High Frequency Identification of Monetary Non-Neutrality: The Information Effect

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Replication Materials

Summary Table 1 summarizes the production of all figures and tables in the paper. In particular, it lists the files that produce the output, and where the output is stored. All code is written so that if one changes their current working directory to the folder in which the code is located, the code will run easily.[1] Detailed descriptions of the code is given in the preambles and comments of that code.

Data Table 2 describes the data that is used in the paper—the sources, and which of it is proprietary. We are not able to post proprietary data online (that is, the Blue Chip data and the tick-by-tick futures data). Figure 1 shows some sample headers of the Blue-Chip and tick data used.

Stata We use Stata for all of the data work, except for the structural estimation and bootstrapping of the Rigobon estimator. The majority of the output comes from a few Stata files (`OLS.do` and `OLSBlueChip.do`), and we provide the `dta` files to run these programs.[2] One can also produce these `dta` files from the raw data, but we cannot provide much of the raw data because it is proprietary (either from Blue Chip or the CME). That said, the production of these `dta` files is performed in the four `DataConstruction` do files.[3] The results shown in the paper tend to be stored in `.xml` files, which can be read in Excel.

Matlab We use Matlab for structural estimation and weak-instruments bootstrapping of the Rigobon estimator. Most of the output is retained in variables in Matlab. Below we describe which variables contain the figures reported in the paper. Further detail can be found in `Matlab/Structural/AdditionalDocumentation.pdf`.

[1] That is, it will look for the input data in the correct place, and write the output to the correct folder. Changing the working directory in Stata or Matlab is done by entering the command `cd "<path to this folder>/Stata/Programs/"`.

[2] The `dta` files are `BlueChip_reg.dta`, and `master.dta`. The do file for the Greenbook results are produced by `GreenbookBlueChip.do`, and use the file `Greenbook_reg.dta`.

[3] `DataConstructionTick.do` needs to be run first, followed by `DataConstruction_BlueChip.do`, `DataConstruction.do`, and `DataConstructionGreenbook.do`

Table 1: Summary of Replication Files

Figure/Table	Input Code and Output File
Table 1	• Code: `Stata/Programs/OLS.do` • Output: – Forwards: `Stata/Output/OLS_path_intra_wide_F_forexcel.xml` – Yields: `Stata/Output/OLS_path_intra_wide_Y_forexcel.xml`
Figure 1	• Code: `Stata/Programs/OLS.do` • Output: `Stata/Output/binscatter50_DRY5.csv`
Table 2	Note that the code that implements the Rigobon estimates needs to be run three times—see the file for more details. The Stata code must be run before the Matlab code. • Code: `Stata/Programs/OLS.do` and `Matlab/RigobonCI/FiellerConfInt.m` • Output: – 30-min Forwards: `Stata/Output/OLS_path_intra_wide_F_forexcel.xml` – 30-min Forwards Rigobon: `Matlab/RigobonCI/Output/FiellerOutput_path_intra_wide.csv` – 1-day Forwards: `Stata/Output/OLS_path_F_forexcel.xml` – 1-day Forwards Rigobon: `Matlab/RigobonCI/Output/FiellerOutput_path.csv` – 2-year Nominal Yields: `Stata/Output/OLS_DNY2_F_forexcel.xml` – 2-year Nominal Yields Rigobon: `Matlab/RigobonCI/Output/FiellerOutput_DNY2_long.csv`
Table 3	• Code: `Stata/Programs/OLSBlueChip.do` • Output: `Stata/Output/GDPsummregs.xml`
Figure 2	• Code: `Stata/Programs/OLSBlueChip.do` • Output: `Stata/Output/binscatter50_DRealGDP_Summary`

