

Appendix A: Summary of key forecast assumptions by Simon Kirby and Iana Liadze

The forecasts for the world 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. Most countries in the OECD are modelled separately,¹ and there are also separate models for China, India, Russia, Brazil, Hong Kong, Taiwan, Indonesia, Singapore, Vietnam, South Africa, Latvia, Lithuania, Romania and Bulgaria. 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 tied down in the long run by factor inputs and technical progress interacting through production functions, but is driven 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 on <http://nimodel.niesr.ac.uk/>.

The key interest rate and exchange rate assumptions underlying our current forecast are shown in tables A1–A2.² 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 of 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 simply the forward convolution of short-term interest rates. Policy rates in many major advanced economies are expected to remain at low levels at least throughout this year.

The Reserve Bank of Australia and the central bank of New Zealand lowered their benchmark interest rates in 2016. The central bank of Australia cut its rate by 50 basis points in two steps and the central bank of New Zealand reduced theirs by 75 basis points in three rounds. The

People's Bank of China and the Indian central bank both reduced their interest rates throughout 2015 by a total of 125 basis points each. While the People's Bank of China has kept them unchanged since, the Indian central bank lowered its benchmark rate by a further 50 basis points in two rounds in 2016. After reducing its policy rate by 100 basis points in four steps between August 2014 and June 2015, the Bank of Korea cut it again by 25 basis points in June 2016. Indonesia's central bank reduced its benchmark interest rate by 25 basis points in February 2015, for the first time since 2012, and then lowered it again by 100 basis points in 2016 in four steps. However, after replacing the official discount interest rate with a new 7-day reverse repurchase rate in August 2016, the interest rates were lowered in two further steps, by 25 basis points in each case. Throughout 2014 and 2015, the Romanian Central Bank reduced its benchmark interest rate by a total of 225 basis points in nine steps and has kept it unchanged since. The National Bank of Hungary brought its benchmark interest rate down by 120 basis points over eight rounds between the beginning of 2015 and May 2016 and has retained it at 0.9 per cent since. The central banks of Norway and Poland lowered their policy rates by 50 basis points each in 2015, to 0.75 and 1.5 per cent, respectively. The central bank of Norway cut its benchmark rate by a further 25 basis points in March 2016, while the central bank of Poland has left them unchanged. Over the course of 2015, the Swedish Riksbank cut its policy rate by 35 basis points in three rounds, lowering it again, by 15 basis points, at the beginning of 2016. At the time of writing, the Riksbank's policy rate stands at –0.5 per cent. At the turn of 2015 the Swiss National Bank cut its benchmark rate by 25 basis points to –0.75 per cent, while the Central Bank of Denmark reduced its policy rate by 15 basis points, to just 0.05 per cent. Both central banks have left their main policy rate unchanged since. After reducing interest rate by cumulative 600 basis points, to 11 per cent over five stages in the first seven months of 2015, the Central Bank of Russia lowered it again in two steps (June and September 2016) by a total of 100 basis points. The Bank of Canada has kept

its benchmark interest rate unchanged, at 0.5 per cent, after lowering it by 50 basis points over two rounds in 2015. These were the Bank of Canada's first cuts to nominal interest rates since April 2009. Following the easing of inflationary pressures and the election of a new government, the Central Bank of Brazil cut its interest rate by 25 basis points twice in the last three months of 2016 – the first time since 2012 – and then lowered it further by 75 basis points in January 2017.

In contrast, after a spell of reductions in interest rates by the Central Bank of Turkey in 2014 and 2015, inflationary pressures led to an increase in the benchmark rate by 50 basis points in November 2016. The South African Reserve Bank increased its benchmark rate by 50 basis points in two rounds in 2015 – the first time since 2008 – and then raised them further by 75 basis points in two rounds last year. The rise increase in the target range for the federal funds rate by the US Federal Reserve in December 2015 placed downward pressure on the Mexican peso. In order to stem this pressure, the central bank of Mexico increased its interest rate by 275 basis points in six rounds since the Fed's move. These were the first increases since August 2008.

