

# Producing short-term forecasts of the Irish economy: a suite of models approach

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# Outline

- Motivation.
- General approach.
- Key features/innovations.
- Distortions.
- Fan charts.

# Why do we produce forecasts?

- Endorsement function, comparison with Department of Finance forecasts.
- Aids understanding of macroeconomic conditions, influencing all aspects of mandate.
- Model approach: useful for simulation purposes/what if scenarios e.g. quantify risks, sensitivity analysis.

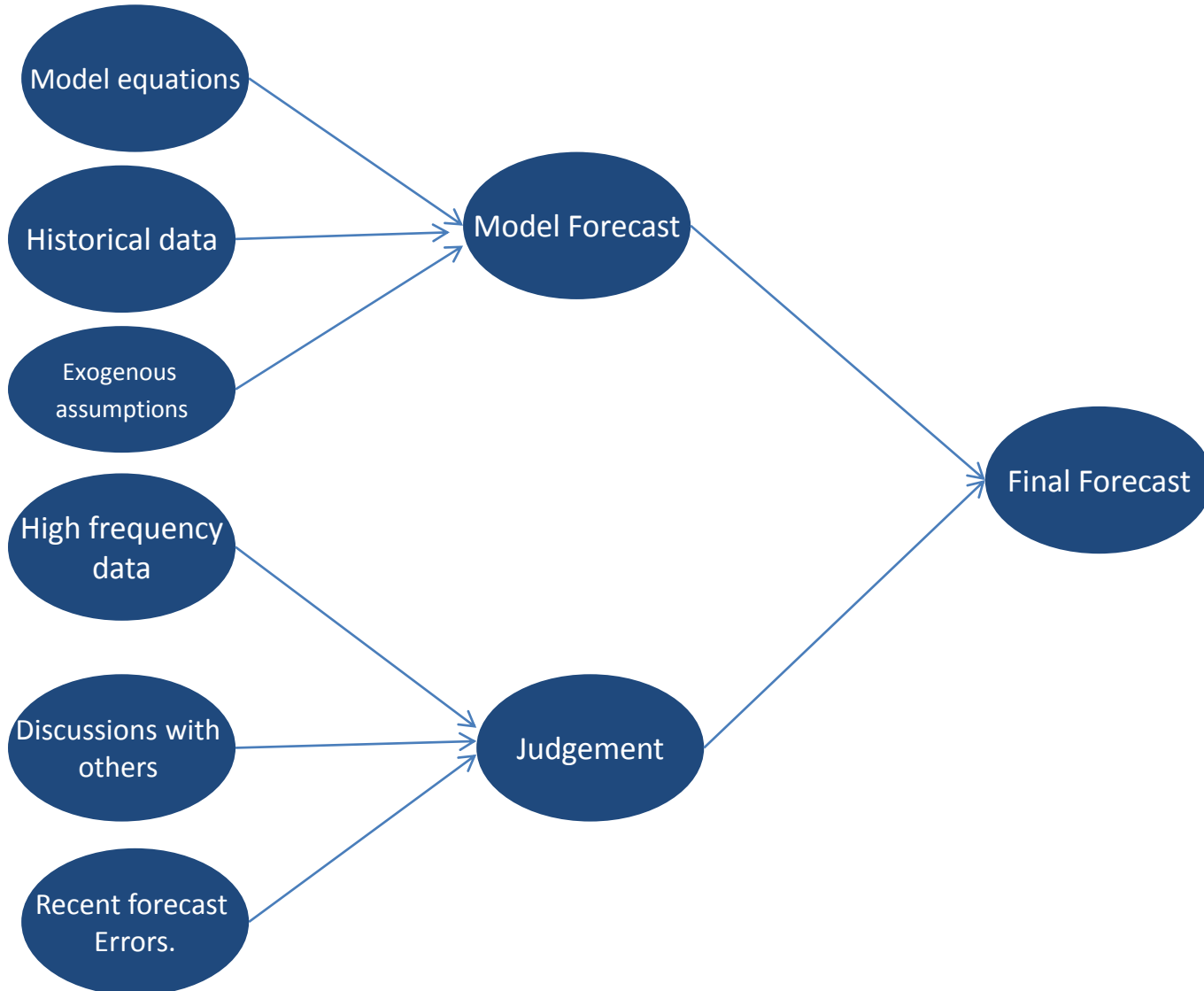
# General Approach

- Final forecast = model + judgement.
- Short term forecasts for T and T+1, revert towards potential growth rate thereafter.
- Model everything in real terms, separate model for the deflator, giving a nominal forecast also.