Table 4	• Code: `Matlab/Structural/RUN.m` • Output: The code needs to be modified for the various specifications listed in the table; see table 3 for details about what to change for each case. After running the code, point estimates are in the variable `model.parameters.estimated`. Confidence intervals are in the structure `bootstrap.statistics.quantiles.parameters`. Each estimated parameter is a vector in this sturcuture, and the bounds of the 95% confidence interval are the 3^{rd} and 11^{th} elements.
Figures 3–9	• Code: `Matlab/Structural/RUN.m` • Output: See notes to table 4. Impulse responses are stored in the columns of the matrix `model.irfs.modelINFO`. Figure 7 uses the matrix `model.irfs.modelINFO_counterfactual`. Figure 8 uses the matrix `model.irfs.modelINFO_difference`. Figure 9 requires the code to be run under the "No-Information" specification from table 4. The relevant columns of the matrices are as follows: – Real Interest Rate: Column 5 minus column 4 – Nominal Interest Rate: 5 – Inflation: 3 – Output Growth: 13 (column 13 is output; annualized output growth is 4 times the element-by-element difference) – Output Gap: 1 – Natural Interest Rate: 12 – Output: 13 – Natural Output: 14 For ease, we have also included a file, `Matlab/Structural/Figs3_9.m` which puts the impulse responses shown in figures 3-9 into a structure called `figs`. The file should be run after `RUN.m` is run under the baseline specification, and again under the "No information" specification for figure 9.

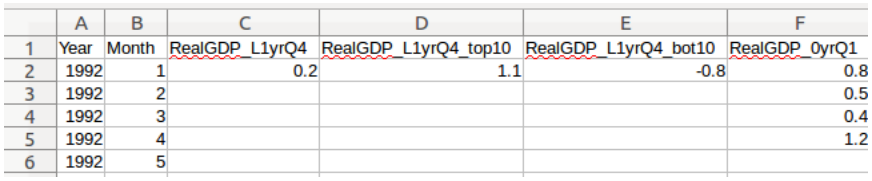
Table 5	• Code: – Response in the data: `Stata/Programs/OLS.do` – Baseline model response: `Matlab/Structural/RUN.m` • Output: – Response in the data: `Stata/Output/OLS_path_intra_wide_SP_forexcel.xml` – Baseline model response: See notes for table 4. After running `RUN.m`, the response is in the variable `model.irfs.stockpriceimpact` – No-info. model response: See notes for table 4. After running `RUN.m`, the response is in the variable `model.irfs.stockpriceimpact`. The confidence intervals are the 3^{rd} and 11^{th} elements of `bootstrap.statistics.quantiles.irfs.stockpriceimpact`.
Table A.1	Same as Table 1: Run `OLS.do`, and modify the "Main Choice Of Sample" section accordingly. Output will be in the same files as for Table 1, so make sure to save a version each time you run this with a different sample.
Table A.2	• Code: `Stata/Programs/OLS.do` • Output: – Forwards: `Stata/Output/OLS_dffr1_intra_wide_F_forexcel.xml` – Yields: `Stata/Output/OLS_dffr1_intra_wide_Y_forexcel.xml`
Table A.3	This table can be produced in two ways. The first uses Stata and uses standard nonparametric bootstrapping for the standard errors. The second produces weak instrument robust standard errors using the Matlab code used in table 2. As stated in the appendix, the two methodologies produce nearly-identical results. • Code: – Stata: `Stata/Programs/OLS.do` – Matlab: `Matlab/RigobonCI/FiellerConfInt.m` • Output: – Stata: ∗ Yields: `Stata/Output/BootRig_path_intra_wide_Y_forexcel.xml` ∗ Forwards: `Stata/Output/BootRig_path_intra_wide_F_forexcel.xml` – Matlab: `Matlab/RigobonCI/Output/FiellerOutput_path_intra_wide.csv`
Table A.4	• Code: `Stata/Programs/OLS.do` • Output:`Stata/Output/OLS_path_intra_wide_I_forexcel.xml`

Table A.5	• Code: `Stata/Programs/OLSBlueChip.do` • Output: `Stata/Output/OLS_con_mshock_path_intra_wide_m.xml`
Figure C.1	• Code: See information pertaining to table 2, above. • Output: – Panel a: `Matlab/RigobonCI/Output/FiellerScatter_path.csv` – Panel b: `Matlab/RigobonCI/Output/FiellerScatter_path_intra_wide.csv`
Figure C.2	• Code: See information pertaining to table 2, above. • Output: `Matlab/RigobonCI/Output/FiellerFigure_path.csv`
Table D.1	• Code: `Stata/Programs/OLSBlueChip.do` • Output: `Stata/Output/OLS_con_mshock_path_intra_wide_m.xml`
Table D.2	• Code: `Stata/Programs/OLS.do` • Output: – Forwards: `Stata/Output/OLS_path_intra_wide_Moench_F_forexcel.xml` – Yields: `Stata/Output/OLS_path_intra_wide_Moench_Y_forexcel.xml`
Table D.3	• Code: `Stata/Programs/OLS.do` • Output: – Real: `Stata/Output/OLS__meanReversion_N_forexcel_NW.xml` – Nominal: `Stata/Output/OLS__meanReversion_N_forexcel_NW.xml`