In December 2016, as expected, the Federal Reserve raised its target range for the federal funds rate by 25 basis points to 0.5–0.75 per cent – the second increase from the low of 0.0–0.25 per cent that applied for the seven years prior to December 2015. The statement accompanying the Fed's decision emphasised that monetary conditions remained accommodative after the increase; that the timing and size of future adjustments would depend on its assessment of actual and expected economic conditions relative to its objectives, and that it expected that only gradual increases in the rate would be warranted. However, the actual path of the federal funds rate will depend on the changing economic outlook as informed by incoming data. The Fed also increased its median projection of the end-2017 federal funds rate by 25 basis points from its projections published in September 2016.

The expectation of the first rate change by the Monetary Policy Committee (MPC) of the Bank of England is based on our view of how the economy will evolve over the next few years. As the UK chapter in this *Review* discusses, we expect the UK economy to experience a slowdown as a consequence of the vote to leave the EU.³ At its

Table A1. Interest rates

Per cent per annum

	Central bank intervention rates					10-year government bond yields				
	US	Canada	Japan	Euro Area	UK	US	Canada	Japan	Euro Area	UK
2013	0.25	1.00	0.10	0.56	0.50	2.3	2.3	0.7	2.7	2.4
2014	0.25	1.00	0.10	0.16	0.50	2.5	2.2	0.6	1.9	2.5
2015	0.26	0.65	0.10	0.05	0.50	2.1	1.5	0.4	1.0	1.8
2016	0.51	0.50	-0.08	0.01	0.40	1.8	1.3	0.0	0.7	1.3
2017	0.94	0.54	-0.04	0.00	0.25	2.6	2.0	0.2	1.1	1.5
2018	1.69	1.04	0.12	0.00	0.25	3.1	2.6	0.4	1.7	2.0
2019–2023	2.99	2.72	0.33	1.10	1.32	3.8	3.7	1.1	3.0	3.2
2015 Q1	0.25	0.81	0.10	0.05	0.50	2.0	1.4	0.3	0.8	1.6
2015 Q2	0.25	0.75	0.10	0.05	0.50	2.2	1.6	0.4	1.0	1.9
2015 Q3	0.25	0.54	0.10	0.05	0.50	2.2	1.5	0.4	1.2	1.9
2015 Q4	0.29	0.50	0.10	0.05	0.50	2.2	1.5	0.3	1.0	1.9
2016 Q1	0.50	0.50	0.00	0.04	0.50	1.9	1.2	0.1	0.8	1.5
2016 Q2	0.50	0.50	-0.10	0.00	0.50	1.7	1.3	-0.1	0.7	1.4
2016 Q3	0.50	0.50	-0.10	0.00	0.34	1.6	1.1	-0.1	0.4	0.8
2016 Q4	0.55	0.50	-0.10	0.00	0.25	2.1	1.5	0.0	0.8	1.3
2017 Q1	0.75	0.50	-0.10	0.00	0.25	2.4	1.7	0.1	0.9	1.3
2017 Q2	0.83	0.50	-0.06	0.00	0.25	2.6	1.9	0.1	1.0	1.5
2017 Q3	1.00	0.50	-0.03	0.00	0.25	2.7	2.1	0.2	1.2	1.6
2017 Q4	1.17	0.65	0.02	0.00	0.25	2.8	2.3	0.3	1.3	1.7
2018 Q1	1.37	0.81	0.06	0.00	0.25	2.9	2.4	0.3	1.5	1.9
2018 Q2	1.58	0.96	0.10	0.00	0.25	3.0	2.6	0.4	1.6	2.0
2018 Q3	1.80	1.12	0.13	0.00	0.25	3.1	2.7	0.5	1.7	2.1
2018 Q4	2.01	1.27	0.17	0.00	0.25	3.2	2.9	0.5	1.9	2.2

