

A Global Monetary Tsunami? Measuring the Spill-overs of US Quantitative Easing

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"This crisis started in the developed world, ... it will not be overcome through quantitative easing policies that have triggered ... a monetary tsunami, have led to a currency war and have introduced new and perverse forms of protectionism in the world."

Dilma Rousseff,
President of Brazil (2012)

What we do...

Is there evidence for global spill-overs of Fed QE policies?

Focus so far narrowly on effects on US

➤ Literature: QEI was fairly effective in the US

Goal of this study:

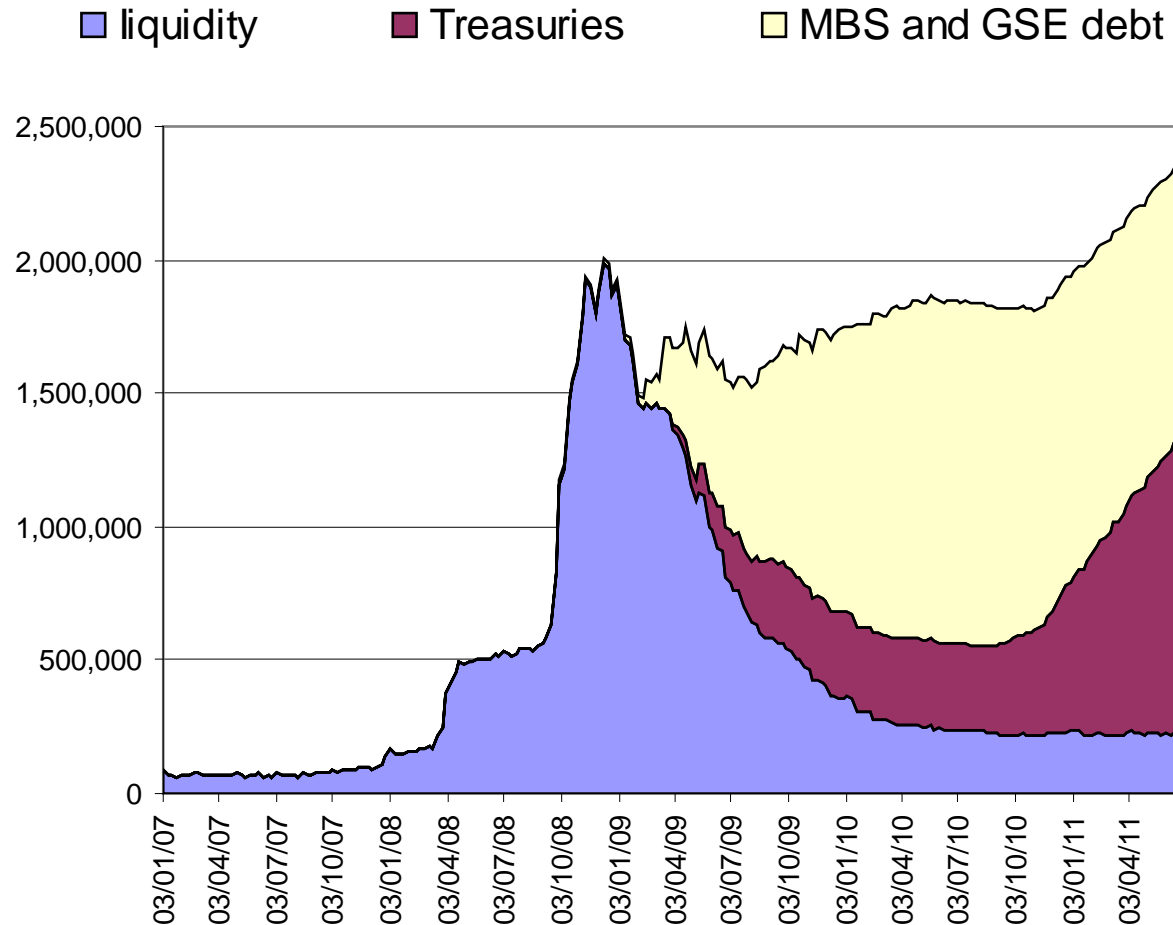
- to quantify the impact of US QE announcements and operations on portfolio flows and asset prices across regions
 - ✓ Global quantities/flows (mutual funds) vs prices vs. exchange rates, 65 countries

Conclusions

- 1. US QE policies affected global asset prices, capital flows and exchange rates**
- 2. Important to look at both announcements and operations**
 - ✓ Portfolio rebalancing occurs mainly with operations
- 3. Different QE instruments have different impact on markets:**
 - ✓ **QE1:** Portfolio Rebalancing into the US
 - ✓ **QE2:** portfolio rebalancing across countries (into EMEs) and assets (from bonds to equity) - boost global equities
- 4. Overall, QE policies are not the main drivers of flows and prices (limited economic impact)**
- 5. QE increased pro-cyclicality of flows into EMEs**

Fed unconventional policy tools

Unconventional operations in the FED balance sheet (USD millions)



Data

- EPFR (Emerging Portfolio Fund Research) – portfolio allocation of mutual funds
- Cover | 6,000 equity funds, 8,000 bond funds
- Mainly US investor perspective
- Aggregated at level of 65 countries of destination of the flows
- correlated with BoP data
- Sample: daily data, January 2007 through December 2010

