Appendix A. Additional Results Adding Industrial Production and the Composite Leading Indicator for the US and Germany to Real GDP, Employment and Investment

We added industrial production and the composite leading indicator for the US and Germany, and we find these variables have some significant coefficients in equations for real GDP at different horizons (see below). The bond spread retains its negative and significant coefficient but the sign on US composite leading indicator is negative rather than positive. Overall these variables do not make a substantial contribution to the goodness of fit, which is about the same as a model that excludes them.

Table A1
Alternative Table 3: Additional Results for Real GDP, Employment and Investment

| Forecast horizon: 4 quarters |
|-----------------------------|
| Financial indicator   | RGDP     | EMP      | INV       |
|                          | (1)      | (2)      | (3)       |
| Bond spread             | -0.673   | -0.404** | -2.425*** |
|                         | (0.428)  | (0.174)  | (0.703)   |
| Germany consumer confidence | -0.0974*** | -0.0242* | -0.215*** |
|                         | (0.032)  | (0.013)  | (0.078)   |
| Germany CLI             | 0.580**  | 0.264**  | 1.198**   |
|                         | (0.255)  | (0.109)  | (0.546)   |
| US CLI                  | -0.519** | -0.299** | -1.200**  |
|                         | (0.213)  | (0.097)  | (0.502)   |
| US IP growth            | 0.202**  | 0.0720** | 0.507**   |
|                         | (0.087)  | (0.033)  | (0.192)   |
| Within R²               | 0.523    | 0.540    | 0.555     |
| Observations            | 255      | 255      | 255       |
| Number of countries     | 8        | 8        | 8         |

Notes. The dependent variable in each column is annualised quarterly real GDP growth (RGDP), employment growth (EMP), fixed capital investment growth (INV) and monthly growth in industrial production (IP). The top panel reports DFEs estimates and the bottom panel reports mean-group estimates of the same (2) using monetary policy indicators (real interest rate and term spread), the country composite leading indicator (country CLI) and the bond spread measure (bond spread). Sample period: July 1994–May 2011. Euro area countries are included from October 2001. All models include five lags of the first-difference growth of the dependent variable. Standard errors are reported in parentheses. ***p < 0.01, **p < 0.05, *p < 0.1. The Hausman statistic tests for evidence of bias in the DFEs estimate of the coefficient for the bond spread with a null of no difference between the estimated coefficients in the top and bottom panels, and therefore no bias. The critical values are 6.635 (p < 0.01), 3.841 (p < 0.05) and 2.706 (p < 0.1).
A.1. Results of Adding One Control Variable at a Time

We add each control variable one at a time to the model in successive columns. The results are reported for DFE and MGE estimators in the Tables below.

### Table A2
**Alternative Table 4: Results for Addition of Variables One at a Time (Dynamic Fixed Effects Estimator)**

| Financial indicator | (1)         | (2)         | (3)         | (4)         | (5)         | (6)         | (7)         |
|---------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Bond spread         | \(-2.002^{***}\) | \(-2.001^{***}\) | \(-2.000^{***}\) | \(-1.350^{***}\) | \(-1.536^{***}\) | \(-1.336^{***}\) | \(-1.189^{***}\) |
|                     | (0.547)     | (0.547)     | (0.535)     | (0.226)     | (0.392)     | (0.316)     | (0.211)     |
| Real interest rate  | \(-0.0294\) | (0.208)     |             |             |             |             |             |
| Term spread         |             |             | \(-0.00858\) | (0.262)     |             |             |             |
| OECD CLI            |             |             |             |             |             |             |             |
| Consumer confidence |             |             |             |             |             |             |             |
| Economic sentiment  |             |             |             |             |             |             |             |
| Within R²           | 0.513       | 0.513       | 0.513       | 0.693       | 0.598       | 0.636       | 0.708       |
| Observations        | 287         | 287         | 287         | 287         | 287         | 287         | 287         |
| Number of countries | 8           | 8           | 8           | 8           | 8           | 8           | 8           |

