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Forecasting Cyprus GDP and its demand components: Single equation models and forecast combinations

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Forecasting Cyprus GDP and its demand components: Single equation models and forecast combinations*

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Executive Summary

The official National Accounts data are published with a considerable delay with respect to the reference quarter and therefore short-term forecasts for the growth rate of GDP and its demand components (i.e. private and public consumption, investment, imports and exports) constitute a valuable tool for macroeconomic surveillance and policy-making. The aim of this paper is the construction of short-term forecasts for the growth rate of GDP and its demand components using a large dataset of predictors and single equation dynamic models. The resulting forecasts are combined using different forecast combination methods whose performance is evaluated. At the same time it is assessed whether the adjustment of model-based forecasts via the application of intercept corrections can improve the forecast accuracy.

The results show that forecast combinations with weights based on the historical performance of individual forecasts are usually associated with higher forecast accuracy than other combination methods. The application of intercept corrections to the model forecasts appears to enhance the forecasting performance. The use of an extensive dataset of predictors from Business and Consumer Surveys for Cyprus at the cost of shorter time series is not found to result in forecast gains. The analysis also reveals that forecasting GDP growth directly leads to much more accurate forecasts than computing forecasts for the growth rates of all the demand components and subsequently aggregating them to obtain the GDP growth forecast (i.e. bottom-up approach). This finding has implications for the construction of forecasts for GDP and its components that are consistent with the National Accounts identity.

The paper also investigates the forecasting performance of bridge equations that link quarterly GDP (or its demand components) with timely available monthly indicators. Such models can be applied for obtaining real time estimates of National Accounts that can be revised with the release of new monthly information. Forecasts from bridge equations that are associated with superior forecasting performance in very recent quarters are found to yield substantial gains over simple models and other combination methods.

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Πρόβλεψη του ΑΕΠ και των συνιστωσών ζήτησής του για την Κύπρο: μοντέλα μιας εξίσωσης και συνδυασμοί προβλέψεων*

ΠΕΡΙΛΗΨΗ

Τα επίσημα στοιχεία των Εθνικών Λογαριασμών δημοσιεύονται με σημαντική καθυστέρηση σε σχέση με το τρίμηνο αναφοράς και επομένως βραχυπρόθεσμες προβλέψεις για το ρυθμό μεταβολής του ΑΕΠ και των συνιστωσών ζήτησής του (δηλ. ιδιωτική και δημόσια κατανάλωση, επενδύσεις, εισαγωγές και εξαγωγές) αποτελούν ένα χρήσιμο εργαλείο για σκοπούς παρακολούθησης των μακροοικονομικών εξελίξεων και άσκησης πολιτικής. Στόχος του δοκιμίου είναι η κατασκευή βραχυπρόθεσμων προβλέψεων για το ρυθμό μεταβολής του ΑΕΠ και των συνιστωσών ζήτησής του με τη χρήση μιας εκτεταμένης βάσης δεδομένων και δυναμικών μοντέλων μιας εξίσωσης. Οι προβλέψεις που προκύπτουν από τα διάφορα μοντέλα αξιοποιούνται εφαρμόζοντας εναλλακτικούς συνδυασμούς προβλέψεων, των οποίων η ικανότητα πρόβλεψης αξιολογείται. Παράλληλα εξετάζεται κατά πόσο η προσαρμογή των προβλέψεων από τα διάφορα μοντέλα μέσω διόρθωσης της σταθεράς των μοντέλων (intercept correction) μπορεί να βελτιώσει την ικανότητα πρόβλεψης.

Τα αποτελέσματα δείχνουν ότι συνδυασμοί προβλέψεων, που δίνουν μεγαλύτερη βαρύτητα σε προβλέψεις από μοντέλα με καλύτερη επίδοση πρόβλεψης ιστορικά, συνδέονται με μεγαλύτερη ακρίβεια από άλλες μεθόδους συνδυασμού προβλέψεων. Η εφαρμογή διόρθωσης της σταθεράς στα μοντέλα βελτιώνει την ικανότητα πρόβλεψης. Η χρήση μιας εκτεταμένης βάσης δεδομένων με μεταβλητές από τις Έρευνες Οικονομικής Συγκυρίας για τη Κύπρο δεν φαίνεται να μειώνει το σφάλμα των προβλέψεων. Επιπλέον, η ανάλυση δείχνει ότι η πρόβλεψη του ρυθμού μεταβολής του ΑΕΠ κατ' ευθείαν οδηγεί σε ακριβέστερες προβλέψεις από τον υπολογισμό προβλέψεων για τους ρυθμούς μεταβολής των συνιστωσών του ΑΕΠ, οι οποίες στη συνέχεια αθροίζονται για να υπολογιστεί η πρόβλεψη για το ρυθμό μεταβολής του ΑΕΠ.

Εξετάζεται, επίσης, η ικανότητα πρόβλεψης μοντέλων γνωστών ως "bridge" που συνδέουν τα τριμηνιαία στοιχεία του ΑΕΠ με μηνιαίους δείκτες οι οποίοι δημοσιεύονται έγκαιρα. Τα μοντέλα αυτά μπορούν να εφαρμοστούν στην κατασκευή προβλέψεων για τις μεταβλητές των Εθνικών Λογαριασμών σε πραγματικό χρόνο οι προβλέψεις μπορούν να αναθεωρούνται με την έλευση νέων μηνιαίων στοιχείων. Προβλέψεις από μοντέλα τύπου "bridge" που σχετίζονται με βελτιωμένη επίδοση πρόβλεψης σε πρόσφατα τρίμηνα έχουν μικρότερο σφάλμα πρόβλεψης από απλά μοντέλα και από άλλους συνδυασμούς προβλέψεων.

* Το Ερευνητικό Έργο με Αρ. Πρωτοκόλλου ΑΝΘΡΩΠΙΣΤΙΚΕΣ/ΟΙΚΟΝ/0311(ΒΙΕ)/03 συγχρηματοδοτείται από την Κυπριακή Δημοκρατία και το Ευρωπαϊκό Ταμείο Περιφερειακής Ανάπτυξης της ΕΕ.

1. Introduction

The construction of forecasts for GDP growth for the present and the short-run constitutes an essential task for Central Banks and other public organisations, since the official GDP data are published with a considerable delay. Thus, policy decisions, which rely on assessments of current and future economic conditions, render the publication of timely information regarding the state of the economy a vital tool. To this end, methods which employ datasets with a large number of predictors –mainly leading indicators– have been developed in the literature. Such methods exploit both the time series dimension and the cross-sectional aspect of the dataset.

There is evidence that the application of techniques of summarising information in large sets of predictors, such as forecast combinations or common factors, lead to substantial improvements upon univariate autoregressive benchmarks in terms of forecasting performance (e.g. Artis et al. 2005 for the UK; Giannone et al. 2008 and Stock and Watson 2002 for the US; Stock and Watson 2004 for OECD countries). An investigation of a large number of alternative predictors as well as alternative methods for forecasting Cyprus GDP growth can be found in Andreou et al. (2010).

Time series models that are traditionally used for forecasting, such as VAR models, can only handle a small number of variables. This limitation of traditional time series models can be tackled with the application of forecast combination methods and factor models. Forecast combinations methods combine information across forecasts computed from different models. There is a large and growing literature which suggests that forecast combinations can provide more accurate forecasts by using evidence from all the models considered rather than relying on a specific model. Areas of applications include, among others, output growth (Stock and Watson 2004) and inflation (Stock and Watson 2008). One justification for using forecast combinations methods is the fact that in many cases we view models as approximations because of the model uncertainty that forecasters face due to the different set of predictors, the various lag structures, and generally the different modelling approaches. Furthermore, forecast combinations can deal with model instability and structural breaks under certain conditions (e.g. Hendry and Clements 2004; Stock and Watson 2004).

Output and its demand components are traditionally forecasted in the context of macroeconometric models. For example Fair and Shiller (1990) compare forecasts from a structural model and alternative VAR models as well as from simple dynamic models for output components leading to bottom-up forecasts. They conclude that models for the components of output can contain useful information for forecasting growth. More recent works have exploited datasets with a large number of macroeconomic and financial indicators for forecasting using factor models and/or forecast combinations. Angelini et al.

(2008) use a dynamic factor model that can handle unbalanced time series to construct monthly estimates and quarterly forecasts for GDP as well as for its demand and value added components for the euro area. Their framework deals also with temporal aggregation constraints, from monthly to quarterly figures, and the national accounts identity. Drechsel and Scheufele (2013) use leading indicator models (MIDAS and ADL) and forecast combinations to compare the accuracy of direct GDP forecasts with those obtained by aggregating forecasts of demand and supply side components. Their application for Germany provides evidence in favour of the computation of direct GDP forecasts for purposes of short-term forecasting. Moreover, they find that forecasts based on the supply-side disaggregation outperform those obtained through demand components. Hahn and Skudelny (2008) apply linear dynamic models (bridge equations) and also consider forecast combinations to forecast real GDP growth for the euro area through projections of the value added components of GDP.

This paper follows an approach similar to Drechsel and Scheufele (2013) in that it uses different single equation dynamic models for GDP and its components (in growth rates) for the computation of forecasts from these models. The application of different methods for constructing combinations of forecasts obtained from single equations models is investigated. Moreover, similarly to Hahn and Skudelny (2008) and Angelini et al. (2011), this paper estimates bridge equations that link quarterly activity measures, with timely available monthly data (e.g. Business and Consumer Survey data). The forecasting performance of the various models and methods is evaluated by comparing the Root Mean Square Forecast error (RMSFE) from the different models with the RMSFE of a benchmark model. Conclusions on the usefulness of different predictors and combination methods are drawn.

Because of the importance of Business and Consumer Survey (BCS) indicators in providing timely insights about the current and future state of the economy, special attention is given to their properties in forecasting GDP, private consumption, investment, imports and exports. Survey data are found to be informative for forecasting GDP growth (e.g. Batchelor and Dua 1998, Claveria et al. 2007) and demand components of GDP such as private consumption growth (e.g. Nahuis and Jansen 2004). Although BCS data for Cyprus are available since May 2001, a number of key confidence indicators (Economic Sentiment Indicator, Consumer Confidence Indicator and Services, Retail Trade, Construction and Manufacturing Confidence Indicators) were extrapolated back to 1995 in order to be included in the database. However, as there are many indicators from BCS (e.g. firms' employment expectations, firms' production/turnover perceptions, consumers' intentions of making major purchase, etc.) that could be useful for forecasting GDP and its demand components, an extended dataset that includes a large number of variables from Cyprus BCS is also used in the forecasting exercise. The extended dataset covers the period 2001Q1-2013Q2. The use of this dataset allows one to assess the usefulness of BCS indicators for forecasting growth in the short run.

In section 2 a description of the dynamic models for forecasting GDP, private consumption, public consumption, gross fixed capital formation, exports and imports is given. Section 2 also discusses the construction of forecast combinations. Section 3 presents the results of the forecast evaluation exercise based on the two alternative sample periods namely 1995Q1-2013Q2 and 2001Q1-2013Q2 to assess the information content of Cyprus BCS data. Section 4 compares the performance of direct GDP growth forecasts with those obtained by aggregating forecasts for the demand components. Section 5 presents the method of bridge equations used for constructing forecasts for the current quarter by utilising monthly information, prior to the release of the National Accounts; such forecasts, also known as nowcasts, can be updated every month with the arrival of new monthly data. Section 6 concludes.

2. Single equation models and forecast combinations

2.1 Single equation models

The single equation dynamic models for the growth rate of GDP or its demand components consist of the following:

- univariate models such as the random walk (RW), autoregressive (AR), moving average (MA) and autoregressive moving average (ARMA) models;
- bivariate models of the form of autoregressive distributed lag (ADL) models, which include lags of alternative indicators in addition to the lagged values of the dependent variable.

Thus the ADL model allows one to assess the forecasting gains that result from different predictors vis-à-vis the univariate models that control only for the history of the variable of interest. The predictors that are included in the ADL cover many aspects of the economy from financial markets and economic confidence to labour markets and fiscal data.

The variable to be forecasted is defined as $y_t = \ln Z_t - \ln Z_{t-1}$ where Z_t is the level of GDP, or the level of any of the GDP demand components, i.e. private consumption, government consumption, gross fixed capital formation, exports or imports.[1] The candidate predictors are denoted by x_t (appropriately transformed to achieve stationarity). In the forecasting models the variable of interest is expressed at annual rate and as a function of the forecasting horizon, h. Specifically, $y_{t+h}^h = (400/h)(\ln Z_{t+h} - \ln Z_t)$ for $h = 1,2,3,4$ which denotes the annualised growth rate of GDP (or any of its demand components) over the next h quarters. The h-step ahead regression model used for computing the forecasts for $h = 1,2,3,4$ is given by

[1] In the analysis that follows we consider modelling and forecasting separately (i) gross capital formation (i.e. fixed investment plus changes in inventories), (ii) gross fixed capital formation (i.e. fixed investment) and (iii) changes in inventories.

$$y_{t+h}^{h} = \alpha + \sum_{i=0}^{p} \beta_i x_{t-i} + \sum_{i=0}^{q} \gamma_i y_{t-i} + e_{t+h}^{h} \quad (1)$$

where e_{t+h}^{h} is the error term.

For $\beta_i = 0$ and $\gamma_i = 0$ equation (1) reduces to the RW model for Z_t (i.e. GDP or its demand components) which is a constant growth model. For $\beta_i = 0$ equation (1) gives the AR model of order q.

The estimation of the parameters and the selection of the number of lags (p, q) in (1) is carried out in a pseudo out-of-sample setup using recursive OLS and recursive determination of the lag length based on the Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC). The Information Criterion for an AR or ADL model with l coefficients including the constant term is given by

$$IC(l) = \ln \frac{SSR(l)}{T} + (l) \frac{I}{T} \quad (2)$$

where $SSR(l)$ is the sum of squared residuals from the model estimated using T observations. For $I = 2$ and $I = \ln T$ equation (2) corresponds to AIC and BIC respectively. Each model is estimated for alternative values of l then AIC and BIC are computed and the models that correspond to the smallest values of AIC and BIC are chosen. Although the sum of squared residuals decreases with the inclusion of extra lags, both criteria penalise models for each additional lag (second term of equation (2)). BIC penalises models with additional lags more than the AIC and as a result the latter can overestimate the lag length. In the analysis that follows both criteria are used and the resulting models (usually, each with a different lag structure) are treated as two alternatives.

The extensive dataset employed contains a large number of candidate predictors that are published on a monthly basis and well before the publication of the National Accounts data. These monthly values, known as monthly leads, can be used in the estimation and forecasting as they provide more timely information than the quarterly series. Monthly leads cover the first, second and in some cases even the third month and therefore the whole quarter following the reference quarter of the most recent National Accounts data. In order to utilise the information in the monthly or quarterly leads relating to the x_t series we extend the ADL model as follows

$$y_{t+h}^{h} = \alpha + \sum_{i=0}^{p} \beta_i x_{t-i} + \sum_{i=0}^{q} \gamma_i y_{t-i} + \delta_1 x_{t+1}^{M1} + \delta_2 x_{t+1}^{M2} + e_{t+h}^{h} \quad (3a)$$

$$y_{t+h}^{h} = \alpha + \sum_{i=0}^{p} \beta_i x_{t-i} + \sum_{i=0}^{q} \gamma_i y_{t-i} + \delta_1 x_{t+1} + e_{t+h}^{h} \quad (3b)$$

where in (3a) x_{t+1}^{M1} and x_{t+1}^{M2} are the monthly values of variable x_t covering the first and second month respectively of period/quarter $t + 1$ (the sample ends at time t); in (3b) x_{t+1}

denotes the quarterly value of variable x_t for the reference period/quarter $t+1$.[2] The models in (3a) and (3b) are ADL models with monthly and quarterly leads and constitute a special case of the mixed data sampling regression (MIDAS-ADL) in Andreou et al. (2013) that includes mixed frequencies in the lags of the predictors.

For comparison purposes we also estimate simple univariate models such as the random walk for GDP (and its demand components) and the autoregressive model (AR) of various orders e.g. one, four, or the order chosen by AIC and BIC. Moreover, the class of univariate models includes Moving Average (MA) and Autoregressive Moving Average processes (ARMA).

The forecast constructed at date t for period $t+h$ is computed using data up to date t, thus no additional projections for predictors are required; this type of forecast is known as 'direct' forecast (see e.g. Stock and Watson 2004, 2008). The choice of the number of lags for predictor x_t is between one and three and for the dependent variable y_t between zero and three.

The computation of 'direct' forecasts as opposed to iterated is more pertinent to our case. The use of an extensive dataset would require forecasts for all the predictors (regressors) if the 'iterated' forecasts were to be computed. Many of the predictors are quite difficult to forecast thus by computing 'direct' forecasts we avoid introducing unreliable forecasts for regressors in the construction of the forecast of interest. The use of 'direct' forecasts is found to be robust to a number of misspecifications (e.g. Chevillon and Hendry 2005).

The models are estimated using the first T_0 observations of the sample and the first pseudo out-of-sample forecast is computed in period $t = T_0 + h$. The recursive procedure requires increasing the sample size by one observation, re-estimating the models and computing the forecast in period $t = T_0 + h + 1$. The procedure is repeated up to the end of the sample period, T, so that the pseudo out-of-sample forecast computed in period $t = T - h$ refers to period T which is the last date for which we have observed data. The h-quarter ahead forecast for y_{t+h}^h computed in period t is given by $\hat{y}_{t+h|t}^h$. Then the Mean Squared Forecast Error (MSFE) used for evaluating the forecasting performance of each model at horizon h is given by

[2] The set of variables for which monthly leads are used includes registered unemployed, unemployment, registration of motor vehicles, tourist arrivals, interest rates, loans, deposits, consumer price indices, etc. Quarterly variables that are observed with leads with respect to quarterly National Accounts data include e.g. business and consumer survey series, stock market indicators, exchange rates, international commodity prices. The data availability in terms of monthly and quarterly leads is based on the following schedule for computing forecasts: early in the quarter t (e.g. during the first ten days of the quarter) forecasts for the growth rate of GDP and its demand components are computed; these forecasts are based on quarterly National Accounts data and other quarterly series up to quarter $t-2$, monthly leads up to the first and second month within quarter $t-1$ and quarterly leads up to quarter $t-1$.

$$MSFE = \frac{1}{(T-h)-(T_0+h)+1}\sum_{t=T_{0+h}}^{T-h}(y_{t+h}^{h} - \hat{y}_{t+h|t}^{h})^2 \quad (4)$$

where T here denotes the number of observations in the sample.

The large number of alternative predictors in the dataset, allows us to estimate a large number of ADL models and to obtain numerous alternative forecasts for the variables of interest. This large number of forecasts can be further exploited by constructing combinations of forecasts.

2.2 Intercept corrections

During the sample period employed in our analysis a number of structural breaks (regime shifts) affected the Cypriot economy e.g. the accession to the European Union, the adoption of the euro, the international financial crisis, the Greek sovereign debt crisis, the economic crisis in Cyprus (inability of the government to borrow from international financial markets, banking crisis) and the economic adjustment programme agreement. Thus events in the economy that are also accompanied by policy changes (fiscal, monetary, institutional, etc.) could alter the relationship among macroeconomic variables. The assumption that the parameters of the models used for forecasting are constant over time, and therefore macroeconomic relationships are unchanged by structural breaks or regime shifts in the economy, leads to predictive failure (Clements and Hendry 1996). A technique used by organisations and institutes that produce forecasts is "intercept correction", namely the adjustment to forecasts that were directly obtained from econometric models. More specifically, according to Hendry (1997, p.1345) "*Intercept corrections (ICs) are non-zero values for a model's error terms added over a forecast period to adjust a model-generated forecast to prior beliefs, allow for anticipated future events that are not incorporated in a model, or 'fix-up' a model for perceived mis-specification over the past [.]*".

The simplest form of intercept correction as a response to suspected structural breaks (one-off change in the deterministic (intercept) term of the model) is the addition of forecast error from the previous period to the model-based forecast thus the 'intercept corrected' forecast $\tilde{y}_{t+h|t}^{h}$ is constructed as

$$\tilde{y}_{t+h|t}^{h} = \hat{y}_{t+h|t}^{h} + \hat{e}_t, \quad h \geq 1 \quad (5)$$

where $\hat{e}_t = y_t - \hat{y}_{t|t-h}^{h}$ and $\hat{y}_{t+h|t}^{h}$, $\hat{y}_{t|t-h}^{h}$ denote model-based forecasts.

Clements and Hendry (1996) present alternative forms of intercept corrections:

- The adjustment to the model-based forecast can be constant over the forecasting period and equal to the forecast error in period t;

- The adjustment to the model-based forecast can be constant over the forecasting period and equal to the average of the forecast errors over a number of periods i.e. t, $t-1, \ldots t-n$;

- The adjustment to the model-based forecast can taper off as the forecasting horizon increases i.e. intercept correction is larger (smaller) for forecasts about the nearer (further) future:

$$\tilde{y}_{t+h|t}^{h} = \hat{y}_{t+h|t}^{h} + \alpha^{h-1}\hat{e}_t, \quad h \geq 1, \quad 0 < \alpha < 1. \tag{6}$$

Clements and Hendry (1996) derive expressions for the forecast biases for different adjustment schemes in vector error correction models and show that when there is a break in the constant term before the forecast origin, intercept corrections can reduce the forecast bias. Furthermore, Clements and Hendry (1996, 1998) demonstrate that in the absence of breaks, intercept corrections do not cause biases in the forecasts; however, they show that intercept corrections lead to a larger forecast error variance. Clements and Hendry (1996) find evidence of improved forecasting ability (reduced forecast bias) following the use of intercept corrections when the long-run relationships in their vector error correction model were subject to change over the forecasting horizon; nevertheless the reduction in the biases is accompanied by larger forecast error variances. Banerjee et al. (2005) used data on five countries that joined the European Union in 2004 to evaluate alternative forecasting techniques including intercept correction, for key macroeconomic variables. They find that intercept corrections applied to forecasts from simple AR or factor-based models can improve upon those from the simple AR benchmark.

The use of forecast combinations described in the next section can also deal with model instabilities and breaks (e.g. Stock and Watson 2004).

2.3 Forecast combinations

There is a large and growing literature that suggests that forecast combinations can provide more accurate forecasts by using evidence from all the models considered rather than relying on a specific model (e.g. Stock and Watson 2004, 2008). Forecast combinations reduce uncertainty resulting from the specification of individual models due to different set of predictors, lag structures and modelling approaches. Although there is a consensus that forecast combinations improve forecast accuracy there is no consensus on how the forecast weights can be formed. Given M models and associated forecasts, combination forecasts are weighted averages of individual forecasts where the weights can be fixed or time-varying:

$$\hat{F}_{t+h|t}^{h} = \sum_{i=1}^{M} w_{i,t}\, \hat{y}_{i,t+h|t}^{h} \tag{7}$$

where $\hat{y}_{i,t+h|t}^{h}$ is the $h-$step ahead forecast from model i made at time t and $w_{i,t}$ is the weight assigned to that forecast. In general the weight $w_{i,t}$ depends on the historical forecasting performance of model i, however $w_{i,t}$ can be fixed leading to simple forecast combinations such as the mean ($w_{i,t} = 1/M$), the median or some type of a trimmed mean. In cases where $w_{i,t}$ depends on model's past forecasting performance the resulting combination forecasts are known as discounted MSFE forecasts (Stock and Watson 2004). In particular, the weights can be inversely proportional to the discounted MSFE (or the square of the discounted MSFE) of the individual models, i.e.

$$w_{i,t} = \frac{v_{i,t}}{\sum_{j=1}^{M} v_{j,t}}, \text{ or,} \tag{8}$$

$$w_{i,t} = \frac{(v_{i,t})^2}{\sum_{j=1}^{M} (v_{j,t})^2} \tag{9}$$

where $v_{i,t} = [\sum_{s=T_{0+h}}^{t-h} \delta^{t-h-s} (y_{s+h}^{h} - \hat{y}_{i,s+h|s}^{h})^2]^{-1}$;

δ is the discount factor so that forecast errors made in the distant past are of smaller importance. Thus larger weights are assigned to forecasts from models with lower MSFE (i.e. better historical forecasting performance). Another forecast combination based on past historical performance is the 'recent best' where the forecast from the model with the lowest MFSE, on average, over the last n periods is used.

3. Forecasting performance

3.1 The setup

The dataset used in the estimations and forecasting exercises covers the period 1995Q1-2013Q2. The dataset contains about 200 variables that represent many aspects of the economy including domestic and foreign output (national accounts and monthly indicators such as volume indices of sectors of the economy, tourist arrivals, cement sales, building permits, etc.); labour market (employment, unemployment, vacancies); domestic and international price indices and international commodity prices; exchange rates; domestic and foreign interest rates, stock market indicators and economic sentiment indicators; fiscal data (government expenditure, revenue and deficit) and banking sector series (loans, deposits, reserves).[3]

We evaluate the forecasting performance of alternative combinations constructed from forecasts estimated by the single equation models discussed in the previous section. The single equation models (univariate and ADL) are employed for the estimation of GDP growth and the growth rates of private consumption, government consumption, investment, exports and imports. The extensive dataset of domestic and foreign predictors is used for the

[3] A detailed list of the variables (along with their transformations) used in estimations is available upon request.

estimation of a large number of ADL models. However, it is found in the literature that the forecasting performance of models based on individual predictors is not stable over time or across countries (e.g. Stock and Watson 2003, 2004); thus we consider alternative forecast combinations of the forecasts based on individual predictors.[4]

We employ datasets for the following periods:

(a) 1995Q1-2013Q2 that does not include BCS data for Cyprus as they are available from 2001 onwards;

(b) 2001Q1-2013Q2 that includes all variables in (a) plus BCS data for Cyprus[5];

(c) 2001Q1-2013Q2 that includes all variables in (a).

We therefore investigate whether using a dataset with shorter time series but with additional predictors, namely BCS series for Cyprus could lead to an improved forecasting performance. The forecasting horizon is four quarters and the pseudo out of sample period is common for the datasets (a) – (c) considered:

2008Q1-2013Q1 for $h = 1$

2008Q3-2012Q4 for $h = 2$

2009Q1-2012Q3 for $h = 3$

2009Q3-2012Q2 for $h = 4$.

Tables A1-A2 present the results of the forecasting exercise using univariate models and two sample periods, i.e. a long sample spanning from 1995Q1 to 2013Q2 and a short sample over the period 2001Q1 to 2013Q2. The univariate models used to compute the forecasts included in the combinations are: the random walk, AR(1), AR(4), AR and ARMA models with lag lengths determined using information criteria (AIC, BIC), and simple MA models of order 1. Tables A3-A5 present the results of the forecasting competition for ADL models estimated using the datasets (a) – (c). The forecasting exercise is conducted for alternative forecast combination methods over a horizon for up to four quarters. Moreover, in all cases (ADL and univariate models), the forecasting performance is evaluated for different values of the intercept correction discount factor, represented by parameter α in equation (6). The values of the discount factor considered range from $\alpha = 0$ (i.e. no intercept correction is applied to the forecasts obtained from the single equation models) to $\alpha = 1$ (i.e.

[4] The results concerning individual models are available in electronic form upon request.
[5] BCS data for Cyprus begin 2001Q2 thus 2001Q1 data were extrapolated.

model-based forecasts are adjusted by the full amount of the previous period's forecast error).[6] Regarding forecast combination methods we consider the following:

(a) simple methods namely the median, mean and trimmed mean, i.e. the mean after discarding the highest and lowest 5% of the distribution of individual forecasts;

(b) methods based on models' past forecasting performance and in particular on discounted MSFE and squared MSFE with weights given by equation (8) and (9) respectively, with discount factors $\delta = 0.9, 0.95, 1$;

(c) the forecast from the model with the best performance during the previous four quarters (smallest average MSFE over the previous four periods), henceforth 'recent best'.

Tables A1-A5 present the square root MSFE (RMSFE) of the different forecast combinations of purely model-based forecasts or 'intercept corrected' forecasts relative to the random walk benchmark. A random walk benchmark for each variable of interest (GDP, private consumption, etc.) was estimated using data from 2001Q1 onwards.

3.2 Results

3.2.1 Growth rate of GDP

Forecasting gains can be enhanced when intercept corrections are applied to the forecasts from the univariate models, with correction factors varying from 0.7 to 1 depending on the horizon. Using the longer sample (starting in 1995Q1) the simple AR(1) with intercept correction of about 0.7 outperforms not only forecast combinations of univariate models (Table A1) but also combinations of ADL models (Table A2) for short horizons of one and two quarters ahead. For horizons of three and four quarters, combining intercept corrected forecasts (correction factor of about 1) from the univariate models improves forecast accuracy compared to simple models such as the random walk, AR(1) or AR(4). However, combinations of univariate models are associated with slightly inferior performance compared to combinations of ADL models for horizons of three and four quarters. Thus, for longer horizons additional information from other predictors (mainly leading indicators) seem to result in some forecast gains against the univariate models.

In the case where the smaller sample size (2001Q1 onwards) is used, intercept corrections improve the forecasting performance of univariate forecast combinations; the application of intercept corrections does not enhance the forecasting accuracy of the AR(1) and AR(2) for one quarter ahead forecasts (Table A2). Moreover, combinations of forecasts from univariate models outperform simple AR(1) and AR(4) models for horizons beyond the first quarter but

[6] For $h = 1$ and $\alpha > 0$ the adjustment equals the full forecast error of the previous period regardless of the value of the adjustment factor ($\alpha^{h-1} = \alpha^0 = 1$).

underperform combinations from ADL models (Table A4) in forecasting two or more quarters ahead.

Looking at the results from ADL models, the use of the dataset with the longer time series necessitates the application of intercept corrections since the resulting relative RMSFEs are lower compared to those where no correction is applied to the forecasts. For horizons of three and four quarters, the application of intercept correction of the full amount of previous period's error ($\alpha = 1$) leads to the largest forecast gains regardless of the combination method. For two quarters ahead an intercept correction factor that discounts previous period's error by 0.3-0.5 yields the highest gains.

Using the dataset with the shorter time series with or without the BCS variables results in the lowest relative RMSFE for $h = 1$ when no intercept correction is used. For $h = 2$ a correction between 0.5 and 0.7 leads to more accurate forecasts; for $h = 3,4$ the lowest RMSFE relative to the random walk is achieved by applying the full intercept correction. The inclusion of the BCS data does not result in any noticeable improvement in the forecasting performance.

Regardless of the dataset used the results of the forecast evaluation exercise for GDP growth show that forecast combination methods that involve the discounted or squared discounted MSFE generate the highest gains. The recent best method is also associated with quite low relative RMSFE in some cases, but its performance is more unstable than that of discounted MSFE methods over the different horizons.

3.2.2 Growth rate of private consumption

In forecasting private consumption growth the use of intercept corrected univariate forecasts leads to improved performance of the forecast combinations for all horizons and for horizons after the first quarter when the long and short sample is used respectively (Table A1 and A2). For one quarter ahead forecasts, combinations of forecasts from univariate models can generate at least as accurate forecasts for private consumption growth as the combinations from ADL models. As the horizon increases larger gains can be achieved by considering forecasts from ADL models, especially if the longer sample is used.

Private consumption is the largest component of GDP hence the outcomes of the forecasting exercise are very similar to those for GDP in the case of ADL models. When the longer time series are employed the forecasting performance of all combination methods is enhanced if the model-based forecasts are intercept corrected. In particular, for $h = 2$, $h = 3$ and $h = 4$ with correction factors of 0.9, 1 and 1, respectively, we obtain the smallest RMSFE relative to the random walk. Examining the results from the shorter time period (2001 onwards), we find that intercept corrections do not lower the relative RMSFE for one quarter ahead forecasts. They do, however, improve the accuracy of the forecasts for horizons of two to four quarters. The presence of BCS predictors seems to affect the magnitude of the breaks

and, therefore the intercept correction factor, marginally. In the absence of BCS data the lowest relative RMSFE are obtained for correction factors of 0.7, 0.9 and 0.9-1 for $h = 2$, $h = 3$ and $h = 4$ respectively. When BCS data are included in the dataset, the correction factors associated with the lowest relative RMSFE are 0.7 or 1 for $h = 2$, 1 and 0.9 for $h = 3$ and $h = 4$ respectively. Overall the use of BCS data seems to lead to better forecasts only for $h = 4$ (lowest relative RMSFE).

In terms of the combination methods, forecasts based on the squared discounted MSFE are the best performers for all the datasets used although only marginally superior to the results obtained from simple combinations.

3.2.3 Growth rate of government consumption

The growth rate of the consumption of the general government is more difficult to predict despite the use of a large number of predictors as they convey little information about the future developments in public consumption. For one quarter ahead forecasts, the dataset with the BCS variables yields only scant forecasting gains of about 5% when no intercept correction is applied; in all other cases (datasets or intercept correction factors) no gains are achieved. For two quarter ahead forecasts the relative RMSFE is minimised when no intercept correction is applied and the gains range from about 9% (longer time series) to 16% (shorter time series with BCS predictors). No forecast combination method could beat the random walk in the case of three-quarter ahead forecasts. The application of an intercept correction with factor of 0.9, in the absence of any BCS predictors, leads to much more accurate forecasts than the use of the random walk for $h = 4$. The use of the dataset that includes BCS series results in slightly smaller gains that the application of the other two datasets. Simple combination methods and those using the discounted MSFE work equally well.

Forecast combinations from univariate models are found to be more useful in forecasting government consumption growth as opposed to combinations from ADL models since the former are associated with smaller forecast error relative to the benchmark. Focusing on the shorter sample can marginally enhance the performance of forecast combinations from univariate models.