# General Approach

- Quarterly data.
- Expenditure side focus due to data availability.
- Automated model based forecast in Eviews, easy to see impact of new data.
- Transparent use of judgement (soft data may play a role).

# General Approach



# General Approach

- Quarterly data.
- Series of component level models rather than large macro model.
- $LN(Y_t) = \alpha_1 + \beta_1 LN(X_{1t}) + \beta_2 LN(X_{2t})$   
 $\Delta LN(Y_t) = \alpha_2 + \beta_3 \Delta LN(X_{1t}) + \beta_4 \Delta LN(X_{2t})$   
 $+ \beta_5 (LN(Y_{t-4}) - (\alpha_1 + \beta_1 LN(X_{1t-4}) + \beta_2 LN(X_{2t-4})))$
- Standard predictors used (PDI for consumption, external demand for exports etc.)

# Key features/innovations

Three key features:

1. Multiple models for each item, diversification. Model Averaging.
2. Rigorous testing/ re-estimation at each round.
3. Additional inputs/judgement.



# 1. Multiple Models / Model Averaging

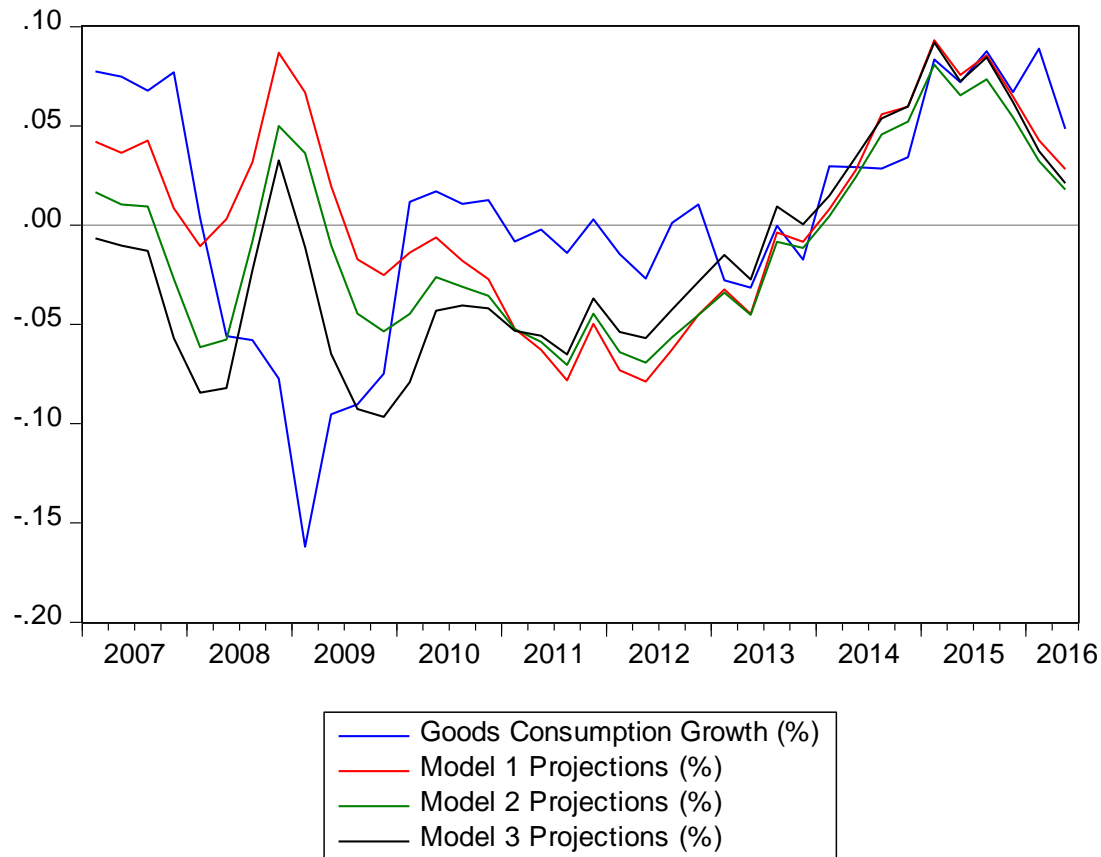
- Model at a disaggregated level.
- Multiple models for each item.
- Take an average of model forecasts.
- Stock and Watson (1999) multiple models outperform single model, diversification.
- Macroeconomic drivers may change over time, having multiple models increases the likelihood of capturing this.

