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Correlation based test of predictability and Mean Squared Prediction Error Comparisons: An Empirical Evaluation.

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Abstract

In the literature forecasts are mostly evaluated using the traditional Mean Squared Prediction Error (MSPE) loss function and with this approach the authors usually find evidence of predictability at the population level, while the evidence of predictability at the sample is usually scarce and weak. However, in recent research (See Pincheira and Hardy ;2021, "The Mean Squared Prediction Error Paradox") the authors find that there are some not empty spaces where correlations between forecasts and the predictand grows when MSPE grows too. This means that in some cases MSPE can suggest that a given forecast is not a good predictor when this is not necessarily the case. In this paper we propose to evaluate predictions measuring the correlation between forecasts and actual values of the predictand to see if using correlations as an alternative approach, we can also find evidence of predictability at sample level. We want to evaluate if results with correlation-based tests of predictability are equivalent to the results coming from the Diebold-Mariano test comparing MSPE at sample level. We will evaluate this hypothesis in the context of the commodity-currencies literature.

Index

1. Introduction

1.1 Introduction first section

This paper have two different sections, in the first section we follow the Pincheira-Hardy forecasting model framework to demonstrate that there is strong in-sample and out-of-sample evidence that it is possible to use some currencies to predict the return of six different fuels commodities (WTI, brent, natural gas, kerosene, heating oil and propane) and the return of six primary nonferrous metals plus the London Metal Exchange Index (LMEX) at multiple step-Ahead at the population level. In this section we show that using the traditional MSPE we find strong evidence of predictability at the population level, while the evidence of predictability at the sample level is scarce and weak. In summary, in the first section of this paper we assess whether six different exchange rates can predict the return of six fuels and six primary nonferrous metals plus the London Metal Exchange Index (LMEX) up to 24 steps ahead at the population and sample level.

Following the Pincheira-Hardy framework, (See Pincheira and Hardy ;2019, "Forecasting Aluminum Prices with Commodity Currencies" and Pincheira and Hardy ;2018, "Forecasting Base Metal Prices with Commodity Currencies") in base metals commodity group, we evaluate our hypothesis using the exchange rate of six different countries: Chile, Iceland, Australia, Canada, New Zeeland and South Africa and we evaluate whether these exchange rates have the ability to predict the returns of the London Metal Exchange Index (LMEX) and of the six primary nonferrous metals that are part of the index: aluminum, copper, lead, nickel, tin and zinc. We use these currencies because Pincheira-Hardy in his research focuses mainly in six exchange rate that are, the Australian dollar, the Canadian dollar, the Chilean peso, the New Zeeland dollar, the South African rand and the Iceland krone. They used the six first currencies because there are two researches where they show evidence of the forecasting ability of these currencies (Chen, Rossi and Roggoff, 2010 and 2014) and we also use the Icelandic exchange rate because Pincheira and Hardy in a previous research find evidence supporting that the Icelandic exchange rate has the ability to predict

aluminum (Pincheira and Hardy, 2021, "Forecasting aluminum prices with commodity currencies")

Moreover, to evaluate fuels we follow the framework of the research “Forecasting Fuel Prices with the Chilean Exchange Rate: Going Beyond the Commodity Currency Hypothesis” (Pincheira, Hardy, Nabil and Bentancor,2021), so we evaluate using the exchange rate of Chile, Iceland, Australia, Canada, New Zeeland and Norway and evaluate whether these currencies have the ability to predict the returns of these six commodities fuels: WTI, brent, natural gas, kerosene, heating oil and propane.

Our article in the first section is also a contribution to Pincheira-Hardy's research because we evaluated up to 24 forward horizons and because we find evidence that exchange rates can predict more steps forward than they report. This section is also important because we show the evidence that motivates the second part of the article, because as we show, even when we find evidence of predictability at the population level, the evidence we find using the accuracy criterion at the sample level does not provide enough evidence to choose the best forecasts at the sample level, therefore, as we explain in the rest of the introduction, we use the correlation criterion as an alternative approach to show that both criteria are not necessarily equivalent and that it is possible to find evidence of predictability at the sample level using the correlation criterion as an alternative approach.

The results of the first section are important for two reasons. The first reason is that we find new evidence of predictability in the in-sample and out-of-sample analysis at the population level in base metals group and in the fuel commodities group. In the case of fuels, we find that it is possible to predict commodities over longer horizons than Pincheira, Hardy, Nabil and Bentancor report and, we find strong evidence that it is possible to predict in multiple steps forward the return of kerosene. In the group of base metals, we find evidence that the Chilean peso can predict the return of copper and the Lmex index multiple steps forward and that it is possible to predict the return of lead and tin multiple steps forward using currencies. The second reason is that in the first section we show that the evidence of predictability at the sample level using the accuracy criterion is scarce and weak and this is

the motivation to use an alternative approach to find evidence of predictability at the sample level.

1.2 Introduction second section

In the second section we show that even when we do not find strong evidence of predictability using the accuracy criteria at sample level we can use the correlation criteria as an alternative approach to find valuable information at sample level, showing that both criteria are not necessarily equivalent and that we can get valuable information using correlation even we do not have evidence to choose the best forecasts using the MSPE criteria. The alternative approach that we use consist in evaluate predictions measuring the correlation between forecasts and actual values of the predictand. We want to evaluate if results with correlation-based tests of predictability are equivalent to the results coming from the Diebold-Mariano test comparing MSPE at sample level.

In economics, forecasts are usually evaluated using the traditional Mean Squared Prediction Error (MSPE) loss function. Yet, in recent research (See Pincheira and Hardy ;2021, "The Mean Squared Prediction Error Paradox") the authors find that there are some not empty spaces where correlations between forecasts and the predictand grows when MSPE grows too. The authors observe that when we compared two forecasts in competition and some conditions of efficiency are violated (Mincer and Zarnowitz (1969)) there is a paradox zone where it is possible the scenario that improving in terms of accuracy (MSPE loss function) it is not necessarily equivalent to improve in terms of how associated is the forecast with the target value (Correlation), they label this as "The Mean Squared Prediction Error Paradox".

This because when the forecast violates the efficiency conditions proposed by Mincer and Zarnowitz (1969) the forecast errors are not orthogonal to the forecast itself, then the forecast is not self-efficient. This means that the covariance between the forecast and errors are different from zero and that is not efficient because we can still obtain information of value about the forecast from the errors. For example, suppose that we want to forecast h-Step-Ahead, and we want to forecast Y. Then the forecast violates the conditions of efficiency if:

$$Cov\left(y_{t+h} - y_t^f(h), y_t^f(h)\right) \neq 0$$

Then, when the forecast it is not self-efficient, we have that the covariance between the forecast with the errors is not zero and this makes the paradox possible because in that scenario we have that the differential of MSPE depends also of the correlation.

To show the paradox analytically we illustrate one of the examples that Pincheira and Hardy used in their research to show the paradox (Pincheira and Hardy ;2021, "The Mean Squared Prediction Error Paradox", Example 1).

Suppose that we have two competing forecasts $\{X_{t-1}\}$ and $\{Z_{t-1}\}$ for $\{Y_{t-1}\}$ (For clarity and simplicity we drop the sub-indexes t). Therefore, the MSPE and MSF of the both forecasts are:

$$\mathrm{MSPE_x} = \mathrm{E(Y-X)^2}\ ;\ \mathrm{MSPE_z} = \mathrm{E(Y-Z)^2}$$

$$\mathrm{MSF_x} = \mathrm{E(X)^2}\ ;\ \mathrm{MSF_z} = \mathrm{E(Z)^2}$$

Consider now that $\mathrm{VAR(Y)} = 1,\ \mathrm{VAR(X)} = \mathrm{VAR(Z)} > 0, \mathrm{E(X)} = 0$ and $E(X^2) > 0$. Therefore, if we solve the decomposition of the MSPE differential of the competing forecast we have that the MSPE comparison is:

$$\Delta\mathrm{MSPE} = \mathrm{MSPE_X} - \mathrm{MSPE_Z} = \mathrm{E(Y-X)^2} - \mathrm{E(Y-Z)^2}$$

Then, if we decompose the equation, we have the following expression:

$$\Delta\mathrm{MSPE} = (\mathrm{EX^2} - \mathrm{EZ^2}) - 2(\mathrm{EYX} - \mathrm{EYZ})$$

$$= (EX^2 - EZ^2) - 2\{Cov(Y,X) - Cov(Y,Z)\}$$

$$= [MSF_X - MSF_Z] - 2\{Cov(Y,X) - Cov(Y,Z)\}$$

$$= [MSF_X - MSF_Z] - 2\sqrt{Var(Y)}\left\{Corr(Y,X)\sqrt{Var(X)} - Corr(Y,Z)\sqrt{Var(Z)}\right\}$$

$$= [MSF_X - MSF_Z] - 2\sqrt{Var(X)}\{Corr(Y,X) - Corr(Y,Z)\}$$

$$= [MSF_X - MSF_Z] - 2\sqrt{MSF_X - (EX)^2}\{Corr(Y,X) - Corr(Y,Z)\}$$

$$= [MSF_X - MSF_Z] - 2\sqrt{MSF_X}\{Corr(Y,X) - Corr(Y,Z)\}$$

Here we can see how the MSPE comparisons depends also on the correlation between the forecast and the actual values.

These results are highly controversial, because in economics, forecasts often violate these efficiency conditions and are usually evaluated with the traditional Mean Squared Prediction Error (MSPE) loss function.

Our hypothesis is evaluated in the growing commodity currencies literature commodity currencies. In forecasting literature there is a debate in which some researchers support that commodity-currencies have the ability to predict the prices of other commodities, this hypothesis it is called as Commodity Currency Hypothesis (CCH). There is evidence that support this theory, one the first was Chen, Rossi and Rogoff (2010) who showed that the Chilean peso along with other currencies has the ability to predict the prices of other commodities. Moreover, Pincheira and Hardy showed that some currencies has the ability to predict the price of aluminum (See Pincheira and Hardy ;2019, "Forecasting Aluminum Prices with Commodity Currencies"), another research by Pincheira and Hardy showed that the Chilean Peso has the ability to predict the prices of some base metals (LME) (See Pincheira and Hardy ;2018, "Forecasting Base Metal Prices with Commodity Currencies"), we will use the framework of this context to evaluate our hypothesis.

Picheira-Hardy in their research find evidence supporting that it is possible to use currencies to predict the return of fuels and base metals at the population level, but they do not find enough evidence to support the same at the sample level. In this paper, we want to fill this gap. We want to find out if the correlation-based test provides value information at the sample level when we compare two competitive forecasts in the context of commodity currencies.

Our hypothesis is important mainly for these three reasons. The first reasons is that when we compare two forecasts the best predictor depends on the preferences of the forecaster, which means that we do not always have to use the same criteria to choose the best forecast, so correlations can be an interesting alternative approach for the forecaster. The second reason is that when we evaluate a forecast at the population level we want to see if the

forecast has the ability to predict at the population level but that it is not necessarily equivalent to proving that the forecast has the ability to predict at the sample level, and the forecaster may be more interested to knowing which model it is better at predicting at sample level, so the sample level evaluation may give valuable information to the forecaster. Finally, the hypothesis is important because often when we compare two competing forecasts in the commodity-currency context and we evaluate with Diebold-Mariano test we usually find that we cannot reject the null hypothesis that both forecasts have the same MSPE, then in many situations we do not have enough evidence to choose which model is better in terms of MSPE, so with the correlation test of predictability we give an alternative approach that can sometimes give valuable information to choose the best forecast when the Diebold-Mariano test does not.

2. Data

We got our data from three different databases; Bloomberg, Thomson Reuters and the Federal Reserve Bank of St.Louis (FRED). We download all the series in monthly frequency using the closing price of the last available day of the month. The sample period is from October 1999 to May 2022, resulting in 272 monthly price observations and 271 one-period return observations. The starting point of our data is October 1999 because, on that date, the monetary authorities of Chile decided to apply a pure floating exchange rate regime.

We have downloaded 2 different groups of commodities to evaluate: fuels and base metals. The fuels and base metals that were unloaded from FRED and Thomson Reuters respectively. On the other hand, we have also downloaded 7 Bloomberg currencies that will be used as independent variables in the prediction models. We will use the exchange rates of Chile, Norway, Canada, Iceland, New Zealand and Australia as predictors for fuels, while we will use the exchange rates of Chile, South Africa, Canada, Iceland, New Zealand and Australia as predictors for base metals.

2.1 Predictand

The commodity fuels are 6. The first and second fuels come from two different measures of crude oil, the first which we call as WTI comes from US Crude oil WTI Cushing OK spot (WTI) and the second measure which we call as brent comes from European Crude Dated Brent Spot. WTI is extracted in the United States while brent is extracted from the North Sea. The remaining fuels are kerosene, propane, heating oil and natural gas. Kerosene is a derivative of crude oil and the commodity that we use as a measured of the kerosene price is from the Tokyo Commodity Exchange kerosene futures contract (JX1 commodity, Generic 1st JX future). Heating oil and propane are also a derivative of crude oil and we use the New York Mercantile Exchange heating oil and propane futures contract as a measure of heating oil price (HO1 commodity and BAP1 commodity). Finally, we use the New York Mercantile Exchange futures contract as a measure of the price of natural gas (NG1 commodity, Generic 1st NG Future).

The base metal that we use are primary aluminum, copper, lead, nickel, tin and zinc. The price measurement for these commodities comes from the London Metal Exchange. We also use the London Metal Exchange index (LMEX) as a predictor, so in total we evaluate 7 commodities from base metals group.

2.2 Predictors

We include seven currencies and we use the spot exchange rate as a measure of the currency price, that matter that we use the price of 1 USD in the currency of the country. The currencies that we use are from Chile, Norway, New Zealand, Australia, Canada, South Africa and Iceland. In Fuels we will use 6 exchange rates, which are Chile, Iceland, New Zealand, Norway, Canada and Australia, while in base metals we use exchange rates of Chile, New Zealand, Australia, Canada, South Africa and Iceland.

3. Models

3.1 Base metals

In this group of commodities, we use a forecast model of a de Pincheira and Hardy (Pincheira, Hardy, 2018, "Forecasting Base Metal Prices with Commodity Currencies"). In their research, they find that six exchange rates can predict the returns of the London Metal Exchange Index and the six primary non-ferrous metals, we use the same base metals and index (LMEX) that they use, but in addition we also evaluate in multiple steps forward.

Following the econometric framework we use three different models, which are the AR(1) and the random walk with and without drift. Then, the econometric specifications at one step ahead are:

Table 2A: Econometric Specifications One-Step-Ahead Base Metals commodities

(1) $AR(1): \Delta \ln(MP_t) = C + B_1[\Delta \ln(ER^i_{t-1}) + \Delta \ln(ER^i_{t-2})] + P\Delta \ln(MP_{t-1}) + \varepsilon_{lt}$

(2) $RW: \Delta \ln(MP_t) = C + B_1[\Delta \ln(ER^i_{t-1}) + \Delta \ln(ER^i_{t-2})] + \varepsilon_{lt}$

(3) $DRW: \ \Delta \ln(MP_t) = \ B_1[\Delta \ln(ER^i_{t-1}) \ + \Delta \ln(ER^i_{t-2})] + \varepsilon_{lt}$

Notes: $\Delta \ln(ER_t)$ represents the currency return that we are evaluating at time t, where $i = \{AUS, CAN, CLP, NZ, ZAR, ISK\}$. On the other hand, the expression $\Delta \ln(MP_t)$ represents the returns of the base metal that we are interested in evaluating at time t. Finally, ε_{lt} represents the error terms at time t.

In the multistep-ahead forecasting horizons we use the same specification of one-step-ahead, but adapted to obtain forecasts at multiple horizons, we forecast at 7 horizons of predictability, which are: h = 1, 3, 6, 9, 12, 15 and 24 months-ahead. The models at multistep-ahead are:

Table 2B: Econometric Specifications Multiple-Step-Ahead Base Metals commodities

(5) $AR(1): \Delta \ln(MP_{t-1,t-1+h}) = C + B_1^{(h)}[\Delta \ln(ER^i_{t-1}) + \Delta \ln(ER^i_{t-2})] \ + \ \mathrm{P}^{(h)}\Delta \ln(MP_{t-1,t-1+h}) + \varepsilon_{lt+h}$

(6) $RW: \Delta \ln(MP_{t-1,t-1+h}) = C + B_1^{(h)}[\Delta \ln(ER^i_{t-1}) + \Delta \ln(ER^i_{t-2})] + \varepsilon_{lt+h}$

(7) $DRW: \ \Delta \ln(MP_{t-1,t-1+h}) = B_1^{(h)}[\Delta \ln(ER^i_{t-1}) + \Delta \ln(ER^i_{t-2})] + \varepsilon_{lt+h}$

3.2 Fuels

In fuels, we evaluate our hypothesis using a forecast model from research by Pincheira, Hardy, Nabil and Bentancor (See Pincheira, Hardy, Nabil and Bentancor,2021, "Forecasting Fuel Prices with the Chilean Exchange Rate: Going Beyond the Commodity Currency Hypothesis"). In their research, the authors show that the Chilean exchange rate can predict the return of 5 different fuels, they find evidence in-sample and out-of-sample for multiple horizons, we use the same commodities, but we add kerosene and analyze also for 15 and 24 steps forward. Then econometric specifications at one step ahead are:

Table 1A: Econometric Specifications One-Step-Ahead fuels commodities

(1) $AR(1)\colon \Delta \ln(FP_t) = C + B_1[\Delta \ln(ER^i_{t-1}) + \Delta \ln(ER^i_{t-2}) + \Delta \ln(ER^i_{t-3})] + B_2[\Delta \ln(ER^i_{t-4}) + \Delta \ln(ER^i_{t-5}) + \Delta \ln(ER^i_{t-6})] + P\Delta \ln(FP_{t-1}) + \varepsilon_{it}$

(2) $RW\colon \Delta \ln(FP_t) = C + B_1[\Delta \ln(ER^i_{t-1}) + \Delta \ln(ER^i_{t-2}) + \Delta \ln(ER^i_{t-3})] + B_2[\Delta \ln(ER^i_{t-4}) + \Delta \ln(ER^i_{t-5}) + \Delta \ln(ER^i_{t-6})] + \varepsilon_{it}$

(3) $DRW\colon \Delta \ln(FP_t) = B_1[\Delta \ln(ER^i_{t-1}) + \Delta \ln(ER^i_{t-2}) + \Delta \ln(ER^i_{t-3})] + B_2[\Delta \ln(ER^i_{t-4}) + \Delta \ln(ER^i_{t-5}) + \Delta \ln(ER^i_{t-6})] + \varepsilon_{it}$

Notes: we define FP_t as the fuel price that we are evaluating at time t, ER^i_t represent the currency of the country that we are evaluating at time t, where $i = \{CLP, ISK, AUD, CAN, NZD, NOK\}$. The $\Delta \ln(FP_t)$ represent the fuel price returns at time t, $\Delta \ln(ER_t)$ is the commodity currency return of each country and $\Delta \ln(ER_t)$ is the return of the Chilean exchange rate, c represents a constant. Finally, ε_{it} represents the error terms at time t.

In the multistep-ahead forecasting horizons we use the same specification of one-step-ahead, but adapted to obtain forecasts at multiple horizons, we forecast at 7 horizons of predictability, which are: h = 1, 3, 6, 9, 12, 15 and 24 months-ahead. The models at multistep-ahead are:

Table 1B: Econometric Specifications Multiple-Step-Ahead fuels commodities

(4) $AR(1)$: $\Delta \ln(FP_{t,t+h}) = C + B_1^{(h)}[\Delta \ln(ER_{t-1}^l) + \Delta \ln(ER_{t-2}^l) + \Delta \ln(ER_{t-3}^l)] + B_2^{(h)}[\Delta \ln(ER_{t-4}^l) + \Delta \ln(ER_{t-5}^l) + \Delta \ln(ER_{t-6}^l)] + P^{(h)}\Delta \ln(FP_{t-1}) + \varepsilon_{it+h}$

(5) RW: $\Delta \ln(FP_{t,t+h}) = C + B_1^{(h)}[\Delta \ln(ER_{t-1}^l) + \Delta \ln(ER_{t-2}^l) + \Delta \ln(ER_{t-3}^l)] + B_2^{(h)}[\Delta \ln(ER_{t-4}^l) + \Delta \ln(ER_{t-5}^l) + \Delta \ln(ER_{t-6}^l)] + \varepsilon_{it+h}$

(6) DRW: $\Delta \ln(FP_{t,t+h}) = B_1^{(h)}[\Delta \ln(ER_{t-1}^l) + \Delta \ln(ER_{t-2}^l) + \Delta \ln(ER_{t-3}^l)] + B_2^{(h)}[\Delta \ln(ER_{t-4}^l) + \Delta \ln(ER_{t-5}^l) + \Delta \ln(ER_{t-6}^l)] + \varepsilon_{it+h}$

4. Methodology

4.1 First section

In the first section we want to evaluate the forecasting ability of the currency to predict the return of fuels and base metals. In this section, our analysis has two parts, the first part is the in-sample evaluation and the second part is the out-of-sample evaluation. In the sample analysis we estimate regressions with all available observations and consider the t-statistic associated to the coefficient of return of the exchange rate. In our out-of-sample we analyzed two models in competition: the model with currencies and the model without currencies (Benchmark), to conduct the analysis we split our sample into two parts: an initial estimation window of size R and a prediction window of size P, for robustness purposes we consider three different sizes of R. In the first window we employ one third of the observations for the initial estimation window, leaving two thirds for the forecast evaluations. In the second window we used approximately 60% of the observations leaving 40% for evaluation. In the third window we used approximately 50% of the observations leaving the other 50% for evaluation We update our OLS estimators using the rolling scheme of R monthly observations. Consider that we have 271 observations of a return period, and we use an initial window size of R=91, R=171 and R=136 then for one-step-ahead analysis we have 180, 100 and 136 predictions (P=T-R). We want to evaluate the currency's predictive ability to predict the return of fuels and base metals using the traditional criteria of accuracy at the sample and population level, so we evaluate which model is better in terms of MSPE

using the ENCNEW test at the population level and the Diebold-Mariano test at the sample level.

4.2 Second section

In the second section we show that the correlation criteria and the precision criteria are not necessarily equivalent on finding evidence of predictability at the sample level. To demonstrate our hypothesis we use two different criteria. The first is to evaluate the predictive accuracy of the forecasts with the MSPE and the second criterion is to evaluate how the forecasts are associated with the target value by measuring with correlations. To compare the forecasts using each criterion we use the R^2_{OOS} inspired in Goyal and Welch (2003) and Pincheira (2013) to assess which model is better in terms of accuracy and we use differential of correlations of Pincheira and Hardy to see which model is better in terms of how the forecasts is associated with the target value. Finally, we test whether the results when we comparing by accuracy are significant statistically using the Diebold-Mariano test and we test if the results when we comparing by correlations are significant statistically using the correlation-based test of predictability. In order to simplify and delimit the research, we analyze the results of this section only at one step ahead.

A) Criterion of accuracy

As we mentioned we use the ratio of R^2_{OOS} inspired in Goyal and Welch (2003) and Pincheira (2013) to evaluate which model is better in terms of accuracy. To calculate this ratio, we divide the MSPE of the first model with the MSPE of the benchmark model. This ratio show which model is better in terms of accuracy. When R^2_{OOS} is greater than zero implies that the model that we are evaluating is better in terms of accuracy than the benchmark model. On the other hand, if R^2_{OOS} is negative implies that the model that we are evaluating it is worse than the benchmark in terms of accuracy.

$$R^2_{OOS} = 1 - \frac{MSPE_{model}}{MSPE_{benchmark}}$$

We evaluate statistical significance of this ratio evaluating the null hypothesis of no difference in the accuracy of the two competing forecasts with the traditional test of Diebold-Mariano.

B) Criterion of correlation

The second criterion is to evaluate which model is better in terms of how the forecast is associated with the target value. We measure the correlations between the model forecasts with their target value and compare this coefficient with the correlation of the benchmark forecasts with the actual values. A higher correlation implies that the forecasts are more associated with the target value, so the forecasts that has the highest correlation coefficient with the target value is better in terms of correlations than the other model. Moreover, the model with the lowest correlation with the actual values is the worst model in terms of correlations.

$$\Delta Correlations = Correlation_{model} - Correlation_{benchmark}$$

A positive differential of correlations implies that the model that we are evaluating improves the benchmark in terms of correlations while a negative differential of correlations implies that the forecasts that we are evaluating are worse in terms of correlations.

We evaluate the statistical significance of the null hypothesis of equal correlations with the objective value with the Pincheira and Hardy predictability correlations test when the forecasts we are evaluating are not constant and when we are evaluating constant forecasts we use a regression where the dependent variable are the objective values and the regressors the forecast plus a constant. Therefore, we use the correlation-based test when the model we are evaluating is the AR(1) and the random walk with drift at the sample level (non-constant forecasts) and regression when we are evaluating the random walk without drift and the random walk with drift at the pseudo-sample level, because in both cases the forecasts are constant. The following equation shows the t-statistic of the correlation-based predictability test for the cases of the non-constant forecasts.

$$Correlation - t = \sqrt{TS_y^2}\left(\frac{r_z - r_x}{\sqrt{\bar{v}}}\right)$$

As we can see, this test can only be used when we are evaluating non-constant forecasts, because for the correlation not to be undefined, the test needs a non-zero variance, which means that in the case of the driftless random walk that is a null forecast (With a null variance) and the non-sample-level random walk that also has a constant forecast (With a null variance) we have to use a different methodology to evaluate the statistical significance of the null hypothesis of correlations. The methodology we use in that scenario is the following regression.

$$y = c + B * y^f + \varepsilon$$

In the regression "y" is the target value, "B" the coefficient associated to the forecasts "y^f", "c" is a constant and finally "ε" is the error of the regression. Therefore with "B" we obtain the coefficient and the statistical significance of how the forecasts are associated with the target value.

C) Finding paradox

To evaluate our hypothesis that both criteria are not necessarily equivalent we do two analyses, the first consists of observing how often we find the paradox and the second analysis consist in compare the out of sample R^2 of Goyal and Welch with the out of sample R^2 that we obtain by correlation to show in an alternative way that both criteria are not equivalent and that sometimes we can even obtain more information using the correlation criteria.

In the first analysis of the second section, we analyze how often we encounter the paradox when analyzing a step forward. There are 6 possible paradox scenarios, 4 of which are weak paradox and the other two are strong paradox. The weak paradox is when one test rejects the null hypothesis while the other test does not. In addition, the strong paradox is when both tests reject the null hypothesis but in opposite directions, that means that one test rejects in favor of one model while the other test rejects the null hypothesis again the other

model. In the results we also show how often each test reject the null hypothesis in favor to the model with currencies and in favor to the benchmark, showing also which test gives more information in each scenario.

The paradox it is evidence that both tests are not equivalent, because in the scenario of weak paradox one test gives evidence to support that one model performance the other while the test that do not reject the null hypothesis support that there is no evidence to choose which model it is better, giving different information. Moreover, the strong paradox provides strong evidence to support that the two tests are not equivalent, because in that scenario they both reject in opposite directions.

Finally in the second analysis of the second section we compare the out of sample R^2 of Goyal and Welch with a pseudo out of sample R^2 that we obtain with the regression between the forecasts and the target values with a constant, where the R^2 it is the coefficient "B" associated to the target value.

$$y^f = c + B * y + \varepsilon$$

5. Empirical Results

5.1 First section

The results of the first section are important because we find evidence supporting that it is possible to predict the return of fuel and base metal commodities using population-level currencies in multiple steps forward. We find evidence according to the pincheira-hardy framework, but we also find more evidence of predictability in multiple steps forward in base metal and fuel commodities. We also evaluated at the sample level, but the evidence we find using the MSPE criterion was weak (The results are in the appendix), but as we show in the second section, when we evaluated using the correlation criterion, we find more evidence at the sample level.

A) Base metals

In base metals we find conclusions similar to those Pincheira and Hardy (2019, 2018) find in their research at the sample and population level. They evaluate the aluminum in multiple steps forward using the same currencies we used, and we find a similar conclusion with their findings in the in-sample and out-of-sample evaluation (See Pincheira and Hardy ;2019, "Forecasting Aluminum Prices with Commodity Currencies"). Moreover, for the rest of base metals and the Lmex index we also find a conclusion similar to that of Pincheira-Hardy(See Pincheira and Hardy ;2018, "Forecasting Base Metal Prices with Commodity Currencies"). However, they evaluate only one step ahead and we evaluate in seven horizons using the same currencies that they use to evaluate aluminum. At the sample level, we find almost no evidence of predictability, but as we said before, this is a result that we expected to find and is the motivation for this work, because as we show in the results of the second section, the correlations criterion is an alternative approach that can help fill this gap.

We find three main findings in base metals, the first is that there is strong evidence in-sample and out-of-sample to support that the Chilean exchange rate can predict the return of copper and Lmex up to 9 steps forward. The second finding is that there is evidence to support that it is possible to predict the return of lead with all six currencies one step ahead and several steps ahead in almost all exchange rates, but in this case the evidence is not so strong in the in-sample analysis. The third finding is that there is evidence supporting that it is possible to predict the return of tin using currencies at the population level in multiple steps forward. The results are stronger when we are evaluating using the Chilean, Australian and the Iceland exchange rate. In table 3 we show the main in-sample results while in tables 4 - 7 we show the main out-of-sample results for base metals, the rest of the results are in the appendix. In tables 4 - 7 we show the results for one window of estimation (P/R = 0.6). However, for the other two windows of estimation (P/R = 1 and P/R = 2) we find similar conclusions and the results can be find in the appendix.

In-sample

Table 3 *Forecasting base metals with commodity currencies at multiple horizons - In sample analysis*

	Chilean Peso				Australian Dollar				Iceland Krone			
Copper	***H1***	***H6***	***H12***	***H24***	***H1***	***H6***	***H12***	***H24***	***H1***	***H6***	***H12***	***H24***
ER(t-1)+ER(t-2)	-0.35***	-1.25***	-0,64	-0,51	-0,17	-0,3	-0,29	-0,22	-0,23	-0.54*	-0,61	-0,16
Copper (t-h)	0,04	-0,13	-0,08	-0,03	0,08	0,13	0	0,04	0,09	0,12	-0,03	0,09
Constant	0,01	0.04*	0,08	0.16*	0,01	0,04	0,08	0.16*	0,01	0,04	0,08	0.16*
F-statistic	8,54	8,89	1,13	0,38	4,38	1,3	0,34	0,13	7,55	3,51	1,91	0,12
R-squared	0,06	0,06	0,01	0	0,03	0,01	0	0	0,05	0,03	0,01	0
Lead	***H1***	***H6***	***H12***	***H24***	***H1***	***H6***	***H12***	***H24***	***H1***	***H6***	***H12***	***H24***
ER(t-1)+ER(t-2)	-0.36**	-0,62	0,25	-0,7	-0.30*	-0,45	0,05	-0,36	-0.35***	-0.66**	-0,41	-0,34
Lead (t-h)	-0,08	0,03	0,03	-0.46*	-0,08	0,05	-0,01	-0,4	-0,08	0,02	-0,11	-0,38
Constant	0,01	0,04	0,07	0.15*	0,01	0,04	0,08	0.15*	0,01	0,04	0,08	0.15*
F-statistic	4,77	2,58	0,16	1,33	3,93	1,84	0,01	0,8	7,63	4,52	0,69	0,87
R-squared	0,03	0,02	0	0,01	0,03	0,01	0	0,01	0,05	0,03	0,01	0,01
Tin	***H1***	***H6***	***H12***	***H24***	***H1***	***H6***	***H12***	***H24***	***H1***	***H6***	***H12***	***H24***
ER(t-1)+ER(t-2)	-0.25***	-1.13***	-0,78	-0,25	-0,2	-0.74***	-0.79*	-0,72	-0.17*	-0.84***	-0.74*	0,01
Tin (t-h)	0,11	0,25	0,35	-0.61*	0,1	0,25	0,27	-0.78**	0.13*	0.33*	0,38	-0,56
Constant	0,01	0.05*	0,09	0.18**	0,01	0,04	0,09	0.18**	0,01	0.05*	0.09*	0.17**
F-statistic	7,08	11,26	3,17	1,17	5,88	6,73	3,42	1,97	6,08	10,5	4,05	1,08
R-squared	0,05	0,08	0,02	0,01	0,04	0,05	0,03	0,02	0,04	0,07	0,03	0,01
Lmex	***H1***	***H6***	***H12***	***H24***	***H1***	***H6***	***H12***	***H24***	***H1***	***H6***	***H12***	***H24***
CLP(t-1)+CLP(t-2)	-0.27***	-0.92***	-0,37	-0,42	-0,14	-0,27	-0,1	-0,1	-0,18	-0.53*	-0,54	-0,07
Lmex (t-h)	0,03	0,08	0,11	-0,22	0,07	0,31	0,2	-0,1	0,09	0,29	0,1	-0,07
Constant	0,01	0,03	0,06	0,12	0	0,03	0,06	0,11	0	0,03	0,06	0,11
F-statistic	7,71	8,66	0,85	0,28	4	3,16	0,45	0,03	6,48	6,38	2,19	0,03
R-squared	0,05	0,06	0,01	0	0,03	0,02	0	0	0,05	0,05	0,02	0

*HAC standard errors are computed according to Newey and West (1987, 1994). ER (ER= CLP, ISK and AUD) stands for Exchange Rates Returns, ER(− 1) and ER(−2) represent the first and second lags of Exchange Rates Returns, we use the same notation for the commodities. H1, H6, H12 and H24 represent the forecasting horizon, 1, 6, 12 and 24 months ahead. (*p<10%, **p<5%, ***p<1%.)*

Out-of-sample

Table 4 Forecasting copper with the commodity currencies at multiple horizons Out of sample analysis at population level.

Copper	P/R = 0.6					
	ENCNEW					
One-Step-AHead	***CLP***	***ISK***	***AUD***	***CAD***	***NZD***	***ZAR***
AR(1)	6.41***	2.78**	1.78**	-0,25	-0,48	0,57
RW	6.09***	1.84**	1.55**	0,37	-0,2	1.12*
DRW	5.32***	1.84**	1.05*	0,04	-0,35	0,89
three-Step-AHead	***CLP***	***ISK***	***AUD***	***CAD***	***NZD***	***ZAR***
AR(1)	4.63***	1.05*	5.33***	-0,55	1.33*	-0,45
RW	5.07***	0,77	6.37***	-0,86	2.77**	-0,29
DRW	3.37***	0,83	4.95***	-2,02	2.09**	-0,73
Six-Step-AHead	***CLP***	***ISK***	***AUD***	***CAD***	***NZD***	***ZAR***
AR(1)	7.41***	0,87	1.24*	0,47	1.01*	-0,29
RW	7.57***	1.13*	2.26**	0.95*	1.97**	-0,11
DRW	5.30***	1.15*	2.06**	0,47	2.26**	-0,28
Nine-Step-AHead	***CLP***	***ISK***	***AUD***	***CAD***	***NZD***	***ZAR***
AR(1)	2.32**	0,83	0,55	1.94**	0,69	0.94*
RW	2.27**	1.49*	-0,02	1.66**	0,35	1.42*
DRW	1.25*	1.63**	0,24	1.14*	0,67	0,69
Twelve-Step-AHead	***CLP***	***ISK***	***AUD***	***CAD***	***NZD***	***ZAR***
AR(1)	1.07*	0,62	-0,64	0.92*	-0,68	1.33*
RW	1.07*	0.98*	-0,62	0,88	-0,72	1.71**
DRW	0,75	1.19*	-0,14	0.96*	-0,11	1.38*

10%, 5% and 1% critical values are 0.764, 1.161 and 2.278 respectively for ENCNEW when excess parameters are 1

Table 5 Forecasting lead with the commodity currencies at multiple horizons Out of sample analysis at population level.

Lead	P/R = 0.6					
	ENCNEW					
One-Step-AHead	***CLP***	***ISK***	***AUD***	***CAD***	***NZD***	***ZAR***
AR(1)	7.48***	5.86***	4.10***	3.25***	4.71***	3.97***
RW	4.16***	3.03***	1.75**	1.62**	2.49**	3.05***
DRW	3.77***	3.38***	1.48*	1.22*	2.38**	2.87***
three-Step-AHead	***CLP***	***ISK***	***AUD***	***CAD***	***NZD***	***ZAR***
AR(1)	2.44**	3.18***	5.15***	0,2	5.80***	2.77**
RW	1.59**	0,22	2.60**	-0,83	3.69***	1.73**
DRW	0,84	1.12*	1.42*	-2,13	2.93***	1.54**
Six-Step-AHead	***CLP***	***ISK***	***AUD***	***CAD***	***NZD***	***ZAR***
AR(1)	5.39***	5.91***	3.54***	2.04**	2.02**	1.51**
RW	5.57***	4.66***	3.71***	2.62**	2.79**	1.67**
DRW	4.49***	6.14***	3.23***	1.56**	2.99***	1.46*
Nine-Step-AHead	***CLP***	***ISK***	***AUD***	***CAD***	***NZD***	***ZAR***
AR(1)	-1,59	1.42*	-2,12	-1,56	-1,49	0,21
RW	-1,01	1.24*	-1,43	-1,11	-0,89	0,3
DRW	-0,81	2.22**	-0,77	-0,35	-0,08	0,01
Twelve-Step-AHead	***CLP***	***ISK***	***AUD***	***CAD***	***NZD***	***ZAR***
AR(1)	-3,76	0,48	-3,17	-2,39	-3,5	-0,25
RW	-3,41	0,37	-2,89	-2,27	-3,14	-0,33
DRW	-2,6	0,81	-2,2	-1,05	-2,21	-0,61

10%, 5% and 1% critical values are 0.764, 1.161 and 2.278 respectively for ENCNEW when excess parameters are 1

Table 6 Forecasting tin with the commodity currencies at multiple horizons Out of sample analysis at population level.

