	0.96	-0.61
Sweden	HI	Real GDP	t	16.00	1.74	45.41	1.68	0.54	1.32	-0.04
Sweden	HI	Short-term Interbank rate	t	16.00	0.98	16.51	1.02	0.78	0.76	0.37
Sweden	HI	Budget deficit (% of GDP)	t+1	15.00	1.95	56.36	1.94	0.67	1.44	-0.45
Sweden	HI	Cons Price Infl. (av)	t+1	15.00	1.15	22.95	1.24	0.98	0.97	0.55
Sweden	HI	Curr Acc Bal (% of GDP)	t+1	15.00	1.33	44.14	1.72	1.16	1.15	-1.13
Sweden	HI	Real GDP	t+1	15.00	2.68	100.89	2.59	0.69	1.95	0.17
Sweden	HI	Short-term Interbank rate	t+1	15.00	1.28	37.85	1.59	0.90	1.34	0.99

Country	Cat.	Variable	Time	Obs	St Dev	Sum(^2)	RMSE	Theils U	MAE	ME
Turkey	UMI	Budget deficit (% of GDP)	t	16.00	5.28	417.53	5.11	1.15	3.32	0.06
Turkey	UMI	Cons Price Infl. (av)	t	16.00	9.75	1433.65	9.47	1.07	6.08	0.63
Turkey	UMI	Curr Acc Bal (% of GDP)	t	13.00	2.93	109.82	2.91	0.80	2.49	0.74
Turkey	UMI	Real GDP	t	16.00	4.48	301.74	4.34	0.58	3.21	0.23
Turkey	UMI	Short-term Interbank rate	t	12.00	18.03	3582.80	17.28	0.87	9.15	-0.82
Turkey	UMI	Budget deficit (% of GDP)	t+1	15.00	5.57	445.98	5.45	1.08	3.81	0.87
Turkey	UMI	Cons Price Infl. (av)	t+1	15.00	16.31	3748.21	15.81	0.98	11.81	1.31
Turkey	UMI	Curr Acc Bal (% of GDP)	t+1	12.00	3.98	188.68	3.97	0.93	3.38	1.08
Turkey	UMI	Real GDP	t+1	15.00	5.78	489.44	5.71	0.84	4.32	1.19
Turkey	UMI	Short-term Interbank rate	t+1	11.00	15.63	2915.36	16.28	0.80	12.09	6.55
Uganda	LI	Budget deficit (% of GDP)	t	10.00	4.19	170.87	4.13	1.17	2.55	-1.13
Uganda	LI	Cons Price Infl. (av)	t	10.00	4.92	290.88	5.39	0.85	4.50	-2.70
Uganda	LI	Curr Acc Bal (% of GDP)	t	10.00	3.58	117.74	3.43	1.00	2.84	-0.50
Uganda	LI	Real GDP	t	10.00	0.91	7.53	0.87	1.11	0.69	0.01
Uganda	LI	Short-term Interbank rate	t	8.00	2.29	37.09	2.15	0.90	1.76	-0.21
Uganda	LI	Budget deficit (% of GDP)	t+1	9.00	5.43	280.42	5.58	1.08	3.42	-2.22
Uganda	LI	Cons Price Infl. (av)	t+1	9.00	4.09	248.03	5.25	0.95	4.08	-3.57
Uganda	LI	Curr Acc Bal (% of GDP)	t+1	9.00	4.29	152.55	4.12	0.97	3.57	-0.74
Uganda	LI	Real GDP	t+1	9.00	0.94	8.96	1.00	1.13	0.76	0.47
Uganda	LI	Short-term Interbank rate	t+1	7.00	1.68	41.47	2.43	1.84	1.96	-1.87
UK	HI	Budget deficit (% of GDP)	t	16.00	1.60	38.69	1.56	0.57	1.09	-0.13
UK	HI	Cons Price Infl. (av)	t	16.00	0.80	11.62	0.85	0.90	0.64	-0.35
UK	HI	Curr Acc Bal (% of GDP)	t	16.00	1.12	19.65	1.11	1.24	0.88	0.23
UK	HI	Real GDP	t	16.00	0.75	8.53	0.73	0.32	0.58	-0.09
UK	HI	Short-term Interbank rate	t	16.00	0.42	2.76	0.42	0.32	0.33	0.08
UK	HI	Budget deficit (% of GDP)	t+1	15.00	3.53	176.49	3.43	0.85	2.19	0.41
UK	HI	Cons Price Infl. (av)	t+1	15.00	1.07	19.17	1.13	1.16	0.86	-0.45
UK	HI	Curr Acc Bal (% of GDP)	t+1	15.00	1.36	32.91	1.48	1.34	1.13	0.69
UK	HI	Real GDP	t+1	15.00	2.13	65.12	2.08	0.77	1.24	0.31
UK	HI	Short-term Interbank rate	t+1	15.00	1.44	32.77	1.48	0.75	1.13	0.50
Ukraine	LMI	Budget deficit (% of GDP)	t	10.00	2.75	74.32	2.73	0.95	1.34	0.80
Ukraine	LMI	Cons Price Infl. (av)	t	10.00	5.02	227.93	4.77	0.71	2.79	-0.27