Table G.1	
	• Code: `Stata/Programs/GreenbookBlueChip.do` • Output: – *Does Relative Fed Optimism Explain Monetary Shocks?* `Stata/Output/OLS_GBBC_con_mshock_path_intra_wide_m.xml` – *Does Relative Fed Optimism Reverse in Response to Monetary Shocks?* `Stata/Output/OLS_d_GBBC_con_mshock_path_intra_wide_m.xml`

Figure 1: Sample Headers of Proprietary Data

(a) Blue Chip



	A	B	C	D	E	F
1	Year	Month	RealGDP_L1yrQ4	RealGDP_L1yrQ4_top10	RealGDP_L1yrQ4_bot10	RealGDP_0yrQ1
2	1992	1	0.2	1.1	-0.8	0.8
3	1992	2				0.5
4	1992	3				0.4
5	1992	4				1.2
6	1992	5				

(b) CME Tick Data

```
T_Date,T_Time,Sequence,Contract_Delivery,Volume,T_Price,hour,minute,last5,first5,Date,minfomc,hourfomc,mingap,indaft_pre10min,indaft_aft20min,tradenum,_FREQ_,LastObsWindow
20031124,19:03:50.000,59634,312,1,989900,19,3,1,1,,15,13,-12,1,1,1,7,0
20031124,21:29:29.000,59640,312,1,989900,21,29,1,0,,15,13,14,1,1,7,7,1
```

Table 2: Data

Series	Source	Provided
Fed Funds Target	FRED [FedTarget.csv]	YES
3- and 6-month Nom. Yields	Fed H15 Release [NominalYields6Months.csv, NominalYields3Months.csv]	YES
Longer maturity Nom. Yields	Gurkaynak, Sack, and Wright (JME 2007) (federalreserve.gov/econresdata/researchdata.htm) [NominalYields.csv]	YES
Real Yields	Gurkaynak, Sack, and Wright (AEJ: Macro 2010) (federalreserve.gov/pubs/feds/2008/200805/200805abs.html) [RealYields.csv]	YES
1-m Daily Eurodollar future	FRED [EuroDollar1Month.csv]	YES
Daily Eurodollar Futures	IHS Global Insight [EDFutures.csv]	YES
Daily Fed Funds Futures	IHS Global Insight [fedfutures.csv]	YES
FOMC meetings	Fed Website [FOMCmeetings.csv]	YES
Inflation Swaps	See the appendix to Fleckenstein, Longstaff, and Lustig (JOF, 2014). Data originally from Bloomberg, with ticker `USSWITn`, for $n \in \{1, 2, \ldots, 10, 12, 15, 20, 25, 30\}$. [InflSwaps.csv]	NO
S&P 500	Yahoo Finance [SP500.csv]	YES
VIX	Yahoo Finance [VIX.csv]	YES
Risk Neutral Returns	Moench et al. [moench_*.csv]	YES
Risk Neutral Returns	Kim & Wright [feds200533.csv]	YES
Gurkaynak et al. (2005) Original	Appendix of "Do Actions speak louder... [DoActionsSpeakData_fullsmpl.csv]	YES
Gurkaynak et al. (2005) Update	Gurkaynak, personal correspondence [tight-Gurkaynakdata.csv]	NO
Tick Futures Data	CME	NO
Blue Chip Economic Indicators	Blue-Chip	NO
Greenbook Forecasts	Philadelphia Fed Website [GBweb_Row_Format.xls]	YES
Greenbook/FOMC Dates	Philadelphia Fed and Federal Reserve Board Websites	YES

Table 3: Matlab Parameters

Variable	Baseline	No Information	Full Information	Lower IES	Higher IES	No Habits
`par.momentUse`	1	2	2	1	1	1
`par.calibration.sigma`	0.5	0.5	0.5	0.25	1	0.5
`par.B_PSI_est`	1	3	3	1	1	1
`par.x0(4)`	*	0	0.99	*	*	*
`par.x0(5)`	0.9	0.9	0.9	0.9	0.9	0

(1) `par.x0(n)` refers to the $\mathtt{n}^{\text{th}}$ element of `par.x0`
(2) In the cells marked with a *, you can chose your favorite starting value. We use 0.6.