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### Forecasting Stock Returns Volatility of the G7 Over Centuries: The Role of Climate Risks Elie Bouri Lebanese American University Rangan Gupta University of Pretoria Asingamaanda Liphadzi University of Pretoria Christian Pierdzioch Helmut Schmidt University Working Paper: 2024-24 June 2024

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# Forecasting Stock Returns Volatility of the G7 Over Centuries: The Role of Climate Risks

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#### Abstract

We analyze whether changes in temperature anomalies, and its second, third, and fourth moments carry valuable information in forecasting historical stock returns volatility of Canada, France, Germany, Italy, Japan, the United Kingdom (UK), and the United States (US), i.e., the G7 countries, after controlling for leverage, skewness and (excess) kurtosis of stock price fluctuations. Using centuries of monthly data, covering the period 1915–2024 for Canada and Italy, 1898–2024 for France, 1870–2024 for Germany, 1914–2024 for Japan, 1693–2024 for the UK, and 1791–2024 for the US, the results show that stock market moments matter more than climate risks for accurately forecasting stock returns volatility. Extended analyses confirm that climate risks are already captured by the moments of stock returns. We discuss the implications of our findings for investment decisions and economic policy.

JEL Classifications: C22; C32; C53; G10; G17; Q54

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### **1** Introduction

Climate change-related extreme weather conditions constitute a large aggregate risk (Del Fava et al., 2024). Climate risks also have been shown theoretically to reduce productivity and/or increase the stochastic depreciation rate of capital in Dynamic Stochastic General Equilibrium (DSGE) models and, thus, can be expected to give rise to adverse impacts on equity valuations (Donadelli et al., 2017, 2021a, 2021b, 2022; Giglio et al., 2021a). In other words, climate risks tend to impact negatively future (aggregate and sectoral) stock returns, as has been shown empirically by Balvers et al. (2017), Choi et al. (2020), Bolton and Kacperczyk (2021), Balcilar et al. (2023), Faccini et al. (2023), Salisu et al. (2023a, 2024), among others.<sup>1</sup>

Building on the first-moment impact of climate risks on stock markets, two recent studies by Bonato et al. (2023) and Wu et al. (2024) have highlighted its role in fore-casting stock returns volatility.<sup>2</sup> In the former study, the authors provide evidence of forecastability of US state-level realized stock-market volatility (derived from intraday data) at medium- to long forecasting horizons, while they provide in the latter study results for an emerging market, namely South Africa, and show that climate risks carry out-of-sample predictive information for conditional volatility, especially at longer forecasting horizons.<sup>3</sup>

In this research, we extend this literature by analyzing the role of climate risks in forecasting the second moment of monthly stock returns of the G7 countries, i.e., Canada, France, Germany, Italy, Japan, the UK, and the US, from a historical perspec-

<sup>&</sup>lt;sup>1</sup>In this regard, a related strand of literature has highlighted comparatively better portfolio performance of green stocks rather than brown stocks in hedging climate risks (see, for example, Engle et al. (2020), Cepni et al. (2022, 2023), Ardia et al. (2023)).

<sup>&</sup>lt;sup>2</sup>From an in-sample perspective, Penzin et al. (2024) has related climate risks with stock market volatility, conditional on levels of technological changes.

<sup>&</sup>lt;sup>3</sup>In this context, it is important to mention the works of Chen et al. (2023), Lv and Li (2023), and Lasisi et al. (2024), who show that uncertainty surrounding climate policies can produce forecasting gains in Generalized Autoregressive Conditional Heteroskedasticity (GARCH)-type models for aggregate and sectoral stock returns volatility of China, the United Kingdom (UK) and the US.

tive. Specifically, we collected data starting at March, 1915 for Canada and Italy, February, 1898 for France, February, 1870 for Germany, September, 1914 for Japan, March, 1693 for the UK, and October, 1791 for the US, with all the time series of stock returns ending in January, 2024. Besides the availability of the longest possible samples of stock market data to avoid a potential sample-selection-bias, our choice of the aforementioned stock markets was primarily motivated by their importance to the global economy, because they represent nearly two-thirds of global net wealth and nearly half of the world output (Das et al., 2019; Salisu et al., 2023b). Hence, analyzing the link between climate risks and stock market volatility for the G7 countries is of pivotal importance from the perspective of the stability to the world financial system, and its associated investment and policy implications. Furthermore, by studying such long spans of data, we were able to capture the fact that climate change is a slow-moving process and its effects have tended to aggravate over time as economies have become more industrialized.

In order to achieve our objective, we proceeded in two steps. In the first step, we used the Autoregressive Conditional Density (ACD) model (Hansen, 1994) to estimate the conditional volatility of the G7 stock returns, which we aim to forecast. The advantage of the ACD model is that it also estimates the skewness (depicting asymmetry) and the (excess) kurtosis (capturing outliers) series. This is important because skewness and kurtosis, along with leverage (i.e., a time series of negative stock returns), have been shown to play important roles in forecasting stock market volatility (Mei et al., 2017; Zhang et al., 2021; Bonato et al., 2023). Hence, we use in our predictive framework leverage, skewness, and (excess) kurtosis as controls to avoid a potential omitted-variables-bias, along with the measures of climate risks. As far as measures of climate risks are concerned, besides the year-on-year changes in country-specific temperature anomalies, we used the ACD model again to derive the associated measures of conditional volatility, skewness, and (excess) kurtosis. In the process, unlike the above-mentioned literature that models climate risks with the first and second moments of changes in temperature anomalies, we were able to capture asymmetric and extreme climate-related risks as well through the third and fourth moments of the deviation of temperature from its long-term trend.

Once we had obtained the moments of both stock returns and changes in temperature anomalies, in the second step, we utilized a (conditional mean-based) predictive regression model to check for the forecasting ability of the four climate risks predictors for the stock market volatility of the G7 countries, over and above the role of leverage, skewness, and (excess) kurtosis of the corresponding stock returns. In addition, we utilized a quantile regression model (originally developed by Koenker and Bassett (1978)) for our forecasting exercise, which renders it possible to investigate the predictive ability of the predictors in forecasting the entire conditional distribution of stock market volatility. Studying the entire conditional distribution is important because the conditional mean may "hide" interesting characteristics of the predictand (Meligkotsidou et al., 2014), and can lead to poor predictive performance, with the predictors possibly being valuable for forecasting certain parts of the conditional distribution of stock market volatility. Furthermore, the quantile regression model retains the simple structure of a linear framework for any given quantile of volatility but, simultaneously, renders it possible to consider an element of nonlinearity because the coefficients of the predictive model are allowed to vary across the different quantiles of the conditional distribution of stock market volatility. This is important especially in our context because we analyzed centuries of data, wherein the relationship between the predictand and the predictors may have been disrupted by regime changes (see,, for example, the discussions in Balcilar et al. (2023), and Salisu et al. (2023a, b)).

A forecasting experiment involving the role of climate-related physical risks, which have become more prevalent in terms of magnitude, severity, and frequency, with this trend expected to continue in the future (Mendelsohn et al., 2012; Stott, 2016), on the volatility of the G7 stock markets is indeed a pertinent issue. Accurate forecasts of stock market volatility carry widespread investment implications, being an input in portfolio models, derivative pricing, and risk management (Poon and Granger, 2003; Rapach et al., 2008). In addition, stock market volatility, as was evident during the Global Financial Crisis of 2007–2009 and the recent COVID-19 pandemic, can impinge back on the economy as a whole via its effect on real economic activity and public confidence (Jurado et al., 2015; Ludvigson et al., 2021). Naturally, forecasts of stock market volatility can serve as a measure of the vulnerability of the overall financial system and the whole economy and, thereby, help policymakers design appropriate preventive policies. Finally, our research also carries academic value in that we are postulate the hypothesis that climate risks can predict stock market volatility and, in turn, check for its validity in the context of an out-of-sample forecasting exercise, which is well-established as a stronger test of predictability than in-sample analyses (Campbell, 2008).

At this stage, given our testable empirical hypothesis, it makes perfect sense to outline a theoretical link through which climate risks, serving as a proxy for rare disaster events (Bansal et al., 2021, forthcoming; Giglio et al., 2021b), are expected to drive stock market volatility. Rietz (1988), and later Barro (2006, 2009), have proposed models of rare disasters to explain the equity premium puzzle, which was initially identified by Mehra and Prescott (1985). More recently, Wachter (2013) and Tsai and Wachter (2015) have extended this line of research by developing theoretical frameworks in which aggregate consumption follows a normal distribution with low volatility most of the time, but a far out-in-the-left-tail realization of consumption can occur with some probability, creating disaster risk. Disaster risk not only substantially raises the equity premium, but the time-variation in its probability is reflected in stock market volatility. In other words, a well-established theoretical channel exists that warrants a detailed empirical analysis of the link between extreme-climate events-produced disaster risks and stock market volatility of the G7 countries. In light of this, we lay out in our research empirical results that shed light on the climate-risks-stock-market-volatility nexus from a forecasting perspective for the first time covering multiple centuries of data.

We organize the rest of this research as follows. In Section 2, we provide a description of the data we use in our study, while we outline in Section 3 the ACD model used to derive the moments of our data, and the linear and quantiles-based forecasting models. In Section 4, we present our empirical results. In Section 5, we conclude.

### 2 Data

Our dataset consists of the monthly aggregate stock market indexes of the G7 countries, namely the S&P TSX 300 Composite Index for Canada, the CAC All-Tradable Index for France, the CDAX Composite Index for Germany, the Banca Commerciale Italiana Index for Italy, the Nikkei 225 Index for Japan, the FTSE All Share Index for the UK and the S&P500 Index for the US. For each stock index, we compute log-returns (in percentages) as the first-difference of the logs of the index, multiplied by 100. We obtained the data on the stock indexes Global Financial Data.<sup>4</sup>

As far as the corresponding monthly temperature anomalies (relative to a historical mean over the period 1991–2020) data are concerned, barring the UK and the US, we obtained the data from the website of the National Oceanic and Atmospheric Administration (NOAA).<sup>5</sup> Because the NOAA data on temperature anomalies only start from 1850:01, we rely on data from the Met Office Hadley Centre for relevant data for the UK,<sup>6</sup> and Berkeley Earth<sup>7</sup> for the US until 2016:12, <sup>8</sup>, and then updated up to and including 2024:01using comparable values of temperature anomalies from the NOAA.<sup>9</sup> Once we obtained the temperature anomalies, we computed year-on-year changes of the

<sup>&</sup>lt;sup>4</sup>https://globalfinancialdata.com/.

<sup>&</sup>lt;sup>5</sup>See: https://www.ncei.noaa.gov/access/monitoring/climate-at-a-glance/global/ time-series, wherein we need to specify the respective coordinates, i.e., latitude and longitude.

<sup>&</sup>lt;sup>6</sup>https://www.metoffice.gov.uk/hadobs/hadcet/data/download.html.

<sup>&</sup>lt;sup>7</sup>https://berkeleyearth.org/data/.

<sup>&</sup>lt;sup>8</sup>https://berkeley-earth-temperature.s3.us-west-1.amazonaws.com/Regional/TAVG/ united-states-TAVG-Trend.txt.

<sup>9</sup>https://www.ncei.noaa.gov/access/monitoring/climate-at-a-glance/national/ time-series.

monthly variables to ensure that we removed any seasonal patterns.

Based on the availability of stock market data, the coverage is heterogenous with Canada and Italy starting in 1915:03, France in 1898:02, Germany in 1870:02, Japan in 1914:09, the UK in 1693:03, and the US in 1791:10, but all the data end in 2024:01, corresponding to the availability of the latest data at the time of conducting the estimations.

### **3** Methods

We first lay out the ACD model that we used to extract the higher-order moments for both the stock returns and changes in temperature anomalies. We then present the forecasting models that we used to for forecasting the conditional volatility (VOL) of the G7 stock returns, based on the information contained in leverage (LEV), skewness (SKEW) and (excess) kurtosis (KURT) of stock returns, and year-on-year changes in temperature anomalies (CR1), its conditional volatility (CR2), skewness (CR3), and (excess) kurtosis (CR4), with the climate risks considered both individually and together.

#### **3.1 Measuring Moments**

We used the ACD model to derive the conditional higher-order moments (conditional volatility, skewness, and (excess) kurtosis) of G7 stock market log-returns, as well as for the year-on-year changes in temperature anomalies.<sup>10</sup> Denoting the log-returns of a particular stock market index or the year-on-year changes in temperature anomalies by  $y_t$ , the mean and variance equations of the Autoregressive Moving Average (ARMA)-GARCH model are given by:

<sup>&</sup>lt;sup>10</sup>We used the R language and environment for statistical computing (R Core Team, 2023) for all our empirical analyses. For the estimation of the ACD model, we rely on the R add-on package "racd" (Ghalanos, 2014).

$$y_t = c + \sum_{i=1}^p \gamma_i r_{t-i} + \sum_{j=1}^q \eta_j \varepsilon_{t-j} \quad , \quad \varepsilon_t = \sigma_t z_t$$
(1)

$$\sigma_t^2 = \omega + \sum_{i=1}^p a_i \varepsilon_{t-1}^2 + \sum_{j=1}^q \beta_j \sigma_{t-j}^2$$
<sup>(2)</sup>

where  $z_t \sim D(0, 1, \theta_t, \tau_t)$ ;  $\varepsilon_t$  and  $z_t$  denote the residuals and white noise disturbances (with unit variance),  $\sigma_t^2$  denotes the conditional variance, and  $\varepsilon_{t-i}^2$  denotes the past innovation to the variance. Three conditions are required to ensure positivity ( $\omega > 0$ ,  $\alpha_1 \leq 0$ and  $\beta_1 \leq 0$ ).

The ARMA-GARCH model is enhanced with complementary parameters relating dynamic conditional skewness and conditional (excess) kurtosis of a distribution D as follows:

$$\theta_t = \Phi(\theta_t) \tag{3}$$

$$\tau_t = \Phi(\tau_t) \tag{4}$$

Modelling skewness and kurtosis requires the application of the distributional parameters  $\theta_t$  and  $\tau_t$ . These parameters are restricted within the lower (L) and upper (U) bounds as follows:

$$\Phi(\theta_t) = L_{\theta_t} + \frac{(U_{\theta_t} - L_{\theta_t})}{1 + e^{-\theta_t}}$$
(5)

$$\Phi(\tau_t) = L_{\tau_t} + \frac{(U_{\tau_t} - L_{\tau_t})}{1 + e^{-\tau_t}}$$
(6)

The skew parameter,  $\theta_t$ , reflects the asymmetry of the distribution of stock market returns or year-on-year changes in temperature anomalies. The shape parameter,  $\tau_t$ , reflects the kurtosis of the tails of each of these two variables, and *L* and *U* represent the lower and upper bounds of the two distributional parameters,  $\theta_t$  and  $\tau_t$ . As for  $\Phi(.)$ , it signifies a transformation function.

Like Hansen (1994), we allow the parameters of skew and shape to evolve over time. Accordingly, the first-order quadratic-type evolution of these parameters is given by:

$$\theta_t = \alpha_0 + \alpha_1 z_{t-1} + \alpha_2 z_{t-1}^2 + c_1 \theta_{t-1}$$
(7)

$$\tau_t = b_0 + b_1 z_{t-1} + b_2 z_{t-1}^2 + d_1 \tau_{t-1} \tag{8}$$

In this regard, the conditional volatility, conditional skewness, and conditional (excess) kurtosis are estimated under the assumption of normal inverse Gaussian innovations, which is suitable for achieving a reasonable modeling (see, among others, He and Hamori (2021), Ahmed et al. (2024)).

#### 3.2 Forecasting Models

In order to conduct our forecasting experiment, we used variants of the following forecasting model:

$$VOL_{t+h} = \beta_0 + \beta_1 VOL_t + \beta_2 LEV_t + \beta_3 SKEW_t + \beta_4 KURT_t + \beta_5 CR_t + u_{t+h},$$
(9)

which we estimated by the ordinary-least-squares (OLS) technique,  $\beta_j$ , j = 0, ..., 5 are coefficients to be estimated,  $u_{t+h}$  denotes a disturbance term, and  $VOL_{t+h}$  is the average stock market volatility over the forecast horizon, h. We analyzed five short, intermediate, and long forecasting horizons by setting h = 1, 3, 6, 9, 12. The stock-market predictors were the period-t stock market volatility ( $VOL_t$ ),  $LEV_t$ ,  $SKEW_t$ , and  $KURT_t$ . In addition, we included, in an extended forecasting model, one or more of the climate risks,  $CR_t$  (where  $\beta_5$  is an appropriately dimensioned vector of coefficients in case we include more than one climate risk in the forecasting model).<sup>11</sup>

In order to inspect whether the climate risks contribute to forecast accuracy, we set up our forecasting experiment using a recursive and a rolling estimation window. When we studied a recursive estimation window, we used the first 25% of a dataset to initialize the estimations, and then expanded the estimation window step by step until we reached the end of the sample period. Similarly, when using a rolling estimation window, we used the first 25% of a dataset for initialization, then added one observation at the end of the estimation window and dropped one observation at the beginning of the estimation window, and continued in this way until we reached the end of the sample period. For every recursive and rolling estimation window, we computed out-of-sample forecasts of stock market volatility for the five different forecast horizons under study.

We evaluated the resulting sequences of out-of-sample forecasts resulting from the recursive and the rolling estimations in three different ways. First, we computed the root-mean-squared forecast error (RMSFE) for all forecasting models, where we expressed the RMSFE in terms of a ratio by comparing the RMSFE of a benchmark and a rival model. A RMSFE ratio larger than unity, thereby, signals that the rival model produced a lower RMSFE than the benchmark model. The rival model included one or more climate risks as predictors, while the benchmark model included only stock-market-related predictors. Second, we took analogous steps to compute the ratio of the mean absolute forecast error (MAFE) of a benchmark and a rival model.

As an extension, we estimated the forecasting model given in Equation (9) as a quantile-regression model. Such an extension is useful to answer the question whether climate risks have differential effects across different quantiles of the conditional distribution of conditional stock market volatility. The quantile-regression model is given by

<sup>&</sup>lt;sup>11</sup>Moreover, we used, as an extension, an optimal predictor selection algorithm (which we shall describe in more detail in Section 4.3) to let the data decide on which of the climate predictors to include in the optimal forecasting model.

the following equation:

$$\mathbf{b}_{\mathbf{q}} = \arg\min\sum_{t}^{T} \rho_q \left( VOL_{t+h} - \beta_0 - \beta_1 VOL_t - \beta_2 LEV_t - \beta_3 SKEW_t - \beta_4 KURT_t - \beta_5 CR_t \right),$$
(10)

where q denotes the quantile being studied,  $\mathbf{b}_{\mathbf{q}}$  denotes the quantile-dependent vector of coefficients, and the function  $\rho_q$ , denotes the usual check function, defined as  $\rho_q = qu_{t+h}$  for  $u_{t+h} > 0$ , and  $\rho_q = (q-1)u_{t+h}$  for  $u_{t+h} < 0$ . We studied the following quantiles:  $q = \{0.1, 0.25, 0.5, 0.75, 0.9\}$ , using the same recursive and rolling estimation windows that we used to estimate the OLS model given in Equation (9). Hence, the time index in Equation (10) covers the relevant estimation window.<sup>12</sup>

We evaluated the resulting out-of-sample forecasts for the different quantiles using the check function. Hence, we assumed that the check function represents the loss function a forecaster uses to estimate a forecasting model as well as to evaluate, given a quantile, the resulting forecast errors. We computed in this way the average forecast error for every forecasting model and quantile, and scaled the resulting numbers by forming their ratio for a benchmark and a rival model.

### 4 Empirical Results

#### 4.1 Baseline Results

We report in Table 1 RMSFE ratios as computed by estimating Equation 9 by means of a recursive estimation window. We observe that the forecasts that we obtained from estimating the AR-MOM model are more accurate in terms of the RMSFE criterion than the forecasts that we computed by means of the corresponding AR model for all seven countries and all five forecast horizons, where the RMSFE ratios decrease as the forecast horizon gets longer (with the results for Germany being an exception). In sharp contrast,

<sup>&</sup>lt;sup>12</sup>We use the R add-on package "quantreg" (Koenker, 2023) to estimate the quantile-regression models.

when we compare the AR-MOM model with the variants of the AR-MOM-CR model, we observe that the latter performs worse than the AR-MOM model in terms of the RMSFE criterion in most cases, and performs better than the AR-MOM model by a tiny margin only in a few cases. Hence, the punchline is that stock market moments rather than the climate risks matter for out-of-sample predictive accuracy.

#### – Table 1 about here. –

The MAFE results that we report in Table 2, again for a recursive estimation window, corroborate that the result that stock market moments matter while climate risks do not. As in the case of the RMSFE ratios, we found that the MAFE ratios tend to exceed unity when we compare the AR benchmark model with the AER-MOM rival model. An exception in this regard are the results for Italy. For Canada, we found that CR2 and CR3 contribute some moderate predictive value at the intermediate forecast horizons. The general result, however, is that climate risks do not contribute much, if anything, to out-of-sample forecasting performance in terms of the MAFE criterion relative to stock market moments.

#### – Table 2 about here. –

Next, we turn to the RMSFE ratios we obtained for a rolling estimation window, as reported in in Table 3. The results demonstrate that the AR-MOM model performs better than the AR benchmark model for Canada, France, Germany, Italy, and Japan. Stock market moments did not improve out-of-sample forecasting performance when we studied data for the United Kingdom and the United States. Importantly, there is hardly any evidence that the climate risks go beyond stock market moments in terms of out-ofsample forecasting accuracy.

- Table 3 about here. -

#### 4.2 **Quantile-Regression Results**

We summarize the results of the quantile-regression-based analyses in Figure 1 for a recursive estimation window and in Figure 2 for a rolling estimation window. In these figures, we plot the check-function ratios, which we calculated using out-of-sample fore-casts, as a function of the quantiles, where we focus on a comparison of the AR vs. AR-MOM models and the AR-MOM vs. AR-MOM-CR models (the model that features all four climate risks) for better readability of the figures.

- Figures 1 and 2 about here. -

The general message of the quantile-regression-based analyses is in line with the main result of the OLS analyses. The AR-MOM model performs better than the AR model for the overwhelming majority of combinations of countries, forecast horizons, and quantiles. As compared to the AR-MOM model, the AR-MOM-CR model either produces rather small forecasting gains or even performs worse. Hence, we conclude that stock market moments, on balance, matter much more for forecasting accuracy of stock returns volatility than climate risks.

#### 4.3 Extensions

A natural question is whether the contribution of the climate risks to out-of-sample forecasting accuracy became more substantial in the second half of the sample period given that the awareness for climate-related risks can be expected to have increased in general towards the end of the sample period. The RMSFE ratios are reported in Table 4 (recursive estimation window) and in Table 5 (rolling estimation window). As compared to the results reported in Tables 1 and 3, we deleted the first 50% of the out-of-sample forecasts. Again, we found that, on balance, the stock market moments are more important for out-of-sample forecasting accuracy of volatility of the G7 equity market returns than the climate risks. Stock market moments lost in importance relative

to our baseline results in the cases of Germany and Italy (the latter mainly in case of a recursive estimation window), but gained in importance in the cases of the United Kingdom and the United States (rolling estimation window).

- Tables 4 and 5 about here. -

It is an arbitrary choice, of course, simply to delete the first 50% of the out-of-sample forecasts. As an alternative specification, we discounted "old" forecast errors using the formula  $FE_s \times \gamma^{T-s}$ , for s = T, T - 1, T - 2, ..., where FE denotes the forecast error and Tdenotes the last observation of the sequence of out-of-sample forecasts. We set  $\gamma = 0.98$ . Hence, more recent forecast errors receive a larger weight as compared to more distant forecast errors. We summarize the results in Table 6 (recursive estimation window) and Table 7 (rolling estimation window). As for the results we obtained based on a recursive estimation window, we found that stock market moments add to forecast accuracy in all countries except Germany. In addition, we found that one of the climate risks, CR4, yielded a noticeable forecasting gains at the longer forecast horizons when we studied the data for Germany, Italy, and Japan. Turning next to the results for the rolling estimation window, we again found strong evidence, for all countries in our sample, that stock market moments add to forecast accuracy beyond the AR benchmark model, while the effect of CR4 on forecasting accuracy was visible only for the Japanese data.

- Tables 6 and 7 about here. -

As a further extension, we used an optimal stepwise predictor selection approach to let the data decide which climate risks to include in the forecasting models (for a textbook exposition, see Chapter 3 of Hastie et al. (2009)). We implemented a forward variant of this algorithm. To this end, we started with the AR-MOM model and estimated by the OLS technique the forecasting models that incorporate only one of the climate risks as an additional predictor. We stored the model for which we obtained the minimum residual sum of squares. Then we started the next round of the algorithm with this model and estimated all models that include two climate risk predictors (the one selected in the first step plus one additional climate risk). Among these models, we chose the model that minimized the residual sum of squares. We continued this process until we reached the forecasting model that features simultaneously all climate risks. Applying the optimal forward stepwise predictor selection algorithm in this way gave us a sequence of forecasting models with increasing complexity. From these sequences of models, we selected the forecasting model that (i) maximized the adjusted  $R^2$  statistic, (ii) minimized the Bayesian Information Criterion (BIC), or (iii) minimized Mallow's CP criterion.<sup>13</sup>

- Tables 8 and 9 about here. -

We summarize the results for the optimal stepwise predictor selection approach in Table 8 (RMSFE ratios) and Table 9 (MAFE ratios). We found that the climate risks either do not or do not contribute much beyond the stock market moments to forecast accuracy. This finding was in line with the results of our other analyses.

#### 4.4 Explaining the Findings

At this stage, it is important to provide a possible explanation for our finding that climate risks relative to the moments of stock returns of the G7 countries do not necessarily add much in terms of forecasting gains associated with corresponding volatilities of these seven advanced economies. We believe that this is likely due to the fact that the climate risks are already reflected in the leverage, skewness, and (excess) kurtosis of the stock returns, as the moments themselves encapuslate the impact of the broader concept of rare disaster events, a part of which is captured by climate risks, on asset market volatility (Gkillas et al., 2019; Bonato et al., 2022; Gupta et al., 2023). This line of reasoning

<sup>&</sup>lt;sup>13</sup>We utilize the R add-on package "leaps" by Lumley (2020), which is based on Fortran code by Alan Miller, to implement the optimal stepwise predictor selection algorithm.

is, in fact, vindicated by the results from the nonparametric causality-in-quantiles test of Jeong et al. (2012), which being a data-driven nonparametric test, controls for any misspecification due to nonlinearity and structural breaks, while producing predictive information about the entire conditional distribution of the dependent variables.

#### - Table 10 about here. -

As can be seen from Table 10, after applying the nonparametric causality-in-quantiles test, in general, there is strong evidence of predictability emanating from all the four climate risks-related variables for the entire conditional distributions of leverage, skewness, and (excess) kurtosis of the G7 stock markets. Understandably, it is impossible to draw an one-to-one correspondence to the findings of Bonato et al. (2023) and Wu et al. (2024), due to differences in the underlying econometric methods and sample periods. But, we are inclined to believe that not accounting for moments could tilt the scale in favor of the climate risks variables in forecasting stock market volatility, as reported by Wu et al. (2024) for South Africa, who, in turn, did not incorporate the role of leverage, skewness, and (excess) kurtosis in modeling the process of volatility. At the same time, the favorable results reported by Bonato et al. (2023) for forecasting of US statelevel stock market volatility originating from extreme weather impacts, over and above the moments, could be highlighting the fact that regional climate variables tend to have heterogeneous data-generating processes (Gil-Alana et al., 2022), which can get washed out in defining the underlying state of the economy at the aggregate-level (Cepni et al., 2024). Moreover, with the state-level stock prices being a capitalization-weighted index of equities domiciled in a state, the findings could also be depicting industry-specific impacts, as sectors indeed can differ in their sensitivity to climate-change-related risks.

