Sovereign debt holders: shifts in the investor base have refinancing risk implications

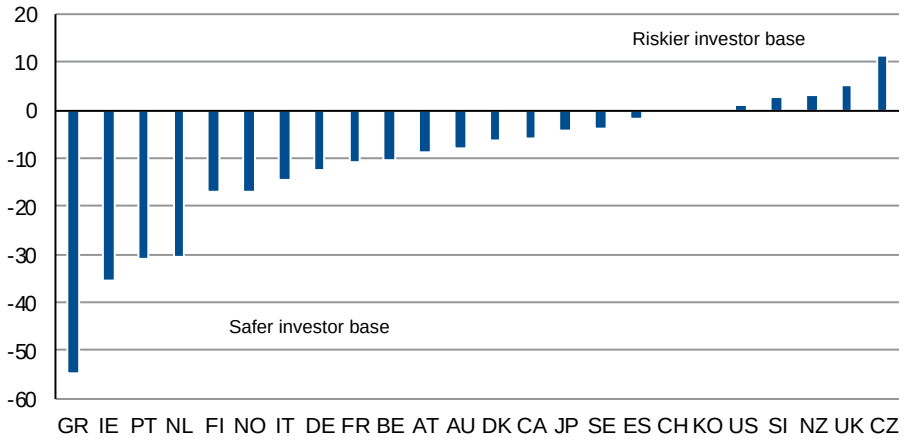
We analyse changes in sovereign vulnerability to sudden investor outflows based on investor sovereign debt holdings of 24 advanced economies from 2004 to 2018. Overall, while debt levels have increased for most countries, shifts to a safer investor base – in particular, for Greece, Ireland and Portugal – have significantly reduced refinancing risks since the financial crisis.

Shifts in the composition of the investor base for sovereign debt can impact i) government borrowing costs, ii) refinancing risks and market access, and iii) the extent of a sovereign-banking nexus, even in the absence of changes in a sovereign's debt level. Based on an IMF database, we look at the sovereign debt issued by 24 advanced economies held by six different investor classes – domestic central banks, domestic banks, domestic nonbanks, the foreign official sector, foreign banks and foreign non-banks from 2004 to 2018.

Based on the IMF's approach, we calculate estimates of the sensitivity of the six types of investors to a rise in yields as observed during the Q2-2008 to Q2-2012 crisis episode to classify them as either "safer" or "riskier" investors from the sovereign's financing (not financial stability) perspective. In other words, we focus on the likelihood of sudden investor outflows, reflected in an investor base risk index.

"Safer" investors include domestic investors and the foreign official sector as, during times of distress, they tend to increase their holdings, thus playing a stabilising role. We refer to foreign banks and foreign non-banks as "riskier" investors because they tend to reduce their holdings when yields rise, thus accentuating crises.

Figure 1: Change in Scope's investor base risk index, Q4 2008 to Q4 2018



Source: IMF Working Paper, Scope Ratings calculations
NB. The index ranges from 0 (low risk) to 100 (high risk).

On this basis, two key conclusions can be drawn for advanced economies:

- For most countries, the increases in the debt-to-GDP ratios over the past few years have been financed mostly by relatively safe or "sticky" sources, reflecting the i) bond purchasing activities of central banks, ii) large absorptions of bonds by domestic banks and iii) interventions of the official foreign sector.
- As a result, applying an "investor base risk index", we note that refinancing risks are lower for most countries (19 out of 24) despite higher public debt levels. This is particularly the case for euro area sovereigns given foreign official loans benefitting countries like Greece, Ireland, and Portugal, as well as the ECB's bond purchases.

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Investor base risk index

The sovereign debt investor base varies significantly across countries but thanks to the IMF database and Working Paper on tracking global demand for advanced economy sovereign debt[1], we are able to observe some general trends. The database looks at the sovereign debt issued by 24 advanced economies held by six different investor classes – domestic central banks, domestic banks, domestic nonbanks, the foreign official sector, foreign banks and foreign non-banks from 2004 to 2018 on a quarterly basis.