---

| Financial indicator | (1)         | (2)         | (3)         | (4)         | (5)         | (6)         | (7)         |
|---------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Bond spread         | \(-1.653^{***}\) | \(-1.648^{***}\) | \(-1.698^{***}\) | \(-1.301^{***}\) | \(-1.414^{***}\) | \(-1.474^{***}\) | \(-1.474^{***}\) |
|                     | (0.461)     | (0.434)     | (0.487)     | (0.373)     | (0.448)     | (0.492)     | (0.412)     |
| Real interest rate  | \(-0.214\) | (0.241)     |             |             |             |             |             |
| Term spread         |             |             | 0.198       | (0.291)     |             |             |             |
| OECD CLI            |             |             |             |             |             |             |             |
| Consumer confidence |             |             |             |             |             |             |             |
| Economic sentiment  |             |             |             |             |             |             |             |
| Within R²           | 0.336       | 0.346       | 0.341       | 0.419       | 0.372       | 0.350       | 0.455       |
| Observations        | 287         | 287         | 287         | 287         | 287         | 287         | 287         |
| Number of countries | 8           | 8           | 8           | 8           | 8           | 8           | 8           |

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### Table A2
(Continued)

Real GDP growth – forecast horizon: 8 quarters

| Financial indicator | (1)     | (2)     | (3)     | (4)     | (5)     | (6)     | (7)     |
|---------------------|---------|---------|---------|---------|---------|---------|---------|
| Bond spread         | −1.057*** (0.349) | −1.053*** (0.322) | −1.127*** (0.358) | −1.042*** (0.388) | −1.089*** (0.380) | −1.270*** (0.396) | −1.286*** (0.367) |
| Real interest rate  | −0.172 (0.240) | 0.11 (0.257) |
| Term spread         | 0.305 (0.356) | 0.403 (0.362) |
| OECD CLI            | 0.024 (0.107) | 0.338*** (0.114) |
| Consumer confidence | −0.0096 (0.024) | 0.0635*** (0.019) |
| Economic sentiment  | −0.0611 (0.037) | −0.159*** (0.045) |
| Within R²           | 0.182 | 0.194 | 0.201 | 0.182 | 0.183 | 0.217 | 0.287 |
| Observations        | 287 | 287 | 287 | 287 | 287 | 287 | 287 |
| Number of countries | 8 | 8 | 8 | 8 | 8 | 8 | 8 |

Notes. The dependent variable in each column is annualised quarterly Real GDP growth (RGDP). See notes to Table 3. ***p < 0.01, **p < 0.05, *p < 0.1.

### Table A3

**Alternative Table 4: Results for Addition of Variables One at a Time (Mean Group Estimator)**

Real GDP growth – forecast horizon: 1 quarter

| Financial indicator | (1)     | (2)     | (3)     | (4)     | (5)     | (6)     | (7)     |
|---------------------|---------|---------|---------|---------|---------|---------|---------|
| Bond spread         | −2.327*** (0.254) | −2.500*** (0.233) | −2.596*** (0.234) | −1.713*** (0.284) | −1.731*** (0.267) | −1.506*** (0.306) | −1.356*** (0.375) |
| Real interest rate  | −0.429** (0.209) | 0.706* (0.369) |
| Term spread         | 0.370* (0.194) | −1.052** (0.471) |
| OECD CLI            | 1.383*** (0.189) | 0.882*** (0.118) |
| Consumer confidence | 0.194*** (0.034) | −0.0507 (0.038) |
| Economic sentiment  | 0.247*** (0.042) | 0.159*** (0.061) |
| RMSE                | 1.789 | 1.702 | 1.738 | 1.172 | 1.463 | 1.326 | 0.920 |
| Observations        | 287 | 287 | 287 | 287 | 287 | 287 | 287 |
| Number of countries | 8 | 8 | 8 | 8 | 8 | 8 | 8 |

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A.2. Compare Models with and Without the Spreads

We have estimated the model using dynamic fixed effects with five lags and an identical specification to Table 4 in the paper but without the bond spread included in the regression. We report the result below for Table 4. The $R^2$ goodness of fit measure falls for one, four and eight quarter models, and the fall is greater the longer the forecast horizon. The measures of within $R^2$ in the original model were 0.696, 0.423 and 0.201.
A.3. Results of using Weighted Averages for the Bond Spread Instead of Simple Averages

The result of using weighted instead of simple averages in construction of the bond spreads does not alter the results. We report Tables 3 and 4 from the paper with weighted average bond spread measures below. The results are reported in Tables A5 and A6.

