Irish Fiscal Advisory Council

Nowcasting to Predict Data Revisions

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Network of EU IFIs Meeting

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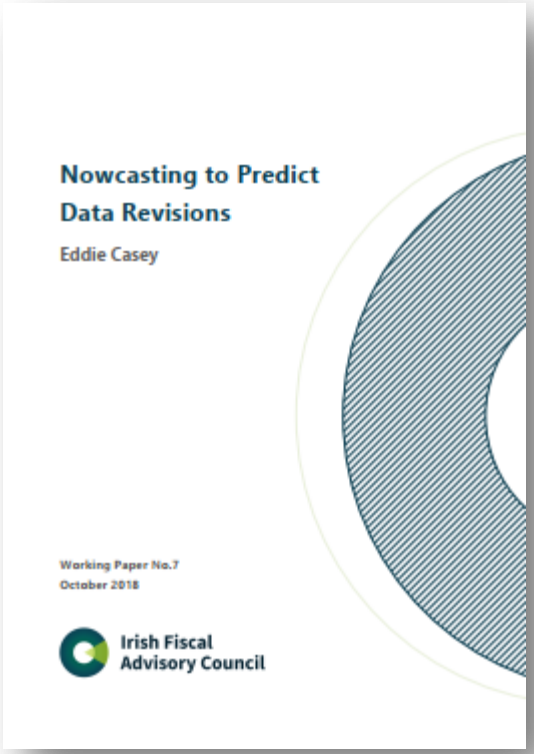
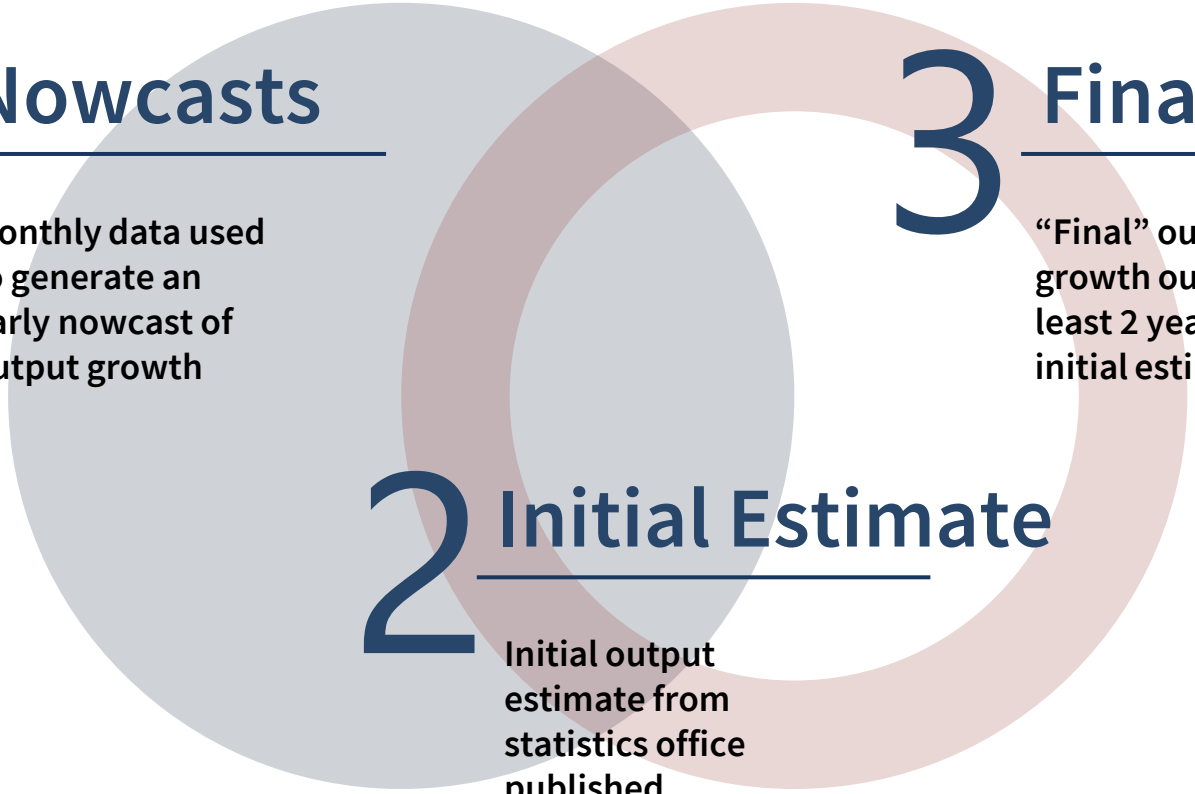
Working Paper is available on our website:



https://www.fiscalcouncil.ie/nowcasting-to-predict-data-revisions/



1 Nowcasts

Monthly data used to generate an early nowcast of output growth

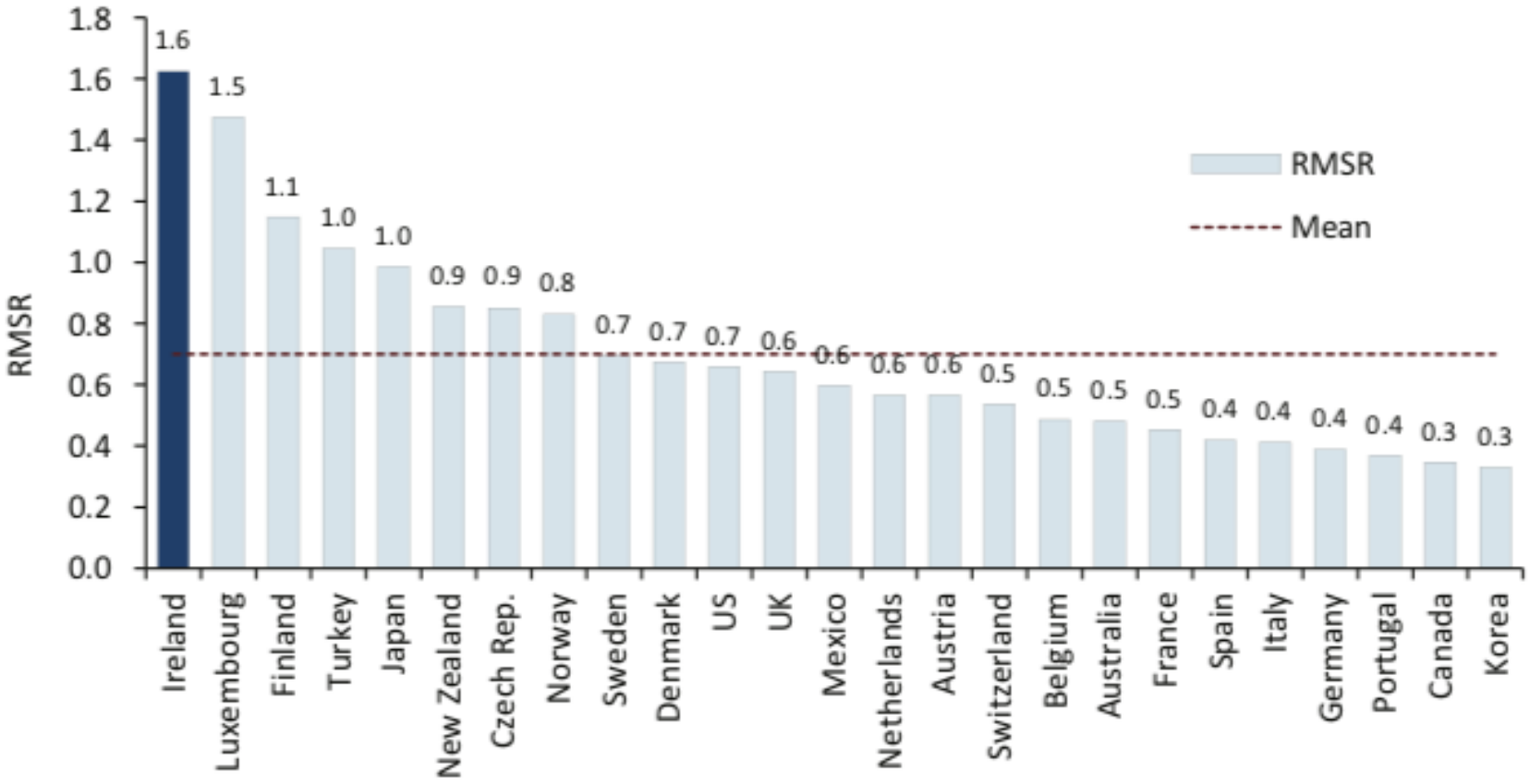
2 Initial Estimate

Initial output estimate from statistics office published

3 Final Outturn

“Final” output growth outturns (at least 2 years after initial estimate)

Irish data revisions are large and frequent



Source: Casey and Smyth (2016). "Revisions to Macroeconomic Data: Ireland and the OECD".
Note: RMSR = Root Mean Squared Revision for quarterly year-on-year growth rates. Sample is 2002 to 2013, but, for Luxembourg, data are only available from end-2005 to 2013.

"…data revisions may not be just another consideration in forecasting, rather they may be the major source of forecast uncertainty and one which is frequently ignored".

Croushore and Stark (2002)

Jumping off points

- Estimated outturns may lie on a wide distribution around the true or final estimate.

- Forecasts can therefore start from very different "jumping-off" points.

Nowcasting Model

Nowcasting model

- We focus on Underlying Domestic Demand:
  - C + G + Underlying I (i.e., excluding planes + intangibles)
  - Real Time Data for all components and factor indicators

- Nowcasts developed using dynamic factor model as in Giannone, Reichlin and Small (2005); D'Agostino, McQuinn and O' Brien (2012).