Tin	P/R = 0.6					
	ENCNEW					
One-Step-AHead	***CLP***	***ISK***	***AUD***	***CAD***	***NZD***	***ZAR***
AR(1)	2.67**	2.13**	1.64**	-0,24	1.01*	0,85
RW	4.27***	3.73***	3.75***	0,91	2.68**	2.29**
DRW	3.49***	3.57***	3.37***	0,7	2.48**	1.84**
three-Step-AHead	***CLP***	***ISK***	***AUD***	***CAD***	***NZD***	***ZAR***
AR(1)	0,46	0,57	1.61**	-0,63	1.51**	-0,28
RW	2.11**	2.46**	4.13***	0,11	3.66***	-0,23
DRW	0,73	2.54**	3.33***	-0,13	2.98***	-0,38
Six-Step-AHead	***CLP***	***ISK***	***AUD***	***CAD***	***NZD***	***ZAR***
AR(1)	4.16***	1.39*	2.39**	1.93**	2.20**	-0,95
RW	6.19***	3.09***	4.37***	3.32***	3.96***	-0,83
DRW	3.83***	2.85**	3.53***	2.56**	3.35***	-0,86
Nine-Step-AHead	***CLP***	***ISK***	***AUD***	***CAD***	***NZD***	***ZAR***
AR(1)	1.77**	1.11*	1.14*	1.74**	0,76	-0,7
RW	2.84**	2.19**	2.00**	2.60**	1.54**	-0,4
DRW	1.58**	1.91**	1.64**	1.82**	1.26*	-0,53
Twelve-Step-AHead	***CLP***	***ISK***	***AUD***	***CAD***	***NZD***	***ZAR***
AR(1)	0.95*	0,2	0,86	1.08*	0,45	-0,58
RW	1.40*	0,8	1.48*	1.71**	0,84	-0,28
DRW	0,91	0,77	1.14*	1.07*	0,73	-0,37

10%, 5% and 1% critical values are 0.764, 1.161 and 2.278 respectively for ENCNEW when excess parameters are 1

Table 7 Forecasting Lmex with the commodity currencies at multiple horizons Out of sample analysis at population level.

LMEX	P/R = 0.6					
	ENCNEW					
One-Step-AHead	***CLP***	***ISK***	***AUD***	***CAD***	***NZD***	***ZAR***
AR(1)	5.97***	2.67**	1.22*	-0,14	-0,52	0,75
RW	7.23***	3.01***	1.92**	0,87	0,49	1.96**
DRW	6.52***	2.78**	1.56**	0,62	0,42	1.61**
three-Step-AHead	***CLP***	***ISK***	***AUD***	***CAD***	***NZD***	***ZAR***
AR(1)	3.39***	1.71**	4.53***	-0,42	1.75**	-0,34
RW	5.75***	2.75**	7.18***	0,03	4.51***	0,66
DRW	4.17***	2.32**	6.04***	-0,92	3.92***	0
Six-Step-AHead	***CLP***	***ISK***	***AUD***	***CAD***	***NZD***	***ZAR***
AR(1)	4.39***	1.50*	0.96*	0,64	0,81	-0,44
RW	6.80***	2.62**	3.44***	1.85**	3.20***	-0,04
DRW	4.87***	2.16**	3.12***	1.25*	3.31***	-0,28
Nine-Step-AHead	***CLP***	***ISK***	***AUD***	***CAD***	***NZD***	***ZAR***
AR(1)	1.06*	1.60**	-0,68	1.10*	-0,19	0,19
RW	1.79**	2.38**	-0,05	1.48*	0,23	0,85
DRW	1.03*	2.10**	0,2	1.08*	0,56	0,34
Twelve-Step-AHead	***CLP***	***ISK***	***AUD***	***CAD***	***NZD***	***ZAR***
AR(1)	0,3	1.05*	-1,4	0,33	-1,35	0,7
RW	0,49	1.43*	-0,95	0,52	-1,18	1.17*
DRW	0,38	1.39*	-0,54	0,63	-0,64	0,86

10%, 5% and 1% critical values are 0.764, 1.161 and 2.278 respectively for ENCNEW when excess parameters are 1

B) Fuels

Similarly with previous research ("Forecasting Fuel Prices with the Chilean Exchange Rate: Going Beyond the Commodity Currency Hypothesis") we also find that the Chilean peso can predict the return of WTI, brent and natural gas at twelve steps ahead. However, our

findings are a contribution because we evaluate up to 24 steps forward while the authors evaluate up to 12 steps forward and we find evidence of predictability at the population level up to fifteen steps forward and even up to 24 steps forward. In addition, in our analysis, we added another fuel commodity (kerosene) and find strong evidence of predictability in multiple steps forward.

So, our main findings in fuels commodities it is that in the in-sample analysis we find strong evidence that supports that the Chilean peso, the Australian Dollar and the Iceland krone can predict any return of fuel to multiple steps forward, but in the case of the Iceland krone and the Australian Dollar the evidence it is weaker compare with the Chilean exchange rate. Moreover, for the Norwegian krone, the Canadian and New Zealand dollar we find less evidence compare with the rest of the currencies. Other interesting results is that we find that there is strong evidence supporting that the exchange rate can predict the return of heating oil fifteen steps ahead in the out-of-sample analysis at the population level. With propane we find that the exchange rate can predict up to nine steps forward. Finally, we also evaluated kerosene and find that the Chilean exchange rate can predict up to fifteen steps forward at the population level.

In table 8 we show the main in-sample results while in table 9 - 11 we show the main out-of-sample results for fuels, the rest of the results are in the appendix. In tables 9 -11 we show the results for one window of estimation (P/R = 0.6). However, for the other two windows of estimation (P/R = 1 and P/R = 2) we find similar conclusions and the results can be find in the appendix.

In-sample

Table 8 *Forecasting fuels with the commodity currencies at multiple horizons - In sample analysis.*

	Chilean Peso				Australian Dollar				Iceland Krone			
WTI	***H1***	***H6***	***H12***	***H24***	***H1***	***H6***	***H12***	***H24***	***H1***	***H6***	***H12***	***H24***
ER(t-h)	-0.47***	-2.23***	-1.86***	-1.91***	-0,27	-1.12***	-1.29**	-0,58	-0,33	-1.09***	-1.36***	-1.78***
WTI (t-h)	0.10**	-0.36***	-0.43**	-0.66***	0.11**	-0.28**	-0.43*	-0.54**	0.10**	-0.29**	-0.44**	-0.74***
Constant	0,01	0,04	0,05	0,09	0,01	0,03	0,06	0,09	0	0,03	0,05	0,08
F-statistic	8,45	20,55	8,02	6,4	5,59	7,51	6,09	2,2	6	5,18	5,02	6,37
R-squared	0,06	0,14	0,06	0,05	0,04	0,05	0,05	0,02	0,04	0,04	0,04	0,05
Brent	***H1***	***H6***	***H12***	***H24***	***H1***	***H6***	***H12***	***H24***	***H1***	***H6***	***H12***	***H24***
ER(t-h)	-0.67***	-2.39***	-1.90***	-2.14***	-0.34*	-1.17***	-1.23**	-0,62	-0.58**	-1.13***	-1.43***	-2.02***
Brent (t-h)	0,01	-0.43***	-0.43**	-0.64***	0,03	-0.36***	-0.41**	-0.52**	0	-0.35***	-0.44**	-0.70***
Constant	0.01*	0,04	0,06	0,1	0,01	0,04	0,06	0,1	0,01	0,03	0,05	0,09
F-statistic	7,83	21,17	7,64	6,87	3,5	8,03	5,38	2,51	6,86	5,81	5,3	7,08
R-squared	0,06	0,14	0,06	0,05	0,03	0,06	0,04	0,02	0,05	0,04	0,04	0,06
Natural Gas	***H1***	***H6***	***H12***	***H24***	***H1***	***H6***	***H12***	***H24***	***H1***	***H6***	***H12***	***H24***
ER(t-h)	-0,17	-1.51***	-1.77***	-0,69	-0,01	-1.14***	-2.01***	-0,57	0,16	-1.34***	-1.52***	-1,05
Natural gas (t-h)	-0.16**	-0.19**	-0.33***	-0.58***	-0.15**	-0.20**	-0.35***	-0.59***	-0.15**	-0.20**	-0.34***	-0.60***
Constant	0,01	0,02	0,02	0	0,01	0,02	0,02	0	0,01	0,01	0,01	-0,01
F-statistic	3,52	6,41	6,09	5,92	3,25	5,88	10,88	5,98	3,53	6,1	5,66	6,95
R-squared	0,03	0,05	0,05	0,05	0,02	0,04	0,08	0,05	0,03	0,04	0,04	0,05
Heating Oil	***H1***	***H6***	***H12***	***H24***	***H1***	***H6***	***H12***	***H24***	***H1***	***H6***	***H12***	***H24***
ER(t-h)	-0.51***	-2.02***	-2.18***	-2.33***	-0.31**	-1.19***	-1.59***	-0,94	-0.37*	-1.15***	-1.68***	-2.21***
Heating Oil (t-h)	0,06	-0,14	-0,29	-0.84**	0,06	-0,11	-0,31	-0.72**	0,06	-0,09	-0,3	-0.91**
Constant	0,01	0,04	0,06	0,09	0,01	0,04	0,06	0,09	0,01	0,03	0,05	0,09
F-statistic	9,33	17,86	9,88	8,48	5,9	9,11	8,18	3,39	6,23	6,25	6,75	8,94
R-squared	0,07	0,12	0,07	0,07	0,04	0,07	0,06	0,03	0,04	0,05	0,05	0,07
Propane	***H1***	***H6***	***H12***	***H24***	***H1***	***H6***	***H12***	***H24***	***H1***	***H6***	***H12***	***H24***
ER(t-h)	-0.49***	-1.81***	-1.77***	-0,84	-0.44**	-1.42***	-1.60**	-0,38	-0,36	-1.14**	-1.26***	-1,02
Propane (t-h)	-0,06	-0.24**	-0,19	-0.64***	-0,08	-0.30***	-0.28*	-0.64***	-0,06	-0.23**	-0,2	-0.68***
Constant	0,01	0,03	0,04	0,06	0,01	0,03	0,04	0,06	0	0,02	0,04	0,05
F-statistic	3,58	10,69	4,32	3,6	4,35	9,84	5,45	3,16	2,23	4,97	2,57	4,07
R-squared	0,03	0,08	0,03	0,03	0,03	0,07	0,04	0,03	0,02	0,04	0,02	0,03
Kerosene	***H1***	***H6***	***H12***	***H24***	***H1***	***H6***	***H12***	***H24***	***H1***	***H6***	***H12***	***H24***
ER(t-h)	-0.56***	-2.22***	-2.31***	-2.48***	-0.29**	-1.22***	-1.60***	-1	-0.45**	-1.34***	-1.82***	-2.45***
Kerosene (t-h)	0.07*	-0.25**	-0.37*	-0.85***	0.09*	-0.18*	-0,36	-0.72**	0,07	-0.20**	-0.38*	-0.93***
Constant	0,01	0,04	0,06	0,09	0,01	0,04	0,06	0,09	0,01	0,03	0,05	0,08
F-statistic	9,23	18,64	10,07	8,77	5,15	8,05	7,58	3,71	7,31	7,24	7,24	9,78
R-squared	0,06	0,12	0,07	0,07	0,04	0,06	0,06	0,03	0,05	0,05	0,05	0,07

*HAC standard errors are computed according to Newey and West (1987, 1994). ER (ER= CLP, ISK and AUD) stands for Exchange Rates Returns, ER(– 1) and ER(–2) represent the first and second lags of Exchange Rates Returns, we use the same notation for the commodities. H1, H6, H12 and H24 represent the forecasting horizon, 1, 6, 12 and 24 months ahead. (*p<10%, **p<5%, ***p<1%.)*

Out-of-sample

Table 9 Forecasting Kerosene with the commodity currencies at multiple horizons - Out of sample analysis at population level

Kerosene	P/R= 0.6					
	ENCNEW					
One-Step-AHead	*CLP*	*ISK*	*AUD*	*CAD*	*NZD*	*NOK*
AR(1)	3.50***	-0,02	1.13*	0,17	1.28*	1.10*
RW	5.57***	0,67	2.26**	0.92*	2.15**	2.31**
DRW	5.02***	0,6	2.05**	0,69	2.03**	1.88**
three-Step-AHead	*CLP*	*ISK*	*AUD*	*CAD*	*NZD*	*NOK*
AR(1)	9.61***	0.92*	2.92***	0.95*	4.72***	3.11***
RW	6.86***	0,1	2.10**	0,48	3.65***	2.13**
DRW	5.68***	0,15	1.77**	0,16	3.39***	1.58**
Six-Step-AHead	*CLP*	*ISK*	*AUD*	*CAD*	*NZD*	*NOK*
AR(1)	10.27***	1.22*	3.38***	2.92***	6.14***	2.39**
RW	8.49***	0,91	2.97***	2.57**	5.53***	2.02**
DRW	6.94***	1.22*	2.50**	1.81**	5.06***	1.58**
Nine-Step-AHead	*CLP*	*ISK*	*AUD*	*CAD*	*NZD*	*NOK*
AR(1)	7.18***	1.57**	3.48***	4.90***	3.26***	1.05*
RW	5.93***	1.94**	2.99***	4.38***	3.06***	0,44
DRW	5.11***	2.09**	2.62**	3.56***	2.61**	0,59
Twelve-Step-AHead	*CLP*	*ISK*	*AUD*	*CAD*	*NZD*	*NOK*
AR(1)	4.09***	2.53**	3.28***	3.01***	2.82**	0,24
RW	3.00***	2.50**	2.76**	2.42**	2.60**	-0,43
DRW	2.77**	2.69**	2.65**	2.41**	2.30**	0,14
Fifteen-Step-AHead	*CLP*	*ISK*	*AUD*	*CAD*	*NZD*	*NOK*
AR(1)	3.29***	1.39*	3.13***	0,78	2.65**	0,35
RW	2.29**	1.75**	2.62**	0,35	2.37**	-0,27
DRW	2.12**	2.05**	2.45**	0,77	1.94**	0,32
Twentyfour-Step-AHead	*CLP*	*ISK*	*AUD*	*CAD*	*NZD*	*NOK*
AR(1)	1.39*	-0,59	1.52**	1.61**	0,23	-0,24
RW	-0,07	-0,41	0,67	0,6	0,13	-0,58
DRW	-0,04	0,48	0.95*	1.16*	0,28	0,47

10%, 5% and 1% critical values are 0.764, 1.161 and 2.278 respectively for ENCNEW when excess parameters are 1

Table 10 Forecasting Heating Oil with the commodity currencies at multiple horizons - Out of sample analysis at population level

Heating Oil	P/R= 0.6					
	ENCNEW					
One-Step-AHead	*CLP*	*ISK*	*AUD*	*CAD*	*NZD*	*NOK*
AR(1)	6.08***	0,5	1.89**	1.00*	2.29**	2.52**
RW	8.21***	1.47*	3.02***	2.04**	3.11***	3.91***
DRW	7.41***	1.36*	2.74**	1.71**	2.93***	3.28***
three-Step-AHead	*CLP*	*ISK*	*AUD*	*CAD*	*NZD*	*NOK*
AR(1)	10.47***	0.94*	2.95***	1.24*	5.09***	3.47***
RW	10.04***	1.04*	3.13***	1.45*	5.10***	3.74***
DRW	8.47***	1.11*	2.73**	0.99*	4.77***	2.95***
Six-Step-AHead	*CLP*	*ISK*	*AUD*	*CAD*	*NZD*	*NOK*
AR(1)	11.94***	1.93**	3.68***	3.95***	6.68***	2.79**
RW	10.96***	2.03**	3.72***	3.96***	6.61***	2.94***
DRW	9.08***	2.44**	3.25***	3.09***	6.10***	2.39**
Nine-Step-AHead	*CLP*	*ISK*	*AUD*	*CAD*	*NZD*	*NOK*
AR(1)	8.28***	2.00**	3.78***	5.72***	3.50***	1.21*
RW	7.56***	2.87***	3.66***	5.50***	3.64***	0,83
DRW	6.53***	3.09***	3.24***	4.66***	3.06***	0,92
Twelve-Step-AHead	*CLP*	*ISK*	*AUD*	*CAD*	*NZD*	*NOK*
AR(1)	4.65***	2.73**	3.62***	2.87***	3.16***	0,19
RW	3.74***	3.05***	3.26***	2.39**	3.11***	-0,4
DRW	3.46***	3.31***	3.18***	2.56**	2.80**	0,24
Fifteen-Step-AHead	*CLP*	*ISK*	*AUD*	*CAD*	*NZD*	*NOK*
AR(1)	3.41***	1.22*	3.35***	0,7	2.77**	0,44
RW	2.55**	1.86**	2.94***	0,2	2.66**	-0,26
DRW	2.45**	2.28**	2.87***	0,86	2.28**	0,46
Twentyfour-Step-AHead	*CLP*	*ISK*	*AUD*	*CAD*	*NZD*	*NOK*
AR(1)	1.43*	-0,79	1.27*	1.38*	0,05	-0,45
RW	0,01	-0,56	0,48	0,33	-0,02	-0,82
DRW	0,13	0,38	0.98*	1.22*	0,25	0,46

10%, 5% and 1% critical values are 0.764, 1.161 and 2.278 respectively for ENCNEW when excess parameters are 1

Table 11 Forecasting Kerosene with the commodity currencies at multiple horizons - Out of sample analysis at population level

Propane	P/R= 0.6					
	ENCNEW					
One-Step-AHead	*CLP*	*ISK*	*AUD*	*CAD*	*NZD*	*NOK*
AR(1)	2.26**	1.52**	1.38*	0,71	1.37*	2.60**
RW	3.09***	2.01**	1.80**	0.97*	1.71**	2.82**
DRW	2.91***	1.96**	1.73**	0,85	1.67**	2.55**
three-Step-AHead	*CLP*	*ISK*	*AUD*	*CAD*	*NZD*	*NOK*
AR(1)	6.84***	5.24***	4.25***	2.16**	5.64***	6.18***
RW	6.20***	4.59***	3.74***	1.87**	5.05***	4.93***
DRW	5.64***	4.47***	3.56***	1.54**	4.92***	4.40***
Six-Step-AHead	*CLP*	*ISK*	*AUD*	*CAD*	*NZD*	*NOK*
AR(1)	10.24***	8.19***	4.60***	4.16***	5.48***	3.92***
RW	9.14***	7.61***	3.99***	3.65***	4.99***	2.96***
DRW	8.27***	7.44***	3.67***	3.02***	4.67***	2.58**
Nine-Step-AHead	*CLP*	*ISK*	*AUD*	*CAD*	*NZD*	*NOK*
AR(1)	3.69***	2.53**	1.50*	2.33**	1.12*	0,23
RW	4.15***	3.74***	1.66**	2.52**	1.37*	-0,04
DRW	3.51***	3.32***	1.25*	2.00**	0,92	-0,17
Twelve-Step-AHead	*CLP*	*ISK*	*AUD*	*CAD*	*NZD*	*NOK*
AR(1)	0,33	1.06*	-0,04	0,09	0,21	-1,03
RW	0,21	1.24*	-0,19	-0,06	0,16	-1,32
DRW	-0,11	0,81	-0,37	-0,04	-0,2	-1,11
Fifteen-Step-AHead	*CLP*	*ISK*	*AUD*	*CAD*	*NZD*	*NOK*
AR(1)	-0,77	-0,48	-0,16	-0,7	-0,28	-0,23
RW	-0,83	-0,18	-0,35	-0,98	-0,3	-0,71
DRW	-0,85	-0,28	-0,24	-0,49	-0,39	-0,25
Twentyfour-Step-AHead	*CLP*	*ISK*	*AUD*	*CAD*	*NZD*	*NOK*
AR(1)	-1,12	0,32	-0,07	-0,4	0,14	0,78
RW	-0,78	0,45	0,05	-0,35	0,28	1.11*
DRW	-0,52	0.95*	0,41	0,09	0,49	1.71**

10%, 5% and 1% critical values are 0.764, 1.161 and 2.278 respectively for ENCNEW when excess parameters are 1

As we can see, we find enough evidence to support that using the ENCNEW test to evaluate the MSPE criterion often provides enough evidence to choose the best prognoses at the population level, but the evidence we find at the sample level is weak, but as we show in the next section, evaluating using the MSPE criteria is not necessarily equivalent to evaluating using the correlation criterion. So, even when the Diebold-Mariano test cannot detect differences between two competing models at the sample level, we can find evidence to choose the best forecasts using the correlation-based test as an alternative approach.

5.3 Paradox

In this section we evaluate if the accuracy criterion is equivalent to the correlation criterion and we want to evaluate if it is possible to get more information at sample level to choose the best forecasts using the correlation criteria. It is important to remember that the analysis in this section it is just one-step-ahead.

A) Paradox: comparing test

In this section we use two version of the AR(1), The first version is when the model with currency does not have the lag of the dependent variable and the second version of the AR(1) is when it does.

The results we find are interesting because we find strong evidence supporting that the Diebold-Mariano test and the Correlation-based test are not equivalent. As we show in the results, we often find scenarios in which we cannot obtain valuable information to choose the best forecasts using the Diebold-Mariano test while rejecting the null hypothesis using the correlation-based test, however, we also find the scenario in which the Diebold-Mariano test rejects the null hypothesis while the correlation-based test does not. However, it is more common to obtain valuable information using the correlation-based test.

The results we find show that it is somewhat common to find weak paradox scenarios, which supports our hypothesis that the two tests are not equivalent. However, the type of paradox we find depends on the benchmark and the group of commodities we are evaluating. Moreover, the type of paradox also shows which tests provide the most information to choose the best model.

The results are important because we find enough evidence to support that at the sample level the correlation criterion is not necessarily equivalent with the accuracy criterion and that in some scenarios, we can obtain more information using the correlation criterion, therefore we can use the correlation criterion as an alternative approach to choose the best model. However, as we show in detail, we find strong evidence to support that both tests

are not equivalent, but at the same time the evidence supporting that the correlation criterion gives more information than the accuracy criterion is weaker.

Base metals

In base metals the results we find suggest that there is sufficient evidence to support that both criteria are not equivalent. However, the evidence to support that the correlation criterion tends to give more information is weak.

Table 12 *Base Metals - Paradox: Comparing test, Benchmark AR(1) First version at Sample Level*

	Benchmark AR(1)																	
	P/R =1						P/R =2						P/R =06					
Base Metals (Sample level)	CLP	ISK	AUD	CAD	NZD	NOK	CLP	ISK	AUD	CAD	NZD	NOK	CLP	ISK	AUD	CAD	NZD	NOK
PH(Currencies)	43%	57%	14%	14%	29%	57%	0%	0%	0%	0%	0%	0%	71%	43%	14%	14%	14%	29%
DM(Currencies)	57%	57%	57%	57%	57%	71%	57%	14%	0%	14%	0%	14%	57%	29%	14%	29%	29%	57%
PH (Benchmark)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	14%	0%	0%	0%	0%	0%	0%	0%
DM (Benchmark)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Weak Paradox: PH-NDM (Currencies)	14%	0%	0%	0%	14%	0%	0%	0%	0%	0%	0%	0%	14%	14%	0%	14%	14%	0%
Weak Paradox: PH-NDM (Benchmark)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	14%	0%	0%	0%	0%	0%	0%	0%
Weak Paradox: NPH-DM (Currencies)	29%	0%	43%	43%	43%	14%	57%	14%	0%	14%	0%	14%	0%	0%	0%	29%	29%	29%
Weak Paradox: NPH-DM (Benchmark)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Strong Paradox: PH(+)-DM(-)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Strong Paradox: PH(-)-DM(+)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total Paradox	**43%**	**0%**	**43%**	**43%**	**57%**	**14%**	**57%**	**14%**	**0%**	**14%**	**14%**	**14%**	**14%**	**14%**	**0%**	**43%**	**43%**	**29%**

PH Represents the percentage of rejections using the correlation-based predictability test, DM Represents the percentage of rejections using the Diebolds-Mariano test. "Currencies" indicates that the rejections are in favor of the model with currencies while "Benchmark" represents the rejections in favor of the model without currencies. (+) indicates that we reject in favor of the test with currencies while (-) indicates that we reject in favor of the benchmark. Finally, NDM means that we do not reject with the Diebold-Mariano test and NPH means that we do not reject with the correlation-based test.

Table 13 *Base Metals - Paradox: Comparing test, Benchmark AR(1) Second version at Sample Level*

	Benchmark AR(1)																	
	P/R =1						P/R =2						P/R =06					
Base Metals (Sample level)	CLP	ISK	AUD	CAD	NZD	NOK	CLP	ISK	AUD	CAD	NZD	NOK	CLP	ISK	AUD	CAD	NZD	NOK
PH(Currencies)	29%	29%	29%	14%	29%	29%	0%	14%	0%	0%	0%	0%	57%	29%	14%	14%	29%	43%
DM(Currencies)	14%	14%	0%	14%	0%	14%	0%	0%	0%	0%	0%	0%	71%	29%	0%	0%	0%	0%
PH (Benchmark)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
DM (Benchmark)	0%	0%	0%	0%	0%	0%	14%	29%	14%	14%	14%	14%	0%	0%	0%	0%	0%	14%
Weak Paradox: PH-NDM (Currencies)	29%	29%	29%	0%	29%	29%	0%	0%	0%	0%	0%	0%	0%	29%	14%	14%	29%	43%
Weak Paradox: PH-NDM (Benchmark)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Weak Paradox: NPH-DM (Currencies)	14%	14%	0%	0%	0%	14%	0%	0%	0%	0%	0%	0%	14%	29%	0%	0%	0%	0%
Weak Paradox: NPH-DM (Benchmark)	0%	0%	0%	0%	0%	0%	14%	14%	14%	14%	14%	14%	0%	0%	0%	0%	0%	14%
Strong Paradox: PH(+)-DM(-)	0%	0%	0%	0%	0%	0%	0%	14%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Strong Paradox: PH(-)-DM(+)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total Paradox	**43%**	**43%**	**29%**	**0%**	**29%**	**43%**	**14%**	**29%**	**14%**	**14%**	**14%**	**14%**	**14%**	**57%**	**14%**	**14%**	**29%**	**57%**

PH Represents the percentage of rejections using the correlation-based predictability test, DM Represents the percentage of rejections using the Diebolds-Mariano test. "Currencies" indicates that the rejections are in favor of the model with currencies while "Benchmark" represents the rejections in favor of the model without currencies. (+) indicates that we reject in favor of the test with currencies while (-) indicates that we reject in favor of the benchmark. Finally, NDM means that we do not reject with the Diebold-Mariano test and NPH means that we do not reject with the correlation-based test.

As we see in table 12 both tests usually reject the null hypothesis in favor of the model with currencies, so in almost all scenarios both tests reject in the same direction, but as we can see there are many cases in which one test rejects the null hypothesis while the other does not. In addition, it is more common to find the weak paradox where the correlation-based

test does not provide information while the Diebold-Mariano test does, but this conclusion also depends on the evaluation window, so in table 12, the evidence to support that is weak. Therefore, with the results find in table 12, it can be concluded that there is evidence to support that both tests are not equivalent, but the evidence to support that one test gives more information than the other is weak.

Moreover, when we evaluate the table 13, we find a different scenario, where in almost all the comparison we find that we can get more information using the correlation-based test than the Diebold-Mariano test. In this scenario we also find that both tests tend to reject in favor of the model with currencies, so consequently it is common to find the weak paradox where the correlation-based test rejects in favor of the model with currencies while the Diebold-Mariano test does not. However, the results are not so strong because when the estimation window is P / R = 2 we find the opposite scenario where the Diebold-Mariano test rejects the null hypothesis more often than the correlation-based test, but it is interesting to note that in that window we find that the Icelandic exchange rate shows some scenarios where there is a strong paradox, that means that both tests are rejected but in opposite directions, which is strong evidence that both tests are not equivalent. Therefore, with tables 12 and 13 we can conclude that there is evidence to support that both tests are not equivalent but at the same time the evidence to support that one test gives more information than the other is weak because it depends on the evaluation window.

Table 14 *Base Metals - Paradox: Comparing test, Benchmark Random Walk at Sample Level*

	Benchmark RW																	
	P/R =1						P/R =2						P/R =06					
Base Metals - (Sample level)	*CLP*	*ISK*	*AUD*	*CAD*	*NZD*	*NOK*	*CLP*	*ISK*	*AUD*	*CAD*	*NZD*	*NOK*	*CLP*	*ISK*	*AUD*	*CAD*	*NZD*	*NOK*
PH (Currencies)	0%	0%	4%	0%	0%	2%	8%	6%	0%	0%	0%	0%	86%	29%	14%	0%	14%	14%
DM (Currencies)	2%	2%	2%	0%	0%	4%	0%	0%	0%	0%	4%	0%	29%	14%	0%	0%	0%	29%
PH (Benchmark)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	14%	0%	14%	14%	14%
DM (Benchmark)	14%	16%	35%	20%	39%	10%	29%	29%	39%	45%	35%	10%	0%	0%	0%	14%	14%	0%
Weak Paradox: C-NDM (Currencies)	0%	0%	4%	0%	0%	2%	8%	6%	0%	0%	0%	0%	71%	14%	14%	0%	14%	0%
Weak Paradox: C-NDM (Benchmark)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	14%	0%	0%	0%	14%
Weak Paradox: NC-DM (Currencies)	2%	2%	2%	0%	0%	4%	0%	0%	0%	0%	4%	0%	14%	0%	0%	0%	0%	14%
Weak Paradox: NC-DM (Benchmark)	14%	16%	35%	20%	39%	10%	29%	29%	39%	45%	35%	10%	0%	0%	0%	0%	0%	0%
Strong Paradox: C(+)-DM(-)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Strong Paradox: C(-)-DM(+)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total Paradox	**16%**	**18%**	**41%**	**20%**	**39%**	**16%**	**37%**	**35%**	**39%**	**45%**	**39%**	**10%**	**86%**	**29%**	**14%**	**0%**	**14%**	**29%**

PH Represents the percentage of rejections using the correlation-based predictability test, DM Represents the percentage of rejections using the Diebolds-Mariano test. "Currencies" indicates that the rejections are in favor of the model with currencies while "Benchmark" represents the rejections in favor of the model without currencies. (+) indicates that we reject in favor of the test with currencies while (-) indicates that we reject in favor of the benchmark. Finally, NDM means that we do not reject with the Diebold-Mariano test and NPH means that we do not reject with the correlation-based test.

Table 15 *Base Metals - Paradox: Comparing test, Benchmark Random Walk at Pseudo Sample Level*

	Benchmark RW																	
	P/R =1						P/R =2						P/R =06					
Base Metals - (Pseudo Sample level)	*CLP*	*ISK*	*AUD*	*CAD*	*NZD*	*NOK*	*CLP*	*ISK*	*AUD*	*CAD*	*NZD*	*NOK*	*CLP*	*ISK*	*AUD*	*CAD*	*NZD*	*NOK*
Coef (Currencies)	0%	0%	0%	0%	0%	14%	57%	14%	0%	0%	0%	0%	86%	29%	14%	0%	14%	14%
DM (Currencies)	0%	14%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	29%	14%	0%	0%	0%	29%
Coef (Benchmark)	0%	0%	0%	43%	14%	0%	0%	14%	14%	14%	14%	14%	0%	14%	0%	14%	14%	14%
DM (Benchmark)	0%	14%	0%	14%	14%	14%	14%	14%	14%	57%	43%	29%	0%	0%	0%	14%	14%	0%
Weak Paradox: C-NDM (Currencies)	0%	0%	0%	0%	0%	14%	57%	14%	0%	0%	0%	0%	71%	14%	14%	0%	14%	0%
Weak Paradox: C-NDM (Benchmark)	0%	0%	0%	29%	14%	0%	0%	0%	14%	0%	0%	0%	0%	14%	0%	0%	0%	14%
Weak Paradox: NC-DM (Currencies)	0%	14%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	14%	0%	0%	0%	0%	14%
Weak Paradox: NC-DM (Benchmark)	0%	14%	0%	0%	14%	14%	14%	0%	14%	43%	29%	14%	0%	0%	0%	0%	0%	0%
Strong Paradox: C(+)-DM(-)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Strong Paradox: C(-)-DM(+)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total Paradox	**0%**	**29%**	**0%**	**29%**	**29%**	**29%**	**71%**	**14%**	**29%**	**43%**	**29%**	**14%**	**86%**	**29%**	**14%**	**0%**	**14%**	**29%**

Coef Represents the percentage of rejections using the correlation-based predictability test, DM Represents the percentage of rejections using the Diebolds-Mariano test. "Currencies" indicates that the rejections are in favor of the model with currencies while "Benchmark" represents the rejections in favor of the model without currencies. (+) indicates that we reject in favor of the test with currencies while (-) indicates that we reject in favor of the benchmark. Finally, NDM means that we do not reject with the Diebold-Mariano test and NC means that we do not reject with the correlation-based test.

The results we find when we evaluated the RW at the pseudo sample level (Table 15) also show often paradoxical scenarios, but in this case the evidence we find to support that the correlation criterion provides more information than the accuracy criterion is weak, because it depends on the evaluation window. However, in all comparisons there is enough evidence to support that both tests are not equivalent. Moreover, when we evaluated the RW at the sample level (Table 14), we find a similar conclusion, because we find strong evidence supporting that both tests are not equivalent. However, like the previous scenarios, there is not enough evidence to support that one test provides more information than the other, but we can support that both test are not equivalent.

Table 16 *Base Metals - Paradox: Comparing test, Benchmark Driftless Random Walk at Pseudo Sample Level*

	Benchmark DRW																	
	P/R =1						P/R =2						P/R =06					
Base Metals (Pseudo Sample level)	*CLP*	*ISK*	*AUD*	*CAD*	*NZD*	*NOK*	*CLP*	*ISK*	*AUD*	*CAD*	*NZD*	*NOK*	*CLP*	*ISK*	*AUD*	*CAD*	*NZD*	*NOK*
Coef (Currencies)	14%	29%	14%	14%	0%	29%	57%	43%	14%	0%	0%	0%	100%	43%	29%	0%	29%	57%
DM (Currencies)	0%	14%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	29%	14%	0%	0%	0%	29%
Coef (Benchmark)	0%	0%	0%	14%	0%	14%	0%	0%	14%	14%	14%	14%	0%	0%	0%	14%	14%	0%
DM (Benchmark)	0%	14%	14%	43%	14%	14%	14%	14%	0%	14%	29%	29%	0%	0%	0%	14%	0%	0%
Weak Paradox: C-NDM (Currencies)	14%	14%	14%	14%	0%	29%	57%	29%	14%	0%	0%	0%	71%	29%	29%	0%	29%	29%
Weak Paradox: C-NDM (Benchmark)	0%	0%	0%	0%	0%	0%	0%	0%	14%	0%	0%	0%	0%	0%	0%	0%	14%	0%
Weak Paradox: NC-DM (Currencies)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Weak Paradox: NC-DM (Benchmark)	0%	14%	14%	29%	14%	0%	14%	14%	0%	0%	14%	14%	0%	0%	0%	0%	0%	0%
Strong Paradox: C(+)-DM(-)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Strong Paradox: C(-)-DM(+)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total Paradox	**14%**	**29%**	**29%**	**43%**	**14%**	**29%**	**71%**	**43%**	**29%**	**0%**	**14%**	**14%**	**71%**	**29%**	**29%**	**0%**	**43%**	**29%**

Coef Represents the percentage of rejections using the correlation-based predictability test, DM Represents the percentage of rejections using the Diebolds-Mariano test. "Currencies" indicates that the rejections are in favor of the model with currencies while "Benchmark" represents the rejections in favor of the model without currencies. (+) indicates that we reject in favor of the test with currencies while (-) indicates that we reject in favor of the benchmark. Finally, NDM means that we do not reject with the Diebold-Mariano test and NC means that we do not reject with the correlation-based test.

Finally, when we evaluated the DRW (Table 16), we find enough evidence to support that both tests are not necessarily equivalent, because as we show the paradox, it is something that happened frequently. Moreover, as we can see, there is also evidence to support that the correlation criterion tends to give more information than the accuracy criteria.

Fuels

Table 17 *Fuels - Paradox: Comparing test, Benchmark AR(1) First version at Sample Level*

	Benchmark AR(1)																	
	P/R =1						P/R =2						P/R =06					
Fuels (Sample level)	CLP	ISK	AUD	CAD	NZD	NOK	CLP	ISK	AUD	CAD	NZD	NOK	CLP	ISK	AUD	CAD	NZD	NOK
PH(Currencies)	17%	0%	0%	17%	0%	17%	50%	33%	33%	17%	33%	33%	0%	0%	0%	0%	0%	0%
DM(Currencies)	17%	0%	17%	17%	0%	0%	83%	17%	67%	33%	33%	50%	17%	0%	0%	0%	0%	0%
PH (Benchmark)	0%	0%	0%	17%	0%	0%	0%	0%	0%	17%	0%	0%	0%	0%	0%	17%	0%	0%
DM (Benchmark)	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%	0%	0%	0%	0%	0%	0%	0%	0%
Weak Paradox: PH-NDM (Currencies)	0%	0%	0%	0%	0%	17%	0%	17%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Weak Paradox: PH-NDM (Benchmark)	0%	0%	0%	17%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%	0%	0%
Weak Paradox: NPH-DM (Currencies)	0%	0%	17%	0%	0%	0%	33%	0%	33%	17%	0%	17%	17%	0%	0%	0%	0%	0%
Weak Paradox: NPH-DM (Benchmark)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Strong Paradox: PH(+)-DM(-)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Strong Paradox: PH(-)-DM(+)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total Paradox	**0%**	**0%**	**17%**	**17%**	**0%**	**17%**	**33%**	**17%**	**33%**	**17%**	**0%**	**17%**	**17%**	**0%**	**0%**	**17%**	**0%**	**0%**

PH Represents the percentage of rejections using the correlation-based predictability test, DM Represents the percentage of rejections using the Diebolds-Mariano test. "Currencies" indicates that the rejections are in favor of the model with currencies while "Benchmark" represents the rejections in favor of the model without currencies. (+) indicates that we reject in favor of the test with currencies while (-) indicates that we reject in favor of the benchmark. Finally, NDM means that we do not reject with the Diebold-Mariano test and NPH means that we do not reject with the correlation-based test.

