The forecasts for the world economy and the UK economy reported in this Review are produced using the National Institute's global econometric model, NiGEM. NiGEM has been in use at NIESR for forecasting and policy analysis since 1987, and is also used by a group of more than 40 model subscribers, mainly in the policy community. Further details, including articles by model users, are provided in the May 2018 edition of the Review. Most countries in the OECD are modelled separately, and there are also separate models for Argentina, Brazil, Bulgaria, China, Hong Kong, India, Indonesia, Romania, Russia, Singapore, South Africa, Taiwan and Vietnam. The rest of the world is modelled through regional blocks so that the model is global in scope. All models contain the determinants of domestic demand, export and import volumes, prices, current accounts and net assets. Output is determined in the long run by factor inputs and technical progress interacting through production functions, but is also affected by demand in the short to medium term. Economies are linked through trade, competitiveness and financial markets and are fully simultaneous. Further details on NiGEM are available at http://nimodel.niesr.ac.uk/.

Table A1. Interest rates

<table>
<thead>
<tr>
<th>Year</th>
<th>US</th>
<th>Canada</th>
<th>Japan</th>
<th>Euro Area</th>
<th>UK</th>
<th>US</th>
<th>Canada</th>
<th>Japan</th>
<th>Euro Area</th>
<th>UK</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>0.26</td>
<td>0.65</td>
<td>0.10</td>
<td>0.05</td>
<td>0.50</td>
<td>2.1</td>
<td>1.5</td>
<td>0.4</td>
<td>1.0</td>
<td>1.8</td>
</tr>
<tr>
<td>2016</td>
<td>0.51</td>
<td>0.50</td>
<td>-0.08</td>
<td>0.01</td>
<td>0.40</td>
<td>1.8</td>
<td>1.3</td>
<td>0.0</td>
<td>0.7</td>
<td>1.3</td>
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<tr>
<td>2017</td>
<td>1.10</td>
<td>0.70</td>
<td>-0.10</td>
<td>0.00</td>
<td>0.29</td>
<td>2.3</td>
<td>1.8</td>
<td>0.1</td>
<td>1.0</td>
<td>1.2</td>
</tr>
<tr>
<td>2018</td>
<td>1.90</td>
<td>1.40</td>
<td>-0.10</td>
<td>0.00</td>
<td>0.60</td>
<td>2.9</td>
<td>2.3</td>
<td>0.1</td>
<td>1.1</td>
<td>1.4</td>
</tr>
<tr>
<td>2019</td>
<td>2.59</td>
<td>2.08</td>
<td>-0.09</td>
<td>0.06</td>
<td>0.86</td>
<td>2.8</td>
<td>2.2</td>
<td>0.2</td>
<td>1.2</td>
<td>1.5</td>
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<tr>
<td>2020</td>
<td>2.93</td>
<td>2.51</td>
<td>-0.08</td>
<td>0.42</td>
<td>1.33</td>
<td>3.2</td>
<td>2.8</td>
<td>0.5</td>
<td>1.7</td>
<td>2.1</td>
</tr>
<tr>
<td>2021–25</td>
<td>3.35</td>
<td>3.25</td>
<td>0.44</td>
<td>1.37</td>
<td>2.28</td>
<td>3.8</td>
<td>3.6</td>
<td>1.3</td>
<td>2.8</td>
<td>3.2</td>
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<table>
<thead>
<tr>
<th>Year</th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
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<th>Q2</th>
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<th>Q4</th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
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</thead>
<tbody>
<tr>
<td>2017</td>
<td>0.80</td>
<td>1.05</td>
<td>1.25</td>
<td>1.30</td>
<td>1.53</td>
<td>1.80</td>
<td>2.01</td>
<td>2.28</td>
<td>2.47</td>
<td>2.69</td>
<td>2.69</td>
<td>2.69</td>
</tr>
<tr>
<td>2018</td>
<td>1.00</td>
<td>1.25</td>
<td>1.47</td>
<td>1.69</td>
<td>1.30</td>
<td>1.80</td>
<td>2.01</td>
<td>2.28</td>
<td>2.47</td>
<td>2.69</td>
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<tr>
<td>2019</td>
<td>1.75</td>
<td>2.00</td>
<td>2.25</td>
<td>2.32</td>
<td>2.50</td>
<td>2.50</td>
<td>2.62</td>
<td>2.75</td>
<td>2.85</td>
<td>2.90</td>
<td>2.96</td>
<td>3.01</td>
</tr>
<tr>
<td>2020</td>
<td>2.85</td>
<td>2.90</td>
<td>2.96</td>
<td>3.01</td>
<td>2.85</td>
<td>2.90</td>
<td>2.96</td>
<td>3.01</td>
<td>2.85</td>
<td>2.90</td>
<td>2.96</td>
<td>3.01</td>
</tr>
</tbody>
</table>
Rate is expected to reach 1.5 per cent in 2020, this 
Bank Rate rising 25 basis points in August 2019. Bank 
assumes a soft Brexit scenario and is conditioned on 
a rate that is close to its potential. Our central forecast 
, we expect UK economic growth to stabilise at 
Review (FOMC) minutes. As discussed in the UK chapter in this 
by the most recent Federal Open Market Committee 
the US are broadly consistent with the path signalled 
that long-term interest rates in the long run are effectively 
exist, we assume they gradually diminish over time, such 
Country-specific term premium. Where term premia do 
interest rate assumptions are consistent with forward 
underlying our current forecast are shown in tables 
The key interest rate and exchange rate assumptions 
shrink ‘naturally’.2 
holds, allowing the Bank of England’s balance sheet to 
reinvesting the proceeds from maturing gilts it currently 
holds, allowing the Bank of England’s balance sheet to shrink ‘naturally’.

