FORWARD GUIDANCE AND HOUSEHOLD EXPECTATIONS

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A KEY ROLE OF FORWARD GUIDANCE IN STIMULATING ECONOMIC ACTIVITY

- Since the onset of the ZLB, there has been growing interest in policies that move expectations, and especially inflation expectations, to affect the real interest rates that households and firms perceive

- Mario Draghi (2016): "*In particular, low interest rates encourage households to bring forward durable consumption, and firms' investment, through credit*."

- Christine Lagarde (2019): "*In particular, easier borrowing conditions for firms and households are underpinning consumer spending and business investment.*"

FORWARD GUIDANCE AS A POLICY TOOL

- **FG puzzle**: empirically relatively modest effects

- Main focus on the effects of FG on economic activity via the **direct financial markets channel**

$$c_t = -\sigma E_t^{hh}\left(\sum_{j=0}^{\infty} i_{t+j} - \pi_{t+1+j}\right)$$

FORWARD GUIDANCE AS A POLICY TOOL

- **FG puzzle**: empirically relatively modest effects

- Main focus on the effects of FG on economic activity via the **direct financial markets channel**

$$c_t = -\sigma E_t^{hh}\left(\sum_{j=0}^{\infty} i_{t+j} - \pi_{t+1+j}\right)$$
$$= -\sigma \boldsymbol{i_{t,\infty}^{mkt}} - \sigma\left(E_t^{hh} i_{t,\infty} - i_{t,\infty}^{mkt}\right) + \sigma E_t^{hh} \pi_{t,\infty}$$

FORWARD GUIDANCE AS A POLICY TOOL

- **FG puzzle**: empirically relatively modest effects

- Main focus on the effects of FG on economic activity via the **direct financial markets channel**

- Limited evidence on **how households' expectations respond to FG announcements**

$$c_t = -\sigma E_t^{hh}\left(\sum_{j=0}^{\infty} i_{t+j} - \pi_{t+1+j}\right)$$
$$= -\sigma i_{t,\infty}^{mkt} - \sigma\left(\boldsymbol{E_t^{hh} i_{t,\infty}} - \boldsymbol{i_{t,\infty}^{mkt}}\right) + \sigma \boldsymbol{E_t^{hh} \pi_{t,\infty}}$$

FORWARD GUIDANCE AND COMMUNICATION

Janet Yellen (2018): "*The strategy]of forward guidance] also potentially supports aggregate demand by raising inflation expectations, thereby lowering real long-term rates relative to a Taylor Rule type baseline.*"

Christine Lagarde (2020): "*After all, it is the everyday economic decisions of people and companies that we seek to influence with our policy and communication. If our language is not accessible, our policy will be less effective.*"

Ben Bernanke (2020): "*The limits to forward guidance depend on what the public understands, and what it believes.*"

WHAT WE DO

- Run a randomized control trial (***RCT***) in a survey of more than 25,000 US consumers to test **whether information treatments** about interest rates and inflation **affect households' different expectations** (also **jointly**)

- **3D Treatments**:
    - **Information variable**: *policy rates*; *inflation*; *market rates*
    - **Horizon**: *current*; *past*; *future periods* (up to 3 years and for longer run)
    - **Trajectories**: *central* tendency; *upper*/ *lower* range

- We **compare** the **causal effect of different forms of FG communication on households' expectations** of: *mortgage rates* (nominal and real); *inflation*; *unemployment*; and *(planned) spending*

WHAT WE FIND (PREVIEW)

- **Limited** household **(pre-treatment) knowledge** about interest rates

- Communications **beyond one year** into the future **small influence** on expectations
  - supports models with agents with limited capacity to collect and process information (e.g. Woodford 2018; Gabaix 2019; Fahri and Werning 2018)