Methodology I

$$y_{i,t} = E_{i,t-1} [y_{i,t}] + (\beta + \gamma^{EME} D_i^{EME} + \gamma^{AE} D_i^{AE}) MP_t + \varepsilon_{i,t}$$

$$\text{with } MP_t = [AN1_t, AN2_t, LQ_t, TR_t, MBS_t]'$$

$y_{i,t}$ → portfolio flows, equity returns, bond yields, FX returns in country i on day t

AN_t → QE1 and QE2 announcement dummies (same as in Wright 2011)

LQ_t, TR_t, MBS_t → Liquidity support, Treasury and MBS purchases by Fed

$E_{t-1}[y_{i,t}]$ → controls variables (fixed effect, lags of VIX, US short term rate, equity returns in the US and in country i , previous days' trend)

Panel fixed-effect estimator

Methodology II

The size of operations, asset prices and portfolio flows might be affected by common factors (deterioration of expectations and mkt confidence, etc)

- LQ_t TR_t MBS_t consist of the residual of a regression where the size of the operation is explained with indicators that are related to market conditions (but are not affected by the operations)
 - i.e. we use the part of the operation that is unrelated to common factors
- Market conditions are measured by intraday returns and volatilities for asset prices and exchange rates in the morning session of European markets
 - 2h time window between 12PM and 2PM CET

Total Impact of QE instruments

(total impact = estimated coefficient x total size of the operations)

| | Portfolio Equity Flows (flows in % of AUM) | | | Portfolio Bond Flows (flows in % of AUM) | | |
|----------------------------------|---|----------|-----------|---|------------|-----------|
| | US | EME | AE | US | EME | AE |
| <i>QE I Announcements (AN1)</i> | 1.36 *** | 0.16 | 0.57 *** | 0.66 *** | -0.58 *** | 0.33 *** |
| <i>QE II Announcements (AN2)</i> | 0.00 | 0.34 *** | -0.04 | 0.07 *** | 0.20 *** | 0.04 |
| <i>Liquidity (LQ)</i> | 2.57 *** | -2.98 ** | -0.13 | 2.14 *** | -3.11 *** | 0.52 |
| <i>Treasuries QE1 (TR1)</i> | 2.31 *** | 0.31 | -0.69 *** | 0.92 *** | -1.07 *** | -0.23 |
| <i>Treasuries QE 2 (TR2)</i> | -2.91 *** | 0.98 | -3.59 *** | -5.68 *** | -11.32 *** | -4.16 *** |
| <i>MBS (MBS)</i> | -0.85 *** | 1.06 ** | -0.67 ** | -0.65 *** | -2.96 *** | -2.47 *** |

| | Equity prices (Return in %) | | | Bond Yields (Change in p.p.) | | |
|----------------------------------|--------------------------------|-----------|-----------|---------------------------------|---------|---------|
| | US | EME | AE | US | EME | AE |
| <i>QE I Announcements (AN1)</i> | 10.40 *** | 5.53 *** | 2.10 ** | -0.58 *** | -0.77 * | -0.81 * |
| <i>QE II Announcements (AN2)</i> | 3.33 *** | 1.71 *** | 1.25 *** | -0.03 *** | 0.11 * | 0.01 |
| <i>Liquidity (LQ)</i> | 8.79 *** | -9.70 *** | -3.79 | 0.55 * | -0.51 | 0.33 |
| <i>Treasuries QE1 (TR1)</i> | -2.52 *** | 0.12 | -1.17 | -0.22 *** | 0.98 | 2.43 |
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| <i>MBS (MBS)</i> | 16.13 *** | 9.81 *** | 16.16 *** | -0.23 *** | -0.45 | -0.19 |

Global spill-overs of US quantitative easing

Portfolio Equity Flows

(flows in % of AUM)

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Portfolio Bond Flows

(flows in % of AUM)

| | US | EME | AE |
|--|-----------|------------|-----------|
| | 0.66 *** | -0.58 *** | 0.33 *** |
| | 0.07 *** | 0.20 *** | 0.04 |
| | 2.14 *** | -3.11 *** | 0.52 |
| | 0.92 *** | -1.07 *** | -0.23 |
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Equity prices

(Return in %)

| | US | EME | AE |
|----------------------------------|-----------|-----------|-----------|
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Bond Yields

(Change in p.p.)

| | US | EME | AE |
|--|-----------|---------|---------|
| | -0.58 *** | -0.77 * | -0.81 * |
| | -0.03 *** | 0.11 * | 0.01 |
| | 0.55 * | -0.51 | 0.33 |
| | -0.22 *** | 0.98 | 2.43 |
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Portfolio rebalancing occurs mainly with operations