Table 18 *Fuels - Paradox: Comparing test, Benchmark AR(1) Second version at Sample Level*

	Benchmark AR(1)																	
	P/R =1						P/R =2						P/R =06					
Fuels (Sample level)	CLP	ISK	AUD	CAD	NZD	NOK	CLP	ISK	AUD	CAD	NZD	NOK	CLP	ISK	AUD	CAD	NZD	NOK
PH(Currencies)	0%	0%	0%	0%	0%	0%	50%	17%	0%	0%	0%	33%	0%	0%	0%	0%	0%	0%
DM(Currencies)	0%	0%	0%	17%	0%	0%	33%	0%	0%	0%	0%	33%	17%	0%	33%	17%	33%	0%
PH (Benchmark)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
DM (Benchmark)	0%	0%	0%	17%	0%	0%	0%	0%	0%	50%	0%	33%	0%	0%	0%	0%	0%	0%
Weak Paradox: PH-NDM (Currencies)	0%	0%	0%	0%	0%	0%	17%	17%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Weak Paradox: PH-NDM (Benchmark)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Weak Paradox: NPH-DM (Currencies)	0%	0%	0%	17%	0%	0%	0%	0%	0%	0%	0%	0%	17%	0%	33%	17%	33%	0%
Weak Paradox: NPH-DM (Benchmark)	0%	0%	0%	17%	0%	0%	0%	0%	0%	50%	0%	33%	0%	0%	0%	0%	0%	0%
Strong Paradox: PH(+)-DM(-)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Strong Paradox: PH(-)-DM(+)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total Paradox	**0%**	**0%**	**0%**	**33%**	**0%**	**0%**	**17%**	**17%**	**0%**	**50%**	**0%**	**33%**	**17%**	**0%**	**33%**	**17%**	**33%**	**0%**

PH Represents the percentage of rejections using the correlation-based predictability test, DM Represents the percentage of rejections using the Diebolds-Mariano test. "Currencies" indicates that the rejections are in favor of the model with currencies while "Benchmark" represents the rejections in favor of the model without currencies. (+) indicates that we reject in favor of the test with currencies while (-) indicates that we reject in favor of the benchmark. Finally, NDM means that we do not reject with the Diebold-Mariano test and NPH means that we do not reject with the correlation-based test.

Tables 18 and 19, show the two scenarios when the benchmark is the AR(1), in these results we find cases of paradox, so there is evidence to support that both tests are not equivalent, but the evidence is weak because the results we find depend on the estimation window. In addition, the evidence to conclude that a test gives us more information is also weak.

Table 19 *Fuels - Paradox: Comparing test, Benchmark Random Walk at Pseudo Sample Level*

	Benchmark RW																	
	P/R =1						P/R =2						P/R =06					
Fuels - (Pseudo Sample level)	*CLP*	*ISK*	*AUD*	*CAD*	*NZD*	*NOK*	*CLP*	*ISK*	*AUD*	*CAD*	*NZD*	*NOK*	*CLP*	*ISK*	*AUD*	*CAD*	*NZD*	*NOK*
Coef (Currencies)	100%	17%	67%	33%	50%	67%	100%	50%	67%	17%	67%	67%	100%	0%	67%	33%	50%	67%
DM (Currencies)	0%	0%	33%	0%	33%	0%	33%	0%	33%	0%	0%	50%	33%	0%	83%	33%	33%	33%
Coef (Benchmark)	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%	0%	0%	0%	0%	0%	0%	0%	0%
DM (Benchmark)	0%	0%	0%	0%	0%	0%	0%	0%	0%	33%	0%	0%	0%	0%	0%	0%	0%	0%
Weak Paradox: C-NDM (Currencies)	100%	17%	33%	33%	17%	67%	67%	50%	33%	17%	67%	17%	67%	0%	0%	0%	17%	33%
Weak Paradox: C-NDM (Benchmark)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Weak Paradox: NC-DM (Currencies)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%	0%	0%	0%
Weak Paradox: NC-DM (Benchmark)	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%	0%	0%	0%	0%	0%	0%	0%	0%
Strong Paradox: C(+)-DM(-)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Strong Paradox: C(-)-DM(+)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total Paradox	**100%**	**17%**	**33%**	**33%**	**17%**	**67%**	**67%**	**50%**	**33%**	**33%**	**67%**	**17%**	**67%**	**0%**	**17%**	**0%**	**17%**	**33%**

Coef Represents the percentage of rejections using the correlation-based predictability test, DM Represents the percentage of rejections using the Diebolds-Mariano test. "Currencies" indicates that the rejections are in favor of the model with currencies while "Benchmark" represents the rejections in favor of the model without currencies. (+) indicates that we reject in favor of the test with currencies while (-) indicates that we reject in favor of the benchmark. Finally, NDM means that we do not reject with the Diebold-Mariano test and NC means that we do not reject with the correlation-based test.

Table 20 *Fuels - Paradox: Comparing test, Benchmark Random Walk at Sample Level*

	Benchmark RW																	
	P/R =1						P/R =2						P/R =06					
Fuels - (Sample level)	*CLP*	*ISK*	*AUD*	*CAD*	*NZD*	*NOK*	*CLP*	*ISK*	*AUD*	*CAD*	*NZD*	*NOK*	*CLP*	*ISK*	*AUD*	*CAD*	*NZD*	*NOK*
PH (Currencies)	100%	17%	83%	33%	83%	100%	100%	50%	33%	17%	50%	67%	100%	50%	100%	50%	100%	83%
DM (Currencies)	0%	0%	33%	0%	33%	0%	33%	0%	33%	0%	0%	50%	33%	0%	83%	33%	33%	33%
PH (Benchmark)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
DM (Benchmark)	0%	0%	0%	0%	0%	0%	0%	0%	0%	33%	0%	0%	0%	0%	0%	0%	0%	0%
Weak Paradox: C-NDM (Currencies)	100%	17%	50%	33%	50%	100%	67%	50%	0%	17%	50%	17%	67%	50%	17%	17%	67%	50%
Weak Paradox: C-NDM (Benchmark)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Weak Paradox: NC-DM (Currencies)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Weak Paradox: NC-DM (Benchmark)	0%	0%	0%	0%	0%	0%	0%	0%	0%	33%	0%	0%	0%	0%	0%	0%	0%	0%
Strong Paradox: C(+)-DM(-)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Strong Paradox: C(-)-DM(+)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total Paradox	**100%**	**17%**	**50%**	**33%**	**50%**	**100%**	**67%**	**50%**	**0%**	**50%**	**50%**	**17%**	**67%**	**50%**	**17%**	**17%**	**67%**	**50%**

PH Represents the percentage of rejections using the correlation-based predictability test, DM Represents the percentage of rejections using the Diebolds-Mariano test. "Currencies" indicates that the rejections are in favor of the model with currencies while "Benchmark" represents the rejections in favor of the model without currencies. (+) indicates that we reject in favor of the test with currencies while (-) indicates that we reject in favor of the benchmark. Finally, NDM means that we do not reject with the Diebold-Mariano test and NPH means that we do not reject with the correlation-based test.

In the case of the RW at the sample level and at the pseudo-sample level (Tables 19 and 20) in most of the paradox scenarios we reject the null hypothesis in favor of the currency model using the correlation-based test while we do not reject using the Diebold-Mariano test, so we find strong evidence to support that both tests are not equivalent and to support that the correlation-based test provides more information than the Diebold-Mariano test.

Table 21 *Fuels - Paradox: Comparing test, Benchmark Driftless Random Walk at Pseudo Sample Level*

	Benchmark DRW																	
	P/R =1						P/R =2						P/R =06					
Fuels (Pseudo Sample level)	*CLP*	*ISK*	*AUD*	*CAD*	*NZD*	*NOK*	*CLP*	*ISK*	*AUD*	*CAD*	*NZD*	*NOK*	*CLP*	*ISK*	*AUD*	*CAD*	*NZD*	*NOK*
Coef (Currencies)	100%	67%	100%	50%	100%	100%	100%	67%	100%	50%	100%	83%	100%	0%	100%	50%	83%	67%
DM (Currencies)	0%	0%	0%	17%	33%	0%	17%	0%	33%	0%	0%	33%	0%	0%	67%	17%	33%	33%
Coef (Benchmark)	100%	67%	100%	50%	100%	100%	100%	67%	100%	50%	100%	83%	100%	0%	100%	50%	83%	67%
DM (Benchmark)	0%	0%	0%	17%	33%	0%	17%	0%	33%	0%	0%	33%	0%	0%	67%	17%	33%	33%
Weak Paradox: C-NDM (Currencies)	100%	67%	100%	33%	67%	100%	83%	67%	67%	50%	100%	50%	100%	0%	33%	33%	33%	33%
Weak Paradox: C-NDM (Benchmark)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Weak Paradox: NC-DM (Currencies)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Weak Paradox: NC-DM (Benchmark)	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%	0%	0%	0%	0%	0%	0%	0%	0%
Strong Paradox: C(+)-DM(-)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Strong Paradox: C(-)-DM(+)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total Paradox	**100%**	**67%**	**100%**	**33%**	**67%**	**100%**	**83%**	**67%**	**67%**	**67%**	**100%**	**50%**	**100%**	**0%**	**33%**	**33%**	**33%**	**33%**

Coef Represents the percentage of rejections using the correlation-based predictability test, DM Represents the percentage of rejections using the Diebolds-Mariano test. "Currencies" indicates that the rejections are in favor of the model with currencies while "Benchmark" represents the rejections in favor of the model without currencies. (+) indicates that we reject in favor of the test with currencies while (-) indicates that we reject in favor of the benchmark. Finally, NDM means that we do not reject with the Diebold-Mariano test and NC means that we do not reject with the correlation-based test.

The table 21 show the results when the benchmark is the DRW, here we find strong evidence supporting that both tests are not equivalent and that the correlation-based test provides more information than the Diebold-Mariano test.

B) Paradox: comparing R^2

The results are interesting, because we find that by using each criterion to get the R^2 out-of-sample we have different results, showing that the criteria of correlation it is not equivalent to the criteria of accuracy. The results in this section are also very interesting because we find more evidence using the correlation criteria than using the accuracy criteria. We have two scenarios that support our hypothesis, the first is that we have that one R^2 is statistical significance and the other is not, so each criteria gives different information, and we also have the scenario where each R^2 is statistical significance but gives the opposite information. Both scenarios support the hypothesis that both criteria are not necessarily equivalent and as we show in the following tables these scenarios occur frequently.

Base metals

The table 22 show interesting findings, because as we can see both criteria give us different information, with the R^2 out of sample that we find using the regression we rejected the null hypothesis more times than using the traditional R^2 of Goyal and Welch. In addition, as we can see in table 22, there are some scenarios in which each R^2 is statistical significance but

each criterion gives opposite information, which further supports our hypothesis that both criteria are not necessarily equivalent. The results that we show in tables 22 - 24 are for one windows of estimation (P/R = 0.6), for the rest of windows of estimation the results are similar and can be find in the appendix.

Table 22 Forecasting base metals with currencies – Paradox: Comparing R^2

Chilean exchange rate	P/R = 0.6						
One-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1) ***R2 Beta***	0.03**	0,02	0.06***	0,01	0,03	0.01*	0.04**
R2	-0,01	0,01	-0.06*	-0,02	-0,03	-0.02**	-0,03
RW ***R2 Beta***	0.03**	0.05**	0.04**	0.01*	0.03*	0.01*	0.06***
R2	-0,02	-0,03	-0,02	-0.03**	-0,03	-0.03**	-0,06
DRW ***R2 Beta***	0.03**	0.05**	0.04**	0.02***	0.04*	0.02**	0.07***
R2	-0,02	-0,03	-0,03	-0.05***	-0,03	-0,03	-0,06
Iceland exchange rate	P/R = 0.6						
One-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1) ***R2 Beta***	0,01	0	0.06**	0	0.05*	0	0,02
R2	0,02	0.06**	-0,02	-0,01	-0,05	0,01	0,02
RW ***R2 Beta***	0,01	0,01	0.03*	-0.01*	0.03**	0	0,02
R2	-0,01	0,02	0,01	0	-0.05*	0	-0,02
DRW ***R2 Beta***	0,01	0,02	0.03*	0	0.03***	0	0.03*
R2	-0,01	-0,01	-0,02	-0.02**	-0.05*	0	-0,03
Australian exchange rate	P/R = 0.6						
One-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1) ***R2 Beta***	0,01	-0,01	0.04*	-0,01	0,03	0	0,01
R2	0,02	0.08*	-0,01	0	-0,03	0	0,04
RW ***R2 Beta***	0	0	0,01	0	0.03*	-0,01	0,01
R2	0,02	0,01	0	0	-0,03	0	0
DRW ***R2 Beta***	0,01	0,01	0,01	0,01	0.03*	0	0,02
R2	0,01	0	0	-0.02*	-0,03	0	0
Canadian exchange rate	P/R = 0.6						
One-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1) ***R2 Beta***	0	-0,02	0.03**	0	0,01	0	0
R2	0,01	0.07*	-0,03	-0,01	0	-0,01	0,03
RW ***R2 Beta***	0	-0,01	0,01	-0.02**	0	-0,01	0
R2	0,01	0,01	0,01	0.02*	-0,01	0	0
DRW ***R2 Beta***	0,01	0	0,01	-0.01*	0,01	0	0,01
R2	0,01	-0,01	0	0	-0,01	-0,01	-0,01
New Zealand exchange rat	P/R = 0.6						
One-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1) ***R2 Beta***	0,01	-0,02	0.05***	0	0,03	0,01	0,01
R2	0,02	0.10**	-0,04	-0,01	-0,02	-0,02	0,04
RW ***R2 Beta***	0	-0.01*	0,02	-0,01	0,02	-0.01**	-0,01
R2	0,01	0,01	-0,01	0	-0,03	0.01*	0
DRW ***R2 Beta***	0,01	0	0.02*	0	0.02*	0	0
R2	0,01	0	-0,02	-0.02*	-0,03	0	-0,01
South African exchange ra	P/R = 0.6						
One-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1) ***R2 Beta***	0,01	0,01	0.09***	0,01	0.05*	0,01	0,03
R2	0.08*	0.10*	-0,03	-0,01	0	0,01	0,06
RW ***R2 Beta***	0	0	0.03**	0	0.02*	-0,01	0,01
R2	0	0	-0.03*	-0.02*	-0,03	0	-0,02
DRW ***R2 Beta***	0,01	0,01	0.03***	0.01**	0.02*	0	0.02*
R2	0	-0,02	-0.05**	-0.03**	-0,03	0	-0,03

"R2 Beta" are the R2 obtained by regression, HAC errors are calculated according to Newey and West (1987,1994).The "R2" are constructed based on Goyal and Welch (2008) and Pincheira (2013).Statistical significance is evaluated with Diebold - Mariano (1995) and

Fuels

With fuels we also find that with the correlation criterion we can obtain more information than using the traditional R^2. As we can see, in those scenarios we also have a similar conclusion to the one we find with base metals, because as we can see by using each R^2 we have different information, even in some cases opposite information, which shows that both criteria are not equivalent.

Table 23 Forecasting fuels with currencies - Paradox: Comparing R^2

Chilean exchange rate		P/R = 0.6					
One-Step-AHead		***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	***R2 Beta***	0.05***	0,01	0.04**	0.03*	0.06***	0.03*
	R2	-0.04*	0,02	-0,04	-0,02	-0,05	-0,01
RW	***R2 Beta***	0.04**	0.02*	0.02**	0.05***	0.07***	0.03**
	R2	-0.04*	-0,02	-0,02	-0,05	-0.07*	-0,01
DRW	***R2 Beta***	0,04	0,03	0,02	0,05	0,07	0,03
	R2	-0,02	-0,07	-0,01	-0,02	-0,04	0
Iceland exchange rate		P/R = 0.6					
One-Step-AHead		***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	***R2 Beta***	0.03*	-0,01	0.02**	0,01	0.02*	0,02
	R2	0	0,07	-0,03	0	-0,01	-0,02
RW	***R2 Beta***	0	-0,01	0,01	0	0,01	0,02
	R2	0,01	0,01	-0,01	0	-0,01	-0,02
DRW	***R2 Beta***	0	0	0,01	0,01	0,01	0,02
	R2	0,02	-0,05	0	0,02	0,01	-0,02
Australian exchange rate		P/R = 0.6					
One-Step-AHead		***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	***R2 Beta***	0.03***	0	0.03**	0.02*	0.03**	0.02*
	R2	-0,02	0,05	-0,03	-0.02**	-0.04***	-0,02
RW	***R2 Beta***	0,01	0	0.01**	0.02**	0.02***	0.01*
	R2	-0.01*	-0,01	-0.02*	-0.03**	-0.04**	-0.02*
DRW	***R2 Beta***	0,01	0	0,01	0,02	0,03	0,02
	R2	0	-0,07	-0,01	-0,01	-0,02	-0,02
Canadian exchange rate		P/R = 0.6					
One-Step-AHead		***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	***R2 Beta***	0.03***	0	0.03***	0,01	0.02**	0,01
	R2	-0,01	0,07	-0.04*	-0,01	-0.03***	-0,01
RW	***R2 Beta***	0	0	0.02**	0	0.01*	0,01
	R2	0	0	-0.02*	-0,01	-0.03*	-0,01
DRW	***R2 Beta***	0	0	0,02	0,01	0,02	0,01
	R2	0,01	-0,06	-0,01	0,01	0	0
New Zealand exchange rat		P/R = 0.6					
One-Step-AHead		***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	***R2 Beta***	0.04***	0	0.03*	0.02*	0.03**	0.02*
	R2	-0,03	0,05	-0,02	-0.03**	-0.05**	-0,02
RW	***R2 Beta***	0,01	0	0,01	0,02	0.02**	0,01
	R2	-0,02	-0,01	0	-0.03*	-0.04**	-0,02
DRW	***R2 Beta***	0,01	0,01	0,01	0,02	0,03	0,02
	R2	-0,01	-0,07	0	-0,01	-0,02	-0,01
Norwegian exchange rate		P/R = 0.6					
One-Step-AHead		***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	***R2 Beta***	0.05***	0,01	0.04**	0.03*	0.06***	0.03*
	R2	-0.04*	0,02	-0,04	-0,02	-0,05	-0,01
RW	***R2 Beta***	0.04**	0.02*	0.02**	0.05***	0.07***	0.03**
	R2	-0.04*	-0,02	-0,02	-0,05	-0.07*	-0,01
DRW	***R2 Beta***	0,04	0,03	0,02	0,05	0,07	0,03
	R2	-0,02	-0,07	-0,01	-0,02	-0,04	0

eta" are the R2 obtained by regression, HAC errors are calculated according to Newey and West (1987,1994).The "R2" are ucted based on Goyal and Welch (2008) and Pincheira (2013).Statistical significance is evaluated with Diebold - Mariano and West (1996).

Table 24 shows a summary of tables 22 and 23 where we can see the percentage of rejection per test in the total comparisons, as we said, the evidence shows not only that both tests are not equivalent, but also a strong proof that we can find more evidence using the correlation test.

Table 24 Summary Paradox: Comparing R^2

P/R = 0.6		Base Metals	Fuels
AR(1)	R2 Beta	31%	72%
	R2	22%	22%
RW	R2 Beta	44%	56%
	R2	19%	36%
DRW	R2 Beta	56%	0%
	R2	19%	0%
Total	R2 Beta	44%	43%
	R2	20%	19%

6. Summary and final remarks

In the first section of this study, we evaluate the predictive ability at population and sample level of exchange rates on the return of fuels and base metals. Then in the second part of our study we made an empirical evaluation one step ahead using the correlations criterion as an alternative approach to evaluate predictive models at the sample level.

In the first section of our study, we find similar results to those find by Pincheira and Hardy in their research and we also find new evidence of predictability at the population level in both commodity groups, so the results of this section were a contribution to previous research. On the other hand, the evidence of predictability at the sample level was scarce and weak, but this was a result that we expected and is the motivation to use an alternative evaluation criterion.

find

The results find strongly support that both criteria are not equivalent, so the use of correlations can be an interesting alternative approach when evaluating predictive models. On the other hand, the evidence we find to support that the correlation criterion gives more information than the accuracy criterion at the sample level was weaker, since it depended on the scenario in which it was being evaluated. However,

the results find in the second section are only one step forward, so for future research it may be interesting to evaluate the results find using the correlation criterion when evaluating multiple steps forward at the sample level.

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8. Appendix

A. *Forecasting Base Metals with currencies – In sample analysis.*

Table A.1) Forecasting base metals with Australian Dollar at multiple horizons - In sample analysis.

Australian Dollar							
Aluminum	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
AUD(t-h)+AUD(t-h-1)	-0,14	-0.60**	-0.68**	-0.64**	-0.73**	-0,55	-0,41
Aluminum (t-h)	0,01	-0,01	-0,01	-0,23	-0,42	-0,32	-0.60*
Constant	0	0,01	0,01	0,02	0,03	0,03	0,04
F-statistic	2,44	12,44	6,18	2,93	3,14	1,51	1,38
R-squared	0,02	0,09	0,05	0,02	0,02	0,01	0,01
Copper	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
AUD(t-h)+AUD(t-h-1)	-0,17	-0.54*	-0,3	-0,43	-0,29	-0,33	-0,22
Copper (t-h)	0,08	0,16	0,13	-0,14	0	-0,05	0,04
Constant	0,01	0,02	0,04	0,06	0,08	0,1	0.16*
F-stadistic	4,38	8,34	1,3	0,71	0,34	0,29	0,13
R-squared	0,03	0,06	0,01	0,01	0	0	0
Lead	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
AUD(t-h)+AUD(t-h-1)	-0.30*	-0.60*	-0,45	0	0,05	-0,14	-0,36
Lead (t-h)	-0,08	-0,05	0,05	0,07	-0,01	-0,26	-0,4
Constant	0,01	0,02	0,04	0,06	0,08	0,09	0.15*
F-statistic	3,93	5,45	1,84	0,07	0,01	0,41	0,8
R-squared	0,03	0,04	0,01	0	0	0	0,01
Nickel	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
AUD(t-h)+AUD(t-h-1)	-0,12	-0,23	-0,48	0,13	0,11	0,08	0,19
Nickel (t-h)	0,03	0,13	0,16	0,2	0,11	0,09	-0,24
Constant	0	0,01	0,02	0,03	0,04	0,06	0,1
F-statistic	0,93	1,72	2,08	0,37	0,09	0,05	0,38
R-squared	0,01	0,01	0,02	0	0	0	0
Tin	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
AUD(t-h)+AUD(t-h-1)	-0,2	-0.39*	-0.74***	-0.70*	-0.79*	-0.98*	-0,72
Tin (t-h)	0,1	0.36***	0,25	0,21	0,27	0,01	-0.78**
Constant	0,01	0,02	0,04	0,07	0,09	0.11*	0.18**
F-statistic	5,88	10,62	6,73	3,58	3,42	2,66	1,97
R-squared	0,04	0,07	0,05	0,03	0,03	0,02	0,02
Zinc	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
AUD(t-h)+AUD(t-h-1)	-0,06	-0,26	0,13	0,58	0,75	0,66	0,36
Zinc (t-h)	-0,01	0,15	0,4	0,55	0,6	0,57	-0,04
Constant	0	0,01	0,03	0,04	0,05	0,06	0,11
F-statistic	0,21	3,11	2,28	2,71	2,48	1,66	0,21
R-squared	0	0,02	0,02	0,02	0,02	0,01	0
Lmex	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
AUD(t-h)+AUD(t-h-1)	-0,14	-0.45*	-0,27	-0,19	-0,1	-0,11	-0,1
Lmex (t-h)	0,07	0,2	0,31	0,13	0,2	0,17	-0,1
Constant	0	0,01	0,03	0,04	0,06	0,07	0,11
F-statistic	4	9,95	3,16	0,6	0,45	0,29	0,03
R-squared	0,03	0,07	0,02	0	0	0	0

HAC standard errors are computed according to Newey and West (1987, 1994). ER (ER= CLP, ISK and AUD) stands for Exchange Rates Returns, ER(− 1) and ER(−2) represent the first and second lags of Exchange Rates Returns, we use the same notation for the commodities. H1, H6, H12 and H24 represent the forecasting horizon, 1, 6, 12 and 24 months ahead. (*p<10%, **p<5%, ***p<1%.)

Table A.2) Forecasting base metals with Iceland Krone at multiple horizons - In sample analysis.

Iceland Krone							
Aluminum	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
ISK(t-h)+ISK(t-h-1)	-0.18**	-0.52**	-0.79***	-0.88**	-0.96***	-0.86***	-0,31
Aluminum (t-h)	0,03	0,12	0,09	-0,15	-0,32	-0,27	-0.49*
Constant	0	0,01	0,02	0,03	0,03	0,04	0,05
F-statistic	4,85	14,23	12,73	9,18	8,75	5,73	1,35
R-squared	0,04	0,1	0,09	0,07	0,06	0,04	0,01
Copper	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
ISK(t-h)+ISK(t-h-1)	-0,23	-0.47*	-0.54*	-0.86*	-0,61	-0,52	-0,16
Copper (t-h)	0,09	0.25*	0,12	-0,18	-0,03	-0,05	0,09
Constant	0,01	0,02	0,04	0,06	0,08	0.10*	0.16*
F-statistic	7,55	9,36	3,51	4,65	1,91	1,11	0,12
R-squared	0,05	0,07	0,03	0,03	0,01	0,01	0
Lead	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
ISK(t-h)+ISK(t-h-1)	-0.35***	-0.69**	-0.66**	-0,55	-0,41	-0,26	-0,34
Lead (t-1)	-0,08	-0,05	0,02	-0,05	-0,11	-0,28	-0,38
Constant	0,01	0,02	0,04	0,06	0,08	0,1	0.15*
F-statistic	7,63	10,43	4,52	1,74	0,69	0,6	0,87
R-squared	0,05	0,07	0,03	0,01	0,01	0	0,01
Nickel	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
ISK(t-h)+ISK(t-h-1)	-0,01	-0,18	-0,49	-0,19	-0,1	-0,11	0,53
Nickel (t-h)	0,06	0,16	0,2	0,15	0,08	0,06	-0,22
Constant	0	0,01	0,03	0,03	0,04	0,06	0,09
F-statistic	0,47	1,68	2,66	0,46	0,1	0,07	0,77
R-squared	0	0,01	0,02	0	0	0	0,01
Tin	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
ISK(t-h)+ISK(t-h-1)	-0.17*	-0.54***	-0.84***	-0.84**	-0.74*	-0,67	0,01
Tin (t-h)	0.13*	0.38***	0.33*	0,28	0,38	0,19	-0,56
Constant	0,01	0,02	0.05*	0.07*	0.09*	0.12*	0.17**
F-statistic	6,08	16,04	10,5	5,97	4,05	1,99	1,08
R-squared	0,04	0,11	0,07	0,04	0,03	0,02	0,01
Zinc	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
ISK(t-h)+ISK(t-h-1)	-0,13	-0.44***	-0,27	-0,35	-0,25	-0,28	-0,22
Zinc (t-h)	-0,01	0,16	0,33	0,34	0,35	0,34	-0,17
Constant	0	0,02	0,03	0,04	0,05	0,07	0,11
F-statistic	1,36	6,82	2,86	2,16	1,26	1,01	0,15
R-squared	0,01	0,05	0,02	0,02	0,01	0,01	0
Lmex	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
ISK(t-h)+ISK(t-h-1)	-0,18	-0.43*	-0.53*	-0,68	-0,54	-0,47	-0,07
Lmex (t-h)	0,09	0.29*	0,29	0,03	0,1	0,09	-0,07
Constant	0	0,01	0,03	0,05	0,06	0,07	0,11
F-statistic	6,48	12,39	6,38	4,17	2,19	1,33	0,03
R-squared	0,05	0,09	0,05	0,03	0,02	0,01	0

HAC standard errors are computed according to Newey and West (1987, 1994). ER (ER= CLP, ISK and AUD) stands for Exchange Rates Returns, ER(− 1) and ER(−2) represent the first and second lags of Exchange Rates Returns, we use the same notation for the commodities. H1, H6, H12 and H24 represent the forecasting horizon, 1, 6, 12 and 24 months ahead. (*p<10%, **p<5%, ***p<1%.)

Table A.3) Forecasting base metals with Chilean Peso at multiple horizons - In sample analysis.

Chilean Peso							
Aluminum	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
CLP(t-1)+CLP(t-2)	-0.24***	-0.65***	-0.98**	-0.92***	-0.86**	-0,66	-0,39
Aluminum (t-h)	0	0,03	-0,04	-0,24	-0,38	-0,29	-0.54**
Constant	0	0,01	0,02	0,02	0,03	0,04	0,05
F-statistic	5,13	12,9	11,25	5,58	3,86	1,87	1,28
R-squared	0,04	0,09	0,08	0,04	0,03	0,01	0,01
Copper	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
CLP(t-1)+CLP(t-2)	-0.35***	-0.70***	-1.25***	-1.03**	-0,64	-0,4	-0,51
Copper (t-h)	0,04	0,15	-0,13	-0,3	-0,08	-0,05	-0,03
Constant	0,01	0,02	0.04*	0,06	0,08	0,1	0.16*
F-statistic	8,54	10,45	8,89	3,6	1,13	0,35	0,38
R-squared	0,06	0,07	0,06	0,03	0,01	0	0
Lead	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
CLP(t-1)+CLP(t-2)	-0.36**	-0,34	-0,62	-0,09	0,25	0,16	-0,7
Lead (t-h)	-0,08	0,03	0,03	0,06	0,03	-0,18	-0.46*
Constant	0,01	0,02	0,04	0,06	0,07	0,09	0.15*
F-statistic	4,77	1,81	2,58	0,09	0,16	0,41	1,33
R-squared	0,03	0,01	0,02	0	0	0	0,01
Nickel	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
CLP(t-1)+CLP(t-2)	-0.23*	-0,29	-0,55	0,12	0,31	0,16	-0,08
Nickel (t-h)	0,02	0,13	0,16	0,19	0,14	0,1	-0,29
Constant	0,01	0,01	0,02	0,03	0,04	0,06	0,1
F-statistic	1,88	1,9	2,22	0,36	0,21	0,07	0,35
R-squared	0,01	0,01	0,02	0	0	0	0
Tin	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
CLP(t-1)+CLP(t-2)	-0.25***	-0.53**	-1.13***	-1.02**	-0,78	-0,78	-0,25
Tin (t-h)	0,11	0.37***	0,25	0,22	0,35	0,15	-0.61*
Constant	0,01	0,02	0.05*	0,07	0,09	0.11*	0.18**
F-statistic	7,08	12,57	11,26	5,48	3,17	1,68	1,17
R-squared	0,05	0,09	0,08	0,04	0,02	0,01	0,01
Zinc	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
CLP(t-1)+CLP(t-2)	-0.22**	-0.51**	-0,34	0,06	0,29	0,11	-0,32
Zinc (t-h)	-0,05	0,1	0,28	0,4	0,46	0,41	-0,22
Constant	0,01	0,02	0,03	0,04	0,05	0,06	0,11
F-statistic	2	5,67	2,78	1,46	1,2	0,79	0,16
R-squared	0,01	0,04	0,02	0,01	0,01	0,01	0
Lmex	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
!)+CLP(t-2)	-0.27***	-0.56***	-0.92***	-0.67*	-0,37	-0,25	-0,42
ex (t-h)	0,03	0,19	0,08	-0,03	0,11	0,12	-0,22
mstant	0,01	0,02	0,03	0,05	0,06	0,07	0,12
tatistic	7,71	11,66	8,66	2,32	0,85	0,41	0,28
squared	0,05	0,08	0,06	0,02	0,01	0	0

dard errors are computed according to Newey and West (1987, 1994). ER (ER= CLP, ISK and AUD) stands for Exchange urns, ER(− 1) and ER(−2) represent the first and second lags of Exchange Rates Returns, we use the same notation for nodities. H1, H6, H12 and H24 represent the forecasting horizon, 1, 6, 12 and 24 months ahead. (*p<10%, **p<5%,)

Table A.4) Forecasting base metals with New Zealand Dollar at multiple horizons - In sample analysis.

New Zealand Dollar							
Aluminum	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
NZD(t-h)+NZD(t-h-1)	-0,12	-0.49*	-0.57*	-0.57*	-0.56*	-0.58*	-0,27
Aluminum (t-h)	0,03	0,06	0,06	-0,17	-0,31	-0,3	-0.52*
Constant	0	0,01	0,01	0,02	0,03	0,03	0,04
F-statistic	1,91	9,18	4,88	2,53	1,99	1,79	1,11
R-squared	0,01	0,07	0,04	0,02	0,02	0,01	0,01
Copper	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
NZD(t-h)+NZD(t-h-1)	0	-0,22	-0,26	-0,33	-0,16	-0,34	0
Copper (t-h)	0,14	0.29*	0,16	-0,09	0,06	-0,03	0,12
Constant	0,01	0,02	0,04	0,06	0,08	0,1	0.16*
F-statistic	2,76	4,99	1,25	0,46	0,17	0,35	0,06
R-squared	0,02	0,04	0,01	0	0	0	0
Lead	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
NZD(t-h)+NZD(t-h-1)	-0.25*	-0.52**	-0,29	-0,03	0,06	0,04	-0,06
Lead (t-h)	-0,06	-0,03	0,09	0,07	-0,01	-0,21	-0,32
Constant	0,01	0,02	0,04	0,06	0,08	0,09	0.15*
F-statistic	2,75	4,33	1,08	0,07	0,02	0,36	0,57
R-squared	0,02	0,03	0,01	0	0	0	0
Nickel	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
NZD(t-h)+NZD(t-h-1)	-0,04	-0,11	-0,32	0,05	0,22	0,23	0,46
Nickel (t-h)	0,05	0,16	0,2	0,18	0,13	0,12	-0,2
Constant	0	0,01	0,02	0,03	0,04	0,06	0,1
F-statistic	0,51	1,35	1,58	0,33	0,16	0,13	0,57
R-squared	0	0,01	0,01	0	0	0	0
Tin	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
NZD(t-h)+NZD(t-h-1)	-0,15	-0.39*	-0.66**	-0.58*	-0,57	-0,78	-0,18
Tin (t-h)	0,12	0.38***	0,31	0,28	0,37	0,12	-0.60*
Constant	0,01	0,02	0,04	0,07	0,09	0.11*	0.17**
F-statistic	4,82	10,84	6,21	3,04	2,61	1,95	1,14
R-squared	0,04	0,08	0,05	0,02	0,02	0,02	0,01
Zinc	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
NZD(t-h)+NZD(t-h-1)	-0,02	-0,24	0,04	0,49	0,63	0,45	0,22
Zinc (t-h)	0	0,17	0,37	0,5	0,53	0,49	-0,09
Constant	0	0,01	0,03	0,04	0,05	0,06	0,11
F-statistic	0,03	3,06	2,19	2,39	2,12	1,2	0,12
R-squared	0	0,02	0,02	0,02	0,02	0,01	0
Lmex	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
NZD(t-h)+NZD(t-h-1)	-0,02	-0,24	-0,24	-0,16	-0,01	-0,13	0,11
Lmex (t-h)	0,13	0.31*	0,34	0,16	0,25	0,17	-0,01
Constant	0	0,01	0,03	0,04	0,06	0,07	0,11
F-statistic	2,61	7,21	3,1	0,57	0,41	0,31	0,03
R-squared	0,02	0,05	0,02	0	0	0	0

HAC standard errors are computed according to Newey and West (1987, 1994). ER (ER= CLP, ISK and AUD) stands for Exchange Rates Returns, ER(− 1) and ER(−2) represent the first and second lags of Exchange Rates Returns, we use the same notation for the commodities. H1, H6, H12 and H24 represent the forecasting horizon, 1, 6, 12 and 24 months ahead. (*p<10%, **p<5%, ***p<1%.)

Table A.5) Forecasting base metals with Canadian Dollar at multiple horizons - In sample analysis.

Canadian Dollar							
Aluminum	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
CAD(t-h)+CAD(t-h-1)	-0,15	-0.59*	-0.81**	-1.10***	-1.11***	-0,61	-0,31
Aluminum (t-h)	0,04	0,1	0,08	-0,2	-0,36	-0,22	-0.49*
Constant	0	0,01	0,01	0,02	0,03	0,03	0,04
F-statistic	1,61	6,71	4,63	4,33	3,59	0,91	1,01
R-squared	0,01	0,05	0,03	0,03	0,03	0,01	0,01
copper	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
CAD(t-h)+CAD(t-h-1)	-0,04	-0,14	-0,3	-0,9	-0,63	-0,09	-0,62
Copper (t-h)	0,13	0.32*	0,17	-0,18	-0,03	0,05	-0,01
Constant	0,01	0,02	0,04	0,06	0,08	0,1	0.16*
F-statistic	2,8	4,4	1,05	1,52	0,66	0,04	0,34
R-squared	0,02	0,03	0,01	0,01	0,01	0	0
Lead	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
CAD(t-h)+CAD(t-h-1)	-0.39*	-0,47	-0.60*	0,05	0,16	0,1	-0,87
Lead (t-h)	-0,06	0,03	0,07	0,08	0	-0,2	-0.44*
Constant	0,01	0,02	0,04	0,06	0,08	0,09	0.15*
F-statistic	3,05	1,86	1,59	0,07	0,04	0,37	1,24
R-squared	0,02	0,01	0,01	0	0	0	0,01
Nickel	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
CAD(t-h)+CAD(t-h-1)	0,08	0,15	-0,37	-0,39	-0,47	0,35	-0,17
Nickel (t-h)	0,07	0.19*	0,21	0,13	0,04	0,12	-0,3
Constant	0	0,01	0,02	0,03	0,04	0,06	0,1
F-statistic	0,56	1,32	1,41	0,51	0,26	0,13	0,36
R-squared	0	0,01	0,01	0	0	0	0
Tin	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
CAD(t-h)+CAD(t-h-1)	-0,06	0,06	-0.72*	-1.03*	-1,02	-0,87	-0,72
Tin (t-h)	0.15*	0.48***	0.36*	0,27	0,36	0,19	-0.66**
Constant	0,01	0,02	0,04	0,07	0,09	0.11*	0.17**
F-statistic	3,35	7,92	4,75	3,69	3,11	1,29	1,53
R-squared	0,02	0,06	0,04	0,03	0,02	0,01	0,01
Zinc	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
CAD(t-h)+CAD(t-h-1)	-0,05	-0,33	-0,25	0,08	0,6	0,63	0,11
Zinc (t-h)	0	0,18	0,33	0,4	0,48	0,47	-0,12
Constant	0	0,01	0,03	0,04	0,05	0,06	0,11
F-statistic	0,07	2,92	2,36	1,46	1,47	1,17	0,07
R-squared	0	0,02	0,02	0,01	0,01	0,01	0
Lmex	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
CAD(t-h)+CAD(t-h-1)	-0,05	-0,16	-0,33	-0,66	-0,44	0,03	-0,38
Lmex (t-h)	0,13	0.36**	0.34*	0,05	0,13	0,23	-0,15
Constant	0	0,01	0,03	0,04	0,06	0,07	0,11
F-statistic	2,64	6,13	3,01	1,47	0,76	0,25	0,14
R-squared	0,02	0,04	0,02	0,01	0,01	0	0

HAC standard errors are computed according to Newey and West (1987, 1994). ER (ER= CLP, ISK and AUD) stands for Exchange Rates Returns, ER(− 1) and ER(−2) represent the first and second lags of Exchange Rates Returns, we use the same notation for the commodities. H1, H6, H12 and H24 represent the forecasting horizon, 1, 6, 12 and 24 months ahead. (*p<10%, **p<5%, ***p<1%.)