Table A2. Nominal exchange rates

	Percentage change in effective rate								Bilateral rate per US \$			
	US	Canada	Japan	Euro Area	Germany	France	Italy	UK	Canadian \$	Yen	Euro	Sterling
2013	2.9	-3.1	-16.7	5.6	2.8	3.0	3.7	-1.2	1.039	97.6	0.753	0.640
2014	4.1	-5.4	-5.1	3.8	1.8	1.8	3.2	7.8	1.112	105.8	0.754	0.607
2015	13.7	-10.7	-5.8	-5.1	-3.2	-3.3	-2.2	6.5	1.299	121.1	0.902	0.654
2016	5.5	0.8	15.9	5.1	2.4	2.7	3.3	-9.7	1.314	108.8	0.904	0.741
2017	5.0	1.4	-2.6	0.1	-0.1	0.4	0.4	-6.5	1.318	115.4	0.944	0.818
2018	-0.1	0.4	1.1	1.0	0.5	0.5	0.7	0.4	1.312	114.2	0.935	0.812
2015 Q1	6.2	-6.9	-0.6	-4.1	-2.5	-2.5	-2.0	2.7	1.262	119.1	0.888	0.660
2015 Q2	0.7	2.4	-1.5	-2.1	-1.2	-0.8	-1.2	2.3	1.237	121.4	0.905	0.652
2015 Q3	3.6	-6.0	2.0	3.3	1.8	1.5	2.1	2.3	1.327	122.2	0.899	0.646
2015 Q4	2.1	-2.5	2.1	0.6	0.3	0.2	0.5	-0.5	1.370	121.5	0.914	0.659
2016 Q1	1.7	4.5	6.9	3.0	1.5	1.3	1.8	-5.4	1.323	115.2	0.908	0.699
2016 Q2	-1.6	2.1	5.6	0.7	0.3	0.7	0.5	-1.7	1.289	107.9	0.886	0.697
2016 Q3	1.0	-1.2	5.8	0.1	-0.1	0.2	-0.1	-8.0	1.310	102.4	0.896	0.762
2016 Q4	3.6	-0.7	-4.0	-0.1	-0.2	0.1	0.2	-2.6	1.335	109.6	0.928	0.805
2017 Q1	2.2	1.9	-3.8	-0.1	-0.1	0.0	0.1	0.0	1.319	115.5	0.945	0.818
2017 Q2	0.0	0.1	0.1	0.0	0.0	0.0	0.0	-0.1	1.318	115.4	0.945	0.819
2017 Q3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.318	115.4	0.945	0.819
2017 Q4	0.0	0.1	0.3	0.3	0.1	0.1	0.2	0.1	1.316	115.1	0.943	0.817
2018 Q1	0.0	0.1	0.3	0.3	0.2	0.2	0.2	0.1	1.315	114.8	0.940	0.816
2018 Q2	0.0	0.1	0.3	0.3	0.2	0.2	0.2	0.1	1.313	114.4	0.937	0.813
2018 Q3	-0.1	0.1	0.3	0.3	0.2	0.2	0.2	0.2	1.311	114.0	0.933	0.811
2018 Q4	-0.1	0.1	0.4	0.4	0.2	0.2	0.2	0.2	1.309	113.5	0.929	0.807

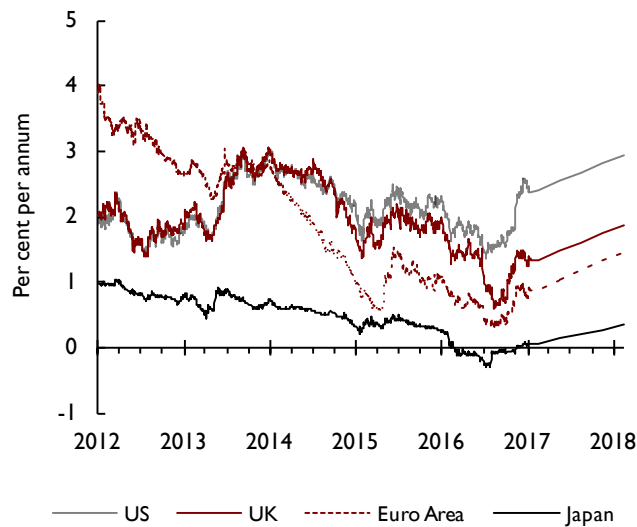
August 2016 meeting, to mitigate the expected downturn, the MPC introduced monetary stimulus, which included a reduction in Bank Rate by 25 basis points to 0.25 per cent, the purchase of £60 billion of government bonds and a programme of £10 billion of purchases of sterling-denominated corporate bonds. At the time of writing, financial markets expect the MPC to raise rates to 50 basis points in the spring of 2019, and to 70 basis points in the first half of 2020. Our view is broadly similar in that we expect a 25 basis point rise in May 2019, following the UK's two-year negotiated withdrawal from the EU. Bank Rate is expected to reach 2 per cent in the second half of 2022, with this being the point at which the MPC is assumed to stop re-investing the proceeds from maturing gilts it currently holds, allowing the Bank of England's balance sheet to shrink 'naturally'.