Table A4

Alternative Table 4. Real GDP without the Bond Spread

| Financial indicator | 1 quarter | 4 quarters | 8 quarters |
|---------------------|-----------|------------|------------|
| Real interest rate  | −0.821*** | −2.048***  | −1.868***  |
|                     | (0.269)   | (0.410)    | (0.345)    |
| Term spread         | −1.545*** | −2.392***  | −1.670***  |
|                     | (0.422)   | (0.583)    | (0.426)    |
| Country CLI         | 1.580***  | 0.903***   | 0.0636     |
|                     | (0.144)   | (0.173)    | (0.097)    |
| Within R²           | 0.627     | 0.317      | 0.062      |
| Observations        | 287       | 287        | 287        |
| Number of countries | 8         | 8          | 8          |

Note. ***p < 0.01, **p < 0.05, *p < 0.1.

Table A5

Alternative Table 3. Weighted-average Bond Spread

| Financial indicator | RGDP       | EMP        | INV        | IP         |
|---------------------|------------|------------|------------|------------|
| Weighted bond spread| −1.635***  | −0.691***  | −4.094***  | −4.198***  |
|                     | (0.418)    | (0.147)    | (1.025)    | (1.215)    |
| Real interest rate  | −0.124     | −0.162     | −0.534     | −0.988     |
|                     | (0.260)    | (0.115)    | (0.680)    | (0.682)    |
| Term spread         | −0.0202    | −0.0673    | 0.203      | 0.437      |
|                     | (0.356)    | (0.106)    | (0.874)    | (0.964)    |
| Country CLI         | 0.503***   | 0.210***   | 1.250***   | 1.887***   |
|                     | (0.155)    | (0.042)    | (0.234)    | (0.393)    |
| Within R²           | 0.453      | 0.559      | 0.505      | 0.800      |

Forecast horizon: 12 months/4 quarters

| Financial indicator | RGDP       | EMP        | INV        | IP         |
|---------------------|------------|------------|------------|------------|
| Weighted bond spread| −1.476***  | −0.384**   | −3.688**   | −3.980***  |
|                     | (0.431)    | (0.189)    | (1.703)    | (0.654)    |
| Real interest rate  | −1.659***  | −0.638***  | −4.509***  | −5.659***  |
|                     | (0.422)    | (0.226)    | (1.137)    | (1.242)    |
| Term spread         | −1.694***  | −0.658***  | −4.409***  | −3.982***  |

Forecast horizon: 12 months/4 quarters

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Table A5

Forecast horizon: 12 months/4 quarters

| Financial indicator | RGDP       | EMP    | INV       | IP        |
|---------------------|------------|--------|-----------|-----------|
|                     | (5)        | (6)    | (7)       | (8)       |
| Country CLI         | (0.533)    | (0.146)| (1.440)   | (1.246)   |
|                     | 0.726***   | 0.436**| 1.556***  | 2.482***  |
|                     | (0.160)    | (0.216)| (0.420)   | (0.359)   |
| RMSE                | 1.1929     | 0.4397 | 2.8897    | 4.4194    |
| Observations        | 287        | 287    | 287       | 872       |
| Number of countries | 8          | 8      | 8         | 8         |

Notes. The dependent variables are annualised quarterly real GDP growth (RGDP), employment growth (EMP), and investment (INV), and monthly industrial production (IP). See notes to Table 3.