3.2.4 Growth rate of investment

In the case of fixed investment growth, intercept corrections applied to forecasts from univariate models lead to higher gains. When the longer sample is used, AR(4) outperforms forecast combinations in one and four quarter ahead forecasting; when the shorter sample is used, AR(4) yields larger gains than the forecast combinations for horizons of three and four quarters. Nevertheless, the forecast accuracy of forecast combinations based on univariate models is somewhat inferior than that from ADL-based forecast combinations.

Looking at the results for the growth rate of gross capital formation (i.e. fixed investment plus changes in inventories), intercept corrections lower the relative RMSFE. Although forecast combinations from univariate models are associated with higher relative RMSFE than those from ADL models, forecasts from an AR(4) model with intercept correction (of 0.7-1) estimated from the longer sample outperform all combination forecasts.

Separate results for the component “changes in inventories” are shown in Table A6. Due to the extremely volatile nature of inventory changes from quarter to quarter, we concentrate on univariate models only. The application of the longer sample yields lower forecast errors compared to the use of the shorter sample. More specifically, the random walk and discounted MSFE combinations of forecasts from univariate models estimated using the longer sample outperform all other alternatives. Intercept corrections do not seem to improve the forecasting performance. Furthermore, the use of an “inventory” series, constructed from Business Surveys, in ADL models does not lead to more accurate forecasts compared to those from the simple random walk.

We also investigate the forecasting performance of ADL models for the growth rate of both fixed investment (i.e. investment that excludes inventory changes) and gross capital formation (i.e. investment that includes inventories). Inventory changes are very volatile from quarter to quarter rendering the gross capital formation series volatile and hence more difficult to forecast than fixed investment. This is also reflected in the relative RMSFE of the two series, with the relative RMSFEs for fixed investment being much lower than those for gross capital formation.

One quarter ahead forecasts for both fixed investment and gross capital formation constructed from the dataset starting in 1995, are more accurate when intercept corrections are used. The opposite holds when the datasets with or without the BCS data beginning in 2001 are employed in the forecasting exercise. For the remaining horizons the performance of all forecast combinations for both fixed investment and gross capital formation is clearly improved when model-based forecasts are corrected by the full forecast error from the previous period.

The use of shorter time series yields higher forecasting gains for fixed investment in all horizons and for gross capital formation for four quarters ahead. In forecasting gross capital formation the use of the longer time series results in the smallest relative RMSFE for horizons of one, two and three quarters. The inclusion of BCS predictors does not appear to considerably improve the forecasting accuracy of either fixed investment or gross capital formation. With the exception of forecast combinations based on the median forecast and recent best model, forecast gains from other combination methods are very similar.

3.2.5 Growth rate of exports and imports

Based on the longer sample we observe no considerable gains over the random walk in forecasting export growth when forecast combinations of univariate models are used; similar results were obtained in the case of forecast combinations from ADL models. Improvements from the application of univariate forecast combinations over the random walk are also limited in the case of the shorter sample.

Combinations of intercept corrected forecasts from univariate models for the growth rate of imports yield some gains over the random walk and in most instances over the AR(1) and AR(4) models for horizons of two, three and four quarters ahead. However, there are cases that information from other predictors appears to be useful in forecasting the growth rate of imports as combinations from ADL (intercept corrected) forecasts outperform univariate forecasts or forecast combinations. Such cases are combination forecasts from ADL models one quarter ahead, estimated using the longer sample as well as combination forecasts from ADL models (intercept correction factor of 0.9) three and four quarters ahead, estimated using the shorter sample that includes BCS series.

Combinations of export growth forecasts constructed from the dataset with longer time series improve to a very limited degree the random walk forecasts for horizons of two and three quarters. The use of BCS predictors increases forecast gains with respect to random walk for horizons two to four quarters. However, the information included in the forecast combinations is not adequate to beat the simple random walk in forecasting export growth one quarter ahead.

For imports, forecast combinations yield forecast gains for longer horizons ($h = 3,4$) while for horizons of one and two quarters only limited gains can be achieved. In particular, the dataset beginning in 1995 and the application of intercept correction (0.3 - 0.7) lead to the lowest relative RMSFE for $h = 1$ and $h = 2$ (squared discounted MSFE and recent best combinations). The use of the dataset beginning in 2001 with BCS predictors results in the highest gains for $h = 3$ and $h = 4$ when the model-based forecasts are intercept corrected by a factor of 0.9; discounted MSFE and recent best combinations appear to be associated with the most accurate forecasts.

3.2.6 Predictors relating to real economy

In Tables A3-A5 we considered combinations of forecasts from all models i.e. covering a wide range of predictors. In Table A7 and A8 we focus on combinations of forecasts from ADL models with predictors pertaining to the real economy only. Again we consider two datasets: one starting from 1995 onwards (Table A7) and another beginning from 2001 (Table A8). Overall, combining forecasts covering all the aspects of the economy (as in Tables A3-A5) leads to enhanced forecasting performance. However, there are some exceptions. Forecasting private consumption one quarter ahead can result in more accurate

forecasts when the combinations are constructed from forecasts (no intercept correction) based on predictors relating to the real economy and the shorter time series (dataset 2001 onwards). Further gains, compared to forecast combinations from all models, can be achieved in forecasting government consumption four quarters ahead through the use of forecast combinations based on real economy predictors (and intercept correction factor equal to 1). A slight improvement in the forecast accuracy is found for one quarter ahead forecasts for fixed investment and exports when forecast combinations of real economy predictors are used (dataset 2001 onwards, no intercept correction).

4. Direct vs. bottom-up forecasts

In the previous sections we analysed the construction of forecasts and their performance for GDP and its demand components without discussing (i) how the forecasts for the demand components can be aggregated to produce a GDP forecast, and (ii) how GDP forecasts can be disaggregated into forecasts for the demand components. Thus, we can compute (i) an alternative GDP forecast by utilising the forecasts for the demand components, and (ii) alternative demand component forecasts by exploiting the forecast estimated directly for GDP. The accuracy of these alternative GDP and demand component forecasts can be evaluated and subsequently the set of forecasts that are internally consistent (i.e. demand component forecasts that add up to the GDP forecast) and are associated with the best forecasting performance can be found.

4.1 Forecasting performance

As discussed in the previous section we construct forecasts for the growth rates of all the demand components of output. The forecasts for the growth rates can be transformed into forecasts for the level of each component, using the last observed value from the data. The level of the GDP forecast is computed as

$$Y_{t+h} = C_{t+h} + G_{t+h} + I_{t+h} + X_{t+h} - M_{t+h} \quad (10)$$

where Y_{t+h} is GDP and the terms on the right hand side are private consumption (C_{t+h}), government consumption (G_{t+h}), investment (I_{t+h}), exports (X_{t+h}), and imports (M_{t+h}), all forecasted at horizon h (here $h = 1,2,3,4$). Investment (I_{t+h}) can be forecasted by predicting the growth rate of gross capital formation and then calculating the level of the variable (KF_{t+h}). The level of GDP is then given by

$$Y_{t+h} = C_{t+h} + G_{t+h} + KF_{t+h} + X_{t+h} - M_{t+h}. \quad (11a)$$

Table 1: Direct vs. bottom-up forecasts for GDP growth

Intercept correction	**0.0**				**0.3**				**0.5**				**0.7**				**0.9**				**1.0**			
Horizon	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**
RMSFE Random walk	1.04	1.98	2.90	3.81	1.04	1.98	2.90	3.81	1.04	1.98	2.90	3.81	1.04	1.98	2.90	3.81	1.04	1.98	2.90	3.81	1.04	1.98	2.90	3.81
	Direct approach																							
Median	0.75	0.75	0.79	0.88	0.64	0.68	0.76	0.87	0.64	0.66	0.72	0.83	0.64	0.67	0.68	0.76	0.64	0.70	0.69	0.71	0.64	0.73	0.72	0.74
Mean	0.72	0.73	0.77	0.86	0.65	0.66	0.74	0.85	0.65	0.64	0.70	0.81	0.65	0.65	0.66	0.74	0.65	0.68	0.67	0.67	0.65	0.71	0.70	0.69
Trimmed mean (5% trimming)	0.73	0.73	0.78	0.87	0.65	0.66	0.75	0.86	0.65	0.64	0.71	0.82	0.65	0.65	0.67	0.74	0.65	0.69	0.67	0.68	0.65	0.71	0.71	0.70
Discounted MSFE (0.90)	0.71	0.71	0.76	0.86	0.65	0.64	0.73	0.85	0.65	0.62	0.69	0.81	0.65	0.63	0.65	0.73	0.65	0.66	0.65	0.66	0.65	0.68	0.67	0.66
Discounted MSFE (0.95)	0.72	0.71	0.76	0.86	0.65	0.64	0.73	0.85	0.65	0.62	0.69	0.81	0.65	0.63	0.65	0.73	0.65	0.66	0.65	0.66	0.65	0.69	0.68	0.67
Discounted MSFE (1.00)	0.72	0.71	0.76	0.86	0.65	0.64	0.74	0.85	0.65	0.63	0.69	0.81	0.65	0.63	0.65	0.73	0.65	0.67	0.65	0.66	0.65	0.69	0.68	0.67
Squared discounted MSFE (0.90)	0.70	0.69	0.75	0.86	0.65	0.62	0.73	0.85	0.65	0.60	0.68	0.81	0.65	0.61	0.64	0.73	0.65	0.64	0.63	0.63	0.65	0.66	0.65	0.62
Squared discounted MSFE (0.95)	0.70	0.69	0.75	0.86	0.65	0.62	0.73	0.85	0.65	0.60	0.68	0.81	0.65	0.61	0.64	0.73	0.65	0.64	0.63	0.63	0.65	0.66	0.65	0.62
Squared discounted MSFE (1.00)	0.72	0.69	0.76	0.87	0.66	0.63	0.73	0.85	0.66	0.61	0.69	0.81	0.66	0.62	0.64	0.73	0.66	0.65	0.64	0.64	0.66	0.68	0.67	0.64
Recent best (past four quarters)	0.63	0.62	0.61	0.82	0.67	0.67	0.53	0.82	0.67	0.69	0.56	0.79	0.67	0.62	0.60	0.76	0.67	0.66	0.54	0.66	0.67	0.66	0.52	0.62
	Bottom-up approach																							
Based on equation (11a)																								
Median	1.55	1.17	1.23	1.16	1.44	0.99	1.18	1.14	1.44	0.92	1.09	1.10	1.44	0.91	0.99	1.01	1.44	0.96	0.95	0.94	1.44	1.01	0.99	0.96
Mean	1.54	1.17	1.22	1.16	1.44	0.99	1.16	1.14	1.44	0.92	1.08	1.10	1.44	0.90	0.98	1.01	1.44	0.95	0.95	0.93	1.44	0.99	0.99	0.94
Trimmed mean (5% trimming)	1.54	1.17	1.22	1.16	1.44	0.99	1.16	1.15	1.44	0.92	1.08	1.10	1.44	0.90	0.98	1.01	1.44	0.94	0.95	0.93	1.44	0.99	0.98	0.94
Discounted MSFE (0.90)	1.53	1.13	1.21	1.16	1.46	0.96	1.16	1.14	1.46	0.90	1.08	1.10	1.46	0.88	0.99	1.01	1.46	0.93	0.94	0.92	1.46	0.98	0.97	0.92
Discounted MSFE (0.95)	1.53	1.13	1.21	1.16	1.46	0.96	1.16	1.14	1.46	0.90	1.08	1.10	1.46	0.88	0.98	1.01	1.46	0.93	0.94	0.92	1.46	0.98	0.97	0.93
Discounted MSFE (1.00)	1.54	1.13	1.21	1.16	1.46	0.96	1.16	1.15	1.46	0.89	1.07	1.10	1.46	0.88	0.98	1.01	1.46	0.93	0.94	0.92	1.46	0.98	0.97	0.93
Squared discounted MSFE (0.90)	1.53	1.09	1.20	1.16	1.49	0.95	1.16	1.15	1.49	0.88	1.08	1.10	1.49	0.87	0.99	1.01	1.49	0.93	0.93	0.91	1.49	0.99	0.96	0.91
Squared discounted MSFE (0.95)	1.53	1.09	1.20	1.16	1.49	0.95	1.16	1.15	1.49	0.88	1.08	1.10	1.49	0.87	0.99	1.01	1.49	0.93	0.93	0.91	1.49	0.99	0.96	0.91
Squared discounted MSFE (1.00)	1.54	1.10	1.21	1.16	1.49	0.94	1.16	1.15	1.49	0.88	1.07	1.10	1.49	0.87	0.97	1.01	1.49	0.92	0.93	0.91	1.49	0.98	0.96	0.92
Recent best (past four quarters)	1.63	1.38	1.16	1.17	1.94	1.37	1.15	1.30	1.94	1.11	1.16	1.08	1.94	1.11	1.15	1.20	1.94	1.24	1.05	1.08	1.94	1.30	0.95	1.07
Based on equation (11b)																								
Median	1.61	1.01	1.00	0.96	1.66	0.91	0.96	0.95	1.66	0.90	0.90	0.92	1.66	0.93	0.83	0.85	1.66	1.00	0.83	0.82	1.66	1.05	0.87	0.86
Mean	1.59	1.01	0.98	0.97	1.64	0.92	0.94	0.96	1.64	0.91	0.88	0.92	1.64	0.94	0.82	0.85	1.64	1.01	0.83	0.79	1.64	1.06	0.87	0.83
Trimmed mean (5% trimming)	1.60	1.01	0.98	0.97	1.65	0.92	0.94	0.96	1.65	0.91	0.88	0.92	1.65	0.94	0.82	0.85	1.65	1.00	0.82	0.80	1.65	1.05	0.87	0.83
Discounted MSFE (0.90)	1.59	1.01	0.99	0.98	1.65	0.92	0.95	0.97	1.65	0.91	0.89	0.93	1.65	0.93	0.83	0.86	1.65	1.00	0.82	0.79	1.65	1.04	0.86	0.82
Discounted MSFE (0.95)	1.59	1.01	0.98	0.98	1.65	0.92	0.95	0.96	1.65	0.91	0.89	0.93	1.65	0.94	0.83	0.85	1.65	1.00	0.82	0.79	1.65	1.05	0.87	0.82
Discounted MSFE (1.00)	1.60	1.02	0.98	0.98	1.65	0.93	0.95	0.96	1.65	0.91	0.89	0.92	1.65	0.94	0.83	0.85	1.65	1.00	0.83	0.79	1.65	1.05	0.87	0.82
Squared discounted MSFE (0.90)	1.59	1.02	0.99	0.99	1.65	0.93	0.95	0.97	1.65	0.91	0.90	0.94	1.65	0.93	0.84	0.86	1.65	1.00	0.82	0.79	1.65	1.04	0.86	0.81
Squared discounted MSFE (0.95)	1.59	1.02	0.99	0.99	1.65	0.93	0.95	0.97	1.65	0.91	0.90	0.94	1.65	0.93	0.84	0.86	1.65	1.00	0.82	0.79	1.65	1.04	0.86	0.81
Squared discounted MSFE (1.00)	1.60	1.02	0.99	0.98	1.65	0.93	0.95	0.97	1.65	0.92	0.89	0.93	1.65	0.94	0.83	0.86	1.65	1.01	0.83	0.79	1.65	1.06	0.87	0.82
Recent best (past four quarters)	2.16	1.26	1.17	1.33	1.96	1.15	1.17	1.31	1.96	1.26	1.18	1.33	1.96	1.15	1.02	1.04	1.96	1.24	1.04	0.90	1.96	1.45	1.14	0.90

Alternatively, one can compute projections for the growth rate of fixed investment and therefore the projected level of the series (FI_{t+h}) and forecasts for inventory changes (CI_{t+h}). The expression for GDP then becomes

$$Y_{t+h} = C_{t+h} + G_{t+h} + FI_{t+h} + CI_{t+h} + X_{t+h} - M_{t+h} \quad (11b)$$

Thus, the forecasted growth rate of Y_{t+h} can be computed and its performance can be compared with the GDP growth forecasts obtained by forecasting the variable directly using single equation models and combination forecasts as in the previous section.

Table 1 shows the RMSFE of direct GDP forecasts and forecasts constructed using the projections of the demand components, i.e. the bottom-up approach via equation (11a) or (11b). More specifically, the second and third panel of Table 1 present the results of the bottom-up approach using (11a) and (11b) respectively.[7] The sample used covers the period 1995Q1-2013Q2 and the RMSFEs shown are relative to that of the random walk model for GDP. As in the previous section, the evaluation is conducted for different values of the intercept correction factor and various forecast combination methods for a horizon of up to four quarters.

The results show that forecasting GDP directly than via the forecasts of its demand components, leads to more accurate forecasts. For example, gains for one-quarter ahead direct forecasts can be as high as 36% compared to those from the random walk benchmark; GDP growth forecasts from the bottom-up approach yield no gains vis-à-vis the benchmark one quarter ahead. As horizon grows, the gap in the forecast accuracy between direct and bottom-up GDP growth forecasts becomes smaller; this is more evident when the bottom-up forecasts are computed using separate forecasts for fixed investment and inventory changes (i.e. equation 11b) rather than a single prediction for gross capital formation. Nevertheless, the direct approach remains superior up to the end of the horizon considered.

4.2 Aggregation

Based on the previous finding that direct GDP forecasts outperform those computed from the demand components of GDP, we investigate alternative ways of constructing demand component forecasts that add up to the direct GDP growth forecast. We consider the following approaches:

A. Forecasts for the growth rates of private and government consumption, fixed investment, exports and imports, are estimated from dynamic models and forecast combinations. Consequently, forecasts for the corresponding levels of these components can be calculated. The forecasts for the demand components from this

[7] Forecasts for inventory changes in (11b) are obtained using a simple random walk model.

approach carry the superscript “A”. Then, inventory changes can be are found as the difference between the *direct* GDP forecast and the forecasts of the demand components

$$CI_{t+h}^{A} = Y_{t+h}^{D} - (C_{t+h}^{A} + G_{t+h}^{A} + FI_{t+h}^{A} + X_{t+h}^{A} - M_{t+h}^{A}) \quad (12)$$

where Y_{t+h}^{D} is the direct forecast for GDP[8].

B. Forecasts for the demand components are computed from the *direct* GDP forecast (Y_{t+h}^{D}) by applying the historical weight of each component to GDP,

$$C_{t+h}^{B} = w_t^{C} Y_{t+h}^{D};\ G_{t+h}^{B} = w_t^{G} Y_{t+h}^{D};\ FI_{t+h}^{B} = w_t^{FI} Y_{t+h}^{D};\ X_{t+h}^{B} = w_t^{X} Y_{t+h}^{D};\ M_{t+h}^{B} = w_t^{M} Y_{t+h}^{D} \quad (13)$$

where w_t^{k} represents the average contribution of demand component k to GDP over the last n data periods,

$$w_t^{k} = \frac{1}{n}\left(\frac{k_t}{Y_t} + \frac{k_{t-1}}{Y_{t-1}} + \cdots + \frac{k_{t-i+1}}{Y_{t-i+1}}\right),\ i = 1, 2, \ldots n\ . \quad (14)$$

The forecasts for the demand components from this approach carry the superscript “B”. Moreover,

$$w_t^{C} + w_t^{G} + w_t^{FI} + w_t^{X} - w_t^{M} + w_t^{CI} = 1 \quad (15)$$

and therefore changes in inventories are given by definition as

$$CI_{t+h}^{B} = Y_{t+h}^{D} - \left(C_{t+h}^{B} + G_{t+h}^{B} + FI_{t+h}^{B} + X_{t+h}^{B} - M_{t+h}^{B}\right). \quad (16)$$

In both approaches the forecasts for the demand components are such that they add up to the direct GDP forecast. As we are also interested in the forecast accuracy of the demand component forecasts, we need to examine which set of forecasts (approach A vs. approach B) results in the highest gains.

Tables A9-A13 present the results of a forecast evaluation exercise for the growth rate of the demand component forecasts based on approach A and B using a dataset for the period 1995Q1-2013Q2. The weights in approach B are computed for $n = 4$. In particular, the tables show the RMSFE relative to the random walk benchmark for each demand component in question. In approach B, intercept correction is applied to the direct GDP forecast prior to the computation of the demand component forecasts; afterwards demand component forecasts obtained for different values of the intercept correction factor are combined using alternative forecast combination methods.

Neither approach outperforms the other across all demand components and horizons. Computing private consumption growth forecasts using forecast combinations from dynamic

[8] Changes in inventories are computed as the discrepancy since this component is the most volatile and difficult to predict using information from other predictors.

models yields superior forecasts than the application of the average consumption share over the four most recent quarters for $h = 1, 2$; however, the opposite holds for $h = 3, 4$. In the case of government consumption, approach B is associated with the highest gains. Combinations of forecasts from dynamic models for fixed investment growth result in substantial gains over both the benchmark model and approach B. Export growth forecasts from approach A are marginally more accurate than those obtained from the random walk model that generates forecasts with lower error compared to approach B. In forecasting import growth one quarter ahead neither approach can beat the random walk; for $h = 3, 4$ approach B seems to be associated with the lowest forecast error.

Although approach B is computationally simple, approach A has more potential for the production of more informative demand component forecasts. Approach A can exploit an increasing number of leading indicators (e.g. business and consumer survey data) which can provide useful information about the evolution of specific demand components such as private consumption, investment, exports and imports. The forecasting performance of individual demand components can be explored further using for example component-specific datasets. Thus, Approach B can work as a shortcut for computing forecasts when leading indicators associated with a demand component are scarce (e.g. government consumption). Approach A could result in more informed forecasts in the case where a large number of alternative predictors for a demand component are available (e.g. private consumption, investment).

5. Bridge equations

Bridge equations constitute a modelling strategy employed by several institutions such as the European Central Bank (e.g. Angelini et al. 2011, Diron 2006) to obtain an early estimate of quarterly GDP growth by exploiting information in timely available monthly data. Bridge equations link monthly variables, whose observations are published early in the quarter of interest, with quarterly data such as GDP, which is released much later.

Let y_t^Q denote quarterly GDP growth or some GDP demand component expressed as quarterly growth rate (i.e. the quarter-on-quarter growth rate) and let $x_t = (x_{1t}, x_{2t}, \dots, x_{kt})'$ be a vector of stationary monthly indicators including BCS variables. The quarterly aggregates of the monthly data are denoted by $x_{it}^Q \; i = 1,2, \dots, k$ and the bridge equation is given by

$$y_t^Q = \beta_0 + \sum_{i=1}^{k} \beta_i(L)\, x_{it}^Q + \varepsilon_t^Q \qquad (17)$$

where $\beta_i(L) = \beta_{i0} + \beta_{i1}L + \cdots + \beta_{ip_i}L^{p_i}$ and L is the lag operator.

Although some monthly indicators will be known for some months within the quarter of interest, forecasts of the monthly indicators for the remaining of the quarter (or for

subsequent quarters, depending on the horizon over which GDP and its components are forecasted) need to be computed, using univariate models. The quarterly aggregates of forecasts of the monthly variables can then be used to predict quarterly activity growth. To sum up, bridge equation estimation involves two steps:

- Step 1: Forecasts of monthly indicators are computed over the rest of the current quarter and for the months of the following quarter; subsequently, forecasts of their quarterly aggregated values are obtained. Usually the forecasts of the monthly predictors are based on univariate models.

- Step 2: The resulting quarterly aggregated values are used as predictors in the bridge equations to obtain the quarterly forecast for the growth rate of GDP and its demand components.

Since bridge equations can be based only on a small number of regressors, different bridge equations for y_t^Q can be estimated and the resulting forecasts can be combined e.g. by averaging (Angelini et al. 2011) or by applying more complicated forecast combination methods discussed above.

We used data on 85 monthly indicators whose values for the first month in a given quarter are published at the end of the reference month the earliest and about four and a half months prior to the release of the National Accounts data for the given quarter. For example, data on the Economic Sentiment Indicator for the reference month e.g. January are published at the end of that month; National Accounts data for the first quarter of the year are published in mid-June.[9] Thus we can obtain information from monthly series on developments in a given quarter about five months prior to the official National Accounts data for the reference quarter. These monthly series can be exploited for forecasting purposes via the bridge equations. In particular, the monthly series employed in the analysis cover domestic and foreign price indices, international commodity prices, domestic and foreign interest rates, stock market and economic sentiment indicators, exchange rates as well as series relating to domestic labour market (unemployment rate, registered unemployed, vacancies) and economic activity (tourist arrivals, registration of motor vehicles, cement sales, etc.).

Early in month M (e.g. at the end of the first week) forecasts for GDP growth and its demand components for the previous and the current quarter can be constructed using monthly series that are available at the time. Table 2 shows the reference quarter and reference month for which National Accounts data and monthly series respectively, are available at the beginning of each month. The monthly series can be divided into three groups according to

[9] In the setup we develop we refer to National Accounts releases and not to GDP flash estimates which are available about one month prior to the National Accounts publication; flash estimates do not provide information about GDP components.

their availability (release dates) early in month M:

- Group A: available data cover all months of the previous quarter;
- Group B: available data cover the first two months of the previous quarter;
- Group C: available data cover only the first month of the previous quarter.

The monthly indicators in Group A, B and C that are used as predictors in bridge equations are shown in Table A14.

In forecasting the previous and current quarter's GDP growth we have monthly data covering

- *at least* the first month of the previous quarter (Group C), when GDP growth projections are constructed in the first month of each quarter;
- *at most* all months of the previous quarter and the first two months of the current quarter (Group A) when GDP growth projections are constructed in the final month of each quarter.

Consequently forecasts for the monthly variables need to be constructed for a horizon between one and five months, depending on the Group of the series and the month when the GDP forecasts are computed (see Table 2).

Table 2: Data releases and forecast horizons for monthly series used in bridge equations

Quarter i in year t: Qi(t)	**Q1(t)**			**Q2(t)**			**Q3(t)**			**Q4(t)**		
Month j in year t: Mj(t)	**M1(t)**	**M2(t)**	**M3(t)**	**M4(t)**	**M5(t)**	**M6(t)**	**M7(t)**	**M8(t)**	**M9(t)**	**M10(t)**	**M11(t)**	**M12(t)**
Data releases												
National Accounts (reference quarter i and year t: Qi(t))			**Q4(t-1)**			**Q1(t)**			**Q2(t)**			**Q3(t)**
Monthly series (reference month j and year t: Mj(t))												
Group A	M12(t-1)	M1(t)	M2(t)	M3(t)	M4(t)	M5(t)	M6(t)	M7(t)	M8(t)	M9(t)	M10(t)	M11(t)
Group B	M11(t-1)	M12(t-1)	M1(t)	M2(t)	M3(t)	M4(t)	M5(t)	M6(t)	M7(t)	M8(t)	M9(t)	M10(t)
Group C	M10(t-1)	M11(t-1)	M12(t-1)	M1(t)	M2(t)	M3(t)	M4(t)	M5(t)	M6(t)	M7(t)	M8(t)	M9(t)
Forecast horizon for monthly series: months ahead												
Group A	3	2	1	3	2	1	3	2	1	3	2	1
Group B	4	3	2	4	3	2	4	3	2	4	3	2
Group C	5	4	3	5	4	3	5	4	3	5	4	3
Number of monthly values forecasted to construct quarterly counterparts												
Group A												
Previous quarter	Q4(t-1); 0	Q4(t-1); 0	Q4(t-1); 0	Q1(t); 0	Q1(t); 0	Q1(t); 0	Q2(t); 0	Q2(t); 0	Q2(t); 0	Q3(t); 0	Q3(t); 0	Q3(t); 0
Current quarter	Q1(t); 3	Q1(t); 2	Q1(t); 1	Q2(t); 3	Q2(t); 2	Q2(t); 1	Q3(t); 3	Q3(t); 2	Q3(t); 1	Q4(t); 3	Q4(t); 2	Q4(t); 1
Group B												
Previous quarter	Q4(t-1); 1	Q4(t-1); 0	Q4(t-1); 0	Q1(t); 1	Q1(t); 0	Q1(t); 0	Q1(t); 1	Q1(t); 0	Q1(t); 0	Q3(t); 1	Q3(t); 0	Q3(t); 0
Current quarter	Q1(t); 3	Q1(t); 3	Q1(t); 2	Q2(t); 3	Q2(t); 3	Q2(t); 2	Q2(t); 3	Q2(t); 3	Q2(t); 2	Q4(t); 3	Q4(t); 3	Q4(t); 2
Group C												
Previous quarter	Q4(t-1); 2	Q4(t-1); 1	Q4(t-1); 0	Q1(t); 2	Q1(t); 1	Q1(t); 0	Q1(t); 2	Q1(t); 1	Q1(t); 0	Q3(t); 2	Q3(t); 1	Q3(t); 0
Current quarter	Q1(t); 3	Q1(t); 3	Q1(t); 3	Q2(t); 3	Q2(t); 3	Q2(t); 3	Q2(t); 3	Q2(t); 3	Q2(t); 3	Q4(t); 3	Q4(t); 3	Q4(t); 3

Both monthly and quarterly data used in the analysis are seasonally adjusted and

transformed into stationary variables. An AR model for each monthly variable is estimated and the required monthly forecasts are computed. The order of the AR model is selected using the Akaike Information Criterion (AIC) from a maximum of 12 lags. The monthly series is subsequently used to get the quarterly series, x_t^Q, by averaging the monthly values in each quarter. At the beginning of each month when the GDP growth forecasts for the previous and current quarter are constructed, we use the quarterly values of the monthly series for the corresponding quarters. The last panel of Table 2 shows the number of monthly values forecasted in each month to construct their quarterly counterparts.

We estimate separate bridge equations for each predictor x_t^Q which take the following form

$$y_t^Q = \alpha + \sum_{l=0}^{p} \beta_l \, x_{t-l}^Q + \varepsilon_t^Q \qquad (18)$$

where t denotes the quarter. Equation (18) is estimated every month using quarterly data for $t = 1, 2, \dots, T-2$ where $T-2$ is the last quarter for which we have published National Accounts data (i.e. the delay between the current quarter and the official publication of the National Accounts data is typically two quarters).[10] The lag length for the predictors is selected using AIC from a maximum of four lags.

The estimated parameters together with the previously constructed quarterly values of x_{T-1}^Q and x_T^Q are then used to compute forecasts for GDP growth (or its demand components) for the previous and the current quarter

$$\hat{y}_{T-1|T-2}^Q = \hat{\alpha} + \sum_{l=0}^{p} \hat{\beta}_l \, x_{T-1-l}^Q$$

$$\hat{y}_{T|T-2}^Q = \hat{\alpha} + \sum_{l=0}^{p} \hat{\beta}_l \, x_{T-l}^Q.$$

As we use many different monthly predictors we obtain a large number of alternative forecasts which are then combined using the different forecast combination methods discussed in section 2.3.

The sample for the forecasting exercise covers the period 1995Q1 to 2013Q2; pseudo out of sample forecasts for the growth rate of GDP and its demand components are constructed from 2002Q1 onwards. The quarterly pseudo out of sample forecasts are based on the pseudo out of sample forecasts of monthly variables which are computed (from monthly data) from March 2002 onwards. Thus, for every monthly forecast computed for each predictor, a GDP (or consumption/investment/exports/imports) growth forecast is constructed; therefore, three monthly forecasts of the quarterly National Accounts series are obtained each quarter as new monthly information arrives.

[10] For example, in January the available National Accounts data cover the third quarter of the previous year.

Table A15 shows the RMSFEs of different forecast combinations constructed from the forecasts of bridge equations; RMSFEs shown are relative to the random walk benchmark. The monthly information set varies depending on whether the forecasts are computed on the first, second or third month of each quarter. At the beginning of each month one can construct forecasts for GDP (or consumption, investment, etc.) growth for the previous quarter and the current quarter prior to the release of the official National Accounts data.[11] Thus here we consider horizons of one and two quarters ahead since the latest available National Accounts data at the beginning of each month refer to two quarters back. The table also reports the number of months between the time (month) of the estimation of the forecast and the relevant National Account release.[12]

For both GDP and its demand components we find that combinations of forecasts from bridge equations work at least as well as the random walk. The recent best method (that selects the forecast from the model with the lowest MSFE over the last four quarters) yields substantial gains against both the random walk and other combination methods. The forecast gains of the recent best method against the random walk are quite high for GDP and private consumption ranging between 47%-58% and 43%-47% respectively; gains for exports, government consumption, fixed investment and imports are somewhat lower (38%-44%, 30%-36%, 30-38% and 28%-31% respectively), while for gross capital formation which is the most volatile component gains reach at most 25%. The arrival of new monthly information within a quarter as the official publication of National Accounts approaches, lowers to some extent the relative RMSFE in the case of GDP and exports; the decline in the forecast error mainly occurs when forecasts are computed for the previous quarter in the last month of each quarter. The improvement in the forecast error with the inclusion of new monthly data is less noticeable in the case of forecasts for the current quarter.

6. Concluding remarks

The aim of this paper was the evaluation of the forecasting performance of different forecast combinations methods applied for forecasting the growth rate of GDP, private and government consumption, investment, exports and imports. At the same time it was assessed whether the adjustment of model-based forecasts via the application of intercept corrections can improve the forecast accuracy.

[11] As the forecasts refer to the previous and current quarter they are also known as back-casts and now-casts respectively.

[12] For example, early in January we estimate forecasts for the last quarter of the previous year (i.e. previous quarter) and the first quarter of the current year (i.e. current quarter). National Accounts for the aforementioned quarters are released in mid-March and mid-June respectively; hence the distance between the month when the forecasts are computed and the publication of the National Accounts is two and five months respectively.

The results show that forecast combinations that assign weights to individual forecasts according to their historical performance (i.e. discounted MSFE) usually outperform other forecast combinations. In the majority of cases the application of intercept corrections to the forecasts lead to improvements in the forecast accuracy. Nevertheless, the use of an extensive dataset of predictors from Business and Consumer Surveys for Cyprus at the cost of shorter time series is not found to result in forecast gains.

