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# Repricing of risk and EME assets: the behaviour of Irish-domiciled funds during the COVID-19 crisis

Silvia Calò, Lorenz Emter, and Vahagn Galstyan  
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# Repricing of risk and EME assets: the behaviour of Irish-domiciled funds during the COVID-19 crisis

*Silvia Calò, Lorenz Emter, and Vahagn Galstyan<sup>1</sup>*

Central Bank of Ireland

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## Abstract

In 2020Q1, emerging market economies (EMEs) experienced significant outflows of portfolio investment capital. Irish-domiciled funds contributed to these portfolio outflows through sales of EME securities in response to heightened redemptions. Consistent with previous evidence around the sensitivity of Irish-resident fund flows to changes in global risk appetite, the retrenchment by Irish-domiciled funds in 2020Q1 was greater for debt, rather than equity, securities. Relative to their initial positions, the retrenchment was bigger for hedge funds, suggesting leverage may have acted as an amplifier of asset sales. Overall, though, Irish-domiciled funds also retrenched by less than might have been expected, given the historical relationship between measures of global risk aversion and fund flows to EMEs. In part, this may be due to the fact that, in the face of large redemptions, Irish funds also sold more liquid advanced economy securities. This points to potential common creditor effects acting as a transmission channel of shocks. The analysis also finds that EME countries with stronger fundamentals were somewhat cushioned from the retrenchment. Finally, valuation effects were strongest vis-à-vis EMEs with more flexible exchange rate regimes, suggesting a major role for currency depreciations in driving the observed reduction in positions.

## 1 Introduction

Emerging Market Economies (EMEs) have become increasingly important for the global economy in recent decades. While Ireland has limited direct trade and financial links to emerging market economies besides China (Emter and McQuade, 2019), indirect exposures to EMEs matter for the Irish real economy through linkages to the rest of the world, especially key trading partners such as the US and the UK. Moreover, Irish-resident investment funds have substantial positions in EME portfolio debt and equity, adding a further link between Ireland and EMEs. While Irish-resident funds may not be a representative sample of the entire fund universe, analysing changes in their positions vis-à-vis EMEs sheds light into the dynamics of this sector which has become increasingly

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<sup>1</sup> Corresponding authors: [silvia.calo@centralbank.ie](mailto:silvia.calo@centralbank.ie) and [lorenz.emter@centralbank.ie](mailto:lorenz.emter@centralbank.ie). The views expressed in this note are those of the authors and do not represent the official views of the Central Bank of Ireland or the European System of Central Banks. We would like to thank Vasileios Madouros, Valerie Herzberg, Brian Golden, Kitty Moloney, Fergal McCann, Neill Killeen, as well as seminar participants at the Central Bank of Ireland and Bank of England for valuable comments. Luke Doyle and Kieran Sheehan provided excellent research assistance.

important in channelling capital flows to EMEs (Carney, 2019), and can help policymakers to better develop policy tools aimed at preserving financial stability.

The COVID-19 crisis caused a sharp repricing of market risk and affected the global investment fund sector. It has also had ramifications in Ireland, given the importance and size of Irish-resident funds (e.g., Cima et al., 2019, FSR 2020:I). As Q1 2020 saw a strong shift in risk sentiment in advanced economies and EMEs, Irish-resident funds witnessed large redemptions (FSR 2020:I). The aim of this note is to investigate the direction and size of the shifts in holdings of EME securities by Irish-resident funds in Q1 2020, at a time of global repricing of risk across asset classes.

Building on Bianchi et al. (2020), we show that large reductions in debt (-19 per cent) and equity (-28 per cent) positions in Q1 2020 were largely driven by valuation effects, given the sharp observed fall in asset prices at the onset of the COVID-19 shock. During this period, however, flows also turned negative, so Irish-resident funds – in aggregate – also contributed to capital outflows from EMEs.<sup>2</sup> We find that the reduction in Irish fund flows was particularly large for debt securities. For equities, the reduction in flows by Irish funds was somewhat lower than implied by their share in countries' external liabilities. Our results also suggest that, to meet redemption pressures, Irish funds with exposures to EMEs also resorted to selling off more liquid advanced economy assets, particularly US securities. This highlights important additional channels in the transmission of shocks to global risk sentiment which may contribute to stress in advanced economy debt markets through a dash-for-cash. Finally, we find that valuation effects were strongest for EMEs with more flexible exchange rate regimes, after controlling for changes in global risk aversion and individual country fundamentals. This suggests a major role for currency fluctuations in driving the observed shifts in positions.

## 2 Recent Developments in EMEs

The COVID-19 pandemic resulted in a global economic standstill, with severe consequences for emerging and developing countries. The IMF projects a contraction of 3 per cent in EME GDP in 2020 (World Economic Outlook Update, June 2020). EMEs were hit by a combination of shocks. At first, the COVID-19 shock affected them indirectly because of the containment measures in trading partners. The measures caused a sharp drop in demand for commodities and a partial interruption of global value chains (GVCs). Second, similar containment measures were put in place domestically, hitting other sectors of the economy that were not linked to GVCs and international trade. Third, a severe drop in the price of oil hit some EMEs.<sup>3</sup> Fourth, because of the halt in economic activity and the risk-off sentiment that permeated global financial markets in mid-March, EMEs experienced a significant outflow of financial capital, in some cases accompanied by sharp

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<sup>2</sup> For literature on extreme capital flow episodes see, for example, Forbes and Warnock (2012, 2020) and Emter (2020).