Table A6

Alternative Table 4. Weighted-average Bond Spread

| Real GDP growth | 1 quarter | 4 quarters | 8 quarters |
|-----------------|-----------|------------|------------|
| Financial indicator | (1)      | (2)       | (3)       |
| Weighted bond spread | −1.571*** | −1.655***  | −1.407***  |
|                    | (0.253)   | (0.418)   | (0.405)   |
| Real interest rate  | 0.0889    | −0.124     | 0.0201     |
|                   | (0.210)   | (0.260)   | (0.260)   |
| Term spread        | −0.113    | −0.0202    | 0.326      |
|                   | (0.246)   | (0.356)   | (0.382)   |
| Country CLI        | 1.028***  | 0.503***   | −0.0349    |
|                    | (0.198)   | (0.155)   | (0.111)   |
| Within R²          | 0.706     | 0.453      | 0.237      |

Notes. The dependent variable in each column is annualised quarterly Real GDP growth (RGDP). See notes to Table 3.

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A.4. Estimates with a Truncated Sample

When we compare the results from Table 4 with a sample of data that ends in 2008Q4 we find that the coefficients on bond spreads are slightly larger than the estimates for a sample period extending to 2011 reported in the Table. Coefficients on bond spreads retain their negative sign and significance, and although there are differences in the point estimates they do not change the argument in the paper. The results are provided below.

Table A7

*Alternative Table 4. Estimates with a Truncated Sample*

| Financial indicator | 1 quarter (1) | 4 quarters (2) | 8 quarters (3) |
|---------------------|--------------|---------------|---------------|
| Bond spread         | -2.060***    | -2.087***     | -1.716***     |
|                     | (0.257)      | (0.674)       | (0.385)       |
| Real interest rate  | 0.0812       | 0.149         | 0.0444        |
|                     | (0.172)      | (0.231)       | (0.239)       |
| Term spread         | -0.442**     | 0.162         | 0.392         |
|                     | (0.200)      | (0.339)       | (0.428)       |
| Country CLI         | 0.844***     | 0.501**       | -0.0392       |
|                     | (0.187)      | (0.238)       | (0.145)       |
| Within $R^2$        | 0.796        | 0.560         | 0.378         |

Notes. The dependent variable in each column is annualised quarterly real GDP growth (RGDP). See notes to Table 3.

A.5. Additional Results for Real GDP, Employment and Investment

When we include additional regressors such as German consumer confidence, German industrial production growth, US composite leading indicator and industrial production growth to estimated (2) for growth in real GDP, employment and investment, we find some significance but the explanatory power of the regression equation is not much improved.

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We report out-of-sample estimates of our European model for real GDP growth for observations from 2008. We compare the one-step ahead forecast performance of our preferred model from Table 7, which allows country differences in the response to bond spreads to influence real GDP growth versus alternative models. We have three alternative models:

| Financial indicator       | RGDP       | EMP       | INV       |
|---------------------------|------------|-----------|-----------|
| Bond spread               | -0.673     | -0.404**  | -2.425*** |
|                           | (0.428)    | (0.174)   | (0.793)   |
| Germany consumer confidence| -0.0974*** | -0.0242*  | -0.215*** |
|                           | (0.032)    | (0.013)   | (0.078)   |
| Germany CLI               | 0.580**    | 0.264**   | 1.198**   |
|                           | (0.235)    | (0.109)   | (0.546)   |
| US CLI                    | -0.519**   | -0.239**  | -1.200**  |
|                           | (0.213)    | (0.097)   | (0.592)   |
| US IP growth              | 0.202**    | 0.0720**  | 0.507**   |
|                           | (0.087)    | (0.033)   | (0.192)   |
| Within R²                 | 0.523      | 0.540     | 0.555     |

Forecast horizon: 4 quarters

| Financial indicator       | RGDP       | EMP       | INV       |
|---------------------------|------------|-----------|-----------|
| Bond spread               | -0.906*    | -0.317*   | -2.811*** |
|                           | (0.489)    | (0.181)   | (0.998)   |
| Real interest rate        | -0.24      | -0.197    | -0.605    |
|                           | (0.298)    | (0.135)   | (0.828)   |
| Term spread               | -0.177     | -0.173    | 0.261     |
|                           | (0.478)    | (0.160)   | (1.227)   |
| Country CLI               | 0.510***   | 0.253***  | 1.556***  |
|                           | (0.218)    | (0.092)   | (0.392)   |
| IP growth                 | 0.000601   | -0.00019  | 0.00108   |
|                           | (0.001)    | (0.000)   | (0.001)   |
| US CLI                    | -0.458*    | -0.170**  | -1.288**  |
|                           | (0.255)    | (0.072)   | (0.526)   |
| US IP growth              | 0.192***   | 0.0685**  | 0.436***  |
|                           | (0.072)    | (0.029)   | (0.154)   |
| Within R²                 | 0.473      | 0.543     | 0.539     |
| Observations              | 255        | 255       | 255       |
| Number of countries       | 8          | 8         | 8         |