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| | Equity prices (Return in %) | | | Bond Yields (Change in p.p.) | | |
|----------------------------------|--------------------------------|-----------|-----------|---------------------------------|---------|---------|
| | US | EME | AE | US | EME | AE |
| <i>QE I Announcements (AN1)</i> | 10.40 *** | 5.53 *** | 2.10 ** | -0.58 *** | -0.77 * | -0.81 * |
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Liquidity operations: rebalancing to the US

| | Portfolio Equity Flows (flows in % of AUM) | | | Portfolio Bond Flows (flows in % of AUM) | | |
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| | Equity prices (Return in %) | | | Bond Yields (Change in p.p.) | | |
|----------------------------------|--------------------------------|-----------|-----------|---------------------------------|---------|---------|
| | US | EME | AE | US | EME | AE |
| <i>QE I Announcements (AN1)</i> | 10.40 *** | 5.53 *** | 2.10 ** | -0.58 *** | -0.77 * | -0.81 * |
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| <i>MBS (MBS)</i> | 16.13 *** | 9.81 *** | 16.16 *** | -0.23 *** | -0.45 | -0.19 |

QE I Announcements: rebalancing to the US and AEs

| | Portfolio Equity Flows (flows in % of AUM) | | | Portfolio Bond Flows (flows in % of AUM) | | |
|----------------------------------|---|----------|-----------|---|------------|-----------|
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| | Equity prices (Return in %) | | | Bond Yields (Change in p.p.) | | |
|----------------------------------|--------------------------------|-----------|-----------|---------------------------------|---------|---------|
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QE I Treasury purchases : rebalancing to the US

| | Portfolio Equity Flows (flows in % of AUM) | | | Portfolio Bond Flows (flows in % of AUM) | | |
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| | Equity prices (Return in %) | | | Bond Yields (Change in p.p.) | | |
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QE2 announcements: rebalancing into EMEs, boosting equity prices worldwide

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QE2 treasury purchases: relative rebalancing into EME equities, boosting equity prices worldwide

| | Portfolio Equity Flows (flows in % of AUM) | | | Portfolio Bond Flows (flows in % of AUM) | | |
|----------------------------------|---|----------|-----------|---|------------|-----------|
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Total impact of QE instruments on exchange rates

| | Exchange Rate | | |
|----------------------------------|-----------------------------------|-----------|-----------|
| | (Return in %, + USD appreciation) | | |
| | US | EME | AE |
| <i>QE I Announcements (AN1)</i> | -2.06 *** | -1.00 * | -6.06 *** |
| <i>QE II Announcements (AN2)</i> | -0.11 *** | -0.29 ** | -0.76 *** |
| <i>Liquidity (LQ)</i> | 3.74 *** | 4.52 *** | 7.10 *** |
| <i>Treasuries QE1 (TR1)</i> | 0.56 *** | 2.70 ** | -0.25 |
| <i>Treasuries QE 2 (TR2)</i> | -1.18 *** | -0.58 | -1.33 |
| <i>MBS (MBS)</i> | -1.46 ** | -5.08 *** | -3.33 *** |