## 2. Testing the models

- Models are re-estimated and tested at each forecasting round.
- Models developed organically at each forecasting round.
- Out of sample forecasting performance tested, four quarter ahead forecasts produced and compared to actual outturns.
- Recent errors may guide judgement applied.

## 2. Testing the models

- All three models underestimating recent goods consumption growth, hence there may be a case for positive judgement to be applied.



### 3. Judgement/other inputs

- Discussions with Council, other forecasters, CSO.
- Examine recent model errors to see if judgement is required.
- Quarterly profiles, carryovers etc.

# Putting it all together

- Sensible forecasts at a component level vs aggregate forecast.
- Converging on potential output growth (post  $t+1$ ).
- Contributions to growth over time.
- Internal consistency, labour market vs expenditure side.
- Implied quarter on quarter growth rates.
- Observed data since last QNA release, retail sales, tax returns, industrial production, QNHS, monthly trade data.

### 3. Judgement/other inputs

- Discussions with Council, other forecasters, CSO.
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# Distortions

- Trade data, monthly trade data vs national accounts.
- Services consumption, recent data inconsistent with employment/ income growth.
- Investment: intangibles, aircraft.
- ISA savings rate.
- Current account.
- Completions data/census.

# Thank You

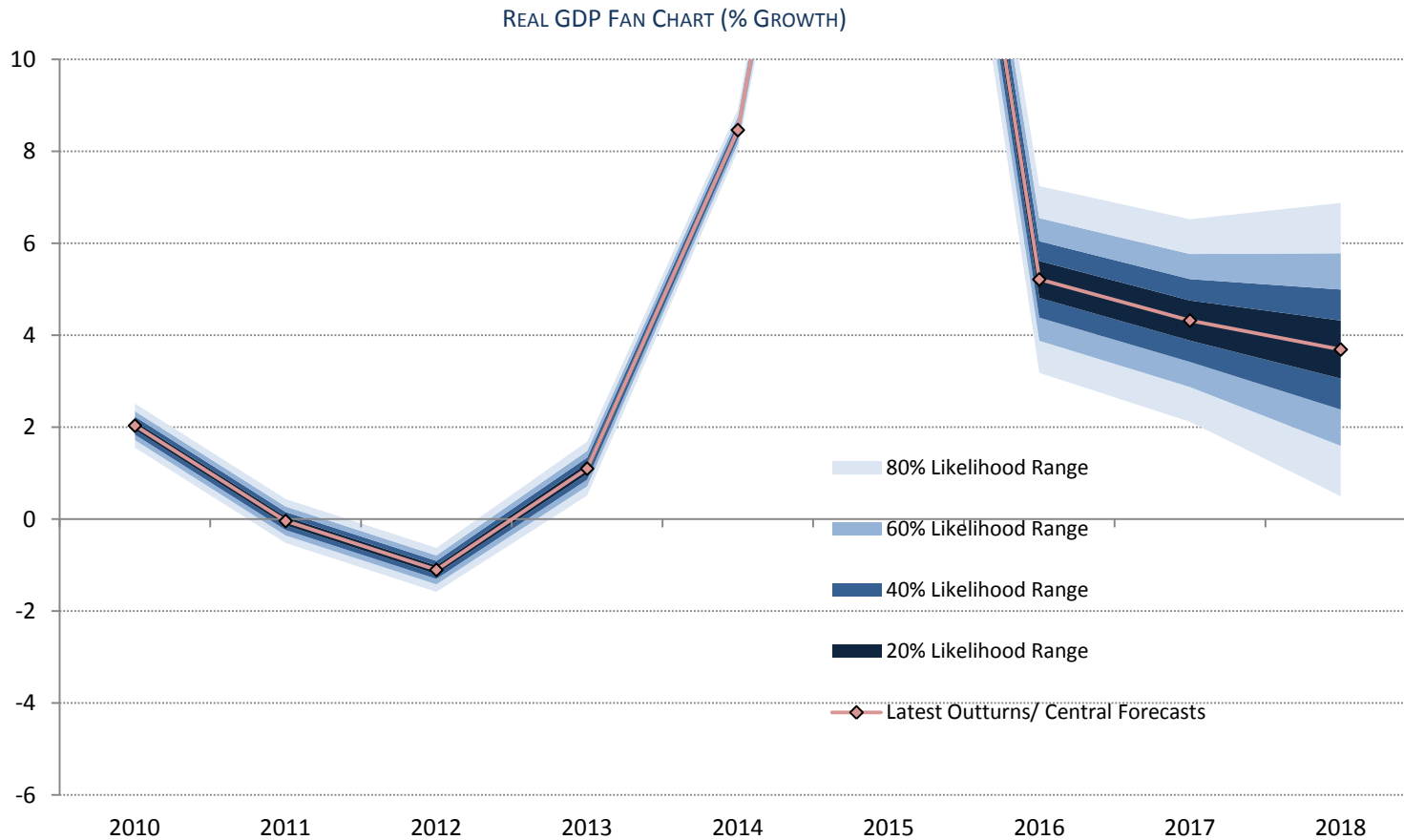
- Questions, comments??