### **5** Concluding Remarks

In light of the burgeoning literature on "climate finance", our objective in this research was to analyze whether changes in temperature anomalies, and its second, third, and fourth moments carry predictive content for forecasting historical stock returns volatility of the G7 countries spanning centuries of data, once we control for leverage, skewness, and (excess) kurtosis of stock returns. The general message to take home from the main results is that stock market moments matter more thank climate risks for accurately forecasting stock returns volatility, with climate risks being already captured by the moments, as shown by the results of a causality-in-quantiles test. While our results do not rule out that climate risks may have contributed to forecasting accuracy during some time-periods and for some countries and model configurations, our results have shown that, on balance, the role of stock market moments to forecasting accuracy relative to an autoregressive benchmark model is more robust across countries and model configurations and, in the majority of cases, they are also quantitatively relatively important than the incremental contribution of climate risks. A quantiles-based analysis and several variations of the forecasting model does not changed the main empirical observation. Based on our findings, we conclude that, in spite of theoretical predictions, on the practical front, investors and policymakers in the G7 countries should closely track moments rather than physical climate risks when they need to produce forecasts of stock market volatility, when such forecasts perhaps are being utilized as inputs in portfolio allocation and policy decisions.

As part of future analysis, it is interesting to extend our analysis to sector-level data. In this regard, the US would be an obvious choice with such data available back to 1926 at a monthly frequency. More importantly, climate-change risks are typically divided into two main components, namely physical and transition risks. While the former stems from the detrimental impacts of climate-related events, which is what we have studied in our research, the latter arises from the gradual shift toward a low-carbon economy (as reflected, for example, in climate and environmental policies, the strengthening competitiveness of eco-friendly technologies, and an adaptation in consumer preferences), which we have completely ignored. Understandably, both physical and transition risks are an integral part of every conceivable future scenario, albeit with varying degrees or forms of uncertainty. While dealing with transition risks would substantially shorten our sample periods to the turn of this century due to data availability (see, Bua et al. (2024) for a detailed discussion), their importance in driving financial-market moments in both developed and developing economies warrants a detailed investigation in future research.

### References

- Ahmed, R., Bouri, E., Hosseini, S.M., and Shahzad, S.J.H. (2024). Spillover in higherorder moments across carbon and energy markets: A portfolio view. European Financial Management. DOI: https://doi.org/10.1111/eufm.12482.
- Ardia, D., Bluteau, K., Boudt, K., Inghelbrecht, K. (2023). Climate change concerns and the performance of green versus brown stocks. Management Science, 69(12), 7607–7632.
- Balcilar, M., Gabauer, D., Gupta, R., and Pierdzioch, C. (2023). Climate risks and forecasting stock market returns in advanced economies over a century. Mathematics, 11(13), 2077.
- Balvers, R., Du, D., and Zhao, X. (2017). Temperature shocks and the cost of equity capital: Implications for climate change perceptions. Journal of Banking & Finance, 77, 18–34.
- Bansal, R., Kiku, D., and Ochoa, M. (2021). Price of long run temperature shifts in capital markets. National Bureau of Economic Research (NBER) Working Paper No. 22529.
- Bansal, R., Kiku., D., and Ochoa, M. (Forthcoming). Climate change and growth risks. In Climate Change Economics: The Role of Uncertainty and Risk; The Role of Uncertainty and Risk in Climate Change Economics. Chari, V.V., Litterman, R., Eds.; Wiley: Hoboken, NJ, USA.
- Barro, R.J. (2006). Rare disasters and asset markets in the twentieth century. Quarterly Journal of Economics, 121(3), 823–866.
- Barro, R.J. (2009). Rare Disasters, Asset Prices, and Welfare Costs. American Economic Review, 99(1), 243–264.

- Bolton, P., and Kacperczyk, M. (2021). Do investors care about carbon risk? Journal of Financial Economics, 142(2), 517–549.
- Bonato, M., Cepni, C., Gupta, R., and Pierdzioch, C. (2022). Forecasting realized volatility of international REITs: The role of realized skewness and realized kurtosis. Journal of Forecasting, 41(2), 303–315.
- Bonato, M., Cepni, O., Gupta, R., and Pierdzioch, C. (2023). Climate risks and statelevel stock market realized volatility. Journal of Financial Markets, 66(C), 100854.
- Bua, G., Kapp, D., Ramella, F., and Rognone, L. (2024). Transition versus physical climate risk pricing in European financial markets: A text-based approach. European Journal of Finance. DOI: https://doi.org/10.1080/1351847X.2024.2355103.
- Campbell, J.Y. (2008). Viewpoint: Estimating the Equity Premium. Canadian Journal of Economics 41(1), 1–21.
- Cepni, O., Demirer, R., and Rognone, L. (2022). Hedging climate risks with green assets. Economics Letters, 212, 110312.
- Cepni, O., Demirer, R., Pham, L., and Rognone, L. (2023). Climate uncertainty and information transmissions across the conventional and ESG assets. Journal of International Financial Markets, Institutions & Money, 83, 101730.
- Cepni, O., Gupta, R., Liao, W., and Ma, J. (2024). Climate Risks and Forecastability of the Weekly State-Level Economic Conditions of the United States. International Review of Finance, 24(1), 154–162.
- Chen, Z., Zhang, L., and Weng, C. (2023). Does climate policy uncertainty affect Chinese stock market volatility? International Review of Economics & Finance, 84, 369–381.

- Choi, D., Gao, Z., and Jiang, W. (2020). Attention to global warming. Review of Financial Studies, 33(3), 1112–1145.
- Das, S., Demirer, R., Gupta, R., and Mangisa, S. (2019). The effect of global crises on stock market correlations: Evidence from scalar regressions via functional data analysis. Structural Change and Economic Dynamics, 50, 132–147.
- Del Fava, S., Gupta, R., Pierdzioch, C., and Rognone, L. (2024). Forecasting International Financial Stress: The Role of Climate Risks. Journal of International Financial Markets, Institutions and Money, 92, 101975.
- Donadelli, M., Grüning, P., Jüppner, M., and Kizys, R. (2021a). Global Temperature, R&D Expenditure, and Growth. Energy Economics, 104, 105608.
- Donadelli, M., Jüppner, M., Paradiso, A., and Schlag, C. (2021b). Computing macro effects and welfare costs of temperature volatility: A structural approach. Computational Economics, 58(2), 347–394.
- Donadelli, M., Jüppner, M., Riedel, M., and Schlag, C. (2017). Temperature shocks and welfare costs. Journal of Economic Dynamics and Control, 82(C), 331–355.
- Donadelli, M., Jüppner, M., and Vergalli, S. (2022). Temperature variability and the macroeconomy: A world tour. Environmental and Resource Economics, 83(1), 221–259.
- Engle, R.F., Giglio, S., Kelly, B., Lee, H., and Stroebel, J. (2020). Hedging climate change news. Review of Financial Studies, 33(3), 1184–1216.
- Faccini, R., Matin, R., and Skiadopoulos, G. (2023). Dissecting climate risks: Are they reflected in stock prices? Journal of Banking & Finance, 155, 106948.
- Ghalanos, A. (2014). racd: Autoregressive Conditional Density Models, R package version 1.0-5., https://bitbucket.org/alexiosg/.

- Giglio, S., Kelly, B., and Stroebel, J. (2021a). Climate finance. Annual Review of Financial Economics, 13, 15–36.
- Giglio, S., Maggiori, M., Rao, K., Stroebel, J., and Weber, A. (2021b). Climate change and long-run discount rates: evidence from real estate. Review of Financial Studies 34(8), 3527–3571.
- Gil-Alana, L.A., Gupta, R., Sauci, L., and Carmona-Gonzalez, N. (2022). Temperature and precipitation in the US states: Long memory, persistence and time trend. Theoretical and Applied Climatology, 150(3–4), 1731–1744.
- Gkillas, K., Gupta, R., and Pierdzioch, C. (2019). Forecasting (downside and upside) realized exchange-rate volatility: Is there a role for realized skewness and kurtosis? Physica A: Statistical Mechanics and its Applications, 532(1), 121867.
- Gupta, R., Ji, Q., Pierdzioch, C., and Plakandaras, V. (2023). Forecasting the conditional distribution of realized volatility of oil price returns: The role of skewness over 1859 to 2023. Finance Research Letters, 58(Part C), 104501.
- Hansen, B.E. (1994). Autoregressive conditional density estimation. International Economic Review, 35(3), 705–730.
- Hastie, T., Tibshirani, R., and Friedman, J. (2009) The elements of statistical learning: Data mining, inference, and prediction, 2nd ed.: Springer: New York, NY, USA.
- He, X., and Hamori, S. (2021). Is volatility spillover enough for investor decisions? A new viewpoint from higher moments. Journal of International Money and Finance, 116, 102412.
- Jeong, K., Härdle, W.K., and Song, S. (2012). A consistent nonparametric test for causality in quantile. Econometric Theory, 28(4), 861–887.

- Jurado, K., Ludvigson, S.C., and Ng, S. (2015). Measuring uncertainty. American Economic Review, 105(3), 1177–1215.
- Koenker, R. (2023). quantreg: Quantile regression. R package version 5.95, https: //CRAN.R-project.org/package=quantreg.
- Koenker, R., and Bassett Jr, G. (1978). Regression quantiles. Econometrica, 46(1), 33–50.
- Lasisi, L., Omoke, P.C., and Salisu, A.A. (2024). Climate policy uncertainty and stock market colatility. Asian Economics Letters, 5(2), Article No. 6.
- Ludvigson, S.C., Ma, S., and Ng, S. (2021). Uncertainty and business cycles: Exogenous impulse or endogenous response? American Economic Journal: Macroeconomics, 13(4), 369–410.
- Lumley, T., based on Fortran code by A. Miller (2020). leaps: Regression subset selection. R package version 3.1. Available for download from: https://CRAN. R-project.org/package=leaps.
- Lv, W., and Li, B. (2023). Climate policy uncertainty and stock market volatility: Evidence from different sectors. Finance Research Letters, 51, 103506.
- Mei, D., Liu, J., Ma, F., and Chen, W. (2017). Forecasting stock market volatility: Do realized skewness and kurtosis help?, Physica A: Statistical Mechanics and its Applications, 481, 153–159.
- Meligkotsidou, L., Panopoulou, E., Vrontos, I.D., and Vrontos, S.D. (2014). A quantile regression approach to equity premium prediction. Journal of Forecasting, 33(7), 558–576.

- Mendelsohn, R., Emanuel, K., Chonabayashi, S., and Bakkensen, L. (2012). The impact of climate change on global tropical cyclone damage. Nature Climate Change, 2(3), 205–209.
- Penzin, D.J., Isah, K.O. and Salisu, A.A. (2024). Climate change-stock return volatility nexus in advanced economies: the role of technology shocks. Journal of Economic Studies. DOI: https://doi.org/10.1108/JES-08-2023-0419.
- Poon, S-H., and Granger, C.W.J. (2003). Forecasting volatility in financial markets: A review. Journal of Economic Literature, 41(2), 47–539.
- R Core Team (2023). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL: https://www.R-project. org/.
- Rapach, D.E., Strauss, J.K., and Wohar, M.E. (2008). Forecasting stock return volatility in the presence of structural breaks, in Forecasting in the Presence of Structural Breaks and Model Uncertainty, in David E. Rapach and Mark E. Wohar (Eds.), Vol. 3 of Frontiers of Economics and Globalization, Bingley, United Kingdom: Emerald, 381–416.
- Rietz, T. (1988). The equity risk premium: A solution. Journal of Monetary Economics, 22(1), 117–131.
- Salisu, A. A., Gupta, R., and Ogbonna, A. E. (2023b). Tail risks and forecastability of stock returns of advanced economies: evidence from centuries of data. The European Journal of Finance, 29(4), 466–481.
- Salisu, A.A., Ogbonna, A.E., and Vo, X.V. (2024). Climate risks and the REITs market. International Journal of Finance & Economics. DOI: https://doi.org/10.1002/ ijfe.2983.

- Salisu, A.A., Pierdzioch, C., Gupta, R., and van Eyden, R. (2023a). Climate risks and U.S. stock-market tail risks: A forecasting experiment using over a century of data. International Review of Finance, 23(2), 228–244.
- Stott, P. (2016). How climate change affects extreme weather events. Science, 352(6293), 1517–1518.
- Tsai, J., and Wachter, J.A. (2015). Disaster risk and its implications for asset pricing. Annual Review of Financial Economics, 7, 219–252.
- Wachter, J.A. (2013). Can time-varying risk of rare disasters explain aggregate stock market volatility?. Journal of Finance, 68(3), 987–1035.
- Wu, K., Karmakar, S., Gupta, R., and Pierdzioch, C. (2024). Climate Risks and Stock Market Volatility over a Century in an Emerging Market Economy: The Case of South Africa. Climate, 12(5), 68.
- Zhang, Z., He, M., Zhang, Y., and Wang, Y. (2021). Realized skewness and the shortterm predictability for aggregate stock market volatility. Economic Modelling, 103, 105614.

Country / Models	h=1	h=3	h=6	h=9	h=12
Canada / AR vs. AR-MOM	1.7928	1.3114	1.1443	1.0810	1.0538
Canada / AR-MOM vs. AR-MOM-CR1	0.9988	0.9982	0.9990	0.9994	0.9996
Canada / AR-MOM vs. AR-MOM-CR2	0.9987	0.9988	0.9981	0.9890	0.9725
Canada / AR-MOM vs. AR-MOM-CR3	0.9992	0.9988	0.9976	0.9960	0.9953
Canada / AR-MOM vs. AR-MOM-CR4	0.9979	0.9968	0.9980	0.9992	1.0000
Canada / AR-MOM vs. AR-MOM-CR	0.9934	0.9912	0.9929	0.9786	0.9596
France / AR vs. AR-MOM	1.7072	1.2598	1.1271	1.0791	1.0615
France / AR-MOM vs. AR-MOM-CR1	1.0003	0.9996	0.9995	0.9995	0.9995
France / AR-MOM vs. AR-MOM-CR2	0.9983	0.9986	0.9980	0.9987	0.9982
France / AR-MOM vs. AR-MOM-CR3	0.9983	0.9983	0.9974	0.9978	0.9974
France / AR-MOM vs. AR-MOM-CR4	0.9984	0.9986	0.9977	0.9981	0.9976
France / AR-MOM vs. AR-MOM-CR	0.9996	0.9981	0.9954	0.9972	0.9960
Germany / AR vs. AR-MOM	1.0186	1.0481	1.0478	1.0546	1.0743
Germany / AR-MOM vs. AR-MOM-CR1	0.9987	0.9994	0.9998	0.9997	0.9995
Germany / AR-MOM vs. AR-MOM-CR2	1.0000	1.0004	1.0020	1.0035	1.0045
Germany / AR-MOM vs. AR-MOM-CR3	1.0001	1.0006	1.0023	1.0037	1.0046
Germany / AR-MOM vs. AR-MOM-CR4	0.9999	0.9998	1.0007	1.0020	1.0034
Germany / AR-MOM vs. AR-MOM-CR	0.9990	0.9998	1.0012	1.0020	1.0030
Italy / AR vs. AR-MOM	1.0619	1.0391	1.0208	1.0144	1.0050
Italy / AR-MOM vs. AR-MOM-CR1	1.0000	0.9996	0.9991	0.9989	0.9981
Italy / AR-MOM vs. AR-MOM-CR2	0.9998	0.9999	0.9997	0.9997	0.9994
Italy / AR-MOM vs. AR-MOM-CR3	0.9997	0.9995	0.9992	0.9992	0.9988
Italy / AR-MOM vs. AR-MOM-CR4	1.0000	0.9969	0.9943	0.9949	0.9917
Italy / AR-MOM vs. AR-MOM-CR	0.9992	0.9938	0.9916	0.9911	0.9867
Japan / AR vs. AR-MOM	1.1088	1.0520	1.0684	1.0668	1.0366
Japan / AR-MOM vs. AR-MOM-CR1	0.9978	0.9945	0.9920	0.9918	0.9942
Japan / AR-MOM vs. AR-MOM-CR2	0.9997	0.9910	0.9907	0.9958	0.9972
Japan / AR-MOM vs. AR-MOM-CR3	0.9989	0.9892	0.9891	0.9938	0.9954
Japan / AR-MOM vs. AR-MOM-CR4	0.9999	1.0032	1.0076	1.0031	1.0002
Japan / AR-MOM vs. AR-MOM-CR	0.9965	0.9904	0.9921	0.9906	0.9911
UK / AR vs. AR-MOM	1.0715	1.0440	1.0347	1.0252	1.0196
UK / AR-MOM vs. AR-MOM-CR1	0.9998	0.9996	0.9995	0.9995	0.9996
UK / AR-MOM vs. AR-MOM-CR2	0.9999	0.9997	0.9986	0.9982	0.9972
UK / AR-MOM vs. AR-MOM-CR3	0.9998	0.9997	0.9981	0.9972	0.9951
UK / AR-MOM vs. AR-MOM-CR4	0.9999	0.9997	0.9990	0.9983	0.9956
UK / AR-MOM vs. AR-MOM-CR	0.9996	0.9990	0.9980	0.9969	0.9938
US / AR vs. AR-MOM	1.3608	1.1537	1.0960	1.0660	1.0471
US / AR-MOM vs. AR-MOM-CR1	0.9998	1.0000	0.9999	1.0001	0.9998
US / AR-MOM vs. AR-MOM-CR2	0.9998	0.9997	0.9996	0.9996	0.9997
US / AR-MOM vs. AR-MOM-CR3	0.9999	0.9998	0.9999	0.9999	0.9995
US / AR-MOM vs. AR-MOM-CR4	0.9995	0.9992	1.0004	1.0017	1.0007
US / AR-MOM vs. AR-MOM-CR	0.9991	0.9985	0.9998	1.0020	1.0004

Table 1: RMSFE ratios for a recursive estimation window

Country / Models	h=1	h=3	h=6	h=9	h=12
Canada / AR vs. AR-MOM	1.6032	1.2679	1.1643	1.0990	1.0607
Canada / AR-MOM vs. AR-MOM-CR1	0.9956	0.9967	0.9967	0.9984	0.9997
Canada / AR-MOM vs. AR-MOM-CR2	1.0078	1.0162	1.0140	0.9826	0.9491
Canada / AR-MOM vs. AR-MOM-CR3	1.0034	1.0131	1.0154	1.0040	1.0000
Canada / AR-MOM vs. AR-MOM-CR4	0.9943	0.9960	0.9976	0.9986	1.0000
Canada / AR-MOM vs. AR-MOM-CR	0.9955	1.0137	1.0050	0.9658	0.9349
France / AR vs. AR-MOM	1.9889	1.2860	1.1200	1.0741	1.0496
France / AR-MOM vs. AR-MOM-CR1	0.9996	0.9993	0.9984	0.9992	0.9992
France / AR-MOM vs. AR-MOM-CR2	0.9978	0.9985	0.9986	0.9977	0.9978
France / AR-MOM vs. AR-MOM-CR3	0.9979	0.9989	0.9983	0.9972	0.9966
France / AR-MOM vs. AR-MOM-CR4	0.9978	0.9987	0.9985	0.9972	0.9972
France / AR-MOM vs. AR-MOM-CR	0.9925	0.9904	0.9889	0.9923	0.9941
Germany / AR vs. AR-MOM	0.7423	0.9193	1.0516	1.1014	1.1220
Germany / AR-MOM vs. AR-MOM-CR1	0.9887	0.9961	0.9976	0.9855	0.9802
Germany / AR-MOM vs. AR-MOM-CR2	0.9952	0.9808	0.9559	0.9472	0.9571
Germany / AR-MOM vs. AR-MOM-CR3	0.9929	0.9750	0.9470	0.9376	0.9480
Germany / AR-MOM vs. AR-MOM-CR4	0.9977	0.9933	0.9896	0.9860	0.9881
Germany / AR-MOM vs. AR-MOM-CR	0.9724	0.9396	0.9130	0.9069	0.9193
Italy / AR vs. AR-MOM	1.0683	1.0058	0.9869	0.9750	0.9613
Italy / AR-MOM vs. AR-MOM-CR1	0.9986	0.9993	0.9990	0.9973	0.9963
Italy / AR-MOM vs. AR-MOM-CR2	1.0010	1.0014	0.9996	0.9992	0.9982
Italy / AR-MOM vs. AR-MOM-CR3	1.0027	1.0016	0.9986	0.9973	0.9960
Italy / AR-MOM vs. AR-MOM-CR4	1.0067	1.0019	0.9975	0.9967	0.9998
Italy / AR-MOM vs. AR-MOM-CR	1.0061	0.9977	0.9933	0.9893	0.9897
Japan / AR vs. AR-MOM	1.2832	1.1449	1.0759	1.0410	1.0241
Japan / AR-MOM vs. AR-MOM-CR1	0.9788	0.9872	0.9890	0.9956	0.9952
Japan / AR-MOM vs. AR-MOM-CR2	1.0000	0.9936	0.9914	0.9936	0.9943
Japan / AR-MOM vs. AR-MOM-CR3	0.9983	0.9952	0.9926	0.9947	0.9960
Japan / AR-MOM vs. AR-MOM-CR4	0.9481	0.9445	0.9494	0.9336	0.9189
Japan / AR-MOM vs. AR-MOM-CR	0.9064	0.9283	0.9347	0.9258	0.9141
UK / AR vs. AR-MOM	0.9124	1.0128	1.0555	1.0488	1.0471
UK / AR-MOM vs. AR-MOM-CR1	0.9980	0.9954	0.9966	0.9979	0.9988
UK / AR-MOM vs. AR-MOM-CR2	0.9992	0.9944	0.9861	0.9850	0.9810
UK / AR-MOM vs. AR-MOM-CR3	0.9992	0.9938	0.9853	0.9821	0.9764
UK / AR-MOM vs. AR-MOM-CR4	0.9967	0.9917	0.9918	0.9898	0.9849
UK / AR-MOM vs. AR-MOM-CR	0.9947	0.9912	1.0030	1.0095	1.0091
US / AR vs. AR-MOM	1.3659	1.1501	1.0856	1.0501	1.0236
US / AR-MOM vs. AR-MOM-CR1	0.9995	1.0002	0.9996	0.9995	0.9993
US / AR-MOM vs. AR-MOM-CR2	1.0004	0.9995	0.9996	0.9991	0.9982
US / AR-MOM vs. AR-MOM-CR3	0.9988	1.0001	1.0005	1.0000	0.9995
US / AR-MOM vs. AR-MOM-CR4	0.9969	0.9968	0.9992	1.0000	0.9995
US / AR-MOM vs. AR-MOM-CR	0.9953	0.9953	0.9939	0.9941	0.9935

