

Discussion of

A skeptical view of the impact of the Fed's balance sheet

by D. Greenlaw, J.D. Hamilton, E. Harris and K.D. West

Oreste Tristani (ECB)

ECB workshop on money markets, monetary policy implementation, and central bank
balance sheets

6-7 November 2018

THE OPINIONS EXPRESSED ARE PERSONAL AND DO NOT
NECESSARILY REPRESENT THOSE OF THE ECB!

- A business for central bank economists

- A business for central bank economists
- Citation of QE research in this paper:

- A business for central bank economists
- Citation of QE research in this paper:
 - Total citations: 28

- A business for central bank economists
- Citation of QE research in this paper:
 - Total citations: 28
 - Papers by CB economists: 19

- A business for central bank economists
- Citation of QE research in this paper:
 - Total citations: 28
 - Papers by CB economists: 19
- A paper by authors "without vested interests" is a welcome addition to this literature ...

- A business for central bank economists
- Citation of QE research in this paper:
 - Total citations: 28
 - Papers by CB economists: 19
- A paper by authors "without vested interests" is a welcome addition to this literature ...
 - ... "without vested interests"?

Main question: what are the effects of QE on yields?

- Although with differences in the implementation, we have had about 20 years of experience in Japan, 10 in the U.S. and 4 in the euro area

Main question: what are the effects of QE on yields?

- Although with differences in the implementation, we have had about 20 years of experience in Japan, 10 in the U.S. and 4 in the euro area
 - Surely we are able to give a reasonably precise answer to this question!

Main question: what are the effects of QE on yields?

- Although with differences in the implementation, we have had about 20 years of experience in Japan, 10 in the U.S. and 4 in the euro area
 - Surely we are able to give a reasonably precise answer to this question!
- The answer in this paper (focused on the US):

Main question: what are the effects of QE on yields?

- Although with differences in the implementation, we have had about 20 years of experience in Japan, 10 in the U.S. and 4 in the euro area
 - Surely we are able to give a reasonably precise answer to this question!
- The answer in this paper (focused on the US):
 - **it's complicated!**

Main question: what are the effects of QE on yields?

- Although with differences in the implementation, we have had about 20 years of experience in Japan, 10 in the U.S. and 4 in the euro area
 - Surely we are able to give a reasonably precise answer to this question!
- The answer in this paper (focused on the US):
 - it's complicated!
 - Asset prices move all the time for different reasons. We can achieve precise identification through event studies, but then we have little to say on persistence. And even the results of event studies may be fragile to changes in the relevant events

Main question: what are the effects of QE on yields?

- Although with differences in the implementation, we have had about 20 years of experience in Japan, 10 in the U.S. and 4 in the euro area
 - Surely we are able to give a reasonably precise answer to this question!
- The answer in this paper (focused on the US):
 - it's complicated!
 - Asset prices move all the time for different reasons. We can achieve precise identification through event studies, but then we have little to say on persistence. And even the results of event studies may be fragile to changes in the relevant events
 - (and the paper doesn't even begin to address the question: what are the effects of QE on inflation and output)

- Review of the results in the paper in light of the literature and euro area experience

Challenges in measuring the impact of QE on 10y yields

- Compared to i policy:

Challenges in measuring the impact of QE on 10y yields

- Compared to i policy:
 - no clear "policy variable", need to focus on (immediate) outcome variables

- Compared to i policy:
 - no clear "policy variable", need to focus on (immediate) outcome variables
 - no obvious way to measure "surprise change," due to lack of precise measures of "QE expectations"

Challenges in measuring the impact of QE on 10y yields

- Compared to i policy:
 - no clear "policy variable", need to focus on (immediate) outcome variables
 - no obvious way to measure "surprise change," due to lack of precise measures of "QE expectations"
 - very few QE shocks

Challenges in measuring the impact of QE on 10y yields

- Compared to i policy:
 - no clear "policy variable", need to focus on (immediate) outcome variables
 - no obvious way to measure "surprise change," due to lack of precise measures of "QE expectations"
 - very few QE shocks

- Hence event studies, but:

Challenges in measuring the impact of QE on 10y yields

- Compared to i policy:
 - no clear "policy variable", need to focus on (immediate) outcome variables
 - no obvious way to measure "surprise change," due to lack of precise measures of "QE expectations"
 - very few QE shocks
- Hence event studies, but:
 - difficult to disentangle the channels (eg through forward guidance vs. portfolio balance)