Ukraine	LMI	Curr Acc Bal (% of GDP)	t	10.00	3.56	113.98	3.38	0.87	2.98	0.14
Ukraine	LMI	Real GDP	t	11.00	4.65	217.12	4.44	0.49	3.69	0.22
Ukraine	LMI	Short-term Interbank rate	t	10.00	2.57	68.79	2.62	0.78	1.77	0.97
Ukraine	LMI	Budget deficit (% of GDP)	t+1	9.00	2.79	90.43	3.17	0.87	2.06	1.77
Ukraine	LMI	Cons Price Infl. (av)	t+1	9.00	7.02	430.08	6.91	0.72	4.91	-2.00
Ukraine	LMI	Curr Acc Bal (% of GDP)	t+1	9.00	4.24	146.15	4.03	0.70	3.30	0.48
Ukraine	LMI	Real GDP	t+1	10.00	7.97	589.77	7.68	0.73	4.99	1.33
Ukraine	LMI	Short-term Interbank rate	t+1	9.00	3.66	109.84	3.49	0.81	2.58	-0.53
United Arab Emirates	HI	Budget deficit (% of GDP)	t	11.00	3.98	348.05	5.63	0.93	4.26	-4.15
United Arab Emirates	HI	Cons Price Infl. (av)	t	11.00	3.53	132.81	3.47	0.75	2.63	-0.85
United Arab Emirates	HI	Curr Acc Bal (% of GDP)	t	11.00	5.40	442.66	6.34	1.18	5.44	-3.71
United Arab Emirates	HI	Real GDP	t	11.00	2.32	54.44	2.22	0.53	1.69	-0.20
United Arab Emirates	HI	Short-term Interbank rate	t	11.00	0.98	13.23	1.10	0.72	0.66	0.57
United Arab Emirates	HI	Budget deficit (% of GDP)	t+1	10.00	8.41	1230.73	11.09	1.23	9.19	-7.71
United Arab Emirates	HI	Cons Price Infl. (av)	t+1	10.00	6.64	410.59	6.41	0.89	5.41	-1.17
United Arab Emirates	HI	Curr Acc Bal (% of GDP)	t+1	10.00	9.01	962.94	9.81	1.23	8.56	-4.82
United Arab Emirates	HI	Real GDP	t+1	10.00	4.59	190.66	4.37	0.87	3.12	0.32
United Arab Emirates	HI	Short-term Interbank rate	t+1	10.00	1.66	46.20	2.15	0.91	1.58	1.46
Uruguay	UMI	Budget deficit (% of GDP)	t	12.00	0.62	4.32	0.60	0.58	0.53	0.07
Uruguay	UMI	Cons Price Infl. (av)	t	13.00	3.44	146.06	3.35	0.75	2.20	-0.58
Uruguay	UMI	Curr Acc Bal (% of GDP)	t	12.00	2.37	61.78	2.27	1.05	1.85	0.05
Uruguay	UMI	Real GDP	t	13.00	4.73	275.03	4.60	0.74	3.64	-0.73
Uruguay	UMI	Short-term Interbank rate	t	12.00	17.44	3372.81	16.77	0.84	9.39	-1.53
Uruguay	UMI	Budget deficit (% of GDP)	t+1	11.00	1.24	15.54	1.19	0.81	1.04	0.13
Uruguay	UMI	Cons Price Infl. (av)	t+1	12.00	5.53	365.58	5.52	0.79	3.98	-1.57
Uruguay	UMI	Curr Acc Bal (% of GDP)	t+1	11.00	2.73	76.93	2.64	0.94	2.03	-0.45
Uruguay	UMI	Real GDP	t+1	12.00	6.16	430.97	5.99	0.77	4.79	-1.06
Uruguay	UMI	Short-term Interbank rate	t+1	11.00	21.33	4575.20	20.39	0.68	14.49	-1.47
USA	HI	Budget deficit (% of GDP)	t	15.00	1.18	19.64	1.14	0.49	0.97	-0.07
USA	HI	Cons Price Infl. (av)	t	16.00	0.68	9.28	0.76	0.65	0.58	-0.39
USA	HI	Curr Acc Bal (% of GDP)	t	15.00	0.48	3.38	0.47	0.64	0.37	0.09
USA	HI	Real GDP	t	16.00	0.91	14.70	0.96	0.45	0.83	-0.38
USA	HI	Short-term Interbank rate	t	16.00	0.77	10.31	0.80	0.58	0.41	0.31
USA	HI	Budget deficit (% of GDP)	t+1	14.00	2.87	110.49	2.81	0.79	1.94	0.51
USA	HI	Cons Price Infl. (av)	t+1	15.00	1.03	14.95	1.00	0.64	0.70	0.05
USA	HI	Curr Acc Bal (% of GDP)	t+1	14.00	0.97	13.33	0.98	0.79	0.88	0.29
USA	HI	Real GDP	t+1	15.00	2.03	58.11	1.97	0.86	1.45	-0.15
USA	HI	Short-term Interbank rate	t+1	15.00	1.86	70.73	2.17	0.91	1.63	1.22