When forecasting GDP growth one or two quarters ahead, forecasts from the AR(1) model with intercept correction outperform combination forecasts from both univariate and ADL models. For longer horizons additional information from other predictors results in forecast gains over the univariate models. Private consumption is the largest component of GDP hence the outcomes of the forecasting exercise are very similar to those described for GDP. Forecast combinations from univariate models are found to be more useful in forecasting government consumption growth as opposed to combinations from ADL models. For fixed investment, the forecast accuracy of univariate forecast combinations is somewhat inferior than that of ADL-based ones. When gross capital formation is considered (i.e. fixed investment plus changes in inventories), forecasts from an AR(4) model with an intercept correction estimated from the longer sample outperform all combination forecasts. In forecasting export growth, no considerable gains over the random walk were found when forecast combinations were used. We find evidence that information from other predictors appears to be useful in forecasting the growth rate of imports as combinations from ADL (intercept corrected) forecasts outperform univariate forecasts and their combinations.

The analysis also reveals that forecasting GDP growth directly leads to much more accurate forecasts than computing forecasts for the growth rates of all the demand components and subsequently aggregating them to get the GDP growth forecast. This finding has implications for the construction of forecasts for GDP and its components that are consistent with the national accounts identity.

Bridge equations that link quarterly GDP (or its demand components) with timely available monthly indicators were estimated and their forecasting performance was evaluated. Such models are used to provide real-time estimates (nowcasts) of National Accounts data for the previous and the current quarter as National Accounts are published 2 ½ months after the end of each quarter. At the beginning of any given month, data on many monthly indicators are employed for constructing National Accounts forecasts for the previous and current quarters prior to the relevant releases. The monthly indicators cover at best the previous month or are published with a delay of at most three months. For both GDP and its demand components we find that combinations of forecasts from bridge equations work at least as well as the random walk. However, the recent best method yields substantial gains against both the random walk and other combination methods.

APPENDIX

Table A1: RMSFE of combination forecasts from univariate models (relative to the RMSFE of the random walk), dataset: 1995Q1 to 2013Q2

Intercept correction factor	0				0.3				0.5				0.7				0.9				1			
Horizon	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**
GDP																								
RMSFE Random walk	1.36	2.44	3.84	5.56	1.36	2.44	3.84	5.56	1.36	2.44	3.84	5.56	1.36	2.44	3.84	5.56	1.36	2.44	3.84	5.56	1.36	2.44	3.84	5.56
AR(1)	0.71	0.70	0.68	0.63	0.50	0.59	0.65	0.63	0.50	0.54	0.61	0.60	0.50	0.51	0.56	0.56	0.50	0.52	0.54	0.52	0.50	0.53	0.55	0.54
AR(4)	0.61	0.62	0.62	0.60	0.53	0.57	0.60	0.60	0.53	0.57	0.57	0.57	0.53	0.59	0.56	0.53	0.53	0.63	0.58	0.51	0.53	0.65	0.62	0.53
Median	0.82	0.78	0.79	0.87	0.56	0.68	0.75	0.85	0.56	0.63	0.69	0.80	0.56	0.59	0.60	0.70	0.56	0.58	0.51	0.57	0.56	0.60	0.47	0.52
Mean	0.78	0.75	0.77	0.81	0.59	0.67	0.74	0.80	0.59	0.63	0.68	0.76	0.59	0.62	0.60	0.69	0.59	0.64	0.51	0.57	0.59	0.66	0.47	0.50
Trimmed mean (5% trimming)	0.76	0.73	0.75	0.80	0.58	0.65	0.71	0.79	0.58	0.62	0.66	0.75	0.58	0.61	0.58	0.68	0.58	0.63	0.50	0.57	0.58	0.64	0.47	0.51
Discounted MSFE (0.90)	0.77	0.74	0.75	0.78	0.59	0.66	0.72	0.77	0.59	0.63	0.67	0.74	0.59	0.62	0.59	0.68	0.59	0.64	0.51	0.57	0.59	0.66	0.47	0.51
Discounted MSFE (0.95)	0.78	0.75	0.77	0.82	0.60	0.67	0.74	0.81	0.60	0.64	0.68	0.77	0.60	0.62	0.60	0.69	0.60	0.64	0.51	0.57	0.60	0.65	0.47	0.51
Discounted MSFE (1.00)	0.79	0.76	0.80	0.85	0.61	0.68	0.75	0.84	0.61	0.64	0.69	0.80	0.61	0.62	0.60	0.70	0.61	0.63	0.51	0.57	0.61	0.65	0.47	0.51
Squared discounted MSFE (0.90)	0.76	0.73	0.73	0.75	0.60	0.66	0.70	0.74	0.60	0.63	0.66	0.72	0.60	0.62	0.59	0.67	0.60	0.64	0.51	0.57	0.60	0.66	0.47	0.51
Squared discounted MSFE (0.95)	0.76	0.73	0.73	0.75	0.60	0.66	0.70	0.74	0.60	0.63	0.66	0.72	0.60	0.62	0.59	0.67	0.60	0.64	0.51	0.57	0.60	0.66	0.47	0.51
Squared discounted MSFE (1.00)	0.80	0.77	0.82	0.89	0.63	0.69	0.77	0.88	0.63	0.65	0.70	0.82	0.63	0.62	0.60	0.72	0.63	0.63	0.51	0.57	0.63	0.65	0.47	0.51
Recent best (past four quarters)	0.69	0.82	0.79	0.71	0.69	0.69	0.77	0.74	0.69	0.64	0.73	0.72	0.69	0.61	0.65	0.72	0.69	0.78	0.53	0.61	0.69	0.81	0.46	0.52
PRIVATE CONSUMPTION																								
RMSFE Random walk	1.64	2.68	4.33	6.40	1.64	2.68	4.33	6.40	1.64	2.68	4.33	6.40	1.64	2.68	4.33	6.40	1.64	2.68	4.33	6.40	1.64	2.68	4.33	6.40
AR(1)	1.10	1.28	1.08	1.03	0.94	1.12	1.05	1.02	0.94	1.07	1.03	1.01	0.94	1.07	1.04	1.02	0.94	1.13	1.15	1.14	0.94	1.18	1.25	1.28
AR(4)	1.01	1.22	1.14	1.13	0.95	1.06	1.10	1.12	0.95	1.00	1.04	1.08	0.95	1.01	1.01	1.03	0.95	1.06	1.07	1.07	0.95	1.11	1.15	1.17
Median	0.83	0.88	0.88	1.00	0.63	0.74	0.83	0.98	0.63	0.71	0.73	0.91	0.63	0.72	0.63	0.76	0.63	0.77	0.58	0.61	0.63	0.80	0.59	0.57
Mean	0.84	0.84	0.81	0.86	0.68	0.72	0.77	0.85	0.68	0.67	0.71	0.81	0.68	0.67	0.63	0.73	0.68	0.71	0.56	0.58	0.68	0.74	0.55	0.48
Trimmed mean (5% trimming)	0.82	0.84	0.80	0.87	0.67	0.72	0.76	0.86	0.67	0.68	0.70	0.82	0.67	0.68	0.62	0.73	0.67	0.72	0.57	0.59	0.67	0.75	0.56	0.51
Discounted MSFE (0.90)	0.83	0.82	0.78	0.81	0.68	0.71	0.75	0.80	0.68	0.68	0.70	0.78	0.68	0.67	0.63	0.71	0.68	0.71	0.56	0.58	0.68	0.74	0.54	0.47
Discounted MSFE (0.95)	0.84	0.83	0.80	0.83	0.68	0.71	0.77	0.83	0.68	0.67	0.71	0.79	0.68	0.67	0.63	0.72	0.68	0.71	0.56	0.58	0.68	0.74	0.55	0.48
Discounted MSFE (1.00)	0.85	0.84	0.82	0.85	0.68	0.72	0.78	0.85	0.68	0.67	0.71	0.81	0.68	0.67	0.63	0.72	0.68	0.71	0.56	0.58	0.68	0.74	0.55	0.48
Squared discounted MSFE (0.90)	0.82	0.80	0.76	0.76	0.68	0.70	0.73	0.76	0.68	0.68	0.69	0.75	0.68	0.68	0.63	0.70	0.68	0.72	0.56	0.57	0.68	0.75	0.54	0.47
Squared discounted MSFE (0.95)	0.82	0.80	0.76	0.76	0.68	0.70	0.73	0.76	0.68	0.68	0.69	0.75	0.68	0.68	0.63	0.70	0.68	0.72	0.56	0.57	0.68	0.75	0.54	0.47
Squared discounted MSFE (1.00)	0.86	0.85	0.82	0.85	0.69	0.72	0.79	0.86	0.69	0.68	0.72	0.81	0.69	0.68	0.63	0.72	0.69	0.71	0.56	0.58	0.69	0.75	0.55	0.48
Recent best (past four quarters)	0.80	0.82	0.74	0.69	0.64	0.78	0.71	0.77	0.64	0.74	0.70	0.78	0.64	0.70	0.64	0.66	0.64	0.68	0.61	0.62	0.64	0.60	0.62	0.57
GOVERNMENT CONSUMPTION																								
RMSFE Random walk	5.94	6.07	4.43	6.50	5.94	6.07	4.43	6.50	5.94	6.07	4.43	6.50	5.94	6.07	4.43	6.50	5.94	6.07	4.43	6.50	5.94	6.07	4.43	6.50
AR(1)	1.08	1.11	1.70	1.08	1.74	1.23	1.74	1.09	1.74	1.35	1.85	1.12	1.74	1.50	2.08	1.21	1.74	1.67	2.46	1.48	1.74	1.77	2.72	1.72
AR(4)	1.06	1.15	1.70	1.09	1.63	1.24	1.72	1.09	1.63	1.35	1.78	1.11	1.63	1.49	1.96	1.18	1.63	1.65	2.29	1.41	1.63	1.74	2.52	1.63
Median	0.91	0.86	1.12	1.06	1.54	1.06	1.05	1.04	1.54	1.24	0.98	0.97	1.54	1.43	0.97	0.84	1.54	1.63	1.10	0.75	1.54	1.74	1.25	0.74
Mean	0.89	0.84	1.02	0.92	1.44	1.05	0.98	0.91	1.44	1.22	0.94	0.87	1.44	1.41	0.93	0.80	1.44	1.61	1.05	0.73	1.44	1.71	1.17	0.74
Trimmed mean (5% trimming)	0.90	0.83	1.03	0.92	1.49	1.04	0.98	0.91	1.49	1.22	0.94	0.87	1.49	1.42	0.94	0.79	1.49	1.62	1.07	0.73	1.49	1.72	1.20	0.74
Discounted MSFE (0.90)	0.89	0.84	1.06	0.95	1.38	1.03	1.02	0.94	1.38	1.20	0.97	0.90	1.38	1.38	0.94	0.82	1.38	1.57	1.02	0.74	1.38	1.67	1.13	0.75
Discounted MSFE (0.95)	0.90	0.85	1.05	0.96	1.38	1.03	1.01	0.95	1.38	1.20	0.96	0.90	1.38	1.38	0.94	0.82	1.38	1.57	1.03	0.74	1.38	1.67	1.14	0.74
Discounted MSFE (1.00)	0.90	0.85	1.02	0.95	1.39	1.04	0.98	0.93	1.39	1.20	0.94	0.89	1.39	1.38	0.93	0.82	1.39	1.58	1.04	0.74	1.39	1.68	1.15	0.74
Squared discounted MSFE (0.90)	0.90	0.85	1.11	0.99	1.34	1.02	1.07	0.98	1.34	1.18	1.01	0.94	1.34	1.35	0.96	0.85	1.34	1.54	1.00	0.76	1.34	1.64	1.09	0.76
Squared discounted MSFE (0.95)	0.90	0.85	1.11	0.99	1.34	1.02	1.07	0.98	1.34	1.18	1.01	0.94	1.34	1.35	0.96	0.85	1.34	1.54	1.00	0.76	1.34	1.64	1.09	0.76
Squared discounted MSFE (1.00)	0.90	0.85	1.02	0.98	1.35	1.03	0.98	0.96	1.35	1.18	0.94	0.92	1.35	1.36	0.93	0.84	1.35	1.55	1.03	0.75	1.35	1.65	1.13	0.75
Recent best (past four quarters)	0.92	0.82	1.08	0.60	1.32	0.96	1.04	0.60	1.32	1.09	1.13	0.62	1.32	1.24	1.13	0.77	1.32	1.41	1.11	0.74	1.32	1.50	1.16	0.76
FIXED INVESTMENT																								
RMSFE Random walk	7.07	12.17	19.53	28.54	7.07	12.17	19.53	28.54	7.07	12.17	19.53	28.54	7.07	12.17	19.53	28.54	7.07	12.17	19.53	28.54	7.07	12.17	19.53	28.54
AR(1)	0.70	0.63	0.58	0.56	0.52	0.50	0.55	0.55	0.52	0.44	0.49	0.52	0.52	0.39	0.42	0.45	0.52	0.36	0.37	0.37	0.52	0.37	0.36	0.36
AR(4)	0.58	0.54	0.54	0.53	0.49	0.44	0.51	0.52	0.49	0.39	0.45	0.48	0.49	0.36	0.39	0.41	0.49	0.36	0.34	0.33	0.49	0.36	0.35	0.33
Median	0.97	0.90	0.92	0.94	0.66	0.71	0.87	0.92	0.66	0.59	0.77	0.86	0.66	0.48	0.62	0.73	0.66	0.38	0.45	0.53	0.66	0.34	0.35	0.40
Mean	0.89	0.84	0.88	0.91	0.65	0.66	0.82	0.89	0.65	0.55	0.73	0.84	0.65	0.44	0.58	0.71	0.65	0.36	0.41	0.50	0.65	0.32	0.33	0.39
Trimmed mean (5% trimming)	0.90	0.85	0.89	0.92	0.64	0.67	0.83	0.90	0.64	0.56	0.74	0.84	0.64	0.45	0.60	0.72	0.64	0.37	0.43	0.52	0.64	0.33	0.34	0.41
Discounted MSFE (0.90)	0.87	0.83	0.88	0.91	0.65	0.65	0.82	0.89	0.65	0.54	0.73	0.83	0.65	0.44	0.58	0.71	0.65	0.35	0.41	0.50	0.65	0.32	0.33	0.39
Discounted MSFE (0.95)	0.90	0.83	0.88	0.91	0.65	0.65	0.83	0.89	0.65	0.54	0.73	0.84	0.65	0.44	0.59	0.71	0.65	0.35	0.41	0.50	0.65	0.32	0.33	0.39
Discounted MSFE (1.00)	0.93	0.84	0.89	0.91	0.65	0.65	0.83	0.90	0.65	0.54	0.73	0.84	0.65	0.43	0.59	0.71	0.65	0.35	0.42	0.50	0.65	0.32	0.34	0.39
Squared discounted MSFE (0.90)	0.86	0.82	0.88	0.90	0.65	0.64	0.82	0.89	0.65	0.53	0.73	0.83	0.65	0.43	0.58	0.71	0.65	0.35	0.41	0.50	0.65	0.32	0.33	0.39
Squared discounted MSFE (0.95)	0.86	0.82	0.88	0.90	0.65	0.64	0.82	0.89	0.65	0.53	0.73	0.83	0.65	0.43	0.58	0.71	0.65	0.35	0.41	0.50	0.65	0.32	0.33	0.39
Squared discounted MSFE (1.00)	0.96	0.83	0.90	0.92	0.66	0.64	0.84	0.90	0.66	0.53	0.74	0.84	0.66	0.42	0.60	0.71	0.66	0.34	0.42	0.50	0.66	0.32	0.34	0.39
Recent best (past four quarters)	0.71	0.67	0.81	0.90	0.60	0.54	0.77	0.88	0.60	0.45	0.64	0.83	0.60	0.38	0.51	0.65	0.60	0.32	0.33	0.43	0.60	0.30	0.28	0.34

Table A1: continued

Intercept correction factor	0				0.3				0.5				0.7				0.9				1			
Horizon	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**
GROSS CAPITAL FORMATION																								
RMSFE Random walk	19.56	28.08	38.17	46.70	19.56	28.08	38.17	46.70	19.56	28.08	38.17	46.70	19.56	28.08	38.17	46.70	19.56	28.08	38.17	46.70	19.56	28.08	38.17	46.70
AR(1)	0.81	0.72	0.63	0.58	0.84	0.69	0.62	0.57	0.84	0.68	0.61	0.56	0.84	0.69	0.60	0.53	0.84	0.71	0.63	0.51	0.84	0.73	0.66	0.53
AR(4)	0.88	0.77	0.69	0.65	0.78	0.71	0.67	0.64	0.78	0.68	0.64	0.62	0.78	0.66	0.60	0.57	0.78	0.67	0.59	0.52	0.78	0.68	0.59	0.52
Median	1.03	1.02	0.99	1.00	0.93	0.96	0.97	0.99	0.93	0.93	0.93	0.95	0.93	0.91	0.90	0.86	0.93	0.90	0.87	0.74	0.93	0.90	0.87	0.68
Mean	1.05	1.02	1.00	1.03	0.92	0.96	0.98	1.02	0.92	0.94	0.94	0.98	0.92	0.92	0.89	0.89	0.92	0.91	0.85	0.76	0.92	0.90	0.84	0.69
Trimmed mean (5% trimming)	1.04	1.01	1.00	1.02	0.92	0.96	0.98	1.01	0.92	0.94	0.94	0.97	0.92	0.92	0.90	0.88	0.92	0.91	0.85	0.75	0.92	0.91	0.84	0.69
Discounted MSFE (0.90)	1.04	1.01	1.00	1.03	0.90	0.96	0.98	1.02	0.90	0.94	0.95	0.98	0.90	0.92	0.90	0.90	0.90	0.90	0.85	0.77	0.90	0.90	0.83	0.69
Discounted MSFE (0.95)	1.04	1.01	1.00	1.03	0.89	0.96	0.98	1.02	0.89	0.94	0.95	0.98	0.89	0.92	0.90	0.90	0.89	0.90	0.85	0.77	0.89	0.90	0.83	0.70
Discounted MSFE (1.00)	1.05	1.01	1.00	1.04	0.89	0.96	0.98	1.03	0.89	0.94	0.94	0.99	0.89	0.92	0.90	0.91	0.89	0.90	0.85	0.77	0.89	0.90	0.83	0.70
Squared discounted MSFE (0.90)	1.03	1.01	1.00	1.02	0.88	0.96	0.98	1.01	0.88	0.94	0.95	0.98	0.88	0.92	0.90	0.90	0.88	0.90	0.85	0.77	0.88	0.90	0.83	0.70
Squared discounted MSFE (0.95)	1.03	1.01	1.00	1.02	0.88	0.96	0.98	1.01	0.88	0.94	0.95	0.98	0.88	0.92	0.90	0.90	0.88	0.90	0.85	0.77	0.88	0.90	0.83	0.70
Squared discounted MSFE (1.00)	1.05	1.01	1.00	1.05	0.87	0.96	0.98	1.03	0.87	0.94	0.95	1.00	0.87	0.92	0.90	0.92	0.87	0.90	0.84	0.78	0.87	0.89	0.82	0.70
Recent best (past four quarters)	1.04	1.01	1.03	1.04	0.94	0.98	1.02	1.09	0.94	0.96	0.98	1.05	0.94	0.95	0.95	0.96	0.94	0.94	0.91	0.85	0.94	0.94	0.92	0.74
EXPORTS																								
RMSFE Random walk	2.51	3.22	3.95	3.46	2.51	3.22	3.95	3.46	2.51	3.22	3.95	3.46	2.51	3.22	3.95	3.46	2.51	3.22	3.95	3.46	2.51	3.22	3.95	3.46
AR(1)	1.04	1.26	1.43	2.02	1.25	1.27	1.43	2.03	1.25	1.34	1.47	2.05	1.25	1.45	1.58	2.15	1.25	1.60	1.81	2.51	1.25	1.68	1.98	2.86
AR(4)	1.09	1.29	1.45	2.07	1.34	1.35	1.45	2.07	1.34	1.45	1.48	2.07	1.34	1.59	1.59	2.15	1.34	1.76	1.82	2.48	1.34	1.86	1.99	2.82
Median	1.00	0.94	0.96	1.15	1.15	1.05	0.97	1.15	1.15	1.17	1.00	1.16	1.15	1.30	1.05	1.20	1.15	1.46	1.16	1.37	1.15	1.54	1.24	1.60
Mean	1.00	0.94	0.94	1.03	1.16	1.05	0.94	1.03	1.16	1.17	0.97	1.04	1.16	1.32	1.03	1.11	1.16	1.49	1.16	1.36	1.16	1.57	1.25	1.61
Trimmed mean (5% trimming)	1.00	0.95	0.95	1.04	1.15	1.06	0.95	1.04	1.15	1.17	0.97	1.04	1.15	1.32	1.03	1.10	1.15	1.48	1.16	1.35	1.15	1.56	1.25	1.61
Discounted MSFE (0.90)	1.00	0.95	0.95	1.03	1.16	1.05	0.95	1.03	1.16	1.17	0.97	1.03	1.16	1.32	1.03	1.10	1.16	1.48	1.16	1.36	1.16	1.57	1.25	1.61
Discounted MSFE (0.95)	0.99	0.95	0.95	1.02	1.16	1.05	0.95	1.02	1.16	1.17	0.97	1.03	1.16	1.32	1.03	1.10	1.16	1.48	1.16	1.36	1.16	1.57	1.25	1.61
Discounted MSFE (1.00)	0.99	0.95	0.94	1.02	1.15	1.05	0.95	1.03	1.15	1.17	0.97	1.04	1.15	1.31	1.03	1.11	1.15	1.48	1.16	1.37	1.15	1.56	1.25	1.61
Squared discounted MSFE (0.90)	0.99	0.96	0.96	1.03	1.16	1.06	0.96	1.02	1.16	1.17	0.98	1.03	1.16	1.31	1.03	1.10	1.16	1.48	1.16	1.36	1.16	1.57	1.25	1.61
Squared discounted MSFE (0.95)	0.99	0.96	0.96	1.03	1.16	1.06	0.96	1.02	1.16	1.17	0.98	1.03	1.16	1.31	1.03	1.10	1.16	1.48	1.16	1.36	1.16	1.57	1.25	1.61
Squared discounted MSFE (1.00)	0.99	0.95	0.95	1.02	1.15	1.05	0.95	1.02	1.15	1.16	0.97	1.03	1.15	1.31	1.03	1.11	1.15	1.47	1.16	1.37	1.15	1.56	1.25	1.61
Recent best (past four quarters)	1.03	1.03	1.12	1.23	1.24	1.13	1.09	1.24	1.24	1.21	1.07	1.23	1.24	1.33	1.03	1.08	1.24	1.49	1.28	1.45	1.24	1.57	1.38	1.81
IMPORTS																								
RMSFE Random walk	4.95	7.67	10.79	13.69	4.95	7.67	10.79	13.69	4.95	7.67	10.79	13.69	4.95	7.67	10.79	13.69	4.95	7.67	10.79	13.69	4.95	7.67	10.79	13.69
AR(1)	1.16	1.12	1.02	0.99	1.15	1.07	1.02	0.99	1.15	1.07	1.02	0.99	1.15	1.11	1.07	1.02	1.15	1.18	1.18	1.15	1.15	1.22	1.28	1.29
AR(4)	1.17	1.14	1.08	1.02	1.16	1.08	1.06	1.01	1.16	1.08	1.05	1.00	1.16	1.11	1.08	0.99	1.16	1.18	1.18	1.07	1.16	1.22	1.27	1.19
Median	1.03	1.01	1.04	1.02	1.02	0.95	1.02	1.01	1.02	0.93	0.99	0.98	1.02	0.93	0.95	0.92	1.02	0.96	0.94	0.88	1.02	0.98	0.96	0.91
Mean	1.04	1.00	1.00	0.99	0.99	0.95	0.98	0.98	0.99	0.93	0.96	0.96	0.99	0.94	0.94	0.91	0.99	0.96	0.95	0.87	0.99	0.98	0.97	0.88
Trimmed mean (5% trimming)	1.03	1.00	1.00	0.98	0.99	0.94	0.98	0.98	0.99	0.93	0.96	0.95	0.99	0.94	0.94	0.91	0.99	0.96	0.94	0.88	0.99	0.98	0.96	0.90
Discounted MSFE (0.90)	1.03	0.99	0.99	0.97	0.99	0.94	0.98	0.97	0.99	0.93	0.96	0.95	0.99	0.94	0.94	0.91	0.99	0.96	0.95	0.87	0.99	0.98	0.97	0.87
Discounted MSFE (0.95)	1.03	0.99	0.99	0.97	0.99	0.95	0.98	0.97	0.99	0.93	0.96	0.95	0.99	0.94	0.94	0.91	0.99	0.96	0.95	0.87	0.99	0.98	0.97	0.87
Discounted MSFE (1.00)	1.03	1.00	0.99	0.97	0.99	0.95	0.98	0.97	0.99	0.93	0.96	0.95	0.99	0.94	0.94	0.91	0.99	0.96	0.95	0.87	0.99	0.98	0.97	0.88
Squared discounted MSFE (0.90)	1.02	0.99	0.98	0.95	0.99	0.94	0.97	0.95	0.99	0.93	0.95	0.93	0.99	0.94	0.94	0.90	0.99	0.96	0.95	0.87	0.99	0.98	0.97	0.87
Squared discounted MSFE (0.95)	1.02	0.99	0.98	0.95	0.99	0.94	0.97	0.95	0.99	0.93	0.95	0.93	0.99	0.94	0.94	0.90	0.99	0.96	0.95	0.87	0.99	0.98	0.97	0.87
Squared discounted MSFE (1.00)	1.03	0.99	0.98	0.96	0.99	0.94	0.97	0.96	0.99	0.93	0.95	0.94	0.99	0.94	0.94	0.90	0.99	0.96	0.95	0.87	0.99	0.98	0.97	0.87
Recent best (past four quarters)	0.97	0.99	0.99	1.02	1.03	0.94	0.98	1.01	1.03	0.94	0.94	0.98	1.03	0.97	0.93	0.92	1.03	0.98	1.01	0.85	1.03	0.99	1.04	0.79

Table A2: RMSFE of combination forecasts from univariate models (relative to the RMSFE of the random walk), dataset: 2001Q1 to 2013Q2

Intercept correction factor	0				0.3				0.5				0.7				0.9				1			
Horizon	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**
GDP																								
RMSFE Random walk	1.36	2.44	3.84	5.56	1.36	2.44	3.84	5.56	1.36	2.44	3.84	5.56	1.36	2.44	3.84	5.56	1.36	2.44	3.84	5.56	1.36	2.44	3.84	5.56
AR(1)	0.64	0.66	0.75	0.81	0.76	0.60	0.71	0.80	0.76	0.59	0.66	0.76	0.76	0.61	0.58	0.68	0.76	0.64	0.52	0.56	0.76	0.67	0.49	0.51
AR(4)	0.64	0.74	0.84	0.84	0.82	0.73	0.81	0.82	0.82	0.75	0.77	0.76	0.82	0.80	0.73	0.64	0.82	0.87	0.72	0.47	0.82	0.91	0.74	0.42
Median	0.67	0.71	0.75	0.79	0.63	0.63	0.70	0.77	0.63	0.60	0.63	0.72	0.63	0.59	0.55	0.62	0.63	0.60	0.49	0.54	0.63	0.61	0.45	0.51
Mean	0.68	0.70	0.73	0.75	0.67	0.63	0.70	0.74	0.67	0.61	0.64	0.71	0.67	0.61	0.57	0.64	0.67	0.63	0.49	0.52	0.67	0.65	0.46	0.46
Trimmed mean (5% trimming)	0.66	0.68	0.70	0.73	0.66	0.62	0.67	0.72	0.66	0.60	0.62	0.69	0.66	0.60	0.56	0.62	0.66	0.61	0.49	0.53	0.66	0.63	0.45	0.47
Discounted MSFE (0.90)	0.66	0.69	0.69	0.70	0.65	0.62	0.66	0.67	0.65	0.59	0.62	0.66	0.65	0.58	0.57	0.62	0.65	0.59	0.50	0.52	0.65	0.61	0.46	0.44
Discounted MSFE (0.95)	0.67	0.69	0.70	0.71	0.65	0.62	0.66	0.67	0.65	0.59	0.62	0.66	0.65	0.58	0.57	0.62	0.65	0.59	0.50	0.52	0.65	0.61	0.46	0.44
Discounted MSFE (1.00)	0.67	0.69	0.70	0.72	0.65	0.62	0.66	0.67	0.65	0.59	0.62	0.66	0.65	0.58	0.57	0.62	0.65	0.59	0.50	0.52	0.65	0.60	0.46	0.44
Squared discounted MSFE	0.65	0.69	0.67	0.67	0.65	0.62	0.65	0.63	0.65	0.59	0.62	0.63	0.65	0.58	0.57	0.61	0.65	0.59	0.51	0.51	0.65	0.60	0.48	0.42
Squared discounted MSFE	0.65	0.69	0.67	0.67	0.65	0.62	0.65	0.63	0.65	0.59	0.62	0.63	0.65	0.58	0.57	0.61	0.65	0.59	0.51	0.51	0.65	0.60	0.48	0.42
Squared discounted MSFE	0.67	0.69	0.69	0.69	0.64	0.63	0.65	0.62	0.64	0.60	0.62	0.62	0.64	0.58	0.57	0.60	0.64	0.58	0.51	0.51	0.64	0.59	0.48	0.42
Recent best (past four quarters)	0.71	0.74	0.77	0.72	0.62	0.62	0.74	0.76	0.62	0.64	0.70	0.74	0.62	0.60	0.62	0.68	0.62	0.61	0.50	0.52	0.62	0.63	0.45	0.44
PRIVATE CONSUMPTION																								
RMSFE Random walk	1.64	2.68	4.33	6.40	1.64	2.68	4.33	6.40	1.64	2.68	4.33	6.40	1.64	2.68	4.33	6.40	1.64	2.68	4.33	6.40	1.64	2.68	4.33	6.40
AR(1)	0.61	0.74	0.76	0.85	0.96	0.70	0.73	0.84	0.96	0.70	0.69	0.80	0.96	0.73	0.67	0.72	0.96	0.79	0.69	0.59	0.96	0.82	0.73	0.52
AR(4)	0.71	0.91	0.96	0.89	1.14	0.82	0.90	0.87	1.14	0.79	0.81	0.80	1.14	0.81	0.72	0.68	1.14	0.85	0.73	0.70	1.14	0.89	0.80	0.87
Median	0.68	0.74	0.75	0.83	0.78	0.67	0.70	0.81	0.78	0.68	0.62	0.74	0.78	0.70	0.57	0.64	0.78	0.75	0.58	0.55	0.78	0.78	0.60	0.54
Mean	0.66	0.71	0.73	0.76	0.81	0.62	0.69	0.75	0.81	0.59	0.64	0.71	0.81	0.58	0.57	0.64	0.81	0.60	0.52	0.51	0.81	0.62	0.51	0.43
Trimmed mean (5% trimming)	0.65	0.69	0.71	0.75	0.80	0.62	0.68	0.74	0.80	0.59	0.62	0.70	0.80	0.59	0.56	0.62	0.80	0.61	0.52	0.51	0.80	0.63	0.52	0.44
Discounted MSFE (0.90)	0.65	0.70	0.69	0.73	0.85	0.63	0.66	0.69	0.85	0.61	0.62	0.68	0.85	0.62	0.57	0.64	0.85	0.65	0.52	0.50	0.85	0.68	0.52	0.43
Discounted MSFE (0.95)	0.66	0.70	0.70	0.74	0.85	0.63	0.66	0.69	0.85	0.61	0.62	0.68	0.85	0.62	0.57	0.64	0.85	0.65	0.52	0.50	0.85	0.68	0.52	0.43
Discounted MSFE (1.00)	0.66	0.70	0.70	0.74	0.85	0.63	0.66	0.69	0.85	0.61	0.62	0.68	0.85	0.62	0.57	0.64	0.85	0.65	0.52	0.50	0.85	0.68	0.52	0.43
Squared discounted MSFE	0.66	0.70	0.67	0.70	0.91	0.65	0.64	0.65	0.91	0.64	0.61	0.66	0.91	0.66	0.58	0.64	0.91	0.71	0.53	0.50	0.91	0.73	0.52	0.46
Squared discounted MSFE	0.66	0.70	0.67	0.70	0.91	0.65	0.64	0.65	0.91	0.64	0.61	0.66	0.91	0.66	0.58	0.64	0.91	0.71	0.53	0.50	0.91	0.73	0.52	0.46
Squared discounted MSFE	0.66	0.70	0.68	0.74	0.91	0.65	0.64	0.65	0.91	0.64	0.61	0.66	0.91	0.67	0.57	0.64	0.91	0.71	0.54	0.50	0.91	0.73	0.53	0.45
Recent best (past four quarters)	0.75	0.86	0.72	0.75	1.00	0.76	0.70	0.74	1.00	0.76	0.68	0.75	1.00	0.77	0.63	0.67	1.00	0.81	0.65	0.63	1.00	0.84	0.71	0.77
GOVERNMENT CONSUMPTION																								
RMSFE Random walk	5.94	6.07	4.43	6.50	5.94	6.07	4.43	6.50	5.94	6.07	4.43	6.50	5.94	6.07	4.43	6.50	5.94	6.07	4.43	6.50	5.94	6.07	4.43	6.50
AR(1)	0.93	0.82	0.99	0.97	1.44	0.97	0.95	0.95	1.44	1.11	0.90	0.90	1.44	1.29	0.89	0.81	1.44	1.47	1.00	0.76	1.44	1.57	1.11	0.83
AR(4)	1.01	0.86	1.37	1.08	1.25	0.89	1.31	1.06	1.25	0.98	1.21	1.01	1.25	1.12	1.11	0.93	1.25	1.28	1.07	0.94	1.25	1.37	1.10	1.05
Median	0.90	0.79	0.93	0.91	1.54	1.02	0.89	0.89	1.54	1.21	0.87	0.84	1.54	1.41	0.91	0.76	1.54	1.61	1.09	0.72	1.54	1.72	1.24	0.73
Mean	0.89	0.80	0.91	0.83	1.43	1.02	0.88	0.82	1.43	1.20	0.86	0.79	1.43	1.40	0.88	0.74	1.43	1.61	1.02	0.72	1.43	1.71	1.14	0.75
Trimmed mean (5% trimming)	0.89	0.79	0.90	0.82	1.48	1.03	0.88	0.81	1.48	1.21	0.86	0.78	1.48	1.41	0.89	0.74	1.48	1.62	1.05	0.71	1.48	1.73	1.17	0.74
Discounted MSFE (0.90)	0.90	0.80	0.90	0.84	1.41	1.02	0.89	0.82	1.41	1.19	0.87	0.80	1.41	1.37	0.89	0.75	1.41	1.56	1.00	0.73	1.41	1.66	1.11	0.76
Discounted MSFE (0.95)	0.90	0.81	0.90	0.84	1.42	1.02	0.90	0.83	1.42	1.19	0.87	0.80	1.42	1.37	0.89	0.75	1.42	1.56	1.00	0.73	1.42	1.66	1.11	0.76
Discounted MSFE (1.00)	0.90	0.81	0.90	0.85	1.43	1.02	0.90	0.84	1.43	1.19	0.88	0.81	1.43	1.37	0.89	0.76	1.43	1.56	1.01	0.73	1.43	1.66	1.12	0.76
Squared discounted MSFE	0.91	0.81	0.90	0.86	1.39	1.01	0.90	0.84	1.39	1.17	0.89	0.81	1.39	1.34	0.89	0.77	1.39	1.52	0.99	0.74	1.39	1.61	1.08	0.78
Squared discounted MSFE	0.91	0.81	0.90	0.86	1.39	1.01	0.90	0.84	1.39	1.17	0.89	0.81	1.39	1.34	0.89	0.77	1.39	1.52	0.99	0.74	1.39	1.61	1.08	0.78
Squared discounted MSFE	0.91	0.82	0.89	0.88	1.43	1.02	0.91	0.87	1.43	1.17	0.89	0.83	1.43	1.34	0.91	0.78	1.43	1.52	1.00	0.74	1.43	1.61	1.10	0.78
Recent best (past four quarters)	1.10	0.72	0.72	0.81	1.34	0.80	0.78	0.80	1.34	0.94	0.78	0.78	1.34	1.10	0.80	0.76	1.34	1.27	0.82	0.74	1.34	1.37	0.88	0.85
FIXED INVESTMENT																								
RMSFE Random walk	7.07	12.17	19.53	28.54	7.07	12.17	19.53	28.54	7.07	12.17	19.53	28.54	7.07	12.17	19.53	28.54	7.07	12.17	19.53	28.54	7.07	12.17	19.53	28.54
AR(1)	0.83	0.75	0.80	0.83	0.81	0.59	0.75	0.81	0.81	0.50	0.66	0.75	0.81	0.42	0.52	0.62	0.81	0.37	0.37	0.44	0.81	0.36	0.31	0.36
AR(4)	0.68	0.53	0.62	0.66	0.78	0.43	0.57	0.65	0.78	0.38	0.49	0.59	0.78	0.36	0.39	0.47	0.78	0.36	0.31	0.31	0.78	0.37	0.31	0.31
Median	0.89	0.84	0.87	0.88	0.69	0.66	0.82	0.86	0.69	0.55	0.72	0.80	0.69	0.46	0.59	0.68	0.69	0.37	0.42	0.50	0.69	0.34	0.33	0.39
Mean	0.83	0.78	0.82	0.84	0.71	0.61	0.77	0.83	0.71	0.51	0.67	0.77	0.71	0.42	0.54	0.65	0.71	0.35	0.38	0.46	0.71	0.33	0.32	0.37
Trimmed mean (5% trimming)	0.84	0.78	0.83	0.85	0.70	0.62	0.78	0.84	0.70	0.52	0.69	0.78	0.70	0.43	0.55	0.66	0.70	0.35	0.40	0.48	0.70	0.33	0.33	0.39
Discounted MSFE (0.90)	0.80	0.76	0.83	0.86	0.70	0.60	0.78	0.84	0.70	0.51	0.69	0.78	0.70	0.42	0.56	0.66	0.70	0.35	0.40	0.48	0.70	0.33	0.33	0.39
Discounted MSFE (0.95)	0.81	0.78	0.84	0.86	0.70	0.62	0.79	0.84	0.70	0.52	0.70	0.79	0.70	0.43	0.57	0.67	0.70	0.35	0.41	0.48	0.70	0.33	0.33	0.39
Discounted MSFE (1.00)	0.82	0.79	0.85	0.86	0.70	0.63	0.80	0.85	0.70	0.53	0.71	0.79	0.70	0.44	0.58	0.67	0.70	0.36	0.41	0.48	0.70	0.33	0.33	0.39
Squared discounted MSFE	0.77	0.75	0.84	0.87	0.69	0.60	0.79	0.85	0.69	0.50	0.70	0.79	0.69	0.42	0.57	0.67	0.69	0.35	0.42	0.49	0.69	0.33	0.34	0.40
Squared discounted MSFE	0.77	0.75	0.84	0.87	0.69	0.60	0.79	0.85	0.69	0.50	0.70	0.79	0.69	0.42	0.57	0.67	0.69	0.35	0.42	0.49	0.69	0.33	0.34	0.40
Squared discounted MSFE	0.82	0.81	0.88	0.88	0.69	0.65	0.82	0.86	0.69	0.55	0.73	0.80	0.69	0.46	0.60	0.69	0.69	0.37	0.43	0.49	0.69	0.34	0.35	0.39
Recent best (past four quarters)	0.66	0.57	0.71	0.82	0.75	0.47	0.67	0.81	0.75	0.41	0.56	0.71	0.75	0.37	0.43	0.54	0.75	0.32	0.37	0.46	0.75	0.32	0.35	0.46