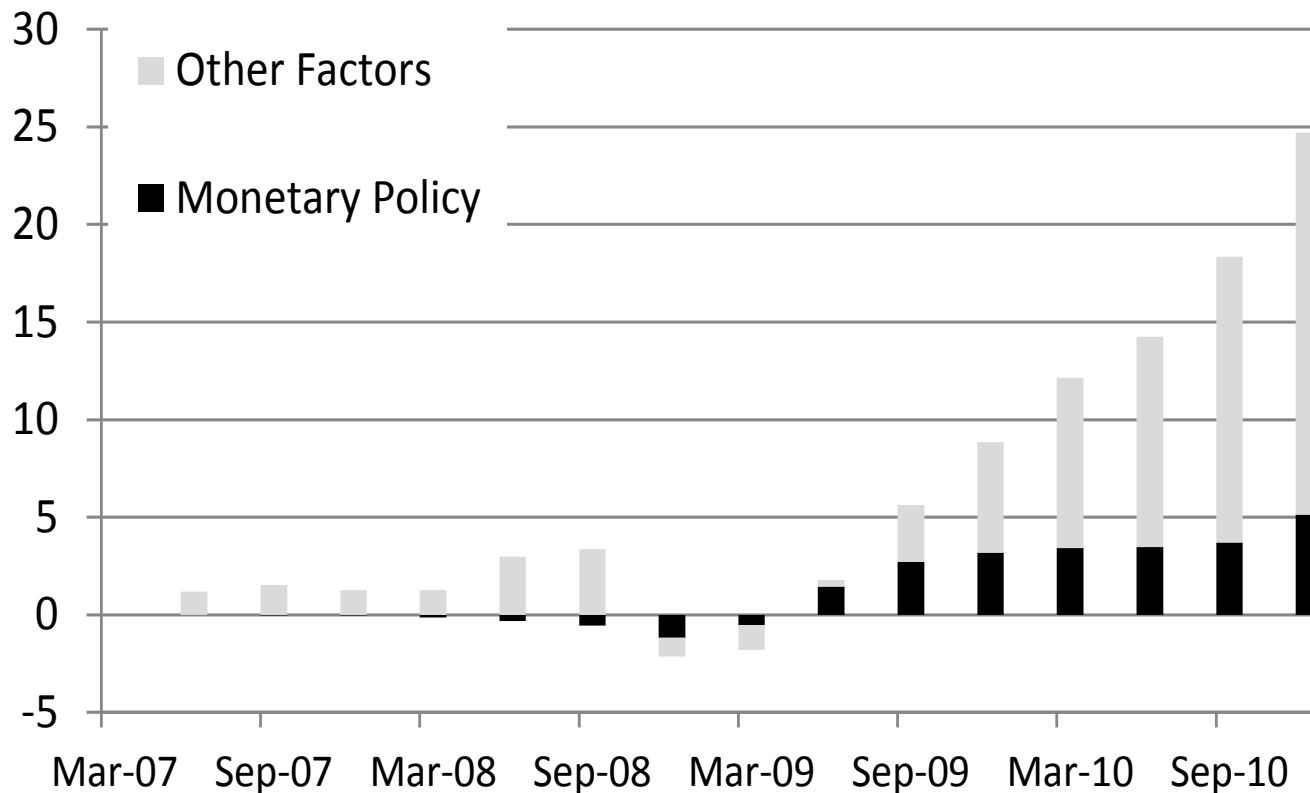
➤ Sizeable exchange rate movements

First set of conclusions

1. **US QE policies affected global asset prices, capital flows and exchange rates**
2. **Important to look at both announcements and operations**
 - ✓ Portfolio rebalancing occurs mainly with operations
3. **Different QE instruments have different impact on markets**
 - ✓ **QE1:** Portfolio Rebalancing into the US
 - ✓ **QE2:** portfolio rebalancing across countries (into EMEs) and assets (from bonds to equity) - boost global equities

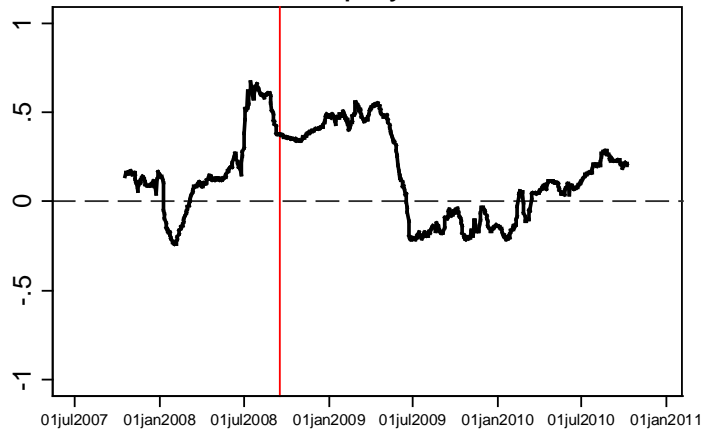
Economic impact of QE policies on equity flows to EMEs

Cumulated impact of QE on EME equity flows (% AUM)