Country	Cat.	Variable	Time	Obs.	St Dev	Sum(^2)	RMSE	Theils U	MAE	ME
Vietnam	LI	Budget deficit (% of GDP)	t	11.00	1.74	34.38	1.77	0.88	1.47	-0.62
Vietnam	LI	Cons Price Infl. (av)	t	12.00	5.92	398.04	5.76	0.76	4.05	-1.02
Vietnam	LI	Curr Acc Bal (% of GDP)	t	11.00	4.06	175.08	3.99	1.13	3.51	-0.96
Vietnam	LI	Real GDP	t	11.00	1.30	19.39	1.33	1.20	1.17	-0.46
Vietnam	LI	Short-term Interbank rate	t	11.00	3.23	108.37	3.14	0.79	2.41	0.63
Vietnam	LI	Budget deficit (% of GDP)	t+1	10.00	2.94	81.74	2.86	0.96	2.30	-0.64
Vietnam	LI	Cons Price Infl. (av)	t+1	11.00	6.87	543.41	7.03	0.94	5.01	-2.55
Vietnam	LI	Curr Acc Bal (% of GDP)	t+1	10.00	5.61	294.94	5.43	0.93	4.12	-1.10
Vietnam	LI	Real GDP	t+1	9.00	1.75	24.69	1.66	1.20	1.32	0.19
Vietnam	LI	Short-term Interbank rate	t+1	10.00	3.40	103.97	3.22	0.80	2.69	-0.11
Yemen	LI	Budget deficit (% of GDP)	t	12.00	3.41	148.49	3.52	0.82	2.74	-1.31
Yemen	LI	Cons Price Infl. (av)	t	16.00	4.76	344.13	4.64	0.58	3.29	0.49
Yemen	LI	Curr Acc Bal (% of GDP)	t	14.00	6.53	645.49	6.79	1.09	5.16	-2.55
Yemen	LI	Real GDP	t	16.00	2.65	109.50	2.62	0.67	1.71	0.53
Yemen	LI	Short-term Interbank rate	t	12.00	2.82	87.25	2.70	0.90	2.04	-0.04
Yemen	LI	Budget deficit (% of GDP)	t+1	11.00	4.16	214.46	4.42	0.88	4.16	-1.95
Yemen	LI	Cons Price Infl. (av)	t+1	15.00	6.17	533.17	5.96	0.72	4.49	0.15
Yemen	LI	Curr Acc Bal (% of GDP)	t+1	13.00	7.44	825.94	7.97	0.89	6.28	-3.52
Yemen	LI	Real GDP	t+1	15.00	2.72	106.26	2.66	0.85	1.68	0.43
Yemen	LI	Short-term Interbank rate	t+1	11.00	3.37	121.00	3.32	0.82	1.91	-0.82
Zambia	LI	Budget deficit (% of GDP)	t	12.00	1.32	19.52	1.28	0.94	1.00	0.15
Zambia	LI	Cons Price Infl. (av)	t	13.00	4.52	244.87	4.34	1.24	3.35	0.05
Zambia	LI	Curr Acc Bal (% of GDP)	t	12.00	4.98	274.08	4.78	1.16	4.00	-0.38
Zambia	LI	Real GDP	t	13.00	1.62	31.68	1.56	1.70	1.12	-0.09
Zambia	LI	Short-term Interbank rate	t	12.00	6.45	498.02	6.44	0.99	5.17	1.83
Zambia	LI	Budget deficit (% of GDP)	t+1	11.00	1.79	35.32	1.79	1.00	1.35	0.55
Zambia	LI	Cons Price Infl. (av)	t+1	12.00	4.17	190.99	3.99	0.83	3.39	-0.04
Zambia	LI	Curr Acc Bal (% of GDP)	t+1	11.00	5.27	286.60	5.10	1.02	3.58	-0.87
Zambia	LI	Real GDP	t+1	12.00	1.63	29.30	1.56	1.54	1.07	-0.05
Zambia	LI	Short-term Interbank rate	t+1	11.00	6.37	549.62	7.07	0.81	5.71	3.62