The index distinguishes between six types of investors

Non-banks include insurance companies, pension and investment funds, as well as households and non-financial corporations. The foreign official sector includes foreign central banks and other foreign official creditors (multilateral and bilateral loans).

Based on this data, the investor base risk index is derived in three steps:

i) calculate the historical correlation between log changes in investor holdings and log changes in sovereign bond yields,

ii) assign a risk score from 0 to 100 to each investor based on the correlations calculated in step 1, applying a simple linear transformation so that the highest positive (negative) correlation maps to a risk score of 0 (100), and

iii) assign an aggregate risk score to the investor base of a country by calculating the weighted average of the risk score for each investor, in which the weights are based on the share of the corresponding investor in the total debt stock.

A low (high) score on the investor base risk index constitutes a safe (risky) investor base.

Figure 2: Risk scores by investor type

	Investor Type	IMF Paper Q3 2008 to Q4 2011 Correlation	IMF Paper Q3 2008 to Q4 2011 Risk Score	Scope Q3 2008 to Q4 2011 Correlation	Scope Q3 2008 to Q4 2011 Risk Score	Scope Q2 2008 to Q2 2012 Correlation	Scope Q2 2008 to Q2 2012 Risk Score
"Safer"	Domestic central bank	0.148	0	0.082	9	0.085	0
"Safer"	Domestic bank	0.056	26	0.035	41	0.054	29
"Safer"	Domestic non-bank	0.093	16	0.070	17	0.078	6
"Safer"	Foreign official sector	0.097	14	0.094	0	0.078	7
"Riskier"	Foreign bank	-0.162	87	-0.048	98	-0.022	100
"Riskier"	Foreign non-bank	-0.207	100	-0.052	100	-0.020	98

Source: IMF Working Paper, Scope Ratings calculations

The IMF authors' calculations are conducted for the Q3-2008 to Q4-2011 period. We replicated these steps for the same period as well as for the Q2-2008 to Q2-2012 period and found very similar results. Differences are likely to be due to data updates, as the original paper was published in 2012 with subsequent updates and revisions to the underlying composition of debt holders, and different sources for government bond yields.

Key assumption: In crisis times, investor behaviour would be the same as observed during Q2-2008 to Q2-2012

For the remainder of this analysis, for simplicity, we therefore apply our own risk scores which are based on the correlations for the Q2-2008 to Q2-2012 period. The key assumption in our analysis is that the behaviour of the six investor types would not change today compared to the time of the previous crisis.

In other words, we assume that despite holding larger amounts of sovereign debt today, in the event of a crisis, domestic and foreign official debt holders would again behave in a stabilising way (holding or buying bonds when yields rise) whereas foreign banks and non-banks would reduce their holdings should yields rise unexpectedly.

[1] Arslanalp and Tsuda (2012), Tracking Global Demand for Advanced Economy Sovereign Debt, IMF Working Paper.

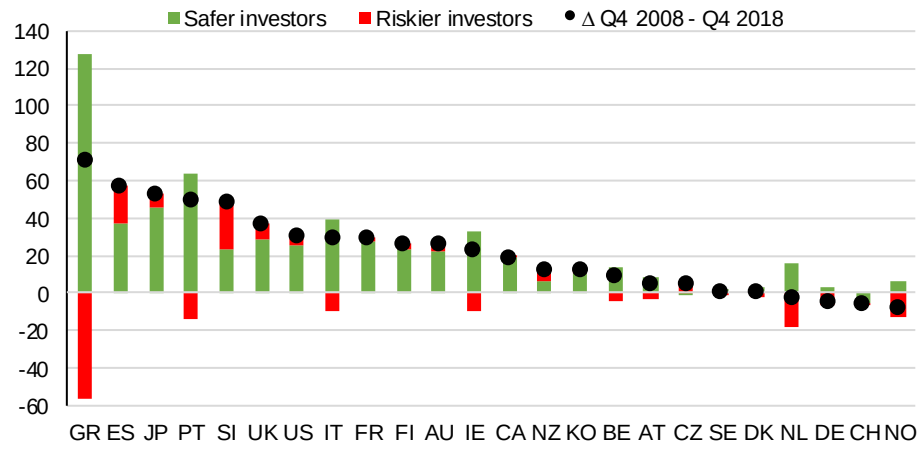
Sovereign debt holders: shifts in the investor base have refinancing risk implications