Table A.6) Forecasting base metals with South African Rand at multiple horizons - In sample analysis.

South African Rand							
Aluminum	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
ZAR(t-h)+ZAR(t-h-1)	-0,06	-0,25	-0,27	-0.51**	-0.63**	-0.53**	-0,21
Aluminum (t-h)	0,05	0,14	0,16	-0,15	-0,34	-0,27	-0.50**
Constant	0	0,01	0,02	0,03	0,03	0,04	0,05
F-statistic	1,14	5,15	2,47	3,51	4,26	2,53	1,12
R-squared	0,01	0,04	0,02	0,03	0,03	0,02	0,01
Copper	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
ZAR(t-h)+ZAR(t-h-1)	-0,05	-0,18	-0,2	-0.63**	-0,55	-0,56	-0,52
Copper (t-h)	0,13	0,3	0,18	-0,17	-0,05	-0,09	-0,02
Constant	0,01	0,02	0,04	0,06	0,08	0.10*	0.16*
F-statistic	3,03	5,1	1,24	3,06	1,88	1,5	0,84
R-squared	0,02	0,04	0,01	0,02	0,01	0,01	0,01
Lead	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
ZAR(t-h)+ZAR(t-h-1)	-0,15	-0,32	-0,29	-0,35	-0,34	-0,32	-0,43
Lead (t-h)	-0,04	0,03	0,1	0	-0,1	-0,29	-0,4
Constant	0,01	0,02	0,04	0,06	0,08	0,1	0.15*
F-statistic	1,79	3,04	1,48	0,96	0,62	0,8	1,2
R-squared	0,01	0,02	0,01	0,01	0	0,01	0,01
Nickel	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
ZAR(t-h)+ZAR(t-h-1)	-0,08	-0,28	-0,25	-0,41	-0,6	-0,42	0,03
Nickel (t-h)	0,04	0,13	0,21	0,1	-0,01	0	-0,27
Constant	0	0,02	0,02	0,04	0,05	0,06	0,09
F-statistic	0,84	2,49	1,59	1,12	1,31	0,52	0,35
R-squared	0,01	0,02	0,01	0,01	0,01	0	0
Tin	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
ZAR(t-h)+ZAR(t-h-1)	-0,1	0,02	-0,08	-0,35	-0,36	-0,42	-0,13
Tin (t-h)	0,13	0.48***	0.44**	0,31	0,39	0,17	-0.60*
Constant	0,01	0,02	0,04	0,07	0,09	0.12*	0.18**
F-statistic	4,29	7,91	3,07	2,36	2,23	1,13	1,13
R-squared	0,03	0,06	0,02	0,02	0,02	0,01	0,01
Zinc	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
ZAR(t-h)+ZAR(t-h-1)	-0,03	-0,13	0,07	-0,07	0,02	-0,06	-0,18
Zinc (t-h)	0	0,19	0,38	0,37	0,39	0,37	-0,18
Constant	0	0,01	0,03	0,04	0,05	0,06	0,11
F-statistic	0,11	2,56	2,23	1,48	1,02	0,79	0,13
R-squared	0	0,02	0,02	0,01	0,01	0,01	0
Lmex	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
ZAR(t-h)+ZAR(t-h-1)	-0,06	-0,17	-0,14	-0.46*	-0,44	-0,4	-0,29
Lmex (t-h)	0,12	0,34	0.38*	0,04	0,08	0,06	-0,16
Constant	0	0,01	0,03	0,05	0,06	0,07	0,12
F-statistic	3,04	6,97	2,91	2,48	1,8	1,16	0,3
R-squared	0,02	0,05	0,02	0,02	0,01	0,01	0

HAC standard errors are computed according to Newey and West (1987, 1994). ER (ER= CLP, ISK and AUD) stands for Exchange Rates Returns, ER(− 1) and ER(−2) represent the first and second lags of Exchange Rates Returns, we use the same notation for the commodities. H1, H6, H12 and H24 represent the forecasting horizon, 1, 6, 12 and 24 months ahead. (*p<10%, **p<5%, ***p<1%.)

B. *Forecasting fuels with currencies – In sample analysis.*

Table B.1) Forecasting fuels with Chilean Peso at multiple horizons - In sample analysis

Chilean Peso							
WTI	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
CLP(t-h)	-0.47***	-1.29***	-2.23***	-1.97***	-1.86***	-1.62***	-1.91***
WTI (t-h)	0.10**	-0,12	-0.36***	-0.44***	-0.43**	-0.49**	-0.66***
Constant	0,01	0,02	0,04	0,05	0,05	0,06	0,09
F-statistic	8,45	11,47	20,55	11,42	8,02	5,77	6,4
R-squared	0,06	0,08	0,14	0,08	0,06	0,04	0,05
Brent	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
CLP(t-h)	-0.67***	-1.34***	-2.39***	-1.98***	-1.90***	-1.72***	-2.14***
Brent (t-h)	0,01	-0,23	-0.43***	-0.43***	-0.43**	-0.46**	-0.64***
Constant	0.01*	0,02	0,04	0,05	0,06	0,07	0,1
F-statistic	7,83	9,97	21,17	10,33	7,64	5,78	6,87
R-squared	0,06	0,07	0,14	0,07	0,06	0,04	0,05
Natural Gas	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
CLP(t-h)	-0,17	-1.48***	-1.51***	-2.21***	-1.77***	-1.42**	-0,69
Natural gas (t-h)	-0.16**	-0.16**	-0.19**	-0.37***	-0.33***	-0.47***	-0.58***
Constant	0,01	0,02	0,02	0,02	0,02	0,01	0
F-statistic	3,52	11,86	6,41	10,92	6,09	6,52	5,92
R-squared	0,03	0,08	0,05	0,08	0,05	0,05	0,05
Heating Oil	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
CLP(t-h)	-0.51***	-1.17***	-2.02***	-2.20***	-2.18***	-1.94***	-2.33***
Heating Oil (t-h)	0,06	-0,02	-0,14	-0.29*	-0,29	-0,41	-0.84**
Constant	0,01	0,02	0,04	0,05	0,06	0,07	0,09
F-statistic	9,33	11,83	17,86	13,49	9,88	6,71	8,48
R-squared	0,07	0,08	0,12	0,09	0,07	0,05	0,07
Propane	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
CLP(t-h)	-0.49***	-1.06***	-1.81***	-2.15***	-1.77***	-1,12	-0,84
Propane (t-h)	-0,06	-0.21**	-0.24**	-0,15	-0,19	-0.32*	-0.64***
Constant	0,01	0,01	0,03	0,04	0,04	0,04	0,06
F-statistic	3,58	7,33	10,69	8,98	4,32	2	3,6
R-squared	0,03	0,05	0,08	0,07	0,03	0,02	0,03
Kerosene	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
CLP(t-h)	-0.56***	-1.21***	-2.22***	-2.36***	-2.31***	-1.99***	-2.48***
Kerosene (t-h)	0.07*	-0,11	-0.25**	-0.41***	-0.37*	-0.44*	-0.85***
Constant	0,01	0,02	0,04	0,05	0,06	0,07	0,09
F-statistic	9,23	9,3	18,64	13,81	10,07	6,42	8,77
R-squared	0,06	0,07	0,12	0,1	0,07	0,05	0,07

HAC standard errors are computed according to Newey and West (1987, 1994). ER (ER= CLP, ISK and AUD) stands for Exchange Rates Returns, ER(– 1) and ER(–2) represent the first and second lags of Exchange Rates Returns, we use the same notation for the commodities. H1, H6, H12 and H24 represent the forecasting horizon, 1, 6, 12 and 24 months ahead. (*p<10%, **p<5%, ***p<1%.)

Table B.2) Forecasting fuels with Iceland Krone at multiple horizons - In sample analysis

Iceland Krone							
WTI	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
ISK(t-h)	-0,27	-0.59*	-1.12***	-1.42***	-1.29**	-1.17***	-0,58
WTI (t-h)	0.11**	-0,06	-0.28**	-0.45**	-0.43*	-0.50*	-0.54**
Constant	0,01	0,02	0,03	0,05	0,06	0,07	0,09
F-statistic	5,59	3,46	7,51	9,3	6,09	4,92	2,2
R-squared	0,04	0,03	0,05	0,07	0,05	0,04	0,02
Brent	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
ISK(t-h)	-0.34*	-0,55	-1.17***	-1.38***	-1.23**	-1.14**	-0,62
Brent (t-h)	0,03	-0,17	-0.36***	-0.42**	-0.41**	-0.44**	-0.52**
Constant	0,01	0,02	0,04	0,05	0,06	0,07	0,1
F-statistic	3,5	2,79	8,03	8,05	5,38	4,36	2,51
R-squared	0,03	0,02	0,06	0,06	0,04	0,03	0,02
Natural Gas	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
ISK(t-h)	-0,01	-0.63**	-1.14***	-2.18***	-2.01***	-1.46**	-0,57
Natural gas (t-h)	-0.15**	-0.16**	-0.20**	-0.40***	-0.35***	-0.49***	-0.59***
Constant	0,01	0,01	0,02	0,03	0,02	0,01	0
F-statistic	3,25	4,27	5,88	15,88	10,88	8,4	5,98
R-squared	0,02	0,03	0,04	0,11	0,08	0,06	0,05
Heating Oil	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
ISK(t-h)	-0.31**	-0,5	-1.19***	-1.65***	-1.59***	-1.60***	-0,94
Heating Oil (t-h)	0,06	0,03	-0,11	-0,31	-0,31	-0,45	-0.72**
Constant	0,01	0,02	0,04	0,05	0,06	0,07	0,09
F-statistic	5,9	3,49	9,11	11,66	8,18	7,13	3,39
R-squared	0,04	0,03	0,07	0,08	0,06	0,05	0,03
Propane	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
ISK(t-h)	-0.44**	-0.67*	-1.42***	-2.06***	-1.60**	-1.30*	-0,38
Propane (t-h)	-0,08	-0.22**	-0.30***	-0,26	-0.28*	-0.40**	-0.64***
Constant	0,01	0,01	0,03	0,04	0,04	0,05	0,06
F-statistic	4,35	4,68	9,84	12,81	5,45	3,5	3,16
R-squared	0,03	0,03	0,07	0,09	0,04	0,03	0,03
Kerosene	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
ISK(t-h)	-0.29**	-0,51	-1.22***	-1.65***	-1.60***	-1.61***	-1
Kerosene (t-h)	0.09*	-0,06	-0.18*	-0.40**	-0,36	-0.46*	-0.72**
Constant	0,01	0,02	0,04	0,05	0,06	0,07	0,09
F-statistic	5,15	2,41	8,05	10,35	7,58	6,66	3,71
R-squared	0,04	0,02	0,06	0,07	0,06	0,05	0,03

HAC standard errors are computed according to Newey and West (1987, 1994). ER (ER= CLP, ISK and AUD) stands for Exchange Rates Returns, ER(– 1) and ER(–2) represent the first and second lags of Exchange Rates Returns, we use the same notation for the commodities. H1, H6, H12 and H24 represent the forecasting horizon, 1, 6, 12 and 24 months ahead. (*p<10%, **p<5%, ***p<1%.)

Table B.3) Forecasting fuels with Australian Dolla at multiple horizons - In sample analysis

Australian Dollar							
WTI	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
AUD(t-h)	-0,33	-0.83**	-1.09***	-1.15***	-1.36***	-1.53***	-1.78***
WTI (t-h)	0.10**	-0,11	-0.29**	-0.41***	-0.44**	-0.56**	-0.74***
Constant	0	0,01	0,03	0,04	0,05	0,06	0,08
F-statistic	6	5,11	5,18	4,69	5,02	5,92	6,37
R-squared	0,04	0,04	0,04	0,04	0,04	0,04	0,05
Brent	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
AUD(t-h)	-0.58**	-0.90**	-1.13***	-1.16***	-1.43***	-1.57***	-2.02***
Brent (t-h)	0	-0,22	-0.35***	-0.39***	-0.44**	-0.50**	-0.70***
Constant	0,01	0,02	0,03	0,04	0,05	0,06	0,09
F-statistic	6,86	5,21	5,81	4,73	5,3	5,7	7,08
R-squared	0,05	0,04	0,04	0,04	0,04	0,04	0,06
Natural Gas	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
AUD(t-h)	0,16	-0,52	-1.34***	-1.69***	-1.52***	-1.24**	-1,05
Natural gas (t-h)	-0.15**	-0.16*	-0.20**	-0.38***	-0.34***	-0.48***	-0.60***
Constant	0,01	0,01	0,01	0,02	0,01	0	-0,01
F-statistic	3,53	2,95	6,1	8,49	5,66	6,32	6,95
R-squared	0,03	0,02	0,04	0,06	0,04	0,05	0,05
Heating Oil	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
AUD(t-h)	-0.37*	-0.81**	-1.15***	-1.34***	-1.68***	-1.90***	-2.21***
Heating Oil (t-h)	0,06	-0,01	-0,09	-0,24	-0,3	-0.48*	-0.91**
Constant	0,01	0,02	0,03	0,04	0,05	0,06	0,09
F-statistic	6,23	6,42	6,25	5,61	6,75	7,61	8,94
R-squared	0,04	0,05	0,05	0,04	0,05	0,06	0,07
Propane	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
AUD(t-h)	-0,36	-0.87**	-1.14**	-1.58***	-1.26***	-1.24**	-1,02
Propane (t-h)	-0,06	-0.22**	-0.23**	-0,16	-0,2	-0.36**	-0.68***
Constant	0	0,01	0,02	0,03	0,04	0,04	0,05
F-statistic	2,23	5,91	4,97	5,56	2,57	2,64	4,07
R-squared	0,02	0,04	0,04	0,04	0,02	0,02	0,03
Kerosene	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
AUD(t-h)	-0.45**	-0.86**	-1.34***	-1.49***	-1.82***	-1.98***	-2.45***
Kerosene (t-h)	0,07	-0,11	-0.20**	-0.36**	-0.38*	-0.51**	-0.93***
Constant	0,01	0,02	0,03	0,04	0,05	0,06	0,08
F-statistic	7,31	5,26	7,24	6,25	7,24	7,48	9,78
R-squared	0,05	0,04	0,05	0,05	0,05	0,06	0,07

HAC standard errors are computed according to Newey and West (1987, 1994). ER (ER= CLP, ISK and AUD) stands for Exchange Rates Returns, ER(– 1) and ER(–2) represent the first and second lags of Exchange Rates Returns, we use the same notation for the commodities. H1, H6, H12 and H24 represent the forecasting horizon, 1, 6, 12 and 24 months ahead. (*p<10%, **p<5%, ***p<1%.)

Table B.4) Forecasting fuels with Canadian Dollar at multiple horizons - In sample analysis

Canadian Dollar							
WTI	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
CAD(t-h)	-0,27	-0,39	-0.78*	-1.34**	-1.94***	-1.10**	-2.03**
WTI (t-h)	0.12**	-0,02	-0.20*	-0.38**	-0.45**	-0.44*	-0.68***
Constant	0	0,01	0,03	0,04	0,05	0,06	0,08
F-statistic	3,9	0,52	1,33	3,1	4,6	2,1	4,32
R-squared	0,03	0	0,01	0,02	0,03	0,02	0,03
Brent	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
CAD(t-h)	-0.46*	-0,45	-0.86**	-1.33**	-1.85***	-1.14*	-2.30**
Brent (t-h)	0,03	-0,14	-0.28**	-0.36***	-0.41**	-0.39*	-0.64***
Constant	0,01	0,02	0,03	0,04	0,05	0,07	0,09
F-statistic	2,36	0,99	2,37	3,25	4,25	2,22	4,91
R-squared	0,02	0,01	0,02	0,02	0,03	0,02	0,04
Natural Gas	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
CAD(t-h)	0,04	-0,85	-1.71**	-2.48***	-2.36***	-1.52**	-0,43
Natural gas (t-h)	-0.15**	-0.16*	-0.19**	-0.37***	-0.33***	-0.47***	-0.58***
Constant	0,01	0,01	0,01	0,01	0,01	0	-0,01
F-statistic	3,25	3,24	4,76	8,35	6,02	5,52	5,46
R-squared	0,02	0,02	0,04	0,06	0,05	0,04	0,04
Heating Oil	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
CAD(t-h)	-0.41*	-0,58	-1.09**	-1.76***	-2.39***	-1.69***	-2.53***
Heating Oil (t-h)	0,06	0,04	-0,05	-0,25	-0,34	-0,39	-0.88***
Constant	0,01	0,02	0,03	0,04	0,05	0,06	0,09
F-statistic	4,04	1,74	2,47	4,1	5,88	2,64	5,73
R-squared	0,03	0,01	0,02	0,03	0,04	0,02	0,05
Propane	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
CAD(t-h)	-0,27	-0,73	-0,96	-1.89***	-1.53**	-0,9	-0,61
Propane (t-h)	-0,05	-0.18*	-0.19*	-0,12	-0,17	-0.30*	-0.63***
Constant	0	0,01	0,02	0,03	0,03	0,04	0,05
F-statistic	0,66	2,55	1,91	3,61	1,75	1,1	3,14
R-squared	0	0,02	0,01	0,03	0,01	0,01	0,03
Kerosene	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
CAD(t-h)	-0,38	-0,48	-1.12**	-1.72***	-2.54***	-1.78***	-2.64***
Kerosene (t-h)	0.09*	-0,03	-0,12	-0.34**	-0.40**	-0.41*	-0.87***
Constant	0,01	0,02	0,03	0,04	0,05	0,06	0,08
F-statistic	3,86	0,71	2,12	3,69	6,1	2,77	5,88
R-squared	0,03	0,01	0,02	0,03	0,05	0,02	0,05

HAC standard errors are computed according to Newey and West (1987, 1994). ER (ER= CLP, ISK and AUD) stands for Exchange Rates Returns, ER(– 1) and ER(–2) represent the first and second lags of Exchange Rates Returns, we use the same notation for the commodities. H1, H6, H12 and H24 represent the forecasting horizon, 1, 6, 12 and 24 months ahead. (*p<10%, **p<5%, ***p<1%.)

Table B.5) Forecasting fuels with New Zealand Dollar at multiple horizons - In sample analysis

New Zealand Dollar							
WTI	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
NZD(t-h)	-0,17	-0,49	-1.25***	-1.12***	-1.01**	-1.31***	-1.03*
WTI (t-h)	0.13***	-0,03	-0.25**	-0.35**	-0,34	-0.46*	-0.56**
Constant	0	0,01	0,03	0,04	0,05	0,06	0,08
F-statistic	3,87	1,93	7,32	4,8	3,2	4,85	3,26
R-squared	0,03	0,01	0,05	0,04	0,02	0,04	0,03
Brent	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
NZD(t-h)	-0.39**	-0,58	-1.28***	-1.12***	-1.00**	-1.35***	-1.16*
Brent (t-h)	0,04	-0,15	-0.31***	-0.34**	-0.34*	-0.41*	-0.54**
Constant	0	0,02	0,03	0,04	0,05	0,06	0,09
F-statistic	3,64	2,52	7,6	4,7	3,26	4,74	3,68
R-squared	0,03	0,02	0,06	0,04	0,02	0,04	0,03
Natural Gas	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
NZD(t-h)	0,07	-0,49	-1.31*	-1.75**	-1.58***	-1.57***	-1,03
Natural gas (t-h)	-0.15**	-0.16*	-0.19**	-0.37***	-0.33***	-0.48***	-0.59***
Constant	0,01	0,01	0,01	0,01	0,01	0	-0,01
F-statistic	3,3	2,78	5,89	8,98	6	7,89	6,91
R-squared	0,02	0,02	0,04	0,07	0,04	0,06	0,05
Heating Oil	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
NZD(t-h)	-0,25	-0,51	-1.22***	-1.35***	-1.35***	-1.70***	-1.46***
Heating Oil (t-h)	0,09	0,06	-0,06	-0,19	-0,19	-0,38	-0.72**
Constant	0,01	0,02	0,03	0,04	0,05	0,06	0,08
F-statistic	3,8	2,92	7,42	6,01	4,53	6,42	4,97
R-squared	0,03	0,02	0,05	0,04	0,03	0,05	0,04
Propane	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
NZD(t-h)	-0,28	-0,6	-1.10**	-1.46***	-0.94**	-1.24**	-0,6
Propane (t-h)	-0,05	-0.18*	-0.21**	-0,12	-0,15	-0.33*	-0.63***
Constant	0	0,01	0,02	0,03	0,03	0,04	0,05
F-statistic	1,44	3,4	4,82	4,87	1,53	2,71	3,36
R-squared	0,01	0,03	0,04	0,04	0,01	0,02	0,03
Kerosene	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
NZD(t-h)	-0,29	-0,5	-1.34***	-1.42***	-1.41***	-1.73***	-1.59***
Kerosene (t-h)	0.10**	-0,03	-0,15	-0.30**	-0,26	-0.40*	-0.73**
Constant	0	0,02	0,03	0,04	0,05	0,06	0,08
F-statistic	4,48	1,85	7,71	6,02	4,54	6,03	5,4
R-squared	0,03	0,01	0,06	0,04	0,03	0,05	0,04

HAC standard errors are computed according to Newey and West (1987, 1994). ER (ER= CLP, ISK and AUD) stands for Exchange Rates Returns, ER(– 1) and ER(–2) represent the first and second lags of Exchange Rates Returns, we use the same notation for the commodities. H1, H6, H12 and H24 represent the forecasting horizon, 1, 6, 12 and 24 months ahead. (*p<10%, **p<5%, ***p<1%.)

Table B.6) Forecasting fuels with Norwegian Krone at multiple horizons - In sample analysis

Norwegian Krone							
WTI	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
NOK(t-h)	-0,17	-0,13	-0,25	-0,43	-0,59	-0,41	-0,59
WTI (t-h)	0.12**	0,01	-0,15	-0.29**	-0,31	-0,37	-0.54**
Constant	0,01	0,02	0,03	0,04	0,05	0,06	0,09
F-statistic	4,4	0,24	0,67	1,65	2,02	1,57	2,4
R-squared	0,03	0	0,01	0,01	0,02	0,01	0,02
Brent	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
NOK(t-h)	-0.29**	-0,13	-0,29	-0,5	-0,65	-0,47	-0,76
Brent (t-h)	0,04	-0,12	-0.25**	-0.31**	-0.34*	-0.35*	-0.53**
Constant	0,01	0,02	0,03	0,05	0,06	0,07	0,1
F-statistic	3,24	0,64	1,69	2,29	2,51	1,85	3,09
R-squared	0,02	0	0,01	0,02	0,02	0,01	0,02
Natural Gas	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
NOK(t-h)	0,12	-0,04	-0,15	-0,58	-0,46	-0,08	0,4
Natural gas (t-h)	-0.15**	-0.16*	-0.18*	-0.36***	-0.32***	-0.47***	-0.58***
Constant	0	0,01	0,02	0,02	0,02	0	-0,01
F-statistic	3,51	1,53	1,17	3,89	2,44	3,9	5,72
R-squared	0,03	0,01	0,01	0,03	0,02	0,03	0,04
Heating Oil	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
NOK(t-h)	-0.28**	-0,36	-0.44*	-0.76***	-0.91**	-0.80**	-1,01
Heating Oil (t-h)	0,06	0,05	0,01	-0,17	-0,2	-0,32	-0.74**
Constant	0,01	0,02	0,04	0,05	0,06	0,07	0,1
F-statistic	5,93	2,36	1,57	2,9	3,21	2,33	4,13
R-squared	0,04	0,02	0,01	0,02	0,02	0,02	0,03
Propane	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
NOK(t-h)	-0.25*	-0,42	-0.59*	-1.00**	-0,74	-0,44	-0,08
Propane (t-h)	-0,05	-0,17	-0,17	-0,07	-0,13	-0,27	-0.60***
Constant	0,01	0,01	0,03	0,04	0,04	0,04	0,06
F-statistic	1,96	2,94	2,54	3,79	1,58	1,06	2,97
R-squared	0,01	0,02	0,02	0,03	0,01	0,01	0,02
Kerosene	***H1***	***H3***	***H6***	***H9***	***H12***	***H15***	***H24***
NOK(t-h)	-0.29**	-0,27	-0,41	-0.73**	-0.93**	-0.85**	-1,03
Kerosene (t-h)	0.08*	-0,03	-0,07	-0.27**	-0,27	-0,35	-0.74**
Constant	0,01	0,02	0,04	0,05	0,06	0,07	0,09
F-statistic	5,87	0,87	1,08	2,6	3,15	2,48	4,23
R-squared	0,04	0,01	0,01	0,02	0,02	0,02	0,03

HAC standard errors are computed according to Newey and West (1987, 1994). ER (ER= CLP, ISK and AUD) stands for Exchange Rates Returns, ER(– 1) and ER(–2) represent the first and second lags of Exchange Rates Returns, we use the same notation for the commodities. H1, H6, H12 and H24 represent the forecasting horizon, 1, 6, 12 and 24 months ahead. (*p<10%, **p<5%, ***p<1%.)

C. *Forecasting base metals with currencies – Out sample analysis P/R = 0.6.*

Table C.1) Forecasting base metals with Chilean Peso at multiple horizons – Out of sample analysis at population level.

Chilean exchange rate P/R=0.6

ENCNEW							
One-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	3.72***	6.41***	7.48***	1.75**	2.67**	2.07**	5.97***
RW	3.25***	6.09***	4.16***	2.20**	4.27***	1.82**	7.23***
DRW	3.06***	5.32***	3.77***	2.08**	3.49***	1.67**	6.52***
three-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	5.50***	4.63***	2.44**	-0,62	0,46	1.70**	3.39***
RW	4.14***	5.07***	1.59**	0,32	2.11**	2.99***	5.75***
DRW	3.41***	3.37***	0,84	0,12	0,73	2.41**	4.17***
Six-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	4.55***	7.41***	5.39***	0,47	4.16***	0	4.39***
RW	5.72***	7.57***	5.57***	1.42*	6.19***	0,6	6.80***
DRW	4.61***	5.30***	4.49***	1.15*	3.83***	0,19	4.87***
Nine-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	2.37**	2.32**	-1,59	-0,65	1.77**	-0,18	1.06*
RW	2.99***	2.27**	-1,01	-0,33	2.84**	-0,22	1.79**
DRW	2.46**	1.25*	-0,81	-0,3	1.58**	-0,19	1.03*
Twelve-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	2.05**	1.07*	-3,76	-2,11	0.95*	-1,22	0,3
RW	1.67**	1.07*	-3,41	-1,65	1.40*	-1,07	0,49
DRW	1.50*	0,75	-2,6	-1,3	0,91	-0,54	0,38
Fifteen-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,74	0,13	-1,56	-1,34	0,6	-1,01	-0,12
RW	0,52	0,03	-1,58	-1,26	0,74	-0,8	-0,07
DRW	0,35	-0,16	-0,43	-0,88	0,34	-0,58	-0,19
Twentyfour-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	-0,67	-0,21	0,68	-1,61	-1,05	0,11	-0,31
RW	-0,73	-0,61	0,14	-1,94	-1,14	0,23	-0,6
DRW	-0,88	-1,15	-0,72	-1,26	-1,3	-0,17	-0,9

10%, 5% and 1% critical values are 0.764, 1.161 and 2.278 respectively for ENCNEW when excess parameters are 1

Table C.2) Forecasting base metals with Iceland Krone at multiple horizons – Out of sample analysis at population level.

Iceland exchange rate P/R=0.6

ENCNEW							
One-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1.37*	2.78**	5.86***	-0,02	2.13**	0,46	2.67**
RW	1.64**	1.84**	3.03***	0,26	3.73***	0,46	3.01***
DRW	1.45*	1.84**	3.38***	0,14	3.57***	0,29	2.78**
three-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	4.80***	1.05*	3.18***	0,34	0,57	1.25*	1.71**
RW	4.78***	0,77	0,22	0,78	2.46**	1.68**	2.75**
DRW	3.89***	0,83	1.12*	0,46	2.54**	1.34*	2.32**
Six-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	5.77***	0,87	5.91***	0,78	1.39*	0,18	1.50*
RW	7.04***	1.13*	4.66***	1.01*	3.09***	0,3	2.62**
DRW	5.61***	1.15*	6.14***	0,67	2.85**	0,12	2.16**
Nine-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	5.28***	0,83	1.42*	0,31	1.11*	0,68	1.60**
RW	5.92***	1.49*	1.24*	0,4	2.19**	1.00*	2.38**
DRW	4.95***	1.63**	2.22**	0,42	1.91**	0,76	2.10**
Twelve-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	4.30***	0,62	0,48	-0,69	0,2	-0,4	1.05*
RW	4.44***	0.98*	0,37	-0,44	0,8	-0,07	1.43*
DRW	3.71***	1.19*	0,81	-0,29	0,77	-0,02	1.39*
Fifteen-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	2.40**	0,23	-0,06	-0,43	-0,18	-0,45	0,49
RW	2.38**	0,31	-0,04	-0,42	-0,04	-0,2	0,57
DRW	1.92**	0,57	0,32	-0,25	0,25	-0,15	0,64
Twentyfour-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,45	0,15	-0,78	0.92*	0,3	0,63	0,45
RW	0,38	0,08	-0,28	0,75	0,52	0,73	0,46
DRW	0,32	1.14*	1.38*	1.21*	1.66**	0.94*	1.13*

10%, 5% and 1% critical values are 0.764, 1.161 and 2.278 respectively for ENCNEW when excess parameters are 1

Table C.3) Forecasting base metals with Australian Dollar at multiple horizons – Out of sample analysis at population level.

Australian exchange rate P/R=0.6

ENCNEW							
One-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,6	1.78**	4.10***	0,28	1.64**	0,08	1.22*
RW	0,48	1.55**	1.75**	0,6	3.75***	0,01	1.92**
DRW	0,45	1.05*	1.48*	0,51	3.37***	0,02	1.56**
three-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	9.98***	5.33***	5.15***	-0,51	1.61**	0.98*	4.53***
RW	7.88***	6.37***	2.60**	0,21	4.13***	1.96**	7.18***
DRW	7.60***	4.95***	1.42*	0,15	3.33***	1.78**	6.04***
Six-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	4.26***	1.24*	3.54***	0,22	2.39**	-0,94	0.96*
RW	5.79***	2.26**	3.71***	1.16*	4.37***	-0,17	3.44***
DRW	5.69***	2.06**	3.23***	1.20*	3.53***	-0,07	3.12***
Nine-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	2.04**	0,55	-2,12	-1,76	1.14*	-2,43	-0,68
RW	2.53**	-0,02	-1,43	-0,93	2.00**	-1,64	-0,05
DRW	2.60**	0,24	-0,77	-0,67	1.64**	-1,22	0,2
Twelve-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	2.03**	-0,64	-3,17	-2,89	0,86	-3,82	-1,4
RW	1.34*	-0,62	-2,89	-1,78	1.48*	-2,86	-0,95
DRW	1.41*	-0,14	-2,2	-1,43	1.14*	-2,33	-0,54
Fifteen-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,62	-0,36	-1,17	-2,53	0,79	-3,53	-1,23
RW	0,07	-0,46	-1,51	-2,06	0.93*	-2,66	-0,9
DRW	0,07	-0,1	-1,21	-1,56	0,45	-2,09	-0,59
Twentyfour-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,47	-0,32	0,01	-0,94	0,3	-0,39	-0,38
RW	0,3	-0,19	-0,48	-1,25	0,04	0,15	-0,08
DRW	0,3	0,58	0,03	-0,14	0,06	0,72	0,55

10%, 5% and 1% critical values are 0.764, 1.161 and 2.278 respectively for ENCNEW when excess parameters are 1

Table C.4) Forecasting base metals with Canadian Dollar at multiple horizons – Out of sample analysis at population level.

Canadian exchange rate P/R=0.6

ENCNEW							
One-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,36	-0,25	3.25***	-1,43	-0,24	0,08	-0,14
RW	0,43	0,37	1.62**	-0,81	0,91	0,03	0,87
DRW	0,36	0,04	1.22*	-0,76	0,7	0,1	0,62
three-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	2.95***	-0,55	0,2	-0,64	-0,63	-0,15	-0,42
RW	2.38**	-0,86	-0,83	-0,44	0,11	0,23	0,03
DRW	2.00**	-2,02	-2,13	-0,31	-0,13	-0,02	-0,92
Six-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1.42*	0,47	2.04**	-0,15	1.93**	0,22	0,64
RW	2.20**	0.95*	2.62**	0,51	3.32***	0,39	1.85**
DRW	1.85**	0,47	1.56**	0,65	2.56**	0,34	1.25*
Nine-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	2.12**	1.94**	-1,56	0,07	1.74**	-0,7	1.10*
RW	2.41**	1.66**	-1,11	0,32	2.60**	-0,51	1.48*
DRW	2.21**	1.14*	-0,35	0,49	1.82**	-0,25	1.08*
Twelve-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	2.08**	0.92*	-2,39	-1,51	1.08*	-1,56	0,33
RW	1.81**	0,88	-2,27	-0,97	1.71**	-1,45	0,52
DRW	1.68**	0.96*	-1,05	-0,47	1.07*	-0,9	0,63
Fifteen-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,41	-0,54	-0,78	-2,41	0,45	-0,78	-0,55
RW	0,26	-0,7	-0,82	-2,2	0,6	-0,73	-0,53
DRW	0,18	0,1	0,09	-1,25	0,3	-0,33	-0,08
Twentyfour-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,02	0,08	0,72	-1,11	0,15	0,17	0,03
RW	0,01	-0,07	0,22	-1,55	-0,21	0,35	-0,1
DRW	-0,02	0,07	-1,39	-0,24	-0,16	0,03	0,08

10%, 5% and 1% critical values are 0.764, 1.161 and 2.278 respectively for ENCNEW when excess parameters are 1

Table C.5) Forecasting base metals with New Zealand Dollar at multiple horizons – Out of sample analysis at population level.

New Zealand exchange rate P/R=0.6

ENCNEW							
One-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,51	-0,48	4.71***	-0,61	1.01*	-0,27	-0,52
RW	0,41	-0,2	2.49**	0,14	2.68**	-0,34	0,49
DRW	0,42	-0,35	2.38**	0,17	2.48**	-0,24	0,42
three-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	6.95***	1.33*	5.80***	-0,94	1.51**	0,74	1.75**
RW	5.64***	2.77**	3.69***	0,13	3.66***	1.92**	4.51***
DRW	5.53***	2.09**	2.93***	0,17	2.98***	1.91**	3.92***
Six-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	4.01***	1.01*	2.02**	-0,69	2.20**	-1,14	0,81
RW	5.36***	1.97**	2.79**	0,57	3.96***	-0,39	3.20***
DRW	5.48***	2.26**	2.99***	0,82	3.35***	-0,15	3.31***
Nine-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	2.16**	0,69	-1,49	-2,4	0,76	-1,97	-0,19
RW	2.67**	0,35	-0,89	-1,5	1.54**	-1,54	0,23
DRW	2.81**	0,67	-0,08	-1,17	1.26*	-1,16	0,56
Twelve-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1.45*	-0,68	-3,5	-3,49	0,45	-3,06	-1,35
RW	1.04*	-0,72	-3,14	-2,41	0,84	-2,61	-1,18
DRW	1.12*	-0,11	-2,21	-1,98	0,73	-2,12	-0,64
Fifteen-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1.02*	-0,07	-1,45	-2,73	0,18	-2,72	-0,84
RW	0,58	-0,18	-1,6	-2,38	0,28	-2,28	-0,73
DRW	0,59	0,3	-0,82	-1,85	-0,11	-1,75	-0,34
Twentyfour-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,52	0,07	-0,48	-0,57	0,2	-0,11	-0,03
RW	0,54	0,2	-0,82	-0,86	0,32	0,24	0,3
DRW	0,57	1.09*	0,76	0,09	0,58	0,77	1.00*

10%, 5% and 1% critical values are 0.764, 1.161 and 2.278 respectively for ENCNEW when excess parameters are 1

Table C.6) Forecasting base metals with South African Rand at multiple horizons – Out of sample analysis at population level.