<sup>3</sup> Oil led a collapse in global commodity prices of 53 per cent in the year to May, because of a drop in demand and price competition between Saudi Arabia and Russia in March.

depreciations of the local currency, equity market declines and jumps in sovereign bond spreads (Hördahl and Shim, 2020).

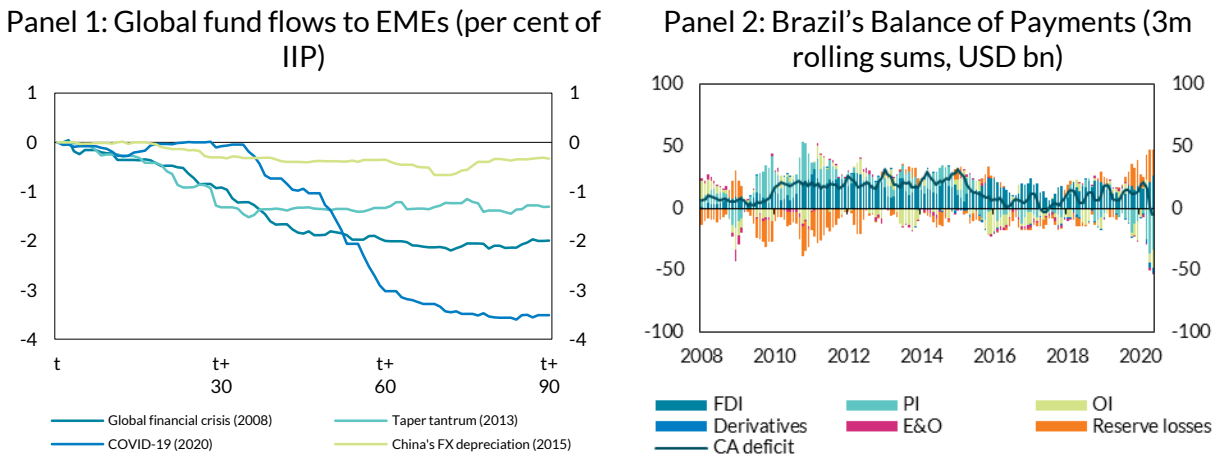
Indeed, despite the development of local currency financial markets, EMEs remain vulnerable to shifts in global funding conditions. Over the last few years, EMEs have developed local-currency bond markets in long maturities to overcome the so-called “original sin” and to reduce vulnerability to exchange rate changes (Eichengreen and Hausmann, 1999). However, while the issuance of domestic currency debt provides some isolation from balance sheet mismatches, it does not offer full protection from shocks to global capital markets. This is because, owing to their smaller domestic institutional investor base, EME bond markets have relied on external portfolio investors who may be more flighty in times of stress (Hofmann et al. 2020).

A recent IMF study calculates that portfolio outflows from emerging markets in March were about \$100 billion - more than three times larger than for the same period of the global financial crisis (IMF GFSR April 2020; Figure 1, Panel 1). According to IIF (2020) these outflows were particularly concentrated in portfolio equity assets. These sharp reversals in capital inflows can be exemplified by Brazil’s monthly balance of payments (BOP). Panel 2 of Figure 1 reports a summary of the Brazilian BOP since 2008, with the current account deficit shown as a positive line (in dark blue), and the constituent components on the flows side shown as financing items. March outflows were beyond anything seen previously, with reserve losses having to step in (orange bars, accounting for roughly \$20 billion) to buffer the impact on the currency of large portfolio (light teal bar) and other investment outflows (light green bars).<sup>4</sup> The net outflows in portfolio investment in March of \$23 billion were larger than the \$21 billion net outflows in portfolio investment between September 2008 and February 2009, i.e. during the height of the GFC.

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<sup>4</sup> Note that Panel 1 of Figure 1 refers to portfolio investment flows to EMEs channelled through global funds as recorded by EPFR, while Panel 2 displays total net portfolio investment flows as recorded in the BOP. EPFR fund flows use net flows of the investors’ contribution/redemption for individual funds - by asset class, investor and fund types - and country weights the funds report to calculate country and sector flows. Hence, while these flows exclude portfolios’ performance and currency fluctuations and correlate closely with portfolio investment flows recorded in the BOP (Moussavi, 2014), they may differ from BOP portfolio investment flows substantially in size.

Figure 1: EMEs witnessed large portfolio investment outflows in March 2020



Note: Panel 1 shows the percent of international investment position using flows based on daily observation from EPFR. Panel 2, FDI = Foreign Direct Investment, PI = Portfolio Investment, OI = Other Investment, E&O = Errors and Omissions, CA deficit = Current Account deficit. Source: IMF, Datastream, Central Bank of Ireland and authors' calculations.