7.2.2. Unemployment- RMSE, MAE, ME & Theil U

Country	Cat.	Variable	Time	Obs.	St Dev	Sum(^2)	RMSE	Theils U	MAE	ME
Argentina	UMI	Unemployment rate (av)	t	13.00	2.09	53.24	3.30	0.87	2.02	0.22
Argentina	UMI	Unemployment rate (av)	t+1	12.00	3.58	141.49	4.48	0.97	3.43	-0.13
Australia	HI	Unemployment rate (av)	t	12.00	0.52	3.25	35.95	0.90	0.52	0.16
Australia	HI	Unemployment rate (av)	t+1	11.00	0.96	9.43	36.26	1.15	0.93	0.15
Austria	HI	Unemployment rate (av)	t	16.00	1.19	21.30	6.59	0.94	1.15	0.09
Austria	HI	Unemployment rate (av)	t+1	15.00	1.78	44.39	13.16	0.99	1.72	-0.05
Azerbaijan	LMI	Unemployment rate (av)	t	10.00	0.10	0.12	4.63	0.89	0.11	0.06
Azerbaijan	LMI	Unemployment rate (av)	t+1	9.00	0.16	0.35	6.90	1.23	0.20	0.12
Bangladesh	LI	Unemployment rate (av)	t	12.00	0.75	6.76	7.53	1.00	0.75	-0.22
Bangladesh	LI	Unemployment rate (av)	t+1	11.00	1.03	13.02	16.34	1.00	1.09	-0.47
Belgium	HI	Unemployment rate (av)	t	16.00	1.22	22.98	0.61	0.96	1.20	0.23
Belgium	HI	Unemployment rate (av)	t+1	15.00	1.30	23.67	1.25	0.85	1.26	0.10
Canada	HI	Unemployment rate (av)	t	15.00	0.56	4.39	2.85	0.73	0.54	-0.02
Canada	HI	Unemployment rate (av)	t+1	14.00	0.89	10.61	5.04	0.76	0.87	-0.14
Chile	UMI	Unemployment rate (av)	t	13.00	1.35	21.85	1.64	1.08	1.30	0.05
Chile	UMI	Unemployment rate (av)	t+1	12.00	1.94	44.22	2.40	1.22	1.92	-0.48
China	LMI	Unemployment rate (av)	t	12.00	2.84	88.84	3.68	0.94	2.72	0.15
China	LMI	Unemployment rate (av)	t+1	11.00	3.15	99.63	6.95	1.04	3.01	-0.19
Costa Rica	UMI	Unemployment rate (av)	t	10.00	0.98	9.11	9.75	0.83	0.95	-0.21
Costa Rica	UMI	Unemployment rate (av)	t+1	9.00	1.60	22.70	15.07	0.99	1.59	-0.49
Croatia	UMI	Unemployment rate (av)	t	13.00	1.36	23.65	0.90	0.86	1.35	-0.32
Croatia	UMI	Unemployment rate (av)	t+1	12.00	2.22	64.26	1.34	0.93	2.31	-0.92
Cuba	UMI	Unemployment rate (av)	t	12.00	0.48	3.86	0.88	0.68	0.57	0.33
Cuba	UMI	Unemployment rate (av)	t+1	11.00	1.15	16.04	1.28	0.82	1.21	0.51
Cyprus	HI	Unemployment rate (av)	t	10.00	2.28	52.36	1.26	0.94	2.29	-0.76
Cyprus	HI	Unemployment rate (av)	t+1	9.00	1.81	38.74	1.81	0.97	2.07	-1.18
Czech Republic	HI	Unemployment rate (av)	t	16.00	1.04	16.11	0.94	0.78	1.00	0.03
Czech Republic	HI	Unemployment rate (av)	t+1	15.00	1.72	44.22	0.97	0.80	1.72	-0.41
Dominican Rep.	LMI	Unemployment rate (av)	t	11.00	1.47	21.92	0.59	1.47	1.41	-0.18
Dominican Rep.	LMI	Unemployment rate (av)	t+1	10.00	2.22	46.24	1.01	1.42	2.15	-0.44
Ecuador	LMI	Unemployment rate (av)	t	12.00	1.60	36.39	0.73	1.26	1.74	0.83
Ecuador	LMI	Unemployment rate (av)	t+1	11.00	2.55	83.09	1.37	1.31	2.75	1.28
Egypt	LMI	Unemployment rate (av)	t	5.00	1.86	16.93	2.10	1.44	1.84	0.78
Egypt	LMI	Unemployment rate (av)	t+1	4.00	0.77	6.18	3.50	0.89	1.24	1.05
El Salvador	LMI	Unemployment rate (av)	t	12.00	2.70	80.81	1.41	0.97	2.60	0.28
El Salvador	LMI	Unemployment rate (av)	t+1	11.00	1.30	17.71	2.22	0.76	1.27	-0.26
Finland	HI	Unemployment rate (av)	t	16.00	0.92	13.65	0.78	0.76	0.92	0.23
Finland	HI	Unemployment rate (av)	t+1	15.00	1.69	40.90	1.46	0.81	1.65	0.21
France	HI	Unemployment rate (av)	t	16.00	0.33	2.69	0.34	0.54	0.41	0.26
France	HI	Unemployment rate (av)	t+1	15.00	0.83	10.96	1.12	0.68	0.85	0.29
Germany	HI	Unemployment rate (av)	t	16.00	0.93	14.59	2.14	1.03	0.95	0.32
Germany	HI	Unemployment rate (av)	t+1	15.00	1.49	32.75	2.27	1.14	1.48	0.31
Greece	HI	Unemployment rate (av)	t	16.00	2.62	111.88	2.36	0.80	2.64	-0.74
Greece	HI	Unemployment rate (av)	t+1	15.00	3.80	244.68	3.55	0.88	4.04	-1.68
Honduras	LMI	Unemployment rate (av)	t	12.00	7.02	587.39	6.29	0.99	7.00	1.94
Honduras	LMI	Unemployment rate (av)	t+1	11.00	9.19	1051.56	10.35	0.99	9.78	4.35
Hong Kong	HI	Unemployment rate (av)	t	12.00	0.67	4.93	3.91	0.60	0.64	0.01
Hong Kong	HI	Unemployment rate (av)	t+1	11.00	1.71	29.37	5.24	0.95	1.63	-0.08
Hungary	HI	Unemployment rate (av)	t	13.00	1.11	15.83	1.05	0.95	1.10	-0.27
Hungary	HI	Unemployment rate (av)	t+1	12.00	1.45	34.45	1.74	1.05	1.69	-0.98
India	LMI	Unemployment rate (av)	t	10.00	1.39	17.79	4.32	0.87	1.33	-0.21
India	LMI	Unemployment rate (av)	t+1	9.00	2.15	39.81	6.01	0.93	2.10	-0.54
Indonesia	LMI	Unemployment rate (av)	t	12.00	2.56	72.04	1.15	0.88	2.45	0.12
Indonesia	LMI	Unemployment rate (av)	t+1	11.00	2.84	81.07	1.27	1.27	2.71	0.15
Ireland	HI	Unemployment rate (av)	t	16.00	3.92	231.73	3.47	0.92	3.81	-0.29
Ireland	HI	Unemployment rate (av)	t+1	15.00	5.84	484.65	4.82	1.01	5.68	-0.67
Israel	HI	Unemployment rate (av)	t	12.00	0.62	5.48	0.69	0.63	0.68	0.32
Israel	HI	Unemployment rate (av)	t+1	11.00	1.26	16.09	1.09	0.76	1.21	0.10
Italy	HI	Unemployment rate (av)	t	16.00	0.66	7.23	0.60	0.79	0.67	0.22
Italy	HI	Unemployment rate (av)	t+1	15.00	1.11	17.51	1.09	0.80	1.08	0.15
Japan	HI	Unemployment rate (av)	t	16.00	0.39	2.31	0.75	0.86	0.38	0.07
Japan	HI	Unemployment rate (av)	t+1	15.00	0.82	9.37	0.85	1.02	0.79	-0.06
Kazakhstan	UMI	Unemployment rate (av)	t	10.00	0.70	4.50	2.00	0.93	0.67	0.12
Kazakhstan	UMI	Unemployment rate (av)	t+1	9.00	1.21	12.58	2.83	1.16	1.18	0.31
Latvia	UMI	Unemployment rate (av)	t	10.00	2.37	54.21	1.21	0.60	2.33	-0.60
Latvia	UMI	Unemployment rate (av)	t+1	9.00	5.33	253.90	1.46	0.88	5.31	-1.72
Lithuania	UMI	Unemployment rate (av)	t	10.00	3.11	88.30	0.50	0.82	2.97	-0.36
Lithuania	UMI	Unemployment rate (av)	t+1	9.00	6.14	320.89	0.96	0.92	5.97	-1.48