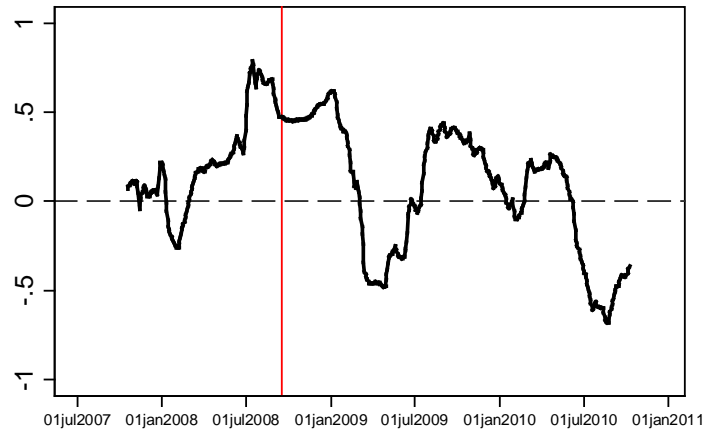


Pro-cyclical for EMEs – counter-cyclical for US

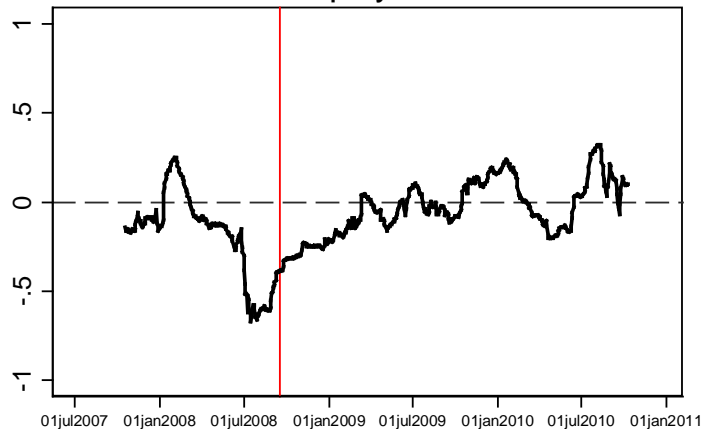
EME Equity Funds



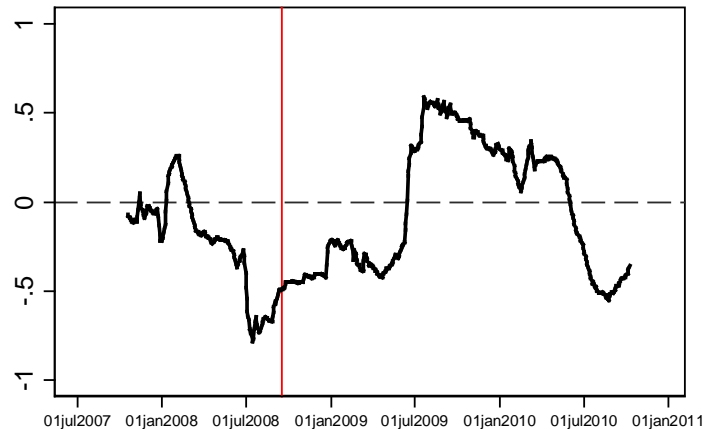
EME Bond Funds



US Equity Funds



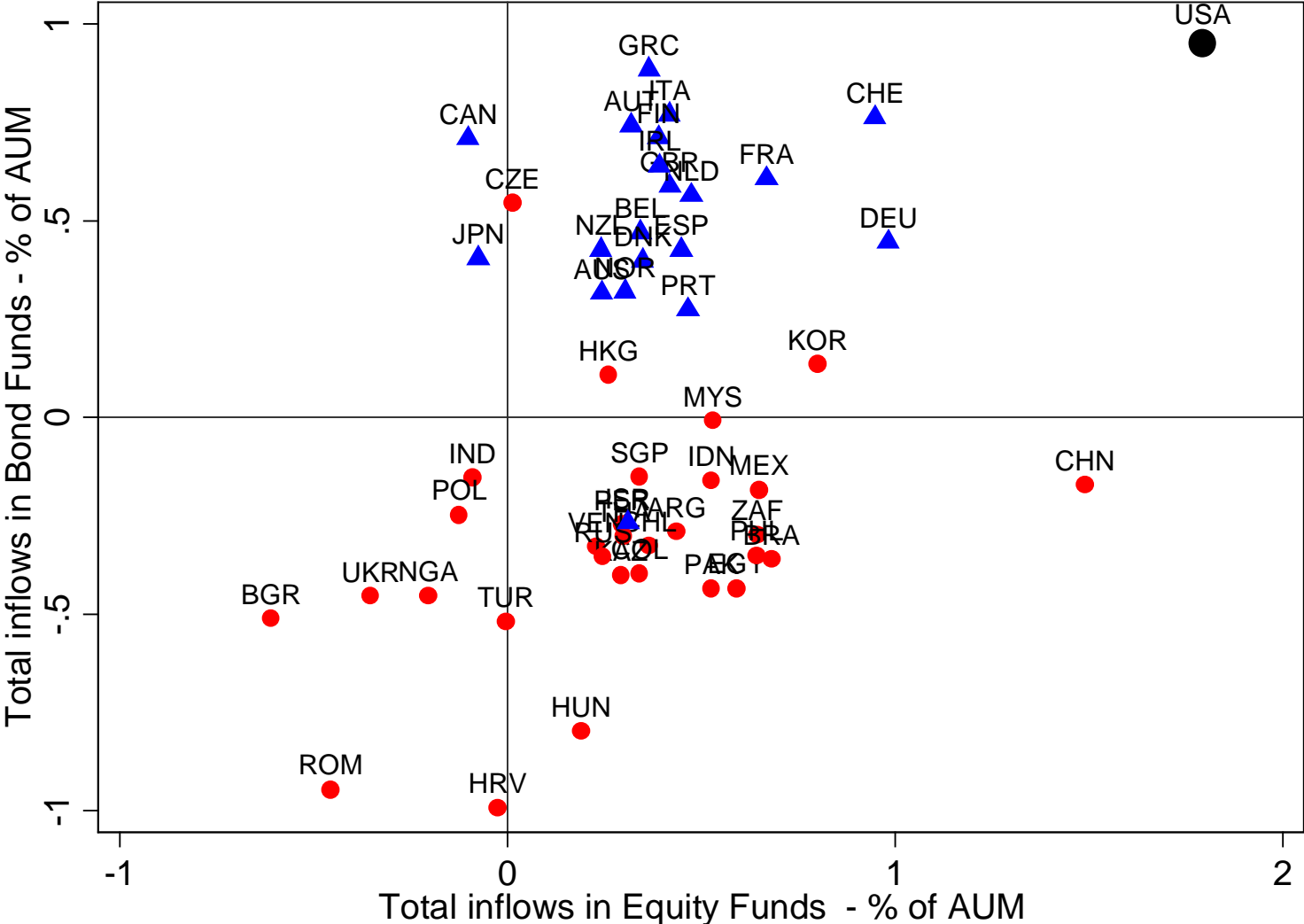
US Bond Funds



Second set of conclusions

4. **Overall, QE policies are not the main drivers of flows and prices (limited economic impact)**
 5. **QE increased pro-cyclicality of flows into EMEs**
- **Policy implications**
 - Presence of adverse externalities (though limited)
 - EME policy-makers' concerns not unfounded

