Under pressure: market conditions and stress – online annex[34]

Input variables for market conditions indicators

Markets	Variables	Definition	Source
FX	JP Morgan FX volatility index	3-month option-implied volatility for G10 and emerging market currencies.	Bloomberg
FX	Quoted spread	Quoted bid-ask spread of spot exchange rates (EUR, JPY, GBP, CHF vs USD).	Datascope
FX	Cross-currency basis	EUR-JPY-GBP-CHF/USD cross-currency basis.	Bloomberg
FX	Triangular VLOOP	Five-day moving average of triangular no-arbitrage deviations between USD-EUR-FX, USD-GBP-FX, with FX = EUR/GBP, CHF, JPY, as in Huang et al (2021).	Datascope
Treasury	MOVE Index	US Treasury yield volatility implied by 1-month options on 2, 5, 10 and 30-year Treasuries.	Bloomberg
Treasury	Quoted spread (pre-2008)	Average spread of the 1st to 4th off-the-run US Treasuries (2, 5, 10 years).	Bloomberg
Treasury	Quoted spread (post-2008)	Average spread of off-the-run US Treasuries; (maturities: 0–1.5, 1.5–3.5, 3.5–5.5, 5.5–10 years).	Tradeweb
Treasury	Time-to-quote	Time taken by dealers to return their first quote for inquiries which ended up as a trade, for 5.5-to-10-year off-the-run US Treasuries.	Tradeweb
Treasury	US Government Securities Liquidity Index (GVLQUSD)	Average yield deviation relative to a fitted yield curve across US Treasuries with maturity beyond 1 year.	Bloomberg
Treasury	On-the-run premium	Difference between par-coupon yields of seasoned 10-year Treasuries and yields on newly issued 10-year Treasuries, as in Christensen et al (2017).	Fed
Treasury	Absolute OIS spread	Absolute value of OIS-US Treasury spread (maturities: 6 months, 2 years, 5 years).	Bloomberg
Treasury	Absolute Treasury futures basis trade	Absolute value of the implied minus actual 5-year repo rate (2-week moving average).	Bloomberg
Money market	Commercial paper (CP)-OIS spread	3-month (A1/P1, Financial (Fin) AA) or 1-month (Non-Fin AA, or Non-Fin A2/P2) CP rates minus OIS.	Bloomberg
Money market	Repo-OIS spread	Absolute value of the 1-month or 1-week US GCF repo rates minus OIS.	Bloomberg
Money market	TED spread	3-month LIBOR minus Treasury-bill rate.	Bloomberg
Money market	LIBOR-OIS spread	3-month LIBOR minus 3-month OIS.	Bloomberg

Source: Authors' elaboration.

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[34] This online annex accompanies the special feature "Under pressure: market conditions and stress", by Iñaki Aldasoro, Peter Hördahl and Sonya Zhu.

Explanatory variables for logit analysis of market stress probabilities
<div align="right">Table B</div>

Variables	Definition	Included for	Source
Variable type: over-extension of investors/perceptions of risk in markets			
ETF total inflows	Total investor flows into major ETFs, all asset types; monthly sum of daily value-weighted net flows.	MM, FX, Tsy	Bloomberg
BCG flow shifts	Intra-family investor flow shifts towards high-yield bond mutual funds, as in Ben-Rephael et al (2021); 12-month moving average of monthly flows scaled by previous period assets under management.	MM, FX, Tsy	ICI
BKW flow shifts	Intra-family investor flow shifts from bond funds towards equity mutual funds, as in Ben-Rephael et al (2012); 12-month moving average of monthly flows scaled by previous period assets under management.	MM, FX, Tsy	ICI
MM flow shifts	Intra-family investor flow shifts towards money market funds; 12-month moving average of monthly flows scaled by previous period assets under management.	MM	ICI
GFCy	Global financial cycle (Miranda-Agrippino and Rey (2020)); approximation based on Davis and Zlate (2022); last value of each month.	MM, FX, Tsy	Bloomberg, BIS
DXY	Broad dollar index; monthly average of daily data.	MM, FX, Tsy	Bloomberg
VIX	30-day option-implied volatility of S&P500 index returns; monthly average of daily data.	MM, FX, Tsy	Bloomberg
Futures margin	Initial margin on 10-year Treasury futures; last value of each month.	Tsy	CME
Variable type: liquidity conditions in markets and market-making capacity of intermediaries			
EBP credit spread	Excess bond premium; unpredictable component of a corporate credit spread (Gilchrist and Zakrajšek, 2012); monthly.	MM, FX, Tsy	Fed Board
PD Treasury holdings	Net holdings of Treasury bonds by primary dealers; last value of each month.	MM, FX, Tsy	FRBNY
Fed purchases	Federal Reserve purchases of Treasuries; last value of each month.	MM, FX, Tsy	FRED
CP issuance	Total issuance of commercial paper, all maturities; 12-month rolling average.	MM, Tsy	FRED