# Fan Charts

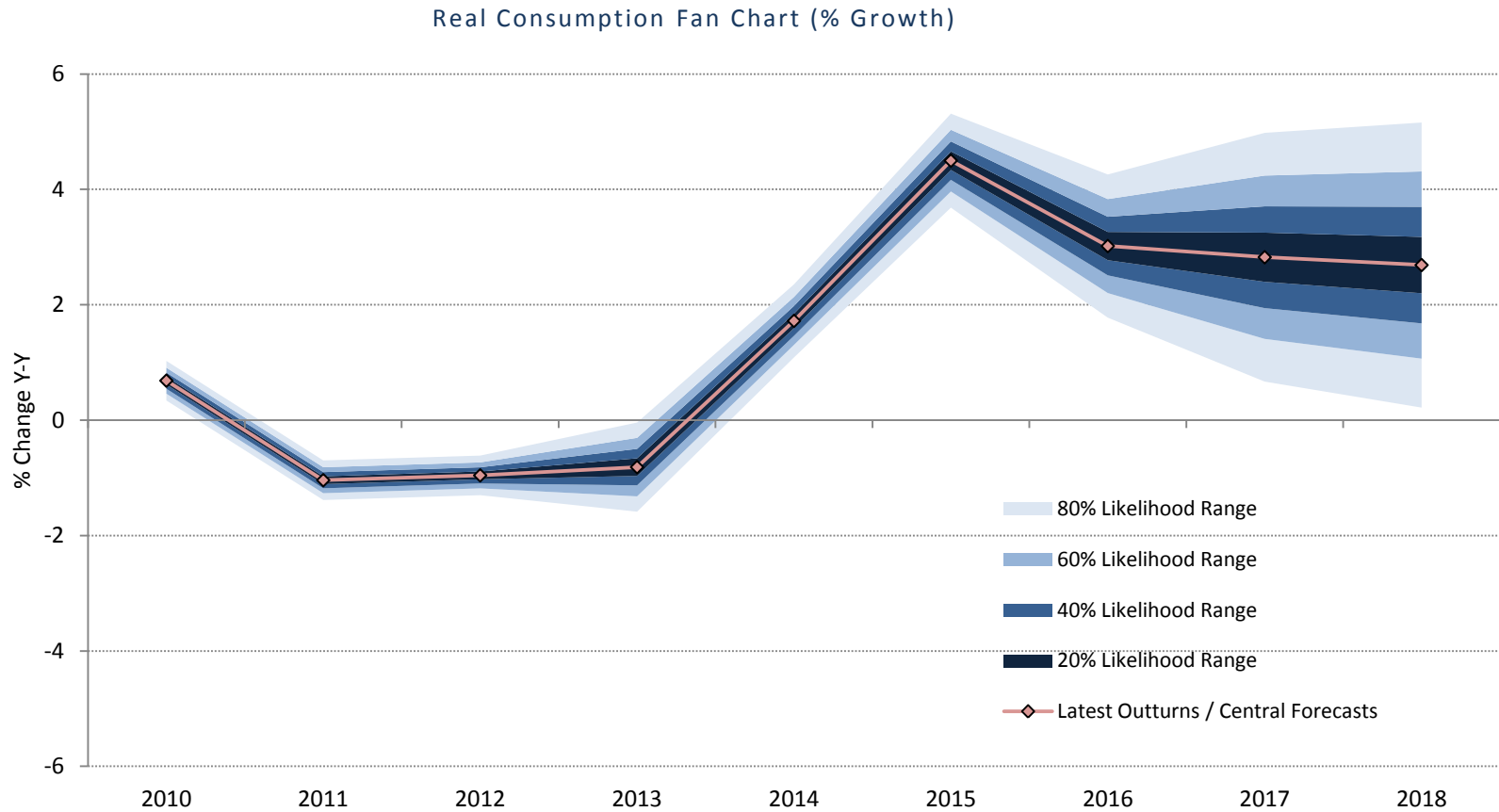
- How confident can one be, what do typical revisions/errors look like?
- Useful when comparing forecasts, given wide typical forecast errors, differences in forecasts are often not as significant as they initially appear.