Table A2: Continued

Intercept correction factor	0.0				0.3				0.5				0.7				0.9				1			
Horizon	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**
GROSS CAPITAL FORMATION																								
RMSFE Random walk	19.56	28.08	38.17	46.70	19.56	28.08	38.17	46.70	19.56	28.08	38.17	46.70	19.56	28.08	38.17	46.70	19.56	28.08	38.17	46.70	19.56	28.08	38.17	46.70
AR(1)	1.05	1.02	1.00	1.05	0.89	0.96	0.98	1.04	0.89	0.93	0.95	0.99	0.89	0.91	0.92	0.90	0.89	0.90	0.89	0.75	0.89	0.89	0.89	0.68
AR(4)	1.10	1.06	1.13	1.23	1.03	0.98	1.10	1.22	1.03	0.94	1.04	1.16	1.03	0.91	0.97	1.04	1.03	0.90	0.89	0.84	1.03	0.89	0.87	0.71
Median	1.00	0.99	0.99	1.00	1.00	0.96	0.98	0.99	1.00	0.94	0.95	0.94	1.00	0.93	0.92	0.85	1.00	0.93	0.90	0.73	1.00	0.93	0.90	0.67
Mean	1.02	1.00	1.00	1.02	0.97	0.96	0.98	1.01	0.97	0.94	0.96	0.97	0.97	0.92	0.92	0.88	0.97	0.92	0.90	0.74	0.97	0.92	0.90	0.67
Trimmed mean (5% trimming)	1.02	1.00	0.99	1.00	0.98	0.96	0.97	0.99	0.98	0.94	0.95	0.95	0.98	0.93	0.92	0.86	0.98	0.93	0.91	0.73	0.98	0.93	0.91	0.66
Discounted MSFE (0.90)	1.01	1.00	0.99	1.00	0.96	0.96	0.97	0.99	0.96	0.94	0.95	0.95	0.96	0.93	0.92	0.87	0.96	0.92	0.90	0.74	0.96	0.92	0.90	0.67
Discounted MSFE (0.95)	1.01	1.00	0.99	1.00	0.96	0.96	0.97	0.99	0.96	0.94	0.95	0.95	0.96	0.93	0.92	0.87	0.96	0.92	0.90	0.74	0.96	0.92	0.90	0.67
Discounted MSFE (1.00)	1.01	0.99	0.99	0.99	0.96	0.96	0.97	0.98	0.96	0.94	0.95	0.95	0.96	0.93	0.92	0.87	0.96	0.92	0.90	0.74	0.96	0.92	0.90	0.67
Squared discounted MSFE (0.90)	1.01	0.99	0.98	0.98	0.95	0.96	0.97	0.97	0.95	0.94	0.95	0.94	0.95	0.93	0.92	0.87	0.95	0.92	0.90	0.75	0.95	0.92	0.90	0.68
Squared discounted MSFE (0.95)	1.01	0.99	0.98	0.98	0.95	0.96	0.97	0.97	0.95	0.94	0.95	0.94	0.95	0.93	0.92	0.87	0.95	0.92	0.90	0.75	0.95	0.92	0.90	0.68
Squared discounted MSFE (1.00)	1.01	0.99	0.98	0.97	0.94	0.95	0.97	0.96	0.94	0.94	0.94	0.93	0.94	0.93	0.92	0.86	0.94	0.92	0.90	0.74	0.94	0.92	0.90	0.68
Recent best (past four quarters)	1.01	0.99	0.99	1.00	0.94	0.97	0.98	0.99	0.94	0.95	0.95	1.07	0.94	0.94	0.96	0.98	0.94	0.95	0.92	0.89	0.94	0.93	0.86	0.77
EXPORTS																								
RMSFE Random walk	2.51	3.22	3.95	3.46	2.51	3.22	3.95	3.46	2.51	3.22	3.95	3.46	2.51	3.22	3.95	3.46	2.51	3.22	3.95	3.46	2.51	3.22	3.95	3.46
AR(1)	0.95	1.04	0.99	1.06	1.38	1.17	0.99	1.06	1.38	1.31	1.02	1.06	1.38	1.46	1.09	1.14	1.38	1.64	1.23	1.42	1.38	1.73	1.34	1.69
AR(4)	0.98	1.01	1.01	1.24	1.41	1.20	1.03	1.24	1.41	1.36	1.07	1.25	1.41	1.54	1.15	1.31	1.41	1.73	1.28	1.52	1.41	1.82	1.38	1.71
Median	0.99	0.98	1.00	1.07	1.24	1.06	0.99	1.06	1.24	1.17	0.99	1.04	1.24	1.31	1.04	1.06	1.24	1.47	1.16	1.33	1.24	1.55	1.26	1.63
Mean	0.97	0.98	0.97	1.01	1.26	1.09	0.96	1.00	1.26	1.20	0.97	0.99	1.26	1.35	1.03	1.04	1.26	1.52	1.16	1.33	1.26	1.61	1.27	1.62
Trimmed mean (5% trimming)	0.98	0.99	0.98	1.01	1.24	1.08	0.97	1.00	1.24	1.20	0.98	0.99	1.24	1.34	1.03	1.03	1.24	1.50	1.16	1.32	1.24	1.59	1.27	1.63
Discounted MSFE (0.90)	0.98	0.98	0.99	1.02	1.25	1.08	0.98	1.02	1.25	1.19	0.98	1.00	1.25	1.33	1.02	1.05	1.25	1.49	1.16	1.33	1.25	1.58	1.26	1.62
Discounted MSFE (0.95)	0.98	0.98	0.99	1.02	1.25	1.07	0.98	1.01	1.25	1.19	0.98	1.00	1.25	1.33	1.02	1.05	1.25	1.49	1.16	1.33	1.25	1.58	1.26	1.62
Discounted MSFE (1.00)	0.98	0.98	0.99	1.02	1.26	1.07	0.97	1.01	1.26	1.18	0.98	1.00	1.26	1.32	1.02	1.05	1.26	1.49	1.15	1.33	1.26	1.57	1.26	1.62
Squared discounted MSFE (0.90)	0.98	0.99	1.00	1.03	1.25	1.07	0.98	1.03	1.25	1.18	0.98	1.01	1.25	1.31	1.02	1.06	1.25	1.47	1.15	1.34	1.25	1.56	1.26	1.62
Squared discounted MSFE (0.95)	0.98	0.99	1.00	1.03	1.25	1.07	0.98	1.03	1.25	1.18	0.98	1.01	1.25	1.31	1.02	1.06	1.25	1.47	1.15	1.34	1.25	1.56	1.26	1.62
Squared discounted MSFE (1.00)	0.98	0.99	0.99	1.03	1.26	1.07	0.98	1.02	1.26	1.17	0.97	1.01	1.26	1.30	1.01	1.06	1.26	1.46	1.15	1.34	1.26	1.55	1.26	1.62
Recent best (past four quarters)	1.08	1.02	1.09	1.25	1.32	1.14	1.07	1.24	1.32	1.28	1.04	1.21	1.32	1.40	1.03	1.07	1.32	1.52	1.29	1.55	1.32	1.60	1.44	1.88
IMPORTS																								
RMSFE Random walk	4.95	7.67	10.79	13.69	4.95	7.67	10.79	13.69	4.95	7.67	10.79	13.69	4.95	7.67	10.79	13.69	4.95	7.67	10.79	13.69	4.95	7.67	10.79	13.69
AR(1)	0.97	0.99	1.01	1.03	1.13	0.95	0.99	1.02	1.13	0.95	0.97	0.99	1.13	0.97	0.96	0.94	1.13	1.01	0.98	0.90	1.13	1.03	1.00	0.90
AR(4)	1.12	1.06	1.04	1.08	1.37	0.99	1.02	1.07	1.37	0.98	1.01	1.03	1.37	0.99	1.02	0.93	1.37	1.03	1.09	0.83	1.37	1.06	1.14	0.80
Median	0.98	0.98	0.99	0.99	1.02	0.94	0.97	0.98	1.02	0.93	0.95	0.95	1.02	0.94	0.93	0.90	1.02	0.96	0.93	0.88	1.02	0.97	0.96	0.91
Mean	0.99	0.98	0.98	0.96	1.06	0.93	0.96	0.95	1.06	0.93	0.95	0.93	1.06	0.94	0.94	0.89	1.06	0.96	0.95	0.86	1.06	0.98	0.97	0.87
Trimmed mean (5% trimming)	0.98	0.98	0.97	0.95	1.03	0.94	0.96	0.95	1.03	0.93	0.94	0.92	1.03	0.93	0.93	0.89	1.03	0.96	0.94	0.88	1.03	0.98	0.96	0.91
Discounted MSFE (0.90)	0.98	0.97	0.96	0.95	1.05	0.93	0.95	0.94	1.05	0.93	0.94	0.92	1.05	0.94	0.93	0.89	1.05	0.96	0.95	0.86	1.05	0.98	0.97	0.87
Discounted MSFE (0.95)	0.98	0.97	0.96	0.95	1.05	0.93	0.95	0.94	1.05	0.93	0.94	0.92	1.05	0.94	0.93	0.89	1.05	0.96	0.94	0.86	1.05	0.98	0.97	0.87
Discounted MSFE (1.00)	0.98	0.97	0.96	0.95	1.05	0.93	0.95	0.94	1.05	0.92	0.93	0.92	1.05	0.94	0.93	0.89	1.05	0.96	0.94	0.86	1.05	0.98	0.97	0.87
Squared discounted MSFE (0.90)	0.97	0.97	0.95	0.94	1.05	0.93	0.94	0.93	1.05	0.92	0.93	0.92	1.05	0.94	0.92	0.89	1.05	0.96	0.94	0.87	1.05	0.98	0.97	0.87
Squared discounted MSFE (0.95)	0.97	0.97	0.95	0.94	1.05	0.93	0.94	0.93	1.05	0.92	0.93	0.92	1.05	0.94	0.92	0.89	1.05	0.96	0.94	0.87	1.05	0.98	0.97	0.87
Squared discounted MSFE (1.00)	0.97	0.97	0.95	0.94	1.04	0.93	0.94	0.93	1.04	0.92	0.92	0.92	1.04	0.93	0.92	0.89	1.04	0.96	0.94	0.87	1.04	0.98	0.96	0.87
Recent best (past four quarters)	0.97	0.98	0.96	0.92	1.14	0.93	0.96	0.92	1.14	0.95	0.96	0.94	1.14	0.94	0.96	1.01	1.14	0.95	0.94	0.90	1.14	1.02	0.94	0.90

Table A3: RMSFE of combination forecasts from ADL models (relative to the RMSFE of the random walk), dataset: 1995Q1 to 2013Q2

Intercept correction factor	0				0.3				0.5				0.7				0.9				1			
Horizon	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**
GDP																								
RMSFE Random walk	1.36	2.44	3.84	5.56	1.36	2.44	3.84	5.56	1.36	2.44	3.84	5.56	1.36	2.44	3.84	5.56	1.36	2.44	3.84	5.56	1.36	2.44	3.84	5.56
Median	0.76	0.72	0.78	0.88	0.61	0.67	0.74	0.87	0.61	0.68	0.68	0.82	0.61	0.71	0.59	0.71	0.61	0.76	0.51	0.53	0.61	0.78	0.47	0.42
Mean	0.74	0.71	0.78	0.89	0.63	0.66	0.74	0.88	0.63	0.66	0.68	0.82	0.63	0.69	0.59	0.71	0.63	0.74	0.50	0.52	0.63	0.76	0.46	0.41
Trimmed mean (5% trimming)	0.74	0.72	0.78	0.89	0.63	0.67	0.75	0.88	0.63	0.67	0.68	0.83	0.63	0.69	0.59	0.71	0.63	0.74	0.50	0.52	0.63	0.76	0.47	0.41
Discounted MSFE (0.90)	0.73	0.71	0.79	0.90	0.63	0.65	0.75	0.88	0.63	0.64	0.69	0.83	0.63	0.66	0.60	0.72	0.63	0.71	0.50	0.52	0.63	0.73	0.45	0.38
Discounted MSFE (0.95)	0.73	0.71	0.79	0.90	0.63	0.65	0.75	0.88	0.63	0.65	0.69	0.83	0.63	0.67	0.60	0.72	0.63	0.71	0.50	0.52	0.63	0.73	0.46	0.39
Discounted MSFE (1.00)	0.74	0.71	0.79	0.90	0.63	0.66	0.75	0.88	0.63	0.65	0.69	0.83	0.63	0.67	0.60	0.72	0.63	0.72	0.50	0.52	0.63	0.74	0.46	0.39
Squared discounted MSFE (0.90)	0.72	0.71	0.81	0.92	0.63	0.64	0.77	0.90	0.63	0.63	0.71	0.85	0.63	0.64	0.62	0.73	0.63	0.68	0.51	0.52	0.63	0.69	0.45	0.37
Squared discounted MSFE (0.95)	0.72	0.71	0.81	0.92	0.63	0.64	0.77	0.90	0.63	0.63	0.71	0.85	0.63	0.64	0.62	0.73	0.63	0.68	0.51	0.52	0.63	0.69	0.45	0.37
Squared discounted MSFE (1.00)	0.74	0.71	0.81	0.92	0.63	0.65	0.77	0.91	0.63	0.64	0.70	0.85	0.63	0.66	0.61	0.73	0.63	0.70	0.50	0.52	0.63	0.72	0.46	0.38
Recent best (past four quarters)	0.77	0.76	0.68	0.76	0.64	0.73	0.67	0.75	0.64	0.69	0.66	0.75	0.64	0.69	0.51	0.67	0.64	0.68	0.52	0.52	0.64	0.70	0.43	0.36
PRIVATE CONSUMPTION																								
RMSFE Random walk	1.64	2.68	4.33	6.40	1.64	2.68	4.33	6.40	1.64	2.68	4.33	6.40	1.64	2.68	4.33	6.40	1.64	2.68	4.33	6.40	1.64	2.68	4.33	6.40
Median	0.85	0.97	0.95	1.03	0.78	0.76	0.88	1.01	0.78	0.66	0.78	0.95	0.78	0.60	0.63	0.82	0.78	0.59	0.50	0.59	0.78	0.62	0.47	0.42
Mean	0.85	0.95	0.93	1.00	0.77	0.76	0.87	0.98	0.77	0.66	0.76	0.92	0.77	0.60	0.62	0.77	0.77	0.59	0.48	0.53	0.77	0.62	0.44	0.36
Trimmed mean (5% trimming)	0.86	0.96	0.94	1.01	0.77	0.76	0.88	0.99	0.77	0.66	0.77	0.93	0.77	0.60	0.63	0.78	0.77	0.59	0.48	0.54	0.77	0.63	0.44	0.36
Discounted MSFE (0.90)	0.84	0.95	0.92	0.99	0.76	0.76	0.86	0.97	0.76	0.66	0.76	0.91	0.76	0.60	0.62	0.77	0.76	0.59	0.47	0.52	0.76	0.63	0.43	0.34
Discounted MSFE (0.95)	0.85	0.95	0.92	0.99	0.76	0.76	0.87	0.97	0.76	0.66	0.76	0.91	0.76	0.60	0.62	0.77	0.76	0.59	0.47	0.52	0.76	0.63	0.43	0.35
Discounted MSFE (1.00)	0.85	0.95	0.93	0.99	0.76	0.76	0.87	0.98	0.76	0.65	0.76	0.91	0.76	0.59	0.62	0.77	0.76	0.59	0.47	0.52	0.76	0.62	0.43	0.35
Squared discounted MSFE (0.90)	0.82	0.94	0.91	0.98	0.75	0.76	0.85	0.96	0.75	0.66	0.76	0.90	0.75	0.60	0.61	0.77	0.75	0.59	0.46	0.51	0.75	0.63	0.43	0.33
Squared discounted MSFE (0.95)	0.82	0.94	0.91	0.98	0.75	0.76	0.85	0.96	0.75	0.66	0.76	0.90	0.75	0.60	0.61	0.77	0.75	0.59	0.46	0.51	0.75	0.63	0.43	0.33
Squared discounted MSFE (1.00)	0.85	0.96	0.92	0.98	0.75	0.76	0.86	0.97	0.75	0.65	0.76	0.91	0.75	0.59	0.61	0.77	0.75	0.59	0.46	0.52	0.75	0.63	0.43	0.34
Recent best (past four quarters)	0.83	0.85	0.90	0.88	0.87	0.80	0.62	0.83	0.87	0.76	0.61	0.90	0.87	0.51	0.52	0.68	0.87	0.71	0.63	0.63	0.87	0.97	0.53	0.56
GOVERNMENT CONSUMPTION																								
RMSFE Random walk	5.94	6.07	4.43	6.50	5.94	6.07	4.43	6.50	5.94	6.07	4.43	6.50	5.94	6.07	4.43	6.50	5.94	6.07	4.43	6.50	5.94	6.07	4.43	6.50
Median	1.01	0.91	1.48	1.15	1.36	0.99	1.40	1.13	1.36	1.10	1.30	1.06	1.36	1.25	1.18	0.93	1.36	1.41	1.14	0.79	1.36	1.52	1.19	0.81
Mean	0.99	0.91	1.46	1.14	1.33	0.99	1.39	1.12	1.33	1.09	1.29	1.06	1.33	1.24	1.18	0.94	1.33	1.40	1.15	0.82	1.33	1.51	1.21	0.84
Trimmed mean (5% trimming)	1.00	0.91	1.47	1.15	1.33	0.99	1.40	1.13	1.33	1.10	1.30	1.07	1.33	1.24	1.18	0.94	1.33	1.41	1.15	0.81	1.33	1.52	1.21	0.83
Discounted MSFE (0.90)	1.00	0.92	1.46	1.15	1.33	0.99	1.39	1.13	1.33	1.10	1.29	1.07	1.33	1.24	1.18	0.95	1.33	1.40	1.14	0.82	1.33	1.51	1.19	0.84
Discounted MSFE (0.95)	1.00	0.91	1.46	1.15	1.33	0.99	1.39	1.13	1.33	1.10	1.29	1.07	1.33	1.24	1.18	0.95	1.33	1.40	1.14	0.82	1.33	1.51	1.20	0.85
Discounted MSFE (1.00)	0.99	0.91	1.46	1.15	1.33	0.99	1.39	1.13	1.33	1.10	1.29	1.07	1.33	1.24	1.18	0.94	1.33	1.40	1.15	0.82	1.33	1.51	1.20	0.85
Squared discounted MSFE (0.90)	1.00	0.92	1.46	1.16	1.33	0.99	1.39	1.14	1.33	1.10	1.29	1.07	1.33	1.24	1.17	0.95	1.33	1.40	1.13	0.82	1.33	1.51	1.18	0.84
Squared discounted MSFE (0.95)	1.00	0.92	1.46	1.16	1.33	0.99	1.39	1.14	1.33	1.10	1.29	1.07	1.33	1.24	1.17	0.95	1.33	1.40	1.13	0.82	1.33	1.51	1.18	0.84
Squared discounted MSFE (1.00)	1.00	0.91	1.46	1.15	1.33	0.99	1.39	1.13	1.33	1.10	1.29	1.07	1.33	1.24	1.18	0.95	1.33	1.41	1.14	0.83	1.33	1.51	1.20	0.86
Recent best (past four quarters)	1.07	1.34	1.42	1.22	1.18	1.15	1.25	1.21	1.18	1.12	1.22	1.17	1.18	1.24	1.46	1.02	1.18	1.39	1.27	0.83	1.18	1.37	1.11	0.78
FIXED INVESTMENT																								
RMSFE Random walk	7.07	12.17	19.53	28.54	7.07	12.17	19.53	28.54	7.07	12.17	19.53	28.54	7.07	12.17	19.53	28.54	7.07	12.17	19.53	28.54	7.07	12.17	19.53	28.54
Median	0.77	0.73	0.84	0.91	0.63	0.57	0.78	0.89	0.63	0.47	0.69	0.83	0.63	0.38	0.54	0.70	0.63	0.31	0.39	0.50	0.63	0.29	0.33	0.41
Mean	0.77	0.72	0.83	0.90	0.62	0.56	0.78	0.89	0.62	0.46	0.68	0.83	0.62	0.37	0.54	0.69	0.62	0.30	0.38	0.48	0.62	0.28	0.32	0.38
Trimmed mean (5% trimming)	0.77	0.73	0.84	0.91	0.63	0.56	0.78	0.89	0.63	0.46	0.68	0.83	0.63	0.37	0.54	0.70	0.63	0.30	0.38	0.49	0.63	0.28	0.32	0.39
Discounted MSFE (0.90)	0.77	0.72	0.83	0.90	0.62	0.56	0.77	0.88	0.62	0.46	0.68	0.82	0.62	0.37	0.54	0.69	0.62	0.30	0.38	0.49	0.62	0.28	0.32	0.38
Discounted MSFE (0.95)	0.77	0.72	0.83	0.90	0.63	0.56	0.78	0.89	0.63	0.46	0.68	0.83	0.63	0.37	0.54	0.69	0.63	0.30	0.38	0.49	0.63	0.28	0.32	0.38
Discounted MSFE (1.00)	0.77	0.72	0.84	0.90	0.62	0.56	0.78	0.89	0.62	0.46	0.68	0.83	0.62	0.37	0.54	0.69	0.62	0.30	0.38	0.49	0.62	0.28	0.32	0.38
Squared discounted MSFE (0.90)	0.76	0.72	0.83	0.90	0.62	0.56	0.77	0.88	0.62	0.46	0.68	0.82	0.62	0.37	0.54	0.70	0.62	0.30	0.38	0.49	0.62	0.28	0.32	0.39
Squared discounted MSFE (0.95)	0.76	0.72	0.83	0.90	0.62	0.56	0.77	0.88	0.62	0.46	0.68	0.82	0.62	0.37	0.54	0.70	0.62	0.30	0.38	0.49	0.62	0.28	0.32	0.39
Squared discounted MSFE (1.00)	0.76	0.72	0.84	0.90	0.63	0.56	0.78	0.89	0.63	0.46	0.68	0.83	0.63	0.37	0.54	0.70	0.63	0.31	0.38	0.49	0.63	0.29	0.32	0.39
Recent best (past four quarters)	0.67	0.75	0.77	0.81	0.60	0.63	0.74	0.82	0.60	0.56	0.75	0.80	0.60	0.53	0.65	0.69	0.60	0.38	0.43	0.57	0.60	0.31	0.39	0.31

Table A3: continued

Intercept correction	0				0.3				0.5				0.7				0.9				1			
Horizon	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
GROSS CAPITAL FORMATION																								
RMSFE Random walk	19.56	28.08	38.17	46.70	19.56	28.08	38.17	46.70	19.56	28.08	38.17	46.70	19.56	28.08	38.17	46.70	19.56	28.08	38.17	46.70	19.56	28.08	38.17	46.70
Median	1.12	1.04	1.03	1.12	0.86	0.98	1.00	1.11	0.86	0.94	0.94	1.06	0.86	0.92	0.87	0.96	0.86	0.90	0.79	0.80	0.86	0.89	0.75	0.71
Mean	1.12	1.04	1.03	1.11	0.86	0.97	0.99	1.10	0.86	0.94	0.94	1.05	0.86	0.91	0.86	0.95	0.86	0.90	0.79	0.79	0.86	0.90	0.75	0.69
Trimmed mean (5% trimming)	1.12	1.04	1.03	1.11	0.86	0.97	1.00	1.10	0.86	0.94	0.94	1.05	0.86	0.91	0.87	0.95	0.86	0.90	0.79	0.79	0.86	0.90	0.75	0.69
Discounted MSFE (0.90)	1.11	1.04	1.02	1.11	0.86	0.97	0.99	1.10	0.86	0.94	0.94	1.05	0.86	0.91	0.86	0.95	0.86	0.90	0.79	0.79	0.86	0.89	0.75	0.69
Discounted MSFE (0.95)	1.12	1.04	1.02	1.11	0.86	0.97	0.99	1.10	0.86	0.94	0.94	1.05	0.86	0.91	0.86	0.95	0.86	0.90	0.79	0.79	0.86	0.90	0.75	0.69
Discounted MSFE (1.00)	1.12	1.04	1.02	1.11	0.86	0.97	0.99	1.10	0.86	0.94	0.94	1.05	0.86	0.91	0.86	0.95	0.86	0.90	0.79	0.79	0.86	0.90	0.75	0.69
Squared discounted MSFE (0.90)	1.11	1.03	1.02	1.11	0.86	0.97	0.99	1.10	0.86	0.94	0.94	1.05	0.86	0.91	0.86	0.95	0.86	0.90	0.79	0.79	0.86	0.89	0.75	0.69
Squared discounted MSFE (0.95)	1.11	1.03	1.02	1.11	0.86	0.97	0.99	1.10	0.86	0.94	0.94	1.05	0.86	0.91	0.86	0.95	0.86	0.90	0.79	0.79	0.86	0.89	0.75	0.69
Squared discounted MSFE (1.00)	1.12	1.04	1.02	1.11	0.86	0.97	0.99	1.10	0.86	0.94	0.94	1.05	0.86	0.91	0.86	0.95	0.86	0.90	0.79	0.79	0.86	0.90	0.75	0.69
Recent best (past four quarters)	1.18	1.05	0.88	1.05	0.94	1.00	0.89	1.05	0.94	1.03	0.88	1.03	0.94	0.99	0.93	0.95	0.94	0.99	0.78	0.75	0.94	0.97	0.66	0.81
EXPORTS																								
RMSFE Random walk	2.51	3.22	3.95	3.46	2.51	3.22	3.95	3.46	2.51	3.22	3.95	3.46	2.51	3.22	3.95	3.46	2.51	3.22	3.95	3.46	2.51	3.22	3.95	3.46
Median	1.02	0.94	0.97	1.13	1.16	1.06	0.99	1.13	1.16	1.18	1.02	1.15	1.16	1.33	1.09	1.21	1.16	1.50	1.21	1.41	1.16	1.58	1.31	1.59
Mean	1.02	0.94	0.96	1.12	1.17	1.05	0.98	1.13	1.17	1.18	1.03	1.14	1.17	1.33	1.11	1.21	1.17	1.50	1.24	1.40	1.17	1.59	1.35	1.55
Trimmed mean (5% trimming)	1.02	0.94	0.97	1.13	1.17	1.05	0.99	1.13	1.17	1.18	1.03	1.15	1.17	1.33	1.11	1.22	1.17	1.49	1.25	1.41	1.17	1.58	1.36	1.56
Discounted MSFE (0.90)	1.02	0.93	0.97	1.11	1.17	1.05	0.99	1.12	1.17	1.17	1.03	1.13	1.17	1.32	1.12	1.19	1.17	1.49	1.25	1.36	1.17	1.58	1.37	1.50
Discounted MSFE (0.95)	1.02	0.94	0.97	1.12	1.17	1.05	0.99	1.12	1.17	1.18	1.03	1.14	1.17	1.33	1.12	1.20	1.17	1.49	1.25	1.37	1.17	1.58	1.36	1.52
Discounted MSFE (1.00)	1.02	0.94	0.97	1.12	1.17	1.05	0.99	1.12	1.17	1.18	1.03	1.14	1.17	1.33	1.12	1.20	1.17	1.50	1.25	1.39	1.17	1.58	1.36	1.54
Squared discounted MSFE (0.90)	1.01	0.93	0.96	1.09	1.16	1.04	0.98	1.10	1.16	1.16	1.04	1.12	1.16	1.31	1.13	1.17	1.16	1.48	1.27	1.32	1.16	1.57	1.39	1.45
Squared discounted MSFE (0.95)	1.01	0.93	0.96	1.09	1.16	1.04	0.98	1.10	1.16	1.16	1.04	1.12	1.16	1.31	1.13	1.17	1.16	1.48	1.27	1.32	1.16	1.57	1.39	1.45
Squared discounted MSFE (1.00)	1.02	0.93	0.97	1.11	1.17	1.05	0.99	1.12	1.17	1.18	1.04	1.13	1.17	1.33	1.13	1.20	1.17	1.50	1.26	1.37	1.17	1.58	1.37	1.53
Recent best (past four quarters)	1.52	1.17	0.92	1.29	1.20	1.15	1.07	1.32	1.20	1.02	1.14	1.40	1.20	1.06	1.37	1.86	1.20	1.12	1.76	1.51	1.20	1.37	1.60	1.66
IMPORTS																								
RMSFE Random walk	4.95	7.67	10.79	13.69	4.95	7.67	10.79	13.69	4.95	7.67	10.79	13.69	4.95	7.67	10.79	13.69	4.95	7.67	10.79	13.69	4.95	7.67	10.79	13.69
Median	1.09	1.02	1.04	1.05	0.95	0.96	1.02	1.05	0.95	0.95	0.99	1.01	0.95	0.95	0.96	0.95	0.95	0.98	0.95	0.88	0.95	0.99	0.96	0.86
Mean	1.09	1.02	1.02	1.05	0.94	0.96	1.00	1.04	0.94	0.95	0.98	1.00	0.94	0.95	0.95	0.94	0.94	0.97	0.95	0.86	0.94	0.99	0.97	0.83
Trimmed mean (5% trimming)	1.09	1.02	1.03	1.05	0.94	0.96	1.01	1.04	0.94	0.95	0.98	1.01	0.94	0.95	0.96	0.94	0.94	0.97	0.96	0.86	0.94	0.99	0.97	0.83
Discounted MSFE (0.90)	1.09	1.02	1.02	1.04	0.94	0.96	1.00	1.03	0.94	0.95	0.98	1.00	0.94	0.95	0.95	0.93	0.94	0.98	0.95	0.84	0.94	0.99	0.97	0.80
Discounted MSFE (0.95)	1.09	1.02	1.02	1.04	0.94	0.96	1.00	1.03	0.94	0.95	0.98	1.00	0.94	0.95	0.95	0.93	0.94	0.98	0.95	0.84	0.94	0.99	0.97	0.80
Discounted MSFE (1.00)	1.09	1.02	1.02	1.04	0.94	0.96	1.00	1.03	0.94	0.95	0.98	1.00	0.94	0.95	0.95	0.93	0.94	0.98	0.95	0.84	0.94	0.99	0.97	0.81
Squared discounted MSFE (0.90)	1.08	1.02	1.02	1.03	0.93	0.96	1.00	1.02	0.93	0.95	0.98	0.99	0.93	0.95	0.95	0.92	0.93	0.98	0.95	0.82	0.93	0.99	0.97	0.77
Squared discounted MSFE (0.95)	1.08	1.02	1.02	1.03	0.93	0.96	1.00	1.02	0.93	0.95	0.98	0.99	0.93	0.95	0.95	0.92	0.93	0.98	0.95	0.82	0.93	0.99	0.97	0.77
Squared discounted MSFE (1.00)	1.09	1.02	1.02	1.04	0.94	0.96	1.00	1.03	0.94	0.95	0.98	0.99	0.94	0.95	0.96	0.92	0.94	0.98	0.96	0.83	0.94	0.99	0.97	0.79
Recent best (past four quarters)	1.12	1.13	1.03	1.06	0.95	1.07	1.02	1.06	0.95	1.12	1.10	1.10	0.95	0.92	1.06	1.01	0.95	0.78	0.88	0.48	0.95	0.92	0.90	0.70