The column labelled "Included for" shows the market segments for which each variable is used in an initial specification; some variables drop out from the final specification due to statistical insignificance (see annex Tables C–E for the final specification). MM refers to money market, Tsy to Treasury market and FX to foreign exchange market.

Source: Authors' elaboration.

Stress episode logistic regressions: money market

Table C

	3m horizon	6m horizon	9m horizon	12m horizon
Constant	–2.7864***	–3.7593***	–3.2997***	–3.6972***
	(0.6393)	(0.6754)	(0.4922)	(0.5155)
Fed purchases	–0.0318***	–0.0301***	–0.0327***	–0.0393***
	(0.01)	(0.0105)	(0.0091)	(0.0091)
BCG flow shift	1.8425	4.7298	5.5232*	7.5671***
	(3.3655)	(3.5314)	(3.0858)	(2.8798)
BKW flow shifts	12.8965	52.5349***	58.2903***	57.0512***
	(18.508)	(18.216)	(16.5052)	(14.8944)
EBP credit spread	–0.4978	1.8559*	3.8739***	3.9864***
	(0.8108)	(0.9685)	(1.0153)	(0.9425)
GFCy	1.3777*	4.6185***	4.0875***	5.0049***
	(0.7973)	(0.9672)	(0.7855)	(0.7662)
ETF total inflows	0.6441***	0.7147***	0.6700***	0.5309***
	(0.2235)	(0.2292)	(0.1872)	(0.1936)
MM flow shifts	7.7617	17.5401*	23.4746***	29.6435***
	(9.8381)	(9.1365)	(8.7962)	(8.8322)
PD Treasury holdings	0.0093	0.0292***	0.0193***	0.0300***
	(0.0072)	(0.0084)	(0.0074)	(0.0077)
Treasury MCI	0.6895	–0.6631	–1.3379*	–0.7886
	(0.7485)	(0.8213)	(0.8083)	(0.7798)
MM MCI	2.8125***	1.4271**	0.1173	–1.7984***
	(0.7834)	(0.6285)	(0.4307)	(0.6306)
FX MCI	0.0857	0.8059**	–0.1888	1.0104**
	(0.3929)	(0.4064)	(0.4199)	(0.4152)
Pseudo R-squared	0.4656	0.4551	0.4498	0.4779

Estimated parameters of a logit model aimed at capturing the (log) odds of money market stress 3, 6, 9 and 12 months ahead. The explanatory variables are listed and defined in Annex Table B. All variables are standardised before estimation. Asymptotic standard errors are displayed in parentheses. ***/**/* indicates statistical significance at the 1/5/10% level. "Pseudo R-squared" refers to McFadden's pseudo R-squared (one minus the ratio of the fitted model's log-likelihood value and the corresponding value of a model with only a constant as explanatory variable).

Source: Authors' calculations.