Public debt vs investor base

While public debt levels are higher, holdings of sovereign debt have shifted to safer sources

While we observe an increase in the public debt levels for most countries in our sample since 2008, the holdings of sovereign debt have shifted to safer sources. Looking at the change in the composition of debt holdings by investor risk type, provides a more benign view of refinancing risk. For instance, while Greece's debt-to-GDP ratio increased by over 70pp, "safer" investors increased their holdings by close to 130% of GDP while "risker" investors decreased their shares by almost 60%. As a result, the refinancing risk is mitigated by a "stickier" investor base, despite a higher debt level.

Figure 3: Change in debt-to-GDP ratios by investor risk type (Q4 2008 to Q4 2018)



Source: IMF, Scope Ratings GmbH
NB. "Safer" investors refer to the holdings of domestic central banks, domestic banks, domestic non-banks, the foreign official sector, while "riskier" refers to the holdings of foreign banks and foreign non-banks

Looking at changes over time, we divide the 24 countries into five groups and plot the investor base risk scores against the 2018 and 2008 debt-to-GDP ratios to identify sovereigns that are/ were potentially vulnerable to refinancing risks due to high debt levels and a risky investor base. An improvement in the investor base risk index, holding debt levels constant, indicates that the sovereign's exposure to refinancing risk has decreased.

Figure 4. Public debt vs investor base risk index, Q4 2008

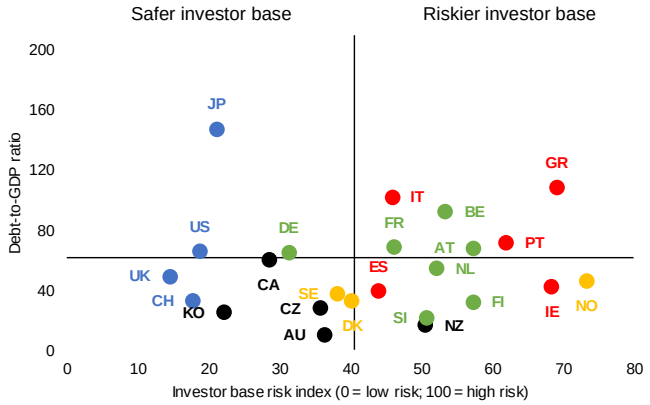
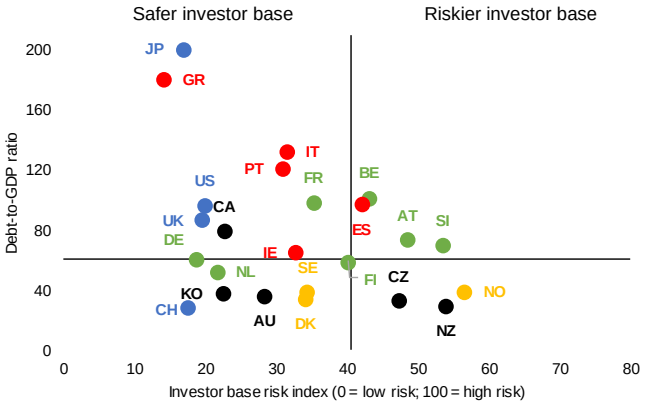


Figure 5. Public debt vs investor base risk index, Q4 2018



Source: IMF Working Paper, Scope Ratings GmbH.
NB. A low (high) score reflects a safe (risky) investor base.
The cross point shows the median of both indicators for the 2004 to 2018 period.