Notes: The dependent variable in each column is annualised real GDP growth (RGDP). The top panel provides estimates from DFEs estimates of (2) using monetary policy indicators (real interest rate and term spread), the composite leading indicators for the European country (Country CLI) and US (US CLI), the US industrial production first-difference growth rate (US IP growth) and the bond spread (bond spread). The lower panel provides mean group estimates of the same model. Sample period: July 1994–May 2011. Euro area countries included from October 2001. All models include five lags of the first-difference growth of the dependent variable. Standard errors are reported in parentheses. ***p < 0.01, **p < 0.05, *p < 0.1.

A.6. Out of Sample Forecasts

We report out-of-sample estimates of our European model for real GDP growth for observations from 2008. We compare the one-step ahead forecast performance of our preferred model from Table 7, which allows country differences in the response to bond spreads to influence real GDP growth versus alternative models. We have three alternative models:
(i) a random walk model;
(ii) a model identical to ours but excluding the bond spreads; and
(iii) an autoregressive model in which the growth of real GDP is predicted by lagged values of itself.

The preferred model and the three alternatives are compared using the ratio of mean squared forecast errors (MSFE); if the ratio is greater than one the alternative model outperforms the model from Table 7. We evaluate the performance in two columns in Table 8. The first column allows forecasts to be made using a model with a fixed estimation period ending December 2008 (fixed window), while the second allows the end of the estimation period to roll forward by one period at a time (expanding window).

The reported forecasts from our preferred model versus the random walk alternative show the MSFE ratio is less than one for nine out of 16 cases. The MSFE ratio results versus the model excluding bond spreads are less than one for 11 out of 16 cases, while versus the autoregressive model, 14 out of 16 cases have a ratio less than one. We take these results as evidence that the model has reliable out-of-sample predictive ability one-step ahead versus three alternative models. However, the forecasts from the baseline model including bond spreads for Austria appear consistently worse than all three alternatives, possibly due to the much higher bond spread and expected default risk associated with this country. We exercise further caution due to the short sample (which does not include a previous large recession) and the overlap of the forecasting period with the financial crisis, which may be reasons to interpret these results with care.

Table A9

| Real GDP growth | Random walk | Baseline excluding spread | Autoregressive |
|-----------------|-------------|---------------------------|---------------|
| Ratio value     | Fixed window | Expanding window | Fixed window | Expanding window | Fixed window | Expanding window |
| (by country)    |             |                     |             |                    |             |                  |
| AT              | 2.129       | 3.731                | 3.296       | 3.955              | 2.547       | 1.539            |
| BE              | 0.815       | 1.044                | 1.209       | 0.823              | 0.895       | 0.400            |
| FR              | 0.286       | 0.759                | 0.307       | 0.527              | 0.276       | 0.226            |
| DE              | 0.888       | 0.955                | 1.448       | 0.928              | 0.853       | 0.349            |
| GB              | 0.551       | 1.477                | 0.286       | 0.525              | 0.277       | 0.420            |
| IT              | 1.049       | 1.096                | 0.965       | 0.723              | 0.990       | 0.400            |
| NL              | 0.667       | 0.703                | 0.743       | 0.488              | 0.508       | 0.301            |
| SP              | 0.920       | 2.235                | 0.285       | 1.363              | 0.333       | 0.795            |