Table A4: RMSFE of combination forecasts from ADL models (relative to the RMSFE of the random walk), dataset: 2001Q1 to 2013Q2, BCS data for Cyprus included

Intercept correction	0				0.3				0.5				0.7				0.9				1			
Horizon	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
GDP																								
RMSFE Random walk	1.36	2.44	3.84	5.56	1.36	2.44	3.84	5.56	1.36	2.44	3.84	5.56	1.36	2.44	3.84	5.56	1.36	2.44	3.84	5.56	1.36	2.44	3.84	5.56
Median	0.67	0.64	0.80	0.84	0.71	0.59	0.75	0.82	0.71	0.59	0.68	0.76	0.71	0.60	0.61	0.63	0.71	0.65	0.52	0.43	0.71	0.72	0.43	0.36
Mean	0.65	0.64	0.77	0.82	0.72	0.59	0.73	0.80	0.72	0.58	0.66	0.75	0.72	0.59	0.57	0.62	0.72	0.62	0.48	0.41	0.72	0.70	0.45	0.34
Trimmed mean (5% trimming)	0.65	0.64	0.78	0.83	0.71	0.58	0.73	0.81	0.71	0.57	0.67	0.75	0.71	0.59	0.58	0.62	0.71	0.62	0.49	0.41	0.71	0.70	0.45	0.35
Discounted MSFE (0.90)	0.65	0.66	0.81	0.87	0.71	0.59	0.77	0.86	0.71	0.57	0.71	0.80	0.71	0.57	0.61	0.67	0.71	0.59	0.50	0.45	0.71	0.62	0.40	0.31
Discounted MSFE (0.95)	0.65	0.66	0.81	0.87	0.71	0.59	0.77	0.85	0.71	0.57	0.70	0.80	0.71	0.57	0.61	0.67	0.71	0.60	0.50	0.45	0.71	0.63	0.41	0.31
Discounted MSFE (1.00)	0.65	0.66	0.81	0.87	0.72	0.59	0.77	0.85	0.72	0.57	0.70	0.79	0.72	0.58	0.61	0.66	0.72	0.61	0.50	0.45	0.72	0.64	0.41	0.32
Squared discounted MSFE (0.90)	0.64	0.70	0.87	0.93	0.70	0.61	0.84	0.92	0.70	0.57	0.77	0.86	0.70	0.55	0.67	0.74	0.70	0.57	0.54	0.52	0.70	0.58	0.40	0.29
Squared discounted MSFE (0.95)	0.64	0.70	0.87	0.93	0.70	0.61	0.84	0.92	0.70	0.57	0.77	0.86	0.70	0.55	0.67	0.74	0.70	0.57	0.54	0.52	0.70	0.58	0.40	0.29
Squared discounted MSFE (1.00)	0.65	0.69	0.87	0.93	0.72	0.60	0.83	0.92	0.72	0.57	0.76	0.86	0.72	0.56	0.66	0.73	0.72	0.59	0.54	0.51	0.72	0.59	0.41	0.30
Recent best (past four quarters)	0.60	0.97	0.88	0.95	0.71	0.65	0.95	0.94	0.71	0.62	0.89	0.84	0.71	0.68	0.84	0.70	0.71	0.67	0.69	0.53	0.71	0.72	0.69	0.37
PRIVATE CONSUMPTION																								
RMSFE Random walk	1.64	2.68	4.33	6.40	1.64	2.68	4.33	6.40	1.64	2.68	4.33	6.40	1.64	2.68	4.33	6.40	1.64	2.68	4.33	6.40	1.64	2.68	4.33	6.40
Median	0.70	0.87	0.95	0.93	1.02	0.76	0.90	0.91	1.02	0.69	0.82	0.81	1.02	0.66	0.74	0.63	1.02	0.69	0.66	0.37	1.02	0.71	0.58	0.48
Mean	0.70	0.87	0.92	0.91	1.00	0.76	0.86	0.88	1.00	0.71	0.78	0.80	1.00	0.70	0.68	0.62	1.00	0.72	0.63	0.36	1.00	0.70	0.55	0.40
Trimmed mean (5% trimming)	0.71	0.89	0.94	0.92	1.03	0.77	0.89	0.89	1.03	0.72	0.80	0.81	1.03	0.70	0.69	0.62	1.03	0.73	0.64	0.35	1.03	0.70	0.55	0.41
Discounted MSFE (0.90)	0.71	0.86	0.91	0.93	1.01	0.75	0.85	0.91	1.01	0.71	0.76	0.83	1.01	0.69	0.65	0.64	1.01	0.70	0.59	0.36	1.01	0.68	0.54	0.44
Discounted MSFE (0.95)	0.71	0.86	0.91	0.93	1.01	0.75	0.85	0.91	1.01	0.70	0.76	0.82	1.01	0.68	0.65	0.64	1.01	0.70	0.59	0.36	1.01	0.68	0.55	0.43
Discounted MSFE (1.00)	0.71	0.85	0.90	0.93	1.02	0.74	0.85	0.91	1.02	0.70	0.76	0.82	1.02	0.68	0.65	0.64	1.02	0.70	0.59	0.36	1.02	0.68	0.55	0.42
Squared discounted MSFE (0.90)	0.71	0.85	0.88	0.97	1.01	0.75	0.83	0.94	1.01	0.71	0.74	0.86	1.01	0.68	0.63	0.67	1.01	0.69	0.57	0.36	1.01	0.66	0.54	0.46
Squared discounted MSFE (0.95)	0.71	0.85	0.88	0.97	1.01	0.75	0.83	0.94	1.01	0.71	0.74	0.86	1.01	0.68	0.63	0.67	1.01	0.69	0.57	0.36	1.01	0.66	0.54	0.46
Squared discounted MSFE (1.00)	0.71	0.83	0.87	0.97	1.02	0.73	0.82	0.94	1.02	0.68	0.73	0.85	1.02	0.66	0.62	0.66	1.02	0.68	0.57	0.36	1.02	0.67	0.54	0.44
Recent best (past four quarters)	0.87	1.14	1.51	0.96	1.27	1.15	1.51	0.90	1.27	1.02	1.02	0.76	1.27	1.21	0.85	0.57	1.27	1.19	0.93	0.40	1.27	1.06	0.96	1.16
GOVERNMENT CONSUMPTION																								
RMSFE Random walk	5.94	6.07	4.43	6.50	5.94	6.07	4.43	6.50	5.94	6.07	4.43	6.50	5.94	6.07	4.43	6.50	5.94	6.07	4.43	6.50	5.94	6.07	4.43	6.50
Median	0.95	0.82	1.27	1.01	1.26	0.93	1.22	1.00	1.26	1.08	1.15	0.97	1.26	1.25	1.14	0.91	1.26	1.42	1.18	0.87	1.26	1.55	1.22	0.83
Mean	0.97	0.84	1.33	1.03	1.28	0.94	1.28	1.02	1.28	1.06	1.22	0.99	1.28	1.21	1.16	0.93	1.28	1.37	1.19	0.91	1.28	1.53	1.20	0.85
Trimmed mean (5% trimming)	0.97	0.84	1.30	1.04	1.27	0.95	1.26	1.03	1.27	1.07	1.19	1.00	1.27	1.22	1.15	0.94	1.27	1.39	1.18	0.92	1.27	1.54	1.21	0.84
Discounted MSFE (0.90)	0.96	0.84	1.31	1.02	1.27	0.94	1.27	1.01	1.27	1.05	1.21	0.97	1.27	1.19	1.17	0.91	1.27	1.35	1.19	0.88	1.27	1.51	1.18	0.83
Discounted MSFE (0.95)	0.96	0.84	1.32	1.02	1.27	0.94	1.27	1.01	1.27	1.05	1.21	0.97	1.27	1.19	1.17	0.91	1.27	1.35	1.19	0.88	1.27	1.51	1.18	0.83
Discounted MSFE (1.00)	0.96	0.84	1.32	1.02	1.27	0.94	1.28	1.01	1.27	1.05	1.22	0.97	1.27	1.19	1.17	0.91	1.27	1.35	1.19	0.88	1.27	1.51	1.18	0.83
Squared discounted MSFE (0.90)	0.96	0.84	1.30	1.00	1.28	0.94	1.26	0.99	1.28	1.04	1.21	0.96	1.28	1.18	1.17	0.90	1.28	1.33	1.20	0.88	1.28	1.48	1.14	0.82
Squared discounted MSFE (0.95)	0.96	0.84	1.30	1.00	1.28	0.94	1.26	0.99	1.28	1.04	1.21	0.96	1.28	1.18	1.17	0.90	1.28	1.33	1.20	0.88	1.28	1.48	1.14	0.82
Squared discounted MSFE (1.00)	0.95	0.84	1.32	1.00	1.28	0.94	1.28	0.99	1.28	1.04	1.22	0.95	1.28	1.18	1.17	0.90	1.28	1.33	1.21	0.88	1.28	1.49	1.15	0.83
Recent best (past four quarters)	1.22	1.17	1.76	1.04	1.48	1.27	1.57	1.16	1.48	1.32	1.63	1.12	1.48	1.42	1.66	1.42	1.48	1.76	1.12	0.98	1.48	1.68	1.90	1.95
FIXED INVESTMENT																								
RMSFE Random walk	7.07	12.17	19.53	28.54	7.07	12.17	19.53	28.54	7.07	12.17	19.53	28.54	7.07	12.17	19.53	28.54	7.07	12.17	19.53	28.54	7.07	12.17	19.53	28.54
Median	0.70	0.67	0.75	0.83	0.74	0.50	0.68	0.80	0.74	0.40	0.58	0.72	0.74	0.31	0.43	0.58	0.74	0.25	0.29	0.41	0.74	0.29	0.32	0.42
Mean	0.71	0.68	0.77	0.82	0.75	0.51	0.71	0.80	0.75	0.41	0.60	0.73	0.75	0.33	0.45	0.57	0.75	0.27	0.29	0.36	0.75	0.25	0.29	0.37
Trimmed mean (5% trimming)	0.71	0.68	0.77	0.82	0.74	0.51	0.71	0.80	0.74	0.41	0.60	0.73	0.74	0.32	0.44	0.57	0.74	0.26	0.29	0.36	0.74	0.26	0.29	0.38
Discounted MSFE (0.90)	0.71	0.65	0.77	0.84	0.75	0.50	0.71	0.83	0.75	0.41	0.61	0.76	0.75	0.33	0.47	0.62	0.75	0.27	0.32	0.43	0.75	0.27	0.29	0.38
Discounted MSFE (0.95)	0.71	0.65	0.76	0.85	0.75	0.50	0.71	0.83	0.75	0.40	0.61	0.76	0.75	0.32	0.47	0.62	0.75	0.27	0.32	0.43	0.75	0.27	0.29	0.37
Discounted MSFE (1.00)	0.71	0.65	0.76	0.85	0.75	0.49	0.70	0.83	0.75	0.40	0.60	0.76	0.75	0.32	0.46	0.62	0.75	0.27	0.31	0.42	0.75	0.27	0.29	0.37
Squared discounted MSFE (0.90)	0.72	0.61	0.77	0.92	0.75	0.48	0.71	0.90	0.75	0.40	0.62	0.84	0.75	0.33	0.48	0.71	0.75	0.29	0.33	0.53	0.75	0.28	0.28	0.37
Squared discounted MSFE (0.95)	0.72	0.61	0.77	0.92	0.75	0.48	0.71	0.90	0.75	0.40	0.62	0.84	0.75	0.33	0.48	0.71	0.75	0.29	0.33	0.53	0.75	0.28	0.28	0.37
Squared discounted MSFE (1.00)	0.72	0.59	0.75	0.92	0.76	0.47	0.70	0.90	0.76	0.39	0.60	0.84	0.76	0.33	0.46	0.71	0.76	0.29	0.30	0.52	0.76	0.28	0.28	0.37
Recent best (past four quarters)	0.94	0.63	0.89	1.08	1.12	0.50	0.87	1.08	1.12	0.51	0.83	1.06	1.12	0.36	0.68	0.83	1.12	0.39	0.81	0.74	1.12	0.54	0.38	0.35

Table A4: continued

Intercept correction	0				0.3				0.5				0.7				0.9				1			
Horizon	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**
GROSS CAPITAL FORMATION																								
RMSFE Random walk	19.56	28.08	38.17	46.70	19.56	28.08	38.17	46.70	19.56	28.08	38.17	46.70	19.56	28.08	38.17	46.70	19.56	28.08	38.17	46.70	19.56	28.08	38.17	46.70
Median	1.07	1.02	1.01	1.10	0.94	0.97	0.99	1.08	0.94	0.94	0.95	1.02	0.94	0.93	0.91	0.89	0.94	0.93	0.87	0.66	0.94	0.91	0.90	0.58
Mean	1.08	1.03	1.03	1.11	0.96	0.98	1.00	1.09	0.96	0.95	0.96	1.03	0.96	0.94	0.90	0.90	0.96	0.93	0.86	0.68	0.96	0.91	0.85	0.59
Trimmed mean (5% trimming)	1.07	1.02	1.03	1.11	0.96	0.97	1.00	1.09	0.96	0.95	0.96	1.03	0.96	0.93	0.91	0.90	0.96	0.92	0.86	0.67	0.96	0.91	0.86	0.59
Discounted MSFE (0.90)	1.08	1.03	1.04	1.11	0.95	0.97	1.01	1.10	0.95	0.95	0.97	1.04	0.95	0.93	0.91	0.91	0.95	0.92	0.86	0.68	0.95	0.90	0.84	0.58
Discounted MSFE (0.95)	1.08	1.03	1.04	1.11	0.95	0.97	1.01	1.10	0.95	0.95	0.97	1.04	0.95	0.93	0.91	0.91	0.95	0.92	0.86	0.68	0.95	0.90	0.84	0.58
Discounted MSFE (1.00)	1.08	1.03	1.04	1.11	0.95	0.98	1.01	1.10	0.95	0.95	0.97	1.04	0.95	0.93	0.91	0.90	0.95	0.92	0.86	0.67	0.95	0.90	0.84	0.58
Squared discounted MSFE (0.90)	1.08	1.03	1.05	1.12	0.94	0.97	1.02	1.10	0.94	0.94	0.98	1.04	0.94	0.92	0.92	0.91	0.94	0.91	0.87	0.69	0.94	0.89	0.83	0.58
Squared discounted MSFE (0.95)	1.08	1.03	1.05	1.12	0.94	0.97	1.02	1.10	0.94	0.94	0.98	1.04	0.94	0.92	0.92	0.91	0.94	0.91	0.87	0.69	0.94	0.89	0.83	0.58
Squared discounted MSFE (1.00)	1.07	1.03	1.05	1.11	0.94	0.97	1.02	1.10	0.94	0.94	0.98	1.03	0.94	0.93	0.92	0.90	0.94	0.91	0.87	0.67	0.94	0.90	0.83	0.57
Recent best (past four quarters)	1.26	1.34	1.09	1.26	0.92	1.12	1.08	1.23	0.92	1.02	1.06	1.19	0.92	0.96	0.95	1.20	0.92	0.88	0.93	0.84	0.92	0.94	0.91	0.80
EXPORTS																								
RMSFE Random walk	2.51	3.22	3.95	3.46	2.51	3.22	3.95	3.46	2.51	3.22	3.95	3.46	2.51	3.22	3.95	3.46	2.51	3.22	3.95	3.46	2.51	3.22	3.95	3.46
Median	1.04	0.91	0.92	0.96	1.28	1.07	0.96	0.97	1.28	1.20	1.05	1.01	1.28	1.35	1.19	1.08	1.28	1.55	1.30	1.27	1.28	1.66	1.34	1.63
Mean	1.05	0.90	0.84	0.98	1.27	1.05	0.88	0.98	1.27	1.20	0.94	1.00	1.27	1.36	1.04	1.06	1.27	1.55	1.19	1.20	1.27	1.63	1.33	1.49
Trimmed mean (5% trimming)	1.05	0.89	0.84	0.98	1.26	1.04	0.88	0.98	1.26	1.18	0.94	1.01	1.26	1.35	1.05	1.08	1.26	1.53	1.19	1.22	1.26	1.64	1.36	1.52
Discounted MSFE (0.90)	1.04	0.90	0.88	0.95	1.27	1.02	0.91	0.95	1.27	1.14	0.98	0.97	1.27	1.28	1.08	1.02	1.27	1.45	1.25	1.18	1.27	1.60	1.40	1.38
Discounted MSFE (0.95)	1.04	0.90	0.89	0.94	1.27	1.02	0.92	0.95	1.27	1.14	0.99	0.96	1.27	1.29	1.09	1.02	1.27	1.46	1.26	1.16	1.27	1.60	1.40	1.39
Discounted MSFE (1.00)	1.04	0.91	0.90	0.94	1.27	1.03	0.93	0.94	1.27	1.15	0.99	0.96	1.27	1.30	1.10	1.01	1.27	1.47	1.27	1.15	1.27	1.61	1.40	1.40
Squared discounted MSFE (0.90)	1.03	0.87	0.92	0.86	1.27	0.97	0.95	0.86	1.27	1.07	1.03	0.88	1.27	1.19	1.17	0.93	1.27	1.35	1.42	1.17	1.27	1.59	1.50	1.32
Squared discounted MSFE (0.95)	1.03	0.87	0.92	0.86	1.27	0.97	0.95	0.86	1.27	1.07	1.03	0.88	1.27	1.19	1.17	0.93	1.27	1.35	1.42	1.17	1.27	1.59	1.50	1.32
Squared discounted MSFE (1.00)	1.04	0.89	0.95	0.83	1.27	0.99	0.99	0.84	1.27	1.09	1.07	0.85	1.27	1.23	1.22	0.91	1.27	1.39	1.48	1.09	1.27	1.59	1.50	1.31
Recent best (past four quarters)	1.37	1.46	0.87	1.52	1.32	1.50	2.74	1.52	1.32	1.51	2.83	1.25	1.32	1.49	2.86	1.35	1.32	1.71	2.30	2.38	1.32	2.15	1.92	3.39
IMPORTS																								
RMSFE Random walk	4.95	7.67	10.79	13.69	4.95	7.67	10.79	13.69	4.95	7.67	10.79	13.69	4.95	7.67	10.79	13.69	4.95	7.67	10.79	13.69	4.95	7.67	10.79	13.69
Median	1.03	1.03	1.00	1.05	1.04	1.01	0.99	1.04	1.04	1.01	0.96	0.98	1.04	1.02	0.92	0.88	1.04	1.03	0.92	0.75	1.04	0.98	0.96	0.87
Mean	1.04	1.04	1.01	1.05	1.03	1.00	0.99	1.04	1.03	0.99	0.95	0.99	1.03	0.99	0.92	0.88	1.03	1.01	0.90	0.74	1.03	0.99	0.94	0.78
Trimmed mean (5% trimming)	1.04	1.05	1.02	1.07	1.03	1.00	1.00	1.05	1.03	0.99	0.96	1.00	1.03	1.00	0.92	0.89	1.03	1.02	0.90	0.74	1.03	0.99	0.95	0.79
Discounted MSFE (0.90)	1.05	1.05	1.01	1.07	1.01	1.01	0.99	1.05	1.01	1.01	0.96	1.00	1.01	1.01	0.92	0.87	1.01	1.04	0.91	0.64	1.01	0.99	0.95	0.69
Discounted MSFE (0.95)	1.05	1.05	1.01	1.07	1.01	1.01	0.99	1.05	1.01	1.01	0.96	0.99	1.01	1.02	0.93	0.86	1.01	1.04	0.91	0.65	1.01	0.99	0.95	0.69
Discounted MSFE (1.00)	1.05	1.05	1.01	1.06	1.02	1.01	0.99	1.05	1.02	1.01	0.96	0.99	1.02	1.02	0.93	0.86	1.02	1.05	0.91	0.65	1.02	0.99	0.95	0.70
Squared discounted MSFE (0.90)	1.05	1.07	1.03	1.10	0.99	1.03	1.00	1.08	0.99	1.03	0.97	1.02	0.99	1.04	0.94	0.88	0.99	1.06	0.92	0.59	0.99	0.99	0.96	0.61
Squared discounted MSFE (0.95)	1.05	1.07	1.03	1.10	0.99	1.03	1.00	1.08	0.99	1.03	0.97	1.02	0.99	1.04	0.94	0.88	0.99	1.06	0.92	0.59	0.99	0.99	0.96	0.61
Squared discounted MSFE (1.00)	1.05	1.06	1.02	1.10	1.01	1.03	1.00	1.08	1.01	1.03	0.97	1.01	1.01	1.04	0.94	0.86	1.01	1.07	0.93	0.60	1.01	1.00	0.96	0.63
Recent best (past four quarters)	1.28	1.23	0.96	1.39	1.36	1.24	0.92	1.38	1.36	1.17	0.95	1.27	1.36	1.19	0.97	1.12	1.36	1.28	0.91	0.52	1.36	1.31	1.26	0.77

Table A5: RMSFE of combination forecasts from ADL models (relative to the RMSFE of the random walk), dataset: 2001Q1 to 2013Q2, BCS data for Cyprus excluded

Intercept correction	0				0.3				0.5				0.7				0.9				1			
Horizon	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
GDP																								
RMSFE Random walk	1.36	2.44	3.84	5.56	1.36	2.44	3.84	5.56	1.36	2.44	3.84	5.56	1.36	2.44	3.84	5.56	1.36	2.44	3.84	5.56	1.36	2.44	3.84	5.56
Median	0.65	0.65	0.76	0.82	0.78	0.61	0.72	0.80	0.78	0.62	0.66	0.75	0.78	0.65	0.57	0.64	0.78	0.69	0.46	0.46	0.78	0.72	0.42	0.35
Mean	0.64	0.65	0.76	0.81	0.76	0.61	0.72	0.80	0.76	0.60	0.65	0.74	0.76	0.62	0.57	0.63	0.76	0.66	0.47	0.44	0.76	0.69	0.44	0.34
Trimmed mean (5% trimming)	0.64	0.65	0.76	0.82	0.76	0.61	0.72	0.80	0.76	0.60	0.66	0.75	0.76	0.63	0.57	0.63	0.76	0.67	0.47	0.44	0.76	0.70	0.44	0.34
Discounted MSFE (0.90)	0.63	0.65	0.77	0.82	0.74	0.59	0.73	0.81	0.74	0.57	0.66	0.76	0.74	0.57	0.57	0.64	0.74	0.60	0.46	0.43	0.74	0.62	0.41	0.30
Discounted MSFE (0.95)	0.63	0.65	0.77	0.83	0.74	0.59	0.73	0.81	0.74	0.57	0.66	0.76	0.74	0.58	0.57	0.64	0.74	0.61	0.46	0.43	0.74	0.63	0.41	0.31
Discounted MSFE (1.00)	0.63	0.65	0.77	0.83	0.74	0.59	0.73	0.81	0.74	0.58	0.66	0.76	0.74	0.58	0.57	0.64	0.74	0.61	0.46	0.43	0.74	0.63	0.41	0.31
Squared discounted MSFE (0.90)	0.62	0.66	0.79	0.84	0.71	0.59	0.75	0.83	0.71	0.56	0.69	0.78	0.71	0.54	0.59	0.66	0.71	0.56	0.46	0.43	0.71	0.58	0.41	0.29
Squared discounted MSFE (0.95)	0.62	0.66	0.79	0.84	0.71	0.59	0.75	0.83	0.71	0.56	0.69	0.78	0.71	0.54	0.59	0.66	0.71	0.56	0.46	0.43	0.71	0.58	0.41	0.29
Squared discounted MSFE (1.00)	0.63	0.66	0.79	0.85	0.71	0.59	0.75	0.83	0.71	0.56	0.68	0.78	0.71	0.55	0.58	0.66	0.71	0.58	0.47	0.43	0.71	0.60	0.42	0.29
Recent best (past four quarters)	0.62	0.64	0.90	0.83	0.73	0.79	0.89	0.83	0.73	0.73	0.86	0.89	0.73	0.75	0.89	0.64	0.73	0.65	0.69	0.40	0.73	0.69	0.69	0.37
PRIVATE CONSUMPTION																								
RMSFE Random walk	1.64	2.68	4.33	6.40	1.64	2.68	4.33	6.40	1.64	2.68	4.33	6.40	1.64	2.68	4.33	6.40	1.64	2.68	4.33	6.40	1.64	2.68	4.33	6.40
Median	0.65	0.83	0.86	0.86	1.08	0.70	0.80	0.84	1.08	0.67	0.71	0.77	1.08	0.66	0.61	0.63	1.08	0.68	0.55	0.44	1.08	0.70	0.57	0.45
Mean	0.64	0.79	0.81	0.83	1.04	0.70	0.76	0.82	1.04	0.66	0.68	0.74	1.04	0.66	0.58	0.60	1.04	0.68	0.52	0.40	1.04	0.70	0.54	0.38
Trimmed mean (5% trimming)	0.65	0.80	0.83	0.85	1.05	0.70	0.78	0.83	1.05	0.66	0.69	0.76	1.05	0.66	0.58	0.60	1.05	0.68	0.52	0.41	1.05	0.70	0.54	0.39
Discounted MSFE (0.90)	0.65	0.78	0.81	0.84	1.03	0.69	0.76	0.82	1.03	0.65	0.67	0.75	1.03	0.64	0.56	0.59	1.03	0.66	0.50	0.39	1.03	0.68	0.53	0.41
Discounted MSFE (0.95)	0.65	0.78	0.81	0.84	1.03	0.69	0.76	0.82	1.03	0.65	0.67	0.75	1.03	0.64	0.56	0.59	1.03	0.66	0.51	0.39	1.03	0.68	0.54	0.41
Discounted MSFE (1.00)	0.65	0.78	0.81	0.84	1.03	0.69	0.76	0.82	1.03	0.65	0.67	0.75	1.03	0.64	0.56	0.59	1.03	0.66	0.51	0.39	1.03	0.68	0.54	0.40
Squared discounted MSFE (0.90)	0.65	0.77	0.80	0.84	1.01	0.68	0.75	0.82	1.01	0.64	0.66	0.74	1.01	0.62	0.55	0.59	1.01	0.64	0.49	0.37	1.01	0.66	0.53	0.43
Squared discounted MSFE (0.95)	0.65	0.77	0.80	0.84	1.01	0.68	0.75	0.82	1.01	0.64	0.66	0.74	1.01	0.62	0.55	0.59	1.01	0.64	0.49	0.37	1.01	0.66	0.53	0.43
Squared discounted MSFE (1.00)	0.65	0.77	0.80	0.85	1.02	0.67	0.75	0.83	1.02	0.64	0.66	0.75	1.02	0.63	0.55	0.59	1.02	0.65	0.49	0.37	1.02	0.67	0.53	0.41
Recent best (past four quarters)	0.88	1.20	0.79	0.78	1.25	1.17	0.83	0.79	1.25	1.08	0.89	0.74	1.25	0.95	0.73	0.93	1.25	1.02	0.84	0.47	1.25	1.06	0.83	0.94
GOVERNMENT CONS																								
RMSFE Random walk	5.94	6.07	4.43	6.50	5.94	6.07	4.43	6.50	5.94	6.07	4.43	6.50	5.94	6.07	4.43	6.50	5.94	6.07	4.43	6.50	5.94	6.07	4.43	6.50
Median	0.98	0.86	1.28	0.98	1.29	0.98	1.24	0.97	1.29	1.12	1.18	0.92	1.29	1.28	1.13	0.83	1.29	1.46	1.16	0.79	1.29	1.55	1.24	0.83
Mean	1.00	0.86	1.25	0.97	1.31	0.97	1.21	0.96	1.31	1.11	1.15	0.92	1.31	1.27	1.11	0.85	1.31	1.45	1.15	0.81	1.31	1.55	1.22	0.86
Trimmed mean (5% trimming)	1.00	0.85	1.26	0.98	1.31	0.97	1.22	0.97	1.31	1.10	1.16	0.93	1.31	1.27	1.12	0.85	1.31	1.45	1.15	0.81	1.31	1.55	1.23	0.86
Discounted MSFE (0.90)	0.99	0.86	1.25	0.98	1.30	0.96	1.21	0.97	1.30	1.09	1.15	0.93	1.30	1.25	1.10	0.85	1.30	1.43	1.13	0.80	1.30	1.53	1.20	0.84
Discounted MSFE (0.95)	0.99	0.86	1.25	0.98	1.30	0.97	1.21	0.97	1.30	1.09	1.15	0.93	1.30	1.25	1.10	0.85	1.30	1.43	1.14	0.80	1.30	1.53	1.20	0.84
Discounted MSFE (1.00)	0.99	0.86	1.25	0.98	1.30	0.97	1.21	0.97	1.30	1.09	1.15	0.93	1.30	1.25	1.10	0.85	1.30	1.43	1.14	0.80	1.30	1.53	1.20	0.84
Squared discounted MSFE (0.90)	0.98	0.85	1.25	0.99	1.29	0.95	1.20	0.98	1.29	1.07	1.14	0.94	1.29	1.23	1.09	0.86	1.29	1.40	1.11	0.80	1.29	1.49	1.18	0.83
Squared discounted MSFE (0.95)	0.98	0.85	1.25	0.99	1.29	0.95	1.20	0.98	1.29	1.07	1.14	0.94	1.29	1.23	1.09	0.86	1.29	1.40	1.11	0.80	1.29	1.49	1.18	0.83
Squared discounted MSFE (1.00)	0.98	0.86	1.25	0.99	1.29	0.96	1.20	0.98	1.29	1.08	1.14	0.94	1.29	1.23	1.09	0.86	1.29	1.41	1.12	0.80	1.29	1.50	1.18	0.83
Recent best (past four quarters)	1.24	0.92	1.81	1.14	1.85	0.95	1.37	1.15	1.85	1.34	1.49	1.39	1.85	1.49	1.36	1.23	1.85	1.70	1.84	1.60	1.85	1.72	1.57	1.72
FIXED INVESTMENT																								
RMSFE Random walk	7.07	12.17	19.53	28.54	7.07	12.17	19.53	28.54	7.07	12.17	19.53	28.54	7.07	12.17	19.53	28.54	7.07	12.17	19.53	28.54	7.07	12.17	19.53	28.54
Median	0.68	0.64	0.73	0.83	0.74	0.49	0.68	0.81	0.74	0.41	0.59	0.75	0.74	0.34	0.47	0.62	0.74	0.30	0.34	0.46	0.74	0.29	0.32	0.42
Mean	0.69	0.65	0.74	0.81	0.74	0.49	0.68	0.79	0.74	0.40	0.58	0.72	0.74	0.32	0.45	0.59	0.74	0.27	0.31	0.40	0.74	0.25	0.28	0.36
Trimmed mean (5% trimming)	0.69	0.65	0.74	0.81	0.74	0.49	0.68	0.80	0.74	0.40	0.58	0.73	0.74	0.32	0.45	0.60	0.74	0.27	0.32	0.41	0.74	0.26	0.29	0.38
Discounted MSFE (0.90)	0.69	0.64	0.73	0.81	0.73	0.50	0.68	0.79	0.73	0.41	0.59	0.73	0.73	0.33	0.46	0.61	0.73	0.28	0.32	0.42	0.73	0.27	0.29	0.37
Discounted MSFE (0.95)	0.69	0.64	0.73	0.81	0.73	0.50	0.68	0.79	0.73	0.41	0.59	0.73	0.73	0.33	0.46	0.60	0.73	0.28	0.32	0.42	0.73	0.27	0.28	0.37
Discounted MSFE (1.00)	0.69	0.64	0.73	0.81	0.73	0.50	0.68	0.79	0.73	0.41	0.59	0.73	0.73	0.33	0.46	0.60	0.73	0.28	0.32	0.42	0.73	0.27	0.28	0.37
Squared discounted MSFE (0.90)	0.68	0.63	0.72	0.81	0.72	0.50	0.67	0.80	0.72	0.41	0.59	0.74	0.72	0.34	0.46	0.62	0.72	0.29	0.32	0.43	0.72	0.28	0.28	0.37
Squared discounted MSFE (0.95)	0.68	0.63	0.72	0.81	0.72	0.50	0.67	0.80	0.72	0.41	0.59	0.74	0.72	0.34	0.46	0.62	0.72	0.29	0.32	0.43	0.72	0.28	0.28	0.37
Squared discounted MSFE (1.00)	0.69	0.64	0.73	0.82	0.72	0.50	0.68	0.81	0.72	0.41	0.59	0.75	0.72	0.34	0.46	0.62	0.72	0.30	0.31	0.43	0.72	0.29	0.28	0.37
Recent best (past four quarters)	0.63	0.65	0.65	0.88	0.76	0.56	0.60	0.88	0.76	0.49	0.67	0.69	0.76	0.36	0.71	0.70	0.76	0.54	0.45	0.39	0.76	0.54	0.38	0.35