What role did Irish-resident funds play? A recent paper by Bianchi et al. (2020) illustrates how both euro area and Irish investment fund positions are sensitive to global sentiment. The paper also drills into the composition of the funds' portfolios and what drives shifts in positions. First, debt flows tend to be more sensitive than equity flows to changes in the VIX (here capturing global risk sentiment). Second, the sensitivity of funds to changes in the VIX is lower the higher the sovereign debt rating of a receiving country. This is especially the case for Irish funds' debt exposures. Third, hedge funds display the greatest degree of sensitivity to changes in global risk sentiment, which may be due to elevated levels of leverage of these funds amplifying exposure to market moves.

In the following, we explore the behaviour of Irish-resident funds' EME positions during Q1 2020 in detail.

### 3 Irish Funds and EMEs in Q1 2020

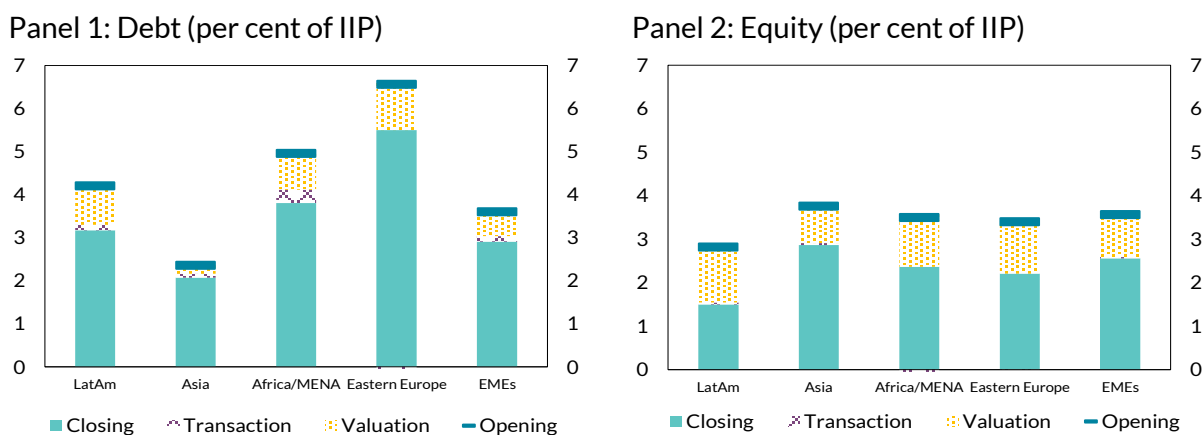
In this section, we describe how positions of Irish-resident investment funds changed during the first three months of 2020. In doing so, we look at different types of funds and disentangle dynamics at country level.<sup>5</sup> Our analysis draws on granular balance sheet-level information from Irish-resident investment funds collected by the Central Bank of Ireland.

Funds resident in Ireland hold a substantial amount of equity and debt securities issued by EMEs. Depending on the region and asset class, the assets held by funds resident in Ireland can make up

<sup>5</sup> The sample of emerging market economies consists of: Argentina, Brazil, Chile, China, Colombia, Egypt, Hong Kong, India, Indonesia, Israel, Malaysia, Mexico, Nigeria, Pakistan, Philippines, Russia, Saudi Arabia, Singapore, South Africa, South Korea, Thailand, and Turkey.

more than 6 per cent of total external liabilities as reported by EMEs in their international investment position (Figure 2).<sup>6</sup>

Figure 2: Changes in holdings of EME securities by Irish-resident investment funds in Q1 2020



Note: Percent of total external liabilities in portfolio debt and equity, respectively, as reported by issuing countries for 2019Q4. Countries are grouped as follows. LatAm: Argentina, Brazil, Chile, Colombia, Mexico; Asia: China, Hong Kong, Indonesia, Malaysia, Philippines, Singapore, South Korea, Thailand, India, Pakistan; Africa/MENA: Egypt, Israel, Nigeria, Saudi Arabia, South Africa; Eastern Europe: Russia, Turkey. Source: IMF BOP, Central Bank of Ireland, and authors' calculations.

During Q1 2020, Irish-resident funds saw their exposure to EMEs reduced for both debt and equity assets (Figure 2). This was due to both negative flows and valuation effects, but – given the significant asset price falls in 2020 Q1 – the latter were the largest contributor to the reduction in the overall positions, especially for equity assets. Overall, Irish funds closed Q1 2020 holding almost €16 billion less in EME debt assets than at the start of the period, and €32 billion less in EME equity assets (Table 1).

As a share of the opening position, aggregate flows were smaller in size. During the period, equity outflows were less than 1 per cent of the opening position. Meanwhile, outflows from bonds were more than twice that from equity. This is consistent with the results of Bianchi et al. (2020), suggesting that debt flows are more sensitive to changes in global risk appetite than equity flows.