Figure A1 illustrates the recent movement in, and our 
projections for, 10-year government bond yields in the 
US, Euro Area, the UK and Japan. The average levels 
of 10-year sovereign bond yields in the US, the UK 
and Euro Area increased marginally (by about 10 basis 
points) in the fourth quarter of 2018 relative to the 
previous quarter, but were largely unchanged in Japan. 
Expectations currently for bond yields for the end of 
2019 are lower, by about 30–50 basis points, for all 
four economies compared to expectations formed three 
months ago. The forecast implies gradual increases for 
10-year bond yields. However, given the risks around the 
forecast, more volatile paths could emerge.

Sovereign risks in the Euro Area were a major 
macroeconomic issue for the global economy and 
financial markets over several years after the financial 
crisis. Figure A2 depicts the spread between 10-year 
government bond yields of Spain, Italy, Portugal and 
Ireland over Germany’s. Political and budgetary issues 
led to Italy experiencing the largest increase in spreads

### Table A2. Nominal exchange rates

<table>
<thead>
<tr>
<th>Year</th>
<th>US</th>
<th>Canada</th>
<th>Japan</th>
<th>Euro Area</th>
<th>Germany</th>
<th>France</th>
<th>Italy</th>
<th>UK</th>
<th>Canadian $</th>
<th>Yen</th>
<th>Euro</th>
<th>Sterling</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>13.3</td>
<td>-11.2</td>
<td>-63</td>
<td>-6</td>
<td>-3.7</td>
<td>-3.8</td>
<td>-3</td>
<td>-30</td>
<td>5.6</td>
<td>1.299</td>
<td>121.1</td>
<td>0.902</td>
</tr>
<tr>
<td>2016</td>
<td>5.2</td>
<td>0.3</td>
<td>15.1</td>
<td>4.8</td>
<td>2.4</td>
<td>2.4</td>
<td>2.9</td>
<td>-10</td>
<td>1.341</td>
<td>108.8</td>
<td>0.904</td>
<td>0.741</td>
</tr>
<tr>
<td>2017</td>
<td>0.4</td>
<td>2.0</td>
<td>-2.6</td>
<td>2.8</td>
<td>1.3</td>
<td>2.0</td>
<td>1.9</td>
<td>-5.3</td>
<td>1.294</td>
<td>112.2</td>
<td>0.887</td>
<td>0.776</td>
</tr>
<tr>
<td>2018</td>
<td>0.1</td>
<td>-1.4</td>
<td>1.6</td>
<td>5.0</td>
<td>2.6</td>
<td>2.7</td>
<td>3.4</td>
<td>2.1</td>
<td>1.308</td>
<td>110.4</td>
<td>0.847</td>
<td>0.749</td>
</tr>
<tr>
<td>2019</td>
<td>2.1</td>
<td>-0.6</td>
<td>4.1</td>
<td>-0.1</td>
<td>-0.1</td>
<td>-0.2</td>
<td>0.1</td>
<td>-1.0</td>
<td>1.327</td>
<td>108.5</td>
<td>0.874</td>
<td>0.777</td>
</tr>
<tr>
<td>2020</td>
<td>-0.7</td>
<td>0.1</td>
<td>1.8</td>
<td>1.4</td>
<td>0.8</td>
<td>0.7</td>
<td>0.8</td>
<td>0.2</td>
<td>1.322</td>
<td>106.0</td>
<td>0.857</td>
<td>0.766</td>
</tr>
</tbody>
</table>