South Africa exchange rate P/R=0.6

ENCNEW							
One-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,1	0,57	3.97***	0,84	0,85	0,15	0,75
RW	0,55	1.12*	3.05***	1.32*	2.29**	0,01	1.96**
DRW	0,4	0,89	2.87***	1.07*	1.84**	-0,05	1.61**
three-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,62	-0,45	2.77**	0,46	-0,28	-0,56	-0,34
RW	0,56	-0,29	1.73**	1.04*	-0,23	-0,2	0,66
DRW	-0,11	-0,73	1.54**	0,54	-0,38	-0,41	0
Six-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,19	-0,29	1.51**	-0,06	-0,95	0,01	-0,44
RW	0.95*	-0,11	1.67**	0,16	-0,83	-0,67	-0,04
DRW	0,29	-0,28	1.46*	-0,16	-0,86	-0,43	-0,28
Nine-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1.27*	0.94*	0,21	-0,07	-0,7	-0,18	0,19
RW	1.59**	1.42*	0,3	0,01	-0,4	-0,61	0,85
DRW	1.02*	0,69	0,01	-0,02	-0,53	-0,4	0,34
Twelve-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1.74**	1.33*	-0,25	0,29	-0,58	-0,16	0,7
RW	1.80**	1.71**	-0,33	0,32	-0,28	-0,38	1.17*
DRW	1.17*	1.38*	-0,61	0,42	-0,37	0,17	0,86
Fifteen-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,39	0,67	-0,59	0,43	-0,35	-0,17	0,28
RW	0,46	0,8	-0,28	0,39	-0,29	-0,47	0,4
DRW	0,1	0,74	0,24	0,52	-0,15	-0,01	0,36
Twentyfour-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	-0,32	0,08	-0,58	-0,24	0,19	-0,61	-0,06
RW	-0,21	-0,13	-0,28	-0,36	0,6	-0,43	-0,17
DRW	-0,36	-0,19	0,6	0,02	1.83**	-0,11	0,01

10%, 5% and 1% critical values are 0.764, 1.161 and 2.278 respectively for ENCNEW when excess parameters are 1

Table C.7) Forecasting base metals with Chilean Peso at multiple horizons – Out of sample analysis at sample level.

Chilean exchange rate P/R=0.6

Ratios DM							
One-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,97	0.93**	0.93*	0.97**	0,99	0.97**	0.93***
RW	0,98	0,97	0,98	0.97**	0,97	0.97**	0,94
DRW	0,99	0,98	0,98	0.97**	0,98	0.98**	0,95
three-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1	0,99	0,98	1,02	1,04	0,99	1
RW	1,05	1,03	1	1	1,03	0,97	1,01
DRW	1,07	1,07	1,02	1	1,06	0,98	1,05
Six-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1,04	0,98	0.92**	1	0,98	1	0,99
RW	1	0,96	0.93*	0,99	0,95	1	0,97
DRW	1,03	1,01	0,96	1	0,99	1,01	1,01
Nine-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1	1	1,04	1,02	0,99	1,01	1
RW	0,97	0,98	1,02	1,01	0,96	1,01	0,98
DRW	0,99	1	1,02	1,01	0,99	1,01	1
Twelve-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,98	0,98	1,12	1,06	0,98	1,04	1
RW	0,97	0,98	1,1	1,04	0.98*	1,03	0,99
DRW	0,98	0,99	1,09	1,03	0,99	1,02	0,99
Fifteen-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,99	1	1,05	1,03	0,99	1,03	1
RW	0,99	1	1,05	1,03	0,99	1,02	1
DRW	1	1,01	1,03	1,02	1	1,02	1,01
Twentyfour-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1,03	1,01	0,99	1,05	1,03	1	1,01
RW	1,02	1,02	1	1,05	1,03	1	1,02
DRW	1,03	1,04	1,02	1,04	1,04	1,01	1,03

We consider the Diebold and Mariano (1995) and West (1996) test to evaluate the null hypothesis of equal MSPE and our test to evaluate the null of equal correlations.*p<0.1 *p<0.05,***p<0.01.

Table C.8) Forecasting base metals with Iceland Krone at multiple horizons – Out of sample analysis at sample level.

Iceland exchange rate P/R=0.6

Ratios DM							
One-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1	0,98	0,97	1	0.98*	1	0,97
RW	0,99	1,02	1,01	1	0.95*	1	0,98
DRW	1	1,01	1	1	0.95*	1	0,99
three-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,98	1,04	1,11	1	1,03	1,01	1,03
RW	1	1,07	1,17	0,99	1,01	1,01	1,04
DRW	1,02	1,07	1,15	1	1	1,01	1,05
Six-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,98	1,02	0,96	0,99	1,01	1	1,01
RW	0,96	1,02	0,99	0,99	0,98	1	1
DRW	0,99	1,02	0,97	1	0,98	1	1,01
Nine-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,94	1,03	1	0.99*	0,99	0,99	1
RW	0,93	1	1	0,99	0,97	0,98	0,98
DRW	0,95	1	0,98	0.99*	0,98	0,99	0,99
Twelve-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,95	1	0,99	1,02	1	1,01	0,99
RW	0,94	0,99	1	1,01	0,99	1	0,98
DRW	0,96	0,98	0,98	1,01	0,99	1	0,98
Fifteen-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,97	1	1	1,01	1,01	1,01	0,99
RW	0,96	1	1	1,01	1	1	0,99
DRW	0,97	0,99	1	1,01	1	1	0,99
Twentyfour-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,99	1	1,03	0,98	0,99	0,99	0,99
RW	0,99	1	1,01	0,99	0,99	0,98	0,99
DRW	0,99	0,97	0,97	0,98	0,96	0,98	0,97

We consider the Diebold and Mariano (1995) and West (1996) test to evaluate the null hypothesis of equal MSPE and our test to evaluate the null of equal correlations.*p<0.1 *p<0.05,***p<0.01.

Table C.9) Forecasting base metals with Australian Dollar at multiple horizons – Out of sample analysis at sample level.

Australian exchange rate P/R=0.6

Ratios DM							
One-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1,02	0,98	0,97	1	1	1	0,99
RW	1,02	1,01	1	1	0,97	1	1
DRW	1,02	1,02	1,01	1	0,98	1	1,01
three-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0.92*	0,96	0,98	1,01	0,99	0,99	0,97
RW	0,96	0,97	1,03	1	0,97	0,98	0,96
DRW	0,97	1	1,06	1,01	0,98	0,98	0,98
Six-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,97	0.98***	0.94***	1	0,97	1,02	0.98***
RW	0,94	0.96*	0.95**	0,98	0.94*	1	0.95*
DRW	0,94	0,97	0.97**	0,98	0,96	1	0,96
Nine-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,98	0.99*	1,06	1,05	0,98	1,09	1,02
RW	0,96	1	1,03	1,02	0.97**	1,05	1
DRW	0,96	1	1,02	1,02	0.97*	1,04	1
Twelve-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0.97*	1,02	1,09	1,08	0,98	1,14	1,04
RW	0.97**	1,01	1,08	1,05	0.97*	1,09	1,02
DRW	0.97**	1	1,06	1,04	0,98	1,08	1,01
Fifteen-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0.99*	1,01	1,03	1,07	0,99	1,13	1,03
RW	1	1,01	1,04	1,06	0,98	1,09	1,02
DRW	1	1	1,04	1,04	1	1,07	1,01
Twentyfour-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,99	1,01	1	1,03	1	1,02	1,01
RW	0,99	1,01	1,02	1,04	1	1,01	1
DRW	0,99	0.99*	1	1,01	1	0,99	0,99

We consider the Diebold and Mariano (1995) and West (1996) test to evaluate the null hypothesis of equal MSPE and our test to evaluate the null of equal correlations.*p<0.1 *p<0.05,***p<0.01.

Table C.10) Forecasting base metals with Canadian Dollar at multiple horizons – Out of sample analysis at sample level.

Canadian exchange rate P/R=0.6

Ratios DM							
One-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1,01	1,01	0,98	1,04	1,01	1	1
RW	1,01	1,01	1,01	1,02	0,99	1	1
DRW	1,01	1,01	1,02	1,02	1	1	1
three-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1	1,02	1,03	1,02	1,01	1,02	1,02
RW	1,04	1,06	1,07	1,01	1,01	1,02	1,05
DRW	1,05	1,09	1,11	1,01	1,01	1,02	1,08
Six-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1,02	0,99	0.97**	1	0,98	1	0,99
RW	1,01	0,99	0.97*	0,99	0.96*	1	0,98
DRW	1,02	1	1	0,99	0,97	1	1
Nine-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1	0,98	1,04	1	0,98	1,02	0,99
RW	0,98	0,98	1,03	1	0,97	1,01	0,98
DRW	0,99	1	1,01	0,99	0,98	1,01	0,99
Twelve-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,98	0,99	1,07	1,04	0,99	1,05	1
RW	0,98	0,99	1,06	1,02	0,98	1,04	0,99
DRW	0,98	0,99	1,03	1,01	0,99	1,03	0,99
Fifteen-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1	1,01	1,02	1,07	1	1,03	1,01
RW	1	1,02	1,03	1,06	0,99	1,02	1,01
DRW	1	1	1,01	1,03	1	1,01	1
Twentyfour-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1	1	0,99	1,03	1	1	1
RW	1	1,01	1	1,04	1,01	0,99	1
DRW	1	1,01	1,06	1,01	1,01	1	1

We consider the Diebold and Mariano (1995) and West (1996) test to evaluate the null hypothesis of equal MSPE and our test to evaluate the null of equal correlations.*p<0.1 *p<0.05,***p<0.01.

Table C.11) Forecasting base metals with Canadian Dollar at multiple horizons – Out of sample analysis at sample level.

New Zealand exchange rate P/R=0.6

Ratios DM							
One-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1,01	1,01	0,95	1,02	1	1,01	1,01
RW	1,01	1,01	0,99	1	0,97	1,01	1
DRW	1,01	1,02	0,99	1	0,98	1,01	1,01
three-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,96	0,99	0,97	1,02	0,99	1	0,99
RW	0,99	0,99	1,01	1	0,97	0,98	0,97
DRW	0,99	1,01	1,03	1	0,99	0,98	0,99
Six-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,97	0.98*	0.97***	1,02	0,98	1,03	0.99*
RW	0,94	0.97*	0.96**	0,99	0.95*	1,01	0.95*
DRW	0,94	0,97	0.96*	0.99*	0,96	1	0.95*
Nine-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,98	0.99**	1,04	1,06	0,99	1,07	1
RW	0.96*	0.99*	1,02	1,04	0,98	1,05	1
DRW	0.96*	0.99*	1	1,03	0,98	1,03	0.99**
Twelve-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0.98**	1,02	1,1	1,11	0,99	1,11	1,04
RW	0.98**	1,02	1,09	1,07	0.98*	1,09	1,03
DRW	0.98**	1	1,06	1,06	0,99	1,07	1,02
Fifteen-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0.98*	1	1,04	1,09	1	1,09	1,02
RW	0.99*	1	1,05	1,07	1	1,07	1,02
DRW	0.99*	1	1,03	1,06	1,01	1,06	1,01
Twentyfour-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0.99*	1	1,02	1,03	1	1,01	1,01
RW	0.99*	1	1,03	1,04	0,99	1	1
DRW	0.99*	0.98*	0,99	1,01	0,99	0,99	0,98

We consider the Diebold and Mariano (1995) and West (1996) test to evaluate the null hypothesis of equal MSPE and our test to evaluate the null of equal correlations.*p<0.1 *p<0.05,***p<0.01.

Table C.12) Forecasting base metals with South African Rand at multiple horizons – Out of sample analysis at sample level.

South African exchange rate P/R=0.6

Ratios DM							
One-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1,01	0,99	0.95**	0.99*	0,99	1	0,99
RW	1	1	0.97*	0.98*	0,97	1	0,98
DRW	1,01	1	0.97*	0.98*	0,98	1	0,99
three-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1,04	1,04	1,01	1	1,01	1,02	1,04
RW	1,07	1,07	1,04	1	1,01	1,02	1,06
DRW	1,09	1,08	1,04	1,01	1,01	1,03	1,07
Six-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1,02	1,02	0,98	1	1,02	1	1,01
RW	1,01	1,02	0,98	1,01	1,02	1,02	1,02
DRW	1,02	1,02	0,98	1,01	1,02	1,01	1,02
Nine-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1	1,03	1,01	1,01	1,02	1,01	1,02
RW	0,99	1,01	1,01	1,01	1,01	1,02	1,01
DRW	1,01	1,03	1,01	1,01	1,02	1,01	1,02
Twelve-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,99	0,99	1,01	1	1,02	1,01	1
RW	0,98	0,98	1,02	1	1,01	1,01	0,99
DRW	1	0,99	1,03	1	1,01	1	0,99
Fifteen-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1,01	1	1,03	0,99	1,01	1,01	1
RW	1	1	1,02	1	1,01	1,01	1
DRW	1,01	0,99	1,01	0,99	1,01	1	1
Twentyfour-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1,02	1,01	1,03	1,01	1	1,02	1,01
RW	1,01	1,02	1,02	1,01	0,99	1,02	1,01
DRW	1,02	1,02	1	1	0,96	1,01	1,01

We consider the Diebold and Mariano (1995) and West (1996) test to evaluate the null hypothesis of equal MSPE and our test to evaluate the null of equal correlations.*p<0.1 *p<0.05,***p<0.01.

D. Forecasting base metals with currencies – Out sample analysis P/R = 2.

Table D.1) Forecasting base metals with Chilean Peso at multiple horizons – Out of sample analysis at population level.

Chilean exchange rate P/R= 2

	ENCNEW						
One-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	6.91***	6.72***	5.00**	2.31*	5.87***	-1,13	-1,13
RW	7.15***	12.14***	3.49**	1.84*	8.05***	-1,18	-1,18
DRW	7.27***	12.95***	3.85**	1.86*	7.74***	-1,3	-1,3
three-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	17.05***	10.45***	-0,57	-1,08	11.77***	-0,08	-0,08
RW	18.12***	15.62***	-0,57	-0,42	15.57***	2.68*	2.68*
DRW	18.35***	16.94***	0,19	-0,32	15.29***	2.40*	2.40*
Six-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	9.66***	11.93***	0,94	0,7	13.06***	-1,19	-1,19
RW	9.02***	12.74***	1,09	1,18	15.78***	0,54	0,54
DRW	9.06***	13.85***	2.09*	1,35	15.01***	0,34	0,34
Nine-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	5.67***	2.90**	-2,41	-0,45	4.20**	-4,44	-4,44
RW	4.44**	1.96*	-1,4	-0,22	5.99***	-3,26	-3,26
DRW	4.39**	1,48	-1,62	-0,75	5.86***	-3,66	-3,66
Twelve-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1,75	-3,87	-3,53	-2,94	0,17	-8,31	-8,31
RW	0,59	-3,6	-3,72	-3,15	1,67	-8,23	-8,23
DRW	0,05	-5,21	-4,32	-3,99	1,08	-9,33	-9,33
Fifteen-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,01	-3,62	-3,58	-3,52	0,42	-8,98	-8,98
RW	-0,2	-3,54	-4,5	-2,85	1,21	-8,09	-8,09
DRW	-1,05	-5,23	-6,49	-3,95	1,22	-9,74	-9,74
Twentyfour-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	2.05*	-0,85	-0,43	-0,06	1,56	-1,71	-1,71
RW	1.82*	-0,28	-1,43	-1,09	1,57	-2,48	-2,48
DRW	2.80*	0,23	-1,99	-0,34	2.12*	-2,12	-2,12

10%, 5% and 1% critical values are 0.764, 1.161 and 2.278 respectively for ENCNEW when excess parameters are 1

Table D.2) Forecasting base metals with Iceland Krone at multiple horizons – Out of sample analysis at population level.

Iceland exchange rate P/R= 2

	ENCNEW						
One-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	4.84**	1,6	8.70***	-1,86	2.28*	-2,16	-2,16
RW	3.99**	3.43**	8.23***	-2,28	3.09**	-1,61	-1,61
DRW	4.16**	4.13**	8.17***	-1,91	3.30**	-1,55	-1,55
three-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	9.32***	0,7	14.87***	-2,58	10.64***	5.61***	5.61***
RW	5.99***	-0,32	15.24***	-2,62	9.55***	7.62***	7.62***
DRW	6.67***	1,68	16.25***	-1,56	9.76***	7.96***	7.96***
Six-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	6.06***	0,19	4.21**	-2,4	8.49***	-1,2	-1,2
RW	5.22***	0,1	3.61**	-2,08	9.28***	-0,84	-0,84
DRW	6.15***	1.89*	5.36***	-0,66	9.30***	-0,73	-0,73
Nine-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	4.85**	4.43**	0,37	-2,88	3.59**	0,33	0,33
RW	4.85**	4.40**	0,12	-3,1	4.94**	0,34	0,34
DRW	5.78***	5.24***	1,75	-1,89	5.37***	0,31	0,31
Twelve-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	5.75***	1,28	0,67	-2,02	2.14*	-0,39	-0,39
RW	5.93***	1,75	0,51	-2,82	3.46**	-0,33	-0,33
DRW	6.39***	0,86	-0,47	-1,33	3.42**	-0,89	-0,89
Fifteen-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	4.87**	-0,34	0,24	-2,7	0,78	-3,19	-3,19
RW	4.73**	-0,48	-0,59	-2,91	2.26*	-3,03	-3,03
DRW	4.67**	-2,85	-1,63	-2	0,98	-5,2	-5,2
Twentyfour-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,55	-1,21	4.73**	-3,71	0,51	-2,05	-2,05
RW	-0,33	-0,85	2.94**	-4,61	1,08	-3,27	-3,27
DRW	-1,81	-8,06	-5,52	-7,09	-2,89	-10,56	-10,56

10%, 5% and 1% critical values are 0.764, 1.161 and 2.278 respectively for ENCNEW when excess parameters are 1

Table D.3) Forecasting base metals with Australian Dollar at multiple horizons – Out of sample analysis at population level.

Australian exchange rate P/R= 2

	ENCNEW						
One-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1,72	-2,28	1.95*	-2,76	3.35**	-3,92	-3,92
RW	1,13	1,18	0,81	-2,75	5.39***	-3,88	-3,88
DRW	2.12*	4.27**	2.47*	-1,28	7.06***	-3,14	-3,14
three-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	5.69***	-0,7	-0,19	-3,98	2.50*	-1,36	-1,36
RW	4.53**	-0,43	0,24	-4,19	5.52***	-0,84	-0,84
DRW	8.40***	6.46***	4.51**	-2,45	9.06***	0,39	0,39
Six-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1.97*	0,35	1,07	0,4	4.13**	1,58	1,58
RW	1,69	0,52	1,66	0,81	7.36***	-0,25	-0,25
DRW	3.86**	1,48	2.65*	0,58	8.15***	-1,18	-1,18
Nine-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	2.63*	0,14	-2,14	-2,04	0,42	4.99**	4.99**
RW	1.97*	-0,38	-1,73	-2,46	2.32*	0,87	0,87
DRW	2.13*	-1,42	-3,8	-4,44	2.59*	-0,97	-0,97
Twelve-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1,8	-1,92	-2,81	-2,45	-0,06	3.84**	3.84**
RW	0,91	-2,1	-3,18	-2,86	1,73	-0,11	-0,11
DRW	0,36	-3,94	-6,89	-4,93	2.06*	-2,4	-2,4
Fifteen-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	-0,13	-3,66	-3,14	-3,27	-1,12	-1,17	-1,17
RW	-0,19	-3,85	-4,11	-2,69	0,17	-3,55	-3,55
DRW	-1,13	-5,8	-8,05	-4,43	1,4	-6,24	-6,24
Twentyfour-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	-0,25	-4	-2,73	-3,21	-0,75	-3,2	-3,2
RW	-0,22	-4,46	-4,32	-3,7	-1,4	-4,11	-4,11
DRW	-0,69	-6,29	-8,52	-6,68	-0,37	-7,61	-7,61

10%, 5% and 1% critical values are 0.764, 1.161 and 2.278 respectively for ENCNEW when excess parameters are 1

Table D.4) Forecasting base metals with Canadian Dollar at multiple horizons – Out of sample analysis at population level.

Canadian exchange rate P/R= 2

	ENCNEW						
One-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1,08	-1,05	3.07**	0,72	-0,9	-2,8	-2,8
RW	0,87	-0,56	2.53*	-0,54	-1,04	-2,78	-2,78
DRW	1,36	0,5	3.34**	0	-0,2	-3,11	-3,11
three-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	4.12**	-1,52	-0,22	-2	-2,75	-1,72	-1,72
RW	4.47**	-1,23	0,58	-2,97	-2,94	-0,79	-0,79
DRW	6.14***	1,42	1.83*	-2,29	-1,07	-1,27	-1,27
Six-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	2.96**	-1	0,76	-2,06	2.45*	-5,6	-5,6
RW	3.06**	-0,76	1,27	-1,83	3.94**	-5,17	-5,17
DRW	4.24**	-0,11	2.47*	-2,62	4.29**	-6,58	-6,58
Nine-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	6.01***	1,46	-1,24	-3,56	2.80*	-3,69	-3,69
RW	4.85**	0,72	-1,08	-3,31	3.96**	-3,96	-3,96
DRW	5.49***	0,88	-1,2	-5,82	4.70**	-6,02	-6,02
Twelve-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	3.57**	-0,66	-2,28	-1,07	2.17*	-2,06	-2,06
RW	2.70*	-0,76	-2,16	-1,36	3.27**	-3,16	-3,16
DRW	2.69*	-2,31	-5,28	-5,37	4.43**	-7,31	-7,31
Fifteen-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	-0,4	-4,07	-5,06	-3,11	-0,4	-6,31	-6,31
RW	-0,28	-4,24	-5,64	-2,75	0,34	-7,22	-7,22
DRW	-1,93	-8,59	-12,6	-7,64	0,7	-12,57	-12,57
Twentyfour-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	-0,62	-4,39	-2,61	-2,31	-0,4	-6,3	-6,3
RW	-0,72	-4,59	-4,51	-3,52	-0,99	-7	-7
DRW	-2,24	-9,29	-13,18	-9,68	-1,72	-12,7	-12,7

10%, 5% and 1% critical values are 0.764, 1.161 and 2.278 respectively for ENCNEW when excess parameters are 1

Table D.5) Forecasting base metals with New Zealand Dollar at multiple horizons – Out of sample analysis at population level.

New Zealand exchange rate P/R= 2

ENCNEW							
One-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1,71	-3,22	3.06**	-2,52	0,76	-1,82	-1,82
RW	1,21	-3,54	1.88*	-2,95	2.39*	-2,16	-2,16
DRW	1.98*	-1,36	2.97**	-1,57	3.75**	-1,72	-1,72
three-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	6.45***	-4,86	2.50*	-4,15	2.80*	-1,32	-1,32
RW	6.66***	-4,94	3.02**	-4,19	5.57***	-0,79	-0,79
DRW	9.58***	-0,05	5.71***	-2,28	7.81***	0,62	0,62
Six-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1,46	-1,24	0,11	1,17	2.14*	0,48	0,48
RW	0,91	-1,09	0,15	0,84	4.30**	-0,56	-0,56
DRW	3.53**	0,8	1,51	1,17	5.90***	-0,69	-0,69
Nine-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	2.91**	2.23*	0,55	2.02*	1,18	5.31***	5.31***
RW	2.51*	2.10*	0,48	1,45	2.12*	2.97**	2.97**
DRW	3.50**	1.90*	-0,97	0,71	3.50**	1.86*	1.86*
Twelve-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1,32	-0,69	-0,89	0,38	0,74	2.26*	2.26*
RW	1,1	-0,85	-1,53	-0,68	1,74	0,23	0,23
DRW	0,81	-2,81	-5,3	-1,82	1.91*	-1,72	-1,72
Fifteen-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,62	-1,93	-0,45	-1,54	-0,85	-0,77	-0,77
RW	0,5	-2,13	-0,97	-1,63	-0,07	-1,97	-1,97
DRW	-0,21	-3,88	-3,86	-2,92	0,74	-4,64	-4,64
Twentyfour-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,17	-1,55	-0,47	-2,57	0,18	-1,66	-1,66
RW	0,22	-2,36	-1,54	-2,6	0,24	-2,12	-2,12
DRW	-1,47	-6,9	-7,44	-6,98	-0,02	-7,96	-7,96

10%, 5% and 1% critical values are 0.764, 1.161 and 2.278 respectively for ENCNEW when excess parameters are 1

Table D.6) Forecasting base metals with South African Rand at multiple horizons – Out of sample analysis at population level.

South African exchange rate P/R= 2

ENCNEW							
One-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	-0,08	-0,66	2.08*	-0,01	-0,09	-1,07	-1,07
RW	-0,98	-0,97	0,34	-0,74	0,65	-1,09	-1,09
DRW	-0,61	-0,55	0,4	-0,4	0,58	-1,09	-1,09
three-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	3.00**	0,51	2.70*	-0,13	-1,06	-0,26	-0,26
RW	3.61**	1,21	2.41*	0,16	-1,63	0,4	0,4
DRW	4.21**	1,6	2.44*	0,68	-1,39	0,67	0,67
Six-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,73	-0,45	1,51	0,05	-0,42	-1,22	-1,22
RW	1,13	-0,09	1,69	0,56	-0,59	-0,89	-0,89
DRW	0,94	-0,82	1,54	0,65	-0,45	-0,92	-0,92
Nine-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	3.07**	3.65**	0,17	0,85	-0,03	-0,09	-0,09
RW	2.47*	2.88**	0,44	0,82	0,06	0,6	0,6
DRW	2.37*	2.29*	0,81	1,01	0,3	0,8	0,8
Twelve-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	3.92**	2.23*	0,22	0,64	0,21	-0,54	-0,54
RW	3.08**	2.19*	0,08	0,62	0,44	-0,38	-0,38
DRW	2.74*	2.05*	1,31	1,28	0,47	0,47	0,47
Fifteen-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	2.16*	0,34	0,17	-0,44	0,17	-0,71	-0,71
RW	1.96*	0,06	-0,57	-0,28	-0,07	-0,78	-0,78
DRW	1,55	-0,48	-0,23	-0,04	0,03	-0,37	-0,37
Twentyfour-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	3.21**	0,29	1.93*	0,21	1,57	1,4	1,4
RW	3.29**	0,17	0,77	-0,89	1,02	1,08	1,08
DRW	3.29**	-1,06	2.32*	-0,73	2.03*	1,55	1,55

10%, 5% and 1% critical values are 0.764, 1.161 and 2.278 respectively for ENCNEW when excess parameters are 1

Table D.7) Forecasting base metals with Chilean Peso at multiple horizons – Out of sample analysis at sample level.

Chilean exchange rate P/R= 2

Ratios DM							
One-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,96	0,96	0,98	0,99	0,98	1,04	1,04
RW	0,97	0,95	1	0,99	0,97	1,05	1,05
DRW	0,97	0,95	1	0,99	0,97	1,05	1,05
three-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,92	0,94	1,02	1,02	0,95	1,04	1,04
RW	0,93	0,93	1,02	1,01	0,94	1,03	1,03
DRW	0,93	0,93	1,01	1,01	0,95	1,04	1,04
Six-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,96	0,94	1	1,01	0,95	1,03	1,03
RW	0,97	0,94	1	1,01	0,93	1,02	1,02
DRW	0,98	0,95	0,99	1,01	0,96	1,03	1,03
Nine-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,97	1,01	1,04	1,02	0,99	1,07	1,07
RW	0,97	1,01	1,02	1,01	0,97	1,06	1,06
DRW	0,98	1,03	1,02	1,02	0,99	1,07	1,07
Twelve-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1,01	1,08	1,06	1,05	1,02	1,15	1,15
RW	1,01	1,09	1,06	1,05	1,01	1,16	1,16
DRW	1,02	1,13	1,07	1,06	1,03	1,19	1,19
Fifteen-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1,03	1,07	1,07	1,05	1,02	1,19	1,19
RW	1,03	1,08	1,08	1,04	1,01	1,2	1,2
DRW	1,05	1,12	1,12	1,06	1,02	1,26	1,26
Twentyfour-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,99	1,03	1,05	1	0,99	1,11	1,11
RW	0,99	1,03	1,06	1,02	0,99	1,12	1,12
DRW	0,98	1,06	1,14	1,01	0,99	1,17	1,17

We consider the Diebold and Mariano (1995) and West (1996) test to evaluate the null hypothesis of equal MSPE and our test to evaluate the null of equal correlations.*p<0.1 *p<0.05,**p<0.01.

Table D.8) Forecasting base metals with Iceland Krone at multiple horizons – Out of sample analysis at sample level.

Iceland exchange rate P/R= 2

Ratios DM							
One-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,97	1,02	0,97	1,03	1	1,05	1,05
RW	0,99	1,02	0,98	1,04	0,99	1,05	1,05
DRW	0,99	1	0,98	1,03	0,99	1,05	1,05
three-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,95	1,02	0,95	1,05	0,97	0,98	0,98
RW	0,99	1,04	0,94	1,05	0,97	0,97	0,97
DRW	0,98	1,01	0,93	1,04	0,97	0,96	0,96
Six-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,99	1,02	0,99	1,06	1	1,03	1,03
RW	0,99	1,02	1	1,06	0,98	1,03	1,03
DRW	0,98	1	0,99	1,04	0,98	1,03	1,03
Nine-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,99	1,01	1,01	1,05	1	1,02	1,02
RW	0,99	1	1,02	1,05	0,98	1,02	1,02
DRW	0,98	1,01	1,01	1,04	0,99	1,02	1,02
Twelve-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,98	1,02	1,01	1,06	1	1,03	1,03
RW	0,97	1,01	1,01	1,07	0,98	1,03	1,03
DRW	0,97	1,04	1,03	1,05	1	1,05	1,05
Fifteen-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,99	1,04	1	1,06	1,04	1,08	1,08
RW	0,99	1,04	1,01	1,06	1,01	1,09	1,09
DRW	1	1,1	1,03	1,05	1,05	1,14	1,14
Twentyfour-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1,04	1,09	1,01	1,07	1,04	1,22	1,22
RW	1,05	1,09	1,02	1,09	1,03	1,24	1,24
DRW	1,09	1,28	1,24	1,14	1,11	1,5	1,5

We consider the Diebold and Mariano (1995) and West (1996) test to evaluate the null hypothesis of equal MSPE and our test to evaluate the null of equal correlations.*p<0.1 *p<0.05,**p<0.01.

Table D.9) Forecasting base metals with Australian Dollar at multiple horizons – Out of sample analysis at sample level.

Australian exchange rate P/R= 2

Ratios DM							
One-Step-AHead	*Aluminum*	*Copper*	*Lead*	*Nickel*	*Tin*	*Zinc*	*Lmex*
AR(1)	1,01	1,05	1,01	1,05	1	1,05	1,05
RW	1,03	1,04	1,02	1,05	1	1,05	1,05
DRW	1,01	1,01	1,01	1,03	0,99	1,04	1,04
three-Step-AHead	*Aluminum*	*Copper*	*Lead*	*Nickel*	*Tin*	*Zinc*	*Lmex*
AR(1)	1,02	1,05	1,04	1,07	1	1,04	1,04
RW	1,06	1,07	1,05	1,07	1	1,03	1,03
DRW	1,02	1	1,01	1,05	0,98	1,01	1,01
Six-Step-AHead	*Aluminum*	*Copper*	*Lead*	*Nickel*	*Tin*	*Zinc*	*Lmex*
AR(1)	1,02	1	0,99	1,01	1	1,03	1,03
RW	1,03	1	0,99	1	0,98	1,02	1,02
DRW	1	0,99	1	1,01	1	1,03	1,03
Nine-Step-AHead	*Aluminum*	*Copper*	*Lead*	*Nickel*	*Tin*	*Zinc*	*Lmex*
AR(1)	0,99	1	1,04	1,05	1,02	1,01	1,01
RW	0,99	1,01	1,03	1,05	1,01	1,02	1,02
DRW	0,99	1,04	1,07	1,07	1,04	1,04	1,04
Twelve-Step-AHead	*Aluminum*	*Copper*	*Lead*	*Nickel*	*Tin*	*Zinc*	*Lmex*
AR(1)	0,99	1,04	1,06	1,07	1,03	1,03	1,03
RW	0,99	1,04	1,06	1,06	1,02	1,04	1,04
DRW	1,01	1,08	1,14	1,08	1,06	1,07	1,07
Fifteen-Step-AHead	*Aluminum*	*Copper*	*Lead*	*Nickel*	*Tin*	*Zinc*	*Lmex*
AR(1)	1,01	1,06	1,07	1,06	1,06	1,06	1,06
RW	1,01	1,07	1,08	1,05	1,06	1,08	1,08
DRW	1,03	1,14	1,21	1,08	1,1	1,13	1,13
Twentyfour-Step-AHead	*Aluminum*	*Copper*	*Lead*	*Nickel*	*Tin*	*Zinc*	*Lmex*
AR(1)	1,02	1,08	1,08	1,07	1,04	1,11	1,11
RW	1,02	1,1	1,11	1,07	1,06	1,12	1,12
DRW	1,04	1,23	1,35	1,14	1,1	1,25	1,25

We consider the Diebold and Mariano (1995) and West (1996) test to evaluate the null hypothesis of equal MSPE and our test to evaluate the null of equal correlations.*p<0.1 *p<0.05,**p<0.01.

Table D.10) Forecasting base metals with Canadian Dollar at multiple horizons – Out of sample analysis at sample level.

Canadian exchange rate P/R= 2

Ratios DM							
One-Step-AHead	*Aluminum*	*Copper*	*Lead*	*Nickel*	*Tin*	*Zinc*	*Lmex*
AR(1)	1	1,01	0,99	1,02	1,02	1,04	1,04
RW	1,01	1,02	1	1,03	1,03	1,04	1,04
DRW	1,01	1,01	1	1,02	1,02	1,05	1,05
three-Step-AHead	*Aluminum*	*Copper*	*Lead*	*Nickel*	*Tin*	*Zinc*	*Lmex*
AR(1)	1	1,02	1,02	1,04	1,04	1,05	1,05
RW	1,02	1,04	1,02	1,05	1,05	1,04	1,04
DRW	1	1,02	1,02	1,03	1,02	1,06	1,06
Six-Step-AHead	*Aluminum*	*Copper*	*Lead*	*Nickel*	*Tin*	*Zinc*	*Lmex*
AR(1)	0,99	1,01	1	1,03	0,99	1,09	1,09
RW	1	1,01	1	1,03	0,98	1,09	1,09
DRW	0,99	1,02	1,01	1,05	0,99	1,13	1,13
Nine-Step-AHead	*Aluminum*	*Copper*	*Lead*	*Nickel*	*Tin*	*Zinc*	*Lmex*
AR(1)	0,97	1,01	1,03	1,07	0,99	1,07	1,07
RW	0,97	1,01	1,02	1,06	0,98	1,08	1,08
DRW	0,97	1,05	1,04	1,12	0,99	1,12	1,12
Twelve-Step-AHead	*Aluminum*	*Copper*	*Lead*	*Nickel*	*Tin*	*Zinc*	*Lmex*
AR(1)	0,98	1,02	1,05	1,03	0,99	1,05	1,05
RW	0,98	1,03	1,05	1,03	0,98	1,07	1,07
DRW	0,99	1,09	1,12	1,1	1	1,15	1,15
Fifteen-Step-AHead	*Aluminum*	*Copper*	*Lead*	*Nickel*	*Tin*	*Zinc*	*Lmex*
AR(1)	1,01	1,07	1,1	1,06	1,02	1,13	1,13
RW	1,01	1,07	1,11	1,05	1,01	1,15	1,15
DRW	1,05	1,18	1,32	1,13	1,05	1,29	1,29
Twentyfour-Step-AHead	*Aluminum*	*Copper*	*Lead*	*Nickel*	*Tin*	*Zinc*	*Lmex*
AR(1)	1,02	1,09	1,09	1,04	1,02	1,18	1,18
RW	1,02	1,1	1,12	1,06	1,02	1,2	1,2
DRW	1,07	1,39	1,68	1,22	1,1	1,5	1,5

We consider the Diebold and Mariano (1995) and West (1996) test to evaluate the null hypothesis of equal MSPE and our test to evaluate the null of equal correlations.*p<0.1 *p<0.05,**p<0.01.

Table D.11) Forecasting base metals with New Zealand Dollar at multiple horizons – Out of sample analysis at sample level.

New Zealand exchange rate P/R= 2

Ratios DM							
One-Step-AHead	*Aluminum*	*Copper*	*Lead*	*Nickel*	*Tin*	*Zinc*	*Lmex*
AR(1)	1	1,05	1	1,05	1,02	1,03	1,03
RW	1,02	1,06	1,01	1,05	1,02	1,03	1,03
DRW	1,01	1,03	1	1,03	1,01	1,02	1,02
three-Step-AHead	*Aluminum*	*Copper*	*Lead*	*Nickel*	*Tin*	*Zinc*	*Lmex*
AR(1)	1	1,07	1,02	1,07	1,02	1,03	1,03
RW	1,03	1,1	1,02	1,07	1,02	1,03	1,03
DRW	1	1,04	1,01	1,04	1,01	1,01	1,01
Six-Step-AHead	*Aluminum*	*Copper*	*Lead*	*Nickel*	*Tin*	*Zinc*	*Lmex*
AR(1)	1,02	1,02	1,01	1,01	1,02	1,02	1,02
RW	1,04	1,02	1,01	1,01	1,01	1,02	1,02
DRW	1,01	1	1,01	1	1,01	1,02	1,02
Nine-Step-AHead	*Aluminum*	*Copper*	*Lead*	*Nickel*	*Tin*	*Zinc*	*Lmex*
AR(1)	0,99	0.98*	1	1,01	1	0,99	0,99
RW	0,99	0.98*	1	1,01	0,99	1	1
DRW	0,98	0,99	1,03	1,01	1	1	1
Twelve-Step-AHead	*Aluminum*	*Copper*	*Lead*	*Nickel*	*Tin*	*Zinc*	*Lmex*
AR(1)	0,99	1,02	1,03	1,04	1	1,02	1,02
RW	0,99	1,02	1,04	1,04	0,99	1,03	1,03
DRW	1	1,06	1,11	1,05	1,01	1,06	1,06
Fifteen-Step-AHead	*Aluminum*	*Copper*	*Lead*	*Nickel*	*Tin*	*Zinc*	*Lmex*
AR(1)	1	1,03	1,02	1,05	1,03	1,04	1,04
RW	1	1,04	1,02	1,04	1,02	1,05	1,05
DRW	1,01	1,09	1,09	1,06	1,05	1,09	1,09
Twentyfour-Step-AHead	*Aluminum*	*Copper*	*Lead*	*Nickel*	*Tin*	*Zinc*	*Lmex*
AR(1)	1,01	1,04	1,03	1,06	1,01	1,07	1,07
RW	1,01	1,06	1,04	1,06	1,02	1,08	1,08
DRW	1,04	1,21	1,23	1,15	1,06	1,23	1,23

We consider the Diebold and Mariano (1995) and West (1996) test to evaluate the null hypothesis of equal MSPE and our test to evaluate the null of equal correlations.*p<0.1 *p<0.05,**p<0.01.