Notes. The left-hand side panel in this Table shows the MSFE ratio for a model with a constant estimation period (ending 2008Q1), and the right-hand side panel shows the MSFE ratio for expanding window forecasts with a lengthening estimation period. The estimates are based on the prediction using dynamic fixed-effects (DFE) estimates of (3) using a baseline model including 5 lags of the first-difference growth of the dependent variable, monetary policy indicators (real interest rate and term spread), the country composite leading indicator (country CLI) and the bond spread measure (bond spread) interacted with respective country dummies, reported in Table 6. The reported ratios are derived from a comparison of the out-of-sample residuals from the DFE estimator versus a forecast alternative, where the alternative takes the form of a random walk model, the baseline model excluding the bond spreads, and an autoregressive model. Sample period: July 1994–May 2011. Euro area countries are included from October 2001. Standard errors are reported in parentheses. ***p < 0.01, **p < 0.05, *p < 0.1.
A.7. Further Evidence on the Relationship Between the Excess Bond Premium and the Bank Lending Survey Measure of Tightness of Credit Standards

To investigate the relationship between EBP and the ECB Bank Lending Survey, we regress the bond spread and the change in the bond spread and other control variables on net percentage balance reporting a tightening of credit supply provided by the ECB Bank Lending Survey. We include one lag of the BLS tightness measure and find that the bond spread has a significant (positive) coefficient, which implies that the tightness of financial markets indicated by our bond spread measure is positively associated with the tightness of bank lending recorded by the ECB in their surveys. This provides us with evidence that the spread should have a credit supply interpretation. The results are reported below (we have not included these Tables in the article due to space constraints).

Table A10
Relationship Between the ECB Bank Lending Survey Credit Supply Tightness and the Bond Spread

| Financial indicator          | Dynamic FE |
|------------------------------|------------|
|                              | (1)        | (2)        | (3)        |
| Credit supply tightness (lag)| 0.683***   | 0.532***   | 0.638***   |
|                              | (0.099)    | (0.066)    | (0.056)    |
| Bond spread                  | 4.313**    | 5.570***   |            |
|                              | (2.041)    | (1.498)    |            |
| Bond spread change           |            |            | 8.525***   |
|                              |            |            | (1.685)    |
| Real interest rate           |            | 5.737**    | 5.974*     |
|                              |            | (2.763)    | (2.993)    |
| Term spread                  | 2.729      |            | 5.359**    |
|                              | (2.376)    |            | (2.515)    |
| Country CLI                  | –1.696**   | –1.687***  |            |
|                              | (0.697)    | (0.607)    |            |
| Within R²                    | 0.689      | 0.775      | 0.815      |
| Observations                 | 242        | 242        | 238        |
| Number of countries          | 8          | 8          | 8          |

Notes. As per original Tables.

A.8. Results using German Bunds as the Benchmark (Based on Gilchrist-Mojon Spreads)

A Banque de France working paper by Gilchrist and Mojon (2014) uses the German Bund as a benchmark to create spreads for non-financial corporations. We checked the correlation of our spreads with the four major euro area spreads that they construct and find the correlation coefficient is very high. When we replaced our spread with theirs (for four economies in the panel not eight) we obtained the results in Table A12 below, which confirm our findings.
| Financial indicator                  | Dynamic FE |            |            |
|-------------------------------------|------------|------------|------------|
|                                     | (1)        | (2)        | (3)        |
| Credit supply tightness (lag)       | 0.193      | −0.135     | −0.169     |
|                                     | (0.169)    | (0.162)    | (0.137)    |
| Bond spread                         | −0.964     | 6.422***   |            |
|                                     | (2.519)    | (1.848)    |            |
| Bond spread change                  | 10.53***   |            |            |
|                                     | (2.268)    |            |            |
| Real interest rate                  |            | 1.493      | 2.613      |
|                                     |            | (2.369)    | (2.680)    |
| Term spread                         | −6.096**   | −1.232     |            |
|                                     | (2.219)    | (2.055)    |            |
| Country CLI                         | 1.015      | 0.206      |            |
|                                     | (0.602)    | (0.521)    |            |
| Within R²                           | 0.037      | 0.295      | 0.359      |
| Observations                        | 230        | 230        | 230        |
| Number of countries                 | 8          | 8          | 8          |