Looking at the typology of funds in Table 1, we see that, within debt assets, bond funds are naturally driving the overall results, with funds selling assets worth €1.8 billion. Yet, as a share of initial position, hedge funds saw the highest ratio of flows to the opening position in this asset category, as they sold off more than one fifth of their initial holdings. Retrenchments from EME equity assets by hedge funds were also the largest in terms of initial positions. This is consistent with the results of Bianchi et al. (2020), and points to potential vulnerabilities associated with fund leverage in the face of asset price shocks. While for portfolio debt, all type of funds have reduced their holdings of EME debt during Q1 2020, some types of funds have registered small positive flows of portfolio equity assets; these were bond funds, mixed funds and other types of funds.

<sup>6</sup> Note that the denominator, the sum of individual countries' external liabilities in the respective category, does not net out positions between countries in the respective country groupings.

Table 1: Holdings of EME securities by Irish funds in Q1 2020 (EUR billion)

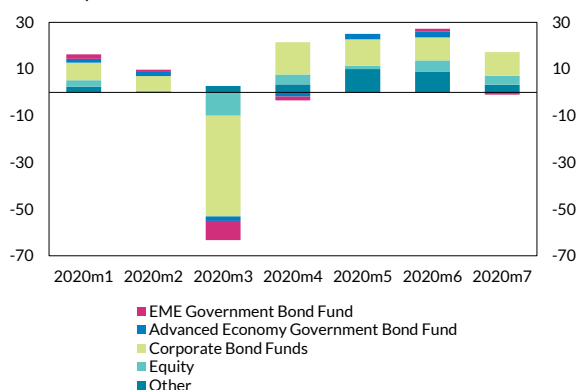
	Portfolio Debt Assets				Portfolio Equity Assets			
	Opening	Flows	Closing	F/O (%)	Opening	Flows	Closing	F/O (%)
Bond	75.82	-1.78	60.09	-2.35	1.10	0.08	0.99	7.38
Equity	1.51	-0.10	0.70	-6.58	107.36	-1.27	75.47	-1.18
Hedge	0.71	-0.16	0.35	-22.05	1.09	-0.19	0.57	-17.15
Mixed	4.94	-0.23	3.79	-4.57	5.94	0.22	4.89	3.76
Other	0.57	-0.03	0.44	-4.86	0.85	0.07	0.77	8.78
<b>Total</b>	<b>83.55</b>	<b>-2.29</b>	<b>65.37</b>	<b>-2.74</b>	<b>116.33</b>	<b>-1.08</b>	<b>82.70</b>	<b>-0.93</b>

Note: The table reports values for Q1 2020 for the countries listed in the note in Figure 1. Columns identify the Irish-resident investment funds' opening position, the net flows, closing position, and the ratio between flows and opening positions in securities issued by the countries listed in the note of Figure 4. Source: Central Bank of Ireland and authors' calculations.

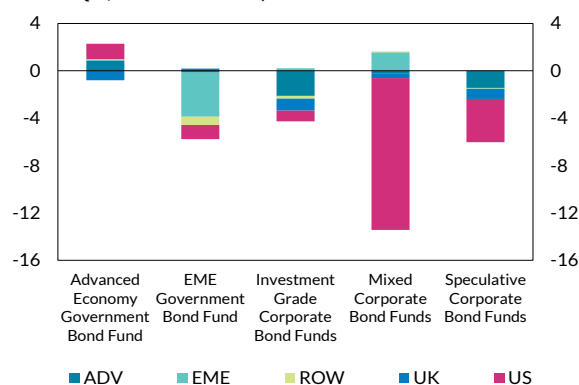
The numbers in Table 1 mask some further important heterogeneity across fund types. In particular, bond funds faced severe redemption pressures in March (Figure 3, Panel 1). Figure 3, Panel 2 shows that, while EME government bond funds did indeed retrench from EME assets to meet redemption pressures in 2020Q1, redemptions did not translate one-to-one in selling of EME assets. Indeed, Irish-resident EME government bond funds sold off some of their assets vis-à-vis US residents, which might indicate that they may have used proceeds from selling more liquid US securities to meet redemption pressures. While selling US assets would have cushioned the impact of redemptions on EMEs, this behaviour constitutes a potential further transmission channel for shocks across financial markets, commonly known as the common creditor channel.

Figure 3: Irish-resident funds behaviour

Panel 1: Redemptions by fund type (EUR billion)



Panel 2: Flows by counterparty country (2020Q1, EUR billion)