# Fan Charts GDP



Note: Distributions or 'fans' around historical growth estimates are based on previous revisions to real GDP data. Forecast errors based on 1999-07; 2010-15 sample. The Y axis is adjusted to make the 2017 and 2018 forecasts legible.

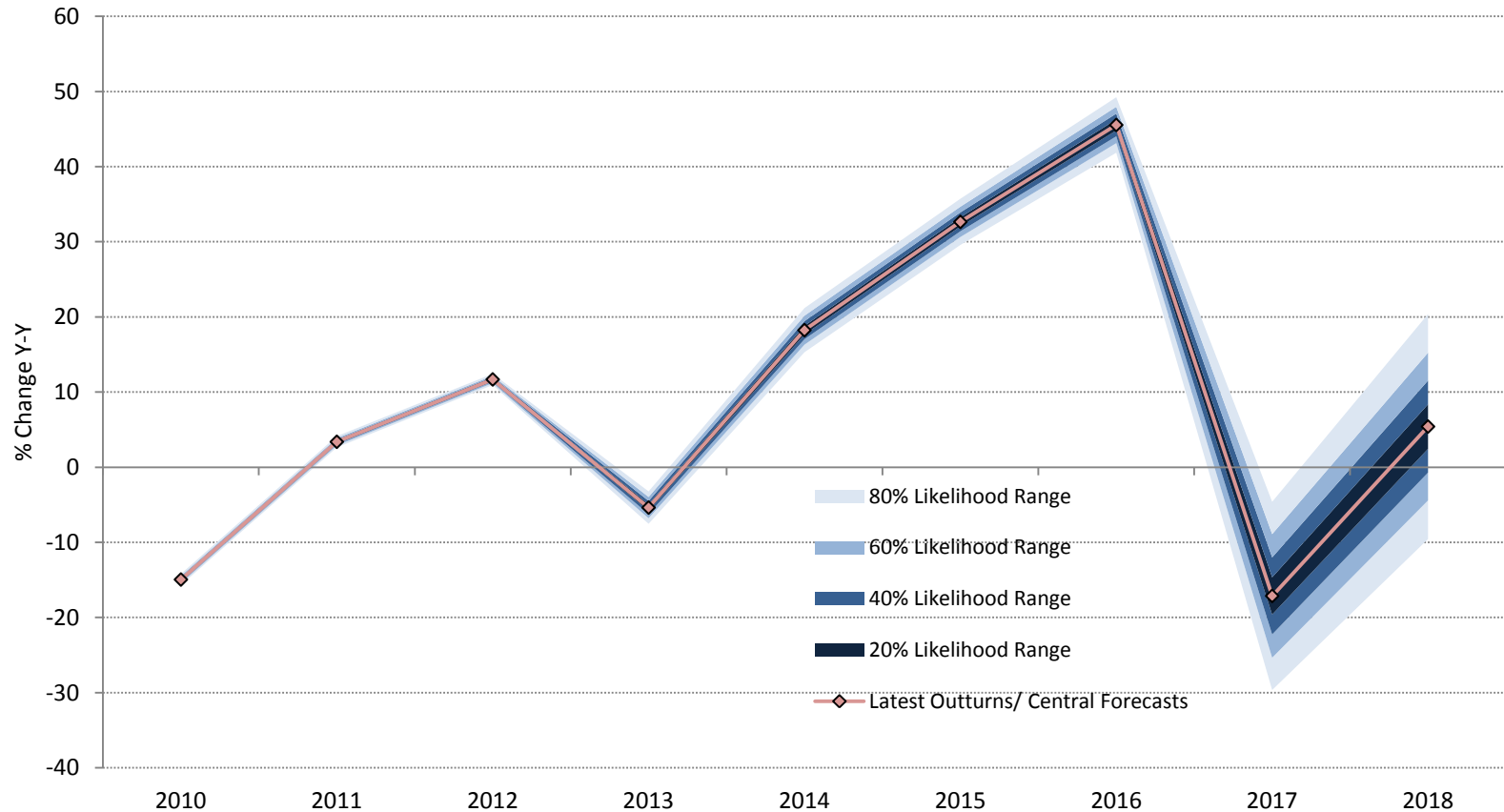
# Fan Charts Consumption



Note: Distributions or 'fans' around historical growth estimates are based on previous revisions to real consumption data. Forecast errors based on 2000-07; 2010-15 sample.