The central banks of the Euro Area (ECB) and Japan (BoJ) continue to expand their balance sheets. The 'expanded asset purchase programme' by the ECB, which began in March 2015, envisaged combined purchases of assets amounting to €60 billion a month until at least September 2016. In April 2016, monthly purchases increased to €80 billion and were expected to "run until end-March 2017, or beyond, if necessary, and in any case

until the Governing Council sees a sustained adjustment in the path of inflation consistent with its inflation aim". With inflation remaining well below the ECB's objective of "below, but close to, 2 per cent", in December 2016, the ECB announced that its asset purchase programme would be extended to at least December 2017, but that starting in April purchases would revert to amounts of €60 billion per month.

In October 2014, the BoJ surprised financial markets by announcing that it would expand its asset purchase programme by about 30 per cent. The programme envisaged an increment of about ¥80 trillion added to the monetary base annually, up from an existing ¥60–70 trillion. First in December 2015 and then in September 2016, the BoJ announced further modifications to its programme of quantitative and qualitative easing (QQE). The latest round of changes was motivated by the Bank's concern that negative interest rates, together with its asset purchase programme, via a flattening in the yield curve, posed risks to financial stability via their implications for bank profitability and pension funds' viability. The Bank therefore announced that the QQE framework would be supplemented by "yield curve control": the Bank would regulate its asset purchases

Figure A1. 10-year government bond yields

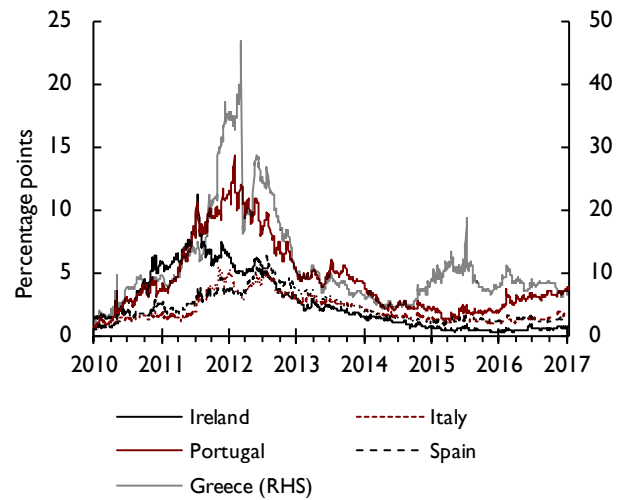


Source: Datastream and NIESR projections.

to target the 10-year government bond yield, initially at zero, so that it would control long-term as well as short-term interest rates.

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. Convergence in Euro Area bond yields towards those in the US, observed since the start of 2013, reversed at the beginning of 2014. Since February 2014, the margin between Euro Area and US bond yields started to widen, reaching a maximum of about 176 basis points at the end of December 2016. In the second half of 2014 a wedge has opened between the US and UK government bond yields, which fluctuated between 20–30 basis points throughout 2015. Since the beginning of 2016, the margin began to widen, reaching a peak of 120 basis points at the end of December last year and then narrowing marginally to about 100 basis points in January this year. Looking at the levels of 10-year sovereign bond yields at the end of 2016, these have increased since the end of October in the US, the Euro Area, and the UK (by a range of about 30–40), but remained largely unchanged in Japan. Expectations for bond yields for 2017, compared with expectations formed just three months ago, are higher for the US, UK, the Euro Area and Japan. While for the US they rose by about 50 basis points, for the UK, the Euro Area and Japan expectations for bond yields increased by about 20 basis points.