Impact of QE: country heterogeneity



Role of policies

| | | Fx flexibility | | CB activism | | FP activism | | Institutions | |
|---------------|----------------------------------|----------------|-----------------|-------------|-----------------|-------------|----------------|--------------|-----------------|
| | | low | high | low | high | low | high | low | high |
| equity flows | <i>QE I Announcements (AN1)</i> | 0.0459 ** | 0.1264 *** * | 0.0711 * | 0.0919 *** | 0.1247 *** | 0.0619 ** | 0.0590 * | 0.1132 *** |
| | <i>QE II Announcements (AN2)</i> | 0.0901 *** | 0.0056 *** | 0.0942 ** | 0.0441 *** | 0.0474 *** | 0.0636 ** | 0.1140 *** | -0.0024 *** |
| | <i>Liquidity (LQ)</i> | -0.0007 *** | -0.0002 | -0.0019 | -0.0005 *** | -0.0011 | -0.0008 *** | -0.0016 ** | -0.0002 * |
| | <i>QE1 Treasuries (TR1)</i> | 0.0002 | -0.0009 | -0.0004 | -0.0003 | -0.0018 | -0.0009 | 0.0010 | -0.0018 ** |
| | <i>QE2 Treasuries (TR2)</i> | -0.0002 | -0.0045 *** * | 0.0011 | -0.0025 * | -0.0001 | -0.0040 *** | 0.0015 | -0.0050 *** ** |
| | <i>MBS (MBS)</i> | 0.0000 | 0.0006 | 0.0010 | 0.0000 | 0.0003 | 0.0010 *** | 0.0011 * | -0.0004 ** |
| bond flows | <i>QE I Announcements (AN1)</i> | -0.0512 *** | -0.0068 | -0.0963 *** | -0.0155 ** | -0.0120 | -0.0780 *** | -0.1079 *** | 0.0332 *** |
| | <i>QE II Announcements (AN2)</i> | -0.0153 | -0.0873 *** * | 0.0071 | -0.0548 *** | -0.0351 | -0.0420 | 0.0144 | -0.0939 *** *** |
| | <i>Liquidity (LQ)</i> | -0.0011 *** | -0.0006 ** | -0.0013 *** | -0.0008 *** | -0.0007 *** | -0.0011 *** | -0.0017 *** | -0.0001 *** |
| | <i>QE1 Treasuries (TR1)</i> | -0.0030 *** | -0.0016 * | -0.0029 *** | -0.0025 *** | -0.0022 *** | -0.0027 *** | -0.0041 *** | -0.0008 *** |
| | <i>QE2 Treasuries (TR2)</i> | -0.0217 *** | -0.0201 *** | -0.0236 *** | -0.0199 *** *** | -0.0183 *** | -0.0206 *** | -0.0239 *** | -0.0170 *** *** |
| | <i>MBS (MBS)</i> | -0.0034 *** | -0.0025 *** | -0.0035 *** | -0.0031 *** | -0.0031 *** | -0.0034 *** | -0.0033 *** | -0.0032 *** |
| equity prices | <i>QE I Announcements (AN1)</i> | 0.8999 *** | 1.2013 *** | 0.4706 | 1.2209 *** ** | 0.9863 *** | 1.2286 *** | 1.2322 *** | 0.7568 *** |
| | <i>QE II Announcements (AN2)</i> | 0.4005 *** | 0.5209 *** | 0.6453 *** | 0.4349 *** | 0.6046 *** | 0.4177 *** | 0.6146 *** | 0.3743 *** |
| | <i>Liquidity (LQ)</i> | -0.0041 *** | -0.0037 ** | -0.0041 ** | -0.0036 *** | -0.0026 * | -0.0043 ** | -0.0048 *** | -0.0026 ** |
| | <i>QE1 Treasuries (TR1)</i> | 0.0049 | -0.0204 *** ** | 0.0165 | -0.0081 * | 0.0030 | -0.0139 | 0.0021 | -0.0051 |
| | <i>QE2 Treasuries (TR2)</i> | 0.0243 *** | 0.0167 *** | 0.0168 *** | 0.0228 *** | 0.0153 *** | 0.0231 *** | 0.0242 *** | 0.0168 *** |
| | <i>MBS (MBS)</i> | 0.0145 *** | 0.0149 *** | 0.0160 *** | 0.0138 *** | 0.0155 *** | 0.0128 *** | 0.0109 *** | 0.0187 *** ** |
| bond yields | <i>QE I Announcements (AN1)</i> | -0.2774 ** | -0.0747 *** | -0.3423 | -0.1528 ** | -0.1939 | -0.2173 * | -0.2472 ** | -0.1594 |
| | <i>QE II Announcements (AN2)</i> | 0.0246 | 0.0136 | 0.0118 | 0.0239 | 0.0308 *** | -0.0128 *** | 0.0382 | 0.0043 |
| | <i>Liquidity (LQ)</i> | 0.0001 | -0.0002 | -0.0001 | 0.0000 | 0.0001 | -0.0002 | -0.0003 | 0.0001 |
| | <i>QE1 Treasuries (TR1)</i> | 0.0087 * | 0.0016 ** | 0.0118 | 0.0036 *** | 0.0073 | 0.0049 ** | 0.0039 * | 0.0070 |
| | <i>QE2 Treasuries (TR2)</i> | 0.0005 | 0.0008 ** | 0.0001 | 0.0008 *** | 0.0006 | 0.0006 * | 0.0006 | 0.0007 ** |
| | <i>MBS (MBS)</i> | -0.0008 | 0.0002 | -0.0014 | 0.0000 | -0.0003 | -0.0006 | -0.0008 | 0.0000 |
| FX | <i>QE I Announcements (AN1)</i> | -0.6564 *** | -1.0287 *** * | -0.4684 ** | -0.9678 *** * | -1.0805 *** | -0.5428 *** ** | -0.2915 * | -1.1365 *** *** |
| | <i>QE II Announcements (AN2)</i> | -0.1093 *** | -0.2795 *** * | -0.1824 ** | -0.1664 *** | -0.1944 *** | -0.1604 *** | -0.1269 *** | -0.1912 *** |
| | <i>Liquidity (LQ)</i> | 0.0033 *** | 0.0024 ** | 0.0020 * | 0.0034 *** | 0.0037 *** | 0.0021 ** | 0.0020 ** | 0.0036 *** |
| | <i>QE1 Treasuries (TR1)</i> | -0.0013 | 0.0155 ** ** | 0.0091 | 0.0023 | 0.0084 | 0.0021 | 0.0101 ** | -0.0004 * |
| | <i>QE2 Treasuries (TR2)</i> | 0.0028 ** | -0.0094 *** *** | -0.0018 | -0.0016 | -0.0012 | -0.0013 | -0.0009 | -0.0017 |
| | <i>MBS (MBS)</i> | -0.0028 ** | -0.0100 *** ** | -0.0082 *** | -0.0032 ** * | -0.0066 *** | -0.0045 ** | -0.0066 *** | -0.0040 *** |