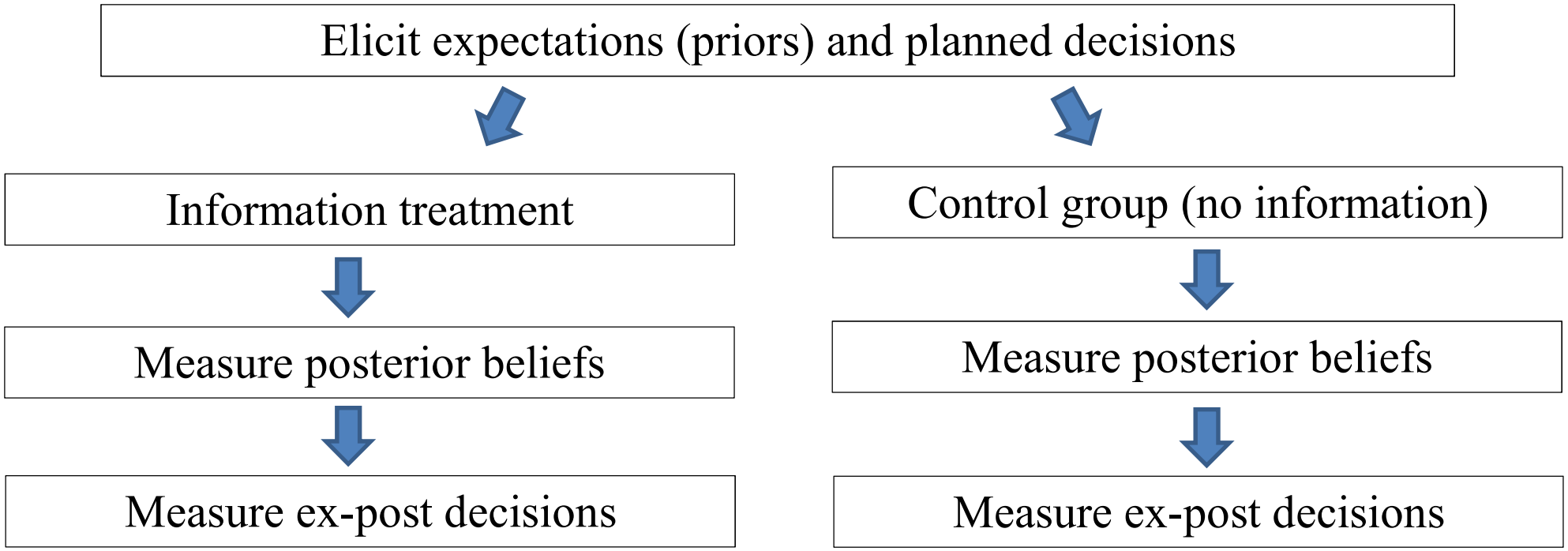
- Communication about current and next period policy rates move expectations **as much as communicating about current inflation/ mortgage** rates
  - *transient effects* for inflation treatments/ *more persistent* for mortgage rates

- Households tend to **revise their inflation expectations** along **with their interest rate** expectations (not in a one-for-one fashion, but maybe a *dampening* effect)

- No effects on expectations about (aggregate) unemployment

- Effects on **spending plans**

An RCT Approach to the Question



NIELSEN CONSUMER PANEL

- Three waves in *Chicago Booth Expectations and Communications Survey* (drawn from Kilts-Nielsen Consumer Panel)
- 26,929 consumers (large scale RCT with multiple treatments)
- Wave I: 34 questions; 19.5 min
- Survey weights; population representative sample
- Cross validate against NY FED; MSC; Freddie Mac Primary Mortgage Market Survey

NIELSEN CONSUMER PANEL

- Wave I (March 2019):
  - Collect:
    - background information (current demographics, recent spending, liquidity constraints, financial/numeric literacy, etc.)
    - expectations/ perceptions: mortgage rates, inflation (probability distribution), unemployment, etc.

What do you think is the current interest rate on a fixed-rate 30-year mortgage for someone like you and what do you think it will be in the future?