Table A5: continued

Intercept correction	0				0.3				0.5				0.7				0.9				1			
Horizon	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
GROSS CAPITAL FORMATION																								
RMSFE Random walk	19.56	28.08	38.17	46.70	19.56	28.08	38.17	46.70	19.56	28.08	38.17	46.70	19.56	28.08	38.17	46.70	19.56	28.08	38.17	46.70	19.56	28.08	38.17	46.70
Median	1.05	1.00	1.00	1.08	0.94	0.95	0.97	1.07	0.94	0.93	0.94	1.01	0.94	0.91	0.91	0.89	0.94	0.91	0.89	0.69	0.94	0.91	0.90	0.57
Mean	1.05	1.00	1.00	1.09	0.95	0.95	0.98	1.08	0.95	0.93	0.94	1.02	0.95	0.91	0.89	0.91	0.95	0.91	0.86	0.71	0.95	0.91	0.85	0.59
Trimmed mean (5% trimming)	1.05	1.00	1.00	1.09	0.95	0.95	0.98	1.08	0.95	0.93	0.94	1.02	0.95	0.91	0.89	0.90	0.95	0.91	0.86	0.71	0.95	0.91	0.86	0.59
Discounted MSFE (0.90)	1.05	1.00	1.01	1.10	0.94	0.95	0.98	1.09	0.94	0.92	0.94	1.03	0.94	0.91	0.89	0.91	0.94	0.90	0.85	0.71	0.94	0.90	0.84	0.58
Discounted MSFE (0.95)	1.05	1.00	1.01	1.10	0.94	0.95	0.98	1.09	0.94	0.92	0.94	1.03	0.94	0.91	0.89	0.91	0.94	0.90	0.85	0.71	0.94	0.90	0.84	0.58
Discounted MSFE (1.00)	1.05	1.00	1.01	1.10	0.94	0.95	0.98	1.09	0.94	0.92	0.94	1.03	0.94	0.91	0.89	0.91	0.94	0.90	0.85	0.71	0.94	0.90	0.84	0.58
Squared discounted MSFE (0.90)	1.05	0.99	1.01	1.11	0.93	0.95	0.99	1.10	0.93	0.92	0.95	1.04	0.93	0.90	0.90	0.93	0.93	0.89	0.85	0.72	0.93	0.89	0.83	0.58
Squared discounted MSFE (0.95)	1.05	0.99	1.01	1.11	0.93	0.95	0.99	1.10	0.93	0.92	0.95	1.04	0.93	0.90	0.90	0.93	0.93	0.89	0.85	0.72	0.93	0.89	0.83	0.58
Squared discounted MSFE (1.00)	1.05	0.99	1.02	1.11	0.93	0.95	0.99	1.10	0.93	0.92	0.95	1.04	0.93	0.90	0.90	0.92	0.93	0.89	0.85	0.71	0.93	0.89	0.83	0.57
Recent best (past four quarters)	1.07	1.09	1.04	1.30	1.02	1.16	1.03	1.28	1.02	0.98	1.10	1.25	1.02	0.97	1.04	1.16	1.02	1.01	0.93	0.75	1.02	0.89	0.91	0.81
EXPORTS																								
RMSFE Random walk	2.51	3.22	3.95	3.46	2.51	3.22	3.95	3.46	2.51	3.22	3.95	3.46	2.51	3.22	3.95	3.46	2.51	3.22	3.95	3.46	2.51	3.22	3.95	3.46
Median	0.99	0.97	0.98	1.02	1.31	1.11	0.98	1.02	1.31	1.24	1.01	1.03	1.31	1.39	1.09	1.09	1.31	1.56	1.24	1.36	1.31	1.66	1.34	1.62
Mean	0.99	0.97	0.94	1.02	1.31	1.10	0.96	1.02	1.31	1.22	1.00	1.03	1.31	1.38	1.09	1.08	1.31	1.55	1.23	1.27	1.31	1.64	1.33	1.46
Trimmed mean (5% trimming)	0.99	0.97	0.96	1.03	1.30	1.10	0.98	1.03	1.30	1.23	1.02	1.04	1.30	1.38	1.10	1.09	1.30	1.55	1.25	1.30	1.30	1.64	1.35	1.49
Discounted MSFE (0.90)	0.98	0.98	0.98	1.03	1.30	1.08	1.00	1.03	1.30	1.20	1.04	1.03	1.30	1.34	1.14	1.08	1.30	1.51	1.30	1.22	1.30	1.60	1.40	1.35
Discounted MSFE (0.95)	0.98	0.98	0.98	1.02	1.30	1.08	1.00	1.02	1.30	1.20	1.04	1.03	1.30	1.34	1.14	1.08	1.30	1.51	1.30	1.23	1.30	1.60	1.40	1.36
Discounted MSFE (1.00)	0.98	0.98	0.97	1.02	1.30	1.08	0.99	1.02	1.30	1.20	1.04	1.03	1.30	1.35	1.14	1.08	1.30	1.52	1.30	1.23	1.30	1.61	1.41	1.37
Squared discounted MSFE (0.90)	0.97	0.99	0.99	1.03	1.29	1.07	1.02	1.04	1.29	1.18	1.07	1.04	1.29	1.31	1.19	1.08	1.29	1.48	1.37	1.19	1.29	1.58	1.50	1.31
Squared discounted MSFE (0.95)	0.97	0.99	0.99	1.03	1.29	1.07	1.02	1.04	1.29	1.18	1.07	1.04	1.29	1.31	1.19	1.08	1.29	1.48	1.37	1.19	1.29	1.58	1.50	1.31
Squared discounted MSFE (1.00)	0.98	0.99	0.99	1.02	1.29	1.08	1.01	1.02	1.29	1.19	1.07	1.03	1.29	1.33	1.19	1.07	1.29	1.50	1.38	1.18	1.29	1.59	1.51	1.29
Recent best (past four quarters)	1.57	2.21	1.01	1.17	1.11	1.81	1.39	1.18	1.11	1.91	1.20	1.31	1.11	1.91	1.19	1.39	1.11	2.11	1.46	1.65	1.11	2.15	1.83	3.28
IMPORTS																								
RMSFE Random walk	4.95	7.67	10.79	13.69	4.95	7.67	10.79	13.69	4.95	7.67	10.79	13.69	4.95	7.67	10.79	13.69	4.95	7.67	10.79	13.69	4.95	7.67	10.79	13.69
Median	0.98	1.00	1.00	1.01	1.03	0.94	0.98	1.00	1.03	0.93	0.96	0.97	1.03	0.94	0.94	0.91	1.03	0.96	0.94	0.85	1.03	0.98	0.96	0.85
Mean	0.98	0.99	0.98	1.01	1.05	0.95	0.96	1.00	1.05	0.94	0.94	0.96	1.05	0.96	0.93	0.89	1.05	0.98	0.93	0.80	1.05	1.00	0.95	0.77
Trimmed mean (5% trimming)	0.98	0.99	0.99	1.02	1.05	0.95	0.97	1.00	1.05	0.94	0.95	0.97	1.05	0.95	0.93	0.89	1.05	0.98	0.93	0.80	1.05	0.99	0.95	0.77
Discounted MSFE (0.90)	0.98	0.99	0.98	1.01	1.05	0.95	0.96	1.00	1.05	0.95	0.94	0.96	1.05	0.96	0.93	0.88	1.05	0.98	0.94	0.74	1.05	1.00	0.96	0.68
Discounted MSFE (0.95)	0.98	0.98	0.98	1.01	1.06	0.95	0.96	1.00	1.06	0.95	0.94	0.96	1.06	0.96	0.93	0.88	1.06	0.98	0.94	0.74	1.06	1.00	0.96	0.68
Discounted MSFE (1.00)	0.98	0.98	0.98	1.01	1.06	0.95	0.96	1.00	1.06	0.95	0.94	0.96	1.06	0.96	0.93	0.88	1.06	0.98	0.94	0.75	1.06	1.00	0.96	0.69
Squared discounted MSFE (0.90)	0.98	0.98	0.98	1.02	1.05	0.95	0.96	1.01	1.05	0.95	0.95	0.97	1.05	0.96	0.93	0.88	1.05	0.98	0.94	0.70	1.05	1.00	0.97	0.61
Squared discounted MSFE (0.95)	0.98	0.98	0.98	1.02	1.05	0.95	0.96	1.01	1.05	0.95	0.95	0.97	1.05	0.96	0.93	0.88	1.05	0.98	0.94	0.70	1.05	1.00	0.97	0.61
Squared discounted MSFE (1.00)	0.98	0.98	0.98	1.03	1.06	0.95	0.96	1.02	1.06	0.95	0.95	0.97	1.06	0.96	0.93	0.88	1.06	0.99	0.94	0.71	1.06	1.01	0.97	0.62
Recent best (past four quarters)	1.17	1.29	1.01	1.47	0.92	0.98	0.94	1.41	0.92	1.04	1.02	1.54	0.92	0.96	1.07	1.28	0.92	1.28	1.25	0.55	0.92	1.35	1.26	0.79

Table A6: Forecasting changes in inventories, RMSFE (relative to RMSFE of the random walk)

Intercept correction factor	0				0.3				0.5				0.7				0.9				1			
Horizon	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**
RMSFE Random walk	72.22	67.91	76.63	72.67	72.22	67.91	76.63	72.67	72.22	67.91	76.63	72.67	72.22	67.91	76.63	72.67	72.22	67.91	76.63	72.67	72.22	67.91	76.63	72.67
Dataset: 1995Q1 to 2013Q2																								
Univariate models																								
Random walk	0.85	0.90	0.81	0.81																				
AR(1)	0.87	0.91	0.82	0.81	1.04	0.92	0.82	0.81	1.04	0.97	0.84	0.81	1.04	1.04	0.90	0.84	1.04	1.13	1.02	0.96	1.04	1.18	1.11	1.08
AR(4)	0.88	0.91	0.83	0.83	1.05	0.92	0.84	0.83	1.05	0.97	0.87	0.83	1.05	1.03	0.93	0.86	1.05	1.12	1.06	0.99	1.05	1.17	1.15	1.12
Combinations from univariate models																								
Median	0.86	0.90	0.81	0.81	1.05	0.92	0.82	0.80	1.05	0.96	0.84	0.81	1.05	1.03	0.90	0.85	1.05	1.13	1.02	0.98	1.05	1.18	1.11	1.11
Mean	0.86	0.90	0.80	0.80	1.06	0.92	0.82	0.81	1.06	0.97	0.84	0.81	1.06	1.05	0.90	0.86	1.06	1.14	1.03	0.99	1.06	1.19	1.12	1.12
Trimmed mean (5% trimming)	0.86	0.90	0.80	0.80	1.06	0.92	0.82	0.81	1.06	0.97	0.84	0.81	1.06	1.04	0.90	0.85	1.06	1.13	1.02	0.98	1.06	1.18	1.11	1.11
Discounted MSFE (0.90)	0.86	0.90	0.79	0.81	1.06	0.92	0.82	0.80	1.06	0.97	0.84	0.81	1.06	1.05	0.90	0.86	1.06	1.14	1.03	0.99	1.06	1.19	1.12	1.11
Discounted MSFE (0.95)	0.86	0.90	0.80	0.81	1.06	0.92	0.82	0.80	1.06	0.97	0.84	0.81	1.06	1.05	0.90	0.86	1.06	1.14	1.03	0.99	1.06	1.19	1.12	1.11
Discounted MSFE (1.00)	0.86	0.90	0.80	0.80	1.06	0.92	0.82	0.80	1.06	0.97	0.84	0.81	1.06	1.05	0.90	0.86	1.06	1.14	1.03	0.99	1.06	1.19	1.12	1.11
Squared discounted MSFE (0.90)	0.86	0.90	0.79	0.82	1.06	0.92	0.82	0.80	1.06	0.97	0.84	0.81	1.06	1.05	0.90	0.86	1.06	1.14	1.03	0.99	1.06	1.19	1.12	1.11
Squared discounted MSFE (0.95)	0.86	0.90	0.79	0.82	1.06	0.92	0.82	0.80	1.06	0.97	0.84	0.81	1.06	1.05	0.90	0.86	1.06	1.14	1.03	0.99	1.06	1.19	1.12	1.11
Squared discounted MSFE (1.00)	0.86	0.90	0.80	0.81	1.06	0.92	0.82	0.80	1.06	0.97	0.84	0.81	1.06	1.05	0.90	0.86	1.06	1.14	1.03	0.99	1.06	1.19	1.12	1.11
Recent best (past four quarters)	0.91	0.99	0.91	0.97	1.07	0.93	0.83	0.82	1.07	0.99	0.87	0.82	1.07	1.04	0.94	0.84	1.07	1.13	1.08	1.04	1.07	1.18	1.19	1.17
Dataset: 2001Q1 to 2013Q2																								
Univariate models																								
Random walk	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AR(1)	1.01	1.01	1.00	1.08	1.15	1.02	1.01	1.07	1.15	1.07	1.03	1.06	1.15	1.14	1.09	1.05	1.15	1.23	1.19	1.10	1.15	1.29	1.27	1.17
AR(4)	1.09	1.05	1.05	1.14	1.26	1.04	1.06	1.13	1.26	1.07	1.09	1.13	1.26	1.13	1.16	1.14	1.26	1.22	1.28	1.21	1.26	1.27	1.36	1.29
Combinations from univariate																								
Median	1.01	1.00	0.99	1.05	1.13	1.02	1.01	1.01	1.13	1.06	1.04	1.04	1.13	1.13	1.10	1.05	1.13	1.22	1.20	1.09	1.13	1.27	1.27	1.17
Mean	1.04	0.98	0.96	1.05	1.16	1.01	1.00	1.02	1.16	1.07	1.04	1.02	1.16	1.15	1.11	1.04	1.16	1.25	1.22	1.11	1.16	1.30	1.30	1.19
Trimmed mean (5% trimming)	1.02	0.99	0.98	1.05	1.15	1.02	1.00	1.02	1.15	1.07	1.04	1.02	1.15	1.14	1.11	1.03	1.15	1.24	1.22	1.09	1.15	1.29	1.29	1.17
Discounted MSFE (0.90)	1.04	0.99	0.97	1.06	1.16	1.02	1.00	1.02	1.16	1.07	1.04	1.02	1.16	1.15	1.11	1.04	1.16	1.25	1.23	1.12	1.16	1.30	1.31	1.20
Discounted MSFE (0.95)	1.04	0.99	0.97	1.05	1.16	1.02	1.00	1.02	1.16	1.07	1.04	1.02	1.16	1.15	1.11	1.04	1.16	1.25	1.23	1.11	1.16	1.30	1.31	1.20
Discounted MSFE (1.00)	1.04	0.99	0.97	1.05	1.17	1.02	1.00	1.02	1.17	1.07	1.04	1.02	1.17	1.15	1.11	1.04	1.17	1.25	1.23	1.11	1.17	1.30	1.31	1.20
Squared discounted MSFE (0.90)	1.03	1.00	0.98	1.07	1.16	1.02	1.00	1.01	1.16	1.07	1.04	1.02	1.16	1.15	1.11	1.04	1.16	1.25	1.23	1.12	1.16	1.31	1.31	1.21
Squared discounted MSFE (0.95)	1.03	1.00	0.98	1.07	1.16	1.02	1.00	1.01	1.16	1.07	1.04	1.02	1.16	1.15	1.11	1.04	1.16	1.25	1.23	1.12	1.16	1.31	1.31	1.21
Squared discounted MSFE (1.00)	1.04	0.99	0.97	1.05	1.17	1.02	1.00	1.01	1.17	1.07	1.04	1.01	1.17	1.15	1.11	1.04	1.17	1.25	1.23	1.12	1.17	1.30	1.31	1.21
Recent best (past four quarters)	1.13	1.04	1.15	1.32	1.19	1.05	1.04	1.11	1.19	1.13	1.07	1.11	1.19	1.21	1.19	1.11	1.19	1.30	1.37	1.19	1.19	1.35	1.49	1.28
ADL models																								
Inventories from Business surveys (AIC)	1.14	1.10	1.10	1.34	1.17	1.09	1.10	1.34	1.17	1.10	1.11	1.34	1.17	1.11	1.13	1.33	1.17	1.12	1.16	1.28	1.17	1.12	1.18	1.23
Inventories from Business surveys (BIC)	1.08	1.09	1.07	1.10	1.05	1.06	1.08	1.09	1.05	1.05	1.09	1.09	1.05	1.05	1.10	1.08	1.05	1.06	1.12	1.06	1.05	1.07	1.13	1.05

Table A7: RMSFE of combination forecasts from ADL models with real economy predictors (relative to the RMSFE of the random walk), dataset: 1995Q1 to 2013Q2

Intercept correction	0				0.3				0.5				0.7				0.9				1			
Horizon	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**
GDP																								
RMSFE Random walk	1.36	2.44	3.84	5.56	1.36	2.44	3.84	5.56	1.36	2.44	3.84	5.56	1.36	2.44	3.84	5.56	1.36	2.44	3.84	5.56	1.36	2.44	3.84	5.56
Median	0.75	0.76	0.78	0.90	0.63	0.71	0.74	0.89	0.63	0.72	0.68	0.84	0.63	0.76	0.59	0.73	0.63	0.82	0.51	0.55	0.63	0.85	0.48	0.44
Mean	0.73	0.74	0.78	0.91	0.63	0.70	0.75	0.90	0.63	0.70	0.68	0.85	0.63	0.74	0.59	0.74	0.63	0.79	0.50	0.56	0.63	0.83	0.47	0.45
Trimmed mean (5% trimming)	0.74	0.74	0.78	0.91	0.63	0.70	0.74	0.89	0.63	0.71	0.68	0.84	0.63	0.75	0.59	0.73	0.63	0.81	0.50	0.56	0.63	0.85	0.47	0.45
Discounted MSFE (0.90)	0.72	0.73	0.79	0.91	0.63	0.69	0.75	0.90	0.63	0.69	0.68	0.85	0.63	0.72	0.59	0.74	0.63	0.78	0.49	0.55	0.63	0.82	0.45	0.43
Discounted MSFE (0.95)	0.73	0.74	0.79	0.91	0.63	0.69	0.75	0.90	0.63	0.69	0.68	0.85	0.63	0.73	0.59	0.74	0.63	0.78	0.49	0.55	0.63	0.82	0.45	0.44
Discounted MSFE (1.00)	0.73	0.74	0.79	0.91	0.63	0.69	0.75	0.90	0.63	0.70	0.68	0.85	0.63	0.73	0.59	0.74	0.63	0.79	0.49	0.55	0.63	0.82	0.46	0.44
Squared discounted MSFE (0.90)	0.71	0.73	0.79	0.92	0.64	0.67	0.75	0.90	0.64	0.67	0.69	0.85	0.64	0.70	0.59	0.74	0.64	0.76	0.48	0.55	0.64	0.80	0.43	0.42
Squared discounted MSFE (0.95)	0.71	0.73	0.79	0.92	0.64	0.67	0.75	0.90	0.64	0.67	0.69	0.85	0.64	0.70	0.59	0.74	0.64	0.76	0.48	0.55	0.64	0.80	0.43	0.42
Squared discounted MSFE (1.00)	0.73	0.74	0.79	0.92	0.64	0.69	0.75	0.91	0.64	0.69	0.68	0.85	0.64	0.72	0.59	0.74	0.64	0.78	0.48	0.55	0.64	0.82	0.44	0.43
Recent best (past four quarters)	0.67	0.76	0.82	0.88	0.90	0.66	0.79	0.87	0.90	0.59	0.80	0.86	0.90	0.50	0.70	0.78	0.90	0.56	0.50	0.55	0.90	0.60	0.37	0.31
PRIVATE CONSUMPTION																								
RMSFE Random walk	1.64	2.68	4.33	6.40	1.64	2.68	4.33	6.40	1.64	2.68	4.33	6.40	1.64	2.68	4.33	6.40	1.64	2.68	4.33	6.40	1.64	2.68	4.33	6.40
Median	0.82	0.95	0.96	1.04	0.79	0.74	0.90	1.02	0.79	0.65	0.78	0.96	0.79	0.61	0.63	0.83	0.79	0.63	0.52	0.62	0.79	0.66	0.52	0.49
Mean	0.80	0.90	0.92	1.00	0.76	0.73	0.87	0.98	0.76	0.65	0.77	0.92	0.76	0.61	0.64	0.78	0.76	0.62	0.53	0.55	0.76	0.65	0.51	0.39
Trimmed mean (5% trimming)	0.81	0.92	0.93	1.01	0.76	0.73	0.87	0.99	0.76	0.65	0.77	0.93	0.76	0.61	0.64	0.79	0.76	0.62	0.53	0.56	0.76	0.65	0.52	0.40
Discounted MSFE (0.90)	0.79	0.90	0.92	1.00	0.76	0.73	0.87	0.98	0.76	0.65	0.77	0.92	0.76	0.61	0.64	0.79	0.76	0.63	0.53	0.54	0.76	0.66	0.52	0.38
Discounted MSFE (0.95)	0.79	0.90	0.93	1.00	0.75	0.73	0.87	0.98	0.75	0.65	0.77	0.92	0.75	0.61	0.64	0.79	0.75	0.63	0.53	0.54	0.75	0.66	0.51	0.39
Discounted MSFE (1.00)	0.80	0.90	0.93	1.00	0.75	0.73	0.87	0.98	0.75	0.65	0.77	0.92	0.75	0.61	0.64	0.79	0.75	0.63	0.53	0.54	0.75	0.65	0.51	0.39
Squared discounted MSFE (0.90)	0.77	0.89	0.93	1.00	0.75	0.73	0.87	0.98	0.75	0.65	0.77	0.92	0.75	0.61	0.64	0.79	0.75	0.63	0.53	0.53	0.75	0.66	0.52	0.38
Squared discounted MSFE (0.95)	0.77	0.89	0.93	1.00	0.75	0.73	0.87	0.98	0.75	0.65	0.77	0.92	0.75	0.61	0.64	0.79	0.75	0.63	0.53	0.53	0.75	0.66	0.52	0.38
Squared discounted MSFE (1.00)	0.80	0.90	0.93	1.00	0.75	0.73	0.87	0.98	0.75	0.65	0.77	0.92	0.75	0.61	0.64	0.79	0.75	0.63	0.53	0.54	0.75	0.66	0.51	0.38
Recent best (past four quarters)	0.76	0.88	0.84	1.07	0.77	0.88	0.89	1.07	0.77	0.81	0.81	1.05	0.77	0.81	0.79	0.80	0.77	0.51	0.64	0.85	0.77	0.37	0.62	0.50
GOVERNMENT CONSUMPTION																								
RMSFE Random walk	5.94	6.07	4.43	6.50	5.94	6.07	4.43	6.50	5.94	6.07	4.43	6.50	5.94	6.07	4.43	6.50	5.94	6.07	4.43	6.50	5.94	6.07	4.43	6.50
Median	1.01	0.93	1.48	1.15	1.36	1.02	1.41	1.13	1.36	1.13	1.29	1.06	1.36	1.28	1.17	0.92	1.36	1.44	1.13	0.78	1.36	1.54	1.18	0.79
Mean	0.99	0.95	1.50	1.17	1.30	1.02	1.43	1.15	1.30	1.13	1.31	1.08	1.30	1.28	1.18	0.95	1.30	1.45	1.13	0.80	1.30	1.54	1.17	0.81
Trimmed mean (5% trimming)	0.99	0.94	1.49	1.16	1.31	1.02	1.41	1.14	1.31	1.13	1.30	1.07	1.31	1.28	1.17	0.93	1.31	1.45	1.13	0.78	1.31	1.54	1.17	0.79
Discounted MSFE (0.90)	0.99	0.95	1.50	1.18	1.30	1.02	1.43	1.16	1.30	1.13	1.31	1.09	1.30	1.27	1.18	0.95	1.30	1.44	1.13	0.80	1.30	1.53	1.16	0.80
Discounted MSFE (0.95)	0.99	0.95	1.50	1.18	1.30	1.02	1.43	1.16	1.30	1.13	1.31	1.09	1.30	1.28	1.19	0.95	1.30	1.44	1.13	0.80	1.30	1.53	1.17	0.81
Discounted MSFE (1.00)	0.99	0.95	1.50	1.18	1.30	1.02	1.43	1.16	1.30	1.13	1.32	1.09	1.30	1.28	1.19	0.95	1.30	1.44	1.13	0.81	1.30	1.54	1.17	0.81
Squared discounted MSFE (0.90)	0.98	0.95	1.50	1.18	1.29	1.02	1.43	1.16	1.29	1.13	1.31	1.09	1.29	1.27	1.19	0.96	1.29	1.44	1.13	0.81	1.29	1.53	1.16	0.80
Squared discounted MSFE (0.95)	0.98	0.95	1.50	1.18	1.29	1.02	1.43	1.16	1.29	1.13	1.31	1.09	1.29	1.27	1.19	0.96	1.29	1.44	1.13	0.81	1.29	1.53	1.16	0.80
Squared discounted MSFE (1.00)	0.99	0.95	1.51	1.18	1.30	1.02	1.44	1.16	1.30	1.13	1.32	1.09	1.30	1.28	1.19	0.95	1.30	1.44	1.13	0.81	1.30	1.53	1.17	0.81
Recent best (past four quarters)	1.21	1.36	2.43	1.09	1.06	1.33	2.60	1.07	1.06	1.38	1.71	1.22	1.06	1.34	1.89	1.10	1.06	1.38	2.32	0.90	1.06	1.45	0.95	0.85
FIXED INVESTMENT																								
RMSFE Random walk	7.07	12.17	19.53	28.54	7.07	12.17	19.53	28.54	7.07	12.17	19.53	28.54	7.07	12.17	19.53	28.54	7.07	12.17	19.53	28.54	7.07	12.17	19.53	28.54
Median	0.78	0.73	0.84	0.91	0.62	0.57	0.79	0.89	0.62	0.47	0.69	0.83	0.62	0.39	0.55	0.71	0.62	0.32	0.40	0.51	0.62	0.30	0.35	0.41
Mean	0.77	0.72	0.83	0.90	0.62	0.56	0.77	0.88	0.62	0.47	0.68	0.83	0.62	0.38	0.54	0.70	0.62	0.32	0.40	0.50	0.62	0.31	0.34	0.40
Trimmed mean (5% trimming)	0.77	0.72	0.83	0.91	0.62	0.56	0.78	0.89	0.62	0.47	0.68	0.83	0.62	0.38	0.55	0.70	0.62	0.32	0.39	0.50	0.62	0.30	0.34	0.40
Discounted MSFE (0.90)	0.77	0.71	0.82	0.90	0.62	0.56	0.77	0.88	0.62	0.47	0.67	0.82	0.62	0.38	0.54	0.70	0.62	0.32	0.39	0.50	0.62	0.30	0.34	0.40
Discounted MSFE (0.95)	0.77	0.72	0.82	0.90	0.62	0.56	0.77	0.88	0.62	0.47	0.68	0.82	0.62	0.38	0.54	0.70	0.62	0.32	0.39	0.50	0.62	0.31	0.34	0.40
Discounted MSFE (1.00)	0.77	0.72	0.83	0.90	0.63	0.56	0.77	0.88	0.63	0.47	0.68	0.82	0.63	0.38	0.55	0.70	0.63	0.32	0.40	0.50	0.63	0.31	0.34	0.40
Squared discounted MSFE (0.90)	0.77	0.71	0.81	0.89	0.62	0.56	0.76	0.87	0.62	0.47	0.67	0.82	0.62	0.38	0.54	0.70	0.62	0.32	0.39	0.50	0.62	0.30	0.34	0.40
Squared discounted MSFE (0.95)	0.77	0.71	0.81	0.89	0.62	0.56	0.76	0.87	0.62	0.47	0.67	0.82	0.62	0.38	0.54	0.70	0.62	0.32	0.39	0.50	0.62	0.30	0.34	0.40
Squared discounted MSFE (1.00)	0.77	0.71	0.83	0.90	0.64	0.56	0.78	0.88	0.64	0.47	0.68	0.82	0.64	0.38	0.55	0.70	0.64	0.32	0.40	0.50	0.64	0.31	0.34	0.40
Recent best (past four quarters)	0.61	0.68	0.73	0.73	0.62	0.56	0.72	0.74	0.62	0.43	0.73	0.75	0.62	0.40	0.55	0.68	0.62	0.32	0.50	0.47	0.62	0.36	0.40	0.30