The following conclusions can be drawn:

- **Euro area core:** This group of countries displays the greatest degree of heterogeneity. All countries, except Slovenia, improved their investor risk profile scores, especially the Netherlands driven by the displacement of foreign non-banks and the increase in Eurosystem holdings, with the ECB being a sizeable owner of public debt following its asset purchase programme launched in March 2015. However, it is only Germany that also decreased its public debt level. While France and Belgium have similar public debt levels of around 100% of GDP, France's investor profile appears safer than Belgium's. While Austria and Finland experienced increases in their debt levels, both of their investor risk profiles decreased whereas for Slovenia both risk metrics deteriorated.
- **Euro area periphery:** Since 2008, Ireland, Greece, Portugal, Italy and Spain all saw their debt-to-GDP ratios increase. However, despite this increase, their investor risk profiles did not deteriorate. In fact, given the interventions of foreign official creditors, Eurosystem central banks and domestic banks, their investor base is now less risky compared to in previous years.
- **Nordics:** Denmark, Sweden and Norway have seen minor changes in their respective debt-to-GDP ratios; however, contrary to Sweden and Denmark which also have relatively safe debt holders, Norway's investor base risk profile score improved markedly, but still remains among the riskiest in the sample. This reflects the 48% of Norwegian sovereign debt held by foreign banks and non-banks, compared to 28% of Sweden's and 24% of Denmark's.
- **Reserve currency countries:** Japan, the US and the UK are among the sovereigns whose debt levels have risen the most whereas Switzerland's decreased over the same period. This notwithstanding, as the tables in the annex indicate, these four reserve currency countries have among the best and most stable investor risk profile scores in the sample.
- **Other:** The Czech Republic and New Zealand are among the few countries whose investor risk profiles deteriorated given an increase in foreign holdings.

Central banks' holdings: the impact of quantitative easing

We note that positive developments in the investor base risk index for the full country sample are driven in part by a large increase in central bank holdings. Based on OECD data, government debt holdings by major central banks such as the ECB, BoE, BoJ and the Fed reached USD 11tn in December 2018 due to quantitative easing policies. As a result, the share of sovereign debt held by domestic central banks has risen significantly, reaching almost 40% in Japan, 25% in the UK and around one fifth for most euro area countries, including France, Germany, Italy, the Netherlands, and Spain.

Central bank holdings reduce refinancing risks but increase the concentration of the investor base

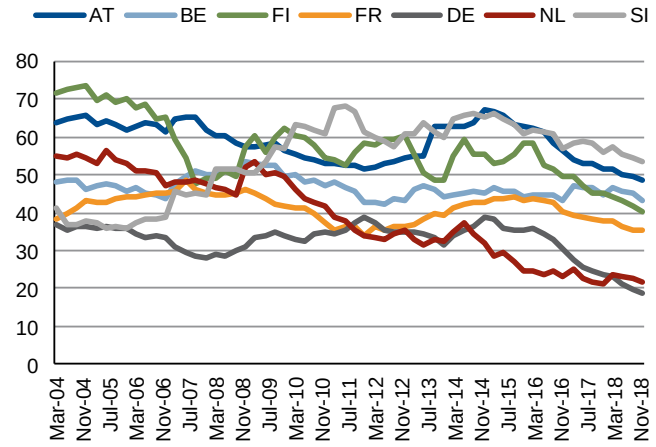
This substantial role played by central banks in recent years has led to a less diversified investor base and raises questions regarding the implications of current monetary policy normalisation. The OECD highlights that efforts to re-engage with the traditional investor base should be mobilised to compensate for the expected reduced support on the part of the central banks as and when their respective QE programmes come to a halt.

Decreased central bank purchases could reduce the crowding out effect while rising yields could induce higher demand from "real money investors". While we expect the gradual exit from QE by the major central banks to lead to an increase in the diversification of the investor base, the impact on the investor base risk will ultimately depend on the funding source that replaces the central banks.