**Notes.** As per original Tables.

Table A12

**Table 4: Results Using German Bunds as the Benchmark (based on Gilchrist-Mojon Spreads)**

| Financial indicator | 1 quarter | 4 quarters | 8 quarters |
|---------------------|-----------|------------|------------|
|                     | (1)       | (2)        | (3)        |
| G&M spread          | −1.118*** | −0.974***  | −1.008**   |
|                     | (0.378)   | (0.354)    | (0.391)    |
| Real interest rate  | −0.546    | −2.134***  | −1.958***  |
|                     | (0.352)   | (0.576)    | (0.354)    |
| Term spread         | −0.746*   | −1.840***  | −1.325***  |
|                     | (0.391)   | (0.465)    | (0.305)    |
| Country CLI         | 1.253***  | 0.489***   | −0.266     |
|                     | (0.208)   | (0.129)    | (0.185)    |
| Within R²           | 0.778     | 0.624      | 0.464      |

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## Table A12
(Continued)

| Estimator: MGE | 1 quarter | 4 quarters | 8 quarters |
|----------------|-----------|------------|------------|
| Financial indicator | (1) | (2) | (3) |
| G&M spread | $-0.921^{***}$ | $-0.913^{***}$ | $-1.450^{***}$ |
| | $(0.244)$ | $(0.284)$ | $(0.493)$ |
| Real interest rate | $-0.671^{**}$ | $-2.159^{***}$ | $-2.024^{***}$ |
| | $(0.321)$ | $(0.399)$ | $(0.196)$ |
| Term spread | $-0.875^{**}$ | $-1.765^{***}$ | $-1.097^{***}$ |
| | $(0.441)$ | $(0.547)$ | $(0.235)$ |
| Country CLI | $1.420^{***}$ | $0.703^{**}$ | $-0.521^{***}$ |
| | $(0.262)$ | $(0.277)$ | $(0.124)$ |
| RMSE | 1.063 | 1.180 | 0.956 |
| Observations | 135 | 135 | 135 |
| Number of countries | 4 | 4 | 4 |

Notes. The dependent variable in each column is annualised quarterly real GDP growth (RGDP). See notes to Table 3.

## Table A13

*Test of Reverse Causation Between the Real Activity Measures and Bond Spreads*

*Test of reverse causation*

| Bond spread | Financial indicator | (1) | (2) | (3) |
|-------------|---------------------|-----|-----|-----|
| Real interest rate | 0.101* | 0.101 | 0.102* |
| | $(0.047)$ | $(0.054)$ | $(0.052)$ |
| Term spread | 0.0886 | 0.12 | 0.114 |
| | $(0.067)$ | $(0.082)$ | $(0.080)$ |
| European CLI | $-0.0531^{**}$ | $-0.110^{***}$ | $-0.101^{***}$ |
| | $(0.018)$ | $(0.022)$ | $(0.021)$ |
| RGDP growth | $-0.0529^{***}$ | 0.000184 | (
| | $(0.012)$ | $(0.012)$ | )
| EMP growth | 0.794 | 0.777 | 0.78 |
| INV growth | 0.00443** | -0.00443** | (0.002) |
| Within $R^2$ | 0.0648 | 0.194 | 0.144 |

| Bond spread | Financial indicator | (1) | (2) | (3) |
|-------------|---------------------|-----|-----|-----|
| Real interest rate | 0.0526 | 0.109 | 0.0648 |
| | $(0.204)$ | $(0.148)$ | $(0.194)$ |
| Term spread | 0.0973 | 0.205 | 0.21 |
| | $(0.226)$ | $(0.170)$ | $(0.144)$ |
| European CLI | $-0.137^{***}$ | $-0.199^{***}$ | $-0.145^{***}$ |
| | $(0.035)$ | $(0.043)$ | $(0.030)$ |

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The top panel reports the dynamic fixed effects estimates showing some significance on coefficients associated with the real activity measures and high values of the within R-squared measures. The results indicate higher growth of GDP and investment imply lower bond spreads. However the results from the mean group estimator are less supportive since only higher growth of GDP implies higher bond spreads. There is some evidence of reverse causation (it is a sensible hypothesis) but we do not think it undermines the results we have reported, which prove very robust to alternative specifications.

**Reference**

Gilchrist, S. and Mojon, B. (2014). ‘Credit risk in the euro area’, NBER Working Paper No 200401.