Table 2: MAFE ratios for a recursive estimation window

Canada / AR vs. AR-MOM         1.7552         1.3109         1.1441         1.0802         1.0524           Canada / AR-MOM vs. AR-MOM-CR1         0.9981         0.9983         0.9984         0.9978         0.9974           Canada / AR-MOM vs. AR-MOM-CR2         1.0020         1.0052         1.0079         0.9951         0.9902           Canada / AR-MOM vs. AR-MOM-CR3         0.9986         0.9964         0.9936         0.9956         0.9902           Canada / AR-MOM vs. AR-MOM-CR4         0.9982         0.9964         0.9936         0.9922         0.9366         0.9923           France / AR-MOM vs. AR-MOM-CR1         0.9995         0.9961         0.9933         0.99951         France / AR-MOM vs. AR-MOM-CR2         0.9945         0.9943         0.9933         0.9907           France / AR-MOM vs. AR-MOM-CR4         0.9951         0.9964         0.9938         0.9993         0.9984         0.9933         0.9907           Germany / AR-MOM vs. AR-MOM-CR4         0.9951         0.9966         0.9948         0.9933         0.9907           Germany / AR-MOM vs. AR-MOM-CR1         0.9979         0.9866         0.9944         0.9978         1.0678           Germany / AR-MOM vs. AR-MOM-CR3         1.0002         1.0013         1.00063         1.0075	Country / Models	h=1	h=3	h=6	h=9	h=12
Canada / AR-MOM vs. AR-MOM-CR1         0.9981         0.9984         0.9978         0.9974           Canada / AR-MOM vs. AR-MOM-CR2         1.0020         1.0052         1.0079         0.9951         0.9970           Canada / AR-MOM vs. AR-MOM-CR3         0.9996         0.9985         0.9964         0.9951         0.9970           Canada / AR-MOM vs. AR-MOM-CR4         0.9988         0.9910         0.9722         0.9366         0.9973           Canada / AR-MOM vs. AR-MOM-CR1         0.99948         0.99910         0.9722         0.9388         0.9981           France / AR-MOM vs. AR-MOM-CR2         0.9945         0.9961         0.9943         0.9933         0.9905           France / AR-MOM vs. AR-MOM-CR3         0.9952         0.9967         0.9948         0.9933         0.9907           Germany / AR-MOM vs. AR-MOM-CR4         0.9957         0.9866         0.9922         0.9884         0.975           Germany / AR-MOM vs. AR-MOM-CR1         1.0185         1.0456         1.0025         1.0047         1.00675           Germany / AR-MOM vs. AR-MOM-CR1         0.9979         0.9866         0.9984         0.9975         Germany / AR-MOM vs. AR-MOM-CR1         0.9991         1.0010         1.0021         1.0027           Germany / AR-MOM vs. AR-MOM-CR1         0.	Canada / AR vs. AR-MOM	1.7552	1.3109	1.1441	1.0802	1.0524
Canada / AR-MOM vs. AR-MOM-CR2         1.0020         1.0052         1.0079         0.9951         0.9700           Canada / AR-MOM vs. AR-MOM-CR3         0.9996         0.9985         0.9964         0.9915         0.9902           Canada / AR-MOM vs. AR-MOM-CR4         0.9988         0.9910         0.9722         0.9366         0.9903           France / AR vs. AR-MOM         1.6846         1.2559         1.1196         1.0687         1.0521           France / AR-MOM vs. AR-MOM-CR1         0.99945         0.9961         0.9933         0.9933         0.9905           France / AR-MOM vs. AR-MOM-CR2         0.9945         0.9967         0.9948         0.9933         0.9907           France / AR-MOM vs. AR-MOM-CR4         0.9957         0.9877         0.9866         0.9841         0.9790           Germany / AR-MOM vs. AR-MOM-CR2         1.0001         1.0038         1.0075         0.9975         0.9976         0.9944         0.9976         0.9974         0.9986         0.9991         1.0018         1.0075         0.0101         1.0068         1.0075         0.9976         0.9976         0.9976         0.9976         0.9976         0.9976         0.9976         0.9976         0.9976         0.9976         0.9976         0.9976         0.9976	Canada / AR-MOM vs. AR-MOM-CR1	0.9981	0.9983	0.9984	0.9978	0.9974
Canada / AR-MOM vs. AR-MOM-CR3         0.9996         0.9985         0.9964         0.9915         0.9902           Canada / AR-MOM vs. AR-MOM-CR4         0.9982         0.9944         0.9936         0.9936         0.9923           France / AR vs. AR-MOM         1.6846         1.2559         1.1196         1.0687         1.0521           France / AR-MOM vs. AR-MOM-CR1         0.9995         0.9984         0.9933         0.9995           France / AR-MOM vs. AR-MOM-CR2         0.9952         0.9967         0.9948         0.9933         0.9905           France / AR-MOM vs. AR-MOM-CR4         0.9951         0.9964         0.9933         0.9907           France / AR-MOM vs. AR-MOM-CR4         0.9951         0.9964         0.9938         0.9922         0.9884           Germany / AR vs. AR-MOM vs. AR-MOM-CR1         0.9979         0.9986         0.9992         0.9984         0.9975           Germany / AR-MOM vs. AR-MOM-CR2         1.0001         1.0003         1.0063         1.0067           Germany / AR-MOM vs. AR-MOM-CR4         0.9998         0.9996         1.0013         1.0017           Germany / AR-MOM vs. AR-MOM-CR4         0.9993         0.9986         0.9911         1.0021         1.0047           Germany / AR-MOM vs. AR-MOM-CR1         0.9993 <td>Canada / AR-MOM vs. AR-MOM-CR2</td> <td>1.0020</td> <td>1.0052</td> <td>1.0079</td> <td>0.9951</td> <td>0.9700</td>	Canada / AR-MOM vs. AR-MOM-CR2	1.0020	1.0052	1.0079	0.9951	0.9700
Canada / AR-MOM vs. AR-MOM-CR4         0.9982         0.9964         0.9936         0.9970           Canada / AR-MOM vs. AR-MOM-CR         0.9948         0.9910         0.9722         0.9396         0.9023           France / AR vs. AR-MOM         1.6846         1.2559         1.1196         1.0687         1.0521           France / AR-MOM vs. AR-MOM-CR1         0.9995         0.9980         0.9943         0.9933         0.9907           France / AR-MOM vs. AR-MOM-CR2         0.9945         0.9961         0.9948         0.9933         0.9907           France / AR-MOM vs. AR-MOM-CR4         0.9951         0.9964         0.9938         0.9922         0.9884           France / AR-MOM vs. AR-MOM-CR4         0.9951         0.9964         0.9938         0.9922         0.9884           Germany / AR vs. AR-MOM         1.0185         1.0456         1.0425         1.0478         1.0678           Germany / AR-MOM vs. AR-MOM-CR2         1.0001         1.0008         1.0031         1.0076           Germany / AR-MOM vs. AR-MOM-CR4         0.9998         0.99961         1.0010         1.0021           Italy / AR-MOM vs. AR-MOM-CR1         0.9998         0.99961         1.0010         1.0021           Italy / AR-MOM vs. AR-MOM-CR2         0.9992         0.99	Canada / AR-MOM vs. AR-MOM-CR3	0.9996	0.9985	0.9964	0.9915	0.9902
Canada / AR-MOM vs. AR-MOM-CR         0.9948         0.9910         0.9722         0.9396         0.9023           France / AR-wo AR-MOM         1.6846         1.2559         1.1196         1.0687         1.0521           France / AR-MOM vs. AR-MOM-CR1         0.9952         0.9961         0.9943         0.9933         0.9905           France / AR-MOM vs. AR-MOM-CR2         0.9952         0.9967         0.9948         0.9933         0.9907           France / AR-MOM vs. AR-MOM-CR3         0.9957         0.9966         0.9948         0.9933         0.9922         0.9844           France / AR-MOM vs. AR-MOM-CR4         0.9951         0.9966         0.9924         0.9975           Germany / AR-MOM vs. AR-MOM-CR1         1.0979         0.9986         0.9922         0.9984         0.9975           Germany / AR-MOM vs. AR-MOM-CR2         1.0001         1.0003         1.0063         1.0080         1.0080         1.0083         1.0080         1.0080         1.0010         1.0021         1.0113         1.0011         1.0021         1.014         1.0445         1.0307         1.0262         1.0184           Italy / AR-MOM vs. AR-MOM-CR1         0.9993         0.9986         0.9981         0.9979         0.9978           Italy / AR-MOM vs. AR-MOM-CR2	Canada / AR-MOM vs. AR-MOM-CR4	0.9982	0.9964	0.9936	0.9956	0.9970
France / AR vs. AR-MOM       1.6846       1.2559       1.1196       1.0687       1.0521         France / AR-MOM vs. AR-MOM-CR1       0.9995       0.9980       0.9993       0.9988       0.9905         France / AR-MOM vs. AR-MOM-CR2       0.9952       0.9967       0.9943       0.9933       0.9905         France / AR-MOM vs. AR-MOM-CR3       0.9952       0.9967       0.9948       0.9933       0.9907         France / AR-MOM vs. AR-MOM-CR4       0.9951       0.9967       0.9866       0.9841       0.9790         Germany / AR vs. AR-MOM       1.0185       1.0456       1.0425       1.0478       1.0678         Germany / AR-MOM vs. AR-MOM-CR1       0.9979       0.9986       0.9992       0.9984       0.9975         Germany / AR-MOM vs. AR-MOM-CR2       1.0001       1.0008       1.0031       1.0047         Germany / AR-MOM vs. AR-MOM-CR4       0.9985       0.9991       1.0005       1.0010       1.0021         Italy / AR-MOM vs. AR-MOM-CR1       0.9985       0.9986       0.9986       0.9962       0.9978         Italy / AR-MOM vs. AR-MOM-CR2       0.9992       0.9985       0.9985       0.9962       0.9964         Italy / AR-MOM vs. AR-MOM-CR2       0.9992       0.9985       0.9966       0.9962	Canada / AR-MOM vs. AR-MOM-CR	0.9948	0.9910	0.9722	0.9396	0.9023
France / AR-MOM vs. AR-MOM-CR1       0.9995       0.9980       0.9993       0.9983       0.9981         France / AR-MOM vs. AR-MOM-CR2       0.9945       0.9961       0.9943       0.9933       0.9905         France / AR-MOM vs. AR-MOM-CR2       0.9951       0.9964       0.9938       0.9922       0.9894         France / AR-MOM vs. AR-MOM-CR4       0.9951       0.9964       0.9938       0.9922       0.9894         Germany / AR-MOM vs. AR-MOM-CR1       0.9857       0.9866       0.9943       0.9975         Germany / AR-MOM vs. AR-MOM-CR2       1.0001       1.0068       1.0026       1.0075         Germany / AR-MOM vs. AR-MOM-CR4       0.9985       0.9991       1.0013       1.0031       1.0047         Germany / AR-MOM vs. AR-MOM-CR4       0.9985       0.9991       1.0005       1.0010       1.0021         Italy / AR-MOM vs. AR-MOM-CR4       0.9993       0.9986       0.9981       0.9979       0.9978         Italy / AR-MOM vs. AR-MOM-CR2       0.9992       0.9985       0.9964       0.9964       0.9964       0.9964       0.9964       0.9964       0.9964       0.9964       0.9964       0.9964       0.9964       0.9964       0.9964       0.9964       0.9965       0.9966       0.9962       0.9964	France / AR vs. AR-MOM	1.6846	1.2559	1.1196	1.0687	1.0521
France / AR-MOM vs. AR-MOM-CR2       0.9945       0.9961       0.9943       0.9933       0.9905         France / AR-MOM vs. AR-MOM-CR3       0.9952       0.9967       0.9948       0.9933       0.9907         France / AR-MOM vs. AR-MOM-CR4       0.9951       0.9964       0.9938       0.9922       0.9894         France / AR-MOM vs. AR-MOM-CR1       0.9975       0.9877       0.9866       0.9841       0.9790         Germany / AR-MOM vs. AR-MOM-CR1       0.9079       0.9926       0.9984       0.9975         Germany / AR-MOM vs. AR-MOM-CR3       1.0002       1.0013       1.0063       1.0080         Germany / AR-MOM vs. AR-MOM-CR4       0.9998       0.9996       1.0013       1.0011       1.0021         Italy / AR-MOM vs. AR-MOM-CR1       0.9985       0.9996       1.0013       1.0021       1.0147         Italy / AR-MOM vs. AR-MOM-CR1       0.9993       0.9986       0.9981       0.9979       0.9978         Italy / AR-MOM vs. AR-MOM-CR2       0.9992       0.9985       0.9966       0.9963       0.9964         Italy / AR-MOM vs. AR-MOM-CR2       0.9997       0.9978       0.9973       0.9973       0.9723       0.9644         Japan / AR-MOM vs. AR-MOM-CR1       0.9985       0.9855       0.9855       0.	France / AR-MOM vs. AR-MOM-CR1	0.9995	0.9980	0.9993	0.9988	0.9981
France / AR-MOM vs. AR-MOM-CR3       0.9952       0.9967       0.9948       0.9933       0.9907         France / AR-MOM vs. AR-MOM-CR4       0.9951       0.9964       0.9938       0.9922       0.9894         France / AR-MOM vs. AR-MOM-CR       0.9857       0.9866       0.9942       0.9844       0.9755         Germany / AR-MOM vs. AR-MOM-CR1       0.9979       0.9986       0.9992       0.9844       0.9075         Germany / AR-MOM vs. AR-MOM-CR3       1.0001       1.0008       1.0036       1.0058       1.0075         Germany / AR-MOM vs. AR-MOM-CR4       0.9998       0.9996       1.0013       1.0011       1.0047         Germany / AR-MOM vs. AR-MOM-CR4       0.9998       0.9996       1.0013       1.0011       1.0021         Italy / AR-MOM vs. AR-MOM-CR1       0.9993       0.9986       0.9981       0.9976       0.9101       1.0021         Italy / AR-MOM vs. AR-MOM-CR2       0.9992       0.9985       0.9966       0.9963       0.9964         Italy / AR-MOM vs. AR-MOM-CR3       0.9974       0.9895       0.9865       0.9962       0.9964         Italy / AR-MOM vs. AR-MOM-CR4       0.9974       0.9895       0.9860       0.9723       0.9644         Japan / AR-MOM vs. AR-MOM-CR1       0.9935       0.	France / AR-MOM vs. AR-MOM-CR2	0.9945	0.9961	0.9943	0.9933	0.9905
France / AR-MOM vs. AR-MOM-CR4       0.9951       0.9964       0.9938       0.9922       0.9894         France / AR-MOM vs. AR-MOM-CR       0.9857       0.9866       0.9841       0.9790         Germany / AR vs. AR-MOM       1.0185       1.0456       1.0425       1.0478       1.0678         Germany / AR-MOM vs. AR-MOM-CR1       0.9979       0.9986       0.9992       0.9984       0.9975         Germany / AR-MOM vs. AR-MOM-CR2       1.0001       1.0008       1.0036       1.0058       1.0075         Germany / AR-MOM vs. AR-MOM-CR3       1.0002       1.0013       1.0040       1.0063       1.0047         Germany / AR-MOM vs. AR-MOM-CR4       0.9985       0.9996       1.0010       1.0021       1taly       1.0047         Germany / AR-MOM vs. AR-MOM-CR1       0.9985       0.9986       0.9981       0.9979       0.9978         Italy / AR-MOM vs. AR-MOM-CR2       0.9992       0.9985       0.9966       0.9962       0.9964         Italy / AR-MOM vs. AR-MOM-CR4       0.9974       0.9895       0.9860       0.9976       0.9976         Italy / AR-MOM vs. AR-MOM-CR1       0.9984       0.9965       0.9962       0.9923       0.9843       0.9895       0.9823       0.9841         Japan / AR-MOM vs. AR-MOM-CR1 </td <td>France / AR-MOM vs. AR-MOM-CR3</td> <td>0.9952</td> <td>0.9967</td> <td>0.9948</td> <td>0.9933</td> <td>0.9907</td>	France / AR-MOM vs. AR-MOM-CR3	0.9952	0.9967	0.9948	0.9933	0.9907
France / AR-MOM vs. AR-MOM-CR       0.9857       0.9877       0.9866       0.9841       0.9790         Germany / AR vs. AR-MOM       1.0185       1.0456       1.0425       1.0478       1.0678         Germany / AR-MOM vs. AR-MOM-CR1       0.9979       0.9986       0.9992       0.9984       0.9975         Germany / AR-MOM vs. AR-MOM-CR2       1.0001       1.0008       1.0036       1.0063       1.0080         Germany / AR-MOM vs. AR-MOM-CR3       1.0002       1.0113       1.0040       1.0063       1.0080         Germany / AR-MOM vs. AR-MOM-CR4       0.9985       0.9996       1.0013       1.0047         Germany / AR-MOM vs. AR-MOM-CR1       0.9993       0.9986       0.9981       0.9079       0.9978         Italy / AR-MOM vs. AR-MOM-CR2       0.9992       0.9985       0.9966       0.9963       0.9964         Italy / AR-MOM vs. AR-MOM-CR2       0.9992       0.9985       0.9966       0.9962       0.9964         Italy / AR-MOM vs. AR-MOM-CR4       0.9974       0.9985       0.9860       0.9760       0.9723       0.9644         Japan / AR-MOM vs. AR-MOM-CR1       0.9984       0.9943       0.9895       0.9829       0.9923         Japan / AR-MOM vs. AR-MOM-CR2       0.9996       0.9527       0.9481 </td <td>France / AR-MOM vs. AR-MOM-CR4</td> <td>0.9951</td> <td>0.9964</td> <td>0.9938</td> <td>0.9922</td> <td>0.9894</td>	France / AR-MOM vs. AR-MOM-CR4	0.9951	0.9964	0.9938	0.9922	0.9894
Germany / AR vs. AR-MOM       1.0185       1.0456       1.0425       1.0478       1.0678         Germany / AR-MOM vs. AR-MOM-CR1       0.9979       0.9986       0.9992       0.9984       0.9975         Germany / AR-MOM vs. AR-MOM-CR2       1.0001       1.0008       1.0036       1.0033       1.0075         Germany / AR-MOM vs. AR-MOM-CR3       1.0021       1.0013       1.0010       1.0063       1.0080         Germany / AR-MOM vs. AR-MOM-CR4       0.9988       0.9996       1.0013       1.0011       1.0021         Italy / AR-MOM vs. AR-MOM-CR1       0.9985       0.9991       1.0005       1.0010       1.0021         Italy / AR-MOM vs. AR-MOM-CR1       0.9993       0.9986       0.9981       0.9979       0.9978         Italy / AR-MOM vs. AR-MOM-CR2       0.9992       0.9985       0.9966       0.9962       0.9964         Italy / AR-MOM vs. AR-MOM-CR3       0.9984       0.9965       0.9962       0.9964         Italy / AR-MOM vs. AR-MOM-CR4       0.9974       0.9885       0.9960       0.9723       0.9644         Japan / AR-MOM vs. AR-MOM-CR1       0.9984       0.9943       0.9895       0.9822       0.9923         Japan / AR-MOM vs. AR-MOM-CR2       0.9996       0.9527       0.9481       0.9755 <td>France / AR-MOM vs. AR-MOM-CR</td> <td>0.9857</td> <td>0.9877</td> <td>0.9866</td> <td>0.9841</td> <td>0.9790</td>	France / AR-MOM vs. AR-MOM-CR	0.9857	0.9877	0.9866	0.9841	0.9790
Germany / AR-MOM vs. AR-MOM-CR1       0.9979       0.9986       0.9992       0.9984       0.9975         Germany / AR-MOM vs. AR-MOM-CR2       1.0001       1.0003       1.0036       1.0075         Germany / AR-MOM vs. AR-MOM-CR3       1.0002       1.0013       1.0013       1.0063       1.0075         Germany / AR-MOM vs. AR-MOM-CR4       0.9998       0.9996       1.0013       1.0010       1.0021         Italy / AR vs. AR-MOM vs. AR-MOM-CR1       0.9985       0.9991       1.0005       1.0010       1.0021         Italy / AR-MOM vs. AR-MOM-CR1       0.9993       0.9986       0.9981       0.9979       0.9978         Italy / AR-MOM vs. AR-MOM-CR1       0.9993       0.9984       0.9965       0.9962       0.9964         Italy / AR-MOM vs. AR-MOM-CR2       0.9997       0.9985       0.9863       0.9964       0.9964         Italy / AR-MOM vs. AR-MOM-CR4       0.9974       0.9985       0.9853       0.9660       0.9766         Italy / AR-MOM vs. AR-MOM-CR1       0.9984       0.9943       0.9965       0.9922       0.9923         Japan / AR-MOM vs. AR-MOM-CR2       0.9996       0.9527       0.9481       0.9755       0.9831         Japan / AR-MOM vs. AR-MOM-CR4       0.9913       0.9691       0.9171       <	Germany / AR vs. AR-MOM	1.0185	1.0456	1.0425	1.0478	1.0678
Germany / AR-MOM vs. AR-MOM-CR2       1.0001       1.0008       1.0036       1.0058       1.0075         Germany / AR-MOM vs. AR-MOM-CR3       1.0002       1.0013       1.0040       1.0063       1.0080         Germany / AR-MOM vs. AR-MOM-CR4       0.9998       0.9996       1.0013       1.0011       1.0031       1.0047         Germany / AR-MOM vs. AR-MOM-CR4       0.9985       0.9991       1.0005       1.0010       1.0021         Italy / AR vs. AR-MOM       1.0714       1.0456       1.0307       1.0262       1.0184         Italy / AR-MOM vs. AR-MOM-CR1       0.9993       0.9986       0.9981       0.9979       0.9978         Italy / AR-MOM vs. AR-MOM-CR2       0.9992       0.9985       0.9966       0.9962       0.9964         Italy / AR-MOM vs. AR-MOM-CR3       0.9974       0.9985       0.9853       0.9860       0.9796         Italy / AR-MOM vs. AR-MOM-CR4       0.9974       0.9895       0.9853       0.9862       0.9964         Japan / AR-MOM vs. AR-MOM-CR1       0.9984       0.9943       0.9855       0.9862       0.9964         Japan / AR-MOM vs. AR-MOM-CR2       0.9996       0.9527       0.9481       0.9755       0.9831         Japan / AR-MOM vs. AR-MOM-CR4       0.9913       0.9969	Germany / AR-MOM vs. AR-MOM-CR1	0.9979	0.9986	0.9992	0.9984	0.9975
Germany / AR-MOM vs. AR-MOM-CR3       1.0002       1.0013       1.0040       1.0063       1.0080         Germany / AR-MOM vs. AR-MOM-CR4       0.9985       0.9996       1.0013       1.0011       1.0047         Germany / AR-MOM vs. AR-MOM-CR4       0.9985       0.9991       1.0005       1.0010       1.0021         Italy / AR-MOM vs. AR-MOM       1.0714       1.0456       1.0307       1.0262       1.0184         Italy / AR-MOM vs. AR-MOM-CR1       0.9993       0.9986       0.9981       0.9979       0.9978         Italy / AR-MOM vs. AR-MOM-CR2       0.9992       0.9985       0.9966       0.9963       0.9964         Italy / AR-MOM vs. AR-MOM-CR3       0.9989       0.9984       0.9965       0.9962       0.9964         Italy / AR-MOM vs. AR-MOM-CR4       0.9935       0.9880       0.9760       0.9723       0.9644         Japan / AR-MOM vs. AR-MOM-CR1       0.9984       0.9943       0.9895       0.9892       0.9923         Japan / AR-MOM vs. AR-MOM-CR2       0.9996       0.9527       0.9481       0.9755       0.9831         Japan / AR-MOM vs. AR-MOM-CR4       0.9913       0.9693       0.9680       0.9917       0.9997         Japan / AR-MOM vs. AR-MOM-CR1       0.9810       0.9683       0.9680 <td>Germany / AR-MOM vs. AR-MOM-CR2</td> <td>1.0001</td> <td>1.0008</td> <td>1.0036</td> <td>1.0058</td> <td>1.0075</td>	Germany / AR-MOM vs. AR-MOM-CR2	1.0001	1.0008	1.0036	1.0058	1.0075