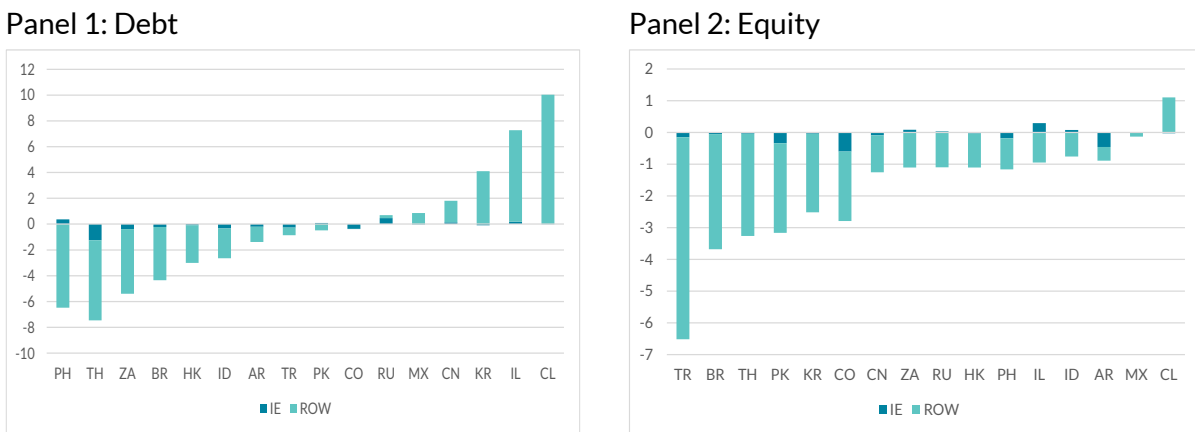
Note: Panel a shows monthly redemptions by fund type for the period January-July 2020, in billions of euro. Panel b shows asset flows for Q1 2020 for each fund bond type, by counterparty country, expressed in billion euro. Source: Central Bank of Ireland, and authors' calculations.

How does the behaviour of Irish-resident funds compare to global portfolio flows? Comparisons of aggregated BOP data for EMEs and Irish EME outflows can be misleading given the increasing role

of intra-EME capital flows which would need to be netted. Still, information can be gleaned from country by country comparisons.

Figure 4 shows the relation between the flows of Irish-resident funds in Q1 2020 and overall BOP portfolio flows of individual economies. Most EMEs, in particular Thailand, the Philippines, South Africa, and Brazil, faced significant outflows in portfolio debt of up to 7 per cent of initial positions. However, some countries, like Chile, also experienced substantial inflows. The outflows were far more broad-based across countries in portfolio equity reaching up to 6.5 per cent of their initial in Turkey and close to 4 per cent in Brazil. While flows from Irish-resident funds are mildly positively correlated with ROW flows (0.38 for debt and 0.19 for equity), they do not make up a large share of emerging market flows at a country level. Nonetheless, in some cases sell-offs by Irish-resident funds were a substantial part of the total outflows (e.g. Thai debt assets; equity assets for Colombia, Argentina, and Pakistan).

Figure 4: EME Irish-resident investment fund flows and portfolio inflows/outflows from the rest of the world in Q1 2020

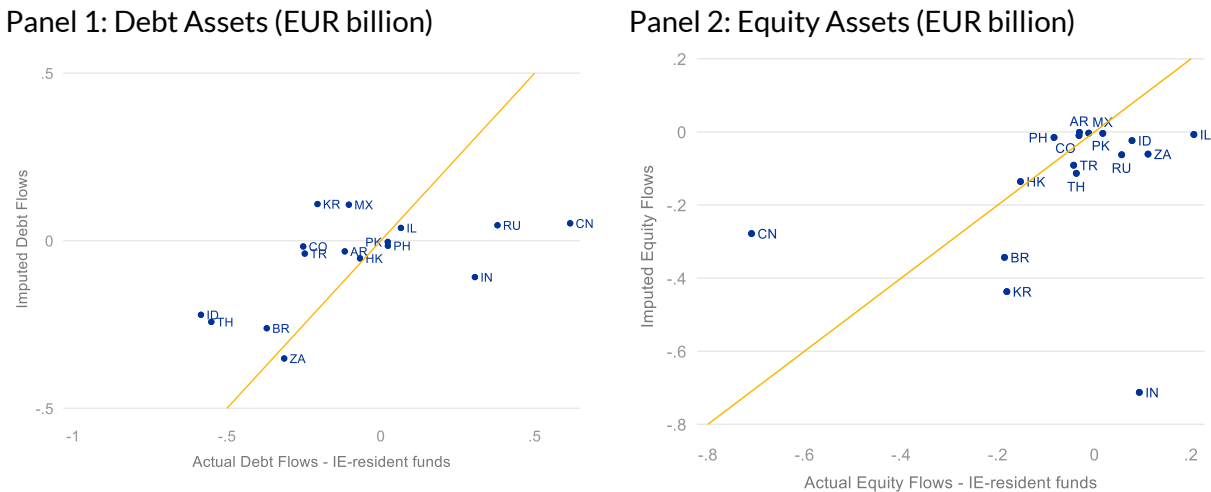


Note: Percent of total external liabilities in portfolio debt and equity, respectively, as reported by issuing countries for 2019Q4. Source: IMF BOP, Central Bank of Ireland, and authors' calculations.