Country	Cat.	Variable	Time	Obs.	St Dev	Sum(^2)	RMSE	Theils U	MAE	ME
Malaysia	UMI	Unemployment rate (av)	t	12.00	0.76	6.70	0.96	2.02	0.75	0.17
Malaysia	UMI	Unemployment rate (av)	t+1	11.00	0.73	5.33	1.39	1.59	0.70	0.08
Mauritius	UMI	Unemployment rate (av)	t	10.00	0.47	2.25	1.10	0.64	0.47	0.17
Mauritius	UMI	Unemployment rate (av)	t+1	9.00	0.79	5.67	1.91	0.66	0.79	0.28
Morocco	LMI	Unemployment rate (av)	t	12.00	2.52	86.47	1.12	1.03	2.68	1.18
Morocco	LMI	Unemployment rate (av)	t+1	11.00	2.82	109.47	1.26	0.85	3.15	1.65
Netherlands	HI	Unemployment rate (av)	t	16.00	0.48	4.36	1.74	0.52	0.52	0.24
Netherlands	HI	Unemployment rate (av)	t+1	15.00	1.23	22.11	1.65	0.69	1.21	0.23
New Zealand	HI	Unemployment rate (av)	t	12.00	0.67	5.41	1.40	0.74	0.67	0.21
New Zealand	HI	Unemployment rate (av)	t+1	11.00	1.42	20.60	2.44	1.02	1.37	0.22
Nicaragua	LMI	Unemployment rate (av)	t	13.00	5.56	371.93	0.48	0.92	5.35	-0.24
Nicaragua	LMI	Unemployment rate (av)	t+1	12.00	7.50	623.36	1.45	0.91	7.21	0.67
Norway	HI	Unemployment rate (av)	t	16.00	0.41	3.32	2.31	0.73	0.46	0.23
Norway	HI	Unemployment rate (av)	t+1	15.00	0.76	10.77	3.16	0.84	0.85	0.42
Pakistan	LI	Unemployment rate (av)	t	12.00	3.72	152.68	1.83	0.94	3.57	0.10
Pakistan	LI	Unemployment rate (av)	t+1	11.00	5.75	332.10	4.15	1.02	5.49	0.35
Paraguay	LMI	Unemployment rate (av)	t	12.00	2.72	83.92	2.57	0.91	2.64	0.48
Paraguay	LMI	Unemployment rate (av)	t+1	11.00	3.72	158.64	4.77	0.90	3.80	1.36
Peru	LMI	Unemployment rate (av)	t	11.00	1.25	15.76	1.75	1.09	1.20	-0.07
Peru	LMI	Unemployment rate (av)	t+1	10.00	2.02	37.34	2.38	1.33	1.93	-0.24
Philippines	LMI	Unemployment rate (av)	t	12.00	1.67	31.77	3.14	0.86	1.63	0.29
Philippines	LMI	Unemployment rate (av)	t+1	11.00	2.44	60.23	4.35	0.98	2.34	0.23
Poland	UMI	Unemployment rate (av)	t	12.00	1.05	12.57	1.63	0.58	1.02	-0.21
Poland	UMI	Unemployment rate (av)	t+1	11.00	2.23	50.81	2.34	0.67	2.15	-0.34
Portugal	HI	Unemployment rate (av)	t	16.00	1.98	59.35	2.72	1.06	1.93	0.19
Portugal	HI	Unemployment rate (av)	t+1	15.00	2.90	118.24	3.13	1.07	2.81	0.23
Romania	UMI	Unemployment rate (av)	t	13.00	2.13	60.33	1.15	0.93	2.15	0.68
Romania	UMI	Unemployment rate (av)	t+1	12.00	3.04	120.12	1.90	1.07	3.16	1.25
Russia	UMI	Unemployment rate (av)	t	12.00	0.86	8.17	2.19	0.83	0.83	-0.01
Russia	UMI	Unemployment rate (av)	t+1	11.00	16.75	3088.51	3.38	14.54	16.76	5.08
Singapore	HI	Unemployment rate (av)	t	12.00	0.65	4.79	0.00	0.78	0.63	0.13
Singapore	HI	Unemployment rate (av)	t+1	11.00	1.31	17.05	0.00	1.00	1.24	0.01
Slovakia	HI	Unemployment rate (av)	t	16.00	1.98	59.11	0.84	0.94	1.92	0.06
Slovakia	HI	Unemployment rate (av)	t+1	15.00	3.30	159.00	1.30	0.95	3.26	-0.64
Slovenia	HI	Unemployment rate (av)	t	12.00	0.90	8.85	0.91	0.76	0.86	-0.01
Slovenia	HI	Unemployment rate (av)	t+1	11.00	1.80	34.17	0.75	0.90	1.76	-0.39
South Korea	HI	Unemployment rate (av)	t	14.00	0.67	6.27	1.31	0.88	0.67	0.18
South Korea	HI	Unemployment rate (av)	t+1	13.00	1.32	21.44	1.33	1.07	1.28	0.20
Spain	HI	Unemployment rate (av)	t	16.00	1.76	47.95	0.57	0.66	1.73	-0.31
Spain	HI	Unemployment rate (av)	t+1	15.00	3.75	213.61	0.71	0.81	3.77	-1.06
Sri Lanka	LMI	Unemployment rate (av)	t	12.00	0.92	9.32	0.21	1.12	0.88	-0.02
Sri Lanka	LMI	Unemployment rate (av)	t+1	11.00	1.20	14.63	0.65	1.11	1.15	-0.10
Sudan	LMI	Unemployment rate (av)	t	0.00	#DIV/0!	0.00	#DIV/0!	N/A	N/A	N/A
Sudan	LMI	Unemployment rate (av)	t+1	0.00	#DIV/0!	0.00	#DIV/0!	N/A	N/A	N/A
Sweden	HI	Unemployment rate (av)	t	14.00	0.85	9.57	0.56	0.87	0.83	0.08
Sweden	HI	Unemployment rate (av)	t+1	13.00	1.40	24.09	0.72	0.99	1.36	-0.18
Switzerland	HI	Unemployment rate (av)	t	16.00	0.60	6.53	0.83	0.82	0.64	0.26
Switzerland	HI	Unemployment rate (av)	t+1	15.00	1.20	21.05	1.27	0.92	1.18	0.23
Taiwan	HI	Unemployment rate (av)	t	16.00	0.56	4.77	0.83	0.74	0.55	-0.03
Taiwan	HI	Unemployment rate (av)	t+1	15.00	1.05	18.24	1.25	1.00	1.10	-0.43
Thailand	LMI	Unemployment rate (av)	t	12.00	0.74	8.19	0.62	1.01	0.83	0.43
Thailand	LMI	Unemployment rate (av)	t+1	11.00	1.00	12.70	1.63	1.01	1.07	0.49
Trinidad and Tobago	HI	Unemployment rate (av)	t	11.00	0.67	6.78	1.86	0.87	0.79	0.45
Trinidad and Tobago	HI	Unemployment rate (av)	t+1	10.00	1.04	17.23	3.51	0.86	1.31	0.87
Tunisia	LMI	Unemployment rate (av)	t	11.00	1.43	23.18	1.22	1.15	1.45	-0.49
Tunisia	LMI	Unemployment rate (av)	t+1	10.00	1.62	28.50	1.77	0.88	1.69	-0.70
Turkey	UMI	Unemployment rate (av)	t	12.00	1.60	28.83	2.43	0.98	1.55	0.24
Turkey	UMI	Unemployment rate (av)	t+1	11.00	2.64	74.24	2.35	1.11	2.60	0.65
Uganda	LI	Unemployment rate (av)	t	0.00	#DIV/0!	0.00	#DIV/0!	N/A	N/A	N/A
Uganda	LI	Unemployment rate (av)	t+1	0.00	#DIV/0!	0.00	#DIV/0!	N/A	N/A	N/A
UK	HI	Unemployment rate (av)	t	16.00	0.66	8.67	1.28	0.82	0.74	0.37
UK	HI	Unemployment rate (av)	t+1	15.00	1.30	27.12	2.21	0.99	1.34	0.48
Ukraine	LMI	Unemployment rate (av)	t	10.00	2.05	38.57	0.80	1.03	1.96	-0.27
Ukraine	LMI	Unemployment rate (av)	t+1	9.00	2.49	52.95	1.43	0.93	2.43	-0.61
Uruguay	UMI	Unemployment rate (av)	t	12.00	1.93	41.53	2.73	0.84	1.86	0.18
Uruguay	UMI	Unemployment rate (av)	t+1	11.00	3.45	122.62	4.82	0.94	3.34	0.58
USA	HI	Unemployment rate (av)	t	16.00	0.54	4.47	1.36	0.46	0.53	0.09
USA	HI	Unemployment rate (av)	t+1	15.00	1.37	26.24	2.49	0.39	1.32	-0.08