Current rate:	_____% per year [RANGE: 0-100, ONE DECIMAL]
At the end of 2019?	_____% per year [RANGE: 0-100, ONE DECIMAL]
At the end of 2020?	_____% per year [RANGE: 0-100, ONE DECIMAL]
At the end of 2021?	_____% per year [RANGE: 0-100, ONE DECIMAL]
In the next 5-10 years?	_____% per year [RANGE: 0-100, ONE DECIMAL]

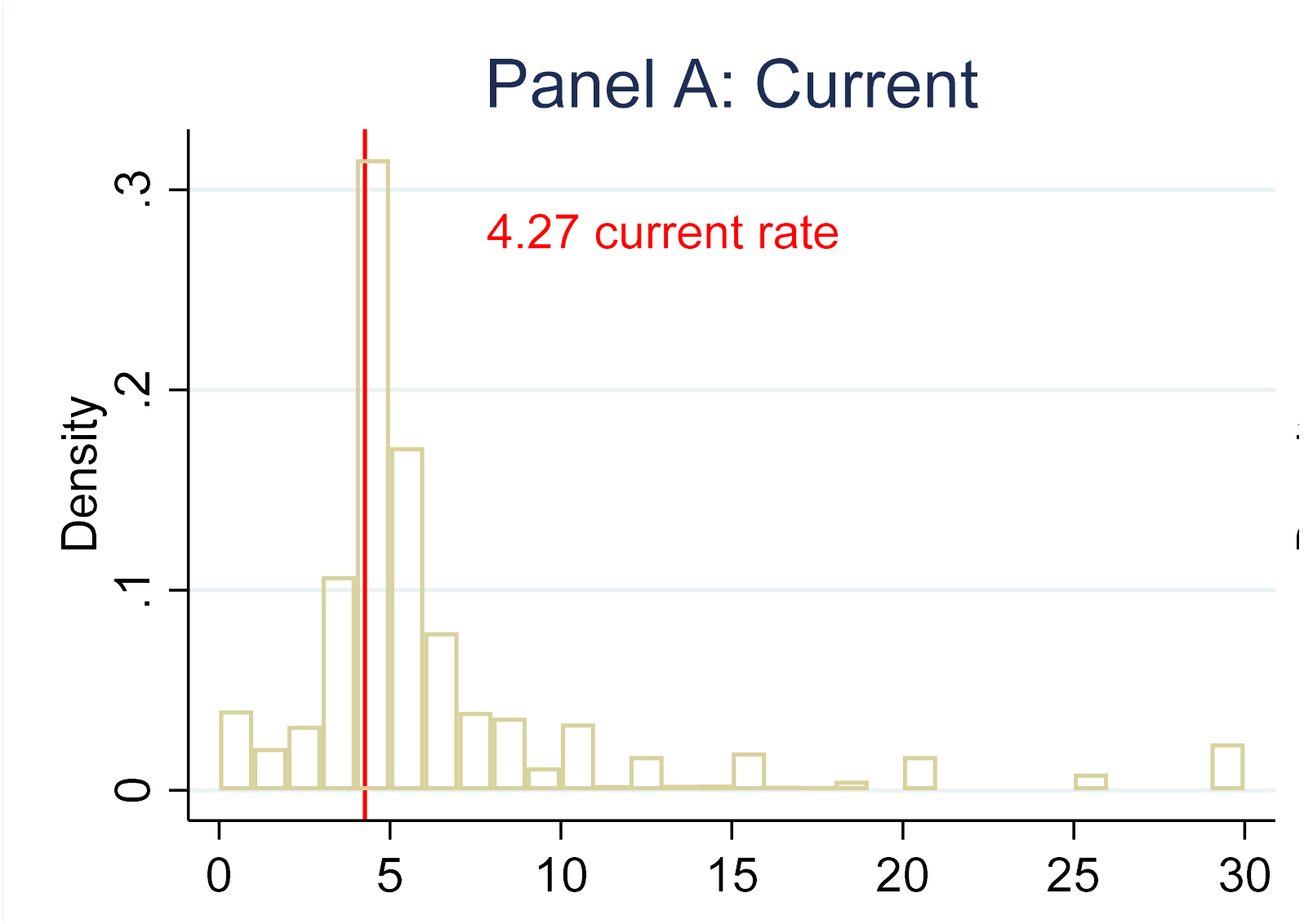
NIELSEN CONSUMER PANEL

- Wave I (March 2019):
  - Collect:
    - background information (current demographics, recent spending, liquidity constraints, financial/numeric literacy, etc.)
    - expectations/ perceptions: mortgage rates, inflation (probability distribution), unemployment, etc.
    - plans for spending on durable goods
  - Administer information treatments
  - Collect expectations again (point predictions)