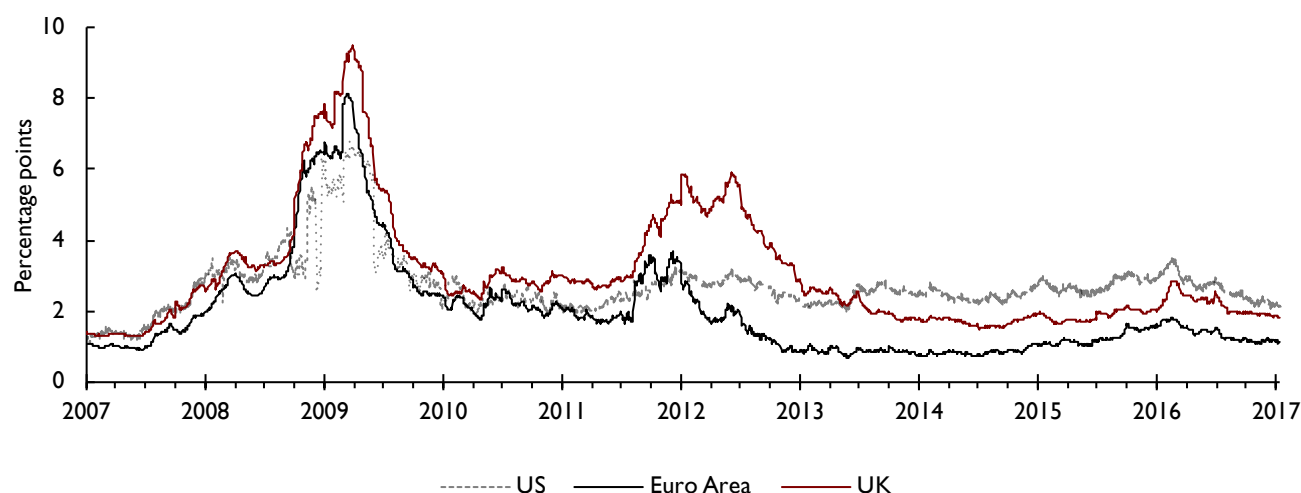
Figure A2. Spreads over 10-year German government bond yields



Source: Derived from Datastream series.

Sovereign risks in the Euro Area have been a major macroeconomic issue for the global economy and financial markets over the past five years. Figure A2 depicts the spread of the 10-year government bond yields of Spain, Italy, Portugal, Ireland and Greece over Germany's. The final agreement on Private Sector Involvement in the Greek government debt restructuring in February 2012 and the potential for Outright Money Transactions (OMT) announced by the ECB in August 2012 brought some relief to bond yields in these vulnerable economies. Sovereign spreads have remained stable, in most cases, from late July 2014, the most notable exception being a marked widening of Greek spreads. For Greece this reflected initial uncertainty following the formation of a government dominated by a political party elected on an 'anti-austerity' manifesto in January 2015. The risk of Greece leaving the Euro Area returned to the fore, as a deal on a third bailout for Greece appeared unlikely. In the summer of 2015 a lack of liquidity led to a three-week closure of the domestic banking system, with withdrawal limits imposed upon Greeks' bank accounts and the imposition of controls on external payments. The dangers relating to the financial difficulties of Greece and the policy programme being negotiated with its European partners subsequently receded. In mid-August 2015, it was confirmed that negotiators had reached agreement in principle on a 3-year fiscal and structural reform programme to be supported by €86 billion of financing from the European

Figure A3. Corporate bond spreads. Spread between BAA corporate and 10-year government bond yields



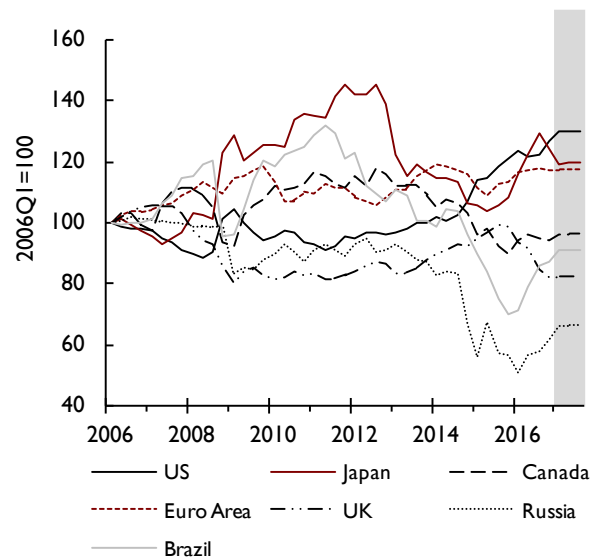
Source: Derived from Datastream series.

Stability Mechanism (ESM). Disbursements (both cash and cashless) totalling €31.7 billion were made by the ESM between August 2015 and October 2016. However, sovereign spreads remain elevated due to issues around long-term debt sustainability.