  - Mix of (i) Principal Components Analysis and (ii) Kalman filtering

Nowcasting model

- Matheson, Mitchell and Silverstone (2009) show some usefulness in context of revisions.
  - We compare our nowcasts vs initial outturns & AR model vis-à-vis predicting final outturns

Data

Table 1: Variables in Factor Analysis for Personal Consumption

Sample: June 2000–Dec 2017 (211 monthly obs; spanning 70 quarters)

Variable	Freq.	Transformation	Source
Consumer Sentiment Index	M	% change y/y	ESRI
Consumer Sentiment (Conditions)	M	% change y/y	ESRI
Consumer Sentiment (Expectations)	M	% change y/y	ESRI
Retail Sales (Bars)	M	% change y/y	CSO
Retail Sales (Books)	M	% change y/y	CSO
Retail Sales (Clothes)	M	% change y/y	CSO
Retail Sales (Department Stores)	M	% change y/y	CSO
Retail Sales (Electricals)	M	% change y/y	CSO
Retail Sales (Food and Beverages)	M	% change y/y	CSO
Retail Sales (Furniture)	M	% change y/y	CSO
Retail Sales (Hardware)	M	% change y/y	CSO
Retail Sales (Motors)	M	% change y/y	CSO
Retail Sales (Non-Specialised Stores)	M	% change y/y	CSO
Retail Sales (Other)	M	% change y/y	CSO
Retail Sales (Pharmaceuticals)	M	% change y/y	CSO
Unemployment Rate (15-24)	M	% labour force 15-24	CSO
Unemployment Rate (25-74)	M	% labour force 25-74	CSO
Vehicles Licensed (2nd Hand)	M	% change y/y	CSO
Vehicles Licensed (New)	M	% change y/y	CSO
PMI Services	M	PMI – 50	Markit