7.3. Appendix Three: F-tests & t-tests

7.3.1. RMSE F-tests

Budget Deficit (t)						
Anova: Single Factor						
SUMMARY						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
RMSE, t, HI	36	87.36063	2.426684	4.248308		
RMSE, t, UMI	21	70.41815	3.353245	42.46658		
RMSE, t, LMI	27	83.68412	3.099412	34.31905		
RMSE, t, LI	17	31.20428	1.835546	0.728414		
ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	28.66165	3	9.553882	0.487245	0.691935	2.698398
Within Groups	1901.972	97	19.60796			
Total	1930.634	100				
Budget Deficit (t+1)						
Anova: Single Factor						
SUMMARY						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
RMSE, t+1, HI	36	136.5195	3.792209	9.496307		
RMSE, t+1, UMI	21	88.32125	4.205774	46.73036		
RMSE, t+1, LMI	27	70.96469	2.628322	2.03693		
RMSE, t+1, LI	17	40.42691	2.378054	1.2374		
ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	52.49637	3	17.49879	1.266953	0.290069	2.698398
Within Groups	1339.737	97	13.81172			
Total	1392.233	100				

CPI (t)						
Anova: Single Factor						
SUMMARY						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
RMSE, t, HI	39	52.10949	1.336141	0.797534		
RMSE, t, UMI	21	75.98085	3.618136	20.64734		
RMSE, t, LMI	29	172.7286	5.956159	170.4125		
RMSE, t, LI	17	94.97439	5.586729	10.46223		
ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	426.0773	3	142.0258	2.691582	0.050134	2.693721
Within Groups	5382.2	102	52.76666			
Total	5808.277	105				
CPI (t+1)						
Anova: Single Factor						
SUMMARY						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
RMSE, t+1, HI	39	74.4871	1.909926	1.787124		
RMSE, t+1, UMI	21	107.475	5.117858	25.17403		
RMSE, t+1, LMI	29	196.9186	6.790298	101.7285		
RMSE, t+1, LI	17	109.886	6.463883	16.14857		
ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	486.0261	3	162.0087	4.492698	0.005283	2.693721
Within Groups	3678.166	102	36.06045			
Total	4164.192	105				

CA Bal (t)						
Anova: Single Factor						
SUMMARY						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
RMSE, t, HI	39	147.0042	3.769339	14.50615		
RMSE, t, UMI	21	164.362	7.82676	377.7078		
RMSE, t, LMI	29	135.4248	4.669822	34.20892		
RMSE, t, LI	17	235.3911	13.84654	1252.938		
ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	1341.986	3	447.3285	1.567404	0.201884	2.693721
Within Groups	29110.25	102	285.3946			
Total	30452.23	105				
CA Bal (t+1)						
Anova: Single Factor						
SUMMARY						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
RMSE, t+1, HI	39	205.2395	5.262552	25.96312		
RMSE, t+1, UMI	21	220.6255	10.50597	626.1315		
RMSE, t+1, LMI	29	353.2606	12.1814	1514.326		
RMSE, t+1, LI	17	223.0551	13.12089	852.9232		
ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	1152.707	3	384.2357	0.563451	0.640347	2.693721
Within Groups	69557.12	102	681.9326			
Total	70709.83	105				

Real GDP (t)						
Anova: Single Factor						
SUMMARY						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
RMSE, t, HI	39	74.78713	1.917619	1.196282		
RMSE, t, UMI	21	58.64215	2.792483	1.333877		
RMSE, t, LMI	29	65.71182	2.265925	1.416613		
RMSE, t, LI	17	27.81627	1.636251	0.694607		
ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	15.6428	3	5.214268	4.327013	0.006489	2.693721
Within Groups	122.9151	102	1.20505			
Total	138.5579	105				
Real GDP (t+1)						
Anova: Single Factor						
SUMMARY						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
RMSE, t+1, HI	39	114.8433	2.9447	1.854708		
RMSE, t+1, UMI	21	89.95963	4.283792	3.28222		
RMSE, t+1, LMI	29	101.5597	3.502057	4.633329		
RMSE, t+1, LI	17	35.46001	2.085883	1.482435		
ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	50.89106	3	16.96369	5.975285	0.000857	2.693721
Within Groups	289.5755	102	2.838975			
Total	340.4665	105				

STIBR (t)						
Anova: Single Factor						
SUMMARY						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
RMSE, t, HI	39	45.53948	1.167679	0.581504		
RMSE, t, UMI	18	74.83125	4.157292	28.54694		
RMSE, t, LMI	26	69.83569	2.685988	7.961705		
RMSE, t, LI	17	46.65199	2.744235	2.70745		
ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	118.8536	3	39.61786	5.07273	0.002647	2.699393
Within Groups	749.757	96	7.809969			
Total	868.6106	99				
STIBR (t+1)						
Anova: Single Factor						
SUMMARY						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
RMSE, t+1, HI	39	78.23915	2.006132	0.85181		
RMSE, t+1, UMI	18	101.9499	5.663881	38.24703		
RMSE, t+1, LMI	26	103.2518	3.971225	23.16797		
RMSE, t+1, LI	17	56.18087	3.304757	2.954939		
ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	176.6612	3	58.88707	4.318532	0.006681	2.699393
Within Groups	1309.047	96	13.6359			
Total	1485.708	99				

Unemp (t)						
Anova: Single Factor						
SUMMARY						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
RMSE, t, HI	31	32.77117	1.057134	0.578347		
RMSE, t, UMI	16	23.79715	1.487322	0.75852		
RMSE, t, LMI/LI	20	44.56631	2.228316	2.538479		
ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	16.68546	2	8.342732	6.937887	0.001874	3.140438
Within Groups	76.95929	64	1.202489			
Total	93.64476	66				
Unemp (t+1)						
Anova: Single Factor						
SUMMARY						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
RMSE, t+1, HI	31	53.69167	1.731989	1.20074		
RMSE, t+1, UMI	15	51.92754	3.461836	15.8258		
RMSE, t+1, LMI/LI	20	57.41676	2.870838	5.157438		
ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	34.85395	2	17.42698	3.087676	0.052573	3.142809
Within Groups	355.5747	63	5.644042			
Total	390.4286	65				