In Portugal sovereign spreads have widened since the end of 2015, and throughout 2016 have been around the levels last seen at the beginning of 2014. A combination of factors, including the initial ‘anti-austerity’ stance of the new Socialist government, the surprise decision by the Portuguese central bank to impose losses on bank bonds held by international investors, the risk of a credit-rating downgrade that could result in the exclusion of government bonds from the ECB’s asset-buying programme and weakness in the banking system combined with a high level of government debt (around 130 per cent of GDP) led to Portuguese bonds being the worst performers in the Euro Area (after Greece). In our current forecast, we have assumed spreads over German bond yields continue to narrow in all Euro Area countries, and that this process also resumes in Portugal, from the second quarter of this year.

Figure A3 reports the spreads of corporate bond yields over government bond yields in the US, UK and Euro Area. These act as proxies for the margin between private sector and ‘risk-free’ borrowing costs. Private sector borrowing costs have risen more or less in line with the observed rise in government bond yields from

Figure A4. Effective exchange rates



Source: NiGEM database and NIESR forecasts. Weights based on 2010 goods and services trade shares.

the second half of 2013 till the second half of 2015, illustrated by the stability of these spreads in the US, Euro Area and the UK. Reflecting the tightening in financial conditions, corporate bond spreads widened at the turn of 2016, but subsequently have come down somewhat barring the jump observed around the period

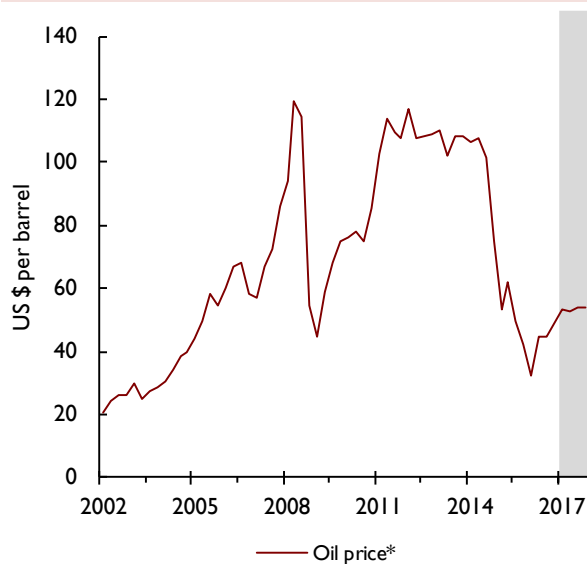
of the UK’s decision to leave the EU. Since summer 2016 corporate bond spreads have been relatively stable in the UK and EA, but on a declining trend in the US, where private sector borrowing costs have risen less than the observed rise in risk-free rates. Our forecast assumption for corporate spreads is that they gradually converge towards their long-term equilibrium level.

Nominal exchange rates against the US dollar are generally assumed to remain constant at the rate prevailing on 12 January 2017 until the end of September 2017. After that, they follow a backward-looking uncovered-interest parity condition, based on interest rate differentials relative to the US. Figure A4 plots their recent history as well as our forecast of the effective exchange rate indices for Brazil, Canada, the Euro Area, Japan, UK, Russia and the US. In the past three months the US dollar has appreciated against most other major currencies that have not benefited from the recent upturn in oil prices. In trade-weighted terms the US dollar gained about 2 per cent – leaving its value at the beginning of this year about 40 per cent above its trough in the second quarter of 2008. Since November last year, in effective terms, the yen has lost about 4 per cent of its value, while the euro has been little changed. Among emerging market currencies, the largest currency movement was the depreciation of the Turkish lira – by about 26 per cent against the US dollar and around 13 per cent in trade-weighted terms. The Mexican peso has

depreciated further since our last forecast, both in terms of the US dollar and in effective terms by about 5 and 8 per cent, respectively. Brazilian and Russian currencies continued to appreciate against the US dollar, mainly reflecting political developments in the former and oil price developments in the latter. In the past three months the trade-weighted value of the Russian rouble and the Brazilian real have increased by about 7.5 and 4.5 per cent, respectively.