Germany / AR-MOM vs. AR-MOM-CR40.99980.99961.00131.00311.0047Germany / AR-MOM vs. AR-MOM-CR0.99850.99911.00051.00101.0021Italy / AR vs. AR-MOM1.07141.04561.03071.02621.0184Italy / AR-MOM vs. AR-MOM-CR10.99930.99860.99810.99790.9978Italy / AR-MOM vs. AR-MOM-CR20.99920.99850.99660.99630.9964Italy / AR-MOM vs. AR-MOM-CR30.99920.99850.98530.98600.9964Italy / AR-MOM vs. AR-MOM-CR40.99740.98950.98530.98600.9796Italy / AR-MOM vs. AR-MOM-CR10.99350.98080.97600.97230.9644Japan / AR-MOM vs. AR-MOM-CR10.99430.98950.98920.9923Japan / AR-MOM vs. AR-MOM-CR10.99840.99430.98950.98290.9923Japan / AR-MOM vs. AR-MOM-CR20.99960.95270.94810.97550.9831Japan / AR-MOM vs. AR-MOM-CR40.99110.96930.96800.99170.9997UK / AR vs. AR-MOM0.80460.78410.95260.96830.9548UK / AR-MOM vs. AR-MOM-CR21.00000.99990.99970.99860.9987UK / AR-MOM vs. AR-MOM-CR30.99990.99960.99770.99850.9985UK / AR-MOM vs. AR-MOM-CR30.99990.99970.99860.99850.9985UK / AR-MOM vs. AR-MOM-CR40.99990.99960.99770.99760.9977 <td< td=""><td>Germany / AR-MOM vs. AR-MOM-CR3</td><td>1.0002</td><td>1.0013</td><td>1.0040</td><td>1.0063</td><td>1.0080</td></td<>	Germany / AR-MOM vs. AR-MOM-CR3	1.0002	1.0013	1.0040	1.0063	1.0080
Germany / AR-MOM vs. AR-MOM-CR0.99850.99911.00051.00101.0021Italy / AR vs. AR-MOM1.07141.04561.03071.02621.0184Italy / AR-MOM vs. AR-MOM-CR10.99930.99860.99810.99790.9978Italy / AR-MOM vs. AR-MOM-CR20.99920.99850.99660.99630.9964Italy / AR-MOM vs. AR-MOM-CR30.99890.99840.99650.99620.9964Italy / AR-MOM vs. AR-MOM-CR40.99740.98950.98530.98600.9769Italy / AR-MOM vs. AR-MOM-CR40.99740.98950.98530.98600.9723Japan / AR-MOM vs. AR-MOM-CR10.99840.99430.98950.98220.9923Japan / AR-MOM vs. AR-MOM-CR10.99840.99430.98950.98290.9923Japan / AR-MOM vs. AR-MOM-CR20.99960.95270.94810.97550.9831Japan / AR-MOM vs. AR-MOM-CR30.99510.96930.96800.9170.9997UK / AR vs. AR-MOM0.80460.78410.95260.96830.9548UK / AR-MOM vs. AR-MOM-CR21.00000.99990.99970.99660.9987UK / AR-MOM vs. AR-MOM-CR21.00000.99980.99970.99660.9987UK / AR-MOM vs. AR-MOM-CR30.99990.99960.99880.99850.9987UK / AR-MOM vs. AR-MOM-CR40.99940.99660.99810.99650.9987UK / AR-MOM vs. AR-MOM-CR40.99970.99660.99770.99760.9977 <td>Germany / AR-MOM vs. AR-MOM-CR4</td> <td>0.9998</td> <td>0.9996</td> <td>1.0013</td> <td>1.0031</td> <td>1.0047</td>	Germany / AR-MOM vs. AR-MOM-CR4	0.9998	0.9996	1.0013	1.0031	1.0047
Italy / AR vs. AR-MOM1.07141.04561.03071.02621.0184Italy / AR-MOM vs. AR-MOM-CR10.99930.99860.99810.99790.9978Italy / AR-MOM vs. AR-MOM-CR20.99920.99850.99660.99630.9964Italy / AR-MOM vs. AR-MOM-CR30.99890.99840.99650.99620.9964Italy / AR-MOM vs. AR-MOM-CR30.99740.99850.98530.98600.9766Italy / AR-MOM vs. AR-MOM-CR40.99740.99850.98530.98600.9766Italy / AR-MOM vs. AR-MOM-CR40.99350.98080.97600.97230.9644Japan / AR vs. AR-MOM1.13011.07921.10071.07131.0317Japan / AR-MOM vs. AR-MOM-CR10.99840.99430.98950.98920.9923Japan / AR-MOM vs. AR-MOM-CR20.99960.95270.94810.97550.9831Japan / AR-MOM vs. AR-MOM-CR40.99130.99491.00561.01151.0130Japan / AR-MOM vs. AR-MOM-CR40.99130.99490.96800.99170.9997UK / AR vs. AR-MOM0.80460.78410.95260.96830.9548UK / AR-MOM vs. AR-MOM-CR21.00000.99980.99910.99880.9987UK / AR-MOM vs. AR-MOM-CR40.99940.99880.99810.99850.9983UK / AR-MOM vs. AR-MOM-CR40.99940.99860.99110.9977UK / AR-MOM vs. AR-MOM-CR40.99940.99860.99810.99951.0008US / AR-MO	Germany / AR-MOM vs. AR-MOM-CR	0.9985	0.9991	1.0005	1.0010	1.0021
Italy / AR-MOM vs. AR-MOM-CR10.99930.99860.99810.99790.9978Italy / AR-MOM vs. AR-MOM-CR20.99920.99850.99660.99630.9964Italy / AR-MOM vs. AR-MOM-CR30.99890.99840.99650.99620.9964Italy / AR-MOM vs. AR-MOM-CR40.99740.98950.98530.98600.9766Italy / AR-MOM vs. AR-MOM-CR0.99350.98080.97600.97230.9644Japan / AR vs. AR-MOM1.13011.07921.10071.07131.0317Japan / AR-MOM vs. AR-MOM-CR10.99840.99430.98950.98920.9923Japan / AR-MOM vs. AR-MOM-CR20.99960.95270.94810.97550.9831Japan / AR-MOM vs. AR-MOM-CR30.99510.96910.97110.98290.9895Japan / AR-MOM vs. AR-MOM-CR40.99130.99491.00561.01151.0130Japan / AR-MOM vs. AR-MOM-CR40.98100.96930.96800.9170.9997UK / AR vs. AR-MOM vs. AR-MOM-CR21.00000.99990.99970.99960.9995UK / AR-MOM vs. AR-MOM-CR30.99940.96800.99110.99830.9977UK / AR-MOM vs. AR-MOM-CR40.99940.99890.99970.99760.9977UK / AR-MOM vs. AR-MOM-CR40.99940.99890.99790.99760.9977UK / AR-MOM vs. AR-MOM-CR40.99940.99860.99810.99951.0008US / AR-MOM vs. AR-MOM-CR10.99971.00031.00141.00181	Italy / AR vs. AR-MOM	1.0714	1.0456	1.0307	1.0262	1.0184
Italy / AR-MOM vs. AR-MOM-CR20.99920.99850.99660.99630.9964Italy / AR-MOM vs. AR-MOM-CR30.99890.99840.99650.99620.9964Italy / AR-MOM vs. AR-MOM-CR40.99740.98950.98530.98600.9760Italy / AR-MOM vs. AR-MOM-CR0.99350.98080.97600.97230.9644Japan / AR vs. AR-MOM1.13011.07921.10071.07131.0317Japan / AR-MOM vs. AR-MOM-CR10.99840.99430.98950.98920.9923Japan / AR-MOM vs. AR-MOM-CR20.99960.95270.94810.97550.9831Japan / AR-MOM vs. AR-MOM-CR30.99510.96910.97110.98290.9895Japan / AR-MOM vs. AR-MOM-CR40.99130.99491.00561.01151.0130Japan / AR-MOM vs. AR-MOM-CR11.00000.99990.99970.99660.9997UK / AR vs. AR-MOM0.80460.78410.95260.96830.9548UK / AR-MOM vs. AR-MOM-CR11.00000.99990.99970.99960.9995UK / AR-MOM vs. AR-MOM-CR21.00000.99980.99110.99880.9987UK / AR-MOM vs. AR-MOM-CR30.99940.99890.99790.99760.9977UK / AR-MOM vs. AR-MOM-CR40.99940.99890.99790.99760.9977UK / AR-MOM vs. AR-MOM-CR10.99970.99760.99770.99760.9977UK / AR-MOM vs. AR-MOM-CR10.99970.99510.99780.99951.0008 <t< td=""><td>Italy / AR-MOM vs. AR-MOM-CR1</td><td>0.9993</td><td>0.9986</td><td>0.9981</td><td>0.9979</td><td>0.9978</td></t<>	Italy / AR-MOM vs. AR-MOM-CR1	0.9993	0.9986	0.9981	0.9979	0.9978
Italy / AR-MOM vs. AR-MOM-CR30.99890.99840.99650.99620.9964Italy / AR-MOM vs. AR-MOM-CR40.99740.98950.98530.98600.9796Italy / AR-MOM vs. AR-MOM-CR0.99350.98080.97600.97230.9644Japan / AR vs. AR-MOM1.13011.07921.10071.07131.0317Japan / AR-MOM vs. AR-MOM-CR10.99840.99430.98950.98920.9923Japan / AR-MOM vs. AR-MOM-CR20.99960.95270.94810.97550.9831Japan / AR-MOM vs. AR-MOM-CR30.99510.96910.97110.98290.9895Japan / AR-MOM vs. AR-MOM-CR40.99130.99491.00561.01151.0130Japan / AR-MOM vs. AR-MOM-CR11.00000.99990.99970.99960.9997UK / AR vs. AR-MOM0.80460.78410.95260.96830.9548UK / AR-MOM vs. AR-MOM-CR11.00000.99990.99970.99960.9995UK / AR-MOM vs. AR-MOM-CR21.00000.99980.99910.99880.9987UK / AR-MOM vs. AR-MOM-CR30.99990.99960.99880.99850.9983UK / AR-MOM vs. AR-MOM-CR40.99940.99890.99790.99760.9977UK / AR-MOM vs. AR-MOM-CR10.99971.00031.00141.00181.0002US / AR-MOM vs. AR-MOM-CR21.00040.99950.99940.99950.9965US / AR-MOM vs. AR-MOM-CR21.00040.99950.99430.9996US / AR-MOM	Italy / AR-MOM vs. AR-MOM-CR2	0.9992	0.9985	0.9966	0.9963	0.9964
Italy / AR-MOM vs. AR-MOM-CR40.99740.98950.98530.98600.9796Italy / AR-MOM vs. AR-MOM-CR0.99350.98080.97600.97230.9644Japan / AR vs. AR-MOM1.13011.07921.10071.07131.0317Japan / AR-MOM vs. AR-MOM-CR10.99840.99430.98950.98920.9923Japan / AR-MOM vs. AR-MOM-CR20.99960.95270.94810.97550.9831Japan / AR-MOM vs. AR-MOM-CR30.99510.96910.97110.98290.9895Japan / AR-MOM vs. AR-MOM-CR40.99130.99491.00561.01151.0130Japan / AR-MOM vs. AR-MOM-CR40.98100.96930.96800.99170.9997UK / AR vs. AR-MOM0.80460.78410.95260.96830.9548UK / AR-MOM vs. AR-MOM-CR11.00000.99990.99970.99960.9995UK / AR-MOM vs. AR-MOM-CR21.00000.99980.99110.99880.9987UK / AR-MOM vs. AR-MOM-CR30.99990.99960.99880.99850.9983UK / AR-MOM vs. AR-MOM-CR40.99940.99890.99790.99760.9977UK / AR-MOM vs. AR-MOM-CR10.99971.00031.00141.00181.0002US / AR-MOM vs. AR-MOM-CR10.99971.00031.00141.00181.0002US / AR-MOM vs. AR-MOM-CR21.00040.99950.99940.99960.9967US / AR-MOM vs. AR-MOM-CR31.00110.99740.99430.99420.9967	Italy / AR-MOM vs. AR-MOM-CR3	0.9989	0.9984	0.9965	0.9962	0.9964
Italy / AR-MOM vs. AR-MOM-CR0.99350.98080.97600.97230.9644Japan / AR vs. AR-MOM1.13011.07921.10071.07131.0317Japan / AR-MOM vs. AR-MOM-CR10.99840.99430.98950.98920.9923Japan / AR-MOM vs. AR-MOM-CR20.99960.95270.94810.97550.9831Japan / AR-MOM vs. AR-MOM-CR30.99130.99491.00561.01151.0130Japan / AR-MOM vs. AR-MOM-CR40.99130.99491.00561.01151.0130Japan / AR-MOM vs. AR-MOM-CR40.98100.96930.96800.99170.9997UK / AR vs. AR-MOM vs. AR-MOM-CR11.00000.99990.99970.99960.9995UK / AR-MOM vs. AR-MOM-CR21.00000.99980.99910.99880.9987UK / AR-MOM vs. AR-MOM-CR30.99990.99960.99880.99870.9977UK / AR-MOM vs. AR-MOM-CR30.99940.99890.99790.99760.9977UK / AR-MOM vs. AR-MOM-CR40.99440.99860.99810.99551.0008US / AR vs. AR-MOM0.87870.99510.95780.94900.9655US / AR-MOM vs. AR-MOM-CR10.99971.00031.00141.00181.0002US / AR-MOM vs. AR-MOM-CR31.00110.99740.99430.99420.9967US / AR-MOM vs. AR-MOM-CR41.00090.99681.00051.00281.0003US / AR-MOM vs. AR-MOM-CR41.00090.99681.00051.00281.0003 <td>Italy / AR-MOM vs. AR-MOM-CR4</td> <td>0.9974</td> <td>0.9895</td> <td>0.9853</td> <td>0.9860</td> <td>0.9796</td>	Italy / AR-MOM vs. AR-MOM-CR4	0.9974	0.9895	0.9853	0.9860	0.9796
Japan / AR vs. AR-MOM1.13011.07921.10071.07131.0317Japan / AR-MOM vs. AR-MOM-CR10.99840.99430.98950.98920.9923Japan / AR-MOM vs. AR-MOM-CR20.99960.95270.94810.97550.9831Japan / AR-MOM vs. AR-MOM-CR30.99510.96910.97110.98290.9895Japan / AR-MOM vs. AR-MOM-CR40.99130.99491.00561.01151.0130Japan / AR-MOM vs. AR-MOM-CR40.99130.96930.96800.99170.9997UK / AR vs. AR-MOM vs. AR-MOM-CR11.00000.99990.99970.99960.9995UK / AR-MOM vs. AR-MOM-CR21.00000.99980.99910.99880.9987UK / AR-MOM vs. AR-MOM-CR11.00000.99990.99970.99960.9985UK / AR-MOM vs. AR-MOM-CR30.99990.99960.99880.99870.9983UK / AR-MOM vs. AR-MOM-CR40.99940.99890.99790.99760.9977UK / AR-MOM vs. AR-MOM-CR40.99940.99860.99810.99951.0008US / AR-MOM vs. AR-MOM-CR10.99971.00031.00141.00181.0002US / AR-MOM vs. AR-MOM-CR21.00040.99950.99940.99960.9967US / AR-MOM vs. AR-MOM-CR31.00110.99740.99430.99420.9967US / AR-MOM vs. AR-MOM-CR41.00090.99681.00051.00281.0003US / AR-MOM vs. AR-MOM-CR41.00090.99681.00051.00281.0003 <td>Italy / AR-MOM vs. AR-MOM-CR</td> <td>0.9935</td> <td>0.9808</td> <td>0.9760</td> <td>0.9723</td> <td>0.9644</td>	Italy / AR-MOM vs. AR-MOM-CR	0.9935	0.9808	0.9760	0.9723	0.9644
Japan / AR-MOM vs. AR-MOM-CR10.99840.99430.98950.98920.9923Japan / AR-MOM vs. AR-MOM-CR20.99960.95270.94810.97550.9831Japan / AR-MOM vs. AR-MOM-CR30.99510.96910.97110.98290.9895Japan / AR-MOM vs. AR-MOM-CR40.99130.99491.00561.01151.0130Japan / AR-MOM vs. AR-MOM-CR40.98100.96930.96800.99170.9997UK / AR vs. AR-MOM0.80460.78410.95260.96830.9548UK / AR-MOM vs. AR-MOM-CR11.00000.99990.99970.99960.9995UK / AR-MOM vs. AR-MOM-CR21.00000.99980.99910.99880.9987UK / AR-MOM vs. AR-MOM-CR30.99990.99960.99880.99850.9983UK / AR-MOM vs. AR-MOM-CR40.99940.99890.99790.99760.9977UK / AR-MOM vs. AR-MOM-CR40.99940.99860.99810.99951.0008US / AR vs. AR-MOM vs. AR-MOM-CR10.99971.00031.00141.00181.0002US / AR-MOM vs. AR-MOM-CR21.00040.99950.99940.99960.9967US / AR-MOM vs. AR-MOM-CR31.00110.99740.99430.99420.9967US / AR-MOM vs. AR-MOM-CR41.00090.99681.00051.00281.0003US / AR-MOM vs. AR-MOM-CR41.00090.99681.00051.00281.0003US / AR-MOM vs. AR-MOM-CR41.00090.99681.00051.00281.0003<	Japan / AR vs. AR-MOM	1.1301	1.0792	1.1007	1.0713	1.0317
Japan / AR-MOM vs. AR-MOM-CR20.99960.95270.94810.97550.9831Japan / AR-MOM vs. AR-MOM-CR30.99510.96910.97110.98290.9895Japan / AR-MOM vs. AR-MOM-CR40.99130.99491.00561.01151.0130Japan / AR-MOM vs. AR-MOM-CR0.98100.96930.96800.99170.9997UK / AR vs. AR-MOM0.80460.78410.95260.96830.9548UK / AR-MOM vs. AR-MOM-CR11.00000.99990.99970.99960.9995UK / AR-MOM vs. AR-MOM-CR21.00000.99980.99910.99880.9987UK / AR-MOM vs. AR-MOM-CR21.00000.99990.99960.99880.9987UK / AR-MOM vs. AR-MOM-CR30.99940.99980.99770.99760.9977UK / AR-MOM vs. AR-MOM-CR40.99440.99860.99810.99951.0008US / AR vs. AR-MOM vs. AR-MOM-CR10.99971.00031.00141.00181.0002US / AR-MOM vs. AR-MOM-CR21.00040.99950.99940.99960.99440.9996US / AR-MOM vs. AR-MOM-CR31.00110.99740.99430.99420.9967US / AR-MOM vs. AR-MOM-CR41.00090.99681.00051.00281.0003US / AR-MOM vs. AR-MOM-CR41.00990.99681.00051.00281.0003US / AR-MOM vs. AR-MOM-CR41.00800.99120.99280.99530.9936	Japan / AR-MOM vs. AR-MOM-CR1	0.9984	0.9943	0.9895	0.9892	0.9923
Japan / AR-MOM vs. AR-MOM-CR30.99510.96910.97110.98290.9895Japan / AR-MOM vs. AR-MOM-CR40.99130.99491.00561.01151.0130Japan / AR-MOM vs. AR-MOM-CR0.98100.96930.96800.99170.9997UK / AR vs. AR-MOM0.80460.78410.95260.96830.9945UK / AR-MOM vs. AR-MOM-CR11.00000.99990.99970.99960.9995UK / AR-MOM vs. AR-MOM-CR21.00000.99980.99910.99880.9987UK / AR-MOM vs. AR-MOM-CR21.00000.99990.99960.99880.9987UK / AR-MOM vs. AR-MOM-CR30.99990.99960.99880.99870.9983UK / AR-MOM vs. AR-MOM-CR40.99940.99890.99790.99760.9977UK / AR vs. AR-MOM0.87870.99510.95780.94900.9655US / AR-MOM vs. AR-MOM-CR10.99971.00031.00141.00181.0002US / AR-MOM vs. AR-MOM-CR21.00040.99950.99940.99960.9967US / AR-MOM vs. AR-MOM-CR31.00110.99740.99430.99420.9967US / AR-MOM vs. AR-MOM-CR41.00090.99681.00051.00281.0003US / AR-MOM vs. AR-MOM-CR41.00800.99120.99280.99530.9936	Japan / AR-MOM vs. AR-MOM-CR2	0.9996	0.9527	0.9481	0.9755	0.9831
Japan / AR-MOM vs. AR-MOM-CR40.99130.99491.00561.01151.0130Japan / AR-MOM vs. AR-MOM-CR0.98100.96930.96800.99170.9997UK / AR vs. AR-MOM0.80460.78410.95260.96830.9948UK / AR-MOM vs. AR-MOM-CR11.00000.99990.99970.99960.9995UK / AR-MOM vs. AR-MOM-CR21.00000.99980.99910.99880.9987UK / AR-MOM vs. AR-MOM-CR30.99990.99960.99880.99850.9983UK / AR-MOM vs. AR-MOM-CR40.99940.99890.99790.99760.9977UK / AR-MOM vs. AR-MOM-CR40.99880.99860.99810.99951.0008US / AR vs. AR-MOM0.87870.99510.95780.94900.9655US / AR-MOM vs. AR-MOM-CR21.00040.99950.99940.99940.9996US / AR-MOM vs. AR-MOM-CR31.00110.99740.99430.99420.9967US / AR-MOM vs. AR-MOM-CR41.00090.99681.00051.00281.0003US / AR-MOM vs. AR-MOM-CR41.00090.99681.00051.00281.0003US / AR-MOM vs. AR-MOM-CR41.00800.99120.99280.99530.9936	Japan / AR-MOM vs. AR-MOM-CR3	0.9951	0.9691	0.9711	0.9829	0.9895
Japan / AR-MOM vs. AR-MOM-CR0.98100.96930.96800.99170.9997UK / AR vs. AR-MOM0.80460.78410.95260.96830.9548UK / AR-MOM vs. AR-MOM-CR11.00000.99990.99970.99960.9995UK / AR-MOM vs. AR-MOM-CR21.00000.99980.99910.99880.9987UK / AR-MOM vs. AR-MOM-CR30.99990.99960.99880.99850.9983UK / AR-MOM vs. AR-MOM-CR40.99940.99890.99790.99760.9977UK / AR-MOM vs. AR-MOM-CR40.99880.99860.99810.99951.0008US / AR vs. AR-MOM0.87870.99510.95780.94900.9655US / AR-MOM vs. AR-MOM-CR10.99971.00031.00141.00181.0002US / AR-MOM vs. AR-MOM-CR31.00110.99740.99430.99420.9967US / AR-MOM vs. AR-MOM-CR31.00110.99740.99430.99420.9967US / AR-MOM vs. AR-MOM-CR41.00090.99681.00051.00281.0003US / AR-MOM vs. AR-MOM-CR41.00800.99120.99280.99530.9936	Japan / AR-MOM vs. AR-MOM-CR4	0.9913	0.9949	1.0056	1.0115	1.0130
UK / AR vs. AR-MOM0.80460.78410.95260.96830.9548UK / AR-MOM vs. AR-MOM-CR11.00000.99990.99970.99960.9995UK / AR-MOM vs. AR-MOM-CR21.00000.99980.99910.99880.9987UK / AR-MOM vs. AR-MOM-CR30.99990.99960.99880.99850.9983UK / AR-MOM vs. AR-MOM-CR40.99940.99890.99790.99760.9977UK / AR-MOM vs. AR-MOM-CR40.99940.99860.99810.99951.0008US / AR vs. AR-MOM0.87870.99510.95780.94900.9655US / AR-MOM vs. AR-MOM-CR10.99971.00031.00141.00181.0002US / AR-MOM vs. AR-MOM-CR21.00040.99950.99940.99960.9967US / AR-MOM vs. AR-MOM-CR31.00110.99740.99430.99420.9967US / AR-MOM vs. AR-MOM-CR41.00090.99681.00051.00281.0003US / AR-MOM vs. AR-MOM-CR41.00800.99120.99280.99530.9936	Japan / AR-MOM vs. AR-MOM-CR	0.9810	0.9693	0.9680	0.9917	0.9997
UK / AR-MOM vs. AR-MOM-CR1       1.0000       0.9999       0.9997       0.9996       0.9995         UK / AR-MOM vs. AR-MOM-CR2       1.0000       0.9998       0.9991       0.9988       0.9987         UK / AR-MOM vs. AR-MOM-CR3       0.9999       0.9996       0.9988       0.9985       0.9983         UK / AR-MOM vs. AR-MOM-CR3       0.9999       0.9996       0.9988       0.9985       0.9983         UK / AR-MOM vs. AR-MOM-CR4       0.9994       0.9989       0.9979       0.9976       0.9977         UK / AR-MOM vs. AR-MOM-CR4       0.9984       0.9986       0.9981       0.9995       1.0008         US / AR vs. AR-MOM       0.8787       0.9951       0.9578       0.9490       0.9655         US / AR-MOM vs. AR-MOM-CR1       0.9997       1.0003       1.0014       1.0018       1.0002         US / AR-MOM vs. AR-MOM-CR2       1.0004       0.9995       0.9994       0.9996         US / AR-MOM vs. AR-MOM-CR3       1.0011       0.9974       0.9943       0.9967         US / AR-MOM vs. AR-MOM-CR4       1.0009       0.9968       1.0005       1.0028       1.0003         US / AR-MOM vs. AR-MOM-CR       1.0080       0.9912       0.9928       0.9953       0.9936	UK / AR vs. AR-MOM	0.8046	0.7841	0.9526	0.9683	0.9548
UK / AR-MOM vs. AR-MOM-CR2       1.0000       0.9998       0.9991       0.9988       0.9987         UK / AR-MOM vs. AR-MOM-CR3       0.9999       0.9996       0.9988       0.9985       0.9983         UK / AR-MOM vs. AR-MOM-CR4       0.9994       0.9989       0.9979       0.9976       0.9977         UK / AR-MOM vs. AR-MOM-CR4       0.9984       0.9986       0.9981       0.9995       1.0008         US / AR vs. AR-MOM       0.8787       0.9951       0.9578       0.9490       0.9655         US / AR-MOM vs. AR-MOM-CR1       0.9997       1.0003       1.0014       1.0018       1.0002         US / AR-MOM vs. AR-MOM-CR2       1.0004       0.9995       0.9994       0.9996       0.9994       0.9996         US / AR-MOM vs. AR-MOM-CR3       1.0011       0.9974       0.9943       0.9967       0.9967         US / AR-MOM vs. AR-MOM-CR4       1.0009       0.9968       1.0005       1.0028       1.0003         US / AR-MOM vs. AR-MOM-CR4       1.0080       0.9912       0.9928       0.9953       0.9936	UK / AR-MOM vs. AR-MOM-CR1	1.0000	0.9999	0.9997	0.9996	0.9995
UK / AR-MOM vs. AR-MOM-CR3       0.9999       0.9996       0.9988       0.9985       0.9983         UK / AR-MOM vs. AR-MOM-CR4       0.9994       0.9989       0.9979       0.9976       0.9977         UK / AR-MOM vs. AR-MOM-CR4       0.9988       0.9986       0.9981       0.9995       1.0008         US / AR vs. AR-MOM       0.8787       0.9951       0.9578       0.9490       0.9655         US / AR-MOM vs. AR-MOM-CR1       0.9997       1.0003       1.0014       1.0018       1.0002         US / AR-MOM vs. AR-MOM-CR2       1.0004       0.9995       0.9994       0.9996       0.9967         US / AR-MOM vs. AR-MOM-CR3       1.0011       0.9974       0.9943       0.9967         US / AR-MOM vs. AR-MOM-CR4       1.0009       0.9968       1.0005       1.0028       1.0003         US / AR-MOM vs. AR-MOM-CR4       1.0009       0.9968       1.0025       1.0028       1.0003	UK / AR-MOM vs. AR-MOM-CR2	1.0000	0.9998	0.9991	0.9988	0.9987
UK / AR-MOM vs. AR-MOM-CR40.99940.99890.99790.99760.9977UK / AR-MOM vs. AR-MOM-CR0.99880.99860.99810.99951.0008US / AR vs. AR-MOM0.87870.99510.95780.94900.9655US / AR-MOM vs. AR-MOM-CR10.99971.00031.00141.00181.0002US / AR-MOM vs. AR-MOM-CR21.00040.99950.99940.99940.9996US / AR-MOM vs. AR-MOM-CR31.00110.99740.99430.99420.9967US / AR-MOM vs. AR-MOM-CR41.00090.99681.00051.00281.0003US / AR-MOM vs. AR-MOM-CR41.00800.99120.99280.99530.9936	UK / AR-MOM vs. AR-MOM-CR3	0.9999	0.9996	0.9988	0.9985	0.9983
UK / AR-MOM vs. AR-MOM-CR0.99880.99860.99810.99951.0008US / AR vs. AR-MOM0.87870.99510.95780.94900.9655US / AR-MOM vs. AR-MOM-CR10.99971.00031.00141.00181.0002US / AR-MOM vs. AR-MOM-CR21.00040.99950.99940.99940.9996US / AR-MOM vs. AR-MOM-CR31.00110.99740.99430.99420.9967US / AR-MOM vs. AR-MOM-CR41.00090.99681.00051.00281.0003US / AR-MOM vs. AR-MOM-CR1.00800.99120.99280.99530.9936	UK / AR-MOM vs. AR-MOM-CR4	0.9994	0.9989	0.9979	0.9976	0.9977
US / AR vs. AR-MOM0.87870.99510.95780.94900.9655US / AR-MOM vs. AR-MOM-CR10.99971.00031.00141.00181.0002US / AR-MOM vs. AR-MOM-CR21.00040.99950.99940.99940.9996US / AR-MOM vs. AR-MOM-CR31.00110.99740.99430.99420.9967US / AR-MOM vs. AR-MOM-CR41.00090.99681.00051.00281.0003US / AR-MOM vs. AR-MOM-CR41.00800.99120.99280.99530.9936	UK / AR-MOM vs. AR-MOM-CR	0.9988	0.9986	0.9981	0.9995	1.0008
US / AR-MOM vs. AR-MOM-CR10.99971.00031.00141.00181.0002US / AR-MOM vs. AR-MOM-CR21.00040.99950.99940.99940.9996US / AR-MOM vs. AR-MOM-CR31.00110.99740.99430.99420.9967US / AR-MOM vs. AR-MOM-CR41.00090.99681.00051.00281.0003US / AR-MOM vs. AR-MOM-CR1.00800.99120.99280.99530.9936	US / AR vs. AR-MOM	0.8787	0.9951	0.9578	0.9490	0.9655
US / AR-MOM vs. AR-MOM-CR2       1.0004       0.9995       0.9994       0.9996         US / AR-MOM vs. AR-MOM-CR3       1.0011       0.9974       0.9943       0.9942       0.9967         US / AR-MOM vs. AR-MOM-CR4       1.0009       0.9968       1.0005       1.0028       1.0003         US / AR-MOM vs. AR-MOM-CR4       1.0080       0.9912       0.9928       0.9953       0.9936	US / AR-MOM vs. AR-MOM-CR1	0.9997	1.0003	1.0014	1.0018	1.0002
US / AR-MOM vs. AR-MOM-CR3       1.0011       0.9974       0.9943       0.9942       0.9967         US / AR-MOM vs. AR-MOM-CR4       1.0009       0.9968       1.0005       1.0028       1.0003         US / AR-MOM vs. AR-MOM-CR       1.0080       0.9912       0.9928       0.9953       0.9936	US / AR-MOM vs. AR-MOM-CR2	1.0004	0.9995	0.9994	0.9994	0.9996
US / AR-MOM vs. AR-MOM-CR41.00090.99681.00051.00281.0003US / AR-MOM vs. AR-MOM-CR1.00800.99120.99280.99530.9936	US / AR-MOM vs. AR-MOM-CR3	1.0011	0.9974	0.9943	0.9942	0.9967
US / AR-MOM vs. AR-MOM-CR 1.0080 0.9912 0.9928 0.9953 0.9936	US / AR-MOM vs. AR-MOM-CR4	1.0009	0.9968	1.0005	1.0028	1.0003
· · · · · · · · · · · · · · · · · · ·	US / AR-MOM vs. AR-MOM-CR	1.0080	0.9912	0.9928	0.9953	0.9936