7.3.2. MAE F-tests

Budget Deficit (t)						
Anova: Single Factor						
SUMMARY						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
MAE, t, HI	36	64.2509	1.784747	2.609135		
MAE, t, UMI	21	40.03853	1.906596	5.182065		
MAE, t, LMI	27	49.92424	1.849046	3.83683		
MAE, t, LI	17	23.03889	1.355229	0.312573		
ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	3.470165	3	1.156722	0.374356	0.771683	2.698398
Within Groups	299.7198	97	3.089895			
Total	303.19	100				
Budget Deficit (t+1)						
Anova: Single Factor						
SUMMARY						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
MAE, t+1, HI	36	104.6664	2.907399	6.388229		
MAE, t+1, UMI	21	54.7401	2.606671	6.754929		
MAE, t+1, LMI	27	55.88705	2.069891	1.257761		
MAE, t+1, LI	17	31.11136	1.83008	0.742979		
ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	18.47049	3	6.156831	1.480903	0.224542	2.698398
Within Groups	403.276	97	4.157485			
Total	421.7465	100				

CPI (t)						
Anova: Single Factor						
SUMMARY						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
MAE, t, HI	39	39.40118	1.010287	0.404331		
MAE, t, UMI	21	45.14471	2.149748	2.724346		
MAE, t, LMI	28	100.0539	3.573353	49.91248		
MAE, t, LI	17	73.62846	4.331086	6.574906		
ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	178.2103	3	59.40344	3.940237	0.010529	2.694618
Within Groups	1522.687	101	15.07611			
Total	1700.897	104				
CPI (t+1)						
Anova: Single Factor						
SUMMARY						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
MAE, t+1, HI	39	58.74726	1.50634	1.220142		
MAE, t+1, UMI	21	71.86278	3.422037	7.381931		
MAE, t+1, LMI	29	137.5713	4.743838	48.55879		
MAE, t+1, LI	17	85.96556	5.056798	10.16578		
ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	238.5291	3	79.50969	4.725267	0.003961	2.693721
Within Groups	1716.303	102	16.8265			
Total	1954.832	105				

CA Bal (t)						
Anova: Single Factor						
SUMMARY						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
MAE, t, HI	39	111.2814	2.853369	6.069318		
MAE, t, UMI	21	82.11527	3.910251	30.65418		
MAE, t, LMI	29	93.66378	3.229785	5.649065		
MAE, t, LI	17	108.46	6.38	107.6451		
ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	157.2917	3	52.43055	1.963105	0.124245	2.693721
Within Groups	2724.213	102	26.70797			
Total	2881.504	105				
CA Bal (t+1)						
Anova: Single Factor						
SUMMARY						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
MAE, t+1, HI	39	158.3482	4.060209	14.35251		
MAE, t+1, UMI	21	119.3422	5.682962	57.44217		
MAE, t+1, LMI	29	180.5965	6.227465	136.8844		
MAE, t+1, LI	17	117.62	6.918826	83.76961		
ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	130.6443	3	43.54811	0.646819	0.586724	2.693721
Within Groups	6867.314	102	67.32661			
Total	6997.959	105				

Real GDP (t)						
Anova: Single Factor						
SUMMARY						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
MAE, t, HI	39	54.45384	1.396252	0.590191		
MAE, t, UMI	21	45.26446	2.15545	0.731148		
MAE, t, LMI	29	49.71411	1.71428	0.970645		
MAE, t, LI	17	20.45099	1.202999	0.309405		
ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	11.15538	3	3.71846	5.482652	0.001561	2.693721
Within Groups	69.17873	102	0.678223			
Total	80.33411	105				
Real GDP (t+1)						
Anova: Single Factor						
SUMMARY						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
MAE, t+1, HI	39	82.34982	2.111534	0.992105		
MAE, t+1, UMI	21	66.56972	3.169987	1.423448		
MAE, t+1, LMI	29	71.48528	2.46501	1.973931		
MAE, t+1, LI	17	26.22865	1.542862	0.670666		
ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	27.73894	3	9.246314	7.135706	0.000213	2.693721
Within Groups	132.1697	102	1.295781			
Total	159.9086	105				

STIBR (t)						
Anova: Single Factor						
SUMMARY						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
MAE, t, HI	39	28.95397	0.74241	0.172838		
MAE, t, UMI	18	46.11026	2.561681	8.784671		
MAE, t, LMI	26	47.60098	1.830807	2.925108		
MAE, t, LI	17	33.57341	1.974906	1.689376		
ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	48.96296	3	16.32099	6.118817	0.000747	2.699393
Within Groups	256.065	96	2.667343			
Total	305.0279	99				
STIBR (t+1)						
Anova: Single Factor						
SUMMARY						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
MAE, t+1, HI	39	61.17861	1.568682	0.423782		
MAE, t+1, UMI	18	73.33315	4.074064	17.38705		
MAE, t+1, LMI	26	77.97131	2.998897	13.11863		
MAE, t+1, LI	17	43.19937	2.541139	2.170159		
ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	84.60216	3	28.20072	4.014505	0.00973	2.699393
Within Groups	674.3718	96	7.024706			
Total	758.9739	99				

Unemp (t)						
Anova: Single Factor						
SUMMARY						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
MAE, t, HI	31	106.2254	3.426624	49.11727		
MAE, t, UMI	16	44.72372	2.795232	9.987314		
MAE, t, LMI/LI	20	65.47048	3.273524	6.227193		
ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	4.260747	2	2.130373	0.078285	0.92479	3.140438
Within Groups	1741.644	64	27.21319			
Total	1745.905	66				
Unemp (t+1)						
Anova: Single Factor						
SUMMARY						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
MAE, t+1, HI	31	64.51239	2.081045	7.658223		
MAE, t+1, UMI	16	67.1197	4.194981	66.3437		
MAE, t+1, LMI/LI	20	49.20203	2.460102	3.542251		
ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	48.78673	2	24.39336	1.208148	0.305471	3.140438
Within Groups	1292.205	64	20.1907			
Total	1340.992	66				

7.3.3. Theil U-Statistic F-tests

Budget Deficit (t)						
Anova: Single Factor						
SUMMARY						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
Theil, t, HI	36	31.18835	0.866343	0.059716		
Theil, t, UMI	21	17.56599	0.836476	0.0404		
Theil, t, LMI	27	52.10485	1.929809	29.98278		
Theil, t, LI	17	14.68114	0.863597	0.029982		
ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	22.7704	3	7.590134	0.940369	0.424307	2.698398
Within Groups	782.9299	97	8.071442			
Total	805.7003	100				
Budget Deficit (t+1)						
Anova: Single Factor						
SUMMARY						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
Theil, t+1, HI	37	35.45813	0.958328	0.072815		
Theil, t+1, UMI	21	19.18187	0.913422	0.015046		
Theil, t+1, LMI	27	24.46892	0.906256	0.027194		
Theil, t+1, LI	16	14.18151	0.886345	0.009244		
ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	0.077127	3	0.025709	0.661832	0.577503	2.698398
Within Groups	3.767964	97	0.038845			
Total	3.845091	100				