- Wave II (June 2019)
  - Collect expectations and spending

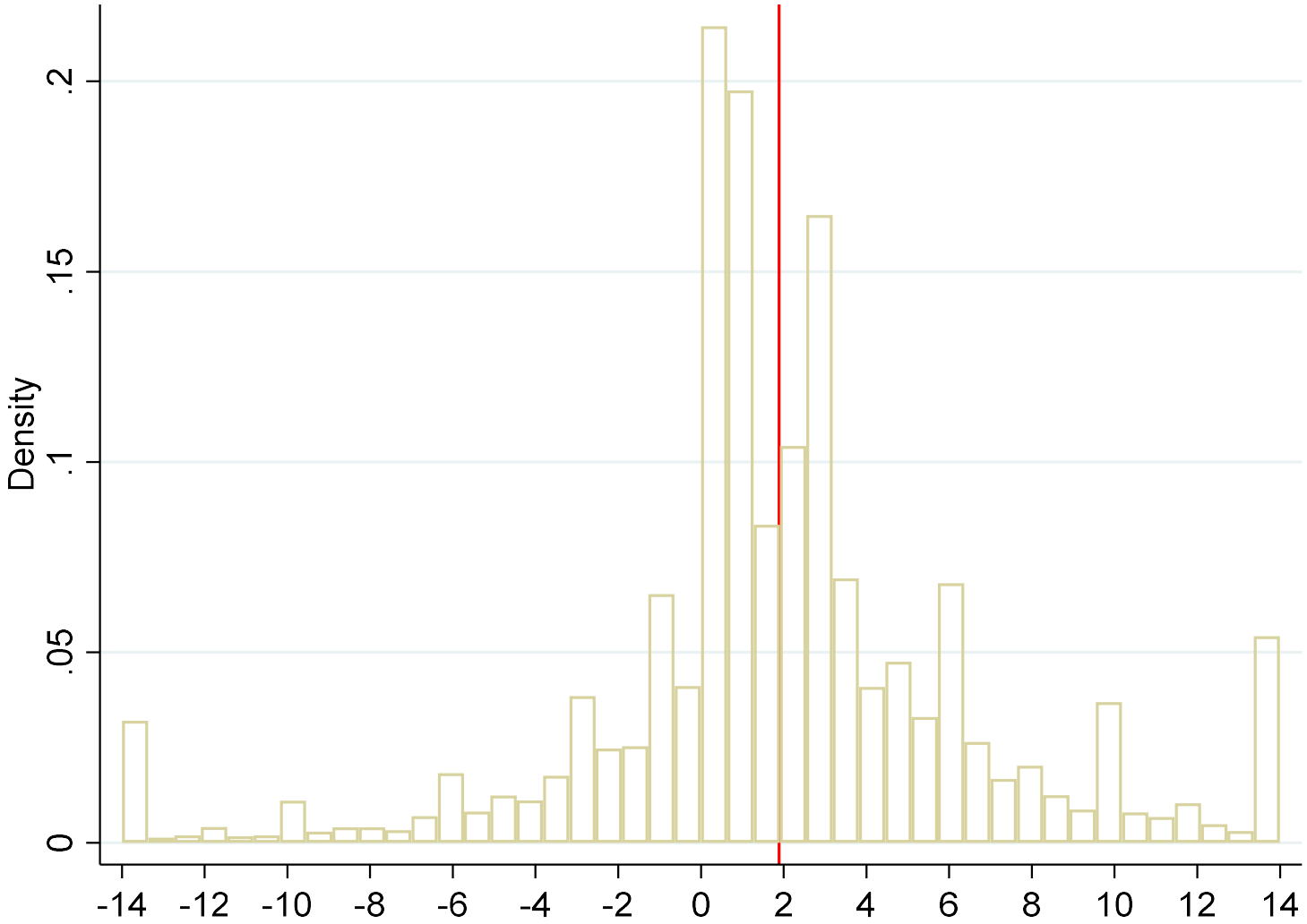
- Wave III (September 2019)
  - Collect expectations and spending