Table 2: Variables in Factor Analysis for Government Consumption

Sample: Jan 2004–Dec 2017 (168 monthly obs; spanning 56 quarters)

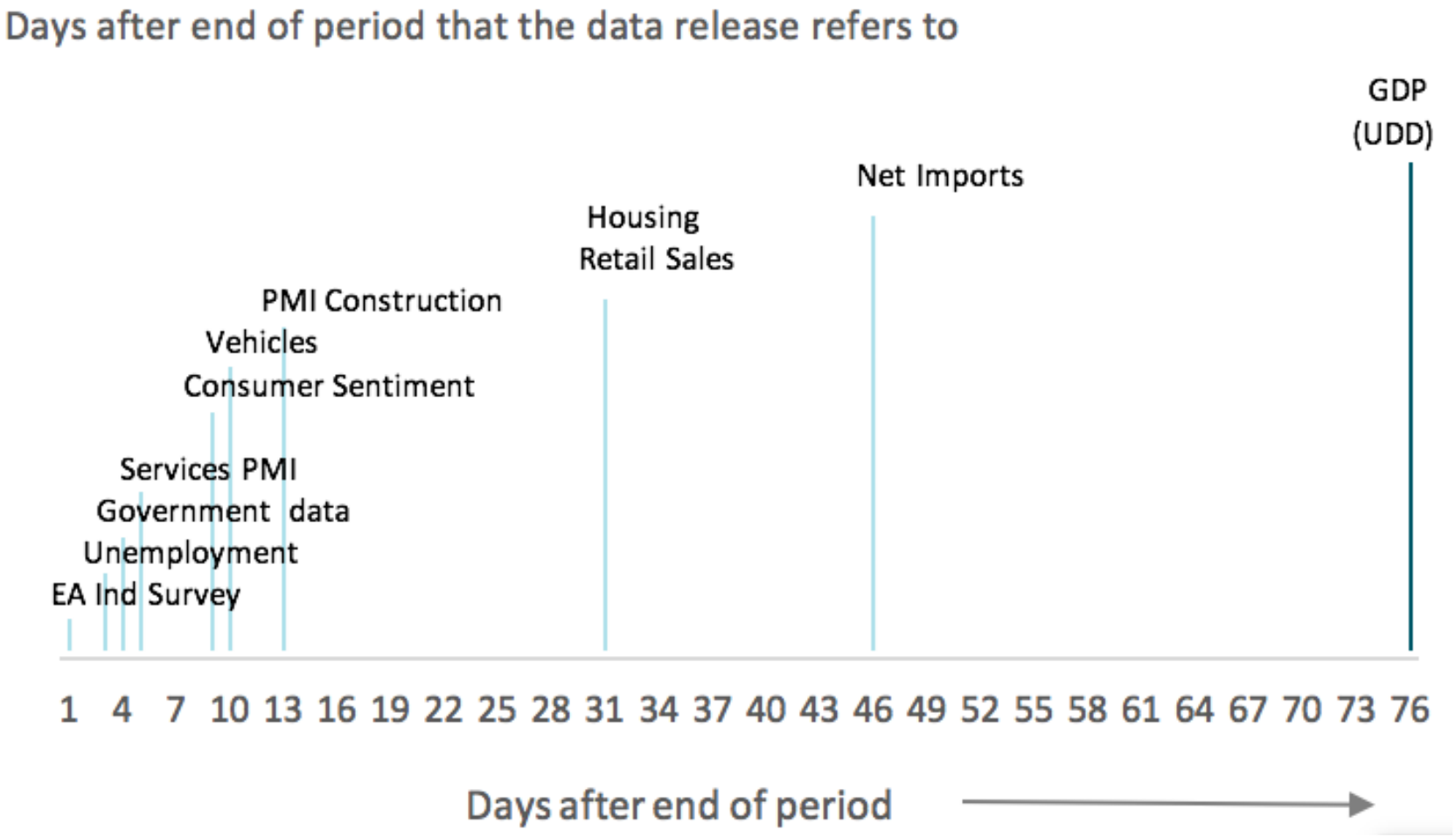
Variable	Freq.	Transformation	Source
Total Voted Current Expenditure	M	% change y/y	Department of Finance
Voted Education Expenditure	M	% change y/y	Department of Finance
Voted Health Expenditure	M	% change y/y	Department of Finance
Voted Justice Expenditure	M	% change y/y	Department of Finance
Voted Social Expenditure	M	% change y/y	Department of Finance