Stress episode logistic regressions: FX market

Table D

	3m horizon	6m horizon	9m horizon	12m horizon
Constant	2.9359	3.8369	8.3483*	7.1659*
	(7.5045)	(5.595)	(4.4366)	(3.6889)
BKW flow shifts	40.0162**	46.2247***	43.2732***	19.4917**
	(16.4259)	(12.4242)	(10.5039)	(9.0125)
EBP credit spread	5.5179***	4.2589***	3.4471***	2.3201***
	(1.2839)	(0.9323)	(0.7962)	(0.6516)
DXY dollar index	−0.0717	−0.0749	−0.1267**	−0.1133***
	(0.0871)	(0.065)	(0.0516)	(0.0433)
GFCy	0.9681	2.0635***	2.6407***	2.4765***
	(0.8627)	(0.6694)	(0.5707)	(0.5374)
ETF total inflows	0.4809	0.4885*	0.4661**	0.2765
	(0.397)	(0.2762)	(0.211)	(0.185)
PD Treasury holdings	−0.0033	0.0017	0.0164**	0.0214***
	(0.0128)	(0.0095)	(0.0068)	(0.0062)
Treasury MCI	−2.5498**	−1.8500*	−0.1694	0.7896*
	(1.1828)	(0.9725)	(0.6962)	(0.4084)
MM MCI	0.7183	0.1884	−0.9510**	−1.7504***
	(0.9092)	(0.7741)	(0.4255)	(0.5253)
FX MCI	2.9489***	1.7826***	1.4468***	1.2760***
	(0.6253)	(0.3975)	(0.338)	(0.3302)
Pseudo R-squared	0.6459	0.4803	0.3569	0.2515

Estimated parameters of a logit model aimed at capturing the (log) odds of FX market stress 3, 6, 9 and 12 months ahead. The explanatory variables are listed and defined in Annex Table B. All variables are standardised before estimation. Asymptotic standard errors are displayed in parentheses. ***/**/* indicates statistical significance at the 1/5/10% level. "Pseudo R-squared" refers to McFadden's pseudo R-squared (one minus the ratio of the fitted model's log-likelihood value and the corresponding value of a model with only a constant as explanatory variable).

Source: Authors' calculations.

Stress episode logistic regressions: Treasury market

Table E

	3m horizon	6m horizon	9m horizon	12m horizon
Constant	−40.7535***	−56.6682***	−39.7001***	−5.0419
	(12.0398)	(13.9587)	(11.3375)	(8.5131)
Fed purchases	−0.0076	−0.0121*	−0.0504**	−0.0174
	(0.0058)	(0.0064)	(0.0197)	(0.0186)
BCG flow shift	1.7427	−1.0745	−11.0980**	−7.9365
	(3.9316)	(3.4807)	(5.1077)	(4.8648)
BKW flow shifts	26.1932	−24.7610*	−45.0716**	−5.4936
	(16.5129)	(14.6294)	(18.1182)	(15.6137)
EBP credit spread	2.8011*	−3.7082***	−3.7190***	−4.4705***
	(1.6452)	(1.3712)	(1.4101)	(1.6007)
DXY dollar index	0.3200***	0.4125***	0.1971**	−0.1087
	(0.1126)	(0.1136)	(0.0942)	(0.0837)
Futures margin	2.1415	7.0846***	9.1974***	1.7973
	(1.6518)	(2.3151)	(2.7881)	(2.329)
CP issuance	0.2837***	0.3078***	0.2682**	0.3497***
	(0.1035)	(0.1102)	(0.1085)	(0.1158)
PD Treasury holdings	−0.0197**	−0.0305***	−0.0223***	0.0075
	(0.0086)	(0.0099)	(0.0082)	(0.0082)
MM MCI	2.1591**	3.8840***	1.7142**	0.2891
	(0.8973)	(1.0872)	(0.7227)	(1.1214)
FX MCI	−3.8343***	−3.1022***	−4.5677***	−2.0323**
	(1.1797)	(0.923)	(1.0741)	(0.7898)
Pseudo R-squared	0.6514	0.6519	0.6911	0.6311

Estimated parameters of a logit model aimed at capturing the (log) odds of Treasury market stress 3, 6, 9 and 12 months ahead. The explanatory variables are listed and defined in Annex Table B. All variables are standardised before estimation. Asymptotic standard errors are displayed in parentheses. ***/**/* indicates statistical significance at the 1/5/10% level. "Pseudo R-squared" refers to McFadden's pseudo R-squared (one minus the ratio of the fitted model's log-likelihood value and the corresponding value of a model with only a constant as explanatory variable).

Source: Authors' calculations.