Table 3: RMSFE ratios for a rolling estimation window

Table 4: RMSFE	ratios for a	recursive	estimation	window	(50% c	of the	forecasts	deleted)
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Canada / AR vs. AR-MOM         2.0107         1.3590         1.1531         1.0840         1.0568           Canada / AR-MOM vs. AR-MOM-CR1         0.9998         0.9991         0.9995         0.9994         0.9999           Canada / AR-MOM vs. AR-MOM-CR2         0.9987         0.9990         0.9991         0.9975         0.9950           Canada / AR-MOM vs. AR-MOM-CR3         0.9990         0.9983         0.9974         0.9972         0.9976           Canada / AR-MOM vs. AR-MOM-CR4         0.9981         0.9980         0.9989         1.0003         1.0005           Canada / AR-MOM vs. AR-MOM-CR4         0.9955         0.9931         0.9962         0.9927         0.9867           France / AR vs. AR-MOM vs. AR-MOM-CR4         0.9955         0.9931         0.9962         0.9927         0.9867           France / AR wom vs. AR-MOM         1.8771         1.3148         1.1553         1.0007         1.0627           France / AR-MOM vs. AR-MOM-CR2         0.9983         0.9994         1.0005         1.0006         1.0001           France / AR-MOM vs. AR-MOM-CR2         0.9983         0.9994         1.0003         1.0002         0.9998           France / AR-MOM vs. AR-MOM-CR4         0.9985         0.9994         1.0003         1.0002         0.9996	Country / Models	h=1	h=3	h=6	h=9	h=12
Canada / AR-MOM vs. AR-MOM-CR1       0.9998       0.9981       0.9995       0.9994       0.9999         Canada / AR-MOM vs. AR-MOM-CR2       0.9987       0.9990       0.9991       0.9975       0.9950         Canada / AR-MOM vs. AR-MOM-CR3       0.9990       0.9983       0.9974       0.9972       0.9976         Canada / AR-MOM vs. AR-MOM-CR4       0.9981       0.9980       0.9989       1.0003       1.0005         Canada / AR-MOM vs. AR-MOM-CR4       0.9955       0.9931       0.9962       0.9927       0.9867         France / AR vs. AR-MOM       1.8771       1.3148       1.1553       1.0907       1.0627         France / AR-MOM vs. AR-MOM-CR1       1.0007       0.9998       0.9993       0.9996       1.0001         France / AR-MOM vs. AR-MOM-CR2       0.9982       0.9991       0.9998       0.9995       0.9995         France / AR-MOM vs. AR-MOM-CR4       0.9982       0.9991       0.9998       0.9995       0.9995         France / AR-MOM vs. AR-MOM-CR4       0.9982       0.9994       1.0003       1.0002       0.9996         France / AR-MOM vs. AR-MOM-CR4       0.9982       0.9994       1.0003       1.0002       0.9996         France / AR-MOM vs. AR-MOM-CR4       0.9998       0.9996       0.9953 </td <td>Canada / AR vs. AR-MOM</td> <td>2.0107</td> <td>1.3590</td> <td>1.1531</td> <td>1.0840</td> <td>1.0568</td>	Canada / AR vs. AR-MOM	2.0107	1.3590	1.1531	1.0840	1.0568
Canada / AR-MOM vs. AR-MOM-CR2       0.9987       0.9990       0.9991       0.9975       0.9950         Canada / AR-MOM vs. AR-MOM-CR3       0.9990       0.9983       0.9974       0.9972       0.9976         Canada / AR-MOM vs. AR-MOM-CR4       0.9981       0.9980       0.9989       1.0003       1.0005         Canada / AR-MOM vs. AR-MOM-CR4       0.9955       0.9931       0.9962       0.9927       0.9867         France / AR vs. AR-MOM       1.8771       1.3148       1.1553       1.0907       1.0627         France / AR-MOM vs. AR-MOM-CR1       1.0007       0.9998       0.9993       0.9996       1.0001         France / AR-MOM vs. AR-MOM-CR2       0.9983       0.9994       1.0005       1.0006       1.0001         France / AR-MOM vs. AR-MOM-CR3       0.9982       0.9991       0.9998       0.9995       0.9996         France / AR-MOM vs. AR-MOM-CR4       0.9985       0.9994       1.0003       1.0002       0.9996         France / AR-MOM vs. AR-MOM-CR4       0.9985       0.9994       1.0003       1.0002       0.9996         France / AR-MOM vs. AR-MOM-CR4       0.9988       0.9976       0.9988       0.9975       0.9986         Germany / AR-MOM vs. AR-MOM-CR4       0.9998       0.9988       0.9835<	Canada / AR-MOM vs. AR-MOM-CR1	0.9998	0.9981	0.9995	0.9994	0.9999
Canada / AR-MOM vs. AR-MOM-CR3       0.9990       0.9983       0.9974       0.9972       0.9976         Canada / AR-MOM vs. AR-MOM-CR4       0.9981       0.9980       0.9989       1.0003       1.0005         Canada / AR-MOM vs. AR-MOM-CR       0.9955       0.9931       0.9962       0.9927       0.9867         France / AR vs. AR-MOM       1.8771       1.3148       1.1553       1.0907       1.0627         France / AR-MOM vs. AR-MOM-CR1       1.0007       0.9998       0.9993       0.9996       1.0001         France / AR-MOM vs. AR-MOM-CR2       0.9983       0.9991       0.9998       0.9995       0.9998         France / AR-MOM vs. AR-MOM-CR3       0.9982       0.9991       0.9998       0.9995       0.9996         France / AR-MOM vs. AR-MOM-CR4       0.9985       0.9994       1.0003       1.0002       0.9996         France / AR-MOM vs. AR-MOM-CR4       0.9985       0.9994       1.0003       1.0002       0.9996         France / AR-MOM vs. AR-MOM       0.4319       0.5108       0.5562       0.5611       0.5536         Germany / AR-MOM vs. AR-MOM-CR4       0.9999       0.9988       0.9835       0.9647       0.9626         Germany / AR-MOM vs. AR-MOM-CR4       0.9999       0.9011       1.0007	Canada / AR-MOM vs. AR-MOM-CR2	0.9987	0.9990	0.9991	0.9975	0.9950
Canada / AR-MOM vs. AR-MOM-CR4       0.9981       0.9980       0.9989       1.0003       1.0005         Canada / AR-MOM vs. AR-MOM-CR       0.9955       0.9931       0.9962       0.9927       0.9867         France / AR vs. AR-MOM       1.8771       1.3148       1.1553       1.0907       1.0627         France / AR-MOM vs. AR-MOM-CR1       1.0007       0.9998       0.9993       0.9996       1.0001         France / AR-MOM vs. AR-MOM-CR2       0.9983       0.9994       1.0005       1.0006       1.0001         France / AR-MOM vs. AR-MOM-CR3       0.9982       0.9991       0.9998       0.9995       0.9989         France / AR-MOM vs. AR-MOM-CR4       0.9985       0.9994       1.0003       1.0002       0.9996         France / AR-MOM vs. AR-MOM-CR4       0.9985       0.9994       1.0003       1.0002       0.9996         France / AR-MOM vs. AR-MOM-CR4       0.9985       0.9994       1.0003       1.0002       0.9986         Germany / AR-MOM vs. AR-MOM       0.4319       0.5108       0.5562       0.5611       0.5536         Germany / AR-MOM vs. AR-MOM-CR4       0.9999       0.9988       0.9835       0.9647       0.9626         Germany / AR-MOM vs. AR-MOM-CR4       0.9999       1.0001       1.0007 <td>Canada / AR-MOM vs. AR-MOM-CR3</td> <td>0.9990</td> <td>0.9983</td> <td>0.9974</td> <td>0.9972</td> <td>0.9976</td>	Canada / AR-MOM vs. AR-MOM-CR3	0.9990	0.9983	0.9974	0.9972	0.9976
Canada / AR-MOM vs. AR-MOM-CR       0.9955       0.9931       0.9962       0.9927       0.9867         France / AR vs. AR-MOM       1.8771       1.3148       1.1553       1.0907       1.0627         France / AR-MOM vs. AR-MOM-CR1       1.0007       0.9998       0.9993       0.9996       1.0001         France / AR-MOM vs. AR-MOM-CR2       0.9983       0.9994       1.0005       1.0006       1.0001         France / AR-MOM vs. AR-MOM-CR3       0.9982       0.9991       0.9998       0.9995       0.9989         France / AR-MOM vs. AR-MOM-CR4       0.9985       0.9994       1.0003       1.0002       0.9996         France / AR-MOM vs. AR-MOM-CR4       0.9985       0.9994       1.0003       1.0002       0.9996         France / AR-MOM vs. AR-MOM-CR4       0.9985       0.9994       1.0003       1.0002       0.9996         France / AR-MOM vs. AR-MOM-CR4       0.9985       0.9994       0.0015       0.9988       0.9975         Germany / AR-MOM vs. AR-MOM-CR1       1.0000       1.0004       1.0015       0.9953       0.9866         Germany / AR-MOM vs. AR-MOM-CR3       0.9992       0.9968       0.9788       0.9647       0.9626         Germany / AR-MOM vs. AR-MOM-CR4       0.99991       1.0001       1.000	Canada / AR-MOM vs. AR-MOM-CR4	0.9981	0.9980	0.9989	1.0003	1.0005
France / AR vs. AR-MOM1.87711.31481.15531.09071.0627France / AR-MOM vs. AR-MOM-CR11.00070.99980.99930.99961.0001France / AR-MOM vs. AR-MOM-CR20.99830.99941.00051.00061.0001France / AR-MOM vs. AR-MOM-CR30.99820.99910.99980.99950.9989France / AR-MOM vs. AR-MOM-CR40.99850.99941.00031.00020.9996France / AR-MOM vs. AR-MOM-CR40.99850.99941.00031.00020.9996France / AR-MOM vs. AR-MOM-CR11.00261.00220.99960.99880.9975Germany / AR vs. AR-MOM0.43190.51080.55620.56110.5536Germany / AR-MOM vs. AR-MOM-CR11.00001.00041.00150.99530.9866Germany / AR-MOM vs. AR-MOM-CR30.99920.99680.97880.96470.9626Germany / AR-MOM vs. AR-MOM-CR40.99991.00011.00070.99960.9994Germany / AR-MOM vs. AR-MOM-CR40.99270.97510.94490.92350.9177Italy / AR vs. AR-MOM1.10440.99370.96280.92880.9130Italy / AR-MOM vs. AR-MOM-CR21.00010.99960.99700.99510.9920Italy / AR-MOM vs. AR-MOM-CR31.00010.99970.99920.99880.9276Italy / AR-MOM vs. AR-MOM-CR31.00010.99970.99920.99880.9976Italy / AR-MOM vs. AR-MOM-CR31.00010.99970.99920.	Canada / AR-MOM vs. AR-MOM-CR	0.9955	0.9931	0.9962	0.9927	0.9867
France / AR-MOM vs. AR-MOM-CR1       1.0007       0.9998       0.9993       0.9996       1.0001         France / AR-MOM vs. AR-MOM-CR2       0.9983       0.9994       1.0005       1.0006       1.0001         France / AR-MOM vs. AR-MOM-CR3       0.9982       0.9991       0.9998       0.9995       0.9989         France / AR-MOM vs. AR-MOM-CR3       0.9985       0.9994       1.0003       1.0002       0.9996         France / AR-MOM vs. AR-MOM-CR4       0.9985       0.9994       1.0003       1.0002       0.9996         France / AR-MOM vs. AR-MOM-CR4       0.9985       0.9994       1.0003       1.0002       0.9996         France / AR-MOM vs. AR-MOM-CR4       1.0026       1.0022       0.9996       0.9988       0.9975         Germany / AR-MOM vs. AR-MOM-CR1       1.0000       1.0004       1.0015       0.9953       0.9866         Germany / AR-MOM vs. AR-MOM-CR2       0.9998       0.9988       0.9835       0.9677       0.9677         Germany / AR-MOM vs. AR-MOM-CR3       0.9992       0.9968       0.9788       0.9647       0.9626         Germany / AR-MOM vs. AR-MOM-CR4       0.99991       1.0001       1.0007       0.9996       0.9994         Germany / AR-MOM vs. AR-MOM-CR1       1.0028       0.9977	France / AR vs. AR-MOM	1.8771	1.3148	1.1553	1.0907	1.0627
France / AR-MOM vs. AR-MOM-CR2       0.9983       0.9994       1.0005       1.0006       1.0001         France / AR-MOM vs. AR-MOM-CR3       0.9982       0.9991       0.9998       0.9995       0.9989         France / AR-MOM vs. AR-MOM-CR4       0.9985       0.9994       1.0003       1.0002       0.9996         France / AR-MOM vs. AR-MOM-CR4       0.9985       0.9994       1.0003       1.0002       0.9996         France / AR-MOM vs. AR-MOM-CR4       1.0026       1.0022       0.9996       0.9988       0.9975         Germany / AR vs. AR-MOM       0.4319       0.5108       0.5562       0.5611       0.5536         Germany / AR-MOM vs. AR-MOM-CR1       1.0000       1.0004       1.0015       0.9953       0.9866         Germany / AR-MOM vs. AR-MOM-CR2       0.9998       0.9988       0.9835       0.9677       0.9677         Germany / AR-MOM vs. AR-MOM-CR3       0.9992       0.9968       0.9788       0.9647       0.9626         Germany / AR-MOM vs. AR-MOM-CR4       0.9999       1.0001       1.0007       0.9996       0.9994         Germany / AR-MOM vs. AR-MOM-CR1       0.9927       0.9751       0.9449       0.9235       0.9177         Italy / AR-MOM vs. AR-MOM-CR1       1.0008       0.9996       0.9	France / AR-MOM vs. AR-MOM-CR1	1.0007	0.9998	0.9993	0.9996	1.0001
France / AR-MOM vs. AR-MOM-CR3       0.9982       0.9991       0.9998       0.9995       0.9989         France / AR-MOM vs. AR-MOM-CR4       0.9985       0.9994       1.0003       1.0002       0.9996         France / AR-MOM vs. AR-MOM-CR4       1.0026       1.0022       0.9996       0.9988       0.9975         Germany / AR vs. AR-MOM       0.4319       0.5108       0.5562       0.5611       0.5536         Germany / AR-MOM vs. AR-MOM-CR1       1.0000       1.0004       1.0015       0.9953       0.9866         Germany / AR-MOM vs. AR-MOM-CR2       0.9998       0.9988       0.9835       0.9697       0.9677         Germany / AR-MOM vs. AR-MOM-CR3       0.9992       0.9968       0.9788       0.9647       0.9626         Germany / AR-MOM vs. AR-MOM-CR4       0.9999       1.0001       1.0007       0.9996       0.9994         Germany / AR-MOM vs. AR-MOM-CR4       0.9927       0.9751       0.9449       0.9235       0.9177         Italy / AR-MOM vs. AR-MOM-CR1       1.0008       0.9996       0.9970       0.9951       0.9920         Italy / AR-MOM vs. AR-MOM-CR2       1.0011       0.9997       0.9920       0.9988       0.9170       0.9920         Italy / AR-MOM vs. AR-MOM-CR3       1.0001       0.999	France / AR-MOM vs. AR-MOM-CR2	0.9983	0.9994	1.0005	1.0006	1.0001
France / AR-MOM vs. AR-MOM-CR4       0.9985       0.9994       1.0003       1.0002       0.9996         France / AR-MOM vs. AR-MOM-CR       1.0026       1.0022       0.9996       0.9988       0.9975         Germany / AR vs. AR-MOM       0.4319       0.5108       0.5562       0.5611       0.5536         Germany / AR-MOM vs. AR-MOM-CR1       1.0000       1.0004       1.0015       0.9953       0.9866         Germany / AR-MOM vs. AR-MOM-CR2       0.9998       0.9988       0.9835       0.9697       0.9677         Germany / AR-MOM vs. AR-MOM-CR3       0.9992       0.9968       0.9788       0.9647       0.9626         Germany / AR-MOM vs. AR-MOM-CR4       0.9999       1.0001       1.0007       0.9996       0.9994         Germany / AR-MOM vs. AR-MOM-CR4       0.9927       0.9751       0.9449       0.9235       0.9177         Italy / AR vs. AR-MOM       1.1044       0.9937       0.9628       0.9288       0.9130         Italy / AR-MOM vs. AR-MOM-CR1       1.0008       0.9996       0.9970       0.9951       0.9920         Italy / AR-MOM vs. AR-MOM-CR2       1.0001       0.9997       0.9997       0.9990       0.9997       0.9990       0.9997         Italy / AR-MOM vs. AR-MOM-CR3       1.0001	France / AR-MOM vs. AR-MOM-CR3	0.9982	0.9991	0.9998	0.9995	0.9989
France / AR-MOM vs. AR-MOM-CR       1.0026       1.0022       0.9996       0.9988       0.9975         Germany / AR vs. AR-MOM       0.4319       0.5108       0.5562       0.5611       0.5536         Germany / AR-MOM vs. AR-MOM-CR1       1.0000       1.0004       1.0015       0.9953       0.9866         Germany / AR-MOM vs. AR-MOM-CR2       0.9998       0.9988       0.9835       0.9697       0.9677         Germany / AR-MOM vs. AR-MOM-CR3       0.9992       0.9968       0.9788       0.9647       0.9626         Germany / AR-MOM vs. AR-MOM-CR4       0.9999       1.0001       1.0007       0.9996       0.9994         Germany / AR-MOM vs. AR-MOM-CR4       0.9927       0.9751       0.9449       0.9235       0.9177         Italy / AR-MOM vs. AR-MOM       1.1044       0.9997       0.9968       0.9288       0.9130         Italy / AR-MOM vs. AR-MOM-CR1       1.0008       0.9996       0.9970       0.9951       0.9920         Italy / AR-MOM vs. AR-MOM-CR2       1.0001       0.9998       1.0000       0.9997       0.9990         Italy / AR-MOM vs. AR-MOM-CR3       1.0001       0.9997       0.9920       0.9988       0.9976         Italy / AR-MOM vs. AR-MOM-CR3       1.0023       1.0035       1.0042	France / AR-MOM vs. AR-MOM-CR4	0.9985	0.9994	1.0003	1.0002	0.9996
Germany / AR vs. AR-MOM       0.4319       0.5108       0.5562       0.5611       0.5536         Germany / AR-MOM vs. AR-MOM-CR1       1.0000       1.0004       1.0015       0.9953       0.9866         Germany / AR-MOM vs. AR-MOM-CR2       0.9998       0.9988       0.9835       0.9697       0.9677         Germany / AR-MOM vs. AR-MOM-CR3       0.9992       0.9968       0.9788       0.9647       0.9626         Germany / AR-MOM vs. AR-MOM-CR4       0.9999       1.0001       1.0007       0.9996       0.9994         Germany / AR-MOM vs. AR-MOM-CR4       0.9927       0.9751       0.9449       0.9235       0.9177         Italy / AR vs. AR-MOM       1.1044       0.9937       0.9628       0.9288       0.9130         Italy / AR-MOM vs. AR-MOM-CR1       1.0008       0.9996       0.9970       0.9951       0.9920         Italy / AR-MOM vs. AR-MOM-CR2       1.0001       0.9997       0.9997       0.9990         Italy / AR-MOM vs. AR-MOM-CR3       1.0001       0.9997       0.9920       0.9988       0.9976         Italy / AR-MOM vs. AR-MOM-CR3       1.0001       0.9997       0.9988       0.9976       0.9976	France / AR-MOM vs. AR-MOM-CR	1.0026	1.0022	0.9996	0.9988	0.9975
Germany / AR-MOM vs. AR-MOM-CR1       1.0000       1.0004       1.0015       0.9953       0.9866         Germany / AR-MOM vs. AR-MOM-CR2       0.9998       0.9988       0.9835       0.9697       0.9677         Germany / AR-MOM vs. AR-MOM-CR3       0.9992       0.9968       0.9788       0.9647       0.9626         Germany / AR-MOM vs. AR-MOM-CR4       0.9999       1.0001       1.0007       0.9996       0.9994         Germany / AR-MOM vs. AR-MOM-CR4       0.9997       0.9751       0.9449       0.9235       0.9177         Italy / AR vs. AR-MOM       1.1044       0.9937       0.9628       0.9288       0.9130         Italy / AR-MOM vs. AR-MOM-CR1       1.0008       0.9996       0.9970       0.9951       0.9920         Italy / AR-MOM vs. AR-MOM-CR2       1.0001       0.9997       0.9997       0.9990         Italy / AR-MOM vs. AR-MOM-CR3       1.0001       0.9997       0.9992       0.9988       0.9976         Italy / AR-MOM vs. AR-MOM-CR3       1.0001       0.9997       0.9992       0.9988       0.9976	Germany / AR vs. AR-MOM	0.4319	0.5108	0.5562	0.5611	0.5536
Germany / AR-MOM vs. AR-MOM-CR2         0.9998         0.9988         0.9835         0.9697         0.9677           Germany / AR-MOM vs. AR-MOM-CR3         0.9992         0.9968         0.9788         0.9647         0.9626           Germany / AR-MOM vs. AR-MOM-CR4         0.9999         1.0001         1.0007         0.9996         0.9994           Germany / AR-MOM vs. AR-MOM-CR4         0.9999         1.0001         1.0007         0.9996         0.9994           Germany / AR-MOM vs. AR-MOM-CR4         0.9927         0.9751         0.9449         0.9235         0.9177           Italy / AR vs. AR-MOM         1.1044         0.9937         0.9628         0.9288         0.9130           Italy / AR-MOM vs. AR-MOM-CR1         1.0008         0.9996         0.9970         0.9951         0.9920           Italy / AR-MOM vs. AR-MOM-CR2         1.0001         0.9997         0.9997         0.9997         0.9997           Italy / AR-MOM vs. AR-MOM-CR3         1.0001         0.9997         0.9992         0.9988         0.9076           Italy / AR-MOM vs. AR-MOM-CR4         1.0023         1.0035         1.0042         1.0058         1.0092	Germany / AR-MOM vs. AR-MOM-CR1	1.0000	1.0004	1.0015	0.9953	0.9866
Germany / AR-MOM vs. AR-MOM-CR3         0.9992         0.9968         0.9788         0.9647         0.9626           Germany / AR-MOM vs. AR-MOM-CR4         0.9999         1.0001         1.0007         0.9996         0.9994           Germany / AR-MOM vs. AR-MOM-CR4         0.9927         0.9751         0.9449         0.9235         0.9177           Italy / AR vs. AR-MOM         1.1044         0.9937         0.9628         0.9288         0.9130           Italy / AR-MOM vs. AR-MOM-CR1         1.0008         0.9996         0.9970         0.9951         0.9920           Italy / AR-MOM vs. AR-MOM-CR2         1.0001         0.9998         1.0000         0.9997         0.9920           Italy / AR-MOM vs. AR-MOM-CR3         1.0001         0.9997         0.9997         0.9990           Italy / AR-MOM vs. AR-MOM-CR3         1.0001         0.9997         0.9988         0.9976           Italy / AR-MOM vs. AR-MOM-CR4         1.0023         1.0042         1.0058         1.0058	Germany / AR-MOM vs. AR-MOM-CR2	0.9998	0.9988	0.9835	0.9697	0.9677
Germany / AR-MOM vs. AR-MOM-CR4         0.9999         1.0001         1.0007         0.9996         0.9994           Germany / AR-MOM vs. AR-MOM-CR         0.9927         0.9751         0.9449         0.9235         0.9177           Italy / AR vs. AR-MOM         1.1044         0.9937         0.9628         0.9288         0.9130           Italy / AR-MOM vs. AR-MOM-CR1         1.0008         0.9996         0.9970         0.9951         0.9920           Italy / AR-MOM vs. AR-MOM-CR2         1.0001         0.9998         1.0000         0.9997         0.9990           Italy / AR-MOM vs. AR-MOM-CR3         1.0001         0.9997         0.9992         0.9988         0.9170           Italy / AR-MOM vs. AR-MOM-CR3         1.0001         0.9998         1.0000         0.9997         0.9990           Italy / AR-MOM vs. AR-MOM-CR4         1.0023         1.0035         1.0042         1.0058         1.0099	Germany / AR-MOM vs. AR-MOM-CR3	0.9992	0.9968	0.9788	0.9647	0.9626
Germany / AR-MOM vs. AR-MOM-CR         0.9927         0.9751         0.9449         0.9235         0.9177           Italy / AR vs. AR-MOM         1.1044         0.9937         0.9628         0.9288         0.9130           Italy / AR-MOM vs. AR-MOM-CR1         1.0008         0.9996         0.9970         0.9951         0.9920           Italy / AR-MOM vs. AR-MOM-CR2         1.0001         0.9998         1.0000         0.9997         0.9990           Italy / AR-MOM vs. AR-MOM-CR3         1.0001         0.9997         0.9992         0.9988         0.9976           Italy / AR-MOM vs. AR-MOM-CR3         1.0001         0.9997         0.9992         0.9988         0.9976           Italy / AR-MOM vs. AR-MOM-CR4         1.0023         1.0035         1.0042         1.0058         1.0099	Germany / AR-MOM vs. AR-MOM-CR4	0.9999	1.0001	1.0007	0.9996	0.9994
Italy / AR vs. AR-MOM       1.1044       0.9937       0.9628       0.9288       0.9130         Italy / AR-MOM vs. AR-MOM-CR1       1.0008       0.9996       0.9970       0.9951       0.9920         Italy / AR-MOM vs. AR-MOM-CR2       1.0001       0.9998       1.0000       0.9997       0.9990         Italy / AR-MOM vs. AR-MOM-CR3       1.0001       0.9997       0.9992       0.9988       0.9130         Italy / AR-MOM vs. AR-MOM-CR3       1.0001       0.9997       0.9992       0.9988       0.9976         Italy / AR-MOM vs. AR-MOM-CR4       1.0023       1.0035       1.0042       1.0058       1.0099	Germany / AR-MOM vs. AR-MOM-CR	0.9927	0.9751	0.9449	0.9235	0.9177
Italy / AR-MOM vs. AR-MOM-CR1         1.0008         0.9996         0.9970         0.9951         0.9920           Italy / AR-MOM vs. AR-MOM-CR2         1.0001         0.9998         1.0000         0.9997         0.9990           Italy / AR-MOM vs. AR-MOM-CR3         1.0001         0.9997         0.9992         0.9988         0.9976           Italy / AR-MOM vs. AR-MOM-CR3         1.0001         0.9997         0.9992         0.9988         0.9976           Italy / AR-MOM vs. AR-MOM-CR4         1.0023         1.0035         1.0042         1.0058         1.0099	Italy / AR vs. AR-MOM	1.1044	0.9937	0.9628	0.9288	0.9130
Italy / AR-MOM vs. AR-MOM-CR2         1.0001         0.9998         1.0000         0.9997         0.9990           Italy / AR-MOM vs. AR-MOM-CR3         1.0001         0.9997         0.9992         0.9988         0.9976           Italy / AR-MOM vs. AR-MOM-CR4         1.0023         1.0035         1.0042         1.0058         1.0099	Italy / AR-MOM vs. AR-MOM-CR1	1.0008	0.9996	0.9970	0.9951	0.9920
Italy / AR-MOM vs. AR-MOM-CR3         1.0001         0.9997         0.9992         0.9988         0.9976           Italy / AR-MOM vs. AR-MOM-CR4         1.0023         1.0035         1.0042         1.0058         1.0099	Italy / AR-MOM vs. AR-MOM-CR2	1.0001	0.9998	1.0000	0.9997	0.9990
Italy / AR-MOM vs. AR-MOM-CR4 1.0023 1.0035 1.0042 1.0058 1.0099	Italy / AR-MOM vs. AR-MOM-CR3	1.0001	0.9997	0.9992	0.9988	0.9976
	Italy / AR-MOM vs. AR-MOM-CR4	1.0023	1.0035	1.0042	1.0058	1.0099
Italy / AR-MOM vs. AR-MOM-CR 1.0029 1.0024 1.0004 1.0000 1.0000	Italy / AR-MOM vs. AR-MOM-CR	1.0029	1.0024	1.0004	1.0000	1.0000
Japan / AR vs. AR-MOM 1.4454 1.1434 1.0244 0.9574 0.9545	Japan / AR vs. AR-MOM	1.4454	1.1434	1.0244	0.9574	0.9545
Japan / AR-MOM vs. AR-MOM-CR1 0.9900 0.9963 0.9993 0.9989 0.9989	Japan / AR-MOM vs. AR-MOM-CR1	0.9900	0.9963	0.9993	0.9989	0.9989
Japan / AR-MOM vs. AR-MOM-CR2 0.9999 0.9982 0.9972 0.9976 0.9978	Japan / AR-MOM vs. AR-MOM-CR2	0.9999	0.9982	0.9972	0.9976	0.9978
Japan / AR-MOM vs. AR-MOM-CR3 0.9996 0.9935 0.9907 0.9932 0.9945	Japan / AR-MOM vs. AR-MOM-CR3	0.9996	0.9935	0.9907	0.9932	0.9945
Japan / AR-MOM vs. AR-MOM-CR4 0.9937 0.9827 0.9708 0.9694 0.9661	Japan / AR-MOM vs. AR-MOM-CR4	0.9937	0.9827	0.9708	0.9694	0.9661
Japan / AR-MOM vs. AR-MOM-CR 0.9566 0.9597 0.9621 0.9629 0.9626	Japan / AR-MOM vs. AR-MOM-CR	0.9566	0.9597	0.9621	0.9629	0.9626
UK / AR vs. AR-MOM 1.2122 1.1322 1.0837 1.0613 1.0549	UK / AR vs. AR-MOM	1.2122	1.1322	1.0837	1.0613	1.0549
UK / AR-MOM vs. AR-MOM-CR1 0.9999 0.9993 0.9998 0.9999 1.0000	UK / AR-MOM vs. AR-MOM-CR1	0.9999	0.9993	0.9998	0.9999	1.0000
UK / AR-MOM vs. AR-MOM-CR2 0.9997 0.9992 0.9969 0.9958 0.9960	UK / AR-MOM vs. AR-MOM-CR2	0.9997	0.9992	0.9969	0.9958	0.9960
UK / AR-MOM vs. AR-MOM-CR3 0.9994 0.9987 0.9955 0.9936 0.9930	UK / AR-MOM vs. AR-MOM-CR3	0.9994	0.9987	0.9955	0.9936	0.9930
UK / AR-MOM vs. AR-MOM-CR4 0.9997 0.9999 0.9994 1.0002 1.0017	UK / AR-MOM vs. AR-MOM-CR4	0.9997	0.9999	0.9994	1.0002	1.0017
UK / AR-MOM vs. AR-MOM-CR 0.9995 0.9979 0.9945 0.9918 0.9888	UK / AR-MOM vs. AR-MOM-CR	0.9995	0.9979	0.9945	0.9918	0.9888
US / AR vs. AR-MOM 1.6017 1.1632 1.0516 1.0135 0.9940	US / AR vs. AR-MOM	1.6017	1.1632	1.0516	1.0135	0.9940
US / AR-MOM vs. AR-MOM-CR1 0.9999 1.0001 1.0001 0.9999 0.9999	US / AR-MOM vs. AR-MOM-CR1	0.9999	1.0001	1.0001	0.9999	0.9999
US / AR-MOM vs. AR-MOM-CR2 1.0001 0.9999 1.0000 0.9996 0.9989	US / AR-MOM vs. AR-MOM-CR2	1.0001	0.9999	1.0000	0.9996	0.9989
US / AR-MOM vs. AR-MOM-CR3 0.9997 0.9997 0.9997 1.0000 0.9995	US / AR-MOM vs. AR-MOM-CR3	0.9997	0.9997	0.9997	1.0000	0.9995
US / AR-MOM vs. AR-MOM-CR4 0.9996 0.9996 1.0003 1.0016 1.0005	US / AR-MOM vs. AR-MOM-CR4	0.9996	0.9996	1.0003	1.0016	1.0005
US / AR-MOM vs. AR-MOM-CR 0.9994 0.9989 0.9982 0.9976 0.9944	US / AR-MOM vs. AR-MOM-CR	0.9994	0.9989	0.9982	0.9976	0.9944