CPI (t)						
Anova: Single Factor						
SUMMARY						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
Theil, t, HI	37	14.16106	0.382731	0.069048		
Theil, t, UMI	21	4.16587	0.198375	0.019653		
Theil, t, LMI	29	4.637349	0.159909	0.020432		
Theil, t, LI	17	2.651692	0.155982	0.020902		
ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	1.092051	3	0.364017	9.616599	1.23E-05	2.695534
Within Groups	3.785298	100	0.037853			
Total	4.877348	103				
CPI (t+1)						
Anova: Single Factor						
SUMMARY						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
Theil, t+1, HI	37	15.83066	0.427856	0.086762		
Theil, t+1, UMI	21	3.523366	0.167779	0.013498		
Theil, t+1, LMI	29	6.562411	0.22629	0.146655		
Theil, t+1, LI	17	2.284543	0.134385	0.012775		
ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	1.509333	3	0.503111	6.530412	0.000444323	2.695534
Within Groups	7.704124	100	0.077041			
Total	9.213457	103				

CA Bal (t)						
Anova: Single Factor						
SUMMARY						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
Theil, t, HI	39	14.3183	0.367136	0.126157		
Theil, t, UMI	21	4.524257	0.215441	0.039134		
Theil, t, LMI	29	7.428492	0.256155	0.03118		
Theil, t, LI	17	4.426761	0.260398	0.042772		
ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	0.396888	3	0.132296	1.891518	0.135727	2.693721
Within Groups	7.134061	102	0.069942			
Total	7.53095	105				
CA Bal (t+1)						
Anova: Single Factor						
SUMMARY						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
Theil, t+1, HI	39	11.1605	0.286167	0.076937		
Theil, t+1, UMI	21	3.369528	0.160454	0.020872		
Theil, t+1, LMI	29	6.767967	0.233378	0.02266		
Theil, t+1, LI	17	3.297243	0.193955	0.023402		
ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	0.246584	3	0.082195	1.927352	0.129856	2.693721
Within Groups	4.349934	102	0.042646			
Total	4.596518	105				

Real GDP (t)						
Anova: Single Factor						
SUMMARY						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
Theil, t, HI	39	8.057217	0.206595	0.016114		
Theil, t, UMI	21	4.337342	0.20654	0.034081		
Theil, t, LMI	29	6.416021	0.221242	0.039949		
Theil, t, LI	17	6.683784	0.393164	0.298		
ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	0.476011	3	0.15867	2.253927	0.086603	2.693721
Within Groups	7.180528	102	0.070397			
Total	7.65654	105				
Real GDP (t+1)						
Anova: Single Factor						
SUMMARY						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
Theil, t+1, HI	39	9.690919	0.248485	0.023809		
Theil, t+1, UMI	21	4.031948	0.191998	0.034268		
Theil, t+1, LMI	29	6.504383	0.224289	0.03361		
Theil, t+1, LI	17	6.874084	0.404358	0.228906		
ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	0.491547	3	0.163849	2.698336	0.049712	2.693721
Within Groups	6.193666	102	0.060722			
Total	6.685212	105				

STIBR (t)						
Anova: Single Factor						
SUMMARY						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
Theil, t, HI	39	27.93277	0.716225	2.288429		
Theil, t, UMI	18	15.23403	0.846335	2.750998		
Theil, t, LMI	26	15.50026	0.596164	0.466766		
Theil, t, LI	17	14.30813	0.841655	4.183802		
ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	0.928653	3	0.309551	0.139951	0.935848	2.699393
Within Groups	212.3373	96	2.211847			
Total	213.2659	99				
STIBR (t+1)						
Anova: Single Factor						
SUMMARY						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
Theil, t+1, HI	39	30.75978	0.788712	4.821633		
Theil, t+1, UMI	18	11.77654	0.654252	1.107479		
Theil, t+1, LMI	26	14.50959	0.558061	0.546784		
Theil, t+1, LI	17	6.028094	0.354594	0.245035		
ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	2.416906	3	0.805635	0.352127	0.787692	2.699393
Within Groups	219.6394	96	2.28791			
Total	222.0563	99				

Unemp (t)						
Anova: Single Factor						
SUMMARY						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
Theil, t, HI	31	9.680612	0.312278	0.040104		
Theil, t, UMI	16	7.258059	0.453629	0.882225		
Theil, t, LMI/LI	20	10.04204	0.502102	0.868279		
ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	0.492576	2	0.246288	0.509554	0.60318	3.140438
Within Groups	30.93381	64	0.483341			
Total	31.42638	66				
Unemp (t+1)						
Anova: Single Factor						
SUMMARY						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
Theil, t+1, HI	31	39.158	1.263161	0.799528		
Theil, t+1, UMI	16	32.03407	2.002129	17.01823		
Theil, t+1, LMI/LI	20	26.09075	1.304537	8.214055		
ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	6.382645	2	3.191322	0.469176	0.627652	3.140438
Within Groups	435.3263	64	6.801973			
Total	441.7089	66				

7.3.4. Theil U t-tests

Avg. Theil U t-tests: Current-Year (t) Forecasts t-statistics							
	n	Real GDP	Inf. (CPI)	STIBR	CA Bal.	Budget Def.	Unemp.
HI	38	0.000	0.000	0.000	0.073	0.000	0.000
UMI	20	0.000	0.000	0.226	0.926	0.013	0.341
LMI	27	0.000	0.000	0.506	0.007	0.376	0.675
LI	16	0.052	0.004	0.680	0.491	0.005	
Avg. Theil U t-tests One-Year-Ahead (t+1) Forecasts t-statistics							
	n	Real GDP	Inf. (CPI)	STIBR	CA Bal.	Budget Def.	Unemp.
HI	38	0.000	0.000	0.319	0.695	0.001	0.004
UMI	20	0.000	0.000	0.768	0.689	0.018	0.328
LMI	27	0.000	0.003	0.441	0.077	0.369	0.650
LI	16	0.625	0.008	0.457	0.460	0.123	