Table A7: continued

Intercept correction	0				0.3				0.5				0.7				0.9				1			
Horizon	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**
GROSS CAPITAL FORMATION																								
RMSFE Random walk	19.56	28.08	38.17	46.70	19.56	28.08	38.17	46.70	19.56	28.08	38.17	46.70	19.56	28.08	38.17	46.70	19.56	28.08	38.17	46.70	19.56	28.08	38.17	46.70
Median	1.10	1.03	1.03	1.12	0.86	0.97	1.00	1.11	0.86	0.93	0.94	1.06	0.86	0.91	0.86	0.96	0.86	0.89	0.78	0.80	0.86	0.89	0.74	0.71
Mean	1.09	1.02	1.01	1.10	0.86	0.96	0.98	1.09	0.86	0.92	0.92	1.04	0.86	0.90	0.85	0.95	0.86	0.88	0.77	0.80	0.86	0.88	0.74	0.71
Trimmed mean (5% trimming)	1.10	1.03	1.02	1.11	0.86	0.96	0.99	1.09	0.86	0.93	0.93	1.05	0.86	0.90	0.85	0.95	0.86	0.89	0.77	0.80	0.86	0.88	0.74	0.71
Discounted MSFE (0.90)	1.09	1.02	1.01	1.09	0.86	0.96	0.97	1.08	0.86	0.92	0.92	1.04	0.86	0.90	0.85	0.95	0.86	0.88	0.77	0.80	0.86	0.88	0.74	0.71
Discounted MSFE (0.95)	1.09	1.02	1.01	1.10	0.86	0.96	0.98	1.08	0.86	0.92	0.92	1.04	0.86	0.90	0.85	0.95	0.86	0.88	0.77	0.80	0.86	0.88	0.74	0.71
Discounted MSFE (1.00)	1.09	1.02	1.01	1.10	0.86	0.96	0.98	1.08	0.86	0.92	0.92	1.04	0.86	0.90	0.85	0.95	0.86	0.88	0.77	0.80	0.86	0.88	0.74	0.71
Squared discounted MSFE (0.90)	1.09	1.01	1.00	1.09	0.86	0.95	0.97	1.08	0.86	0.92	0.92	1.04	0.86	0.90	0.84	0.95	0.86	0.88	0.77	0.79	0.86	0.88	0.74	0.70
Squared discounted MSFE (0.95)	1.09	1.01	1.00	1.09	0.86	0.95	0.97	1.08	0.86	0.92	0.92	1.04	0.86	0.90	0.84	0.95	0.86	0.88	0.77	0.79	0.86	0.88	0.74	0.70
Squared discounted MSFE (1.00)	1.09	1.02	1.00	1.09	0.86	0.95	0.97	1.08	0.86	0.92	0.92	1.04	0.86	0.90	0.85	0.94	0.86	0.88	0.77	0.80	0.86	0.88	0.74	0.71
Recent best (past four quarters)	1.08	0.96	0.90	1.04	0.92	0.94	0.90	1.03	0.92	0.92	0.88	0.99	0.92	0.93	0.89	0.93	0.92	0.93	0.69	0.80	0.92	0.89	0.66	0.66
EXPORTS																								
RMSFE Random walk	2.51	3.22	3.95	3.46	2.51	3.22	3.95	3.46	2.51	3.22	3.95	3.46	2.51	3.22	3.95	3.46	2.51	3.22	3.95	3.46	2.51	3.22	3.95	3.46
Median	1.02	0.94	0.97	1.13	1.16	1.07	0.98	1.13	1.16	1.21	1.01	1.15	1.16	1.36	1.08	1.21	1.16	1.53	1.19	1.41	1.16	1.62	1.27	1.61
Mean	1.01	0.96	0.97	1.15	1.16	1.08	0.98	1.15	1.16	1.21	1.01	1.17	1.16	1.37	1.08	1.23	1.16	1.54	1.20	1.43	1.16	1.63	1.28	1.62
Trimmed mean (5% trimming)	1.01	0.95	0.97	1.14	1.16	1.07	0.98	1.14	1.16	1.20	1.01	1.16	1.16	1.36	1.08	1.22	1.16	1.53	1.20	1.42	1.16	1.63	1.28	1.62
Discounted MSFE (0.90)	1.00	0.95	0.97	1.15	1.16	1.08	0.98	1.15	1.16	1.21	1.01	1.17	1.16	1.36	1.08	1.23	1.16	1.54	1.20	1.42	1.16	1.63	1.29	1.59
Discounted MSFE (0.95)	1.00	0.95	0.97	1.15	1.16	1.08	0.98	1.15	1.16	1.21	1.01	1.17	1.16	1.37	1.08	1.23	1.16	1.54	1.20	1.42	1.16	1.63	1.29	1.60
Discounted MSFE (1.00)	1.00	0.95	0.97	1.15	1.16	1.08	0.98	1.15	1.16	1.21	1.01	1.17	1.16	1.37	1.08	1.23	1.16	1.54	1.20	1.42	1.16	1.63	1.29	1.61
Squared discounted MSFE (0.90)	1.00	0.94	0.96	1.15	1.15	1.07	0.98	1.15	1.15	1.20	1.01	1.17	1.15	1.36	1.08	1.23	1.15	1.53	1.20	1.40	1.15	1.62	1.29	1.56
Squared discounted MSFE (0.95)	1.00	0.94	0.96	1.15	1.15	1.07	0.98	1.15	1.15	1.20	1.01	1.17	1.15	1.36	1.08	1.23	1.15	1.53	1.20	1.40	1.15	1.62	1.29	1.56
Squared discounted MSFE (1.00)	1.00	0.95	0.97	1.15	1.15	1.08	0.98	1.15	1.15	1.21	1.01	1.17	1.15	1.37	1.08	1.23	1.15	1.54	1.20	1.42	1.15	1.63	1.29	1.59
Recent best (past four quarters)	1.13	0.73	0.93	1.37	1.11	1.08	0.94	1.45	1.11	1.05	1.10	1.34	1.11	1.10	1.25	1.39	1.11	1.16	1.39	1.40	1.11	1.21	1.92	1.54
IMPORTS																								
RMSFE Random walk	4.95	7.67	10.79	13.69	4.95	7.67	10.79	13.69	4.95	7.67	10.79	13.69	4.95	7.67	10.79	13.69	4.95	7.67	10.79	13.69	4.95	7.67	10.79	13.69
Median	1.06	1.01	1.03	1.05	0.98	0.96	1.01	1.04	0.98	0.94	0.98	1.01	0.98	0.95	0.95	0.96	0.98	0.98	0.94	0.90	0.98	1.00	0.96	0.90
Mean	1.05	0.99	1.01	1.04	0.98	0.94	0.99	1.03	0.98	0.93	0.97	1.00	0.98	0.94	0.94	0.95	0.98	0.97	0.94	0.89	0.98	0.99	0.95	0.89
Trimmed mean (5% trimming)	1.05	1.00	1.02	1.04	0.97	0.95	1.00	1.03	0.97	0.93	0.97	1.00	0.97	0.94	0.94	0.95	0.97	0.97	0.94	0.89	0.97	0.99	0.95	0.89
Discounted MSFE (0.90)	1.04	0.99	1.01	1.04	0.98	0.94	0.99	1.03	0.98	0.93	0.96	1.00	0.98	0.94	0.94	0.94	0.98	0.97	0.94	0.88	0.98	0.99	0.95	0.88
Discounted MSFE (0.95)	1.04	0.99	1.01	1.04	0.98	0.94	0.99	1.03	0.98	0.93	0.96	1.00	0.98	0.94	0.94	0.94	0.98	0.97	0.94	0.88	0.98	0.99	0.95	0.88
Discounted MSFE (1.00)	1.04	0.99	1.01	1.04	0.98	0.94	0.99	1.03	0.98	0.93	0.96	1.00	0.98	0.94	0.94	0.94	0.98	0.97	0.94	0.89	0.98	0.99	0.95	0.88
Squared discounted MSFE (0.90)	1.02	0.98	1.01	1.04	0.97	0.93	0.99	1.03	0.97	0.93	0.96	1.00	0.97	0.94	0.94	0.94	0.97	0.96	0.93	0.87	0.97	0.99	0.95	0.86
Squared discounted MSFE (0.95)	1.02	0.98	1.01	1.04	0.97	0.93	0.99	1.03	0.97	0.93	0.96	1.00	0.97	0.94	0.94	0.94	0.97	0.96	0.93	0.87	0.97	0.99	0.95	0.86
Squared discounted MSFE (1.00)	1.03	0.98	1.01	1.04	0.98	0.94	0.99	1.03	0.98	0.93	0.96	1.00	0.98	0.94	0.94	0.94	0.98	0.97	0.93	0.88	0.98	0.99	0.95	0.87
Recent best (past four quarters)	1.10	1.08	1.01	1.00	1.07	0.99	0.98	1.00	1.07	0.94	1.00	1.02	1.07	0.78	0.75	0.93	1.07	0.75	0.81	0.81	1.07	0.77	0.81	0.82

Table A8: RMSFE of combination forecasts from ADL models with real economy predictors (relative to the RMSFE of the random walk), dataset: 2001Q1 to 2013Q2

Intercept correction	0				0.3				0.5				0.7				0.9				1			
Horizon	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
GDP																								
RMSFE Random walk	1.36	2.44	3.84	5.56	1.36	2.44	3.84	5.56	1.36	2.44	3.84	5.56	1.36	2.44	3.84	5.56	1.36	2.44	3.84	5.56	1.36	2.44	3.84	5.56
Median	0.66	0.68	0.75	0.81	0.85	0.65	0.71	0.79	0.85	0.66	0.65	0.74	0.85	0.69	0.57	0.64	0.85	0.75	0.49	0.49	0.85	0.79	0.46	0.41
Mean	0.65	0.67	0.75	0.80	0.83	0.65	0.71	0.79	0.83	0.66	0.65	0.74	0.83	0.70	0.57	0.63	0.83	0.76	0.50	0.47	0.83	0.79	0.48	0.38
Trimmed mean (5% trimming)	0.65	0.68	0.75	0.80	0.83	0.65	0.72	0.79	0.83	0.66	0.65	0.74	0.83	0.70	0.57	0.63	0.83	0.76	0.50	0.47	0.83	0.80	0.48	0.38
Discounted MSFE (0.90)	0.64	0.68	0.75	0.80	0.81	0.65	0.71	0.79	0.81	0.65	0.65	0.74	0.81	0.68	0.57	0.64	0.81	0.73	0.47	0.46	0.81	0.76	0.43	0.36
Discounted MSFE (0.95)	0.64	0.68	0.75	0.80	0.81	0.65	0.71	0.79	0.81	0.65	0.65	0.74	0.81	0.68	0.57	0.64	0.81	0.73	0.47	0.46	0.81	0.76	0.44	0.36
Discounted MSFE (1.00)	0.64	0.68	0.75	0.80	0.81	0.65	0.71	0.79	0.81	0.65	0.65	0.74	0.81	0.68	0.57	0.64	0.81	0.73	0.48	0.46	0.81	0.76	0.44	0.36
Squared discounted MSFE (0.90)	0.62	0.70	0.75	0.80	0.79	0.65	0.71	0.79	0.79	0.64	0.66	0.74	0.79	0.65	0.57	0.64	0.79	0.68	0.45	0.45	0.79	0.71	0.39	0.33
Squared discounted MSFE (0.95)	0.62	0.70	0.75	0.80	0.79	0.65	0.71	0.79	0.79	0.64	0.66	0.74	0.79	0.65	0.57	0.64	0.79	0.68	0.45	0.45	0.79	0.71	0.39	0.33
Squared discounted MSFE (1.00)	0.63	0.70	0.75	0.80	0.79	0.66	0.72	0.79	0.79	0.65	0.65	0.74	0.79	0.66	0.56	0.64	0.79	0.70	0.45	0.45	0.79	0.73	0.40	0.35
Recent best (past four quarters)	0.65	0.99	0.81	0.80	0.82	0.96	0.80	0.83	0.82	0.57	0.73	0.86	0.82	0.61	0.55	0.86	0.82	0.61	0.49	0.47	0.82	0.61	0.47	0.60
PRIVATE CONSUMPTION																								
RMSFE Random walk	1.64	2.68	4.33	6.40	1.64	2.68	4.33	6.40	1.64	2.68	4.33	6.40	1.64	2.68	4.33	6.40	1.64	2.68	4.33	6.40	1.64	2.68	4.33	6.40
Median	0.63	0.84	0.88	0.85	1.11	0.72	0.82	0.83	1.11	0.69	0.72	0.75	1.11	0.69	0.62	0.61	1.11	0.72	0.60	0.55	1.11	0.75	0.66	0.65
Mean	0.60	0.77	0.82	0.81	1.10	0.69	0.77	0.80	1.10	0.67	0.69	0.73	1.10	0.68	0.61	0.60	1.10	0.72	0.58	0.47	1.10	0.75	0.62	0.48
Trimmed mean (5% trimming)	0.61	0.78	0.83	0.82	1.12	0.69	0.77	0.80	1.12	0.66	0.69	0.74	1.12	0.67	0.60	0.60	1.12	0.71	0.57	0.48	1.12	0.73	0.62	0.52
Discounted MSFE (0.90)	0.61	0.76	0.81	0.81	1.09	0.69	0.77	0.79	1.09	0.66	0.69	0.73	1.09	0.67	0.60	0.60	1.09	0.70	0.59	0.50	1.09	0.73	0.64	0.59
Discounted MSFE (0.95)	0.61	0.77	0.82	0.81	1.09	0.69	0.77	0.79	1.09	0.66	0.69	0.73	1.09	0.67	0.60	0.60	1.09	0.70	0.58	0.50	1.09	0.73	0.63	0.58
Discounted MSFE (1.00)	0.61	0.77	0.82	0.81	1.09	0.69	0.77	0.79	1.09	0.66	0.69	0.73	1.09	0.67	0.60	0.60	1.09	0.71	0.58	0.49	1.09	0.73	0.63	0.57
Squared discounted MSFE (0.90)	0.62	0.76	0.82	0.80	1.07	0.68	0.77	0.79	1.07	0.66	0.69	0.72	1.07	0.66	0.61	0.59	1.07	0.69	0.59	0.53	1.07	0.73	0.65	0.67
Squared discounted MSFE (0.95)	0.62	0.76	0.82	0.80	1.07	0.68	0.77	0.79	1.07	0.66	0.69	0.72	1.07	0.66	0.61	0.59	1.07	0.69	0.59	0.53	1.07	0.73	0.65	0.67
Squared discounted MSFE (1.00)	0.62	0.76	0.83	0.82	1.08	0.68	0.78	0.80	1.08	0.66	0.70	0.73	1.08	0.66	0.60	0.60	1.08	0.70	0.59	0.51	1.08	0.73	0.64	0.64
Recent best (past four quarters)	1.12	1.02	1.06	0.93	1.23	1.02	1.04	0.99	1.23	0.82	0.96	0.94	1.23	0.95	0.73	1.05	1.23	0.87	0.83	0.71	1.23	1.30	0.68	1.10
GOVERNMENT CONSUMPTION																								
RMSFE Random walk	5.94	6.07	4.43	6.50	5.94	6.07	4.43	6.50	5.94	6.07	4.43	6.50	5.94	6.07	4.43	6.50	5.94	6.07	4.43	6.50	5.94	6.07	4.43	6.50
Median	1.00	0.91	1.30	0.99	1.31	1.01	1.25	0.98	1.31	1.14	1.18	0.92	1.31	1.30	1.13	0.83	1.31	1.48	1.17	0.78	1.31	1.59	1.24	0.84
Mean	1.01	0.92	1.28	0.99	1.32	1.03	1.24	0.98	1.32	1.17	1.17	0.93	1.32	1.33	1.12	0.84	1.32	1.52	1.15	0.79	1.32	1.63	1.22	0.84
Trimmed mean (5% trimming)	1.00	0.91	1.30	1.01	1.31	1.02	1.25	0.99	1.31	1.16	1.19	0.94	1.31	1.33	1.13	0.84	1.31	1.52	1.16	0.78	1.31	1.62	1.23	0.83
Discounted MSFE (0.90)	1.00	0.91	1.29	0.99	1.31	1.02	1.24	0.97	1.31	1.15	1.18	0.93	1.31	1.31	1.12	0.84	1.31	1.50	1.15	0.78	1.31	1.60	1.22	0.82
Discounted MSFE (0.95)	1.00	0.91	1.29	0.99	1.31	1.02	1.24	0.97	1.31	1.15	1.17	0.93	1.31	1.31	1.12	0.84	1.31	1.50	1.15	0.78	1.31	1.60	1.22	0.82
Discounted MSFE (1.00)	1.00	0.91	1.29	0.99	1.31	1.02	1.24	0.98	1.31	1.15	1.17	0.93	1.31	1.31	1.12	0.84	1.31	1.50	1.15	0.78	1.31	1.60	1.22	0.83
Squared discounted MSFE (0.90)	0.99	0.90	1.29	0.98	1.29	1.00	1.24	0.97	1.29	1.13	1.18	0.93	1.29	1.29	1.12	0.85	1.29	1.47	1.15	0.78	1.29	1.57	1.21	0.80
Squared discounted MSFE (0.95)	0.99	0.90	1.29	0.98	1.29	1.00	1.24	0.97	1.29	1.13	1.18	0.93	1.29	1.29	1.12	0.85	1.29	1.47	1.15	0.78	1.29	1.57	1.21	0.80
Squared discounted MSFE (1.00)	0.99	0.90	1.29	0.99	1.30	1.01	1.24	0.98	1.30	1.13	1.17	0.93	1.30	1.30	1.12	0.84	1.30	1.48	1.15	0.78	1.30	1.58	1.22	0.81
Recent best (past four quarters)	1.20	0.87	1.50	0.98	1.29	0.89	1.22	0.98	1.29	0.75	1.64	0.91	1.29	0.74	1.34	0.96	1.29	1.02	0.92	1.20	1.29	1.05	1.36	1.32
FIXED INVESTMENT																								
RMSFE Random walk	7.07	12.17	19.53	28.54	7.07	12.17	19.53	28.54	7.07	12.17	19.53	28.54	7.07	12.17	19.53	28.54	7.07	12.17	19.53	28.54	7.07	12.17	19.53	28.54
Median	0.68	0.63	0.74	0.84	0.74	0.49	0.69	0.82	0.74	0.41	0.60	0.76	0.74	0.35	0.49	0.64	0.74	0.31	0.36	0.48	0.74	0.30	0.34	0.44
Mean	0.67	0.62	0.72	0.80	0.73	0.49	0.67	0.78	0.73	0.41	0.59	0.73	0.73	0.34	0.47	0.61	0.73	0.30	0.36	0.45	0.73	0.29	0.34	0.41
Trimmed mean (5% trimming)	0.67	0.63	0.73	0.81	0.74	0.49	0.68	0.79	0.74	0.41	0.59	0.74	0.74	0.34	0.47	0.62	0.74	0.30	0.36	0.46	0.74	0.30	0.34	0.42
Discounted MSFE (0.90)	0.66	0.61	0.71	0.79	0.72	0.49	0.66	0.78	0.72	0.41	0.58	0.72	0.72	0.34	0.47	0.61	0.72	0.30	0.36	0.45	0.72	0.30	0.33	0.40
Discounted MSFE (0.95)	0.67	0.61	0.71	0.79	0.73	0.49	0.66	0.78	0.73	0.41	0.58	0.72	0.73	0.34	0.47	0.61	0.73	0.30	0.36	0.45	0.73	0.30	0.33	0.40
Discounted MSFE (1.00)	0.67	0.62	0.71	0.79	0.73	0.49	0.66	0.78	0.73	0.41	0.58	0.72	0.73	0.34	0.47	0.61	0.73	0.30	0.36	0.45	0.73	0.30	0.34	0.40
Squared discounted MSFE (0.90)	0.66	0.60	0.69	0.78	0.72	0.48	0.64	0.77	0.72	0.41	0.57	0.72	0.72	0.35	0.46	0.61	0.72	0.30	0.35	0.44	0.72	0.30	0.33	0.39
Squared discounted MSFE (0.95)	0.66	0.60	0.69	0.78	0.72	0.48	0.64	0.77	0.72	0.41	0.57	0.72	0.72	0.35	0.46	0.61	0.72	0.30	0.35	0.44	0.72	0.30	0.33	0.39
Squared discounted MSFE (1.00)	0.66	0.61	0.70	0.79	0.72	0.49	0.65	0.77	0.72	0.41	0.58	0.72	0.72	0.35	0.47	0.61	0.72	0.30	0.36	0.45	0.72	0.30	0.33	0.40
Recent best (past four quarters)	0.61	0.55	0.59	0.62	0.81	0.47	0.51	0.61	0.81	0.50	0.63	0.62	0.81	0.47	0.45	0.58	0.81	0.47	0.47	0.33	0.81	0.48	0.46	0.29

Table A8: continued

Intercept correction	0				0.3				0.5				0.7				0.9				1			
Horizon	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
GROSS CAPITAL FORMATION																								
RMSFE Random walk	19.56	28.08	38.17	46.70	19.56	28.08	38.17	46.70	19.56	28.08	38.17	46.70	19.56	28.08	38.17	46.70	19.56	28.08	38.17	46.70	19.56	28.08	38.17	46.70
Median	1.10	1.03	1.03	1.12	0.86	0.97	1.00	1.11	0.86	0.93	0.94	1.06	0.86	0.91	0.86	0.96	0.86	0.89	0.78	0.80	0.86	0.89	0.74	0.71
Mean	1.09	1.02	1.01	1.10	0.86	0.96	0.98	1.09	0.86	0.92	0.92	1.04	0.86	0.90	0.85	0.95	0.86	0.88	0.77	0.80	0.86	0.88	0.74	0.71
Trimmed mean (5% trimming)	1.10	1.03	1.02	1.11	0.86	0.96	0.99	1.09	0.86	0.93	0.93	1.05	0.86	0.90	0.85	0.95	0.86	0.89	0.77	0.80	0.86	0.88	0.74	0.71
Discounted MSFE (0.90)	1.09	1.02	1.01	1.09	0.86	0.96	0.97	1.08	0.86	0.92	0.92	1.04	0.86	0.90	0.85	0.95	0.86	0.88	0.77	0.80	0.86	0.88	0.74	0.71
Discounted MSFE (0.95)	1.09	1.02	1.01	1.10	0.86	0.96	0.98	1.08	0.86	0.92	0.92	1.04	0.86	0.90	0.85	0.95	0.86	0.88	0.77	0.80	0.86	0.88	0.74	0.71
Discounted MSFE (1.00)	1.09	1.02	1.01	1.10	0.86	0.96	0.98	1.08	0.86	0.92	0.92	1.04	0.86	0.90	0.85	0.95	0.86	0.88	0.77	0.80	0.86	0.88	0.74	0.71
Squared discounted MSFE (0.90)	1.09	1.01	1.00	1.09	0.86	0.95	0.97	1.08	0.86	0.92	0.92	1.04	0.86	0.90	0.84	0.95	0.86	0.88	0.77	0.79	0.86	0.88	0.74	0.70
Squared discounted MSFE (0.95)	1.09	1.01	1.00	1.09	0.86	0.95	0.97	1.08	0.86	0.92	0.92	1.04	0.86	0.90	0.84	0.95	0.86	0.88	0.77	0.79	0.86	0.88	0.74	0.70
Squared discounted MSFE (1.00)	1.09	1.02	1.00	1.09	0.86	0.95	0.97	1.08	0.86	0.92	0.92	1.04	0.86	0.90	0.85	0.94	0.86	0.88	0.77	0.80	0.86	0.88	0.74	0.71
Recent best (past four quarters)	1.08	0.96	0.90	1.04	0.92	0.94	0.90	1.03	0.92	0.92	0.88	0.99	0.92	0.93	0.89	0.93	0.92	0.93	0.69	0.80	0.92	0.89	0.66	0.66
EXPORTS																								
RMSFE Random walk	2.51	3.22	3.95	3.46	2.51	3.22	3.95	3.46	2.51	3.22	3.95	3.46	2.51	3.22	3.95	3.46	2.51	3.22	3.95	3.46	2.51	3.22	3.95	3.46
Median	0.99	1.01	0.99	1.03	1.35	1.14	0.99	1.03	1.35	1.28	1.00	1.03	1.35	1.45	1.07	1.09	1.35	1.62	1.21	1.39	1.35	1.71	1.31	1.66
Mean	0.98	1.05	1.01	1.03	1.34	1.17	1.01	1.02	1.34	1.30	1.03	1.02	1.34	1.46	1.09	1.10	1.34	1.64	1.25	1.41	1.34	1.74	1.36	1.71
Trimmed mean (5% trimming)	0.98	1.03	1.00	1.02	1.34	1.15	1.00	1.02	1.34	1.29	1.01	1.02	1.34	1.45	1.08	1.09	1.34	1.63	1.22	1.39	1.34	1.72	1.34	1.68
Discounted MSFE (0.90)	0.96	1.08	1.04	1.04	1.32	1.17	1.03	1.03	1.32	1.28	1.04	1.03	1.32	1.42	1.09	1.10	1.32	1.58	1.23	1.39	1.32	1.68	1.34	1.67
Discounted MSFE (0.95)	0.97	1.08	1.04	1.04	1.32	1.16	1.03	1.03	1.32	1.28	1.04	1.03	1.32	1.42	1.09	1.10	1.32	1.59	1.23	1.39	1.32	1.68	1.35	1.67
Discounted MSFE (1.00)	0.97	1.07	1.04	1.04	1.32	1.16	1.03	1.03	1.32	1.28	1.04	1.03	1.32	1.42	1.09	1.10	1.32	1.59	1.24	1.39	1.32	1.68	1.35	1.68
Squared discounted MSFE (0.90)	0.94	1.16	1.09	1.05	1.30	1.19	1.07	1.05	1.30	1.27	1.07	1.04	1.30	1.38	1.10	1.10	1.30	1.52	1.21	1.36	1.30	1.61	1.30	1.62
Squared discounted MSFE (0.95)	0.94	1.16	1.09	1.05	1.30	1.19	1.07	1.05	1.30	1.27	1.07	1.04	1.30	1.38	1.10	1.10	1.30	1.52	1.21	1.36	1.30	1.61	1.30	1.62
Squared discounted MSFE (1.00)	0.95	1.15	1.09	1.05	1.30	1.18	1.07	1.04	1.30	1.27	1.06	1.04	1.30	1.38	1.10	1.10	1.30	1.53	1.22	1.37	1.30	1.62	1.32	1.64
Recent best (past four quarters)	1.30	2.17	2.14	1.37	1.23	1.66	2.11	1.37	1.23	1.66	2.10	1.39	1.23	1.51	1.96	1.21	1.23	1.51	1.29	1.41	1.23	1.51	1.29	1.54
IMPORTS																								
RMSFE Random walk	4.95	7.67	10.79	13.69	4.95	7.67	10.79	13.69	4.95	7.67	10.79	13.69	4.95	7.67	10.79	13.69	4.95	7.67	10.79	13.69	4.95	7.67	10.79	13.69
Median	0.95	0.98	1.00	1.00	1.04	0.93	0.98	0.99	1.04	0.92	0.96	0.97	1.04	0.93	0.93	0.92	1.04	0.95	0.94	0.89	1.04	0.97	0.96	0.90
Mean	0.92	0.96	0.97	0.99	1.05	0.92	0.96	0.98	1.05	0.91	0.94	0.96	1.05	0.92	0.92	0.91	1.05	0.95	0.93	0.89	1.05	0.97	0.96	0.91
Trimmed mean (5% trimming)	0.92	0.96	0.97	0.98	1.04	0.91	0.95	0.98	1.04	0.91	0.93	0.95	1.04	0.92	0.91	0.91	1.04	0.94	0.92	0.88	1.04	0.96	0.94	0.90
Discounted MSFE (0.90)	0.92	0.95	0.97	0.98	1.05	0.91	0.95	0.97	1.05	0.91	0.93	0.95	1.05	0.92	0.91	0.90	1.05	0.95	0.92	0.84	1.05	0.97	0.94	0.83
Discounted MSFE (0.95)	0.92	0.95	0.97	0.98	1.06	0.92	0.95	0.98	1.06	0.91	0.93	0.95	1.06	0.93	0.91	0.90	1.06	0.95	0.92	0.85	1.06	0.97	0.94	0.84
Discounted MSFE (1.00)	0.92	0.95	0.97	0.98	1.06	0.92	0.95	0.98	1.06	0.91	0.93	0.95	1.06	0.93	0.91	0.90	1.06	0.96	0.92	0.85	1.06	0.98	0.94	0.85
Squared discounted MSFE (0.90)	0.91	0.95	0.96	0.99	1.06	0.91	0.95	0.98	1.06	0.91	0.92	0.95	1.06	0.92	0.90	0.90	1.06	0.95	0.91	0.80	1.06	0.97	0.93	0.75
Squared discounted MSFE (0.95)	0.91	0.95	0.96	0.99	1.06	0.91	0.95	0.98	1.06	0.91	0.92	0.95	1.06	0.92	0.90	0.90	1.06	0.95	0.91	0.80	1.06	0.97	0.93	0.75
Squared discounted MSFE (1.00)	0.91	0.95	0.97	0.99	1.07	0.92	0.95	0.98	1.07	0.91	0.93	0.95	1.07	0.93	0.91	0.90	1.07	0.96	0.91	0.82	1.07	0.98	0.93	0.79
Recent best (past four quarters)	1.20	1.07	0.95	1.46	1.15	1.07	0.89	1.50	1.15	1.07	0.76	1.32	1.15	1.13	0.65	1.08	1.15	1.21	0.64	0.65	1.15	1.28	1.14	1.02

Table A9: Approach A vs. approach B, RMSFE (relative to the RMSFE of the random walk), private consumption

Intercept correction	0.0				0.3				0.5				0.7				0.9				1.0			
Horizon	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
RMSFE Random walk	1.80	3.36	4.88	6.46	1.80	3.36	4.88	6.46	1.80	3.36	4.88	6.46	1.80	3.36	4.88	6.46	1.80	3.36	4.88	6.46	1.80	3.36	4.88	6.46
	APPROACH A																							
Median	0.91	0.95	0.96	1.00	0.84	0.82	0.93	1.00	0.84	0.78	0.89	0.98	0.84	0.78	0.86	0.97	0.84	0.82	0.92	1.04	0.84	0.85	0.99	1.14
Mean	0.88	0.92	0.92	0.97	0.82	0.80	0.89	0.97	0.82	0.76	0.85	0.95	0.82	0.76	0.84	0.94	0.82	0.81	0.90	1.01	0.82	0.84	0.98	1.13
Trimmed mean (5% trimming)	0.89	0.92	0.93	0.98	0.83	0.80	0.90	0.97	0.83	0.77	0.86	0.95	0.83	0.77	0.84	0.94	0.83	0.81	0.91	1.02	0.83	0.85	0.98	1.13
Discounted MSFE (0.90)	0.88	0.91	0.91	0.97	0.82	0.79	0.88	0.96	0.82	0.76	0.85	0.94	0.82	0.76	0.83	0.93	0.82	0.81	0.89	1.00	0.82	0.85	0.97	1.11
Discounted MSFE (0.95)	0.88	0.91	0.91	0.97	0.82	0.79	0.88	0.96	0.82	0.76	0.85	0.94	0.82	0.76	0.83	0.93	0.82	0.81	0.89	1.00	0.82	0.84	0.97	1.11
Discounted MSFE (1.00)	0.88	0.91	0.91	0.96	0.82	0.79	0.88	0.96	0.82	0.76	0.85	0.94	0.82	0.76	0.83	0.93	0.82	0.81	0.89	1.00	0.82	0.84	0.97	1.11
Squared discounted MSFE (0.90)	0.88	0.89	0.90	0.96	0.82	0.79	0.87	0.95	0.82	0.76	0.84	0.94	0.82	0.77	0.83	0.92	0.82	0.81	0.88	0.99	0.82	0.85	0.96	1.10
Squared discounted MSFE (0.95)	0.88	0.89	0.90	0.96	0.82	0.79	0.87	0.95	0.82	0.76	0.84	0.94	0.82	0.77	0.83	0.92	0.82	0.81	0.88	0.99	0.82	0.85	0.96	1.10
Squared discounted MSFE (1.00)	0.88	0.90	0.90	0.96	0.82	0.79	0.87	0.95	0.82	0.76	0.84	0.93	0.82	0.76	0.83	0.92	0.82	0.81	0.88	0.99	0.82	0.85	0.96	1.10
Recent best (past four quarters)	0.97	0.94	0.84	1.13	0.98	0.91	0.81	1.11	0.98	0.95	0.83	1.06	0.98	0.93	0.88	0.92	0.98	1.01	0.96	0.94	0.98	1.01	1.00	0.99
	APPROACH B																							
Weight: Average of last four quarters of available data																								
Median	1.35	1.05	0.97	0.95	1.14	0.99	0.95	0.94	1.14	0.95	0.92	0.92	1.14	0.92	0.88	0.88	1.14	0.89	0.84	0.84	1.14	0.88	0.82	0.82
Mean	1.33	1.05	0.96	0.93	1.14	0.98	0.94	0.92	1.14	0.94	0.91	0.90	1.14	0.91	0.87	0.86	1.14	0.88	0.83	0.82	1.14	0.87	0.81	0.80
Trimmed mean (5% trimming)	1.33	1.05	0.96	0.93	1.14	0.98	0.94	0.93	1.14	0.95	0.91	0.91	1.14	0.91	0.87	0.87	1.14	0.88	0.83	0.82	1.14	0.87	0.81	0.80
Discounted MSFE (0.90)	1.33	1.04	0.95	0.93	1.14	0.98	0.94	0.92	1.14	0.94	0.91	0.90	1.14	0.91	0.87	0.86	1.14	0.88	0.83	0.81	1.14	0.87	0.81	0.80
Discounted MSFE (0.95)	1.33	1.04	0.95	0.93	1.14	0.98	0.94	0.92	1.14	0.94	0.91	0.90	1.14	0.91	0.87	0.86	1.14	0.88	0.83	0.81	1.14	0.87	0.81	0.80
Discounted MSFE (1.00)	1.33	1.04	0.95	0.93	1.14	0.98	0.94	0.92	1.14	0.94	0.91	0.90	1.14	0.91	0.87	0.86	1.14	0.88	0.83	0.81	1.14	0.87	0.81	0.80
Squared discounted MSFE (0.90)	1.33	1.04	0.95	0.93	1.15	0.98	0.93	0.92	1.15	0.94	0.91	0.90	1.15	0.91	0.87	0.86	1.15	0.88	0.83	0.81	1.15	0.87	0.81	0.79
Squared discounted MSFE (0.95)	1.33	1.04	0.95	0.93	1.15	0.98	0.93	0.92	1.15	0.94	0.91	0.90	1.15	0.91	0.87	0.86	1.15	0.88	0.83	0.81	1.15	0.87	0.81	0.79
Squared discounted MSFE (1.00)	1.33	1.04	0.95	0.93	1.15	0.98	0.93	0.92	1.15	0.94	0.91	0.90	1.15	0.91	0.87	0.86	1.15	0.88	0.83	0.81	1.15	0.87	0.81	0.80
Recent best (past four quarters)	1.22	1.02	0.92	0.92	1.29	0.99	0.92	0.91	1.29	0.99	0.92	0.92	1.29	0.99	0.88	0.88	1.29	0.97	0.86	0.81	1.29	0.96	0.86	0.79

Table A10: Approach A vs. approach B, RMSFE (relative to the RMSFE of the random walk), government consumption