Challenges in measuring the impact of QE on 10y yields

- Compared to i policy:
 - no clear "policy variable", need to focus on (immediate) outcome variables
 - no obvious way to measure "surprise change," due to lack of precise measures of "QE expectations"
 - very few QE shocks
- Hence event studies, but:
 - difficult to disentangle the channels (eg through forward guidance vs. portfolio balance)
 - **hard to learn general lessons, since stress level in markets matters**

Challenges in measuring the impact of QE on 10y yields

- Compared to i policy:
 - no clear "policy variable", need to focus on (immediate) outcome variables
 - no obvious way to measure "surprise change," due to lack of precise measures of "QE expectations"
 - very few QE shocks
- Hence event studies, but:
 - difficult to disentangle the channels (eg through forward guidance vs. portfolio balance)
 - hard to learn general lessons, since stress level in markets matters
 - **statistical precision hard to define**

Challenges in measuring the impact of QE on 10y yields

- Compared to i policy:
 - no clear "policy variable", need to focus on (immediate) outcome variables
 - no obvious way to measure "surprise change," due to lack of precise measures of "QE expectations"
 - very few QE shocks
- Hence event studies, but:
 - difficult to disentangle the channels (eg through forward guidance vs. portfolio balance)
 - hard to learn general lessons, since stress level in markets matters
 - statistical precision hard to define
 - **measuring persistence is difficult**

Challenges in measuring the impact of QE on 10y yields

- Compared to i policy:
 - no clear "policy variable", need to focus on (immediate) outcome variables
 - no obvious way to measure "surprise change," due to lack of precise measures of "QE expectations"
 - very few QE shocks
- Hence event studies, but:
 - difficult to disentangle the channels (eg through forward guidance vs. portfolio balance)
 - hard to learn general lessons, since stress level in markets matters
 - statistical precision hard to define
 - measuring persistence is difficult
 - **scarcity of events makes results somewhat sensitive to event choice**

- Andrade et al. (2016)

Table 1: Impact of QE programs on 10 yrs government bond yields*

	All QE episodes	Euro area	US			UK	Japan	
		APP 03/15- 09/16	LSAP1 12/08- 03/10	LSAP2 11/10- 06/11	MEP 09/11- 12/12	APF1 03/09 - 01/10	CME+ 12/08- 08/11	QQE 04/13- 09/14
Size (% of GDP)		11%	12%	4%	3%	14%	21%	23%
Median	53	43	76	45	60	67	11	20
Range	10-175	27-64	32-175	33-138	23-175	34-107	10-12	14-26

*Based on results from 24 studies listed in Appendix B. The table indicates the size of the purchases conducted within each program as a share of domestic GDP, the periods when the purchases were conducted, and the median and range of the impact on 10-yrs bond yields, expressed in bps, standardized to purchases of 10% of GDP.

A review of the literature

- Andrade et al. (2016)

Table 1: Impact of QE programs on 10 yrs government bond yields*

	All QE episodes	Euro area	US			UK	Japan	
		APP 03/15- 09/16	LSAP1 12/08- 03/10	LSAP2 11/10- 06/11	MEP 09/11- 12/12	APF1 03/09 - 01/10	CME+ 12/08- 08/11	QQE 04/13- 09/14
Size (% of GDP)		11%	12%	4%	3%	14%	21%	23%
Median	53	43	76	45	60	67	11	20
Range	10-175	27-64	32-175	33-138	23-175	34-107	10-12	14-26

*Based on results from 24 studies listed in Appendix B. The table indicates the size of the purchases conducted within each program as a share of domestic GDP, the periods when the purchases were conducted, and the median and range of the impact on 10-yrs bond yields, expressed in bps, standardized to purchases of 10% of GDP.