While the previous figure put the behaviour of Irish-resident funds in Q1 2020 in the context of the BOP flows experienced by each EME, to further understand their relative behaviour in Q1 2020, we show flows in the context of the share of each EME assets Irish-resident funds held by the end of 2019. To do this, Figure 5 shows a scatterplot of realised flows against imputed flows conditional on initial exposures. To estimate the latter we first calculate the ratio of Irish funds' EME holdings in a given asset class to external liabilities of EMEs in the same asset class at the end of 2019. Next, these shares are applied to EME liability flows, as recorded in the balance of payments, to compute imputed flows. The figure suggests that, on average – given more countries “on the right of the 45 line -Irish equity funds retracted by somewhat less than what would have been “expected” given their starting position, while being more or less in line with their average share as regards debt assets. It is also noteworthy that, in contrast to Irish funds, the IIF (2020) reports a stronger decline in equity than in debt.



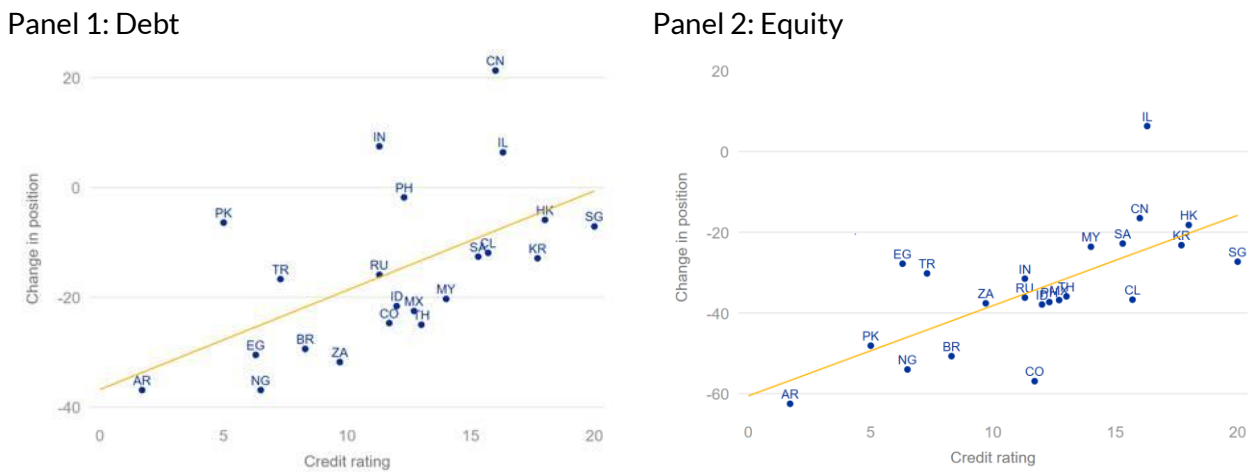
Figure 5 Effective versus imputed flows from Irish-resident investment funds to EMEs in Q1 2020



Source: Authors’ calculations based on data from the IMF, Haver Analytics and Central Bank of Ireland.

Turning to fundamentals, proxied by the credit rating of the country’s sovereign debt, we observe a positive correlation between the credit rating and shifts in portfolio positions for both debt and equity assets (Figure 6). Naturally, in the face of rising risk aversion, riskier securities tend to fall in value more. Hence this observed effect is, to a large extent, driven by valuation changes.

Figure 6: Change in position versus rating



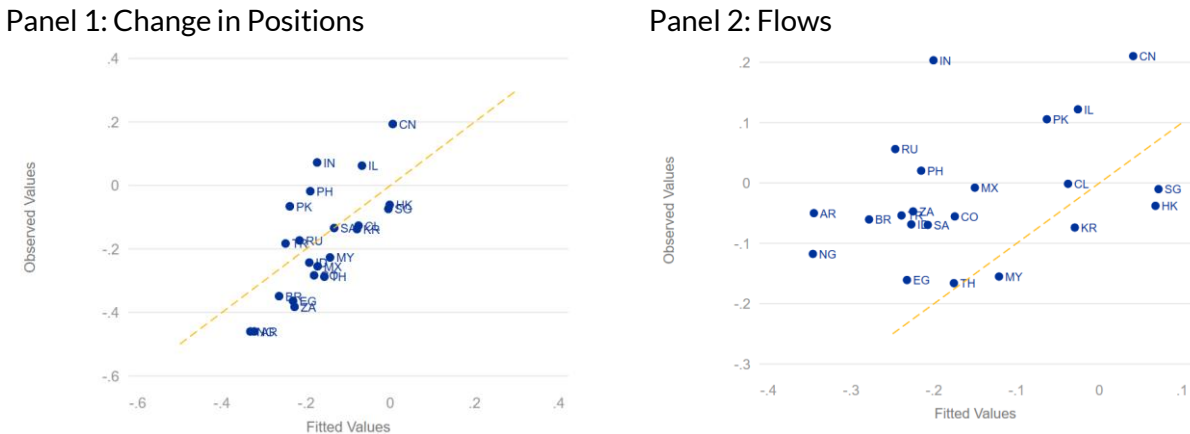
Note: Change in positions expressed in per cent. Credit rating captures the sovereign credit rating. Higher values imply a higher rating, i.e. 20 = AAA. Source: Central Bank of Ireland, Oxford Economics through Refinitiv Datastream, and authors’ calculations.