Table D.12) Forecasting base metals with South African Rand at multiple horizons – Out of sample analysis at sample level.

South African exchange rate P/R= 2

Ratios DM							
One-Step-AHead	*Aluminum*	*Copper*	*Lead*	*Nickel*	*Tin*	*Zinc*	*Lmex*
AR(1)	1,01	1,02	1	1,01	1,01	1,01	1,01
RW	1,02	1,03	1,01	1,02	1	1,01	1,01
DRW	1,02	1,02	1,01	1,01	1,01	1,01	1,01
three-Step-AHead	*Aluminum*	*Copper*	*Lead*	*Nickel*	*Tin*	*Zinc*	*Lmex*
AR(1)	1	1,01	0,99	1,01	1,01	1,01	1,01
RW	1,01	1,01	1	1,01	1,02	1,01	1,01
DRW	1,01	1,01	1	1,01	1,02	1	1
Six-Step-AHead	*Aluminum*	*Copper*	*Lead*	*Nickel*	*Tin*	*Zinc*	*Lmex*
AR(1)	1	1,01	0,99	1	1,01	1,02	1,02
RW	1	1,01	0,99	1	1,01	1,01	1,01
DRW	1,01	1,02	0,99	1	1,01	1,01	1,01
Nine-Step-AHead	*Aluminum*	*Copper*	*Lead*	*Nickel*	*Tin*	*Zinc*	*Lmex*
AR(1)	0,98	0,99	1,01	0,99	1,01	1,01	1,01
RW	0,99	0,99	1	1	1,01	1	1
DRW	0,99	1	1	1	1,01	1	1
Twelve-Step-AHead	*Aluminum*	*Copper*	*Lead*	*Nickel*	*Tin*	*Zinc*	*Lmex*
AR(1)	0,98	0,99	1	1	1	1,01	1,01
RW	0,98	0,99	1,01	1	1	1,01	1,01
DRW	0,99	1	0,99	0,99	1	1	1
Fifteen-Step-AHead	*Aluminum*	*Copper*	*Lead*	*Nickel*	*Tin*	*Zinc*	*Lmex*
AR(1)	0,99	1,01	1,01	1,01	1,01	1,02	1,02
RW	0,99	1,02	1,02	1,01	1,01	1,03	1,03
DRW	1	1,03	1,02	1,01	1,01	1,02	1,02
Twentyfour-Step-AHead	*Aluminum*	*Copper*	*Lead*	*Nickel*	*Tin*	*Zinc*	*Lmex*
AR(1)	0,97	1,01	0,99	1	0,99	1,02	1,02
RW	0,97	1,02	1,01	1,01	0,99	1,04	1,04
DRW	0,97	1,05	1	1,01	0,98	1,05	1,05

We consider the Diebold and Mariano (1995) and West (1996) test to evaluate the null hypothesis of equal MSPE and our test to evaluate the null of equal correlations.*p<0.1 *p<0.05,**p<0.01.

E. Forecasting base metals with currencies – Out sample analysis P/R = 1.

Table E.1) Forecasting base metals with Chilean Peso at multiple horizons – Out of sample analysis at population level.

Chilean exchange rate P/R= 1

			ENCNEW				
One-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	3.58***	3.72***	7.14***	1.79**	0,16	0,71	0,71
RW	1.32*	0,89	3.19***	1.59**	0,09	-0,16	-0,16
DRW	1.15*	-0,27	2.48**	1.43*	-0,61	-0,43	-0,43
three-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	4.69***	2.67**	2.93***	0,22	-0,92	2.39**	2.39**
RW	2.68**	1.24*	2.02**	0,56	-0,71	2.96***	2.96***
DRW	2.01**	-1,7	0,9	0,22	-2,25	1.87**	1.87**
Six-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	4.99***	2.87***	4.78***	0,87	1.59**	-0,24	-0,24
RW	4.02***	3.02***	4.03***	1.75**	1.86**	0,1	0,1
DRW	2.68**	-1,02	3.15***	1.03*	-0,43	-0,69	-0,69
Nine-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	3.43***	1.87**	-0,25	-0,51	1.46*	0,58	0,58
RW	3.49***	3.05***	-0,35	-0,17	2.01**	0,33	0,33
DRW	2.37**	1.12*	0,59	-0,21	0,62	0,09	0,09
Twelve-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	2.08**	0,86	-3,15	-0,57	0,68	-0,27	-0,27
RW	2.22**	1.41*	-3,2	-0,26	1.14*	-0,21	-0,21
DRW	1.54**	1.40*	-1,67	0,34	0,59	0,19	0,19
Fifteen-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,73	0	-0,73	-0,17	-0,05	0,17	0,17
RW	0,84	0,29	-0,94	-0,37	0	-0,34	-0,34
DRW	0,33	0,63	1.26*	0,31	-0,56	-0,23	-0,23
Twentyfour-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	-0,72	-0,45	0,53	-0,95	-0,5	0.96*	0.96*
RW	-0,45	-0,04	0,22	-1,22	-0,59	1.11*	1.11*
DRW	-0,55	0,17	0,74	-0,5	-0,27	0.93*	0.93*

10%, 5% and 1% critical values are 0.764, 1.161 and 2.278 respectively for ENCNEW when excess parameters are 1

Table E.2) Forecasting base metals with Iceland Krone at multiple horizons – Out of sample analysis at population level.

Iceland exchange rate P/R= 1

			ENCNEW				
One-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1.55**	2.37**	5.15***	0,46	0.93*	-0,18	-0,18
RW	0,18	-0,33	1.59**	0,8	1.04*	-0,33	-0,33
DRW	0,44	0,26	2.12**	0,83	1.43*	-0,15	-0,15
three-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	4.10***	1.74**	6.04***	0,34	0,01	1.59**	1.59**
RW	2.68**	-1,09	1.90**	0,55	-0,11	1.55**	1.55**
DRW	3.34***	-0,13	3.54***	0,62	0.95*	2.05**	2.05**
Six-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	5.96***	-0,06	6.07***	-0,04	1.37*	-0,51	-0,51
RW	5.83***	-0,34	3.88***	0,1	1.51**	-0,18	-0,18
DRW	6.43***	0,24	6.91***	0,23	2.83**	0	0
Nine-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	4.60***	-0,35	0,75	-0,56	0,3	0,45	0,45
RW	4.77***	0,79	0,56	-0,56	0,62	0,75	0,75
DRW	5.11***	1.86**	2.52**	-0,55	1.46*	0,7	0,7
Twelve-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	3.22***	-1,03	-0,42	-2,14	-0,53	-1,69	-1,69
RW	3.31***	-0,19	-0,62	-1,86	-0,12	-1,15	-1,15
DRW	3.27***	-0,16	-0,58	-2,2	0,05	-1,4	-1,4
Fifteen-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	2.22**	-0,55	-0,6	-1,63	-0,44	-1,64	-1,64
RW	2.29**	-0,13	-0,52	-1,58	-0,46	-1,3	-1,3
DRW	2.02**	-0,04	-1,02	-1,94	-0,18	-1,53	-1,53
Twentyfour-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	-0,08	-0,52	-1,16	0,62	-0,07	1.64**	1.64**
RW	0	-0,27	-0,04	0,27	0,35	1.43*	1.43*
DRW	0,29	1.24*	1.23*	1.08*	1.76**	1.80**	1.80**

10%, 5% and 1% critical values are 0.764, 1.161 and 2.278 respectively for ENCNEW when excess parameters are 1

Table E.3) Forecasting base metals with Australian Dollar at multiple horizons – Out of sample analysis at population level.

Australian exchange rate P/R= 1

			ENCNEW				
One-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	2.40**	1.61**	4.61***	-0,01	1.06*	-0,47	-0,47
RW	0,89	-0,1	2.25**	0,01	0,49	-0,38	-0,38
DRW	0,76	-1,18	1.59**	-0,14	-0,43	-0,36	-0,36
three-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	10.54***	5.37***	6.35***	0,1	1.22*	1.87**	1.87**
RW	7.40***	4.36***	3.77***	0,46	1.92**	2.90***	2.90***
DRW	6.23***	1.36*	1.43*	-0,02	0,08	2.46**	2.46**
Six-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	6.90***	0,71	3.09***	0,07	1.33*	-1,27	-1,27
RW	6.72***	1.43*	2.67**	0.99*	1.62**	-0,31	-0,31
DRW	5.25***	0,27	1.10*	0,48	-0,38	-0,01	-0,01
Nine-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	4.10***	0,43	-2,13	-2,23	0,74	-3,74	-3,74
RW	4.52***	0,19	-1,62	-1,58	1.05*	-2,44	-2,44
DRW	3.86***	1.05*	-0,31	-1,06	0,05	-0,93	-0,93
Twelve-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	2.33**	-1,64	-3,73	-2,91	0,09	-4,99	-4,99
RW	1.91**	-1,63	-3,77	-2,15	0,54	-3,48	-3,48
DRW	1.58**	-0,53	-2,59	-1,34	-0,54	-1,7	-1,7
Fifteen-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1.06*	-0,82	-1,46	-2,07	0,37	-2,83	-2,83
RW	0,65	-0,96	-1,87	-1,95	0,17	-2,22	-2,22
DRW	0,33	0,17	-1,08	-0,81	-0,95	-0,82	-0,82
Twentyfour-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	-0,11	-1,19	-0,78	-1,54	-0,3	0,12	0,12
RW	0,09	-1,03	-1,39	-1,84	-0,6	0,82	0,82
DRW	0,19	0,73	-0,5	-0,11	-0,03	1.21*	1.21*

10%, 5% and 1% critical values are 0.764, 1.161 and 2.278 respectively for ENCNEW when excess parameters are 1

Table E.4) Forecasting base metals with Canadian Dollar at multiple horizons – Out of sample analysis at population level.

Canadian exchange rate P/R= 1

			ENCNEW				
One-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1.17*	-0,31	4.11***	-1,34	-0,52	-0,92	-0,92
RW	0,59	-0,52	2.32**	-0,27	-0,54	-0,93	-0,93
DRW	0,38	-1,22	1.56**	-0,12	-0,92	-0,87	-0,87
three-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	2.77**	-0,25	0,28	-0,79	-0,58	-0,01	-0,01
RW	2.42**	-0,82	-0,36	-0,44	-0,58	0,52	0,52
DRW	1.10*	-3,48	-2,83	-0,56	-1,06	-0,41	-0,41
Six-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	2.12**	0,23	1.27*	-0,7	0,87	-0,36	-0,36
RW	2.11**	0,62	1.79**	0,39	1.45*	0,01	0,01
DRW	0,32	-1,2	-0,17	-0,02	0,12	-0,67	-0,67
Nine-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	3.70***	2.13**	-1,78	0,04	1.17*	-0,77	-0,77
RW	3.60***	1.72**	-1,5	0,49	1.63**	-0,56	-0,56
DRW	1.97**	0,17	0,06	0,24	0,2	-0,26	-0,26
Twelve-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	2.68**	0,28	-3,38	-0,84	0,69	-1,48	-1,48
RW	2.18**	0,38	-3,34	-0,44	1.29*	-1,44	-1,44
DRW	1.11*	0,4	-1,36	0,13	-0,11	-0,19	-0,19
Fifteen-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0.95*	-0,81	-0,15	-2,09	0,2	-0,34	-0,34
RW	0,88	-0,92	-0,38	-1,93	0,19	-0,6	-0,6
DRW	0,2	0,68	1.71**	-0,3	-0,71	0,15	0,15
Twentyfour-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,33	-0,15	0,76	-0,73	0,28	0,86	0,86
RW	0,42	-0,08	0,08	-1,3	-0,31	0.95*	0.95*
DRW	0,48	0,72	-1,11	0,68	0,17	0,6	0,6

10%, 5% and 1% critical values are 0.764, 1.161 and 2.278 respectively for ENCNEW when excess parameters are 1

Table E.5) Forecasting base metals with New Zealand Dollar at multiple horizons – Out of sample analysis at population level.

New Zealand exchange rate P/R= 1

ENCNEW							
One-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1.62**	-0,16	4.58***	-0,4	-0,32	-0,79	-0,79
RW	0,19	-0,78	2.35**	0,23	-0,81	-0,49	-0,49
DRW	0,07	-1,22	1.95**	0,28	-1,39	-0,43	-0,43
three-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	5.15***	0,14	4.33***	-0,19	-0,64	0,65	0,65
RW	2.96***	-0,4	2.16**	0,14	-0,28	1.86**	1.86**
DRW	2.21**	-1,99	0,49	0,02	-1,69	1.69**	1.69**
Six-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	3.98***	-0,33	0.94*	-0,78	-0,18	-1,67	-1,67
RW	3.60***	0,05	0,88	0,11	-0,04	-0,89	-0,89
DRW	2.71**	-0,96	-0,16	0,13	-1,52	-0,48	-0,48
Nine-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	2.89***	-0,33	-1,95	-2,41	0,09	-3,53	-3,53
RW	3.06***	-0,53	-1,48	-2,14	0,25	-2,94	-2,94
DRW	2.65**	-0,59	-0,96	-1,58	-0,56	-1,69	-1,69
Twelve-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1.08*	-1,84	-4,03	-3,7	-0,52	-4,3	-4,3
RW	1.02*	-1,85	-3,89	-3,09	-0,32	-3,67	-3,67
DRW	0,84	-1,32	-3,7	-2,24	-0,99	-2,18	-2,18
Fifteen-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,66	-1,17	-1,54	-2,49	-0,65	-2,8	-2,8
RW	0,52	-1,23	-1,66	-2,44	-0,86	-2,76	-2,76
DRW	0,15	-0,81	-1,09	-1,34	-2,01	-1,63	-1,63
Twentyfour-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	-0,79	-0,82	-1,35	-1	-0,83	0,42	0,42
RW	-0,19	-0,7	-1,36	-1,31	-0,54	0,81	0,81
DRW	-0,26	0,27	-1,16	-0,14	-0,3	0,76	0,76

10%, 5% and 1% critical values are 0.764, 1.161 and 2.278 respectively for ENCNEW when excess parameters are 1

Table E.6) Forecasting base metals with South African Rand at multiple horizons – Out of sample analysis at population level.

South Africa exchange rate P/R= 1

ENCNEW							
One-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,85	0,5	4.93***	0.93*	0,5	-0,42	-0,42
RW	0,47	0,53	3.23***	1.25*	0.95*	-0,49	-0,49
DRW	0,43	0,14	2.86***	1.10*	0,53	-0,44	-0,44
three-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,87	-0,14	3.55***	1.11*	-0,9	0,25	0,25
RW	0,56	0,32	2.74**	1.75**	-1,26	1.07*	1.07*
DRW	0,11	-1,58	1.51**	1.30*	-1,63	0,36	0,36
Six-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,71	0,24	0,9	-0,2	-0,2	0,33	0,33
RW	0.98*	0,86	1.05*	0,61	-0,73	0,07	0,07
DRW	0,17	-0,8	0,27	0,18	-1,08	0,05	0,05
Nine-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	3.55***	4.04***	2.35**	1.97**	0,48	0,7	0,7
RW	3.62***	4.41***	2.07**	1.73**	0,44	0,38	0,38
DRW	2.42**	1.91**	1.50*	1.29*	-0,17	0,04	0,04
Twelve-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1.68**	0,22	0,08	0,66	-0,57	-0,93	-0,93
RW	1.48*	1.22*	-0,43	0,89	-0,06	-0,95	-0,95
DRW	0,38	-1,14	-1,76	0,18	-1,16	-0,75	-0,75
Fifteen-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,4	1.16*	1.40*	0,25	-0,17	0,52	0,52
RW	0,48	1.67**	1.31*	0,51	-0,14	-0,11	-0,11
DRW	-0,54	0,02	0,22	0,21	-0,97	-0,32	-0,32
Twentyfour-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	-0,55	0,84	1.05*	-0,37	-0,22	2.37**	2.37**
RW	-0,23	1.20*	1.02*	-0,56	0,11	2.10**	2.10**
DRW	-1,07	0,07	-1,29	-0,72	0,59	1.15*	1.15*

10%, 5% and 1% critical values are 0.764, 1.161 and 2.278 respectively for ENCNEW when excess parameters are 1

Table E.7) Forecasting base metals with Chilean Peso at multiple horizons – Out of sample analysis at sample level.

Chilean exchange rate P/R= 1

Ratios DM							
One-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,99	0,98	0,96	0.98*	1,02	1	1
RW	1,02	1,06	1	0,98	1,03	1,01	1,01
DRW	1,02	1,08	1,01	0,99	1,04	1,01	1,01
three-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1,04	1,03	0,98	1	1,05	0,99	0,99
RW	1,1	1,11	1,01	1	1,08	1	1
DRW	1,11	1,18	1,03	1,01	1,11	1,01	1,01
Six-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1,06	1,07	0.96*	1	1,03	1,01	1,01
RW	1,07	1,06	0,98	1	1,03	1,01	1,01
DRW	1,1	1,16	1	1,01	1,08	1,03	1,03
Nine-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1,01	1,01	1,01	1,01	1	1	1
RW	0,99	0,98	1,01	1	0,99	1	1
DRW	1,01	1,02	1	1,01	1,02	1	1
Twelve-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,99	0,99	1,09	1,02	0,99	1,03	1,03
RW	0,98	0.98*	1,08	1,01	0,99	1,02	1,02
DRW	0,99	0,98	1,07	1	1	1,01	1,01
Fifteen-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1	1	1,02	1,01	1,01	1,01	1,01
RW	0,99	1	1,04	1,01	1,01	1,02	1,02
DRW	1	0,99	1,01	1	1,02	1,02	1,02
Twentyfour-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1,02	1,01	1	1,02	1,01	0,99	0,99
RW	1,01	1	1	1,02	1,01	0,99	0,99
DRW	1,02	1,01	1	1,01	1,01	0,99	0,99

We consider the Diebold and Mariano (1995) and West (1996) test to evaluate the null hypothesis of equal MSPE and our test to evaluate the null of equal correlations.*p<0.1 *p<0.05,**p<0.01.

Table E.8) Forecasting base metals with Iceland Krone at multiple horizons – Out of sample analysis at sample level.

Iceland exchange rate P/R= 1

Ratios DM							
One-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,99	0,99	0,98	1	1	1,01	1,01
RW	1,02	1,04	1,02	0.99*	1	1,01	1,01
DRW	1,01	1,03	1,01	0.99*	0,99	1,01	1,01
three-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1,01	1,03	1,05	1	1,03	1,01	1,01
RW	1,05	1,1	1,09	1	1,04	1,01	1,01
DRW	1,04	1,09	1,07	1	1,03	1	1
Six-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1	1,04	0,97	1,01	1,01	1,02	1,02
RW	1,02	1,04	1	1,01	1,01	1,01	1,01
DRW	1,01	1,04	0,97	1,01	0,99	1,01	1,01
Nine-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,98	1,05	1,01	1,01	1,01	1	1
RW	0,98	1,02	1,01	1,01	1,01	1	1
DRW	0,98	1	0,99	1,01	0,99	1	1
Twelve-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,99	1,03	1,01	1,04	1,02	1,03	1,03
RW	0,98	1,01	1,01	1,03	1,01	1,02	1,02
DRW	0,98	1,01	1,01	1,04	1,01	1,02	1,02
Fifteen-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,98	1,01	1,01	1,03	1,01	1,03	1,03
RW	0,98	1	1,01	1,03	1,01	1,02	1,02
DRW	0,98	1	1,02	1,04	1	1,03	1,03
Twentyfour-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1	1,01	1,03	1	1	0,98	0,98
RW	1	1,01	1,01	1,01	1	0,98	0,98
DRW	1	0,98	0,99	0,99	0,98	0,98	0,98

We consider the Diebold and Mariano (1995) and West (1996) test to evaluate the null hypothesis of equal MSPE and our test to evaluate the null of equal correlations.*p<0.1 *p<0.05,**p<0.01.

Table E.9) Forecasting base metals with New Zealand Dollar at multiple horizons – Out of sample analysis at sample level.

New Zealand exchange rate P/R= 1

Ratios DM							
One-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,99	1	0,97	1,01	1,02	1,01	1,01
RW	1,02	1,02	1	1	1,03	1,01	1,01
DRW	1,02	1,03	1	1	1,04	1,01	1,01
three-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1,02	1,01	1,01	1,01	1,03	1,01	1,01
RW	1,08	1,06	1,05	1,01	1,05	1	1
DRW	1,09	1,1	1,1	1,01	1,08	1	1
Six-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1	1,01	0,99	1,02	1,02	1,04	1,04
RW	1,01	1,01	1	1	1,03	1,02	1,02
DRW	1,03	1,03	1,03	1,01	1,06	1,01	1,01
Nine-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,99	1,01	1,04	1,06	1,01	1,11	1,11
RW	0,97	1,01	1,03	1,04	1	1,07	1,07
DRW	0,98	1,01	1,02	1,03	1,02	1,05	1,05
Twelve-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,99	1,04	1,1	1,1	1,01	1,15	1,15
RW	0,99	1,04	1,09	1,08	1,01	1,12	1,12
DRW	0,99	1,03	1,09	1,06	1,03	1,07	1,07
Fifteen-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,99	1,02	1,04	1,07	1,02	1,11	1,11
RW	0,99	1,02	1,05	1,06	1,02	1,09	1,09
DRW	1	1,02	1,04	1,05	1,05	1,05	1,05
Twentyfour-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1,02	1,02	1,04	1,03	1,02	1,01	1,01
RW	1,01	1,02	1,04	1,04	1,01	1,01	1,01
DRW	1,01	1	1,05	1,03	1,01	1	1

We consider the Diebold and Mariano (1995) and West (1996) test to evaluate the null hypothesis of equal MSPE and our test to evaluate the null of equal correlations.*p<0.1 *p<0.05,***p<0.01.

Table E.10) Forecasting base metals with South African Rand at multiple horizons – Out of sample analysis at sample level.

South African exchange rate P/R= 1

Ratios DM							
One-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1	1	0.96*	1	1	1,01	1,01
RW	1,01	1,01	0,98	0,99	1	1,01	1,01
DRW	1,01	1,02	0,98	0,99	1	1,01	1,01
three-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1,05	1,03	1,01	1	1,01	1,01	1,01
RW	1,1	1,07	1,04	1	1,03	1,01	1,01
DRW	1,11	1,1	1,06	1,01	1,03	1,02	1,02
Six-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1,02	1	1	1,01	1	1	1
RW	1,03	1	1	1	1,01	1	1
DRW	1,04	1,03	1,02	1,01	1,02	1	1
Nine-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,99	0,99	0.97**	0.98***	1	0,99	0,99
RW	0,98	0,97	0.98*	0.98*	1	1	1
DRW	1	1,01	0,99	0,99	1,01	1,01	1,01
Twelve-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1,02	1,02	1,01	1	1,01	1,02	1,02
RW	1,01	1	1,01	0,99	1,01	1,02	1,02
DRW	1,03	1,04	1,05	1,01	1,03	1,02	1,02
Fifteen-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1,02	0,99	0,99	1	1,01	1	1
RW	1,01	0,98	0,99	0,99	1,01	1,01	1,01
DRW	1,03	1,01	1,02	1	1,02	1,02	1,02
Twentyfour-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1,02	0,99	0,99	1,01	1,01	0,99	0,99
RW	1,01	0,99	0,99	1,01	1	0,99	0,99
DRW	1,03	1,01	1,05	1,01	0,99	1,01	1,01

We consider the Diebold and Mariano (1995) and West (1996) test to evaluate the null hypothesis of equal MSPE and our test to evaluate the null of equal correlations.*p<0.1 *p<0.05,***p<0.01.

Table E.11) Forecasting base metals with Australian Dollar at multiple horizons – Out of sample analysis at sample level.

Australian exchange rate P/R= 1

Ratios DM							
One-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,99	0,99	0,98	1,01	1	1,01	1,01
RW	1,01	1,04	1	1,01	1,02	1,01	1,01
DRW	1,01	1,06	1,01	1,01	1,04	1,01	1,01
three-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,96	0,98	0,99	1,01	1	0,99	0,99
RW	1,02	1,04	1,03	1,01	1,01	0,98	0,98
DRW	1,04	1,1	1,08	1,01	1,05	0,99	0,99
Six-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,96	0,99	0.97*	1,01	1	1,04	1,04
RW	0,97	0,99	0,98	0,99	1	1,01	1,01
DRW	0,99	1,01	1,02	1	1,04	1	1
Nine-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,96	1	1,05	1,05	0,99	1,13	1,13
RW	0.95*	1	1,03	1,03	0,99	1,07	1,07
DRW	0,96	0,99	1,01	1,02	1,01	1,03	1,03
Twelve-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,98	1,03	1,09	1,07	1	1,19	1,19
RW	0,97	1,03	1,08	1,05	1	1,11	1,11
DRW	0,98	1,01	1,06	1,03	1,02	1,06	1,06
Fifteen-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,99	1,02	1,03	1,05	1	1,13	1,13
RW	0,99	1,02	1,04	1,04	1	1,08	1,08
DRW	1	1	1,03	1,02	1,03	1,04	1,04
Twentyfour-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1	1,02	1,02	1,04	1,01	1,02	1,02
RW	1	1,02	1,03	1,04	1,01	1	1
DRW	1	0,99	1,02	1,01	1,01	0,99	0,99

We consider the Diebold and Mariano (1995) and West (1996) test to evaluate the null hypothesis of equal MSPE and our test to evaluate the null of equal correlations.*p<0.1 *p<0.05,***p<0.01.

Table E.12) Forecasting base metals with Canadian Dollar at multiple horizons – Out of sample analysis at sample level.

Canadian exchange rate P/R= 1

Ratios DM							
One-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,99	1,01	0,97	1,03	1,01	1,01	1,01
RW	1,01	1,02	1	1,01	1,02	1,01	1,01
DRW	1,01	1,03	1,01	1,01	1,02	1,01	1,01
three-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1,02	1,01	1,03	1,02	1,01	1,02	1,02
RW	1,07	1,06	1,06	1,01	1,02	1,02	1,02
DRW	1,08	1,12	1,11	1,01	1,03	1,03	1,03
Six-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1,02	1	0,99	1,01	1	1,01	1,01
RW	1,03	1	0,99	1	0,99	1,01	1,01
DRW	1,06	1,03	1,03	1	1,02	1,02	1,02
Nine-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,99	0,98	1,05	1	0,99	1,02	1,02
RW	0,98	0,98	1,03	0,99	0,99	1,01	1,01
DRW	1,01	1,02	1,01	1	1,02	1,01	1,01
Twelve-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,98	1	1,08	1,02	1	1,06	1,06
RW	0,98	1	1,08	1,01	0,99	1,04	1,04
DRW	1	1	1,04	1	1,02	1,02	1,02
Fifteen-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	0,99	1,02	1,01	1,05	1	1,04	1,04
RW	0,99	1,02	1,02	1,04	1	1,03	1,03
DRW	1	0,99	1	1,01	1,02	1,01	1,01
Twentyfour-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	1	1	0,99	1,02	1	0,99	0,99
RW	0,99	1	1	1,03	1,01	0,99	0,99
DRW	1	1	1,05	0,99	1	1	1

We consider the Diebold and Mariano (1995) and West (1996) test to evaluate the null hypothesis of equal MSPE and our test to evaluate the null of equal correlations.*p<0.1 *p<0.05,***p<0.01.

F. Forecasting fuels with currencies – Out sample analysis P/R = 0.6.

Table F.1) Forecasting fuels with Chilean Peso at multiple horizons – Out of sample analysis at population level.

Chilean exchange rate P/R= 0.6

ENCNEW						
One-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	3.70***	4.54***	3.44***	3.50***	6.08***	2.26**
RW	4.55***	2.99***	2.43**	5.57***	8.21***	3.09***
DRW	4.13***	2.64**	2.25**	5.02***	7.41***	2.91***
three-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	10.64***	10.48***	8.97***	9.61***	10.47***	6.84***
RW	6.53***	4.25***	7.64***	6.86***	10.04***	6.20***
DRW	5.67***	3.57***	6.96***	5.68***	8.47***	5.64***
Six-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	9.57***	9.26***	12.61***	10.27***	11.94***	10.24***
RW	6.28***	4.87***	11.21***	8.49***	10.96***	9.14***
DRW	5.32***	4.04***	10.26***	6.94***	9.08***	8.27***
Nine-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	3.80***	2.78**	9.11***	7.18***	8.28***	3.69***
RW	2.46**	1.56**	8.29***	5.93***	7.56***	4.15***
DRW	2.17**	1.40*	7.25***	5.11***	6.53***	3.51***
Twelve-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	1.45*	1.16*	2.81**	4.09***	4.65***	0,33
RW	0,42	0,14	2.43**	3.00***	3.74***	0,21
DRW	0,46	0,28	1.57**	2.77**	3.46***	-0,11
Fifteen-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	1.39*	1.89**	-0,34	3.29***	3.41***	-0,77
RW	0,25	0,48	-0,44	2.29**	2.55**	-0,83
DRW	0,26	0,48	-1,11	2.12**	2.45**	-0,85
Twentyfour-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	-0,27	0,61	-2,07	1.39*	1.43*	-1,12
RW	-1,24	-0,86	-1,57	-0,07	0,01	-0,78
DRW	-0,94	-0,63	-1,32	-0,04	0,13	-0,52

10%, 5% and 1% critical values are 0.764, 1.161 and 2.278 respectively for ENCNEW when excess parameters are 1

Table F.2) Forecasting fuels with Iceland Krone at multiple horizons – Out of sample analysis at population level.

Iceland exchange rate P/R= 0.6

ENCNEW						
One-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0,02	0,33	1.37*	-0,02	0,5	1.52**
RW	0,04	-0,18	0.96*	0,67	1.47*	2.01**
DRW	0,02	-0,16	0,78	0,6	1.36*	1.96**
three-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	1.64**	1.89**	3.85***	0.92*	0.94*	5.24***
RW	-0,18	-0,51	3.26***	0,1	1.04*	4.59***
DRW	-0,07	-0,36	2.89***	0,15	1.11*	4.47***
Six-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	1.31*	1.73**	8.39***	1.22*	1.93**	8.19***
RW	0,32	0	7.64***	0,91	2.03**	7.61***
DRW	0,58	0,27	7.14***	1.22*	2.44**	7.44***
Nine-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0,13	0,54	10.23***	1.57**	2.00**	2.53**
RW	0,44	0,41	9.90***	1.94**	2.87***	3.74***
DRW	0,6	0,54	8.68***	2.09**	3.09***	3.32***
Twelve-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0,61	0.98*	5.44***	2.53**	2.73**	1.06*
RW	0,6	0,59	5.70***	2.50**	3.05***	1.24*
DRW	0,8	0,76	4.43***	2.69**	3.31***	0,81
Fifteen-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	-0,21	0,37	1.77**	1.39*	1.22*	-0,48
RW	0,15	0,34	1.98**	1.75**	1.86**	-0,18
DRW	0,42	0,53	1.09*	2.05**	2.28**	-0,28
Twentyfour-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	-0,57	-0,73	-0,96	-0,59	-0,79	0,32
RW	-0,26	-0,25	-0,67	-0,41	-0,56	0,45
DRW	0,72	0,58	-0,76	0,48	0,38	0.95*

10%, 5% and 1% critical values are 0.764, 1.161 and 2.278 respectively for ENCNEW when excess parameters are 1

Table F.3) Forecasting fuels with Australian Dollar at multiple horizons – Out of sample analysis at population level.

Australian exchange rate P/R= 0.6

ENCNEW						
One-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	0,76	0,86	1.97**	1.13*	1.89**	1.38*
RW	1.15*	0,59	1.32*	2.26**	3.02***	1.80**
DRW	1.02*	0,5	1.28*	2.05**	2.74**	1.73**
three-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	1.85**	1.71**	6.68***	2.92***	2.95***	4.25***
RW	1.03*	0,57	5.65***	2.10**	3.13***	3.74***
DRW	0,87	0,46	5.52***	1.77**	2.73**	3.56***
Six-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0.95*	0,77	10.09***	3.38***	3.68***	4.60***
RW	0,63	0,32	9.05***	2.97***	3.72***	3.99***
DRW	0,5	0,26	8.56***	2.50**	3.25***	3.67***
Nine-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0,83	0,44	8.24***	3.48***	3.78***	1.50*
RW	0,32	0,08	7.44***	2.99***	3.66***	1.66**
DRW	0,34	0,25	6.39***	2.62**	3.24***	1.25*
Twelve-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0,68	0,44	3.73***	3.28***	3.62***	-0,04
RW	0,24	0,1	3.26***	2.76**	3.26***	-0,19
DRW	0,44	0,46	2.09**	2.65**	3.18***	-0,37
Fifteen-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	1.07*	1.25*	1.37*	3.13***	3.35***	-0,16
RW	0,52	0,7	1.08*	2.62**	2.94***	-0,35
DRW	0,64	0,91	0,31	2.45**	2.87***	-0,24
Twentyfour-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0,19	0,33	-0,08	1.52**	1.27*	-0,07
RW	-0,32	-0,23	-0,04	0,67	0,48	0,05
DRW	0,54	0,57	-0,18	0.95*	0.98*	0,41

10%, 5% and 1% critical values are 0.764, 1.161 and 2.278 respectively for ENCNEW when excess parameters are 1

Table F.4) Forecasting fuels with Canadian Dollar at multiple horizons – Out of sample analysis at population level.

Canadian exchange rate P/R= 0.6

ENCNEW						
One-Step-AHead	***CAD***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	-0,01	-0,12	2.58**	0,17	1.00*	0,71
RW	0,27	-0,03	1.80**	0.92*	2.04**	0.97*
DRW	0,16	-0,11	1.62**	0,69	1.71**	0,85
three-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0,25	0,47	7.26***	0.95*	1.24*	2.16**
RW	-0,06	-0,15	5.99***	0,48	1.45*	1.87**
DRW	-0,16	-0,22	5.16***	0,16	0.99*	1.54**
Six-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	1.70**	1.91**	9.58***	2.92***	3.95***	4.16***
RW	1.01*	0,78	8.41***	2.57**	3.96***	3.65***
DRW	0,74	0,55	6.69***	1.81**	3.09***	3.02***
Nine-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	2.92***	2.13**	10.89***	4.90***	5.72***	2.33**
RW	2.17**	1.38*	9.88***	4.38***	5.50***	2.52**
DRW	1.98**	1.36*	7.95***	3.56***	4.66***	2.00**
Twelve-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0,52	0,13	5.66***	3.01***	2.87***	0,09
RW	-0,09	-0,4	5.32***	2.42**	2.39**	-0,06
DRW	0,51	0,34	3.92***	2.41**	2.56**	-0,04
Fifteen-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	-0,99	-0,89	0,87	0,78	0,7	-0,7
RW	-1,45	-1,25	0,77	0,35	0,2	-0,98
DRW	-0,4	-0,22	0,08	0,77	0,86	-0,49
Twentyfour-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0,36	0,69	0,2	1.61**	1.38*	-0,4
RW	-0,33	-0,2	0,14	0,6	0,33	-0,35
DRW	0,78	0,81	0,11	1.16*	1.22*	0,09

10%, 5% and 1% critical values are 0.764, 1.161 and 2.278 respectively for ENCNEW when excess parameters are 1

Table F.5) Forecasting fuels with New Zealand Dollar at multiple horizons – Out of sample analysis at population level.

New Zealand exchange rate P/R= 0.6

ENCNEW						
One-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	1.03*	0,84	1.70**	1.28*	2.29**	1.37*
RW	1.40*	0,61	0.97*	2.15**	3.11***	1.71**
DRW	1.33*	0,56	0.93*	2.03**	2.93***	1.67**
three-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	4.62***	3.86***	6.78***	4.72***	5.09***	5.64***
RW	3.13***	1.89**	5.65***	3.65***	5.10***	5.05***
DRW	2.99***	1.78**	5.50***	3.39***	4.77***	4.92***
Six-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	4.58***	3.67***	12.76***	6.14***	6.68***	5.48***
RW	3.46***	2.35**	11.48***	5.53***	6.61***	4.99***
DRW	3.19***	2.16**	11.03***	5.06***	6.10***	4.67***
Nine-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	1.36*	0,72	8.07***	3.26***	3.50***	1.12*
RW	1.05*	0,55	7.36***	3.06***	3.64***	1.37*
DRW	0,82	0,5	6.39***	2.61**	3.06***	0,92
Twelve-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0.97*	0,62	3.56***	2.82**	3.16***	0,21
RW	0,71	0,45	3.31***	2.60**	3.11***	0,16
DRW	0,59	0,53	2.01**	2.30**	2.80**	-0,2
Fifteen-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	1.07*	1.13*	1.67**	2.65**	2.77**	-0,28
RW	0,75	0,79	1.49*	2.37**	2.66**	-0,3
DRW	0,46	0,63	0,57	1.94**	2.28**	-0,39
Twentyfour-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	-0,2	-0,44	-0,4	0,23	0,05	0,14
RW	-0,24	-0,29	-0,25	0,13	-0,02	0,28
DRW	0,34	0,28	-0,49	0,28	0,25	0,49

10%, 5% and 1% critical values are 0.764, 1.161 and 2.278 respectively for ENCNEW when excess parameters are 1

Table F.6) Forecasting fuels with New Zealand Dollar at multiple horizons – Out of sample analysis at population level.