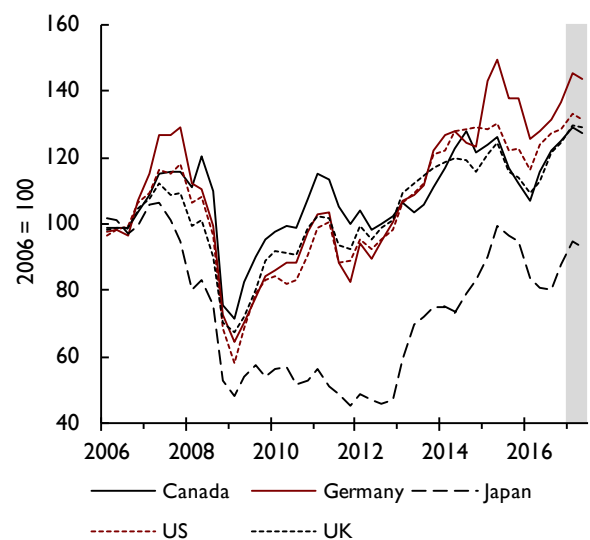
Our oil price assumptions for the short term are based on those of the US Energy Information Administration (EIA), published in January 2017, and updated with daily spot price data available up to 12 January 2017. The EIA uses information from forward markets as well as an evaluation of supply conditions. These oil price assumptions are illustrated in figure A5. Global oil prices have risen by about 10 per cent in US dollar terms since late October, to about \$55 a barrel, which is more than double the low of \$26, reached last February. These recent gains return the level of oil prices to only about half the level that prevailed in 2011–13. The recent rise in prices seems due mainly to agreements reached first, in late November, by OPEC producers to reduce output by 1.2 million barrels per day (about 3.5 per cent) for six months from January 2017, and second, in early December, by a group of ten non-OPEC producers, including Russia and Mexico, to reduce output in parallel with OPEC producers by about 0.6 million barrels per

Figure A5. Oil prices



Source: NiGEM database and NIESR forecast.
 Note: *Average of Dubai and Brent spot prices.

Figure A6. Share prices



Source: NiGEM database and NIESR forecast.

Table A3. Government revenue assumptions

	Average income tax rate (per cent) ^(a)			Effective corporate tax rate (per cent)			Gov't revenue (% of GDP) ^(b)		
	2016	2017	2018	2016	2017	2018	2016	2017	2018
Australia	14.8	14.9	14.8	25.7	25.7	25.7	32.9	32.9	33.1
Austria	32.6	32.6	32.6	21.8	21.8	21.8	44.3	44.3	43.9
Belgium	35.6	35.6	35.6	21.7	21.7	21.7	42.9	43.0	42.7
Canada	20.1	19.8	19.8	20.8	20.8	20.8	35.9	35.8	35.7
Denmark	33.0	33.2	32.9	17.9	17.9	17.9	47.8	48.4	48.0
Finland	32.8	32.8	32.6	23.1	23.1	23.1	46.2	46.7	46.5
France	31.9	31.9	31.9	32.7	32.7	32.7	45.8	45.9	45.8
Germany	29.2	29.2	29.2	19.4	19.4	19.4	40.8	40.9	40.9
Greece	23.8	23.8	23.8	13.5	13.5	13.5	41.2	40.8	39.6
Ireland	25.3	24.3	23.2	9.8	9.8	9.8	21.5	21.4	21.2
Italy	29.1	29.1	29.1	26.9	26.9	26.9	42.1	41.3	40.4
Japan	24.7	24.7	24.7	29.6	29.6	29.6	34.8	35.1	35.2
Netherlands	33.0	33.0	32.9	8.4	8.4	8.4	40.1	40.5	40.6
Portugal	23.7	23.6	23.7	20.1	20.1	20.1	39.4	39.5	39.1
Spain	24.9	24.8	24.3	16.4	16.4	16.4	37.5	37.8	37.5
Sweden	26.3	26.5	26.0	23.1	23.1	23.1	43.5	44.2	44.0
UK	22.5	22.4	22.5	13.1	12.3	12.1	35.5	35.0	34.8
US	19.2	19.2	19.4	29.0	29.0	29.0	30.2	30.4	30.9

Notes: (a) The average income tax rate is calculated as total income tax plus both employee and employer social security contributions as a share of personal income. (b) Revenue shares reflect NiGEM aggregates, which may differ from official government figures.