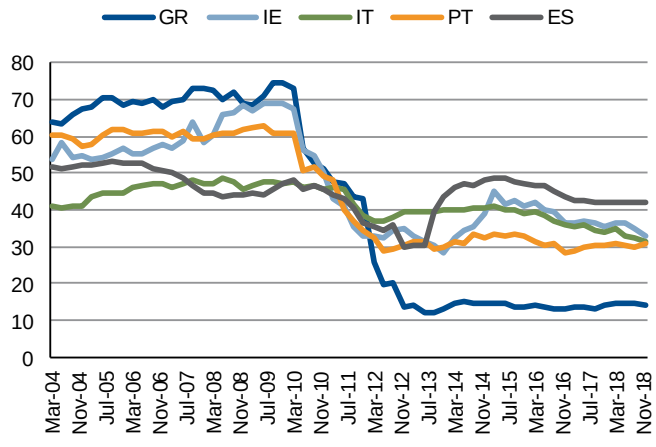
Sovereign debt holders: shifts in the investor base have refinancing risk implications

Annex I: Investor base risk index by geography, 2004 to 2018

Investor base risk index: EA Core 2004 to 2018

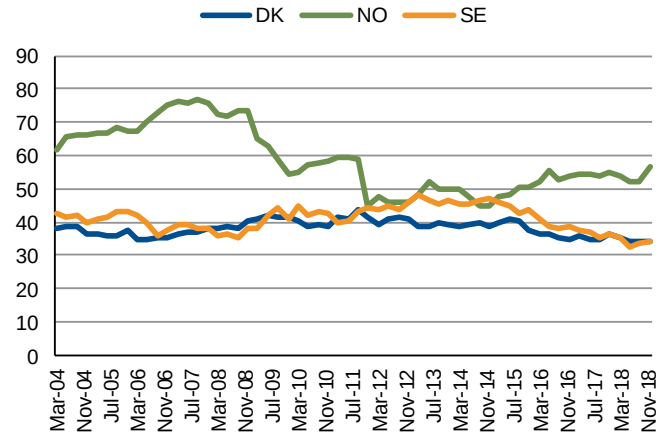


Investor base risk index: EA Periphery 2004 to 2018

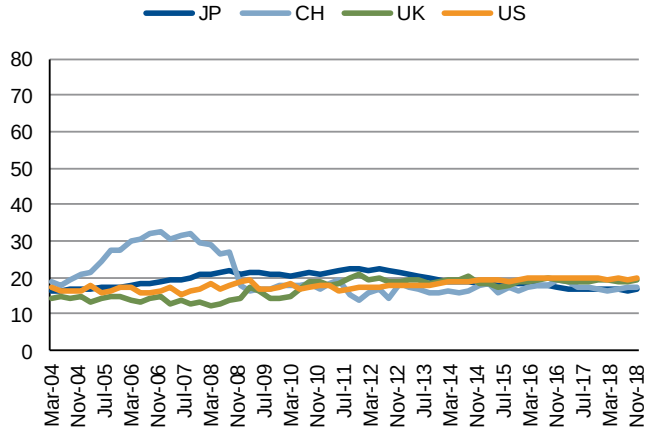


Source: IMF Working Paper, Scope Ratings GmbH
NB.A low (high) score reflects a safe (risky) investor base.

Investor base risk index: Nordics 2004 to 2018

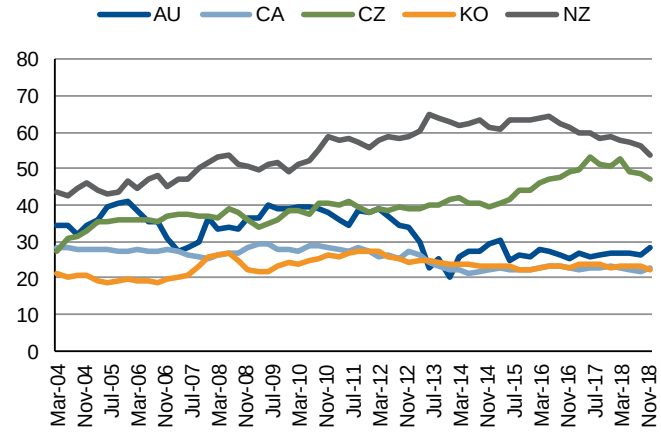


Investor base risk index: Reserve Currency 2004 to 2018



Source: IMF Working Paper, Scope Ratings GmbH
NB.A low (high) score reflects a safe (risky) investor base.