Intercept correction	0.0				0.3				0.5				0.7				0.9				1.0			
Horizon	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**
RMSFE Random walk	7.55	7.91	8.20	8.42	7.55	7.91	8.20	8.42	7.55	7.91	8.20	8.42	7.55	7.91	8.20	8.42	7.55	7.91	8.20	8.42	7.55	7.91	8.20	8.42
	APPROACH A																							
Median	0.86	0.85	0.95	0.82	1.36	0.94	0.97	0.82	1.36	1.04	1.03	0.84	1.36	1.15	1.15	0.91	1.36	1.28	1.35	1.11	1.36	1.35	1.48	1.29
Mean	0.85	0.86	0.93	0.81	1.32	0.95	0.95	0.81	1.32	1.05	1.00	0.83	1.32	1.16	1.12	0.90	1.32	1.29	1.31	1.09	1.32	1.36	1.45	1.27
Trimmed mean (5% trimming)	0.85	0.86	0.93	0.81	1.32	0.95	0.95	0.82	1.32	1.04	1.00	0.83	1.32	1.16	1.12	0.90	1.32	1.29	1.32	1.10	1.32	1.36	1.45	1.27
Discounted MSFE (0.90)	0.85	0.86	0.92	0.81	1.31	0.95	0.94	0.82	1.31	1.05	1.00	0.83	1.31	1.16	1.11	0.90	1.31	1.29	1.30	1.09	1.31	1.36	1.43	1.25
Discounted MSFE (0.95)	0.85	0.86	0.92	0.81	1.31	0.95	0.95	0.82	1.31	1.05	1.00	0.83	1.31	1.16	1.11	0.90	1.31	1.29	1.30	1.09	1.31	1.36	1.43	1.25
Discounted MSFE (1.00)	0.85	0.86	0.92	0.81	1.31	0.95	0.95	0.82	1.31	1.05	1.00	0.83	1.31	1.16	1.11	0.90	1.31	1.29	1.30	1.09	1.31	1.36	1.43	1.25
Squared discounted MSFE (0.90)	0.84	0.87	0.92	0.83	1.28	0.95	0.94	0.83	1.28	1.05	0.99	0.85	1.28	1.16	1.09	0.91	1.28	1.29	1.28	1.07	1.28	1.36	1.40	1.23
Squared discounted MSFE (0.95)	0.84	0.87	0.92	0.83	1.28	0.95	0.94	0.83	1.28	1.05	0.99	0.85	1.28	1.16	1.09	0.91	1.28	1.29	1.28	1.07	1.28	1.36	1.40	1.23
Squared discounted MSFE (1.00)	0.85	0.87	0.92	0.83	1.30	0.95	0.94	0.83	1.30	1.05	1.00	0.85	1.30	1.16	1.10	0.91	1.30	1.29	1.29	1.08	1.30	1.36	1.42	1.24
Recent best (past four quarters)	0.90	1.10	1.16	1.19	1.04	1.17	1.22	1.11	1.04	1.17	1.27	1.20	1.04	1.15	1.29	1.29	1.04	1.26	1.18	1.21	1.04	1.28	1.26	1.37
	APPROACH B																							
Weight: Average of last four quarters of available data																								
Median	0.80	0.79	0.79	0.74	0.82	0.81	0.80	0.74	0.82	0.82	0.81	0.73	0.82	0.84	0.82	0.73	0.82	0.86	0.85	0.74	0.82	0.86	0.87	0.76
Mean	0.80	0.79	0.80	0.75	0.82	0.81	0.80	0.74	0.82	0.82	0.81	0.74	0.82	0.84	0.83	0.74	0.82	0.85	0.85	0.74	0.82	0.86	0.87	0.76
Trimmed mean (5% trimming)	0.80	0.79	0.80	0.74	0.82	0.81	0.80	0.74	0.82	0.82	0.81	0.74	0.82	0.84	0.83	0.73	0.82	0.85	0.85	0.74	0.82	0.86	0.87	0.76
Discounted MSFE (0.90)	0.80	0.79	0.80	0.74	0.82	0.81	0.80	0.74	0.82	0.82	0.81	0.74	0.82	0.84	0.83	0.74	0.82	0.85	0.85	0.74	0.82	0.86	0.87	0.76
Discounted MSFE (0.95)	0.80	0.79	0.80	0.74	0.82	0.81	0.80	0.74	0.82	0.82	0.81	0.74	0.82	0.84	0.83	0.74	0.82	0.85	0.85	0.74	0.82	0.86	0.87	0.76
Discounted MSFE (1.00)	0.80	0.79	0.80	0.74	0.82	0.81	0.80	0.74	0.82	0.82	0.81	0.74	0.82	0.84	0.83	0.74	0.82	0.85	0.85	0.74	0.82	0.86	0.87	0.76
Squared discounted MSFE (0.90)	0.80	0.79	0.80	0.74	0.82	0.81	0.80	0.74	0.82	0.82	0.81	0.74	0.82	0.84	0.83	0.73	0.82	0.85	0.85	0.74	0.82	0.86	0.87	0.76
Squared discounted MSFE (0.95)	0.80	0.79	0.80	0.74	0.82	0.81	0.80	0.74	0.82	0.82	0.81	0.74	0.82	0.84	0.83	0.73	0.82	0.85	0.85	0.74	0.82	0.86	0.87	0.76
Squared discounted MSFE (1.00)	0.80	0.79	0.80	0.74	0.82	0.81	0.80	0.74	0.82	0.82	0.81	0.74	0.82	0.84	0.83	0.73	0.82	0.85	0.85	0.74	0.82	0.86	0.87	0.76
Recent best (past four quarters)	0.80	0.80	0.76	0.71	0.80	0.82	0.76	0.72	0.80	0.83	0.79	0.73	0.80	0.81	0.81	0.73	0.80	0.82	0.85	0.74	0.80	0.84	0.87	0.80

Table A11: Approach A vs. approach B, RMSFE (relative to the RMSFE of the random walk), fixed investment

Intercept correction	0.0				0.3				0.5				0.7				0.9				1.0			
Horizon	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**
RMSFE Random walk	4.94	8.34	12.35	16.42	4.94	8.34	12.35	16.42	4.94	8.34	12.35	16.42	4.94	8.34	12.35	16.42	4.94	8.34	12.35	16.42	4.94	8.34	12.35	16.42
	APPROACH A																							
Median	0.82	0.80	0.88	0.95	0.69	0.64	0.83	0.93	0.69	0.56	0.74	0.87	0.69	0.51	0.64	0.75	0.69	0.50	0.57	0.62	0.69	0.51	0.58	0.61
Mean	0.81	0.79	0.87	0.94	0.68	0.64	0.82	0.92	0.68	0.56	0.73	0.87	0.68	0.50	0.63	0.75	0.68	0.49	0.56	0.61	0.68	0.49	0.56	0.59
Trimmed mean (5% trimming)	0.82	0.79	0.87	0.94	0.68	0.64	0.82	0.93	0.68	0.56	0.74	0.87	0.68	0.51	0.63	0.75	0.68	0.49	0.56	0.61	0.68	0.50	0.57	0.60
Discounted MSFE (0.90)	0.81	0.78	0.86	0.94	0.69	0.63	0.81	0.92	0.69	0.56	0.73	0.87	0.69	0.50	0.63	0.75	0.69	0.49	0.56	0.61	0.69	0.49	0.56	0.59
Discounted MSFE (0.95)	0.81	0.78	0.87	0.94	0.69	0.63	0.81	0.92	0.69	0.56	0.73	0.87	0.69	0.50	0.63	0.75	0.69	0.49	0.56	0.61	0.69	0.49	0.56	0.59
Discounted MSFE (1.00)	0.80	0.78	0.87	0.94	0.69	0.63	0.82	0.92	0.69	0.56	0.73	0.87	0.69	0.50	0.63	0.75	0.69	0.49	0.56	0.61	0.69	0.49	0.56	0.59
Squared discounted MSFE (0.90)	0.81	0.77	0.86	0.94	0.76	0.63	0.81	0.92	0.76	0.56	0.73	0.87	0.76	0.50	0.63	0.75	0.76	0.49	0.56	0.62	0.76	0.49	0.56	0.59
Squared discounted MSFE (0.95)	0.81	0.77	0.86	0.94	0.76	0.63	0.81	0.92	0.76	0.56	0.73	0.87	0.76	0.50	0.63	0.75	0.76	0.49	0.56	0.62	0.76	0.49	0.56	0.59
Squared discounted MSFE (1.00)	0.81	0.78	0.87	0.94	0.77	0.63	0.82	0.92	0.77	0.56	0.74	0.87	0.77	0.50	0.64	0.75	0.77	0.49	0.56	0.62	0.77	0.49	0.56	0.59
Recent best (past four quarters)	0.78	0.80	0.79	0.96	0.80	0.75	0.76	0.98	0.80	0.62	0.70	1.05	0.80	0.61	0.65	0.92	0.80	0.56	0.68	0.81	0.80	0.57	0.68	0.72
	APPROACH B																							
Weight: Average of last four quarters of available data																								
Median	1.66	1.40	1.25	1.18	1.56	1.37	1.24	1.18	1.56	1.35	1.22	1.17	1.56	1.33	1.20	1.14	1.56	1.31	1.17	1.10	1.56	1.30	1.15	1.07
Mean	1.65	1.40	1.24	1.18	1.56	1.37	1.24	1.18	1.56	1.35	1.22	1.17	1.56	1.33	1.20	1.14	1.56	1.31	1.16	1.10	1.56	1.30	1.15	1.07
Trimmed mean (5% trimming)	1.65	1.40	1.25	1.18	1.56	1.37	1.24	1.18	1.56	1.35	1.22	1.17	1.56	1.33	1.20	1.14	1.56	1.31	1.16	1.10	1.56	1.30	1.15	1.07
Discounted MSFE (0.90)	1.65	1.40	1.24	1.18	1.56	1.37	1.24	1.18	1.56	1.35	1.22	1.17	1.56	1.33	1.20	1.14	1.56	1.31	1.17	1.10	1.56	1.30	1.15	1.07
Discounted MSFE (0.95)	1.65	1.40	1.24	1.18	1.56	1.37	1.24	1.18	1.56	1.35	1.22	1.17	1.56	1.33	1.20	1.14	1.56	1.31	1.16	1.10	1.56	1.30	1.15	1.07
Discounted MSFE (1.00)	1.65	1.40	1.24	1.18	1.56	1.37	1.24	1.18	1.56	1.35	1.22	1.17	1.56	1.33	1.20	1.14	1.56	1.31	1.16	1.10	1.56	1.30	1.15	1.07
Squared discounted MSFE (0.90)	1.65	1.40	1.24	1.18	1.56	1.37	1.24	1.18	1.56	1.35	1.22	1.17	1.56	1.33	1.20	1.14	1.56	1.31	1.17	1.10	1.56	1.30	1.15	1.07
Squared discounted MSFE (0.95)	1.65	1.40	1.24	1.18	1.56	1.37	1.24	1.18	1.56	1.35	1.22	1.17	1.56	1.33	1.20	1.14	1.56	1.31	1.17	1.10	1.56	1.30	1.15	1.07
Squared discounted MSFE (1.00)	1.65	1.40	1.24	1.18	1.56	1.37	1.24	1.18	1.56	1.35	1.22	1.17	1.56	1.33	1.20	1.14	1.56	1.31	1.17	1.10	1.56	1.30	1.15	1.07
Recent best (past four quarters)	1.62	1.39	1.24	1.18	1.66	1.40	1.24	1.18	1.66	1.38	1.22	1.18	1.66	1.38	1.23	1.16	1.66	1.38	1.22	1.16	1.66	1.38	1.21	1.14

Table A12: Approach A vs. approach B, RMSFE(relative to the RMSFE of the random walk), exports

Intercept correction	0.0				0.3				0.5				0.7				0.9				1.0			
Horizon	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**
RMSFE Random walk	2.58	4.11	5.60	6.86	2.58	4.11	5.60	6.86	2.58	4.11	5.60	6.86	2.58	4.11	5.60	6.86	2.58	4.11	5.60	6.86	2.58	4.11	5.60	6.86
	APPROACH A																							
Median	0.99	0.99	0.99	0.99	1.22	0.99	1.00	0.99	1.22	1.03	1.02	1.00	1.22	1.11	1.10	1.05	1.22	1.22	1.26	1.23	1.22	1.28	1.37	1.40
Mean	0.98	0.97	0.97	0.97	1.23	0.98	0.98	0.97	1.23	1.03	1.00	0.97	1.23	1.11	1.08	1.02	1.23	1.22	1.24	1.19	1.23	1.28	1.35	1.35
Trimmed mean (5% trimming)	0.98	0.98	0.98	0.97	1.22	0.98	0.98	0.97	1.22	1.03	1.01	0.98	1.22	1.11	1.08	1.03	1.22	1.22	1.24	1.20	1.22	1.28	1.36	1.36
Discounted MSFE (0.90)	0.98	0.97	0.97	0.96	1.22	0.97	0.97	0.96	1.22	1.02	1.00	0.97	1.22	1.10	1.07	1.01	1.22	1.21	1.23	1.17	1.22	1.27	1.34	1.33
Discounted MSFE (0.95)	0.98	0.97	0.97	0.97	1.22	0.97	0.97	0.97	1.22	1.02	1.00	0.97	1.22	1.10	1.07	1.02	1.22	1.21	1.23	1.18	1.22	1.27	1.34	1.34
Discounted MSFE (1.00)	0.98	0.97	0.97	0.97	1.22	0.97	0.98	0.97	1.22	1.02	1.00	0.97	1.22	1.10	1.07	1.02	1.22	1.21	1.23	1.18	1.22	1.27	1.35	1.35
Squared discounted MSFE (0.90)	0.97	0.96	0.97	0.96	1.21	0.97	0.97	0.96	1.21	1.02	0.99	0.96	1.21	1.10	1.06	1.00	1.21	1.20	1.22	1.15	1.21	1.26	1.33	1.30
Squared discounted MSFE (0.95)	0.97	0.96	0.97	0.96	1.21	0.97	0.97	0.96	1.21	1.02	0.99	0.96	1.21	1.10	1.06	1.00	1.21	1.20	1.22	1.15	1.21	1.26	1.33	1.30
Squared discounted MSFE (1.00)	0.97	0.96	0.97	0.97	1.21	0.97	0.97	0.97	1.21	1.02	1.00	0.98	1.21	1.10	1.07	1.02	1.21	1.21	1.22	1.17	1.21	1.27	1.34	1.33
Recent best (past four quarters)	1.07	1.11	0.95	0.86	1.46	1.25	0.86	0.90	1.46	1.23	0.89	0.91	1.46	1.24	0.89	1.03	1.46	1.36	1.11	1.13	1.46	1.43	1.20	1.07
	APPROACH B																							
Weight: Average of last four quarters of available data																								
Median	1.41	1.16	1.06	1.04	1.33	1.14	1.05	1.03	1.33	1.12	1.04	1.03	1.33	1.11	1.04	1.04	1.33	1.11	1.04	1.06	1.33	1.10	1.04	1.09
Mean	1.40	1.15	1.04	1.02	1.34	1.13	1.04	1.02	1.34	1.12	1.03	1.01	1.34	1.11	1.03	1.02	1.34	1.10	1.03	1.04	1.34	1.10	1.04	1.06
Trimmed mean (5% trimming)	1.40	1.16	1.04	1.02	1.33	1.13	1.04	1.02	1.33	1.12	1.03	1.02	1.33	1.11	1.03	1.02	1.33	1.10	1.03	1.04	1.33	1.10	1.04	1.07
Discounted MSFE (0.90)	1.40	1.15	1.04	1.01	1.34	1.13	1.03	1.01	1.34	1.12	1.03	1.01	1.34	1.11	1.03	1.01	1.34	1.10	1.03	1.03	1.34	1.10	1.04	1.06
Discounted MSFE (0.95)	1.40	1.15	1.04	1.01	1.34	1.13	1.03	1.01	1.34	1.12	1.03	1.01	1.34	1.11	1.03	1.01	1.34	1.10	1.03	1.03	1.34	1.10	1.04	1.06
Discounted MSFE (1.00)	1.40	1.15	1.04	1.01	1.34	1.13	1.03	1.01	1.34	1.12	1.03	1.01	1.34	1.11	1.03	1.01	1.34	1.10	1.03	1.04	1.34	1.10	1.04	1.06
Squared discounted MSFE (0.90)	1.40	1.15	1.04	1.01	1.34	1.13	1.03	1.01	1.34	1.11	1.03	1.01	1.34	1.11	1.02	1.01	1.34	1.10	1.03	1.03	1.34	1.10	1.04	1.06
Squared discounted MSFE (0.95)	1.40	1.15	1.04	1.01	1.34	1.13	1.03	1.01	1.34	1.11	1.03	1.01	1.34	1.11	1.02	1.01	1.34	1.10	1.03	1.03	1.34	1.10	1.04	1.06
Squared discounted MSFE (1.00)	1.40	1.15	1.04	1.01	1.34	1.13	1.03	1.01	1.34	1.11	1.03	1.01	1.34	1.10	1.02	1.01	1.34	1.10	1.03	1.03	1.34	1.10	1.04	1.06
Recent best (past four quarters)	1.33	1.06	0.97	0.92	1.52	1.05	0.95	0.91	1.52	1.06	0.98	0.95	1.52	1.08	1.02	0.96	1.52	1.12	1.01	0.96	1.52	1.13	1.00	1.02

Table A13: Approach A vs. approach B, RMSFE (relative to the RMSFE of the random walk), imports

Intercept correction	0.0				0.3				0.5				0.7				0.9				1.0			
Horizon	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**
RMSFE Random walk	5.24	8.22	10.90	13.03	5.24	8.22	10.90	13.03	5.24	8.22	10.90	13.03	5.24	8.22	10.90	13.03	5.24	8.22	10.90	13.03	5.24	8.22	10.90	13.03
	APPROACH A																							
Median	1.06	1.01	0.98	1.01	1.07	0.97	0.98	1.01	1.07	0.99	0.99	1.01	1.07	1.03	1.04	1.05	1.07	1.10	1.16	1.18	1.07	1.14	1.25	1.33
Mean	1.04	0.99	0.97	0.98	1.05	0.96	0.96	0.98	1.05	0.97	0.98	0.98	1.05	1.01	1.03	1.01	1.05	1.08	1.15	1.14	1.05	1.12	1.24	1.28
Trimmed mean (5% trimming)	1.05	0.99	0.97	0.99	1.06	0.96	0.97	0.99	1.06	0.97	0.98	0.99	1.06	1.02	1.03	1.02	1.06	1.08	1.15	1.15	1.06	1.12	1.24	1.28
Discounted MSFE (0.90)	1.03	0.98	0.96	0.98	1.05	0.96	0.96	0.98	1.05	0.97	0.97	0.98	1.05	1.01	1.02	1.00	1.05	1.08	1.14	1.13	1.05	1.12	1.23	1.27
Discounted MSFE (0.95)	1.04	0.98	0.96	0.98	1.05	0.96	0.96	0.98	1.05	0.97	0.97	0.98	1.05	1.01	1.02	1.00	1.05	1.08	1.14	1.13	1.05	1.12	1.23	1.27
Discounted MSFE (1.00)	1.04	0.98	0.96	0.98	1.05	0.96	0.96	0.98	1.05	0.97	0.97	0.98	1.05	1.01	1.02	1.00	1.05	1.08	1.14	1.13	1.05	1.12	1.23	1.27
Squared discounted MSFE (0.90)	1.03	0.98	0.96	0.97	1.04	0.95	0.96	0.97	1.04	0.97	0.97	0.97	1.04	1.01	1.01	0.99	1.04	1.08	1.13	1.12	1.04	1.12	1.22	1.25
Squared discounted MSFE (0.95)	1.03	0.98	0.96	0.97	1.04	0.95	0.96	0.97	1.04	0.97	0.97	0.97	1.04	1.01	1.01	0.99	1.04	1.08	1.13	1.12	1.04	1.12	1.22	1.25
Squared discounted MSFE (1.00)	1.03	0.98	0.96	0.97	1.05	0.95	0.96	0.97	1.05	0.97	0.97	0.97	1.05	1.01	1.01	1.00	1.05	1.08	1.13	1.12	1.05	1.12	1.22	1.25
Recent best (past four quarters)	1.02	1.09	1.03	1.05	1.03	1.02	1.01	1.05	1.03	0.89	0.98	1.05	1.03	0.97	1.04	1.03	1.03	1.02	1.15	1.05	1.03	1.00	1.17	1.09
	APPROACH B																							
Weight: Average of last four quarters of available data																								
Median	1.29	1.08	1.00	0.99	1.20	1.05	0.99	0.99	1.20	1.03	0.97	0.98	1.20	1.01	0.95	0.96	1.20	0.99	0.93	0.94	1.20	0.98	0.91	0.92
Mean	1.29	1.08	0.99	0.98	1.20	1.05	0.98	0.98	1.20	1.03	0.97	0.97	1.20	1.01	0.95	0.95	1.20	0.99	0.92	0.93	1.20	0.98	0.91	0.91
Trimmed mean (5% trimming)	1.29	1.08	0.99	0.99	1.20	1.05	0.98	0.98	1.20	1.03	0.97	0.97	1.20	1.01	0.95	0.96	1.20	0.99	0.92	0.93	1.20	0.98	0.91	0.91
Discounted MSFE (0.90)	1.29	1.08	0.99	0.98	1.20	1.05	0.98	0.98	1.20	1.03	0.97	0.97	1.20	1.01	0.95	0.95	1.20	0.99	0.92	0.93	1.20	0.98	0.91	0.91
Discounted MSFE (0.95)	1.29	1.08	0.99	0.98	1.20	1.05	0.98	0.98	1.20	1.03	0.97	0.97	1.20	1.01	0.95	0.95	1.20	0.99	0.92	0.93	1.20	0.98	0.91	0.91
Discounted MSFE (1.00)	1.29	1.08	0.99	0.98	1.20	1.05	0.98	0.98	1.20	1.03	0.97	0.97	1.20	1.01	0.95	0.95	1.20	0.99	0.92	0.93	1.20	0.98	0.91	0.91
Squared discounted MSFE (0.90)	1.29	1.08	0.99	0.98	1.20	1.05	0.98	0.98	1.20	1.03	0.97	0.97	1.20	1.01	0.95	0.95	1.20	0.99	0.92	0.93	1.20	0.98	0.91	0.91
Squared discounted MSFE (0.95)	1.29	1.08	0.99	0.98	1.20	1.05	0.98	0.98	1.20	1.03	0.97	0.97	1.20	1.01	0.95	0.95	1.20	0.99	0.92	0.93	1.20	0.98	0.91	0.91
Squared discounted MSFE (1.00)	1.29	1.08	0.99	0.98	1.20	1.05	0.98	0.98	1.20	1.03	0.97	0.97	1.20	1.01	0.95	0.95	1.20	0.99	0.92	0.93	1.20	0.98	0.91	0.91
Recent best (past four quarters)	1.28	1.08	0.98	0.97	1.26	1.05	0.99	0.97	1.26	1.04	0.96	0.95	1.26	1.04	0.95	0.92	1.26	1.03	0.93	0.90	1.26	1.03	0.93	0.86

Table A14: Monthly indicators in bridge equations, by group

Group A		Group B	Group C
CSE All Share Composite	EU Industry Confidence Indicator	Domestic interest rate: personal Lending Rate	Registration of motor vehicles (passenger cars)
CSE Banks Index	EU Consumer Confidence Indicator	Domestic interest rate: 1-year Time Deposits	Local cement sales (million tons)
CSE Hotels Index	EU Retail Trade Confidence Indicator	Gold Bullion Price-New York (€/Ounce) Price	Tourist arrivals
ATHEX Composite- Price Index	EU Construction Confidence Indicator	Silver Cash Price (€/Ounce) -Commodity Prices	Unemployment Rate
DAX 30 Performance - Price Index	EU Economic Sentiment Indicator	Harmonised Index of Consumer Prices - Greece	
FTSE 100 - Price Index	EA Industry Confidence Indicator	Harmonised Index of Consumer Prices - UK	
Euro, Dow Jones Euro Stoxx Price Index	EA Consumer Confidence Indicator	Consumer Price Index (Statistical Service)	
Europe, Euro, Dow Jones Stoxx 50 Price Index	EA Retail Trade Confidence Indicator	Vacancies Notified (act number)	
Euro, Dow Jones Euro Stoxx Industrials Index	EA Construction Confidence Indicator	Vacancies Outstanding (act number)	
Euro, Dow Jones Euro Stoxx Basic Materials E Index	EA Economic Sentiment Indicator	MFI loans to domestic residents, outstanding amounts	
Euro, Dow Jones Euro Stoxx Consumer Goods Index	GR Industry Confidence Indicator	Total MFI loans to non-MFIs, outstanding amounts	
Euro, Dow Jones Euro Stoxx Consumer Services Index	GR Consumer Confidence Indicator	Deposits of non-MFIs held with MFIs, domestic	
United States, US dollar, Standard & Poors 500 Composite Index	GR Retail Trade Confidence Indicator	Total deposits of non-MFIs held with MFIs	
Japan, Nikkei 225 Stock Average Index	GR Construction Confidence Indicator		
Exchange rate EUR to US dollar	GR Economic Sentiment Indicator		
Exchange rate EUR to Pound sterling	UK Industry Confidence Indicator		
Exchange rate EUR to Swiss franc	CY Industry Confidence Indicator		
Exchange rate EUR to Canadian dollar	CY Consumer Confidence Indicator		
Exchange rate EUR to Japanese yen	CY Retail Trade Confidence Indicator		
Brent Crude Oil (€)-Commodity Prices	CY Construction Confidence Indicator		
Europe 3-month EURIBOR	CY Economic Sentiment Indicator		
Europe 6-month EURIBOR	UK Consumer Confidence Indicator		
Europe 12-month EURIBOR	UK Retail Trade Confidence Indicator		
Greece 10 -year Government Note Yield (GNYGR10)	UK Construction Confidence Indicator		
Greece 3-month Treasury Bill Yield ITGRC3M)	UK Economic Sentiment Indicator		
Spain 10-year Government Bond Yield (SP10Y)			
Spain 3-month Treasury Bill Yield (SP3M)			
Italy 10-year Government Bond Yield (IT10Y)			
Italy 3-month Treasury Bill Yield (IT3M)			
France 10-year Government Bond Yield (IGFRA10D)			
France 3-month Treasury Bill Yield (ITFRA3D)			
Germany 10 -year Gov. Benchmark Bond Yield (GBBG10)			
Germany 3-month Treasury Bill Yield (ITDEU3D)			
Spread Greece (GNYGR10 - ITGRC3M)			
Spread Spain (SP10Y - SP3M)			
Spread Italy (IT10Y - IT3M)			
Spread France (IGFRA10D - ITFRA3D)			
Spread Germany (GBBG10 - ITDEU3D)			
UK 10 -year Government Bond Yield			
Moody's Aaa Corporate Yield (MACY)			
Moody's Baa Corporate Yield (MBCY)			
Spread Moody's (MACY - MBCY)			
Total Registered Unemployed (act number)			

Note: the particular groupings result from the setup of the forecasting exercise (i.e. forecasts are computed early in month *M*) and the data availability pattern from the data sources used.

Table A15: RMSFE of combination forecasts from bridge equations (relative to the RMSFE of the random walk)

Forecasts are estimated early in:	Jan/Apr/Jul/Oct		Feb/May/Aug/Nov		Mar/Jun/Sep/Dec	
Quarter for which forecast is estimated	Previous	Current	Previous	Current	Previous	Current
Number of months to National Accounts release	*2*	*5*	*1*	*4*	*0*	*3*
GDP						
RMSFE	1.01	1.18	1.01	1.18	1.01	1.18
Median	0.98	0.86	0.98	0.86	0.91	0.87
Mean	1.00	0.90	1.00	0.89	0.96	0.89
Trimmed mean (5% trimming)	0.97	0.86	0.97	0.86	0.88	0.86
Discounted MSFE (0.90)	0.93	0.83	0.93	0.83	0.83	0.83
Discounted MSFE (0.95)	0.94	0.83	0.94	0.84	0.89	0.83
Discounted MSFE (1.00)	0.95	0.84	0.95	0.84	0.92	0.84
Squared discounted MSFE (0.90)	0.89	0.79	0.89	0.79	0.85	0.79
Squared discounted MSFE (0.95)	0.92	0.81	0.92	0.81	0.89	0.81
Squared discounted MSFE (1.00)	0.94	0.83	0.94	0.83	0.91	0.83
Recent best (past four quarters)	0.53	0.49	0.48	0.48	0.42	0.46
PRIVATE CONSUMPTION						
RMSFE	2.13	2.40	2.13	2.40	2.13	2.40
Median	0.78	0.72	0.78	0.72	0.78	0.72
Mean	0.78	0.71	0.78	0.72	0.77	0.72
Trimmed mean (5% trimming)	0.77	0.71	0.77	0.71	0.77	0.71
Discounted MSFE (0.90)	0.74	0.69	0.74	0.69	0.74	0.69
Discounted MSFE (0.95)	0.75	0.69	0.75	0.69	0.74	0.69
Discounted MSFE (1.00)	0.76	0.69	0.76	0.70	0.75	0.69
Squared discounted MSFE (0.90)	0.72	0.67	0.72	0.68	0.72	0.67
Squared discounted MSFE (0.95)	0.74	0.68	0.74	0.68	0.73	0.68
Squared discounted MSFE (1.00)	0.75	0.69	0.75	0.69	0.74	0.69
Recent best (past four quarters)	0.43	0.46	0.46	0.47	0.45	0.44
GOVERNMENT CONSUMPTION						
RMSFE	7.47	7.62	7.47	7.62	7.47	7.62
Median	0.96	0.92	0.96	0.92	0.95	0.91
Mean	0.96	0.92	0.96	0.91	0.96	0.90
Trimmed mean (5% trimming)	0.96	0.92	0.96	0.92	0.96	0.91
Discounted MSFE (0.90)	0.95	0.91	0.95	0.90	0.95	0.90
Discounted MSFE (0.95)	0.95	0.91	0.95	0.91	0.94	0.91
Discounted MSFE (1.00)	0.96	0.91	0.96	0.90	0.95	0.90
Squared discounted MSFE (0.90)	0.94	0.90	0.94	0.90	0.93	0.89
Squared discounted MSFE (0.95)	0.94	0.90	0.94	0.90	0.94	0.90
Squared discounted MSFE (1.00)	0.95	0.91	0.95	0.90	0.94	0.89
Recent best (past four quarters)	0.70	0.65	0.70	0.65	0.69	0.64
GROSS FIXED CAPITAL FORMATION						
RMSFE	4.51	4.44	4.51	4.44	4.51	4.44
Median	1.04	0.99	1.04	0.99	1.03	0.99
Mean	1.06	1.03	1.06	1.03	1.05	1.02
Trimmed mean (5% trimming)	1.03	0.99	1.03	0.99	1.03	0.98
Discounted MSFE (0.90)	1.01	0.97	1.01	0.97	1.00	0.96
Discounted MSFE (0.95)	1.02	0.98	1.02	0.98	1.01	0.96
Discounted MSFE (1.00)	1.02	0.98	1.02	0.98	1.02	0.97
Squared discounted MSFE (0.90)	0.98	0.95	0.99	0.95	0.98	0.94
Squared discounted MSFE (0.95)	1.00	0.96	1.00	0.96	1.00	0.95
Squared discounted MSFE (1.00)	1.02	0.97	1.02	0.98	1.02	0.96
Recent best (past four quarters)	0.67	0.62	0.70	0.63	0.70	0.65
GROSS CAPITAL FORMATION						
RMSFE	13.29	15.58	13.29	15.58	13.29	15.58
Median	1.03	0.98	1.03	0.98	1.02	0.99
Mean	1.03	0.98	1.03	0.99	1.02	0.98
Trimmed mean (5% trimming)	1.03	0.98	1.03	0.99	1.02	0.98
Discounted MSFE (0.90)	1.02	0.98	1.02	0.98	1.02	0.98
Discounted MSFE (0.95)	1.02	0.98	1.02	0.98	1.01	0.98
Discounted MSFE (1.00)	1.02	0.98	1.02	0.98	1.02	0.98
Squared discounted MSFE (0.90)	1.02	0.98	1.01	0.97	1.01	0.97
Squared discounted MSFE (0.95)	1.02	0.98	1.02	0.98	1.02	0.97
Squared discounted MSFE (1.00)	1.02	0.98	1.02	0.98	1.02	0.98
Recent best (past four quarters)	0.80	0.77	0.80	0.75	0.80	0.75

Table A15: Continued

Forecasts are estimated early in:	Jan/Apr/Jul/Oct		Feb/May/Aug/Nov		Mar/Jun/Sep/Dec	
Quarter for which forecast is estimated	**Previous**	**Current**	**Previous**	**Current**	**Previous**	**Current**
Number of months to National Accounts release	*2*	*5*	*1*	*4*	*0*	*3*
EXPORTS						
RMSFE	2.62	2.72	2.62	2.72	2.62	2.72
Median	0.96	0.94	0.96	0.92	0.96	0.92
Mean	0.96	0.93	0.96	0.91	0.95	0.91
Trimmed mean (5% trimming)	0.96	0.93	0.95	0.90	0.95	0.91
Discounted MSFE (0.90)	0.93	0.91	0.93	0.89	0.93	0.89
Discounted MSFE (0.95)	0.94	0.92	0.94	0.90	0.93	0.89
Discounted MSFE (1.00)	0.94	0.92	0.94	0.90	0.93	0.90
Squared discounted MSFE (0.90)	0.91	0.90	0.91	0.87	0.90	0.86
Squared discounted MSFE (0.95)	0.92	0.91	0.92	0.89	0.91	0.87
Squared discounted MSFE (1.00)	0.93	0.92	0.93	0.89	0.92	0.88
Recent best (past four quarters)	0.58	0.62	0.57	0.61	0.56	0.57
IMPORTS						
RMSFE	4.81	4.86	4.81	4.86	4.81	4.86
Median	1.00	1.00	0.99	0.99	0.99	0.99
Mean	0.99	1.00	0.98	0.99	0.98	0.99
Trimmed mean (5% trimming)	0.99	0.99	0.98	0.98	0.98	0.98
Discounted MSFE (0.90)	0.97	0.99	0.97	0.97	0.97	0.96
Discounted MSFE (0.95)	0.97	0.99	0.97	0.98	0.97	0.97
Discounted MSFE (1.00)	0.98	0.99	0.98	0.98	0.97	0.97
Squared discounted MSFE (0.90)	0.95	0.98	0.95	0.97	0.94	0.95
Squared discounted MSFE (0.95)	0.96	0.99	0.96	0.97	0.96	0.96
Squared discounted MSFE (1.00)	0.97	0.99	0.97	0.98	0.96	0.96
Recent best (past four quarters)	0.70	0.81	0.70	0.69	0.69	0.72

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