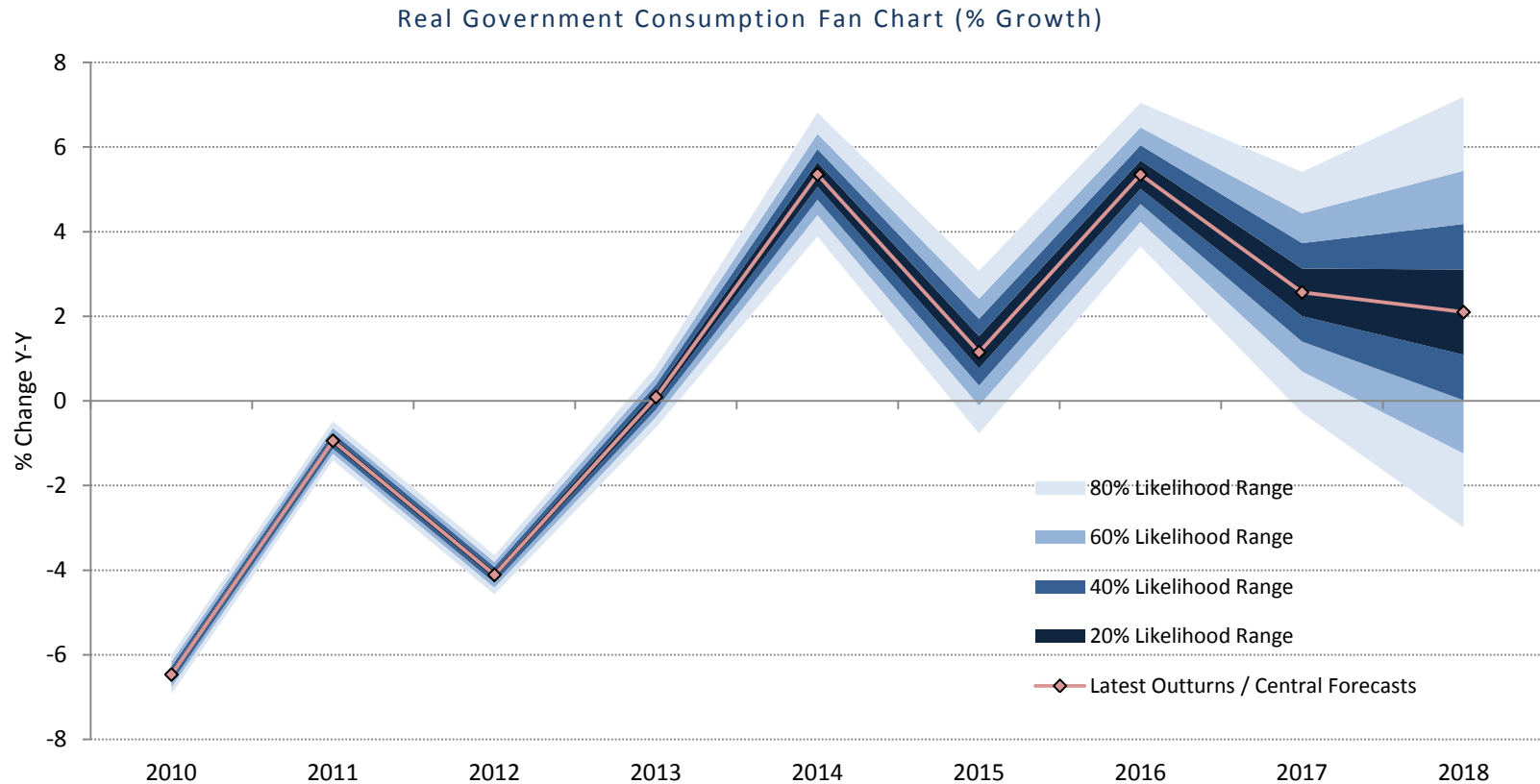
# Fan Charts Investment

Real Investment Fan Chart (% Growth)



Note: Distributions or 'fans' around historical growth estimates are based on previous revisions to real investment data. Forecast errors based on 2000-07; 2010-15 sample.

# Fan Charts Government

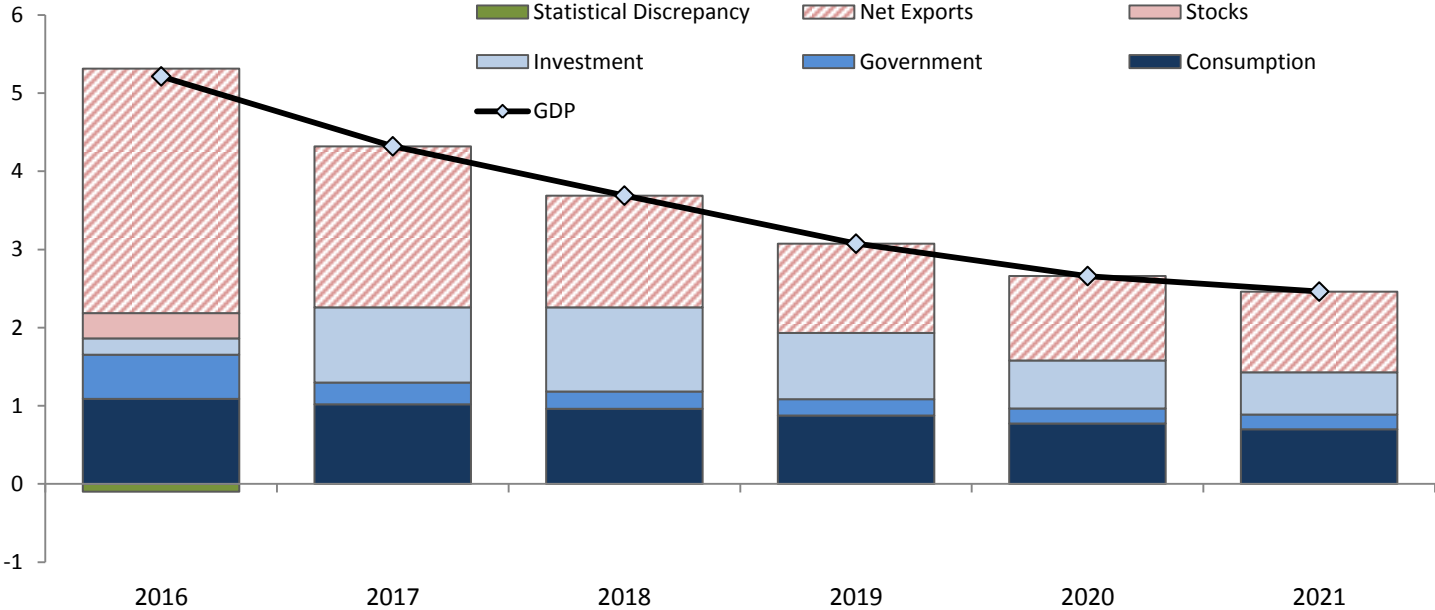


Note: Distributions or 'fans' around historical growth estimates are based on previous revisions to government consumption data. Forecast errors based on 2000-07; 2010-15 sample.

# Appendix

- Contributions to growth

**SPU 2017 Underlying Contributions**  
Percentage Point Contributions



Sources: SPU 2017; CSO; internal IFAC calculations.

Notes: "Underlying" investment and net exports strip out intangibles and aircraft purchases in full as these are, in the main, imported, with little impact on real GDP.