Table A4. Government spending assumptions^(a)

	Gov't spending excluding interest payments (% of GDP)			Gov't interest payments (% of GDP)			Deficit projected to fall below 3% of GDP ^(b)
	2016	2017	2018	2016	2017	2018	
Australia	33.8	33.2	32.7	1.7	1.6	1.6	–
Austria	42.7	42.9	42.7	2.1	1.8	1.6	–
Belgium	43.2	43.0	42.5	2.7	2.3	2.0	2015
Canada	34.7	34.7	34.5	2.9	2.8	2.8	–
Denmark	46.8	47.5	47.0	1.4	1.3	1.1	–
Finland	47.9	47.6	47.2	1.0	0.9	0.8	2015
France	47.3	47.4	47.3	1.8	1.5	1.3	2018
Germany	39.0	39.0	39.1	1.1	0.8	0.7	–
Greece	40.3	40.0	38.0	3.6	3.3	3.1	2016
Ireland	20.6	20.7	20.8	2.5	2.4	2.3	2015
Italy	40.8	40.4	39.8	3.8	3.3	2.6	2015
Japan	38.0	38.0	37.8	1.5	1.2	1.1	–
Netherlands	39.9	39.8	39.5	1.1	0.9	0.7	–
Portugal	37.9	37.9	37.1	4.2	4.3	4.2	2016
Spain	39.3	39.0	38.6	2.7	2.2	1.7	2018
Sweden	44.3	44.3	44.1	0.5	0.4	0.4	–
UK	35.4	34.5	33.5	1.9	1.7	1.7	2018
US	31.6	31.3	31.1	3.6	3.6	3.8	2022

Notes: (a) Expenditure shares reflect NiGEM aggregates, which may differ from official government figures. (b) The deficit in Australia, Austria, Canada, Denmark, Germany, Netherlands and Sweden is not expected to exceed 3 per cent of GDP within our forecast horizon. In Japan the deficit is not expected to fall below 3 per cent of GDP within our forecast horizon.

day. Projections from the EIA suggest around a 10 per cent, year-on-year increase in prices towards the end of 2018. Current expectations for the position of oil prices at the end of next year have increased by about 2 per cent, compared to the expectations formed just three months ago. Oil prices are expected to reach about \$54 and \$58 a barrel by the ends of 2017 and 2018, respectively.

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 exchange rate movements and shifts in country-specific equity risk premia. Figure A6 illustrates the key equity price assumptions underlying our current forecast. Equity markets have risen in all the major advanced economies since late October. Increases in stock prices have been particularly marked for banks, apparently reflecting a widening of interest margins associated with the recent steepening of yield curves and, particularly in the US, expectations of an easing of financial regulation by the new President of the United States. In the Euro Area the largest gains were recorded in Greece and Italy, where equity prices increased by about 9 and 12 per cent respectively.

Fiscal policy assumptions for 2017 follow announced policies as of 12 January 2016. Average personal sector tax rates and effective corporate tax rate assumptions underlying the projections are reported in table A3, while table A4 lists assumptions for government spending. Government spending is expected to continue to decline as a share of GDP between 2017 and 2016 in the majority of Euro Area countries reported in the table. Pressure continues to mount for a loosening of fiscal policy to support demand. The European Commission argued

in November 2016 that, “In light of the slow recovery and risks in the macroeconomic environment, there is a case for a moderately expansionary fiscal stance for the euro area”, more specifically a fiscal expansion of up to 0.5 per cent of GDP at the level of the Euro Area as a whole for 2017.⁴ However in December 2016, the Eurogroup of Euro Area finance ministers rejected the Commission’s recommendation, approving instead a neutral fiscal stance for the Area this year. A policy loosening relative to our current assumptions poses an upside risk to the short-term outlook in Europe. For a discussion of fiscal multipliers and the impact of fiscal policy on the macroeconomy, based on NiGEM simulations, see Barrell *et al.* (2012).

NOTES

- 1 With the exception of Chile, Iceland and Israel.
- 2 Interest rate assumptions are based on information available for the period to 12 January 2017.
- 3 For discussions of the short and long-run economic implications of the UK leaving the EU see Baker *et al.* (2016) and Ebell *et al.* (2016), respectively.
- 4 *Towards a Positive Fiscal Stance for the Euro Area*, Communication to the European Parliament, The Council, the European Economic and Social Committee and the Committee of the Regions, November 16, 2016. https://ec.europa.eu/info/sites/info/files/2017-european-semester-communication-fiscal-stance_en_1.pdf.

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