## 4 A Regression-Based Assessment

In the previous section, we described the dynamics of Irish-resident funds’ holdings of EME securities. This section assesses how much of these dynamics can be explained by an overall repricing of risk in the markets, and to what extent individual country risk mitigated or amplified the effects of the global repricing of risk. To do so, we run a model similar to the one in Bianchi et al. (2020), where shifts in holdings of EME securities by Irish-resident funds are regressed on a

measure of global risk-sentiment (the VIX), and idiosyncratic risk factors proxied by the countries' sovereign credit rating.<sup>7</sup> The results, described in detail in the appendix, show that shifts in Irish-resident funds' positions and flows in EME debt assets are negatively correlated with global risk aversion. The regression results also suggest that higher sovereign credit ratings cushion the impact of such a global risk-off sentiment.

Figure 7: Actual versus fitted values for debt assets in Q1 2020



Note: Observed changes in Irish-domiciled funds' position vis-à-vis respective EME countries plotted against the fitted values from the regression described in Column 1 and Column 3 from Table A1. Observed and fitted values capture the log change of Irish funds debt position (Panel 1) and Irish funds debt flows divided by average opening debt position (Panel 2). Source: Central Bank of Ireland and authors' calculations.

We use the estimated relationship from this simple econometric model to assess whether the changes in positions and flows during Q1 2020 were in line with past behaviour with regard to swings in global risk sentiment.<sup>8</sup> Figure 7 highlights that while the changes in positions were mostly in line with what our simple model would predict, the observed flows – while in aggregate negative – were substantially smaller than implied by the past relationship between flows and global risk sentiment. Hence, this finding suggests that tail events, like the one in Q1 2020, do not conform to a linear relation present in historical data.

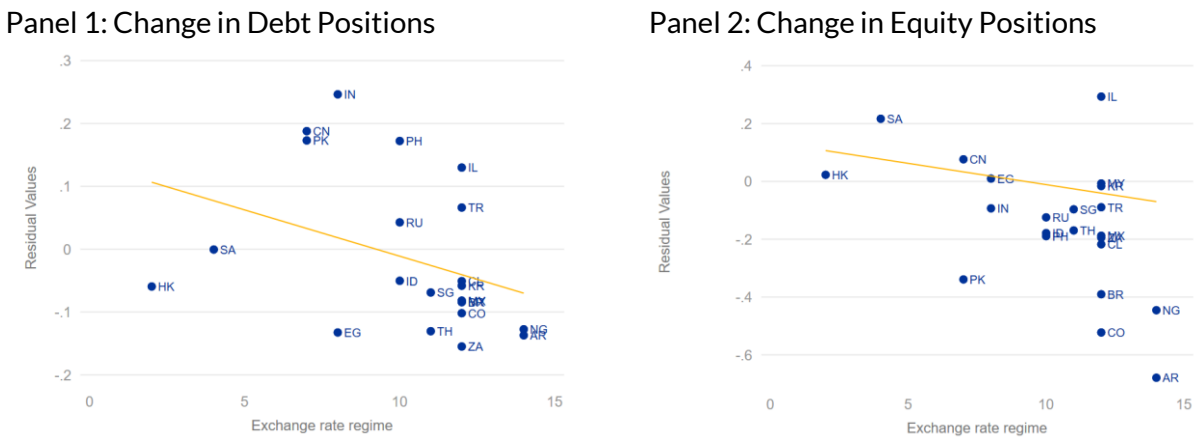
Taken together, these results show that estimates based on past episodes of fluctuations in risk appetite can, to some extent, explain the reduction in debt positions. However, actual flows in Q1 2020 were smaller than implied by our simple model based on past observations. One potential explanation of this pattern is that, as documented in Figure 3, faced with large redemptions driven by the large spike in risk aversion, funds sold less of EME assets and compensated by selling more liquid assets to meet redemptions.

<sup>7</sup> In addition we control for the opening position and country fixed effects. Deviating from Bianchi et al (2020), we use the period average of the 90-day VIX instead of the start of period value like Bianchi et al. (2020) in order to capture developments in March 2020. We run the regression for the entire period between 2014Q1 and 2020Q1 but the results are almost identical if 2020Q1 is omitted.

<sup>8</sup> Since, as detailed in the appendix, regression results are not significant for changes in equity positions and equity flows, we did not do similar exercise for equities.

The dominance of valuation effects in the changes in positions documented above suggests a major role for changes in exchange rates. The importance of exchange rate depreciations in EMEs is highlighted by Figure 8, which shows that positions changed particularly strongly in Q1 2020 vis-à-vis countries with more flexible exchange rate regimes, even when accounting for movements in the VIX and credit ratings.<sup>9</sup> Hence, positions declined particularly strongly vis-à-vis those EMEs for which the currency is not pegged and was, hence, free to depreciate during Q1 2020.