Table 5: RM	SFE ratios fo	r a rolling	estimation	window	(50% o	f the	forecasts	deleted)
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Canada / AR vs. AR-MOM       1.9261       1.3577       1.1533       1.0803       1.0522         Canada / AR-MOM vs. AR-MOM-CR1       0.9988       0.9991       0.9990       0.9974       0.9974         Canada / AR-MOM vs. AR-MOM-CR2       0.9996       0.9960       0.9913       0.9776       0.9575         Canada / AR-MOM vs. AR-MOM-CR3       0.9991       0.9957       0.9880       0.9792       0.9755         Canada / AR-MOM vs. AR-MOM-CR3       0.9991       0.9957       0.9880       0.9792       0.9755         Canada / AR-MOM vs. AR-MOM-CR4       1.0010       0.9970       0.9966       0.9982       0.9985         Canada / AR-MOM vs. AR-MOM-CR4       1.0010       0.9970       0.9966       0.9982       0.9985         Canada / AR-MOM vs. AR-MOM-CR1       0.9974       0.9980       0.9459       0.9101       0.8696         France / AR-MOM vs. AR-MOM-CR1       0.9991       0.9991       0.9996       0.9994       0.9985         France / AR-MOM vs. AR-MOM-CR2       0.9903       0.9940       0.9945       0.9906       0.9855         France / AR-MOM vs. AR-MOM-CR3       0.9918       0.9922       0.9953       0.9909       0.9855         France / AR-MOM vs. AR-MOM-CR4       0.9919       0.9948       0.9848 </th <th>h=6 h=9 h=12</th> <th>n=3 h=6</th> <th>h=1 h</th> <th>Country / Models</th>	h=6 h=9 h=12	n=3 h=6	h=1 h	Country / Models
Canada / AR-MOM vs. AR-MOM-CR1       0.9988       0.9991       0.9990       0.9974       0.9974         Canada / AR-MOM vs. AR-MOM-CR2       0.9996       0.9960       0.9913       0.9776       0.9575         Canada / AR-MOM vs. AR-MOM-CR3       0.9991       0.9957       0.9880       0.9792       0.9755         Canada / AR-MOM vs. AR-MOM-CR3       0.9991       0.9970       0.9966       0.9982       0.9985         Canada / AR-MOM vs. AR-MOM-CR4       1.0010       0.9970       0.9966       0.9982       0.9985         Canada / AR-MOM vs. AR-MOM-CR4       0.9974       0.9809       0.9459       0.9101       0.8696         France / AR vs. AR-MOM       1.8184       1.3076       1.1462       1.0796       1.0528         France / AR-MOM vs. AR-MOM-CR1       0.9991       0.9940       0.9945       0.9906       0.9885         France / AR-MOM vs. AR-MOM-CR2       0.9903       0.9940       0.9945       0.9906       0.9855         France / AR-MOM vs. AR-MOM-CR4       0.9918       0.9952       0.9953       0.9909       0.9855         France / AR-MOM vs. AR-MOM-CR4       0.9919       0.9948       0.9939       0.9891       0.9826         Germany / AR-MOM vs. AR-MOM-CR1       1.0005       0.9971       1.0020<	1.1533 1.0803 1.0522	3577 1.1533	1.9261 1.3	Canada / AR vs. AR-MOM
Canada / AR-MOM vs. AR-MOM-CR2       0.9996       0.9960       0.9913       0.9776       0.9575         Canada / AR-MOM vs. AR-MOM-CR3       0.9991       0.9957       0.9880       0.9792       0.9755         Canada / AR-MOM vs. AR-MOM-CR4       1.0010       0.9970       0.9966       0.9982       0.9983         Canada / AR-MOM vs. AR-MOM-CR4       1.0010       0.9970       0.9966       0.9982       0.9983         Canada / AR-MOM vs. AR-MOM-CR       0.9974       0.9809       0.9459       0.9101       0.8669         France / AR vs. AR-MOM       1.8184       1.3076       1.1462       1.0796       1.0528         France / AR-MOM vs. AR-MOM-CR1       0.9991       0.9981       0.9996       0.9994       0.9985         France / AR-MOM vs. AR-MOM-CR2       0.9903       0.9940       0.9945       0.9906       0.9855         France / AR-MOM vs. AR-MOM-CR3       0.9918       0.9952       0.9953       0.9909       0.9855         France / AR-MOM vs. AR-MOM-CR4       0.9919       0.9948       0.9939       0.9891       0.9834         France / AR-MOM vs. AR-MOM-CR4       0.9917       0.5957       0.7039       0.7725       0.7530         Germany / AR-MOM vs. AR-MOM-CR1       1.0005       0.9971       1.0020 </td <td>0.9990 0.9974 0.9974</td> <td>9991 0.9990</td> <td>0.9988 0.9</td> <td>Canada / AR-MOM vs. AR-MOM-CR1</td>	0.9990 0.9974 0.9974	9991 0.9990	0.9988 0.9	Canada / AR-MOM vs. AR-MOM-CR1
Canada / AR-MOM vs. AR-MOM-CR3       0.9991       0.9957       0.9880       0.9792       0.9753         Canada / AR-MOM vs. AR-MOM-CR4       1.0010       0.9970       0.9966       0.9982       0.9983         Canada / AR-MOM vs. AR-MOM-CR4       1.0010       0.9970       0.9966       0.9982       0.9983         Canada / AR-MOM vs. AR-MOM-CR       0.9974       0.9809       0.9459       0.9101       0.8696         France / AR vs. AR-MOM       1.8184       1.3076       1.1462       1.0796       1.0524         France / AR-MOM vs. AR-MOM-CR1       0.9991       0.9981       0.9995       0.9994       0.9985         France / AR-MOM vs. AR-MOM-CR2       0.9903       0.9940       0.9945       0.9906       0.9852         France / AR-MOM vs. AR-MOM-CR3       0.9918       0.9952       0.9953       0.9909       0.9855         France / AR-MOM vs. AR-MOM-CR4       0.9919       0.9948       0.9939       0.9891       0.9834         France / AR-MOM vs. AR-MOM-CR1       0.9804       0.9848       0.9887       0.9809       0.9723         Germany / AR vs. AR-MOM       0.4917       0.5957       0.7039       0.7725       0.7330         Germany / AR-MOM vs. AR-MOM-CR2       1.0002       1.0007       0.9921	0.9913 0.9776 0.9575	9960 0.9913	0.9996 0.9	Canada / AR-MOM vs. AR-MOM-CR2
Canada / AR-MOM vs. AR-MOM-CR4       1.0010       0.9970       0.9966       0.9982       0.9983         Canada / AR-MOM vs. AR-MOM-CR       0.9974       0.9809       0.9459       0.9101       0.8696         France / AR vs. AR-MOM       1.8184       1.3076       1.1462       1.0796       1.0528         France / AR-MOM vs. AR-MOM-CR1       0.9991       0.9981       0.9996       0.9994       0.9985         France / AR-MOM vs. AR-MOM-CR2       0.9903       0.9940       0.9945       0.9906       0.9852         France / AR-MOM vs. AR-MOM-CR3       0.9918       0.9922       0.9933       0.9909       0.9855         France / AR-MOM vs. AR-MOM-CR4       0.9919       0.9948       0.9939       0.9891       0.9834         France / AR-MOM vs. AR-MOM-CR4       0.9919       0.9948       0.9939       0.9891       0.9834         France / AR-MOM vs. AR-MOM-CR4       0.9919       0.9948       0.9887       0.9809       0.9726         Germany / AR vs. AR-MOM       0.4917       0.5957       0.7039       0.7725       0.7530         Germany / AR-MOM vs. AR-MOM-CR2       1.0002       1.0007       0.9921       0.9686       0.9699         Germany / AR-MOM vs. AR-MOM-CR3       1.0001       1.0004       0.9850	0.9880 0.9792 0.9753	9957 0.9880	0.9991 0.9	Canada / AR-MOM vs. AR-MOM-CR3
Canada / AR-MOM vs. AR-MOM-CR       0.9974       0.9809       0.9459       0.9101       0.8696         France / AR vs. AR-MOM       1.8184       1.3076       1.1462       1.0796       1.0528         France / AR-MOM vs. AR-MOM-CR1       0.9991       0.9981       0.9996       0.9994       0.9988         France / AR-MOM vs. AR-MOM-CR2       0.9903       0.9940       0.9945       0.9906       0.9852         France / AR-MOM vs. AR-MOM-CR3       0.9918       0.9952       0.9933       0.9909       0.9855         France / AR-MOM vs. AR-MOM-CR4       0.9919       0.9948       0.9939       0.9891       0.9834         France / AR-MOM vs. AR-MOM-CR4       0.9919       0.9948       0.9939       0.9891       0.9834         France / AR-MOM vs. AR-MOM-CR4       0.9919       0.9948       0.9887       0.9809       0.9726         Germany / AR vs. AR-MOM       0.4917       0.5957       0.7039       0.7725       0.7530         Germany / AR-MOM vs. AR-MOM-CR1       1.0005       0.9971       1.0020       0.9743       0.9442         Germany / AR-MOM vs. AR-MOM-CR3       1.0001       1.0007       0.9921       0.9686       0.9699         Germany / AR-MOM vs. AR-MOM-CR4       1.0001       0.9991       1.0022	0.9966 0.9982 0.9983	9970 0.9966	1.0010 0.9	Canada / AR-MOM vs. AR-MOM-CR4
France / AR vs. AR-MOM       1.8184       1.3076       1.1462       1.0796       1.0528         France / AR-MOM vs. AR-MOM-CR1       0.9991       0.9981       0.9996       0.9994       0.9988         France / AR-MOM vs. AR-MOM-CR2       0.9903       0.9940       0.9945       0.9906       0.9985         France / AR-MOM vs. AR-MOM-CR3       0.9918       0.9952       0.9953       0.9909       0.9855         France / AR-MOM vs. AR-MOM-CR4       0.9919       0.9948       0.9939       0.9891       0.9834         France / AR-MOM vs. AR-MOM-CR4       0.9919       0.9948       0.9939       0.9891       0.9834         France / AR-MOM vs. AR-MOM-CR4       0.9917       0.5957       0.7039       0.7725       0.7530         Germany / AR-MOM vs. AR-MOM-CR1       1.0005       0.9971       1.0020       0.9743       0.9442         Germany / AR-MOM vs. AR-MOM-CR3       1.0001       1.0007       0.9921       0.9686       0.9699         Germany / AR-MOM vs. AR-MOM-CR3       1.0001       1.0004       0.9850       0.9620       0.9655         Germany / AR-MOM vs. AR-MOM-CR4       1.0001       0.9991       1.0022       1.0027       1.0010         Germany / AR-MOM vs. AR-MOM-CR4       0.9992       0.9826       0.9	0.9459 0.9101 0.8696	9809 0.9459	0.9974 0.9	Canada / AR-MOM vs. AR-MOM-CR
France / AR-MOM vs. AR-MOM-CR1       0.9991       0.9981       0.9996       0.9994       0.9985         France / AR-MOM vs. AR-MOM-CR2       0.9903       0.9940       0.9945       0.9906       0.9855         France / AR-MOM vs. AR-MOM-CR3       0.9918       0.9952       0.9953       0.9909       0.9855         France / AR-MOM vs. AR-MOM-CR3       0.9918       0.9952       0.9939       0.9891       0.9835         France / AR-MOM vs. AR-MOM-CR4       0.9919       0.9948       0.9939       0.9891       0.9834         France / AR-MOM vs. AR-MOM-CR       0.9804       0.9848       0.9887       0.9809       0.9726         Germany / AR vs. AR-MOM       0.4917       0.5957       0.7039       0.7725       0.7530         Germany / AR-MOM vs. AR-MOM-CR1       1.0005       0.9971       1.0020       0.9743       0.9442         Germany / AR-MOM vs. AR-MOM-CR3       1.0001       1.0007       0.9921       0.9686       0.9699         Germany / AR-MOM vs. AR-MOM-CR3       1.0001       1.0004       0.9850       0.9620       0.9655         Germany / AR-MOM vs. AR-MOM-CR4       1.0001       0.9991       1.0022       1.0027       1.0010         Germany / AR-MOM vs. AR-MOM-CR4       0.9992       0.9826       0.9	1.1462 1.0796 1.0528	3076 1.1462	1.8184 1.3	France / AR vs. AR-MOM
France / AR-MOM vs. AR-MOM-CR2       0.9903       0.9940       0.9945       0.9906       0.9855         France / AR-MOM vs. AR-MOM-CR3       0.9918       0.9952       0.9953       0.9909       0.9855         France / AR-MOM vs. AR-MOM-CR4       0.9919       0.9948       0.9939       0.9891       0.9834         France / AR-MOM vs. AR-MOM-CR4       0.9919       0.9848       0.9887       0.9809       0.9726         Germany / AR vs. AR-MOM       0.4917       0.5957       0.7039       0.7725       0.7530         Germany / AR-MOM vs. AR-MOM-CR1       1.0005       0.9971       1.0020       0.9743       0.9442         Germany / AR-MOM vs. AR-MOM-CR2       1.0002       1.0007       0.9921       0.9686       0.9695         Germany / AR-MOM vs. AR-MOM-CR3       1.0001       1.0004       0.9850       0.9620       0.9655         Germany / AR-MOM vs. AR-MOM-CR4       1.0001       0.9991       1.0022       1.0027       1.0010         Germany / AR-MOM vs. AR-MOM-CR4       1.0001       0.9991       0.022       1.0027       1.0010         Germany / AR-MOM vs. AR-MOM-CR4       1.0001       0.9920       0.9826       0.9169       0.8416       0.8222	0.9996 0.9994 0.9989	9981 0.9996	0.9991 0.9	France / AR-MOM vs. AR-MOM-CR1
France / AR-MOM vs. AR-MOM-CR3       0.9918       0.9952       0.9953       0.9909       0.9855         France / AR-MOM vs. AR-MOM-CR4       0.9919       0.9948       0.9939       0.9891       0.9834         France / AR-MOM vs. AR-MOM-CR       0.9804       0.9848       0.9887       0.9809       0.9726         Germany / AR vs. AR-MOM       0.4917       0.5957       0.7039       0.7725       0.7530         Germany / AR-MOM vs. AR-MOM-CR1       1.0005       0.9971       1.0020       0.9743       0.9442         Germany / AR-MOM vs. AR-MOM-CR2       1.0002       1.0007       0.9921       0.9686       0.9695         Germany / AR-MOM vs. AR-MOM-CR3       1.0001       1.0004       0.9850       0.9620       0.9655         Germany / AR-MOM vs. AR-MOM-CR4       1.0001       0.9991       1.0022       1.0027       1.0010         Germany / AR-MOM vs. AR-MOM-CR4       1.0001       0.9991       0.022       1.0027       1.0010         Germany / AR-MOM vs. AR-MOM-CR4       1.0001       0.9991       0.022       0.0277       1.0010         Germany / AR-MOM vs. AR-MOM-CR4       0.9992       0.9826       0.9169       0.8416       0.8222	0.9945 0.9906 0.9852	9940 0.9945	0.9903 0.9	France / AR-MOM vs. AR-MOM-CR2
France / AR-MOM vs. AR-MOM-CR4       0.9919       0.9948       0.9939       0.9891       0.9834         France / AR-MOM vs. AR-MOM-CR       0.9804       0.9848       0.9887       0.9809       0.9726         Germany / AR vs. AR-MOM       0.4917       0.5957       0.7039       0.7725       0.7530         Germany / AR-MOM vs. AR-MOM-CR1       1.0005       0.9971       1.0020       0.9743       0.9442         Germany / AR-MOM vs. AR-MOM-CR2       1.0002       1.0007       0.9921       0.9686       0.9695         Germany / AR-MOM vs. AR-MOM-CR3       1.0001       1.0004       0.9850       0.9620       0.9655         Germany / AR-MOM vs. AR-MOM-CR4       1.0001       0.9991       1.0022       1.0027       1.0010         Germany / AR-MOM vs. AR-MOM-CR4       1.0001       0.9991       0.022       0.0277       1.0010         Germany / AR-MOM vs. AR-MOM-CR4       1.0001       0.9991       0.022       0.0277       1.0010         Germany / AR-MOM vs. AR-MOM-CR4       0.9992       0.9826       0.9169       0.8416       0.8222	0.9953 0.9909 0.9855	9952 0.9953	0.9918 0.9	France / AR-MOM vs. AR-MOM-CR3
France / AR-MOM vs. AR-MOM-CR         0.9804         0.9848         0.9887         0.9809         0.9726           Germany / AR vs. AR-MOM         0.4917         0.5957         0.7039         0.7725         0.7530           Germany / AR-MOM vs. AR-MOM-CR1         1.0005         0.9971         1.0020         0.9743         0.9442           Germany / AR-MOM vs. AR-MOM-CR1         1.0002         1.0007         0.9921         0.9686         0.9695           Germany / AR-MOM vs. AR-MOM-CR3         1.0001         1.0004         0.9850         0.9620         0.9655           Germany / AR-MOM vs. AR-MOM-CR4         1.0001         0.9991         1.0022         1.0027         1.0010           Germany / AR-MOM vs. AR-MOM-CR4         0.9992         0.9826         0.9169         0.8416         0.8222           Germany / AR-MOM vs. AR-MOM-CR         0.9992         1.0820         0.9620         0.2621         0.2622	0.9939 0.9891 0.9834	9948 0.9939	0.9919 0.9	France / AR-MOM vs. AR-MOM-CR4
Germany / AR vs. AR-MOM         0.4917         0.5957         0.7039         0.7725         0.7530           Germany / AR-MOM vs. AR-MOM-CR1         1.0005         0.9971         1.0020         0.9743         0.9442           Germany / AR-MOM vs. AR-MOM-CR2         1.0002         1.0007         0.9921         0.9686         0.9695           Germany / AR-MOM vs. AR-MOM-CR3         1.0001         1.0004         0.9850         0.9620         0.9655           Germany / AR-MOM vs. AR-MOM-CR4         1.0001         0.9991         1.0022         1.0017         0.9686         0.9695           Germany / AR-MOM vs. AR-MOM-CR4         0.001         0.9991         1.0022         1.0027         1.0010           Germany / AR-MOM vs. AR-MOM-CR4         0.9992         0.9826         0.9169         0.8416         0.8222           He he (AP error AP MOM         he he (AP error AP MOM         he he (AP error AP MOM         0.9222         0.9221         0.9221         0.9221	0.9887 0.9809 0.9726	9848 0.9887	0.9804 0.9	France / AR-MOM vs. AR-MOM-CR
Germany / AR-MOM vs. AR-MOM-CR1         1.0005         0.9971         1.0020         0.9743         0.9442           Germany / AR-MOM vs. AR-MOM-CR2         1.0002         1.0007         0.9921         0.9686         0.9695           Germany / AR-MOM vs. AR-MOM-CR3         1.0001         1.0004         0.9850         0.9620         0.9655           Germany / AR-MOM vs. AR-MOM-CR4         1.0001         0.9991         1.0022         1.0027         1.0010           Germany / AR-MOM vs. AR-MOM-CR4         0.9992         0.9826         0.9169         0.8416         0.8222           Germany / AR-MOM vs. AR-MOM-CR         0.9992         1.0820         1.0622         0.2027         1.0010	0.7039 0.7725 0.7530	5957 0.7039	0.4917 0.5	Germany / AR vs. AR-MOM
Germany / AR-MOM vs. AR-MOM-CR2         1.0002         1.0007         0.9921         0.9686         0.9699           Germany / AR-MOM vs. AR-MOM-CR3         1.0001         1.0004         0.9850         0.9620         0.9655           Germany / AR-MOM vs. AR-MOM-CR4         1.0001         0.9991         1.0022         1.0027         1.0010           Germany / AR-MOM vs. AR-MOM-CR4         0.9992         0.9826         0.9169         0.8416         0.8222           He her (AP are AP MOM vs. AR-MOM-CR         0.9992         0.9826         0.9169         0.8416         0.8222	1.0020 0.9743 0.9442	9971 1.0020	1.0005 0.9	Germany / AR-MOM vs. AR-MOM-CR1
Germany / AR-MOM vs. AR-MOM-CR3         1.0001         1.0004         0.9850         0.9620         0.9655           Germany / AR-MOM vs. AR-MOM-CR4         1.0001         0.9991         1.0022         1.0027         1.0010           Germany / AR-MOM vs. AR-MOM-CR4         0.9992         0.9826         0.9169         0.8416         0.8222           Habit (AP are AP MOM         AR-MOM vs. AR-MOM-CR         0.9992         0.9826         0.9169         0.8416         0.8222	0.9921 0.9686 0.9699	0.9921	1.0002 1.0	Germany / AR-MOM vs. AR-MOM-CR2
Germany / AR-MOM vs. AR-MOM-CR4         1.0001         0.9991         1.0022         1.0027         1.0010           Germany / AR-MOM vs. AR-MOM-CR         0.9992         0.9826         0.9169         0.8416         0.8222           Label (AP are AP MOM)         AP MOM vs. AR-MOM-CR         0.9992         0.9826         0.9169         0.8416         0.8222	0.9850 0.9620 0.9651	0004 0.9850	1.0001 1.0	Germany / AR-MOM vs. AR-MOM-CR3
Germany / AR-MOM vs. AR-MOM-CR 0.9992 0.9826 0.9169 0.8416 0.8222	1.0022 1.0027 1.0010	9991 1.0022	1.0001 0.9	Germany / AR-MOM vs. AR-MOM-CR4
H-1- / AD AD MOM	0.9169 0.8416 0.8222	9826 0.9169	0.9992 0.9	Germany / AR-MOM vs. AR-MOM-CR
Italy / AR vs. AR-MOM 1.1500 1.0662 1.0228 0.9984 0.996	1.0228 0.9984 0.9969	0662 1.0228	1.1500 1.0	Italy / AR vs. AR-MOM
Italy / AR-MOM vs. AR-MOM-CR1 0.9992 0.9981 0.9967 0.9947 0.9953	0.9967 0.9947 0.9953	9981 0.9967	0.9992 0.9	Italy / AR-MOM vs. AR-MOM-CR1
Italy / AR-MOM vs. AR-MOM-CR2 0.9981 0.9943 0.9884 0.9888 0.9905	0.9884 0.9888 0.9905	9943 0.9884	0.9981 0.9	Italy / AR-MOM vs. AR-MOM-CR2
Italy / AR-MOM vs. AR-MOM-CR3 0.9981 0.9942 0.9898 0.9907 0.9930	0.9898 0.9907 0.9930	9942 0.9898	0.9981 0.9	Italy / AR-MOM vs. AR-MOM-CR3
Italy / AR-MOM vs. AR-MOM-CR4 0.9973 0.9910 0.9889 0.9901 0.9889	0.9889 0.9901 0.9889	9910 0.9889	0.9973 0.9	Italy / AR-MOM vs. AR-MOM-CR4
Italy / AR-MOM vs. AR-MOM-CR 0.9916 0.9756 0.9593 0.9452 0.9372	0.9593 0.9452 0.9372	9756 0.9593	0.9916 0.9	Italy / AR-MOM vs. AR-MOM-CR
Japan / AR vs. AR-MOM 1.5081 1.1852 1.0887 1.0382 1.0160	1.0887 1.0382 1.0160	1852 1.0887	1.5081 1.1	Japan / AR vs. AR-MOM
Japan / AR-MOM vs. AR-MOM-CR1 1.0005 0.9972 0.9924 0.9916 0.9903	0.9924 0.9916 0.9903	9972 0.9924	1.0005 0.9	Japan / AR-MOM vs. AR-MOM-CR1
Japan / AR-MOM vs. AR-MOM-CR2 1.0004 0.9983 0.9982 0.9982 0.9990	0.9982 0.9982 0.9990	9983 0.9982	1.0004 0.9	Japan / AR-MOM vs. AR-MOM-CR2
Japan / AR-MOM vs. AR-MOM-CR3 0.9996 0.9952 0.9958 0.9959 0.9974	0.9958 0.9959 0.9974	9952 0.9958	0.9996 0.9	Japan / AR-MOM vs. AR-MOM-CR3
Japan / AR-MOM vs. AR-MOM-CR4 0.9982 0.9960 0.9920 0.9882 0.9894	0.9920 0.9882 0.9894	9960 0.9920	0.9982 0.9	Japan / AR-MOM vs. AR-MOM-CR4
Japan / AR-MOM vs. AR-MOM-CR 0.9944 0.9841 0.9794 0.9757 0.9769	0.9794 0.9757 0.9769	9841 0.9794	0.9944 0.9	Japan / AR-MOM vs. AR-MOM-CR
UK / AR vs. AR-MOM 1.1972 1.1129 1.0690 1.0343 1.0049	1.0690 1.0343 1.0049	1129 1.0690	1.1972 1.1	UK / AR vs. AR-MOM
UK / AR-MOM vs. AR-MOM-CR1 0.9998 0.9995 0.9996 0.9995 0.9995	0.9996 0.9995 0.9995	9995 0.9996	0.9998 0.9	UK / AR-MOM vs. AR-MOM-CR1
UK / AR-MOM vs. AR-MOM-CR2 1.0001 0.9997 0.9988 0.9986 0.9993	0.9988 0.9986 0.9991	9997 0.9988	1.0001 0.9	UK / AR-MOM vs. AR-MOM-CR2
UK / AR-MOM vs. AR-MOM-CR3 1.0001 0.9996 0.9987 0.9986 0.9994	0.9987 0.9986 0.9994	9996 0.9987	1.0001 0.9	UK / AR-MOM vs. AR-MOM-CR3
UK / AR-MOM vs. AR-MOM-CR4 0.9998 0.9993 0.9983 0.9988 1.0002	0.9983 0.9988 1.0002	9993 0.9983	0.9998 0.9	UK / AR-MOM vs. AR-MOM-CR4
UK / AR-MOM vs. AR-MOM-CR 1.0005 0.9988 0.9973 0.9980 1.0005	0.9973 0.9980 1.0005	9988 0.9973	1.0005 0.9	UK / AR-MOM vs. AR-MOM-CR
US / AR vs. AR-MOM 1.5284 1.1294 1.0108 0.9593 0.9199	1.0108 0.9593 0.9199	1294 1.0108	1.5284 1.1	US / AR vs. AR-MOM
US / AR-MOM vs. AR-MOM-CR1 0.9987 0.9990 0.9996 0.9992 0.9995	0.9996 0.9992 0.9995	9990 0.9996	0.9987 0.9	US / AR-MOM vs. AR-MOM-CR1
US / AR-MOM vs. AR-MOM-CR2 0.9999 0.9996 0.9997 0.9993 0.9988	0.9997 0.9993 0.9989	9996 0.9997	0.9999 0.9	US / AR-MOM vs. AR-MOM-CR2
US / AR-MOM vs. AR-MOM-CR3 0.9990 0.9993 0.9988 0.9994 0.9993	0.9988 0.9994 0.9993	9993 0.9988	0.9990 0.9	US / AR-MOM vs. AR-MOM-CR3
US / AR-MOM vs. AR-MOM-CR4 0.9994 0.9997 1.0002 1.0002 0.9995	1.0002 1.0002 0.9995	9997 1.0002	0.9994 0.9	US / AR-MOM vs. AR-MOM-CR4
US / AR-MOM vs. AR-MOM-CR 0.9960 0.9974 0.9968 0.9934 0.9923	0.9968 0.9934 0.9923	9974 0.9968	0.9960 0.9	US / AR-MOM vs. AR-MOM-CR