Table 3: Variables in Factor Analysis for Underlying Investment

Sample: Jan 2005–Dec 2017 (156 monthly obs; spanning 52 quarters)

Variable	Freq.	Transformation	Source
Ireland Housing Completions	M	% change y/y	Dept. Environment
Ireland New House Guarantee Registrations	M	% change y/y	Dept. Environment
Net Imports of Road Vehicles	M	% change y/y	CSO
Net Imports of Machinery and Transport Equipment	M	% change y/y	CSO
PMI Construction	M	PMI – 50	Markit
Euro Area Industry Survey, Export Order Books	M	-	DG ECFIN

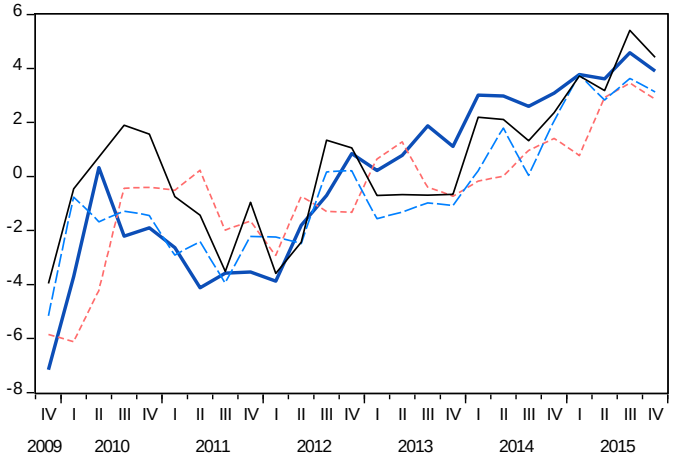
Timing of Releases Compared to Output



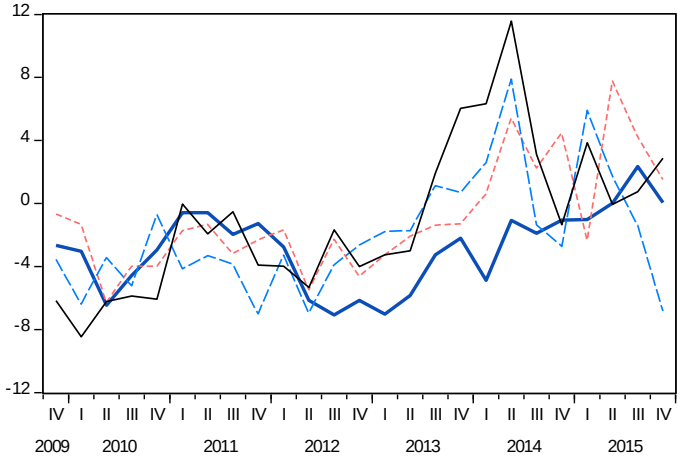
Nowcasts, Benchmark Estimates, and Outturns