Table A2. Nominal exchange rates

The key interest rate and exchange rate assumptions 
underlying our current forecast are shown in tables 
A1–A2. Our short-term interest rate assumptions are 
generally based on current financial market expectations, 
as implied by the rates of return on treasury bills and 
government bonds of different maturities. Long-term 
interest rate assumptions are consistent with forward 
estimates from short-term interest rates, allowing for a 
country-specific term premium. Where term premia do 
exist, we assume they gradually diminish over time, such 
that long-term interest rates in the long run are effectively 
the forward convolution of short-term interest rates.

Short-term interest rates are expected to rise slightly in 
the second half of 2019 in the US, the UK and the Euro 
Area, but remain unchanged in Japan. Interest rates in 
the US are broadly consistent with the path signalled 
by the most recent Federal Open Market Committee 
(FOMC) minutes. As discussed in the UK chapter in this 
Review, we expect UK economic growth to stabilise at 
a rate that is close to its potential. Our central forecast 
assumes a soft Brexit scenario and is conditioned on 
Bank Rate rising 25 basis points in August 2019. Bank 
Rate is expected to reach 1.5 per cent in 2020, this 
being the point at which the MPC is assumed to stop

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in 2018 since 2013. Spreads in Italy remain elevated, leaving it as the worst performer, after Greece. We have assumed that spreads over German bond yields narrow in all Euro Area countries over the course of the forecast horizon.

Figure A3 shows the spreads of corporate bond yields over government bond yields in the US, UK and Euro Area. This acts as a proxy for the margin between private sector and ‘risk-free’ borrowing costs. Since the beginning of February 2018 corporate bond spreads in the US, UK and Euro Area have been on an upward trend, with private sector borrowing costs rising more than the observed increase in risk-free rates. However, the latest data indicate some divergence in spreads, which have remained largely unchanged in the UK and...
the Euro Area, and declined in the US, where corporate bond yields have edged down relative to government bond yields. Our forecast assumption for corporate spreads is that they gradually converge towards their long-term average level.

Nominal exchange rates against the US dollar are generally assumed to remain constant at the rate prevailing on 16 January 2019 until the end of September. After that, they follow a backward-looking uncovered-interest parity condition, based on interest rate differentials relative to the US. Figure A4 plots the recent history as well as our short-term forecast of the effective exchange rate indices for Canada, the Euro Area, Japan, UK, and the US. After appreciating by about 7 per cent, in trade-weighted terms, over the course of last year, the US dollar has depreciated, by about 1 per cent, since the start of 2019. After having strengthened over the past two years, the euro has marginally lost value in effective terms since the end of last year. Among the emerging market currencies in our model, the largest movement in trade-weighted terms between the third and fourth quarters of 2018 was the depreciation of the Argentinian peso by about 13 per cent, followed by the Russian rouble and Mexican peso, which lost about 3–4 per cent of their value.

Our oil price assumptions for the short term generally follow those of the US Energy Information Administration (EIA), published in January 2019, and updated with daily spot price data available up to 16 January 2019. The EIA uses information from forward markets as well as an evaluation of supply conditions. As illustrated in figure A5, oil prices, in US dollar terms, have fallen since October 2018, by about 30 per cent, reaching levels last seen at the end of 2017. Expectations for oil prices by the end of 2019 are lower than the expectation three months ago, which leaves oil prices about $40 per barrel lower than their nominal level in mid-2014.

Our equity price assumptions for the US reflect the expected return on capital. Other equity markets are assumed to move in line with the US market, but are adjusted for different exchange rate movements and shifts in country-specific equity risk premia. Since the third quarter of last year equity prices have generally fallen in major European as well as non-European economies. Figure A6 illustrates the key short-term equity price assumptions underlying our current forecast.

NOTES
1 With the exception of Iceland and Israel.
2 Interest rate assumptions are based on information available for the period to 16 January 2019.