Role of policies

| | | Fx flexibility | | CB activism | | FP activism | | Institutions | | |
|---------------|----------------------------------|----------------|----------------|-------------|----------------|-------------|----------------|--------------|-------------|-----|
| | | low | high | low | high | low | high | low | high | |
| equity flows | <i>QE I Announcements (AN1)</i> | 0.0459 ** | 0.1264 *** * | 0.0711 * | 0.0919 *** | 0.1247 *** | 0.0619 ** | 0.0590 * | 0.1132 *** | |
| | <i>QE II Announcements (AN2)</i> | 0.0901 *** | 0.0056 *** | 0.0942 ** | 0.0441 *** | 0.0474 *** | 0.0636 ** | 0.1140 *** | -0.0024 | *** |
| | <i>Liquidity (LQ)</i> | -0.0007 *** | -0.0002 | -0.0019 | -0.0005 *** | -0.0011 | -0.0008 *** | -0.0016 ** | -0.0002 | * |
| | <i>QE1 Treasuries (TR1)</i> | 0.0002 | -0.0009 | -0.0004 | -0.0003 | -0.0018 | -0.0009 | 0.0010 | -0.0018 ** | |
| | <i>QE2 Treasuries (TR2)</i> | -0.0002 | -0.0045 *** * | 0.0011 | -0.0025 * | -0.0001 | -0.0040 *** | 0.0015 | -0.0050 *** | ** |
| | <i>MBS (MBS)</i> | 0.0000 | 0.0006 | 0.0010 | 0.0000 | 0.0003 | 0.0010 *** | 0.0011 * | -0.0004 | ** |
| bond flows | <i>QE I Announcements (AN1)</i> | -0.0512 *** | -0.0068 | -0.0963 *** | -0.0155 ** | -0.0120 | -0.0780 *** | -0.1079 *** | 0.0332 | *** |
| | <i>QE II Announcements (AN2)</i> | -0.0153 | -0.0873 *** * | 0.0071 | -0.0548 *** | -0.0351 | -0.0420 | 0.0144 | -0.0939 *** | *** |
| | <i>Liquidity (LQ)</i> | -0.0011 *** | -0.0006 ** | -0.0013 *** | -0.0008 *** | -0.0007 *** | -0.0011 *** | -0.0017 *** | -0.0001 | *** |
| | <i>QE1 Treasuries (TR1)</i> | -0.0030 *** | -0.0016 * | -0.0029 *** | -0.0025 *** | -0.0022 *** | -0.0027 *** | -0.0041 *** | -0.0008 | *** |
| | <i>QE2 Treasuries (TR2)</i> | -0.0217 *** | -0.0201 *** | -0.0236 *** | -0.0199 *** ** | -0.0183 *** | -0.0206 *** | -0.0239 *** | -0.0170 *** | *** |
| | <i>MBS (MBS)</i> | -0.0034 *** | -0.0025 *** | -0.0035 *** | -0.0031 *** | -0.0031 *** | -0.0034 *** | -0.0033 *** | -0.0032 | *** |
| equity prices | <i>QE I Announcements (AN1)</i> | 0.8999 *** | 1.2013 *** | 0.4706 | 1.2209 *** ** | 0.9863 *** | 1.2286 *** | 1.2322 *** | 0.7568 *** | |
| | <i>QE II Announcements (AN2)</i> | 0.4005 *** | 0.5209 *** | 0.6453 *** | 0.4349 *** | 0.6046 *** | 0.4177 *** | 0.6146 *** | 0.3743 *** | |
| | <i>Liquidity (LQ)</i> | -0.0041 *** | -0.0037 ** | -0.0041 ** | -0.0036 *** | -0.0026 * | -0.0043 ** | -0.0048 *** | -0.0026 ** | |
| | <i>QE1 Treasuries (TR1)</i> | 0.0049 | -0.0204 *** ** | 0.0165 | -0.0081 * | 0.0030 | -0.0139 | 0.0021 | -0.0051 | |
| | <i>QE2 Treasuries (TR2)</i> | 0.0243 *** | 0.0167 *** | 0.0168 *** | 0.0228 *** | 0.0153 *** | 0.0231 *** | 0.0242 *** | 0.0168 *** | |
| | <i>MBS (MBS)</i> | 0.0145 *** | 0.0149 *** | 0.0160 *** | 0.0138 *** | 0.0155 *** | 0.0128 *** | 0.0109 *** | 0.0187 *** | ** |