A review of the literature

- Andrade et al. (2016)

Table 1: Impact of QE programs on 10 yrs government bond yields*

	All QE episodes	Euro area	US			UK	Japan	
		APP 03/15- 09/16	LSAP1 12/08- 03/10	LSAP2 11/10- 06/11	MEP 09/11- 12/12	APF1 03/09 - 01/10	CME+ 12/08- 08/11	QQE 04/13- 09/14
Size (% of GDP)		11%	12%	4%	3%	14%	21%	23%
Median	53	43	76	45	60	67	11	20
Range	10-175	27-64	32-175	33-138	23-175	34-107	10-12	14-26

*Based on results from 24 studies listed in Appendix B. The table indicates the size of the purchases conducted within each program as a share of domestic GDP, the periods when the purchases were conducted, and the median and range of the impact on 10-yrs bond yields, expressed in bps, standardized to purchases of 10% of GDP.

- Andrade et al. (2016)

Table 1: Impact of QE programs on 10 yrs government bond yields*

	All QE episodes	Euro area	US			UK	Japan	
		APP 03/15- 09/16	LSAP1 12/08- 03/10	LSAP2 11/10- 06/11	MEP 09/11- 12/12	APF1 03/09 - 01/10	CME+ 12/08- 08/11	QQE 04/13- 09/14
Size (% of GDP)		11%	12%	4%	3%	14%	21%	23%
Median	53	43	76	45	60	67	11	20
Range	10-175	27-64	32-175	33-138	23-175	34-107	10-12	14-26

*Based on results from 24 studies listed in Appendix B. The table indicates the size of the purchases conducted within each program as a share of domestic GDP, the periods when the purchases were conducted, and the median and range of the impact on 10-yrs bond yields, expressed in bps, standardized to purchases of 10% of GDP.

- GDHW: "We read the evidence as indicating that while unconventional policy works, the impacts are more modest and uncertain than some summaries of the literature suggest"

Main results of the paper I

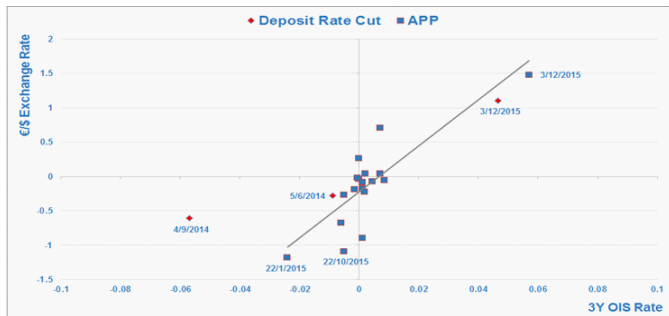
- A more "objective" selection of events: (1) yields changes on "Fed Days"; (2) yields changes interpreted by Reuters as "Fed News"

Main results of the paper I

- A more "objective" selection of events: (1) yields changes on "Fed Days"; (2) yields changes interpreted by Reuters as "Fed News"
 - On Fed Days "the market only moved strongly in the "right direction" at two big turning points" (QE1 and tapering); the bond market rallied on Reuters Fed News days only in the early stages of QE1

Main results of the paper I

- A more "objective" selection of events: (1) yields changes on "Fed Days"; (2) yields changes interpreted by Reuters as "Fed News"
 - On Fed Days "the market only moved strongly in the "right direction" at two big turning points" (QE1 and tapering); the bond market rallied on Reuters Fed News days only in the early stages of QE1
- Fed news occur outside Fed days. ECB example:

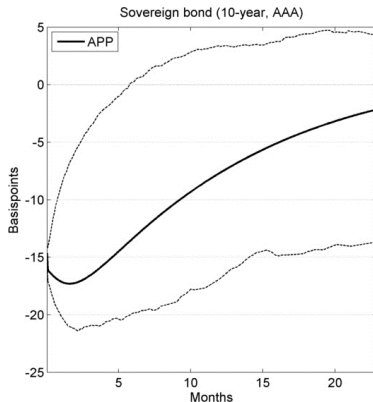


Main results of the paper II

- Results: yields tend to rise on "Fed Days" and on "Fed News" days following big QE surprises. An indication of low persistence?