Figure 8: Residuals from regressions in Table 2 for Q1 2020 versus the exchange rate regime



Note: Residuals from the regression described in Table A1 in the appendix for Q1 2020 plotted against the exchange rate regime as classified by Ilzetzki et al (2019). Higher values imply a more flexible exchange rate regime. Source: Authors' calculations.

## 5 Conclusions

Irish-resident funds have been important actors in global financial markets and invested also in EME equity and debt assets. When the COVID-19 shock hit emerging economies during the first quarter of 2020, some emerging markets experienced sharp portfolio outflows, depreciations of their domestic currency, and a general repricing of assets took place, amid increased market volatility.

Our analysis shows large reductions in debt and equity positions of Irish-resident investment funds vis-à-vis EMEs, to a large extent driven by valuation effects given the sharp fall in asset prices and depreciations of many EMEs currencies against the euro over the period. Positions changed particularly strongly in Q1 2020 vis-à-vis countries with more flexible exchange rate regimes, suggesting a major role for currency depreciations in driving the observed reduction in positions.

During this period, however, flows also turned negative, so Irish-resident funds – in aggregate – also contributed to capital outflows from EMEs. We find that the reduction in Irish fund flows was particularly large for debt securities. For equities, the reduction in flows by Irish funds was somewhat lower than implied by their share in countries' external liabilities. Moreover, the

<sup>9</sup> Note that the exchange rate regime is not a significant explanatory variable when included into the regressions for the sample period between 2014Q1 and 2020Q1 and does not alter the results depicted in Table 2.

observed behaviour of flows in Q1 2020 is also different from the historical relationship between flows and global risk sentiment.

We also find that to meet redemption pressures, Irish EME debt funds also resorted to selling off more liquid advanced economy assets such as US securities. This highlights important channels in the transmission of shocks to global risk sentiment which may induce stress in advanced economy sovereign debt markets through a “dash-for-cash”.

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## Appendix A

Table A1 reports the results from a regression for a panel of quarterly data on positions of Irish resident funds in EME securities between Q1 2014 and Q1 2020. Columns (1) and (2) describe the change in debt and equity position, respectively. We relate the logarithmic change in positions to: the overall implied volatility in the markets, captured by the period average in the 90-day VIX; the country's credit rating, capturing the different country-specific risk levels; and an interaction between the VIX and the sovereign credit rating, to capture nonlinearities arising from the effects of risk repricing on more vulnerable countries. In addition, we control for the opening position. Columns (3) and (4) repeat the exercise for debt and equity flows, i.e. flows (normalised by the opening position), respectively.

*Table A1: Regression results - Funds' reaction to uncertainty and country-risk*

VARIABLES	(1) Change in Position		(3) Flows	
	Debt	Equity	Debt	Equity
Log of VIX	-0.924*** (0.146)	-0.677*** (0.211)	-1.231*** (0.335)	0.442 (1.592)
VIX*Credit Rating	0.045*** (0.011)	0.013 (0.016)	0.069*** (0.026)	-0.092 (0.123)
Credit Rating	-0.147*** (0.035)	-0.052 (0.051)	-0.240*** (0.081)	0.234 (0.383)
Opening Position	-0.025*** (0.009)	-0.095*** (0.023)	-0.057*** (0.021)	-0.833*** (0.173)
Constant	2.860*** (0.444)	2.081*** (0.639)	4.012*** (1.016)	-0.539 (4.829)
Observations	545	550	546	550
R-squared	0.18	0.14	0.09	0.11

Note: The dependent variable in Column (1) is the log change of Irish funds debt position. The dependent variable in Column (2) is the log change of Irish funds equity position. The dependent variable in Column (3) is Irish funds debt flows divided by average opening debt position. The dependent variable in Column (4) is Irish funds equity flows divided by average opening equity position. VIX is the 3-month VIX. All regressions include country fixed effects. Standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

The regression results show that for both changes in debt and equity position, a higher opening position is associated with larger outflows of funds from Irish-resident funds during the sample period. The repricing of risk, captured by the logarithm of the VIX, also saw outflows increase as implied volatility in the markets grew. The magnitude of this risk-off sentiment effect seems to be similar for debt and equity. The positive coefficient on the interaction of the VIX with the credit rating indicates that in a general risk-off sentiment captured by an increase in the VIX, funds positions in the riskier assets in countries with a lower credit rating are reduced more substantially. The interaction term is not significantly different from zero in relation to changes in equity positions.

When focusing on flows of debt and equity assets in Column (3) and (4) respectively, we strip the valuation effects out of the change in positions. While the direction of the effects does not change, the magnitude of the coefficients is quite different compared to results for the change in the overall position, and in some cases coefficients that were statistically different from zero loose explanatory

power. Moreover, differences between debt and equity flows appear to be more substantial. Equity flows for instance seem more strongly related to the funds' opening position, with a coefficient one order of magnitude larger than the one for debt flows, but coefficients for the other variables are not statistically different from zero anymore. When it comes to debt flows, on the other hand, market volatility, a country's fundamentals and their interactions are significant and drive flows in the same direction as they drive the overall change in position, but with larger coefficients/strength.



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