| bond yields | <i>QE I Announcements (AN1)</i> | -0.2774 ** | -0.0747 *** | -0.3423 | -0.1528 ** | -0.1939 | -0.2173 * | -0.2472 ** | -0.1594 | |
| | <i>QE II Announcements (AN2)</i> | 0.0246 | 0.0136 | 0.0118 | 0.0239 | 0.0308 *** | -0.0128 *** | 0.0382 | 0.0043 | |
| | <i>Liquidity (LQ)</i> | 0.0001 | -0.0002 | -0.0001 | 0.0000 | 0.0001 | -0.0002 | -0.0003 | 0.0001 | |
| | <i>QE1 Treasuries (TR1)</i> | 0.0087 * | 0.0016 ** | 0.0118 | 0.0036 *** | 0.0073 | 0.0049 ** | 0.0039 * | 0.0070 | |
| | <i>QE2 Treasuries (TR2)</i> | 0.0005 | 0.0008 ** | 0.0001 | 0.0008 *** | 0.0006 | 0.0006 * | 0.0006 | 0.0007 ** | |
| | <i>MBS (MBS)</i> | -0.0008 | 0.0002 | -0.0014 | 0.0000 | -0.0003 | -0.0006 | -0.0008 | 0.0000 | |
| FX | <i>QE I Announcements (AN1)</i> | -0.6564 *** | -1.0287 *** * | -0.4684 ** | -0.9678 *** * | -1.0805 *** | -0.5428 *** ** | -0.2915 * | -1.1365 *** | *** |
| | <i>QE II Announcements (AN2)</i> | -0.1093 *** | -0.2795 *** * | -0.1824 ** | -0.1664 *** | -0.1944 *** | -0.1604 *** | -0.1269 *** | -0.1912 *** | |
| | <i>Liquidity (LQ)</i> | 0.0033 *** | 0.0024 ** | 0.0020 * | 0.0034 *** | 0.0037 *** | 0.0021 ** | 0.0020 ** | 0.0036 *** | |
| | <i>QE1 Treasuries (TR1)</i> | -0.0013 | 0.0155 ** ** | 0.0091 | 0.0023 | 0.0084 | 0.0021 | 0.0101 ** | -0.0004 | * |
| | <i>QE2 Treasuries (TR2)</i> | 0.0028 ** | -0.0094 *** ** | -0.0018 | -0.0016 | -0.0012 | -0.0013 | -0.0009 | -0.0017 | |
| | <i>MBS (MBS)</i> | -0.0028 ** | -0.0100 *** ** | -0.0082 *** | -0.0032 ** * | -0.0066 *** | -0.0045 ** | -0.0066 *** | -0.0040 *** | |

Third set of conclusions

Policy implications

- Domestic policy mix could mitigate/exacerbate spillovers
- Low exchange rate flexibility / bad institutions magnify the pro-cyclicality of the impact of QE on flows

List of QE announcements

| | Date | Event | Gagnon | Wright |
|-------|---------------------------|-------------------|---------------|---------------|
| QE I | (1) Tuesday 25/11/2008 | FOMC statement | -22 | 0.75 |
| QE I | (2) Monday 01/12/2008 | Bernanke's Speech | -19 | 0.84 |
| QE I | (3) Tuesday 16/12/2008 | FOMC statement | -26 | 2.22 |
| QE I | (4) Wednesday 28/01/2009 | FOMC statement | 14 | -0.23 |
| QE I | (5) Wednesday 18/03/2009 | FOMC statement | -47 | 3.41 |
| QE I | (6) Wednesday 12/08/2009 | FOMC statement | 5 | 0.15 |
| QE I | (7) Wednesday 23/09/2009 | FOMC statement | -3 | 0.85 |
| QE I | (8) Wednesday 04/11/2009 | FOMC statement | 6 | 0.12 |
| QE II | (9) Tuesday 10/08/2010 | FOMC statement | NA | 0.57 |
| QE II | (10) Friday 27/08/2010 | Bernanke's Speech | NA | -0.83 |
| QE II | (11) Friday 15/10/2010 | Bernanke's Speech | NA | -0.21 |
| QE II | (12) Wednesday 03/11/2010 | FOMC Statement | NA | -0.05 |