Norwegian exchange rate P/R= 0.6

ENCNEW						
One-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	0,43	0,35	3.03***	1.10*	2.52**	2.60**
RW	1.00*	0,34	2.08**	2.31**	3.91***	2.82**
DRW	0,75	0,17	1.92**	1.88**	3.28***	2.55**
three-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	1.57**	1.32*	12.52***	3.11***	3.47***	6.18***
RW	0,88	0,3	10.36***	2.13**	3.74***	4.93***
DRW	0,62	0,14	9.61***	1.58**	2.95***	4.40***
Six-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0,1	-0,83	13.22***	2.39**	2.79**	3.92***
RW	-0,14	-0,86	11.61***	2.02**	2.94***	2.96***
DRW	-0,1	-0,67	10.50***	1.58**	2.39**	2.58**
Nine-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	-1,12	-1,94	8.46***	1.05*	1.21*	0,23
RW	-1,61	-2,15	7.18***	0,44	0,83	-0,04
DRW	-1,01	-1,39	6.12***	0,59	0,92	-0,17
Twelve-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	-1,8	-2,41	3.23***	0,24	0,19	-1,03
RW	-2,25	-2,61	2.58**	-0,43	-0,4	-1,32
DRW	-1,34	-1,58	1.81**	0,14	0,24	-1,11
Fifteen-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	-0,93	-1,39	1.41*	0,35	0,44	-0,23
RW	-1,47	-1,68	1.06*	-0,27	-0,26	-0,71
DRW	-0,56	-0,7	0,49	0,32	0,46	-0,25
Twentyfour-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	-0,67	-1,04	-0,01	-0,24	-0,45	0,78
RW	-0,84	-1,08	0,26	-0,58	-0,82	1.11*
DRW	0,65	0,51	-0,08	0,47	0,46	1.71**

10%, 5% and 1% critical values are 0.764, 1.161 and 2.278 respectively for ENCNEW when excess parameters are 1

Table F.7) Forecasting fuels with New Zealand Dollar at multiple horizons – Out of sample analysis at sample level.

Chilean exchange rate P/R= 0.6

Ratios DM						
One-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0.97**	0,95	0,97	0,99	0,97	1
RW	0.96*	0,98	0,98	0,95	0.93*	0,99
DRW	0,97	0,99	0,98	0,96	0,94	0,99
three-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0,9	0,89	0,93	0,94	0,93	0,94
RW	0,95	0,96	0,94	0,95	0,92	0,95
DRW	0,96	0,98	0,95	0,97	0,95	0,96
Six-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0.89*	0.89*	0,88	0,9	0,88	0,89
RW	0,92	0,94	0,89	0,91	0,88	0,9
DRW	0,94	0,95	0,91	0,94	0,91	0,92
Nine-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0.94**	0.95**	0.88*	0.89**	0.88***	0,95
RW	0.96**	0.97**	0.88*	0.90***	0.88***	0,94
DRW	0.96**	0.97**	0.90*	0.92**	0.90**	0,95
Twelve-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0.97**	0.98**	0.95*	0.93***	0.92***	1
RW	0,99	1	0.95*	0.95**	0.93***	1
DRW	0,99	1	0,97	0.95**	0.94**	1
Fifteen-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0,98	0.97**	1,01	0.94**	0.94**	1,02
RW	1	0,99	1,01	0,96	0.95*	1,02
DRW	1	0,99	1,03	0,96	0,96	1,02
Twentyfour-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	1,02	1	1,06	0,98	0,98	1,03
RW	1,04	1,03	1,04	1,01	1,01	1,02
DRW	1,03	1,02	1,04	1,01	1,01	1,01

We consider the Diebold and Mariano (1995) and West (1996) test to evaluate the null hypothesis of equal MSPE and our test to evaluate the null of equal correlations.*p<0.1 **p<0.05,***p<0.01.

Table F.8) Forecasting fuels with Iceland Krone at multiple horizons – Out of sample analysis at sample level.

Iceland exchange rate P/R= 0.6

Ratios DM						
One-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	1,01	1	0,98	1,01	1,01	0,99
RW	1,01	1,01	0,99	1	0,99	0,98
DRW	1,01	1,01	0,99	1	0,99	0,98
three-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0,99	0.98*	0,96	1,01	1,02	0,94
RW	1,02	1,02	0,97	1,02	1,01	0,94
DRW	1,02	1,02	0,98	1,02	1,01	0,95
Six-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	1,01	1	0,93	1,03	1,02	0,91
RW	1,02	1,02	0,94	1,02	1,01	0,91
DRW	1,01	1,01	0,95	1,01	1	0,91
Nine-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	1,03	1,01	0,9	1,01	1	0,98
RW	1,01	1	0,89	0,99	0,97	0,95
DRW	1	1	0,92	0,98	0,97	0,96
Twelve-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	1	0,99	0,93	0,97	0,97	0,98
RW	0,99	0,99	0,92	0,96	0,96	0,98
DRW	0,99	0,99	0,95	0,96	0,95	0,99
Fifteen-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	1,01	1	0,98	0,98	0,99	1,01
RW	1	1	0,97	0,97	0,97	1
DRW	0,99	0,99	0,99	0,97	0,96	1,01
Twentyfour-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	1,02	1,02	1,03	1,02	1,02	0,99
RW	1,01	1,01	1,02	1,01	1,02	0,99
DRW	0,98	0,99	1,02	0,99	0,99	0,98

We consider the Diebold and Mariano (1995) and West (1996) test to evaluate the null hypothesis of equal MSPE and our test to evaluate the null of equal correlations.*p<0.1 **p<0.05,***p<0.01.

Table F.9) Forecasting fuels with Australian Dollar at multiple horizons – Out of sample analysis at sample level.

Australian exchange rate P/R= 0.6

Ratios DM						
One-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	0.99**	0,99	0.98*	0,99	0,98	0,99
RW	0.99*	0,99	0.98*	0.97**	0.96**	0.98*
DRW	0,99	1	0.98*	0.97**	0.96**	0.98*
three-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0.97**	0.97*	0.93**	0,96	0,96	0.94**
RW	0,99	0,99	0.94*	0,97	0.96*	0.94**
DRW	0,99	0,99	0.93**	0,98	0,96	0.95**
Six-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0.98**	0.99**	0.89**	0.95**	0.94**	0.92***
RW	0.99*	0.99*	0.90**	0.95**	0.94**	0.93**
DRW	0,99	1	0.90**	0.96*	0.95*	0.94**
Nine-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0.98***	0.99**	0.88**	0.94***	0.93***	0.97**
RW	0.99***	1	0.89**	0.94***	0.93***	0.97**
DRW	0.99**	0.99***	0.91**	0.95**	0.94**	0.98**
Twelve-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0.99***	0.99**	0.93**	0.94***	0.93***	1
RW	0.99*	1	0.94**	0.95***	0.94***	1
DRW	0.99**	0.99**	0.96**	0.95***	0.94***	1,01
Fifteen-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0.98***	0.97***	0.97*	0.94***	0.94***	1
RW	0.99*	0.99**	0,98	0.95**	0.94***	1,01
DRW	0.99*	0.98**	0,99	0.95**	0.95**	1,01
Twentyfour-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	1	0,99	1,01	0.97**	0.97*	1
RW	1,01	1,01	1,01	0,99	0,99	1
DRW	0.99*	0.99*	1,01	0,98	0,98	0,99

We consider the Diebold and Mariano (1995) and West (1996) test to evaluate the null hypothesis of equal MSPE and our test to evaluate the null of equal correlations.*p<0.1 *p<0.05,***p<0.01.

Table F.10) Forecasting fuels with Iceland Krone at multiple horizons – Out of sample analysis at sample level.

Canadian exchange rate P/R= 0.6

Ratios DM						
One-Step-AHead	***CAD***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	1	1	0.97*	1	0,99	1
RW	1	1	0.98*	0,99	0.97*	0,99
DRW	1	1	0.98*	0,99	0,98	0,99
three-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	1	0.99*	0.92**	0,99	0,99	0,97
RW	1	1	0.93*	1	0,98	0,97
DRW	1	1,01	0,94	1	0,99	0,98
Six-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0.97**	0.97***	0,92	0.96*	0.94**	0.94**
RW	0,98	0,99	0,93	0,97	0.94*	0.95*
DRW	0,99	0,99	0,95	0,98	0,96	0,96
Nine-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0.95*	0.97*	0.87*	0.93**	0.91**	0.96*
RW	0.96*	0,98	0.88*	0.93*	0.91**	0.96*
DRW	0.97*	0,98	0.90*	0.95*	0.93*	0.97*
Twelve-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0,99	1	0.91**	0.95**	0.95**	1
RW	1	1,01	0.91**	0.96**	0.96*	1
DRW	0,99	0,99	0.93*	0.96*	0.95*	1
Fifteen-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	1,02	1,02	0.98*	0.99*	0.99*	1,02
RW	1,04	1,03	0.98*	0,99	1	1,02
DRW	1,01	1,01	1	0,99	0.98*	1,01
Twentyfour-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0,99	0,99	1	0.97*	0.97*	1,01
RW	1,01	1,01	1	0,99	1	1,01
DRW	0,99	0,99	1	0,98	0,98	1

We consider the Diebold and Mariano (1995) and West (1996) test to evaluate the null hypothesis of equal MSPE and our test to evaluate the null of equal correlations.*p<0.1 *p<0.05,***p<0.01.

Table F.11) Forecasting fuels with New Zealand Dollar at multiple horizons – Out of sample analysis at sample level.

New Zealand exchange rate P/R= 0.6

Ratios DM						
One-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	0.98**	0.99*	0,99	0,99	0,97	0,99
RW	0,98	0,99	1	0.97*	0.96**	0,98
DRW	0,98	0,99	1	0.97*	0.96*	0,98
three-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0.93***	0.94**	0,94	0.94*	0.93*	0.92**
RW	0.95*	0.97*	0,95	0.95*	0.93*	0.93**
DRW	0.96*	0.97*	0,95	0.95*	0.94*	0.93**
Six-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0.92***	0.94***	0.86**	0.91***	0.90***	0.92**
RW	0.94**	0.96**	0.86**	0.91**	0.90**	0.92**
DRW	0.95**	0.96**	0.86**	0.92**	0.91**	0.93**
Nine-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0.97**	0.99**	0.90**	0.95**	0.94**	0,98
RW	0.98**	0.99**	0.90**	0.95**	0.94**	0.98*
DRW	0,98	0.99*	0.91*	0.96**	0.95**	0,98
Twelve-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0.98**	0.99**	0,95	0.95***	0.94**	1
RW	0.99*	0.99*	0,95	0.95**	0.94**	1
DRW	0,99	0,99	0,97	0.96**	0.95**	1
Fifteen-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0.98*	0.98*	0,98	0.95**	0.95*	1,01
RW	0,99	0,98	0,98	0.96*	0.95*	1,01
DRW	0,99	0,99	0,99	0,97	0,96	1,01
Twentyfour-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	1,01	1,01	1,02	1	1	1
RW	1,01	1,01	1,01	1	1	0,99
DRW	0,99	0,99	1,02	1	1	0,99

We consider the Diebold and Mariano (1995) and West (1996) test to evaluate the null hypothesis of equal MSPE and our test to evaluate the null of equal correlations.*p<0.1 *p<0.05,***p<0.01.

Table F.12) Forecasting fuels with Norwegian Krone at multiple horizons – Out of sample analysis at sample level.

Norwegian exchange rate P/R= 0.6

Ratios DM						
One-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	1	1	0,97	0,99	0,97	0,98
RW	0,99	1	0,98	0.98*	0.95**	0,97
DRW	1	1	0,99	0.98*	0.96**	0,98
three-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0.97**	0.98**	0.88***	0.96**	0.95*	0.92**
RW	0,99	1	0.90**	0,97	0.95*	0.93*
DRW	1	1	0.91***	0,98	0,96	0.94*
Six-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	1	1,02	0.88*	0.96**	0.95***	0.94**
RW	1	1,02	0,9	0.97**	0.95**	0.95*
DRW	1	1,01	0,9	0,97	0.96*	0.96*
Nine-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	1,03	1,05	0.90*	0.98*	0.98**	1
RW	1,04	1,05	0.91*	0,99	0.98*	1
DRW	1,02	1,03	0.92*	0,99	0.98*	1
Twelve-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	1,04	1,06	0,95	1	1	1,03
RW	1,06	1,07	0,95	1,01	1,01	1,03
DRW	1,03	1,04	0,97	1	1	1,03
Fifteen-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	1,02	1,03	0,97	0,99	0,99	1,01
RW	1,04	1,04	0,98	1,01	1,01	1,02
DRW	1,01	1,02	0,99	0,99	0,99	1,01
Twentyfour-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	1,02	1,03	1,01	1,01	1,01	0,98
RW	1,03	1,03	1	1,02	1,02	0,98
DRW	0,98	0,99	1,01	0,99	0,99	0.96*

We consider the Diebold and Mariano (1995) and West (1996) test to evaluate the null hypothesis of equal MSPE and our test to evaluate the null of equal correlations.*p<0.1 *p<0.05,***p<0.01.

G. *Forecasting fuels with currencies – Out sample analysis P/R = 2.*

Table G.1) Forecasting fuels with Chilean Peso at multiple horizons – Out of sample analysis at population level.

Chilean exchange rate P/R= 2

			ENCNEW			
One-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	8.47***	7.69***	7.45***	13.11***	20.16***	13.52***
RW	13.36***	8.90***	5.77***	16.34***	21.53***	10.13***
DRW	12.43***	8.11***	5.34***	15.30***	20.19***	10.21***
three-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	19.04***	13.91***	13.81***	24.32***	26.83***	16.79***
RW	16.08***	10.05***	12.12***	19.85***	24.36***	11.61***
DRW	14.44***	8.64***	10.86***	17.27***	21.44***	11.56***
Six-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	15.53***	12.66***	11.51***	21.74***	22.91***	20.27***
RW	11.54***	8.42***	10.69***	18.90***	21.23***	16.78***
DRW	10.05***	6.95***	10.53***	16.33***	18.42***	16.25***
Nine-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	7.46***	5.64***	8.84***	14.94***	16.46***	5.77***
RW	4.06**	2.39*	7.74***	11.25***	14.12***	5.48***
DRW	2.86**	1,26	7.70***	9.35***	11.77***	3.88**
Twelve-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	1.89*	1.95*	3.80**	8.23***	9.15***	-2,39
RW	-1,21	-1,48	3.78**	5.19***	6.77***	-2,74
DRW	-2,32	-2,37	1,12	4.44**	5.72***	-4,92
Fifteen-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	1,4	1.83*	2.40*	6.61***	6.90***	-3,04
RW	-1,8	-2,02	3.14**	3.88**	4.13**	-3,64
DRW	-3,14	-2,96	-0,99	3.28**	3.75**	-6,05
Twentyfour-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	-3,85	-2,04	-3,97	0,78	0,67	0,01
RW	-5,88	-4,96	-3,38	-2,66	-2,42	0,45
DRW	-5,44	-4,23	-3,69	-1,63	-1,13	-0,07

10%, 5% and 1% critical values are 0.764, 1.161 and 2.278 respectively for ENCNEW when excess parameters are 1

Table G.2) Forecasting fuels with Iceland Krone at multiple horizons – Out of sample analysis at population level.

Iceland exchange rate P/R= 2

			ENCNEW			
One-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	0,92	1,16	4.53**	3.23**	5.78***	9.08***
RW	2.66*	2.15*	2.89**	4.06**	6.21***	7.54***
DRW	2.97**	2.48*	2.68*	4.48**	6.71***	8.09***
three-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	4.42**	3.24**	15.99***	10.00***	12.56***	18.08***
RW	3.06**	1,3	14.09***	7.40***	10.30***	13.72***
DRW	3.47**	1,68	13.61***	8.16***	11.21***	14.48***
Six-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	7.87***	5.83***	41.92***	17.23***	20.23***	25.86***
RW	6.32***	3.92**	38.54***	15.65***	19.20***	22.74***
DRW	5.71***	3.43**	37.78***	15.24***	18.78***	22.40***
Nine-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	4.83**	2.78*	50.08***	12.69***	14.59***	10.56***
RW	4.12**	1,6	43.01***	11.58***	14.50***	10.71***
DRW	2.86**	0,5	40.69***	10.64***	13.32***	9.64***
Twelve-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	1,36	1,25	25.84***	9.69***	9.62***	1,32
RW	1,72	0,63	22.08***	10.04***	11.05***	1,47
DRW	-0,5	-1,57	18.50***	8.16***	9.24***	0,68
Fifteen-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	0,21	1,27	10.00***	7.12***	6.47***	-4,05
RW	-0,04	-0,37	7.60***	7.21***	7.20***	-3,81
DRW	-2,48	-2,89	4.44**	4.99**	5.37***	-3,95
Twentyfour-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	-0,95	-2,56	2.33*	-1,48	-2,1	-0,68
RW	-1,33	-3,27	1,62	-2,23	-2,67	-0,31
DRW	-1,44	-3,74	1,48	-2,88	-2,89	0,36

10%, 5% and 1% critical values are 0.764, 1.161 and 2.278 respectively for ENCNEW when excess parameters are 1

Table G.3) Forecasting fuels with Australian Dollar at multiple horizons – Out of sample analysis at population level.

Australian exchange rate P/R= 2

			ENCNEW			
One-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	0,45	0,26	4.31**	4.01**	5.32***	4.71**
RW	3.09**	1,47	2.84**	6.31***	6.68***	2.85**
DRW	3.51**	1.84*	2.76*	6.89***	7.72***	3.62**
three-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	-0,43	-0,66	15.87***	5.76***	4.15**	7.70***
RW	-0,83	-1,57	14.09***	4.80**	4.32**	5.12***
DRW	0,91	-0,28	12.06***	6.24***	6.36***	5.41***
Six-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	2.07*	0,77	32.01***	7.76***	8.01***	9.93***
RW	0,83	-0,72	29.69***	6.78***	8.00***	7.60***
DRW	-0,47	-2,05	27.29***	5.74***	6.70***	6.42***
Nine-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	1,29	0,81	23.05***	7.91***	8.19***	2.96**
RW	-0,81	-1,09	19.09***	5.30***	6.69***	1,73
DRW	-3,56	-3,89	17.82***	2.68*	3.52**	-0,94
Twelve-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	-0,24	0,23	9.41***	6.88***	7.52***	-1,79
RW	-2,45	-2,11	7.53***	4.75**	5.96***	-2,8
DRW	-5,15	-4,74	4.03**	2.53*	3.09**	-5,32
Fifteen-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	-0,94	-0,84	4.26**	5.05**	5.80***	-1,89
RW	-3,95	-3,63	3.17**	2.21*	2.76*	-3,55
DRW	-6,22	-5,63	-0,6	0,9	1,32	-5,69
Twentyfour-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	-6,33	-4,83	2.05*	-1,78	-1,96	-2,38
RW	-8,26	-7,36	1,04	-4,94	-4,99	-2,62
DRW	-8,57	-7,02	0,1	-4,1	-3,9	-3,19

10%, 5% and 1% critical values are 0.764, 1.161 and 2.278 respectively for ENCNEW when excess parameters are 1

Table G.4) Forecasting fuels with Canadian Dollar at multiple horizons – Out of sample analysis at population level.

Canadian exchange rate P/R= 2

			ENCNEW			
One-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	-1,5	-1,56	3.55**	-0,17	1,08	0,72
RW	-0,53	-0,77	2.95**	1,07	2.76*	0,68
DRW	0	-0,26	3.10**	1.84*	3.57**	1,34
three-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	-3,31	-2,48	4.88**	-1,15	-0,68	0,45
RW	-3,85	-2,99	4.22**	-1,04	-0,15	-0,27
DRW	-1,81	-1,44	5.35***	1,02	2.01*	1,01
Six-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	-0,46	-0,64	14.73***	4.31**	5.29***	4.88**
RW	-1,45	-1,95	14.96***	3.69**	5.35***	3.99**
DRW	-0,17	-0,82	16.53***	5.42***	6.77***	5.00**
Nine-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	4.40**	2.92**	18.59***	9.55***	10.49***	4.64**
RW	2.35*	0,69	17.40***	7.09***	8.91***	4.55**
DRW	2.42*	0,64	17.53***	8.29***	9.74***	3.92**
Twelve-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	2.93**	2.72*	9.02***	6.81***	6.95***	1,64
RW	0,99	0,32	9.25***	4.61**	5.19***	1,26
DRW	-0,66	-1,44	6.89***	4.70**	5.28***	-0,71
Fifteen-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	-2,29	-2,46	-0,45	-0,23	0,01	-1,78
RW	-3,75	-4,4	1,06	-1,53	-1,23	-2,36
DRW	-6,43	-7	-0,65	-2,92	-2,44	-4,69
Twentyfour-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	-4,06	-3,4	-2,89	-1,26	-1,23	-1,64
RW	-5,65	-5,37	-2,04	-3,72	-3,57	-1,62
DRW	-7,8	-6,73	-1,07	-4,68	-4,3	-3,05

10%, 5% and 1% critical values are 0.764, 1.161 and 2.278 respectively for ENCNEW when excess parameters are 1

Table G.5) Forecasting fuels with New Zealand Dollar at multiple horizons – Out of sample analysis at population level.

New Zealand exchange rate P/R= 2

ENCNEW						
One-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	1,03	0,9	7.13***	3.50**	6.22***	4.44**
RW	3.11**	1,44	5.04**	5.57***	7.66***	3.04**
DRW	3.52**	1.89*	4.38**	6.15***	8.31***	3.90**
three-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	5.70***	4.01**	22.37***	9.49***	9.94***	10.96***
RW	4.29**	1.82*	19.50***	8.72***	10.40***	8.26***
DRW	5.38***	2.75*	16.57***	9.46***	11.48***	9.05***
Six-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	6.11***	3.56**	31.25***	11.71***	12.00***	10.55***
RW	4.03**	1,57	29.02***	10.69***	11.91***	8.80***
DRW	3.78**	1,23	25.80***	10.43***	11.70***	9.10***
Nine-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	2.01*	1,07	21.96***	7.79***	7.76***	3.14**
RW	0,57	-0,21	18.91***	6.22***	6.88***	2.15*
DRW	-1,37	-2,15	17.01***	4.65**	5.11***	0,76
Twelve-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	-0,14	-0,09	12.22***	5.77***	6.26***	-0,31
RW	-1,41	-1,43	10.43***	4.84**	5.76***	-1,06
DRW	-3,61	-3,36	6.97***	3.32**	3.89**	-3,02
Fifteen-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	-0,2	-0,47	6.94***	4.70**	5.20***	-0,96
RW	-2,01	-2,01	5.71***	3.04**	3.49**	-2,01
DRW	-3,74	-3,4	1.90*	2.36*	2.83*	-3,41
Twentyfour-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	-1,92	-1,46	3.38**	-0,28	-0,24	1.89*
RW	-3,16	-2,64	3.08**	-1,7	-1,77	1,72
DRW	-5,22	-4,17	1,63	-2,93	-2,82	0,14

10%, 5% and 1% critical values are 0.764, 1.161 and 2.278 respectively for ENCNEW when excess parameters are 1

Table G.6) Forecasting fuels with Norwegian Krone at multiple horizons – Out of sample analysis at population level.

Norwegian exchange rate P/R= 2

ENCNEW						
One-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	-0,17	-0,71	9.05***	3.57**	7.04***	9.61***
RW	2.60*	0,76	6.56***	6.49***	9.35***	7.44***
DRW	2.77*	1,08	5.88***	6.38***	8.98***	7.07***
three-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	-0,66	-0,37	28.66***	3.25**	4.76**	11.38***
RW	-2,05	-2,4	24.55***	2.27*	5.04**	8.28***
DRW	-0,42	-1,35	19.38***	3.47**	5.92***	7.65***
Six-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	3.03**	1.95*	35.93***	5.29***	6.30***	6.85***
RW	1,7	0,51	32.47***	4.75**	6.65***	5.69***
DRW	-0,45	-1,95	26.07***	3.01**	4.37**	3.65**
Nine-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	1.91*	1,53	20.73***	4.11**	4.80**	-0,87
RW	0,62	0,19	16.59***	3.06**	4.56**	-0,25
DRW	-3,46	-4,07	12.94***	-0,11	0,62	-3,65
Twelve-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	2.01*	1.92*	7.18***	5.68***	6.11***	-1,93
RW	-0,63	-1,04	5.39***	2.80*	3.93**	-2,23
DRW	-5,34	-5,62	0,17	-0,72	-0,16	-6,09
Fifteen-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	-2,84	-2,7	2.49*	-0,24	-0,14	-4,26
RW	-4,94	-5,21	1,57	-1,91	-1,88	-5,31
DRW	-9,18	-9,15	-4,23	-5,15	-5,16	-8,55
Twentyfour-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propano***
AR(1)	-5,45	-5,12	2.53*	-4,17	-4,34	-0,53
RW	-6,39	-6,25	1,72	-5,75	-5,99	-0,43
DRW	-9,94	-9,33	-0,48	-8,39	-8,47	-2,9

10%, 5% and 1% critical values are 0.764, 1.161 and 2.278 respectively for ENCNEW when excess parameters are 1

Table G.7) Forecasting fuels with Chilean Peso at multiple horizons – Out of sample analysis at sample level.

Chilean exchange rate P/R= 2

Ratios DM						
One-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0,97	0,96	0,96	0,94	0.90*	0.93*
RW	0,94	0,97	0,97	0.92*	0.89*	0,95
DRW	0,96	0,98	0,98	0,93	0.91*	0,95
three-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0,92	0,95	0,94	0,9	0,89	0.92*
RW	0,94	0,97	0,95	0,92	0,9	0,95
DRW	0,96	0,99	0,96	0,95	0,92	0,95
Six-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0,93	0,94	0,95	0,91	0,9	0.90*
RW	0,95	0,97	0,96	0,92	0,9	0.91*
DRW	0,97	0,99	0,96	0,95	0,93	0,93
Nine-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0,97	0,98	0,94	0,92	0.91*	1
RW	1	1,01	0,95	0,94	0,92	1,01
DRW	1,02	1,03	0,95	0,97	0,96	1,05
Twelve-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	1,02	1,02	0,97	0,95	0,95	1,07
RW	1,06	1,06	0,97	0,98	0,97	1,07
DRW	1,09	1,08	1,01	1,01	1	1,12
Fifteen-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	1,03	1,03	1	0,97	0,97	1,07
RW	1,07	1,08	0,99	1	1	1,08
DRW	1,11	1,11	1,04	1,03	1,03	1,13
Twentyfour-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	1,08	1,06	1,06	1,03	1,03	1,01
RW	1,11	1,1	1,05	1,07	1,07	1
DRW	1,12	1,1	1,06	1,07	1,07	1,01

We consider the Diebold and Mariano (1995) and West (1996) test to evaluate the null hypothesis of equal MSPE and our test to evaluate the null of equal correlations.*p<0.1 *p<0.05,***p<0.01.

Table G.8) Forecasting fuels with Iceland Krone at multiple horizons – Out of sample analysis at sample level.

Iceland exchange rate P/R= 2

Ratios DM						
One-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	1,01	1,01	0,97	1	0,98	0,97
RW	1	1,01	0,98	0,99	0,98	0,98
DRW	1	1	0,99	0,99	0,97	0,97
three-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	1,02	1,03	0,92	0,98	0,96	0,95
RW	1,04	1,06	0,93	1	0,98	0,97
DRW	1,03	1,05	0,94	0,99	0,97	0,96
Six-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	1,06	1,08	0,85	1,01	1	0,99
RW	1,07	1,1	0,86	1,02	1	1
DRW	1,09	1,11	0,87	1,03	1,01	1
Nine-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	1,08	1,08	0,8	1,03	1,03	1,08
RW	1,08	1,09	0,83	1,03	1,02	1,07
DRW	1,11	1,12	0,85	1,05	1,05	1,09
Twelve-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	1,08	1,07	0,87	1,01	1,02	1,08
RW	1,07	1,08	0,89	1	1	1,07
DRW	1,12	1,12	0,93	1,04	1,04	1,1
Fifteen-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	1,08	1,07	0,95	1,02	1,03	1,12
RW	1,07	1,08	0,97	1,02	1,02	1,11
DRW	1,14	1,14	1,01	1,08	1,07	1,12
Twentyfour-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	1,04	1,07	0,99	1,07	1,06	1,03
RW	1,04	1,07	1	1,07	1,07	1,02
DRW	1,06	1,09	1	1,11	1,09	1,02

We consider the Diebold and Mariano (1995) and West (1996) test to evaluate the null hypothesis of equal MSPE and our test to evaluate the null of equal correlations.*p<0.1 *p<0.05,***p<0.01.

Table G.9) Forecasting fuels with Australian Dollar at multiple horizons – Out of sample analysis at sample level.

Australian exchange rate P/R= 2

Ratios DM						
One-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	1,01	1,01	0,98	0,99	0,98	0,98
RW	1	1,01	0,99	0.98**	0.98*	1
DRW	0,99	1	0,99	0.97*	0.97*	0,99
three-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	1,03	1,03	0,92	0,99	1	0.95**
RW	1,05	1,04	0.93*	1	1	0,97
DRW	1,03	1,03	0.94*	0,99	0,99	0,97
Six-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	1,02	1,03	0,95	0,99	0,97	0,97
RW	1,03	1,04	0,97	1,01	0,98	0,99
DRW	1,07	1,07	0,94	1,04	1,02	1
Nine-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	1,06	1,04	1,05	1,02	1,01	1,07
RW	1,08	1,06	1,09	1,05	1,03	1,09
DRW	1,16	1,13	1,08	1,12	1,11	1,14
Twelve-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	1,08	1,05	1,04	1,01	1,01	1,09
RW	1,11	1,08	1,07	1,04	1,03	1,1
DRW	1,21	1,17	1,13	1,13	1,13	1,16
Fifteen-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	1,11	1,09	1,03	1,06	1,05	1,08
RW	1,15	1,13	1,05	1,09	1,09	1,11
DRW	1,29	1,25	1,12	1,21	1,22	1,18
Twentyfour-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	1,16	1,13	1,06	1,13	1,12	1,06
RW	1,19	1,17	1,08	1,18	1,16	1,06
DRW	1,33	1,27	1,17	1,32	1,28	1,12

We consider the Diebold and Mariano (1995) and West (1996) test to evaluate the null hypothesis of equal MSPE and our test to evaluate the null of equal correlations.*p<0.1 *p<0.05,**p<0.01.

Table G.10) Forecasting fuels with Canadian Dollar at multiple horizons – Out of sample analysis at sample level.

Canadian exchange rate P/R= 2

Ratios DM						
One-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	1,02	1,02	0,98	1,01	1	1,01
RW	1,02	1,02	0,99	1	0,99	1,01
DRW	1,01	1,01	0,98	1	0,99	1
three-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	1,05	1,04	1,01	1,03	1,02	1,01
RW	1,06	1,04	1,01	1,03	1,02	1,02
DRW	1,03	1,03	0,99	1,01	1	1
Six-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	1,03	1,03	0,94	1	0,98	0,97
RW	1,04	1,05	0,94	1	0,98	0,98
DRW	1,03	1,04	0,92	1	0,98	0,97
Nine-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	0,98	0,99	0,91	0,95	0,94	0,97
RW	1	1,01	0,92	0,97	0,95	0,97
DRW	1,03	1,04	0,92	0,99	0,97	0,99
Twelve-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	0,98	0,98	0,93	0.94*	0.94*	0,99
RW	1	1,01	0,93	0,96	0,96	0,99
DRW	1,05	1,05	0,96	1	0,99	1,02
Fifteen-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	1,05	1,05	1,02	1,02	1,01	1,03
RW	1,07	1,08	1	1,03	1,03	1,04
DRW	1,13	1,14	1,01	1,09	1,08	1,08
Twentyfour-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	1,1	1,09	1,04	1,08	1,06	1,03
RW	1,12	1,12	1,03	1,11	1,09	1,03
DRW	1,32	1,28	1,05	1,29	1,26	1,1

We consider the Diebold and Mariano (1995) and West (1996) test to evaluate the null hypothesis of equal MSPE and our test to evaluate the null of equal correlations.*p<0.1 *p<0.05,**p<0.01.

Table G.11) Forecasting fuels with New Zealand Dollar at multiple horizons – Out of sample analysis at sample level.

New Zealand exchange rate P/R= 2

Ratios DM						
One-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	1,01	1	0,96	0,99	0,97	0,98
RW	1	1,01	0,98	0,98	0,97	0,99
DRW	0,99	1	0,98	0,97	0,96	0,98
three-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	1	1,02	0.88**	0,98	0,97	0.94*
RW	1,02	1,04	0.90*	0,98	0,97	0,96
DRW	1,01	1,02	0.91*	0,98	0,96	0,95
Six-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	1,01	1,03	0.85*	0,97	0,96	0,96
RW	1,02	1,04	0.86*	0,98	0,97	0,98
DRW	1,03	1,05	0.87*	0,99	0,98	0,97
Nine-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	1,03	1,03	0,92	0,99	0,99	1,03
RW	1,04	1,04	0,95	1	1	1,04
DRW	1,1	1,08	0,96	1,05	1,05	1,06
Twelve-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	1,07	1,05	0,98	1,01	1	1,05
RW	1,09	1,07	1	1,02	1,01	1,06
DRW	1,17	1,14	1,04	1,08	1,08	1,1
Fifteen-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	1,08	1,07	1	1,04	1,03	1,05
RW	1,11	1,1	1,01	1,05	1,05	1,06
DRW	1,21	1,18	1,08	1,14	1,14	1,11
Twentyfour-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	1,05	1,04	0,98	1,04	1,04	0,99
RW	1,07	1,06	0,99	1,06	1,05	0,99
DRW	1,17	1,14	1,05	1,17	1,15	1,04

We consider the Diebold and Mariano (1995) and West (1996) test to evaluate the null hypothesis of equal MSPE and our test to evaluate the null of equal correlations.*p<0.1 *p<0.05,**p<0.01.

Table G.12) Forecasting fuels with Norwegian Krone at multiple horizons – Out of sample analysis at sample level.

Norwegian exchange rate P/R= 2

Ratios DM						
One-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	1,01	1,02	0.95*	0,99	0,97	0.96*
RW	1	1,01	0.97*	0,98	0.96*	0.97*
DRW	1	1,01	0.97*	0,98	0,96	0.97*
three-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	1,03	1,02	0.86**	1	0,99	0.94*
RW	1,05	1,05	0.88**	1,01	0,99	0,96
DRW	1,03	1,03	0.90**	1	0,99	0,96
Six-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	0,99	1	0,91	0,96	0,96	0,96
RW	0,99	1,01	0,93	0,97	0.95*	0,96
DRW	1,03	1,05	0,92	1	1	0,99
Nine-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	1	1,01	1,04	0,98	0,97	1,05
RW	1,01	1,02	1,07	0,98	0,97	1,03
DRW	1,08	1,09	1,06	1,05	1,05	1,09
Twelve-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	1,01	1,02	1,06	0,96	0,96	1,06
RW	1,04	1,05	1,07	0,99	0,98	1,06
DRW	1,12	1,12	1,15	1,06	1,06	1,12
Fifteen-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	1,06	1,06	1,05	1,03	1,03	1,1
RW	1,1	1,1	1,06	1,05	1,05	1,11
DRW	1,21	1,2	1,16	1,14	1,15	1,18
Twentyfour-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	1,12	1,11	1,03	1,1	1,11	1,05
RW	1,13	1,12	1,05	1,13	1,13	1,05
DRW	1,3	1,26	1,15	1,29	1,29	1,14

We consider the Diebold and Mariano (1995) and West (1996) test to evaluate the null hypothesis of equal MSPE and our test to evaluate the null of equal correlations.*p<0.1 *p<0.05,**p<0.01.

H. Forecasting fuels with currencies – Out sample analysis P/R = 1.

Table H.1) Forecasting fuels with Chilean Peso at multiple horizons – Out of sample analysis at population level.

Chilean exchange rate P/R= 1

ENCNEW						
One-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	3.40***	4.24***	3.57***	4.57***	7.22***	3.15***
RW	13.36***	8.90***	5.77***	16.34***	21.53***	10.13***
DRW	12.43***	8.11***	5.34***	15.30***	20.19***	10.21***
three-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	13.18***	12.16***	11.40***	13.39***	14.46***	9.11***
RW	16.08***	10.05***	12.12***	19.85***	24.36***	11.61***
DRW	14.44***	8.64***	10.86***	17.27***	21.44***	11.56***
Six-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	12.89***	12.75***	12.51***	14.25***	15.24***	14.89***
RW	11.54***	8.42***	10.69***	18.90***	21.23***	16.78***
DRW	10.05***	6.95***	10.53***	16.33***	18.42***	16.25***
Nine-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	4.79***	3.03***	7.54***	9.79***	11.25***	4.93***
RW	4.06**	2.39*	7.74***	11.25***	14.12***	5.48***
DRW	2.86**	1,26	7.70***	9.35***	11.77***	3.88**
Twelve-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	1.82**	1.37*	2.15**	6.30***	7.09***	0,05
RW	-1,21	-1,48	3.78**	5.19***	6.77***	-2,74
DRW	-2,32	-2,37	1,12	4.44**	5.72***	-4,92
Fifteen-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	1.39*	1.75**	-0,85	4.59***	4.74***	-1,62
RW	-1,8	-2,02	3.14**	3.88**	4.13**	-3,64
DRW	-3,14	-2,96	-0,99	3.28**	3.75**	-6,05
Twentyfour-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	-0,5	0,23	-2,43	1.59**	1.53**	-1,09
RW	-5,88	-4,96	-3,38	-2,66	-2,42	0,45
DRW	-5,44	-4,23	-3,69	-1,63	-1,13	-0,07

10%, 5% and 1% critical values are 0.764, 1.161 and 2.278 respectively for ENCNEW when excess parameters are 1

Table H.2) Forecasting fuels with Iceland Krone at multiple horizons – Out of sample analysis at population level.