Main results of the paper II

- Results: yields tend to rise on "Fed Days" and on "Fed News" days following big QE surprises. An indication of low persistence?
- Euro area experience (Andrade et al, 2015; based on a daily VAR model estimated over the 2013-2015 sample following 25 APP news)



Main results of the paper III

- "Fed exit signals appear to have had relatively little net impact on the market. [...] perhaps balance sheet expansion mainly works by signaling when and how fast rates will rise"

Main results of the paper III

- "Fed exit signals appear to have had relatively little net impact on the market. [...] perhaps balance sheet expansion mainly works by signaling when and how fast rates will rise"
- An alternative portfolio-balance interpretation: HH's have a certain SDF $Q_{t+1}^{\$}$ which they use to price assets, hence

$$R_{t,n} = \left(E_t \left[Q_{t,t+1}^{\$} Q_{t+1,t+2}^{\$} \cdots Q_{t+n-1,t+n}^{\$} \right] \right)^{-1/n}$$

Main results of the paper III

- "Fed exit signals appear to have had relatively little net impact on the market. [...] perhaps balance sheet expansion mainly works by signaling when and how fast rates will rise"
- An alternative portfolio-balance interpretation: HH's have a certain SDF $Q_{t+1}^{\$}$ which they use to price assets, hence

$$R_{t,n} = \left(E_t \left[Q_{t,t+1}^{\$} Q_{t+1,t+2}^{\$} \cdots Q_{t+n-1,t+n}^{\$} \right] \right)^{-1/n}$$

- Banks are different because they have a leverage constraint $k(I_{t+1}) > 0$ ($k' > 0$, $k'' > 0$). As a result (Lenel, Piazzesi and Schneider 2018)

$$Q_{t+1}^{\$,B} = \left[Q_{t+1}^{\$} (1 + k'(\cdot) I_{t+1} - k(\cdot)) \right]$$

which is the relevant SDF if banks are the marginal investor

- The central bank-government has the same SDF as HHs, hence buying assets from households has no effects

Model implications

- The central bank-government has the same SDF as HHs, hence buying assets from households has no effects
- Purchasing assets from banks affects their SDF and yields as long as (a) banks are the marginal investors and (b) the purchase changes bank leverage l_{t+1} (eg assets/capital or deposits/assets). Hence:

Model implications

- The central bank-government has the same SDF as HHs, hence buying assets from households has no effects
- Purchasing assets from banks affects their SDF and yields as long as (a) banks are the marginal investors and (b) the purchase changes bank leverage l_{t+1} (eg assets/capital or deposits/assets). Hence:
 - purchasing safe short term government bonds from banks is neutral

Model implications

- The central bank-government has the same SDF as HHs, hence buying assets from households has no effects
- Purchasing assets from banks affects their SDF and yields as long as (a) banks are the marginal investors and (b) the purchase changes bank leverage l_{t+1} (eg assets/capital or deposits/assets). Hence:
 - purchasing safe short term government bonds from banks is neutral
 - purchasing safe long term government bonds changes $Q_{t+1}^{$,B}$ because of duration risk

Model implications

- The central bank-government has the same SDF as HHs, hence buying assets from households has no effects
- Purchasing assets from banks affects their SDF and yields as long as (a) banks are the marginal investors and (b) the purchase changes bank leverage l_{t+1} (eg assets/capital or deposits/assets). Hence:
 - purchasing safe short term government bonds from banks is neutral
 - purchasing safe long term government bonds changes $Q_{t+1}^{$,B}$ because of duration risk
 - purchasing risky long term bonds also changes $Q_{t+1}^{$,B}$

Model implications

- The central bank-government has the same SDF as HHs, hence buying assets from households has no effects
- Purchasing assets from banks affects their SDF and yields as long as (a) banks are the marginal investors and (b) the purchase changes bank leverage l_{t+1} (eg assets/capital or deposits/assets). Hence:
 - purchasing safe short term government bonds from banks is neutral
 - purchasing safe long term government bonds changes $Q_{t+1}^{\$,B}$ because of duration risk
 - purchasing risky long term bonds also changes $Q_{t+1}^{\$,B}$
- Effects of purchases will be stronger, the tighter the leverage constraint (i.e. the larger $k'(l_{t+1})$)

Model implications

- The central bank-government has the same SDF as HHs, hence buying assets from households has no effects
- Purchasing assets from banks affects their SDF and yields as long as (a) banks are the marginal investors and (b) the purchase changes bank leverage l_{t+1} (eg assets/capital or deposits/assets). Hence:
 - purchasing safe short term government bonds from banks is neutral
 - purchasing safe long term government bonds changes $Q_{t+1}^{\$,B}$ because of duration risk
 - purchasing risky long term bonds also changes $Q_{t+1}^{\$,B}$
- Effects of purchases will be stronger, the tighter the leverage constraint (i.e. the larger $k'(l_{t+1})$)
- When banks are well capitalised, leverage is low, $k'(l_{t+1}) \simeq 0$. Hence purchases/sales will have near-negligible effects

Main results of the paper IV

- "In our view, negative interest rates have limited potential. [...] To the extent that the negative rates are not fully passed through to customers, the policy amounts to a tax that decapitalizes banks at a time when maintaining the health and stability of financial institutions may be a key policy goal".