% change year-on-year

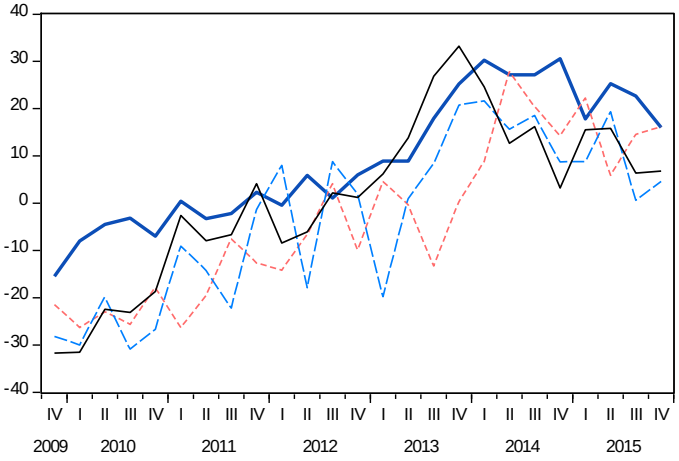
Personal Consumption Expenditure



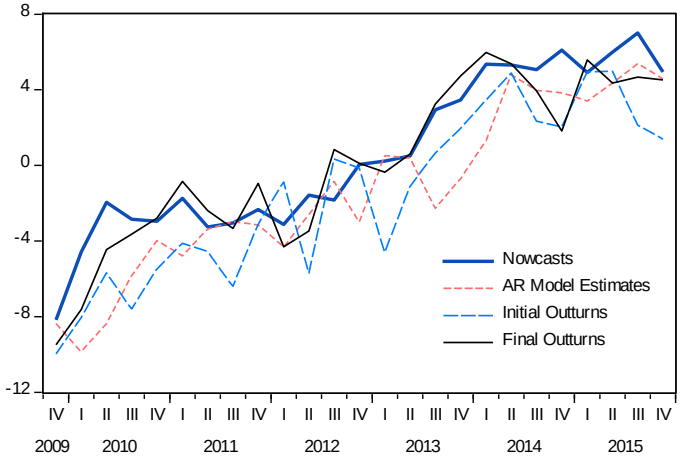
Government Consumption



Underlying Investment

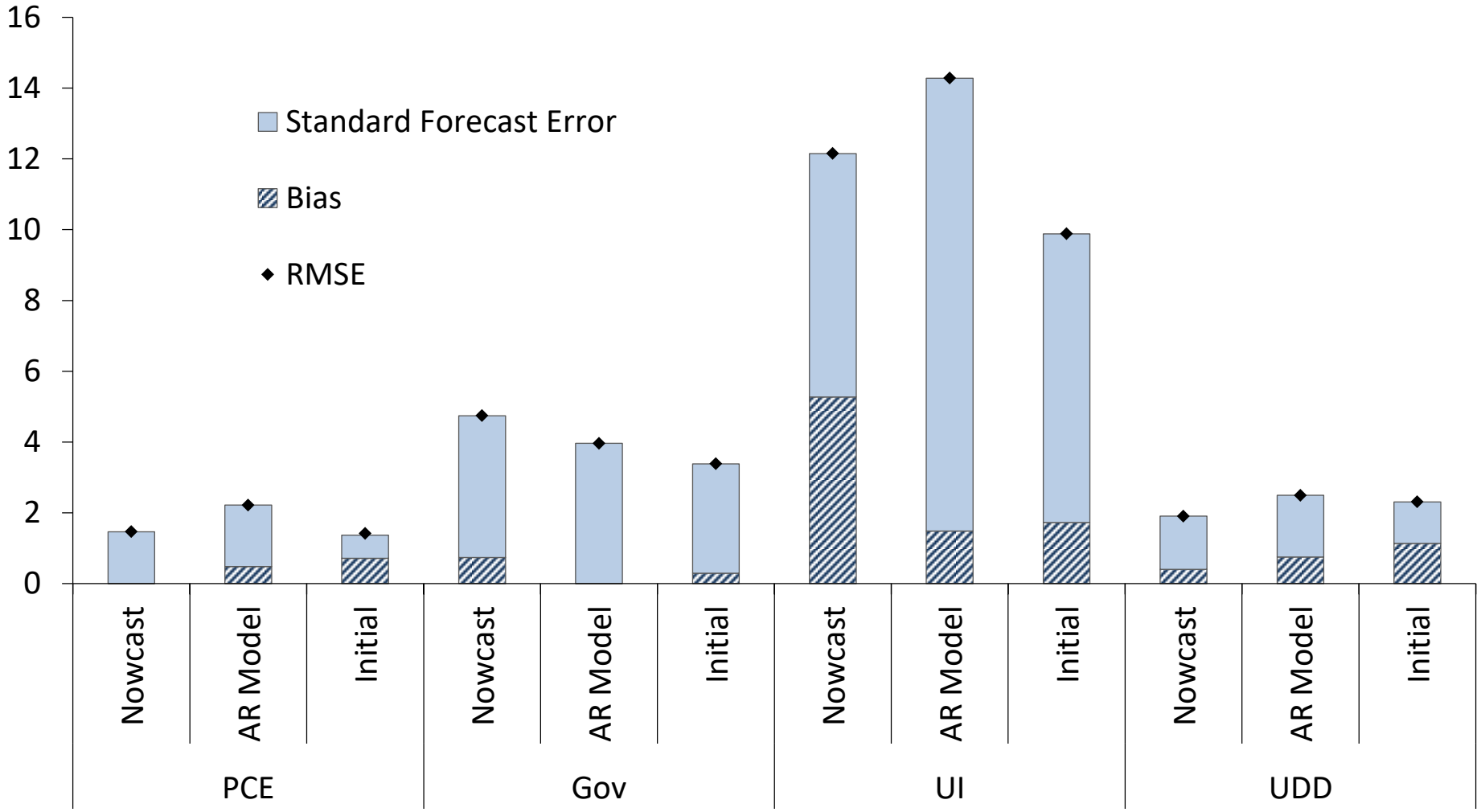


Underlying Domestic Demand



Decomposition of Errors for Each Component

RMSE (Q4 2009–Q4 2015, spanning 25 quarters)



Augmenting initial outturns

Nowcast-Augmented Initial Estimates (NAIE)

- Simple algorithm through which we may augment initial estimates wih the information contained in our nowcasts.
- We increase or decrease the initial estimate by the typical size of revisions whenever we judge that the nowcast has departed from our initial estimates by an amount greater than the typical revision size

$$NAIE_t = \begin{cases} Initial_t & if \ \ |Nowcast_t - Initial_t| < typerror \\ Initial_t + \dfrac{Nowcast_t - Initial_t}{|Nowcast_t - Initial_t|} * typerror & if \ \ |Nowcast_t - Initial_t| > typerror \end{cases}$$

- where $\mathrm{Initial_t}$ are our initial outturns; $\mathrm{Nowcast_t}$ are our nowcasts and typerror is the typical error (RMSE) between initial and final outturns for a pre-defined historical period.

Initial Estimates vs Nowcast-Augmented Initial Estimates

Sample: Q4 2009–Q4 2015 (spanning 25 quarters)

Variable	RMSE	Bias[1]	Standard Error[1]
PCE Initial Estimates	1.4	0.7	0.7
PCE Nowcast-Augmented Initial Estimates	1.3	0.1	1.2
GOV Initial Estimates	3.4	0.3	3.1
GOV Nowcast-Augmented Initial Estimates	3.6	0.5	3.1
UI Initial Estimates	9.9	1.7	8.2
UI Nowcast-Augmented Initial Estimates	7.9	0.0	7.9
UDD Initial Estimates	2.3	1.1	1.2
UDD Nowcast-Augmented Initial Estimates	1.6	0.1	1.5

Conclusions

Conclusions

- Nowcasts perform relatively well across components and better for aggregate domestic demand.
- Aggregate result reflects the fact that bias is lower than for initial estimates.
- However, overall size of errors still large.

We can view Nowcasts as a complementary tool for helping to understand how the economy is performing now.