Investor base risk index: Other 2004 to 2018



Source: IMF Working Paper, Scope Ratings GmbH
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Sovereign debt holders: shifts in the investor base have refinancing risk implications

Annex II: Investor base risk index, 2004 to 2018

Country	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Australia	34.5	41.0	31.0	36.4	36.3	38.8	37.9	38.1	33.8	20.1	29.3	25.6	25.1	26.6	28.3
Austria	65.5	62.0	61.4	61.7	57.4	56.7	53.1	51.6	54.5	62.7	67.4	62.6	56.2	51.6	48.6
Belgium	46.1	45.5	43.6	50.3	53.3	49.7	47.2	42.8	43.3	44.2	45.3	44.3	43.2	44.6	43.0
Canada	27.9	27.0	27.9	25.5	28.4	27.8	28.1	27.3	27.2	22.3	22.1	22.1	22.5	23.3	22.6
Czech Republic	32.7	35.7	36.9	37.0	35.7	38.2	40.3	37.7	39.0	41.4	39.5	44.2	48.9	50.7	47.3
Denmark	36.4	37.5	35.4	38.2	40.2	41.6	38.8	41.4	40.7	39.2	38.6	37.7	34.8	36.2	34.0
Finland	73.6	70.2	65.4	49.3	57.2	62.5	54.4	58.3	60.2	48.4	55.4	58.2	49.5	45.1	40.1
France	43.2	44.3	45.0	45.0	46.1	41.8	37.2	33.9	36.3	39.5	42.7	43.2	40.5	37.7	35.2
Germany	36.3	35.8	33.2	28.2	31.2	34.0	34.9	38.9	35.1	31.5	38.6	35.3	30.5	23.6	18.7
Greece	67.4	68.3	68.2	72.9	69.0	74.7	51.1	43.1	13.4	12.9	14.5	13.8	13.1	14.1	14.1
Ireland	54.9	56.9	58.1	58.2	68.4	69.1	50.2	32.9	35.1	28.5	39.2	41.0	36.3	35.7	32.7
Italy	41.2	44.6	47.3	47.1	45.8	47.2	45.5	38.6	39.5	39.8	40.3	39.0	36.1	33.8	31.5
Japan	16.8	17.4	18.6	20.7	21.1	21.0	21.0	22.5	21.3	19.4	18.5	18.2	17.5	16.6	16.8
Korea	20.6	19.8	19.5	25.8	22.1	24.2	26.2	27.2	24.4	23.6	23.1	22.1	22.8	22.7	22.4
Netherlands	54.7	53.1	47.2	47.6	52.1	49.4	41.5	33.9	35.2	32.3	31.8	24.6	23.3	21.0	21.6
New Zealand	46.3	46.3	44.9	51.8	50.5	49.1	58.6	55.8	58.7	62.8	61.0	63.3	61.1	58.9	53.9
Norway	66.2	67.3	75.1	75.8	73.3	54.6	58.6	45.1	45.8	49.9	44.8	50.5	53.6	54.9	56.5
Portugal	57.5	61.8	61.2	59.5	61.9	60.9	49.1	34.6	30.4	29.9	32.5	32.9	28.5	30.3	30.9
Slovenia	37.7	35.8	38.7	44.8	50.6	56.8	60.7	61.1	60.9	59.8	65.3	60.8	56.9	55.7	53.4
Spain	52.2	53.0	50.9	44.4	44.0	47.2	45.5	36.6	29.8	43.8	48.3	47.3	43.8	41.8	42.0
Sweden	39.6	42.9	37.8	37.9	38.1	40.7	42.3	44.1	46.2	46.7	47.3	43.6	38.9	36.5	34.4
Switzerland	21.0	27.6	32.5	29.4	17.7	17.6	16.8	13.5	18.6	15.6	17.7	16.5	19.3	17.0	17.4
United Kingdom	14.6	14.8	14.7	13.4	14.3	14.2	18.8	20.7	19.0	18.8	18.5	18.8	19.3	19.3	19.5
United States	16.5	17.3	16.4	17.0	18.6	17.3	17.7	17.3	17.6	18.2	19.3	19.2	20.0	19.6	19.9

Source: IMF Working Paper, Scope Ratings GmbH
NB. A low (high) score reflects a safe (risky) investor base.

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