Main results of the paper IV

- "In our view, negative interest rates have limited potential. [...] To the extent that the negative rates are not fully passed through to customers, the policy amounts to a tax that decapitalizes banks at a time when maintaining the health and stability of financial institutions may be a key policy goal".
- A hasty conclusion?

Main results of the paper IV

- "In our view, negative interest rates have limited potential. [...] To the extent that the negative rates are not fully passed through to customers, the policy amounts to a tax that decapitalizes banks at a time when maintaining the health and stability of financial institutions may be a key policy goal".
- A hasty conclusion?
 - bank funding costs also affected by money market rates, which fell. Banks with mostly wholesale funding can lower lending rates, expand lending and improve profitability

Main results of the paper IV

- "In our view, negative interest rates have limited potential. [...] To the extent that the negative rates are not fully passed through to customers, the policy amounts to a tax that decapitalizes banks at a time when maintaining the health and stability of financial institutions may be a key policy goal".
- A hasty conclusion?
 - bank funding costs also affected by money market rates, which fell. Banks with mostly wholesale funding can lower lending rates, expand lending and improve profitability
 - **bank profitability is not a static notion: current losses may be outweighed by future larger profits, if the economy recovers faster**

Main results of the paper IV

- "In our view, negative interest rates have limited potential. [...] To the extent that the negative rates are not fully passed through to customers, the policy amounts to a tax that decapitalizes banks at a time when maintaining the health and stability of financial institutions may be a key policy goal".
- A hasty conclusion?
 - bank funding costs also affected by money market rates, which fell. Banks with mostly wholesale funding can lower lending rates, expand lending and improve profitability
 - bank profitability is not a static notion: current losses may be outweighed by future larger profits, if the economy recovers faster
 - many more studies of the euro area experience provide a more nuanced picture (Ampudia and Van den Heuvel, 2018; Demiralp, Eisenschmidt and Vlassopoulos, 2018; Amzallag, Calza, Georgarakos and Sousa, 2018): adverse effects present, but minor. The "reversal rate" possibly much lower than zero.

- "Three recent summaries have concluded that LSAPs lowered rates by about 100bp, a consensus view that we question." This is indeed a rough order of manitude, not a (statistically) precise conclusion

- "Three recent summaries have concluded that LSAPs lowered rates by about 100bp, a consensus view that we question." This is indeed a rough order of manitude, not a (statistically) precise conclusion
- Given the scarcity of QE announcements, some "reasoned" selection of the appropriate news is unavoidable—hard to convince a skeptic

- "Three recent summaries have concluded that LSAPs lowered rates by about 100bp, a consensus view that we question." This is indeed a rough order of magnitude, not a (statistically) precise conclusion
- Given the scarcity of QE announcements, some "reasoned" selection of the appropriate news is unavoidable—hard to convince a skeptic
 - We need more QE for the sake of research!

- "Three recent summaries have concluded that LSAPs lowered rates by about 100bp, a consensus view that we question." This is indeed a rough order of magnitude, not a (statistically) precise conclusion
- Given the scarcity of QE announcements, some "reasoned" selection of the appropriate news is unavoidable—hard to convince a skeptic
 - We need more QE for the sake of research!
- "The Fed's balance sheet does not appeal as a primary tool of monetary policy going forward" ✓

- "Three recent summaries have concluded that LSAPs lowered rates by about 100bp, a consensus view that we question." This is indeed a rough order of magnitude, not a (statistically) precise conclusion
- Given the scarcity of QE announcements, some "reasoned" selection of the appropriate news is unavoidable—hard to convince a skeptic
 - We need more QE for the sake of research!
- "The Fed's balance sheet does not appeal as a primary tool of monetary policy going forward" ✓
- Judgement on negative interest rates experiences is still open