## Table 6: RMSFE ratios for a recursive estimation window (discounting of forecast errors)

Country / Models	h=1	h=3	h=6	h=9	h=12
Canada / AR vs. AR-MOM	2.2690	1.3688	1.1537	1.1049	1.0828
Canada / AR-MOM vs. AR-MOM-CR1	1.0034	0.9947	0.9968	0.9996	1.0004
Canada / AR-MOM vs. AR-MOM-CR2	1.0035	1.0034	1.0060	0.9967	0.9859
Canada / AR-MOM vs. AR-MOM-CR3	0.9989	1.0002	1.0004	0.9943	0.9881
Canada / AR-MOM vs. AR-MOM-CR4	0.9996	0.9980	1.0008	1.0022	1.0021
Canada / AR-MOM vs. AR-MOM-CR	1.0038	0.9974	0.9971	0.9902	0.9838
France / AR vs. AR-MOM	2.0836	1.3548	1.1652	1.1173	1.0811
France / AR-MOM vs. AR-MOM-CR1	1.0005	1.0012	0.9998	0.9998	1.0012
France / AR-MOM vs. AR-MOM-CR2	0.9989	0.9983	0.9954	0.9915	0.9959
France / AR-MOM vs. AR-MOM-CR3	0.9989	0.9984	0.9954	0.9911	0.9957
France / AR-MOM vs. AR-MOM-CR4	0.9987	0.9981	0.9942	0.9884	0.9933
France / AR-MOM vs. AR-MOM-CR	1.0018	1.0018	1.0023	0.9971	0.9948
Germany / AR vs. AR-MOM	0.4813	0.6310	0.7057	0.6864	0.6394
Germany / AR-MOM vs. AR-MOM-CR1	1.0000	1.0012	1.0039	0.9961	0.9830
Germany / AR-MOM vs. AR-MOM-CR2	0.9950	0.9957	0.9877	0.9899	0.9958
Germany / AR-MOM vs. AR-MOM-CR3	0.9929	0.9901	0.9771	0.9793	0.9863
Germany / AR-MOM vs. AR-MOM-CR4	0.9997	1.0005	1.0042	1.0092	1.0117
Germany / AR-MOM vs. AR-MOM-CR	0.9829	0.9552	0.9381	0.9360	0.9354
Italy / AR vs. AR-MOM	1.3138	1.0784	1.0150	0.9897	0.9798
Italy / AR-MOM vs. AR-MOM-CR1	1.0011	0.9982	1.0007	0.9977	0.9974
Italy / AR-MOM vs. AR-MOM-CR2	1.0019	1.0034	1.0011	1.0006	1.0011
Italy / AR-MOM vs. AR-MOM-CR3	1.0039	1.0044	1.0005	1.0001	1.0001
Italy / AR-MOM vs. AR-MOM-CR4	1.0076	1.0051	1.0014	1.0057	1.0198
Italy / AR-MOM vs. AR-MOM-CR	1.0101	1.0018	0.9973	1.0010	1.0144
Japan / AR vs. AR-MOM	1.7611	1.4559	1.3563	1.3207	1.2615
Japan / AR-MOM vs. AR-MOM-CR1	1.0051	1.0002	0.9993	0.9998	0.9996
Japan / AR-MOM vs. AR-MOM-CR2	0.9998	1.0084	1.0118	1.0105	1.0079
Japan / AR-MOM vs. AR-MOM-CR3	1.0035	1.0084	1.0096	1.0148	1.0108
Japan / AR-MOM vs. AR-MOM-CR4	0.9334	1.0143	1.0800	1.1646	1.2255
Japan / AR-MOM vs. AR-MOM-CR	0.9400	1.0140	1.0888	1.1616	1.2261
UK / AR vs. AR-MOM	1.7098	1.2985	1.0898	0.9916	0.9226
UK / AR-MOM vs. AR-MOM-CR1	0.9979	0.9991	0.9997	0.9994	0.9997
UK / AR-MOM vs. AR-MOM-CR2	1.0000	0.9992	0.9989	1.0006	0.9987
UK / AR-MOM vs. AR-MOM-CR3	0.9999	0.9989	0.9985	1.0012	0.9975
UK / AR-MOM vs. AR-MOM-CR4	0.9995	0.9983	0.9975	0.9976	0.9948
UK / AR-MOM vs. AR-MOM-CR	0.9977	0.9981	0.9987	1.0024	0.9969
US / AR vs. AR-MOM	1.8939	1.1540	1.0597	1.0153	0.9928
US / AR-MOM vs. AR-MOM-CR1	1.0001	0.9997	0.9994	0.9989	0.9992
US / AR-MOM vs. AR-MOM-CR2	0.9997	0.9998	0.9997	0.9996	1.0002
US / AR-MOM vs. AR-MOM-CR3	1.0000	0.9994	0.9987	0.9981	0.9994
US / AR-MOM vs. AR-MOM-CR4	0.9999	0.9994	0.9984	0.9944	0.9950
US / AR-MOM vs. AR-MOM-CR	0.9999	0.9985	0.9963	0.9923	0.9934
	0.0000	5.5500	5.5500	5.5520	0.0001

Table 7:	<b>RMSFE</b> ratio	os for a rolling	g estimation	window (	discounting	of forecast	errors)
		c c	2	•			,

Country / Models Canada / AR vs. AR-MOM Canada / AR-MOM vs. AR-MOM-CR1 Canada / AR-MOM vs. AR-MOM-CR2 Canada / AR-MOM vs. AR-MOM-CR3 Canada / AR-MOM vs. AR-MOM-CR4	h=1 2.0897 0.9985 0.9813 0.9794	h=3 1.3735 0.9982	h=6 1.1591	h=9 1.0970	$\frac{h=12}{1.0721}$
Canada / AR vs. AR-MOM Canada / AR-MOM vs. AR-MOM-CR1 Canada / AR-MOM vs. AR-MOM-CR2 Canada / AR-MOM vs. AR-MOM-CR3 Canada / AR-MOM vs. AR-MOM-CR4	2.0897 0.9985 0.9813 0.9794	$1.3735 \\ 0.9982$	1.1591	1.0970	1.0721
Canada / AR-MOM vs. AR-MOM-CR1 Canada / AR-MOM vs. AR-MOM-CR2 Canada / AR-MOM vs. AR-MOM-CR3 Canada / AR-MOM vs. AR-MOM-CR4	$0.9985 \\ 0.9813 \\ 0.9794$	0.9982	0 0000		
Canada / AR-MOM vs. AR-MOM-CR2 Canada / AR-MOM vs. AR-MOM-CR3 Canada / AR-MOM vs. AR-MOM-CR4	$0.9813 \\ 0.9794$		0.9900	0.9979	1.0008
Canada / AR-MOM vs. AR-MOM-CR3	0.9794	0.9804	0.9798	0.9748	0.9645
Canada / AR-MOM ve AR-MOM-CRA		0.9601	0.9303	0.9083	0.8816
Callada / ARTINOM VS. ARTINOM-CR4	1.0036	0.9995	0.9988	1.0012	1.0015
Canada / AR-MOM vs. AR-MOM-CR	0.9808	0.9526	0.9072	0.8712	0.8458
France / AR vs. AR-MOM	2.0142	1.3740	1.1708	1.1079	1.0673
France / AR-MOM vs. AR-MOM-CR1	0.9998	1.0005	1.0021	0.9992	0.9998
France / AR-MOM vs. AR-MOM-CR2	0.9938	0.9971	0.9908	0.9822	0.9750
France / AR-MOM vs. AR-MOM-CR3	0.9951	0.9976	0.9920	0.9833	0.9757
France / AR-MOM vs. AR-MOM-CR4	0.9939	0.9967	0.9900	0.9793	0.9693
France / AR-MOM vs. AR-MOM-CR	0.9792	0.9882	0.9961	0.9733	0.9543
Germany / AR vs. AR-MOM	1.4643	1.3153	1.1935	1.1244	1.0843
Germany / AR-MOM vs. AR-MOM-CR1	0.9989	1.0005	1.0047	1.0033	1.0008
Germany / AR-MOM vs. AR-MOM-CR2	0.9992	0.9920	0.9920	0.9929	0.9892
Germany / AR-MOM vs. AR-MOM-CR3	0.9981	0.9927	0.9929	0.9937	0.9887
Germany / AR-MOM vs. AR-MOM-CR4	0.9978	0.9881	0.9898	0.9923	0.9912
Germany / AR-MOM vs. AR-MOM-CR	0.9873	0.9960	0.9955	0.9916	0.9847
Italy / AR vs. AR-MOM	1.4029	1.1808	1.0945	1.0683	1.0497
Italy / AR-MOM vs. AR-MOM-CR1	0.9987	1.0037	1.0032	0.9984	0.9984
Italy / AR-MOM vs. AR-MOM-CR2	0.9983	0.9984	0.9996	1.0005	1.0029
Italy / AR-MOM vs. AR-MOM-CR3	0.9978	0.9980	0.9997	1.0010	1.0046
Italy / AR-MOM vs. AR-MOM-CR4	0.9975	0.9990	0.9969	0.9951	1.0053
Italy / AR-MOM vs. AR-MOM-CR	0.9982	0.9992	0.9961	0.9928	0.9954
Japan / AR vs. AR-MOM	1.6847	1.2700	1.0471	0.9242	0.8936
Japan / AR-MOM vs. AR-MOM-CR1	0.9750	0.9897	0.9991	1.0035	1.0014
Japan / AR-MOM vs. AR-MOM-CR2	1.0038	1.0003	0.9998	0.9997	0.9995
Japan / AR-MOM vs. AR-MOM-CR3	1.0035	1.0000	0.9995	0.9997	0.9996
Japan / AR-MOM vs. AR-MOM-CR4	0.9929	1.0708	1.0836	1.0984	1.0925
Japan / AR-MOM vs. AR-MOM-CR	0.9665	1.0481	1.0794	1.0988	1.0902
UK / AR vs. AR-MOM	1.6020	1.3016	1.1255	1.0580	1.0083
UK / AR-MOM vs. AR-MOM-CR1	0.9975	1.0011	0.9999	0.9995	0.9999
UK / AR-MOM vs. AR-MOM-CR2	1.0009	1.0003	0.9991	0.9996	0.9998
UK / AR-MOM vs. AR-MOM-CR3	0.9992	0.9997	0.9985	0.9989	0.9995
UK / AR-MOM vs. AR-MOM-CR4	0.9997	0.9951	0.9953	0.9946	0.9895
UK / AR-MOM vs. AR-MOM-CR	0.9778	0.9792	0.9801	0.9725	0.9726
US / AR vs. AR-MOM	1.7511	1.1482	1.0863	1.0622	1.0413
US / AR-MOM vs. AR-MOM-CR1	1.0000	1.0000	0.9991	0.9980	0.9983
US / AR-MOM vs. AR-MOM-CR2	0.9997	0.9986	0.9971	0.9943	0.9962
US / AR-MOM vs. AR-MOM-CR3	1.0000	0.9989	0.9972	0.9942	0.9979
US / AR-MOM vs. AR-MOM-CR4	0.9991	0.9991	0.9994	0.9986	0.9996
US / AR-MOM vs. AR-MOM-CR	0.9986	0.9988	0.9986	0.9952	0.9976

## Table 8: Results for the optimal stepwise predictor selection approach (RMSFE ratios)

Country / Models	h=1	h=3	h=6	h=9	h=12
Canada / AR-MOM vs. AR-MOM-R2	0.9937	0.9891	0.9950	0.9796	0.9609
Canada / AR-MOM vs. AR-MOM-BIC	0.9973	0.9926	0.9942	0.9889	0.9648
Canada / AR-MOM vs. AR-MOM-CP	0.9953	0.9905	0.9939	0.9810	0.9588
France / AR-MOM vs. AR-MOM-R2	0.9983	0.9989	0.9975	0.9988	0.9962
France / AR-MOM vs. AR-MOM-BIC	0.9990	0.9971	0.9985	0.9979	0.9949
France / AR-MOM vs. AR-MOM-CP	0.9985	0.9973	0.9986	0.9990	0.9963
Germany / AR-MOM vs. AR-MOM-R2	0.9988	0.9998	1.0012	1.0023	1.0030
Germany / AR-MOM vs. AR-MOM-BIC	0.9985	0.9992	1.0000	1.0019	1.0031
Germany / AR-MOM vs. AR-MOM-CP	0.9982	0.9994	1.0011	1.0018	1.0030
Italy / AR-MOM vs. AR-MOM-R2	0.9997	0.9958	0.9901	0.9913	0.9863
Italy / AR-MOM vs. AR-MOM-BIC	0.9997	0.9959	0.9943	0.9956	0.9909
Italy / AR-MOM vs. AR-MOM-CP	0.9997	0.9959	0.9927	0.9931	0.9861
Japan / AR-MOM vs. AR-MOM-R2	0.9959	0.9915	0.9925	0.9918	0.9926
Japan / AR-MOM vs. AR-MOM-BIC	0.9989	0.9948	0.9965	0.9980	0.9956
Japan / AR-MOM vs. AR-MOM-CP	0.9930	0.9914	0.9922	0.9916	0.9925
UK / AR-MOM vs. AR-MOM-R2	0.9993	0.9982	0.9987	0.9978	0.9952
UK / AR-MOM vs. AR-MOM-BIC	0.9995	0.9992	0.9978	0.9965	0.9954
UK / AR-MOM vs. AR-MOM-CP	0.9995	0.9991	0.9987	0.9978	0.9954
US / AR-MOM vs. AR-MOM-R2	0.9993	0.9984	0.9991	1.0019	1.0003
US / AR-MOM vs. AR-MOM-BIC	0.9992	0.9988	1.0000	1.0017	0.9994
US / AR-MOM vs. AR-MOM-CP	0.9993	0.9987	0.9987	1.0021	1.0002

Panel A: Recursive estimation window

Panel B: Rolling estimation window

Country / Models	h=1	h=3	h=6	h=9	h=12
Canada / AR-MOM vs. AR-MOM-R2	0.9963	0.9953	0.9750	0.9491	0.9047
Canada / AR-MOM vs. AR-MOM-BIC	0.9983	0.9974	0.9808	0.9653	0.9164
Canada / AR-MOM vs. AR-MOM-CP	0.9971	0.9994	0.9779	0.9546	0.9134
France / AR-MOM vs. AR-MOM-R2	0.9875	0.9876	0.9847	0.9835	0.9787
France / AR-MOM vs. AR-MOM-BIC	0.9921	0.9925	0.9867	0.9842	0.9800
France / AR-MOM vs. AR-MOM-CP	0.9901	0.9889	0.9868	0.9844	0.9788
Germany / AR-MOM vs. AR-MOM-R2	0.9984	0.9994	1.0002	1.0003	1.0012
Germany / AR-MOM vs. AR-MOM-BIC	0.9974	0.9984	0.9986	0.9993	1.0013
Germany / AR-MOM vs. AR-MOM-CP	0.9988	0.9996	1.0002	0.9989	1.0012
Italy / AR-MOM vs. AR-MOM-R2	0.9968	0.9844	0.9793	0.9752	0.9649
Italy / AR-MOM vs. AR-MOM-BIC	0.9969	0.9860	0.9848	0.9847	0.9752
Italy / AR-MOM vs. AR-MOM-CP	0.9969	0.9858	0.9818	0.9745	0.9668
Japan / AR-MOM vs. AR-MOM-R2	0.9796	0.9669	0.9689	0.9922	1.0010
Japan / AR-MOM vs. AR-MOM-BIC	0.9773	0.9700	0.9644	1.0029	1.0073
Japan / AR-MOM vs. AR-MOM-CP	0.9798	0.9671	0.9623	0.9923	1.0033
UK / AR-MOM vs. AR-MOM-R2	0.9995	0.9985	0.9987	0.9998	1.0012
UK / AR-MOM vs. AR-MOM-BIC	0.9995	0.9987	0.9990	0.9989	1.0004
UK / AR-MOM vs. AR-MOM-CP	0.9995	0.9986	0.9987	0.9996	1.0012
US / AR-MOM vs. AR-MOM-R2	1.0088	0.9912	0.9946	0.9950	0.9928
US / AR-MOM vs. AR-MOM-BIC	0.9999	0.9969	0.9939	0.9954	0.9955
US / AR-MOM vs. AR-MOM-CP	1.0089	0.9917	0.9936	0.9930	0.9931

## Table 9: Results for the optimal stepwise predictor selection approach (MAFE ratios)

Country / Models	h=1	h=3	h=6	h=9	h=12
Canada / AR-MOM vs. AR-MOM-R2	0.9953	1.0058	1.0057	0.9718	0.9366
Canada / AR-MOM vs. AR-MOM-BIC	0.9999	0.9983	1.0041	0.9834	0.9458
Canada / AR-MOM vs. AR-MOM-CP	0.9971	1.0011	1.0036	0.9727	0.9357
France / AR-MOM vs. AR-MOM-R2	0.9948	0.9920	0.9911	0.9945	0.9942
France / AR-MOM vs. AR-MOM-BIC	0.9982	0.9950	0.9934	0.9938	0.9920
France / AR-MOM vs. AR-MOM-CP	0.9970	0.9911	0.9933	0.9951	0.9941
Germany / AR-MOM vs. AR-MOM-R2	0.9743	0.9450	0.9140	0.9044	0.9179
Germany / AR-MOM vs. AR-MOM-BIC	0.9868	0.9610	0.9153	0.9066	0.9196
Germany / AR-MOM vs. AR-MOM-CP	0.9811	0.9481	0.9149	0.9057	0.9177
Italy / AR-MOM vs. AR-MOM-R2	1.0064	0.9998	0.9935	0.9901	0.9894
Italy / AR-MOM vs. AR-MOM-BIC	1.0064	1.0003	0.9978	0.9960	0.9953
Italy / AR-MOM vs. AR-MOM-CP	1.0064	1.0003	0.9970	0.9937	0.9905
Japan / AR-MOM vs. AR-MOM-R2	0.9061	0.9282	0.9359	0.9292	0.9156
Japan / AR-MOM vs. AR-MOM-BIC	0.9463	0.9374	0.9393	0.9289	0.9169
Japan / AR-MOM vs. AR-MOM-CP	0.9050	0.9303	0.9363	0.9291	0.9163
UK / AR-MOM vs. AR-MOM-R2	0.9950	0.9902	1.0066	1.0116	1.0127
UK / AR-MOM vs. AR-MOM-BIC	0.9966	0.9909	0.9835	1.0028	1.0123
UK / AR-MOM vs. AR-MOM-CP	0.9966	0.9924	1.0066	1.0116	1.0123
US / AR-MOM vs. AR-MOM-R2	0.9956	0.9959	0.9933	0.9932	0.9937
US / AR-MOM vs. AR-MOM-BIC	0.9971	0.9967	0.9989	0.9999	0.9961
US / AR-MOM vs. AR-MOM-CP	0.9970	0.9966	0.9934	0.9942	0.9936