Iceland exchange rate P/R= 1

ENCNEW						
One-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0,19	0,75	0,2	0,17	0,7	2.85**
RW	2.66*	2.15*	2.89**	4.06**	6.21***	7.54***
DRW	2.97**	2.48*	2.68*	4.48**	6.71***	8.09***
three-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	2.23**	2.48**	2.04**	1.29*	1.62**	8.82***
RW	3.06**	1,3	14.09***	7.40***	10.30***	13.72***
DRW	3.47**	1,68	13.61***	8.16***	11.21***	14.48***
Six-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	3.31***	3.78***	3.48***	3.01***	3.78***	14.25***
RW	6.32***	3.92**	38.54***	15.65***	19.20***	22.74***
DRW	5.71***	3.43**	37.78***	15.24***	18.78***	22.40***
Nine-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	1.25*	1.65**	5.02***	2.49**	3.17***	4.26***
RW	4.12**	1,6	43.01***	11.58***	14.50***	10.71***
DRW	2.86**	0,5	40.69***	10.64***	13.32***	9.64***
Twelve-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0,46	0.92*	0.98*	3.11***	3.28***	0.99*
RW	1,72	0,63	22.08***	10.04***	11.05***	1,47
DRW	-0,5	-1,57	18.50***	8.16***	9.24***	0,68
Fifteen-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	-0,67	-0,45	0,07	1.57**	1.63**	-0,91
RW	-0,04	-0,37	7.60***	7.21***	7.20***	-3,81
DRW	-2,48	-2,89	4.44**	4.99**	5.37***	-3,95
Twentyfour-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	-1,26	-1,76	-2,04	-2,14	-2,36	-0,12
RW	-1,33	-3,27	1,62	-2,23	-2,67	-0,31
DRW	-1,44	-3,74	1,48	-2,88	-2,89	0,36

10%, 5% and 1% critical values are 0.764, 1.161 and 2.278 respectively for ENCNEW when excess parameters are 1

Table H.3) Forecasting fuels with Australian Dollar at multiple horizons – Out of sample analysis at population level.

Australian exchange rate P/R= 1

ENCNEW						
One-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0,55	0,83	1.20*	1.41*	1.98**	1.52**
RW	3.09**	1,47	2.84**	6.31***	6.68***	2.85**
DRW	3.51**	1.84*	2.76*	6.89***	7.72***	3.62**
three-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	2.15**	2.10**	5.31***	4.00***	3.78***	4.56***
RW	-0,83	-1,57	14.09***	4.80**	4.32**	5.12***
DRW	0,91	-0,28	12.06***	6.24***	6.36***	5.41***
Six-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	-0,14	-0,69	3.47***	3.33***	3.11***	4.83***
RW	0,83	-0,72	29.69***	6.78***	8.00***	7.60***
DRW	-0,47	-2,05	27.29***	5.74***	6.70***	6.42***
Nine-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	-0,18	-0,65	1.48*	3.90***	3.75***	1.28*
RW	-0,81	-1,09	19.09***	5.30***	6.69***	1,73
DRW	-3,56	-3,89	17.82***	2.68*	3.52**	-0,94
Twelve-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	-0,48	-0,62	-0,39	3.69***	3.85***	-1,02
RW	-2,45	-2,11	7.53***	4.75**	5.96***	-2,8
DRW	-5,15	-4,74	4.03**	2.53*	3.09**	-5,32
Fifteen-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0,14	0,18	-1	3.77***	4.03***	-1,04
RW	-3,95	-3,63	3.17**	2.21*	2.76*	-3,55
DRW	-6,22	-5,63	-0,6	0,9	1,32	-5,69
Twentyfour-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	-1,06	-0,86	0,02	1.35*	1.02*	-0,69
RW	-8,26	-7,36	1,04	-4,94	-4,99	-2,62
DRW	-8,57	-7,02	0,1	-4,1	-3,9	-3,19

10%, 5% and 1% critical values are 0.764, 1.161 and 2.278 respectively for ENCNEW when excess parameters are 1

Table H.4) Forecasting fuels with Canadian Dollar at multiple horizons – Out of sample analysis at population level.

Canadian exchange rate P/R = 1

ENCNEW						
One-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	-0,26	-0,23	3.17***	-0,06	0,79	0,71
RW	-0,53	-0,77	2.95**	1,07	2.76*	0,68
DRW	0	-0,26	3.10**	1.84*	3.57**	1,34
three-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	-0,47	-0,19	8.69***	0.96*	1.42*	2.77**
RW	-3,85	-2,99	4.22**	-1,04	-0,15	-0,27
DRW	-1,81	-1,44	5.35***	1,02	2.01*	1,01
Six-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	1.67**	1.89**	7.25***	4.11***	5.29***	6.11***
RW	-1,45	-1,95	14.96***	3.69**	5.35***	3.99**
DRW	-0,17	-0,82	16.53***	5.42***	6.77***	5.00**
Nine-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	4.20***	3.16***	5.35***	7.42***	8.10***	3.12***
RW	2.35*	0,69	17.40***	7.09***	8.91***	4.55**
DRW	2.42*	0,64	17.53***	8.29***	9.74***	3.92**
Twelve-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	-0,17	-0,47	2.17**	3.78***	3.40***	-0,76
RW	0,99	0,32	9.25***	4.61**	5.19***	1,26
DRW	-0,66	-1,44	6.89***	4.70**	5.28***	-0,71
Fifteen-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	-2,42	-2,51	-0,27	0,53	0,48	-1,6
RW	-3,75	-4,4	1,06	-1,53	-1,23	-2,36
DRW	-6,43	-7	-0,65	-2,92	-2,44	-4,69
Twentyfour-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	-0,16	0,14	-0,46	1.68**	1.24*	-1,17
RW	-5,65	-5,37	-2,04	-3,72	-3,57	-1,62
DRW	-7,8	-6,73	-1,07	-4,68	-4,3	-3,05

10%, 5% and 1% critical values are 0.764, 1.161 and 2.278 respectively for ENCNEW when excess parameters are 1

Table H.5) Forecasting fuels with New Zealand Dollar at multiple horizons – Out of sample analysis at population level.

New Zealand exchange rate P/R = 1

ENCNEW						
One-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0.99*	0,77	1.41*	1.72**	2.61**	1.76**
RW	3.11**	1,44	5.04**	5.57***	7.66***	3.04**
DRW	3.52**	1.89*	4.38**	6.15***	8.31***	3.90**
three-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	5.26***	3.96***	7.00***	5.62***	5.96***	7.23***
RW	4.29**	1.82*	19.50***	8.72***	10.40***	8.26***
DRW	5.38***	2.75*	16.57***	9.46***	11.48***	9.05***
Six-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	4.94***	3.37***	7.19***	7.31***	7.19***	5.98***
RW	4.03**	1,57	29.02***	10.69***	11.91***	8.80***
DRW	3.78**	1,23	25.80***	10.43***	11.70***	9.10***
Nine-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0,39	-0,39	2.17**	3.21***	3.04***	0,26
RW	0,57	-0,21	18.91***	6.22***	6.88***	2.15*
DRW	-1,37	-2,15	17.01***	4.65**	5.11***	0,76
Twelve-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	-0,07	-0,42	0,03	2.65**	2.86***	-0,59
RW	-1,41	-1,43	10.43***	4.84**	5.76***	-1,06
DRW	-3,61	-3,36	6.97***	3.32**	3.89**	-3,02
Fifteen-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0,53	0,37	-0,36	2.99***	3.19***	-0,57
RW	-2,01	-2,01	5.71***	3.04**	3.49**	-2,01
DRW	-3,74	-3,4	1.90*	2.36*	2.83*	-3,41
Twentyfour-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	-1,02	-1,36	-0,93	-0,61	-0,74	-0,13
RW	-3,16	-2,64	3.08**	-1,7	-1,77	1,72
DRW	-5,22	-4,17	1,63	-2,93	-2,82	0,14

10%, 5% and 1% critical values are 0.764, 1.161 and 2.278 respectively for ENCNEW when excess parameters are 1

Table H.6) Forecasting fuels with Norwegian Krone at multiple horizons – Out of sample analysis at population level.

Norwegian exchange rate P/R= 1

ENCNEW						
One-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0,06	0,14	2.77**	0,85	1.78**	2.78**
RW	2.60*	0,76	6.56***	6.49***	9.35***	7.44***
DRW	2.77*	1,08	5.88***	6.38***	8.98***	7.07***
three-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	1.61**	1.58**	12.25***	3.63***	3.51***	7.34***
RW	-2,05	-2,4	24.55***	2.27*	5.04**	8.28***
DRW	-0,42	-1,35	19.38***	3.47**	5.92***	7.65***
Six-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	-0,74	-2,33	5.91***	2.23**	2.19**	4.03***
RW	1,7	0,51	32.47***	4.75**	6.65***	5.69***
DRW	-0,45	-1,95	26.07***	3.01**	4.37**	3.65**
Nine-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	-2,36	-3,5	0,58	1.09*	0,7	-0,2
RW	0,62	0,19	16.59***	3.06**	4.56**	-0,25
DRW	-3,46	-4,07	12.94***	-0,11	0,62	-3,65
Twelve-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	-3,57	-4,44	-0,41	-0,51	-0,76	-2,06
RW	-0,63	-1,04	5.39***	2.80*	3.93**	-2,23
DRW	-5,34	-5,62	0,17	-0,72	-0,16	-6,09
Fifteen-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	-2,76	-3,87	-0,51	-1,14	-1,08	-0,52
RW	-4,94	-5,21	1,57	-1,91	-1,88	-5,31
DRW	-9,18	-9,15	-4,23	-5,15	-5,16	-8,55
Twentyfour-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	-1,47	-2,23	0,62	-1,26	-1,57	1.19*
RW	-6,39	-6,25	1,72	-5,75	-5,99	-0,43
DRW	-9,94	-9,33	-0,48	-8,39	-8,47	-2,9

10%, 5% and 1% critical values are 0.764, 1.161 and 2.278 respectively for ENCNEW when excess parameters are 1

Table H.7) Forecasting fuels with Chilean Peso at multiple horizons – Out of sample analysis at sample level.

Chilean exchange rate P/R= 1

Ratios DM						
One-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0,99	0,97	0,98	0,99	0,98	1
RW	0,94	0,97	0,97	0.92*	0.89*	0,95
DRW	0,96	0,98	0,98	0,93	0.91*	0,95
three-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0,9	0,91	0,94	0,93	0,93	0,95
RW	0,94	0,97	0,95	0,92	0,9	0,95
DRW	0,96	0,99	0,96	0,95	0,92	0,95
Six-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0.89*	0.89*	0,93	0,91	0,9	0.89*
RW	0,95	0,97	0,96	0,92	0,9	0.91*
DRW	0,97	0,99	0,96	0,95	0,93	0,93
Nine-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0.95*	0,97	0,94	0.90**	0.88***	0,95
RW	1	1,01	0,95	0,94	0,92	1,01
DRW	1,02	1,03	0,95	0,97	0,96	1,05
Twelve-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0,98	0,98	0,98	0.92**	0.91**	1
RW	1,06	1,06	0,97	0,98	0,97	1,07
DRW	1,09	1,08	1,01	1,01	1	1,12
Fifteen-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0,99	0,98	1,02	0.95**	0.94**	1,03
RW	1,07	1,08	0,99	1	1	1,08
DRW	1,11	1,11	1,04	1,03	1,03	1,13
Twentyfour-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	1,02	1	1,05	0,99	0,99	1,02
RW	1,11	1,1	1,05	1,07	1,07	1
DRW	1,12	1,1	1,06	1,07	1,07	1,01

We consider the Diebold and Mariano (1995) and West (1996) test to evaluate the null hypothesis of equal MSPE and our test to evaluate the null of equal correlations.*p<0.1 *p<0.05,**p<0.01.

Table H.8) Forecasting fuels with Iceland Krone at multiple horizons – Out of sample analysis at sample level.

Iceland exchange rate P/R= 1

Ratios DM						
One-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	1	0,99	1,01	1,01	1,01	0,98
RW	1	1,01	0,98	0,99	0,98	0,98
DRW	1	1	0,99	0,99	0,97	0,97
three-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0.98*	0.98*	1	1,01	1,01	0.92*
RW	1,04	1,06	0,93	1	0,98	0,97
DRW	1,03	1,05	0,94	0,99	0,97	0,96
Six-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	0,98	0,97	1,02	1,01	1	0.87**
RW	1,07	1,1	0,86	1,02	1	1
DRW	1,09	1,11	0,87	1,03	1,01	1
Nine-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	1,01	1	1	1,01	1	0,96
RW	1,08	1,09	0,83	1,03	1,02	1,07
DRW	1,11	1,12	0,85	1,05	1,05	1,09
Twelve-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	1	0,99	1,02	0,98	0,98	0,99
RW	1,07	1,08	0,89	1	1	1,07
DRW	1,12	1,12	0,93	1,04	1,04	1,1
Fifteen-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	1,02	1,01	1,02	0,99	0,99	1,02
RW	1,07	1,08	0,97	1,02	1,02	1,11
DRW	1,14	1,14	1,01	1,08	1,07	1,12
Twentyfour-Step-AHead	***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	1,03	1,04	1,04	1,04	1,05	1,01
RW	1,04	1,07	1	1,07	1,07	1,02
DRW	1,06	1,09	1	1,11	1,09	1,02

We consider the Diebold and Mariano (1995) and West (1996) test to evaluate the null hypothesis of equal MSPE and our test to evaluate the null of equal correlations.*p<0.1 *p<0.05,**p<0.01.

Table H.9) Forecasting fuels with Australian Dollar at multiple horizons – Out of sample analysis at sample level.

Australian exchange rate P/R= 1

Ratios DM						
One-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	1	0,99	1	0,99	0,99	0,99
RW	1	1,01	0,99	0.98**	0.98*	1
DRW	0,99	1	0,99	0.97*	0.97*	0,99
three-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	0.97*	0.97*	0,97	0,97	0,97	0.95*
RW	1,05	1,04	0.93*	1	1	0,97
DRW	1,03	1,03	0.94*	0,99	0,99	0,97
Six-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	1	1,01	1,02	0,97	0,97	0.94**
RW	1,03	1,04	0,97	1,01	0,98	0,99
DRW	1,07	1,07	0,94	1,04	1,02	1
Nine-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	1	1,01	1,02	0.95**	0.95**	0.98**
RW	1,08	1,06	1,09	1,05	1,03	1,09
DRW	1,16	1,13	1,08	1,12	1,11	1,14
Twelve-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	1,01	1,01	1,01	0.95***	0.95***	1,02
RW	1,11	1,08	1,07	1,04	1,03	1,1
DRW	1,21	1,17	1,13	1,13	1,13	1,16
Fifteen-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	1	1	1,02	0.95***	0.94***	1,02
RW	1,15	1,13	1,05	1,09	1,09	1,11
DRW	1,29	1,25	1,12	1,21	1,22	1,18
Twentyfour-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	1,02	1,02	1,01	0,98	0,98	1,01
RW	1,19	1,17	1,08	1,18	1,16	1,06
DRW	1,33	1,27	1,17	1,32	1,28	1,12

We consider the Diebold and Mariano (1995) and West (1996) test to evaluate the null hypothesis of equal MSPE and our test to evaluate the null of equal correlations.*p<0.1 *p<0.05,***p<0.01.

Table H.10) Forecasting fuels with Canadian Dollar at multiple horizons – Out of sample analysis at sample level.

Canadian exchange rate P/R = 1

Ratios DM						
One-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	1	1	0.97*	1,01	1	1
RW	1,02	1,02	0,99	1	0,99	1,01
DRW	1,01	1,01	0,98	1	0,99	1
three-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	1,01	1	0.94*	0,99	0,99	0,97
RW	1,06	1,04	1,01	1,03	1,02	1,02
DRW	1,03	1,03	0,99	1,01	1	1
Six-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	0.98**	0.98**	0,98	0.96**	0.94**	0.93**
RW	1,04	1,05	0,94	1	0,98	0,98
DRW	1,03	1,04	0,92	1	0,98	0,97
Nine-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	0.95**	0.96**	0,99	0.92**	0.91**	0.96**
RW	1	1,01	0,92	0,97	0,95	0,97
DRW	1,03	1,04	0,92	0,99	0,97	0,99
Twelve-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	1	1,01	0,99	0.95**	0.96**	1,01
RW	1	1,01	0,93	0,96	0,96	0,99
DRW	1,05	1,05	0,96	1	0,99	1,02
Fifteen-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	1,04	1,05	1,01	0,99	0,99	1,03
RW	1,07	1,08	1	1,03	1,03	1,04
DRW	1,13	1,14	1,01	1,09	1,08	1,08
Twentyfour-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	1,01	1	1,02	0.98*	0,98	1,02
RW	1,12	1,12	1,03	1,11	1,09	1,03
DRW	1,32	1,28	1,05	1,29	1,26	1,1

We consider the Diebold and Mariano (1995) and West (1996) test to evaluate the null hypothesis of equal MSPE and our test to evaluate the null of equal correlations.*p<0.1 *p<0.05,***p<0.01.

Table H.11) Forecasting fuels with New Zealand Dollar at multiple horizons – Out of sample analysis at sample level.

New Zealand exchange rate P/R = 1

Ratios DM						
One-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	0,99	0,99	1	0,99	0,98	0,99
RW	1	1,01	0,98	0,98	0,97	0,99
DRW	0,99	1	0,98	0,97	0,96	0,98
three-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	0.94**	0.95**	0,97	0,95	0,95	0.93**
RW	1,02	1,04	0.90*	0,98	0,97	0,96
DRW	1,01	1,02	0.91*	0,98	0,96	0,95
Six-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	0.94**	0.96**	0,96	0.92**	0.92**	0.93**
RW	1,02	1,04	0.86*	0,98	0,97	0,98
DRW	1,03	1,05	0.87*	0,99	0,98	0,97
Nine-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	1	1,01	1	0.96**	0.96**	1
RW	1,04	1,04	0,95	1	1	1,04
DRW	1,1	1,08	0,96	1,05	1,05	1,06
Twelve-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	1	1,01	1,01	0.96***	0.96**	1,01
RW	1,09	1,07	1	1,02	1,01	1,06
DRW	1,17	1,14	1,04	1,08	1,08	1,1
Fifteen-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	0,99	1	1,01	0.96**	0.96**	1,01
RW	1,11	1,1	1,01	1,05	1,05	1,06
DRW	1,21	1,18	1,08	1,14	1,14	1,11
Twentyfour-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	1,02	1,03	1,03	1,01	1,01	1,01
RW	1,07	1,06	0,99	1,06	1,05	0,99
DRW	1,17	1,14	1,05	1,17	1,15	1,04

We consider the Diebold and Mariano (1995) and West (1996) test to evaluate the null hypothesis of equal MSPE and our test to evaluate the null of equal correlations.*p<0.1 *p<0.05,***p<0.01.

Table H.12) Forecasting fuels with Norwegian Krone at multiple horizons – Out of sample analysis at sample level.

Norwegian exchange rate P/R= 1

Ratios DM						
One-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	1	1	0,99	1	0,99	0,99
RW	1	1,01	0.97*	0,98	0.96*	0.97*
DRW	1	1,01	0.97*	0,98	0,96	0.97*
three-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	0.98*	0.98*	0.92*	0.97**	0.97*	0.93**
RW	1,05	1,05	0.88**	1,01	0,99	0,96
DRW	1,03	1,03	0.90**	1	0,99	0,96
Six-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	1,02	1,05	1	0.97*	0,97	0.95*
RW	0,99	1,01	0,93	0,97	0.95*	0,96
DRW	1,03	1,05	0,92	1	1	0,99
Nine-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	1,05	1,07	1,04	0,99	0,99	1
RW	1,01	1,02	1,07	0,98	0,97	1,03
DRW	1,08	1,09	1,06	1,05	1,05	1,09
Twelve-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	1,07	1,09	1,01	1,01	1,02	1,04
RW	1,04	1,05	1,07	0,99	0,98	1,06
DRW	1,12	1,12	1,15	1,06	1,06	1,12
Fifteen-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	1,05	1,08	1,01	1,02	1,02	1,02
RW	1,1	1,1	1,06	1,05	1,05	1,11
DRW	1,21	1,2	1,16	1,14	1,15	1,18
Twentyfour-Step-AHead	*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	1,03	1,05	1	1,02	1,03	0,98
RW	1,13	1,12	1,05	1,13	1,13	1,05
DRW	1,3	1,26	1,15	1,29	1,29	1,14

We consider the Diebold and Mariano (1995) and West (1996) test to evaluate the null hypothesis of equal MSPE and our test to evaluate the null of equal correlations.*p<0.1 *p<0.05,***p<0.01.

I. Forecasting fuels with currencies – Out sample analysis finding paradox P/R = 2.

Chilean exchange rate P/R = 2

One-Step-AHead		*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	*R2 Beta*	0.08***	0,03	0.03**	0.08**	0.10***	0.04**
	R2	-0,05	0,03	0	-0,06	-0.09*	-0,02
RW	*R2 Beta*	0.07**	0.04*	0.03**	0.08***	0.11***	0.05***
	R2	-0,06	-0,03	-0,03	-0.08*	-0.11*	-0,05
DRW	*R2 Beta*	0,07	0,05	0,03	0,08	0,1	0,05
	R2	-0,02	-0,08	-0.06*	-0,06	-0.10*	-0.10**

Iceland exchange rate

One-Step-AHead		*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	*R2 Beta*	0.05**	0	0,01	0,03	0.03*	0,02
	R2	-0,01	0,07	0,01	-0,01	-0,01	0,02
RW	*R2 Beta*	0,01	0,01	0,01	0,02	0.03*	0.04*
	R2	0	0,01	-0,02	-0,01	-0,02	-0,02
DRW	*R2 Beta*	0,02	0,01	0,01	0,03	0,04	0,04
	R2	0,02	-0,06	-0.05**	-0,01	-0,04	-0.08*

Australian exchange rate

One-Step-AHead		*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	*R2 Beta*	0.04***	0	0,01	0.03**	0.03**	0
	R2	-0,01	0,07	0,02	-0,02	-0,01	0,03
RW	*R2 Beta*	0,01	0	0.01*	0.03**	0.03***	0,01
	R2	0	0,01	-0,01	-0.02**	-0.02*	0
DRW	*R2 Beta*	0,02	0,01	0,02	0,04	0,04	0,02
	R2	0,01	-0,06	-0.05**	-0,02	-0.04*	-0.06**

Canadian exchange rate

One-Step-AHead		*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	*R2 Beta*	0.03***	-0,01	0,01	0,01	0,01	-0,02
	R2	0	0,09	0,02	0	0,01	0.06**
RW	*R2 Beta*	-0.01*	-0.01*	0.01**	0	0,01	0
	R2	0.02**	0.02**	-0,01	0	-0,01	0,01
DRW	*R2 Beta*	0	0	0,02	0,01	0,02	0,01
	R2	0,03	-0,05	-0.05**	0	-0,02	-0.05**

New Zealand exchange rate

One-Step-AHead		*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	*R2 Beta*	0.04**	0	0.02*	0.03*	0.04**	0
	R2	-0,01	0,07	0	-0,01	-0,02	0,03
RW	*R2 Beta*	0,01	0	0.03**	0.03**	0.04***	0,02
	R2	0	0,01	-0,02	-0,02	-0,03	-0,01
DRW	*R2 Beta*	0,02	0,01	0,02	0,03	0,04	0,02
	R2	0,01	-0,06	-0.06**	-0,02	-0,04	-0.07**

Norwegian exchange rate

One-Step-AHead		*WTI*	*Brent*	*Natural Gas*	*Kerosene*	*Heating Oil*	*Propane*
AR(1)	*R2 Beta*	0.04**	0	0.03**	0.03*	0.04***	0.02*
	R2	-0,01	0,08	-0,01	-0,01	-0,02	0,01
RW	*R2 Beta*	0,01	0	0.03**	0.03**	0.05***	0.04**
	R2	0	0,01	-0.03*	-0,02	-0.04*	-0.03*
DRW	*R2 Beta*	0,02	0,01	0,03	0,04	0,05	0,04
	R2	0,02	-0,05	-0.07**	-0,02	-0,04	-0.08**

"R2 Beta" are the R2 obtained by regression, HAC errors are calculated according to Newey and West (1987,1994).The "R2" are constructed based on Goyal and Welch (2008) and Pincheira (2013).Statistical significance is evaluated with Diebold - Mariano (1995) and West (1996).

J. *Forecasting fuels with currencies – Out sample analysis finding paradox P/R = 1.*

Chilean exchange rate		P/R = 1					
One-Step-AHead		***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	***R2 Beta***	0.04***	0,01	0.02*	0.03**	0.05***	0.03**
	R2	-0,03	0,02	0	-0,02	-0,04	-0,01
RW	***R2 Beta***	0.03**	0.02*	0.02**	0.04***	0.06***	0.02**
	R2	-0,03	-0,02	-0,01	-0,04	-0,06	-0,01
DRW	***R2 Beta***	0,03	0,03	0,02	0,04	0,06	0,02
	R2	0	-0,06	-0,03	-0,02	-0,03	0
Iceland exchange rate		P/R = 1					
One-Step-AHead		***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	***R2 Beta***	0.03**	0	-0,01	0,01	0,01	0.02*
	R2	-0,01	0,04	0.02*	0	0	-0,03
RW	***R2 Beta***	0	0	0	0	0,01	0.02*
	R2	0	0	0	0	-0,01	-0,03
DRW	***R2 Beta***	0,01	0,01	0	0,01	0,02	0,03
	R2	0,01	-0,05	-0,01	0	0	-0,02
Australian exchange rate		P/R = 1					
One-Step-AHead		***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	***R2 Beta***	0.03***	0	0,01	0,01	0.02*	0.01*
	R2	-0,02	0,04	0,01	-0,02	-0,02	-0,02
RW	***R2 Beta***	0,01	0	0.01*	0.02**	0.02**	0.01*
	R2	-0,01	-0,01	0	-0.03*	-0.03*	-0,01
DRW	***R2 Beta***	0,01	0,01	0,01	0,02	0,02	0,01
	R2	0,01	-0,05	-0.02***	-0,01	-0,02	0
Canadian exchange rate		P/R = 1					
One-Step-AHead		***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	***R2 Beta***	0.03***	0	0.02**	0,01	0,01	0,01
	R2	-0,01	0,05	-0,01	0	-0,01	-0,01
RW	***R2 Beta***	0	0	0.02**	0	0.01*	0
	R2	0	0	-0,02	-0,01	-0,02	0
DRW	***R2 Beta***	0	0	0,02	0,01	0,01	0,01
	R2	0,02	-0,05	-0.04**	0,01	-0,01	0,01
New Zealand exchange rat		P/R = 1					
One-Step-AHead		***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	***R2 Beta***	0.04**	0	0,01	0,02	0.02*	0.02**
	R2	-0,03	0,04	0,02	-0,02	-0,03	-0,02
RW	***R2 Beta***	0,01	0	0,01	0.02*	0.02**	0.01*
	R2	-0,02	-0,01	0	-0.03*	-0.04*	-0,02
DRW	***R2 Beta***	0,01	0,01	0,01	0,02	0,03	0,01
	R2	0	-0,06	-0.02*	-0,02	-0,02	-0,01
Norwegian exchange rate		P/R = 1					
One-Step-AHead		***WTI***	***Brent***	***Natural Gas***	***Kerosene***	***Heating Oil***	***Propane***
AR(1)	***R2 Beta***	0.03**	0	0.02*	0,01	0.02*	0.02**
	R2	-0,01	0,05	0	-0,01	-0,02	-0,02
RW	***R2 Beta***	0	0	0.02**	0.01*	0.02**	0.02**
	R2	-0,01	0	-0,01	-0,02	-0,03	-0,02
DRW	***R2 Beta***	0,01	0,01	0,02	0,02	0,03	0,02
	R2	0,01	-0,05	-0.03*	0	-0,01	-0,01

"R2 Beta" are the R2 obtained by regression, HAC errors are calculated according to Newey and West (1987,1994).The "R2" are constructed based on Goyal and Welch (2008) and Pincheira (2013).Statistical significance is evaluated with Diebold- Mariano (1995) and West (1996).

K. *Forecasting base metals with currencies – Out sample analysis finding paradox P/R = 2.*

Chilean exchange rate		P/R = 2						
One-Step-AHead		***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	***R2 Beta***	0,02	0.08**	0,03	0	0,04	-0.02*	0.05*
	R2	0,03	-0,04	-0,01	0,01	-0,01	0.07**	-0,02
RW	***R2 Beta***	0.04*	0.06*	0,02	0	0.04*	-0,01	0.05*
	R2	-0,03	-0,05	0	-0,01	-0,03	0.05**	-0,04
DRW	***R2 Beta***	0.04*	0.07**	0,02	0,01	0.04*	-0,01	0.06**
	R2	-0,04	-0,07	-0,02	-0.03*	-0,04	0.03*	-0,06
Iceland exchange rate		P/R = 2						
One-Step-AHead		***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	***R2 Beta***	0,03	0.09*	0,02	-0,02	0,05	0	0.05*
	R2	0,01	-0,05	0,02	0.05**	-0,01	0.06***	-0,02
RW	***R2 Beta***	0,02	0,02	0,04	-0,02	0,02	-0.02**	0,01
	R2	-0,01	0,02	-0,02	0,04	-0,01	0.05**	0,02
DRW	***R2 Beta***	0,02	0,02	0,04	-0,01	0.02*	-0.01*	0,02
	R2	-0,02	-0,02	-0,04	0,01	-0,02	0,02	-0,01
Australian exchange rate		P/R = 2						
One-Step-AHead		***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	***R2 Beta***	0,02	0.07*	0,03	-0,01	0,06	-0,02	0,05
	R2	0,05	-0,01	0,01	0.03*	-0,02	0.08**	0,01
RW	***R2 Beta***	0	0,01	0	-0,02	0,03	-0.03**	0
	R2	0,03	0.04***	0,02	0,05	0	0,05	0,05
DRW	***R2 Beta***	0,01	0,02	0,01	-0,01	0,04	-0.02*	0,02
	R2	0	-0,01	-0,01	0,01	-0,02	0,02	0
Canadian exchange rate		P/R = 2						
One-Step-AHead		***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	***R2 Beta***	0	0,03	0,02	-0,01	0,03	-0.03***	0,01
	R2	0,05	0,02	0	0.03*	0	0.08***	0,04
RW	***R2 Beta***	0	-0,01	0,01	-0,01	-0,01	-0.02**	-0,01
	R2	0,01	0.02**	0	0,03	0.03**	0.04***	0.02**
DRW	***R2 Beta***	0,01	0	0,02	0	0	-0.02**	0
	R2	0	-0,01	-0,02	0	0,01	0.03*	-0,01
New Zealand exchange rat		P/R = 2						
One-Step-AHead		***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	***R2 Beta***	0,01	0,05	0,02	-0,01	0,04	-0,02	0,03
	R2	0,06	0,02	0,02	0.04*	0,01	0.07**	0,04
RW	***R2 Beta***	0,01	-0,02	0,01	-0,02	0,01	-0.02***	-0,02
	R2	0,02	0.06*	0,01	0,05	0,02	0.03*	0.06*
DRW	***R2 Beta***	0,01	-0,01	0,02	-0,01	0,02	-0.01**	-0,01
	R2	0	0.01***	-0,02	0,01	0	0	0,01
South African exchange ra		P/R = 2						
One-Step-AHead		***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1)	***R2 Beta***	0,01	0,06	0.04*	0	0,04	-0,02	0,04
	R2	0.08*	0,02	0,01	0,03	0,03	0.08***	0,04
RW	***R2 Beta***	-0,01	-0,01	0	-0,01	0	-0.01***	-0,01
	R2	0.02*	0,03	0,01	0,02	0	0.01**	0,02
DRW	***R2 Beta***	0	0	0	0	0	-0.01**	0
	R2	0,01	0	-0,01	-0,01	0	-0,01	0

"R2 Beta" are the R2 obtained by regression, HAC errors are calculated according to Newey and West (1987,1994).The "R2" are constructed based on Goyal and Welch (2008), and Pincheira (2013).Statistical significance is evaluated with Diebold - Mariano (1995), and

L. Forecasting base metals with currencies – Out sample analysis finding paradox P/R = 1.

Chilean exchange rate	P/R = 1						
One-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1) ***R2 Beta***	-0,01	-0,02	0.03*	-0,01	-0,02	0	-0,01
R2	0.07**	0,09	-0,02	0,02	0,05	0,01	0,07
RW ***R2 Beta***	0,01	-0,01	0,01	0	-0,01	0	0
R2	0,02	0,06	0	-0,02	0,03	0,01	0,03
DRW ***R2 Beta***	0,01	0	0,02	0.01*	0	0	0,01
R2	0,02	0,04	-0,02	-0.03**	0,01	0,01	0,02
Iceland exchange rate	P/R = 1						
One-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1) ***R2 Beta***	-0,02	-0.03*	0.03*	-0,02	0	0	-0,02
R2	0.08***	0.09*	-0,01	0.03*	0,03	0,02	0.07**
RW ***R2 Beta***	0	-0,01	0,01	0	0	0	0
R2	0,02	0.04**	0,02	-0.01*	0	0,01	0,02
DRW ***R2 Beta***	0	0	0,02	0.01**	0,01	0	0,01
R2	0,01	-0,01	-0.02**	-0.03***	-0.04**	0,01	-0,01
Australian exchange rate	P/R = 1						
One-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1) ***R2 Beta***	-0,02	-0,03	0,02	-0.03**	-0,02	0	-0,03
R2	0.09**	0.11*	0	0.05***	0,06	0,02	0.10**
RW ***R2 Beta***	0	-0,02	0	-0,01	-0,01	0	-0,01
R2	0,01	0,04	0	0,01	0,02	0,01	0,03
DRW ***R2 Beta***	0,01	-0,01	0,01	0	0	0	0
R2	0,01	0,02	-0,02	-0,01	0,01	0,01	0,01
Canadian exchange rate	P/R = 1						
One-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1) ***R2 Beta***	-0.02*	-0.03*	0,02	-0.02***	-0,02	0	-0.03*
R2	0.07**	0.09*	-0,02	0.04**	0.05*	0,01	0.08**
RW ***R2 Beta***	0	-0.02***	0	-0.01*	-0.01**	-0.01**	-0.01*
R2	0,01	0,02	0	0,01	0,02	0.01***	0,01
DRW ***R2 Beta***	0	-0,01	0,01	0	-0,01	-0.01***	0
R2	0,01	-0,01	-0,02	-0,01	0	0,01	-0,01
New Zealand exchange rat	P/R = 1						
One-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1) ***R2 Beta***	-0,03	-0.05*	0,03	-0.02**	-0,02	0	-0,04
R2	0.11**	0.15**	0,01	0.05**	0,08	0,02	0.13**
RW ***R2 Beta***	0	-0.02**	0,01	-0,01	-0,02	0	-0,01
R2	0,02	0,02	0	0	0,03	0.01*	0,02
DRW ***R2 Beta***	0	-0,01	0,01	0	-0,01	0	0
R2	0,02	-0,01	-0,03	-0.02**	0,02	0,01	0
South African exchange ra	P/R = 1						
One-Step-AHead	***Aluminum***	***Copper***	***Lead***	***Nickel***	***Tin***	***Zinc***	***Lmex***
AR(1) ***R2 Beta***	-0,01	-0,02	0.06**	-0,01	-0,01	0	-0,01
R2	0.12***	0.12*	-0,01	0,02	0,06	0,03	0.10*
RW ***R2 Beta***	0	-0,01	0,01	0	0	-0,01	0
R2	0,01	0,01	-0,02	-0,01	0	0.01**	0
DRW ***R2 Beta***	0	0	0.02**	0,01	0	-0.00*	0,01
R2	0	-0,02	-0.05***	-0.03**	-0,02	0,01	-0,02

"R2 Beta" are the R2 obtained by regression, HAC errors are calculated according to Newey and West (1987,1994).The "R2" are constructed based on Goyal and Welch (2008) and Pincheira (2013).Statistical significance is evaluated with Diebold - Mariano (1995) and

M. Glossary - Paradox: comparing test.

COEF	"Coef" Represents the percentage of rejections using the correlation-based predictability test with the regression.
PH	"PH" Represents the percentage of rejections using the correlation-based predictability test.
DM	"DM" Represents the percentage of rejections using the Diebolds-Mariano test.
W: C-NDM (Currencies)	Weak paradox: The null hypothesis is rejected in the regression but not in the Diebold-Mariano test, the rejection is in favor of the model with currencies.
W: C-NDM (Benchmark)	Weak paradox: The null hypothesis is rejected in the regression but not in the Diebold-Mariano test, the rejection is in favor of the model without currencies.
W: NC-DM (Currencies)	Weak paradox: The null hypothesis is not rejected in the regression but in the Diebold-Mariano test, the rejection is in favor of the model with currencies.
W: NC-DM (Benchmark)	Weak paradox: The null hypothesis is not rejected in the regression but in the Diebold-Mariano test, the rejection is in favor of the model without currencies.
S: C(+)-DM(-)	Strong paradox: It is rejected in the regression in favor of the model with currencies while it is rejected in the DM test in favor of the model without currencies.
S: C(-)-DM(+)	Strong paradox: Rejected in the regression in favor of the model without currencies while rejected in the DM test in favor of the model with currencies.
W: PH-NDM (Currencies)	Weak paradox: The null hypothesis is rejected in the PH test but not in the Diebold-Mariano test, the rejection is in favor of the model with currencies.
W: PH-NDM (Benchmark)	Weak Paradox: The null hypothesis is rejected in the PH test but not in the Diebold-Mariano test, the rejection is in favor of the model with currencies.
W: NPH-DM (Currencies)	Weak paradox: The null hypothesis is not rejected in the PH test but in the Diebold-Mariano test, the rejection is in favor of the model with currencies.
W: NPH-DM (Benchmark)	Weak paradox: The null hypothesis is not rejected in the PH test but in the Diebold-Mariano test, the rejection is in favor of the model without currencies.
S: PH(+)-DM(-)	Strong paradox: It is rejected in the PH test in favor of the model with currencies while it is rejected in the DM test in favor of the model without currencies.
S: PH(-)-DM(+)	Strong paradox: The PH test rejects in favor of the model without currencies while the DM test rejects in favor of the model with currencies.