Panel B: Rolling estimation window

Country / Modelsh=1h=3h=6h=9h=12Canada / AR-MOM vs. AR-MOM-R2 $0.9855$ $1.0050$ $0.9771$ $0.9511$ $0.9154$ Canada / AR-MOM vs. AR-MOM-BIC $0.9934$ $1.0014$ $0.9835$ $0.9713$ $0.9246$ Canada / AR-MOM vs. AR-MOM-CP $0.9884$ $1.0128$ $0.9789$ $0.9620$ $0.9190$ France / AR-MOM vs. AR-MOM-R2 $0.9752$ $0.9865$ $0.9845$ $0.9850$ $0.9820$ France / AR-MOM vs. AR-MOM-BIC $0.9972$ $0.9865$ $0.9845$ $0.9851$ $0.9851$ France / AR-MOM vs. AR-MOM-CP $0.9761$ $0.9882$ $0.9874$ $0.9860$ $0.9813$ Germany / AR-MOM vs. AR-MOM-CP $0.9761$ $0.9843$ $0.9017$ $0.9141$ Germany / AR-MOM vs. AR-MOM-R2 $0.9780$ $0.9398$ $0.8992$ $0.9030$ $0.9196$ Germany / AR-MOM vs. AR-MOM-R2 $0.9691$ $0.9294$ $0.8961$ $0.9047$ $0.9157$ Italy / AR-MOM vs. AR-MOM-R2 $0.9908$ $0.9729$ $0.9719$ $0.9654$ $0.9611$ Italy / AR-MOM vs. AR-MOM-R2 $0.9906$ $0.9765$ $0.9746$ $0.9650$ $0.9605$ Japan / AR-MOM vs. AR-MOM-CP $0.9916$ $0.9440$ $0.9548$ $0.9373$ $0.9209$ Japan / AR-MOM vs. AR-MOM-R2 $0.9904$ $0.9869$ $0.9839$ $0.9822$ $0.9872$ UK / AR-MOM vs. AR-MOM-R2 $0.9904$ $0.9869$ $0.9839$ $0.9822$ $0.9872$ UK / AR-MOM vs. AR-MOM-R2 $0.9904$ $0.9869$ $0.9843$ $0.9818$ $0.9$						
Canada / AR-MOM vs. AR-MOM-R20.98551.00500.97710.95110.9154Canada / AR-MOM vs. AR-MOM-BIC0.99341.00140.98350.97130.9246Canada / AR-MOM vs. AR-MOM-CP0.98841.01280.97890.96200.9190France / AR-MOM vs. AR-MOM-R20.97520.98650.98450.98500.9820France / AR-MOM vs. AR-MOM-BIC0.98470.90220.98830.98510.9851Germany / AR-MOM vs. AR-MOM-CP0.97610.98820.98740.90600.9813Germany / AR-MOM vs. AR-MOM-BIC0.97800.93980.89920.90300.9141Germany / AR-MOM vs. AR-MOM-BIC0.97800.93980.89920.90300.9196Germany / AR-MOM vs. AR-MOM-CP0.96910.92940.89610.90470.9157Italy / AR-MOM vs. AR-MOM-BIC0.99080.97290.97190.96540.9611Italy / AR-MOM vs. AR-MOM-BIC0.99060.97650.97460.96500.9605Japan / AR-MOM vs. AR-MOM-CP0.90460.97650.97460.96500.9206Japan / AR-MOM vs. AR-MOM-CP0.91300.94320.95670.93780.9235UK / AR-MOM vs. AR-MOM-R20.99040.98690.98390.98220.9872UK / AR-MOM vs. AR-MOM-CP0.99360.98690.98430.98660.9823UK / AR-MOM vs. AR-MOM-CP0.99360.98400.98430.98130.9823UK / AR-MOM vs. AR-MOM-R20.99050.99190.99440.992	Country / Models	h=1	h=3	h=6	h=9	h=12
Canada / AR-MOM vs. AR-MOM-BIC0.99341.00140.98350.97130.9246Canada / AR-MOM vs. AR-MOM-CP0.98841.01280.97890.96200.9190France / AR-MOM vs. AR-MOM-R20.97520.98650.98450.98500.9820France / AR-MOM vs. AR-MOM-BIC0.98470.99020.98830.98510.9851France / AR-MOM vs. AR-MOM-CP0.97610.98820.98740.98600.9813Germany / AR-MOM vs. AR-MOM-R20.95840.91710.89430.90170.9141Germany / AR-MOM vs. AR-MOM-R20.97800.93980.89920.90300.9196Germany / AR-MOM vs. AR-MOM-CP0.96910.92940.89610.90470.9157Italy / AR-MOM vs. AR-MOM-R20.98960.97290.97190.96540.9611Italy / AR-MOM vs. AR-MOM-R20.90080.97800.97770.97620.9707Italy / AR-MOM vs. AR-MOM-R20.91240.94400.95480.93730.9209Japan / AR-MOM vs. AR-MOM-R20.91240.94860.96130.94580.9226Japan / AR-MOM vs. AR-MOM-R20.91300.94320.95670.93780.9235UK / AR-MOM vs. AR-MOM-R20.99040.98690.98390.98220.9872UK / AR-MOM vs. AR-MOM-R20.99370.99100.98420.97860.9823UK / AR-MOM vs. AR-MOM-R20.99360.98800.98430.98180.9860UK / AR-MOM vs. AR-MOM-R20.99360.98800.98430.9818	Canada / AR-MOM vs. AR-MOM-R2	0.9855	1.0050	0.9771	0.9511	0.9154
Canada / AR-MOM vs. AR-MOM-CP0.98841.01280.97890.96200.9190France / AR-MOM vs. AR-MOM-R20.97520.98650.98450.98500.9820France / AR-MOM vs. AR-MOM-BIC0.98470.99020.98830.98510.9851France / AR-MOM vs. AR-MOM-CP0.97610.98820.98740.98600.9813Germany / AR-MOM vs. AR-MOM-R20.95840.91710.89430.90170.9141Germany / AR-MOM vs. AR-MOM-R20.96910.92940.89610.90470.9157Italy / AR-MOM vs. AR-MOM-R20.98960.97290.97190.96540.9611Italy / AR-MOM vs. AR-MOM-R20.90080.97650.97460.96500.9605Japan / AR-MOM vs. AR-MOM-R20.91240.94400.95480.93730.9209Japan / AR-MOM vs. AR-MOM-R20.91240.94400.95480.93730.9209Japan / AR-MOM vs. AR-MOM-R20.91240.94860.96130.94580.9226Japan / AR-MOM vs. AR-MOM-R20.91000.94320.95670.93780.9235UK / AR-MOM vs. AR-MOM-R20.99040.98690.98390.98220.9872UK / AR-MOM vs. AR-MOM-R20.99370.99100.98430.98180.9860UK / AR-MOM vs. AR-MOM-R20.99360.98800.98430.98180.9860UK / AR-MOM vs. AR-MOM-R20.99360.98800.98430.98180.9860UK / AR-MOM vs. AR-MOM-R20.99360.99190.99040.99230.9	Canada / AR-MOM vs. AR-MOM-BIC	0.9934	1.0014	0.9835	0.9713	0.9246
France / AR-MOM vs. AR-MOM-R20.97520.98650.98450.98500.9820France / AR-MOM vs. AR-MOM-BIC0.98470.99020.98830.98510.9851France / AR-MOM vs. AR-MOM-CP0.97610.98820.98740.98600.9813Germany / AR-MOM vs. AR-MOM-R20.95840.91710.89430.90170.9141Germany / AR-MOM vs. AR-MOM-BIC0.97800.93980.89920.90300.9196Germany / AR-MOM vs. AR-MOM-CP0.96910.92940.89610.90470.9157Italy / AR-MOM vs. AR-MOM-R20.98860.97290.97190.96540.9611Italy / AR-MOM vs. AR-MOM-R20.90080.97800.97770.97620.9707Italy / AR-MOM vs. AR-MOM-BIC0.99060.97650.97460.96500.9605Japan / AR-MOM vs. AR-MOM-R20.91240.94400.95480.93730.9209Japan / AR-MOM vs. AR-MOM-R20.91300.94320.95670.93780.9235UK / AR-MOM vs. AR-MOM-R20.99040.98690.98390.98220.9872UK / AR-MOM vs. AR-MOM-R20.99370.99100.98430.98180.9860UK / AR-MOM vs. AR-MOM-R20.99360.98800.98430.98180.9860UK / AR-MOM vs. AR-MOM-R20.99360.98800.98430.98180.9860UK / AR-MOM vs. AR-MOM-R20.99050.99190.99040.99230.9897US / AR-MOM vs. AR-MOM-R20.99050.99190.99040.99230.9	Canada / AR-MOM vs. AR-MOM-CP	0.9884	1.0128	0.9789	0.9620	0.9190
France / AR-MOM vs. AR-MOM-BIC0.98470.99020.98830.98510.9851France / AR-MOM vs. AR-MOM-CP0.97610.98820.98740.98600.9813Germany / AR-MOM vs. AR-MOM-R20.95840.91710.89430.90170.9141Germany / AR-MOM vs. AR-MOM-BIC0.97800.93980.89920.90300.9196Germany / AR-MOM vs. AR-MOM-CP0.96910.92940.89610.90470.9157Italy / AR-MOM vs. AR-MOM-R20.98960.97290.97190.96540.9611Italy / AR-MOM vs. AR-MOM-R20.90880.97800.97770.97620.9707Italy / AR-MOM vs. AR-MOM-BIC0.99060.97650.97460.96500.9605Japan / AR-MOM vs. AR-MOM-R20.91240.94400.95480.93730.9209Japan / AR-MOM vs. AR-MOM-BIC0.92440.94860.96130.94580.9226Japan / AR-MOM vs. AR-MOM-R20.91300.94320.95670.93780.9235UK / AR-MOM vs. AR-MOM-R20.99040.98690.98390.98220.9872UK / AR-MOM vs. AR-MOM-R20.99370.99100.98430.98180.9860UK / AR-MOM vs. AR-MOM-R20.99360.98800.98430.98180.9860UK / AR-MOM vs. AR-MOM-R20.99360.98800.98430.98180.9860US / AR-MOM vs. AR-MOM-R20.99050.99190.99040.99230.9897US / AR-MOM vs. AR-MOM-R20.99050.99190.99040.99230.9	France / AR-MOM vs. AR-MOM-R2	0.9752	0.9865	0.9845	0.9850	0.9820
France / AR-MOM vs. AR-MOM-CP0.97610.98820.98740.98600.9813Germany / AR-MOM vs. AR-MOM-R20.95840.91710.89430.90170.9141Germany / AR-MOM vs. AR-MOM-BIC0.97800.93980.89920.90300.9196Germany / AR-MOM vs. AR-MOM-CP0.96910.92940.89610.90470.9157Italy / AR-MOM vs. AR-MOM-R20.98860.97290.97190.96540.9611Italy / AR-MOM vs. AR-MOM-BIC0.99080.97800.97770.97620.9707Italy / AR-MOM vs. AR-MOM-BIC0.99060.97650.97460.96500.9605Japan / AR-MOM vs. AR-MOM-R20.91240.94400.95480.93730.9209Japan / AR-MOM vs. AR-MOM-R20.91240.94460.96130.94580.9226Japan / AR-MOM vs. AR-MOM-R20.91300.94320.95670.93780.9235UK / AR-MOM vs. AR-MOM-R20.99040.98690.98390.98220.9872UK / AR-MOM vs. AR-MOM-BIC0.99370.99100.98430.98180.9860US / AR-MOM vs. AR-MOM-CP0.99360.98800.98430.98180.9860US / AR-MOM vs. AR-MOM-R20.99050.99190.99040.99230.9897US / AR-MOM vs. AR-MOM-BIC0.99180.99480.99690.99480.9920US / AR-MOM vs. AR-MOM-CP0.99230.99190.99480.99200.9887	France / AR-MOM vs. AR-MOM-BIC	0.9847	0.9902	0.9883	0.9851	0.9851
Germany / AR-MOM vs. AR-MOM-R20.95840.91710.89430.90170.9141Germany / AR-MOM vs. AR-MOM-BIC0.97800.93980.89920.90300.9196Germany / AR-MOM vs. AR-MOM-CP0.96910.92940.89610.90470.9157Italy / AR-MOM vs. AR-MOM-R20.98860.97290.97190.96540.9611Italy / AR-MOM vs. AR-MOM-BIC0.99080.97800.97770.97620.9707Italy / AR-MOM vs. AR-MOM-BIC0.99060.97650.97460.96500.9605Japan / AR-MOM vs. AR-MOM-CP0.91240.94400.95480.93730.9209Japan / AR-MOM vs. AR-MOM-R20.91240.94400.95480.93730.9209Japan / AR-MOM vs. AR-MOM-BIC0.92440.94860.96130.94580.9226Japan / AR-MOM vs. AR-MOM-CP0.91300.94320.95670.93780.9235UK / AR-MOM vs. AR-MOM-R20.99040.98690.98390.98220.9872UK / AR-MOM vs. AR-MOM-BIC0.99360.98800.98430.98180.9860US / AR-MOM vs. AR-MOM-R20.99050.99190.9040.99230.9897US / AR-MOM vs. AR-MOM-R20.99050.99190.90440.99230.9897US / AR-MOM vs. AR-MOM-BIC0.99180.99480.99040.99230.9897US / AR-MOM vs. AR-MOM-CP0.99230.99390.99480.99200.9882	France / AR-MOM vs. AR-MOM-CP	0.9761	0.9882	0.9874	0.9860	0.9813
Germany / AR-MOM vs. AR-MOM-BIC0.97800.93980.89920.90300.9196Germany / AR-MOM vs. AR-MOM-CP0.96910.92940.89610.90470.9157Italy / AR-MOM vs. AR-MOM-R20.98960.97290.97190.96540.9611Italy / AR-MOM vs. AR-MOM-BIC0.99080.97800.97770.97620.9707Italy / AR-MOM vs. AR-MOM-BIC0.99060.97650.97460.96500.9605Japan / AR-MOM vs. AR-MOM-R20.91240.94400.95480.93730.9209Japan / AR-MOM vs. AR-MOM-R20.91240.94400.95670.94580.9226Japan / AR-MOM vs. AR-MOM-BIC0.92440.94860.96130.94580.9226Japan / AR-MOM vs. AR-MOM-CP0.91300.94320.95670.93780.9235UK / AR-MOM vs. AR-MOM-R20.99040.98690.98390.98220.9872UK / AR-MOM vs. AR-MOM-BIC0.99360.98800.98430.98180.9860US / AR-MOM vs. AR-MOM-R20.99050.99190.9040.99230.9897US / AR-MOM vs. AR-MOM-R20.99050.99190.90440.99230.9877US / AR-MOM vs. AR-MOM-R20.99180.99480.99040.99230.9877US / AR-MOM vs. AR-MOM-CP0.99230.99480.99040.99230.9887US / AR-MOM vs. AR-MOM-CP0.99230.99390.99480.99200.9882	Germany / AR-MOM vs. AR-MOM-R2	0.9584	0.9171	0.8943	0.9017	0.9141
Germany / AR-MOM vs. AR-MOM-CP0.96910.92940.89610.90470.9157Italy / AR-MOM vs. AR-MOM-R20.98960.97290.97190.96540.9611Italy / AR-MOM vs. AR-MOM-BIC0.99080.97800.97770.97620.9707Italy / AR-MOM vs. AR-MOM-CP0.99060.97650.97460.96500.9605Japan / AR-MOM vs. AR-MOM-R20.91240.94400.95480.93730.9209Japan / AR-MOM vs. AR-MOM-R20.91240.94400.95480.93730.9209Japan / AR-MOM vs. AR-MOM-BIC0.92440.94860.96130.94580.9226Japan / AR-MOM vs. AR-MOM-CP0.91300.94320.95670.93780.9235UK / AR-MOM vs. AR-MOM-R20.99040.98690.98390.98220.9872UK / AR-MOM vs. AR-MOM-BIC0.99360.98400.98430.98600.9823UK / AR-MOM vs. AR-MOM-CP0.99360.98800.98430.98180.9860US / AR-MOM vs. AR-MOM-R20.99050.99190.90440.99230.9897US / AR-MOM vs. AR-MOM-BIC0.99180.99480.99040.99230.9897US / AR-MOM vs. AR-MOM-CP0.99230.99390.99480.99200.9882	Germany / AR-MOM vs. AR-MOM-BIC	0.9780	0.9398	0.8992	0.9030	0.9196
Italy / AR-MOM vs. AR-MOM-R20.98960.97290.97190.96540.9611Italy / AR-MOM vs. AR-MOM-BIC0.99080.97800.97770.97620.9707Italy / AR-MOM vs. AR-MOM-CP0.99060.97650.97460.96500.9605Japan / AR-MOM vs. AR-MOM-R20.91240.94400.95480.93730.9209Japan / AR-MOM vs. AR-MOM-BIC0.92440.94860.96130.94580.9226Japan / AR-MOM vs. AR-MOM-CP0.91300.94320.95670.93780.9235UK / AR-MOM vs. AR-MOM-R20.99040.98690.98390.98220.9872UK / AR-MOM vs. AR-MOM-BIC0.99370.99100.98420.97660.9823UK / AR-MOM vs. AR-MOM-CP0.99360.98800.98430.98180.9860US / AR-MOM vs. AR-MOM-R20.99050.99190.90440.99230.9897US / AR-MOM vs. AR-MOM-BIC0.99360.99480.99230.9897US / AR-MOM vs. AR-MOM-CP0.99230.99480.99200.9882	Germany / AR-MOM vs. AR-MOM-CP	0.9691	0.9294	0.8961	0.9047	0.9157
Italy/ AR-MOM vs. AR-MOM-BIC0.99080.97800.97770.97620.9707Italy/ AR-MOM vs. AR-MOM-CP0.99060.97650.97460.96500.9605Japan/ AR-MOM vs. AR-MOM-R20.91240.94400.95480.93730.9209Japan/ AR-MOM vs. AR-MOM-BIC0.92440.94860.96130.94580.9226Japan/ AR-MOM vs. AR-MOM-CP0.91300.94320.95670.93780.9235UK/ AR-MOM vs. AR-MOM-R20.99040.98690.98390.98220.9872UK / AR-MOM vs. AR-MOM-BIC0.99370.99100.98420.97860.9823UK / AR-MOM vs. AR-MOM-CP0.99360.98800.98430.98180.9860US / AR-MOM vs. AR-MOM-R20.99050.99190.90440.99230.9897US / AR-MOM vs. AR-MOM-BIC0.99180.99480.99240.99480.99200.9882	Italy / AR-MOM vs. AR-MOM-R2	0.9896	0.9729	0.9719	0.9654	0.9611
Italy/ AR-MOM vs. AR-MOM-CP0.99060.97650.97460.96500.9605Japan / AR-MOM vs. AR-MOM-R20.91240.94400.95480.93730.9209Japan / AR-MOM vs. AR-MOM-BIC0.92440.94860.96130.94580.9226Japan / AR-MOM vs. AR-MOM-CP0.91300.94320.95670.93780.9235UK / AR-MOM vs. AR-MOM-R20.99040.98690.98390.98220.9872UK / AR-MOM vs. AR-MOM-BIC0.99370.99100.98420.97860.9823UK / AR-MOM vs. AR-MOM-BIC0.99360.98800.98430.98180.9860US / AR-MOM vs. AR-MOM-R20.99050.99190.90440.99230.9897US / AR-MOM vs. AR-MOM-BIC0.99180.99480.99240.99480.99200.9882	Italy / AR-MOM vs. AR-MOM-BIC	0.9908	0.9780	0.9777	0.9762	0.9707
Japan / AR-MOM vs. AR-MOM-R20.91240.94400.95480.93730.9209Japan / AR-MOM vs. AR-MOM-BIC0.92440.94860.96130.94580.9226Japan / AR-MOM vs. AR-MOM-CP0.91300.94320.95670.93780.9235UK / AR-MOM vs. AR-MOM-R20.99040.98690.98390.98220.9872UK / AR-MOM vs. AR-MOM-BIC0.99370.99100.98420.97860.9823UK / AR-MOM vs. AR-MOM-BIC0.99360.98800.98430.98180.9869US / AR-MOM vs. AR-MOM-R20.99050.99190.90440.99230.9897US / AR-MOM vs. AR-MOM-BIC0.99180.99480.99240.99480.99200.9882	Italy / AR-MOM vs. AR-MOM-CP	0.9906	0.9765	0.9746	0.9650	0.9605
Japan / AR-MOM vs. AR-MOM-BIC0.92440.94860.96130.94580.9226Japan / AR-MOM vs. AR-MOM-CP0.91300.94320.95670.93780.9235UK / AR-MOM vs. AR-MOM-R20.99040.98690.98390.98220.9872UK / AR-MOM vs. AR-MOM-BIC0.99370.99100.98420.97860.9823UK / AR-MOM vs. AR-MOM-CP0.99360.98800.98430.98180.9860US / AR-MOM vs. AR-MOM-R20.99050.99190.99040.99230.9897US / AR-MOM vs. AR-MOM-BIC0.99180.99480.99940.9927US / AR-MOM vs. AR-MOM-CP0.99230.99390.99480.99200.9882	Japan / AR-MOM vs. AR-MOM-R2	0.9124	0.9440	0.9548	0.9373	0.9209
Japan / AR-MOM vs. AR-MOM-CP0.91300.94320.95670.93780.9235UK / AR-MOM vs. AR-MOM-R20.99040.98690.98390.98220.9872UK / AR-MOM vs. AR-MOM-BIC0.99370.99100.98420.97860.9823UK / AR-MOM vs. AR-MOM-CP0.99360.98800.98430.98180.9860US / AR-MOM vs. AR-MOM-R20.99050.99190.99040.99230.9897US / AR-MOM vs. AR-MOM-BIC0.99180.99480.99940.99230.9842US / AR-MOM vs. AR-MOM-CP0.99230.99390.99480.99200.9882	Japan / AR-MOM vs. AR-MOM-BIC	0.9244	0.9486	0.9613	0.9458	0.9226
UK / AR-MOM vs. AR-MOM-R20.99040.98690.98390.98220.9872UK / AR-MOM vs. AR-MOM-BIC0.99370.99100.98420.97860.9823UK / AR-MOM vs. AR-MOM-CP0.99360.98800.98430.98180.9860US / AR-MOM vs. AR-MOM-R20.99050.99190.99040.99230.9897US / AR-MOM vs. AR-MOM-BIC0.99180.99480.99690.99440.9897US / AR-MOM vs. AR-MOM-CP0.99230.99390.99480.99200.9882	Japan / AR-MOM vs. AR-MOM-CP	0.9130	0.9432	0.9567	0.9378	0.9235
UK / AR-MOM vs. AR-MOM-BIC0.99370.99100.98420.97860.9823UK / AR-MOM vs. AR-MOM-CP0.99360.98800.98430.98180.9860US / AR-MOM vs. AR-MOM-R20.99050.99190.99040.99230.9897US / AR-MOM vs. AR-MOM-BIC0.99180.99480.99690.99440.9897US / AR-MOM vs. AR-MOM-CP0.99230.99390.99480.99200.9882	UK / AR-MOM vs. AR-MOM-R2	0.9904	0.9869	0.9839	0.9822	0.9872
UK / AR-MOM vs. AR-MOM-CP0.99360.98800.98430.98180.9860US / AR-MOM vs. AR-MOM-R20.99050.99190.99040.99230.9897US / AR-MOM vs. AR-MOM-BIC0.99180.99480.99690.99940.9897US / AR-MOM vs. AR-MOM-CP0.99230.99390.99480.99200.9882	UK / AR-MOM vs. AR-MOM-BIC	0.9937	0.9910	0.9842	0.9786	0.9823
US / AR-MOM vs. AR-MOM-R2       0.9905       0.9919       0.9904       0.9923       0.9897         US / AR-MOM vs. AR-MOM-BIC       0.9918       0.9948       0.9969       0.9994       0.9897         US / AR-MOM vs. AR-MOM-CP       0.9923       0.9939       0.9948       0.9920       0.9882	UK / AR-MOM vs. AR-MOM-CP	0.9936	0.9880	0.9843	0.9818	0.9860
US / AR-MOM vs. AR-MOM-BIC0.99180.99480.99690.99940.9897US / AR-MOM vs. AR-MOM-CP0.99230.99390.99480.99200.9882	US / AR-MOM vs. AR-MOM-R2	0.9905	0.9919	0.9904	0.9923	0.9897
US / AR-MOM vs. AR-MOM-CP 0.9923 0.9939 0.9948 0.9920 0.9882	US / AR-MOM vs. AR-MOM-BIC	0.9918	0.9948	0.9969	0.9994	0.9897
	US / AR-MOM vs. AR-MOM-CP	0.9923	0.9939	0.9948	0.9920	0.9882

Canada						
	Quantiles					
	0.1	0.25	0.5	0.75	0.9	
CR1->LEV	1.4978	1.7393*	91.9725***	32.0321***	7.8300***	
CR2->LEV	4.3687***	6.4757***	27.2468***	8.0222***	1.9234*	
CR3->LEV	1.5033***	1.8139*	85.4449***	29.8660***	7.2901***	
CR4->LEV	5.5286***	8.3368***	19.9097***	5.8775***	1.3974	
CR1->SKEW	2.0905***	3.5621***	4.1122***	2.8427***	2.0953**	
CR2->SKEW	1.1506	2.0198***	3.3858***	2.5277***	1.7042*	
CR3->SKEW	1.8494*	3.4642***	3.9374***	2.6851***	2.0167**	
CR4->SKEW	1.7398*	3.4852***	3.7353***	2.6334***	1.4553	
CR1->KURT	6.1995***	8.7549***	10.2622***	8.8002***	6.1283***	
CR2->KURT	5.1118***	8.0175***	8.8443***	7.1014***	4.7106***	
CR3->KURT	6.4727***	9.0833***	11.0922***	9.3952***	6.1743***	
CR4->KURT	6.0728***	8.9802***	10.2290***	9.0012***	6.1037***	
		Fra	nce			
			Quantiles			
	0.1	0.25	0.5	0.75	0.9	
CR1->LEV	7.8922***	5.6531***	23.0042***	6.7184***	1.5987	
CR2->LEV	7.4188***	4.7035***	28.2205***	8.2587***	1.9777**	
CR3->LEV	7.1398***	4.7934***	27.8810***	8.1611***	1.9553**	
CR4->LEV	6.5322***	4.3240***	30.8706***	9.0443***	2.1694***	
CR1->SKEW	10.4843***	7.2272***	12.0224***	10.8113***	7.3684***	
CR2->SKEW	9.7263***	6.2407***	10.9346***	10.0485***	6.8481***	
CR3->SKEW	9.4921***	6.4972***	11.2255***	9.7436***	6.8134***	
CR4->SKEW	8.9816***	6.0901***	10.6693***	9.4493***	6.6170***	
CR1->KURT	10.9793***	7.4253***	12.1250***	10.3631***	7.2542***	
CR2->KURT	9.8271***	6.6601***	10.8572***	9.6058***	6.2061***	
CR3->KURT	9.3618***	6.7098***	11.2931***	9.5606***	6.4775***	
CR4->KURT	9.0247***	6.4544***	10.8118***	9.0243***	6.0832***	
		Gern	nany			
			Quantiles			
	0.1	0.25	0.5	0.75	0.9	
CR1->LEV	1.8264*	2.2431**	89.7564***	33.1427***	8.0836***	
CR2->LEV	1.3063	2.0243**	117.2215***	43.2907***	10.5412***	
CR3->LEV	1.4627	2.2115**	95.5475***	35.7116***	8.7063***	
CR4->LEV	1.1957	2.0275**	111.3745***	41.6249***	10.1343***	
CR1->SKEW	4.2068***	7.8725***	7.9979***	5.6804***	3.3724***	
CR2->SKEW	3.0630***	8.5449***	9.0162***	5.0730***	2.1566***	
CR3->SKEW	3.9450***	7.7203***	7.9870***	5.4234***	3.3621***	
CR4->SKEW	2.7127***	8.3724***	9.0297***	5.2916***	2.3872***	
CR1->KURT	3.7283***	6.2506***	8.2476***	8.8427***	4.4456***	
CR2->KURT	3.0876***	5.2306***	7.4489***	8.1627***	3.5532***	
CR3->KURT	3.6739***	5.6812***	8.3721***	8.5761***	3.9456***	
CR4->KURT	3.5190***	5.2571***	7.8559***	8.3658***	3.7300***	

Table 10: Quantile causality between climate risks and stock market moments

### To be continued on next page.

#### Continued.

Italy Quantiles 0.1 0.25 0.50.750.9 1.5942 2.9577\* 75.4886\*\* 6.2824\*\*\* CR1->LEV 25.8020\*\*\* 97.9389\*\*\* 8.0650\*\*\* CR2->LEV 1.0679 1.2462 33.1754\*\*\* 48.6253\*\*\* 3.4175\*\*\* 14.2652\*\*\* CR3->LEV 2.34313.8731\*\*\* 3.4415\*\*\* 54.8544\*\*\* 16.0940\*\*\* 3.8575\*\*\* CR4->LEV 2.0296\*\* 8.0665\*\*\* 2.3340\*\*\* CR1->SKEW 13.9902\*\*\* 5.8921\*\*\* 1.1643 CR2->SKEW 15.2936\*\*\* 9.6775\*\*\* 5.0938\*\*\* 1.9069\*\*\*\*\* 1.0428 15.2693\*\*\* CR3->SKEW 9.6126\*\*\* 5.8803\*\*\* 2.2146\*\*\* 1.1819 10.1131\*\*\* 16.3069\*\*\* 6.1359\*\*\* 2.2592\*\*\* CR4->SKEW 1.1598 14.7119\*\*\* CR1->KURT 8.8021\*\*\* 6.6057\*\*\* 3.2732\*\*\* 1.8952 6.7015\*\*\* 10.8965\*\*\* 19.9517\*\*\* 2.6355\*\*\* CR2->KURT 1.3865 CR3->KURT 10.8965\*\*\* 19.9517\*\*\* 6.7015\*\*\* 2.6355\*\*\* 1.3865 11.9122\*\*\* 2.6055\*\*\* CR4->KURT 21.5946\*\*\* 6.9944\*\*\* 1.3554 Japan Quantiles 0.1 0.250.50.7509 CR1->LEV 1.0090 1.7932\* 86.9123\*\*\* 33.4591\*\*\* 8.1734\*\*\* 56.7905\*\*\* 112.5297\*\*\* 13.8649\*\*\* CR2->LEV 1.8338 1.1615\* 34.1961\*\*\* CR3->LEV 3.9203 4.8826\*\*\* 10.0578\*\*\* 2.4181\*\* 1.3249\*\*\* 112.2820\*\*\* 32.9812\*\*\* 7.8648\*\*\* CR4->LEV 1.0386 7.1255\*\*\* 3.4002\*\*\* 2.9397\*\*\* 6.0102\*\*\*  $1.8928^{*}$ CR1->SKEW CR2->SKEW 8.1390\*\*\* 7.8728\*\*\* 4.2918\*\*\* 3.0540\*\*\* 2.0114\*\* 8.5571\*\*\* 9.1759\*\*\* 2.2244\*\*\* CR3->SKEW 0.6812 1.0460 13.7893\*\*\* 9.3734\*\*\* CR4->SKEW 21.7054\*\*\* 3.6441\*\*\* 1.2782 CR1->KURT 7.8088\*\*\* 10.9723\*\*\* 10.0109\*\*\* 7.5958\*\*\* 5.1426\*\*\* 4.5657\*\*\* CR2->KURT 9.3512\*\*\* 19.0372\*\*\* 10.2802\*\*\* 2.4813\*\*\* 8.4489\*\*\* 13.1936\*\*\* 8.0366\*\*\* 4.4609\*\*\* 2.3887\*\*\* CR3->KURT 21.7054\*\*\* 9.3734\*\*\* 3.6441\*\*\* CR4->KURT 13.7893\*\*\* 1.2782UK Quantiles 0.1 0.25 0.50.75 0.9 CR1->LEV 1.6138 2.4345\*\*\* 194.3323\*\* 71.7660\*\*\* 17.5420\*\*\* CR2->LEV 5.1310\*\*\* 6.6179\*\*\* 10.2200\*\*\* 13.6397\*\*\* 10.7775\*\*\* CR3->LEV 1.7439\* 1.8655\* 210.0351\*\*\* 78.6779\*\*\* 19.2301\*\*\* 85.4019\*\*\* 20.8710\*\*\* 227.5496\*\*\* CR4->LEV 1.7343\* 1.6790\* CR1->SKEW 5.3069\*\*\* 7.4690\*\*\* 9.3459\*\*\* 13.8428\*\*\* 10.9803\*\*\* 5.3069\*\*\* 7.4690\*\*\* 9.3459\*\*\* 13.8428\*\*\* 10.9803\*\*\* CR2->SKEW 6.6179\*\*\* 13.6397\*\*\* CR3->SKEW 5.1310\*\*\* 10.2200\*\*\* 10.7775\*\*\* CR4->SKEW 4.8513\*\*\* 6.1309\*\*\* 9.8515\*\*\* 13.7905\*\*\* 11.2422\*\*\* CR1->KURT 9.4234\*\*\* 12.6813\*\*\* 11.7096\*\*\* 8.6022\*\*\* 6.7766\*\*\* 9.7315\*\*\* 12.6514\*\*\* 9.9259\*\*\* 8.3293\*\*\* 5.9110\*\*\* CR2->KURT 9.4412\*\*\* 12.2899\*\*\* 11.0056\*\*\* 7.3879\*\*\* 5.7274\*\*\* CR3->KURT 9.6464\*\*\* 12.2148\*\*\* 10.3582\*\*\* 6.7688\*\*\* 5.3893\*\*\* CR4->KURT US Quantiles 0.1 0.250.50.750.9 8.2779\*\*\* 11.7762\*\* CR1->LEV 29.6758\*\*\* 8.7010\*\* 2.0696\* CR2->LEV 6.7967\*\*\* 9.6414\*\*\* 39.5453\*\*\* 11.5800\*\*\* 2.7752\*\*\* 7.6296\*\*\* 11.6130\*\*\* 31.9295\*\*\* 9.3309\*\*\* CR3->LEV  $2.2254^{**}$ CR4->LEV 6.0168\*\*\* 8.8138\*\*\* 43.1347\*\*\* 12.6594\*\*\* 3.0374\*\*\* 5.4382\*\*\* 8.6904\*\*\* 9.9798\*\*\* 8.3495\*\*\* 6.5274\*\*\* CR1->SKEW 4.0497\*\*\* 6.4134\*\*\* 7.8359\*\*\* 6.8463\*\*\* 6.3471\*\*\* CR2->SKEW CR3->SKEW 4.9730\*\*\* 7.8084\*\*\* 8.4092\*\*\* 7.8795\*\*\* 6.5663\*\*\* 6.4653\*\*\* 4.0501\*\*\* 6.6500\*\*\* 5.8199\*\*\* 6.0277\*\*\* CR4->SKEW 6.6547\*\*\* 8.0887\*\*\* 9.5206\*\*\* 8.2255\*\*\* CR1->KURT 5.2138\*\*\* 6.5073\*\*\* 6.8945\*\*\* 7.4919\*\*\* 6.1029\*\*\* 3.9002\*\*\* CR2->KURT 6.6717\*\*\* 7.8321\*\*\* 8.0959\*\*\* 7.7029\*\*\* 4.6618\*\*\* CR3->KURT  $5.9593^{***}$   $35_{6.3552^{***}}^{8.0959^{***}}$ 6.4571\*\*\* 6.2074\*\*\* 3.8690\*\*\* CR4->KURT

**Note:** Entries report the standard normal test statistic for the hypothesis that there is no Granger causality for a particular quantile running from a specific climate risks predictor ( $CR_i$ , i = 1, 2, 3, 4) to a particular moment (LEV, SKEW, KURT) of stock returns; \*\*\*, \*\* and \* indicates rejection of the null hypothesis at 1% (Critical value: 2.5750), 5% (Critical value: 1.96), and 10% (Critical value: 1.645) level of significance, respectively.



Figure 1: Quantile regression results for a recursive estimation window (RMSFE ratios)



Figure 2: Quantile regression results for a rolling estimation window (RMSFE ratios)