NOMINAL MORTGAGE RATE EXPECTATIONS



Wide dispersion in beliefs about nominal rates

INFLATION EXPECTATIONS

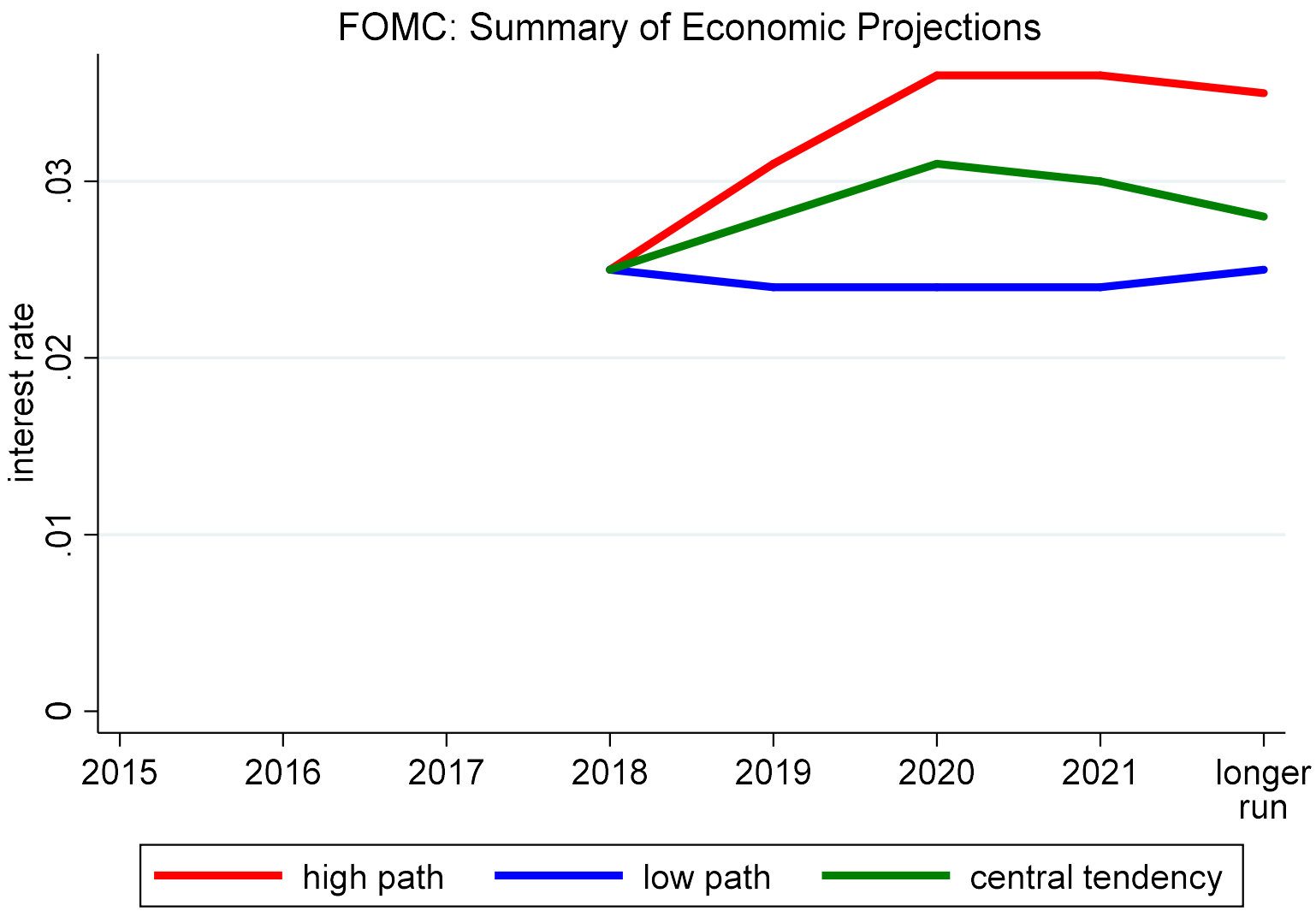


Similarly wide dispersion in beliefs about inflation

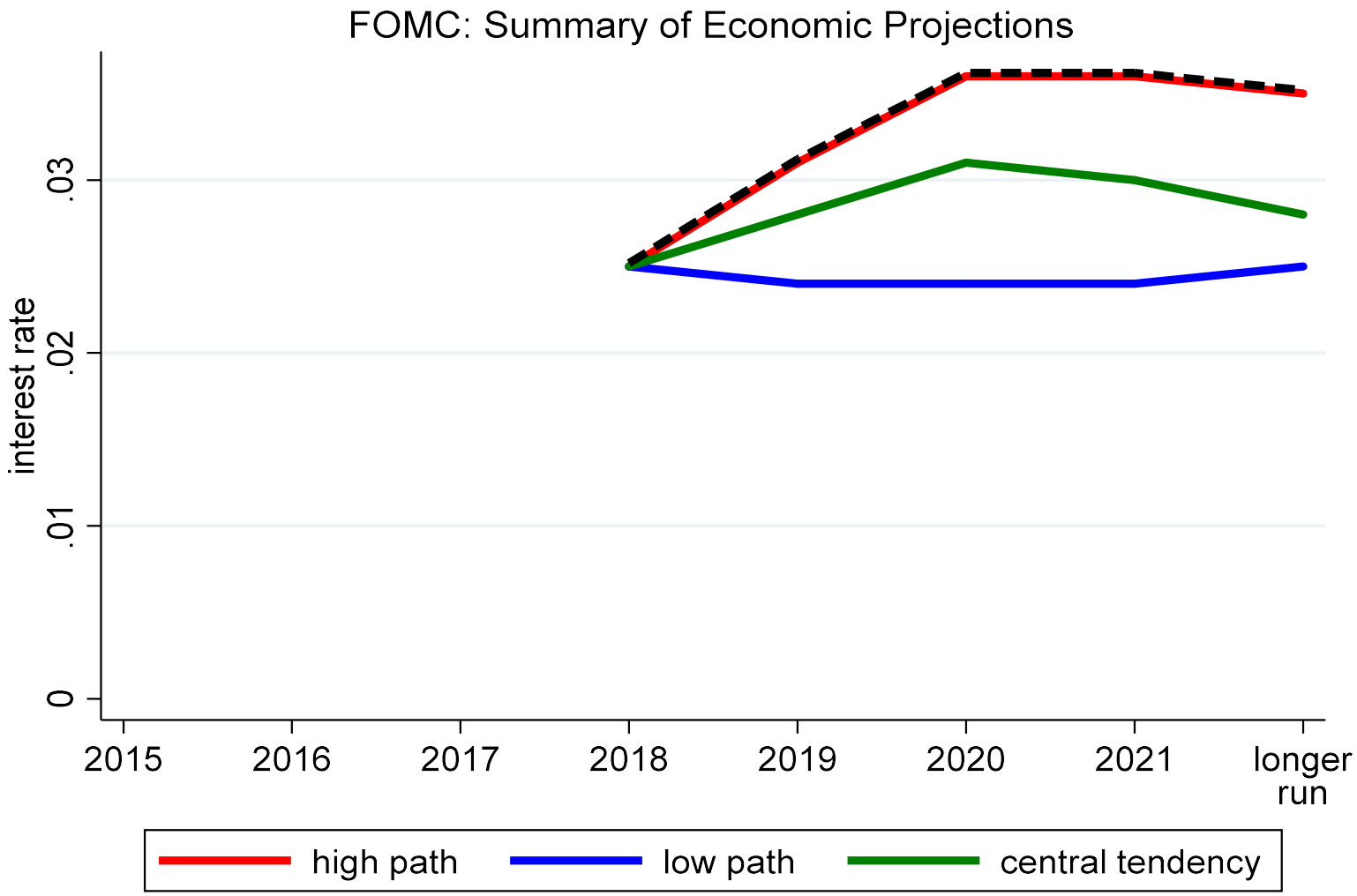
TREATMENTS

- Control group (1/24)
- Placebo group (population growth)
- **Policy rates: various treatments**
  - Current FFR
  - Current FFR + past FFR
  - Current FFR + future FFR: 1y FG; 2y FG; 3y FG; longer-run FG, combined with: central tendency; upper range; lower range

FORWARD GUIDANCE: visualization of treatments

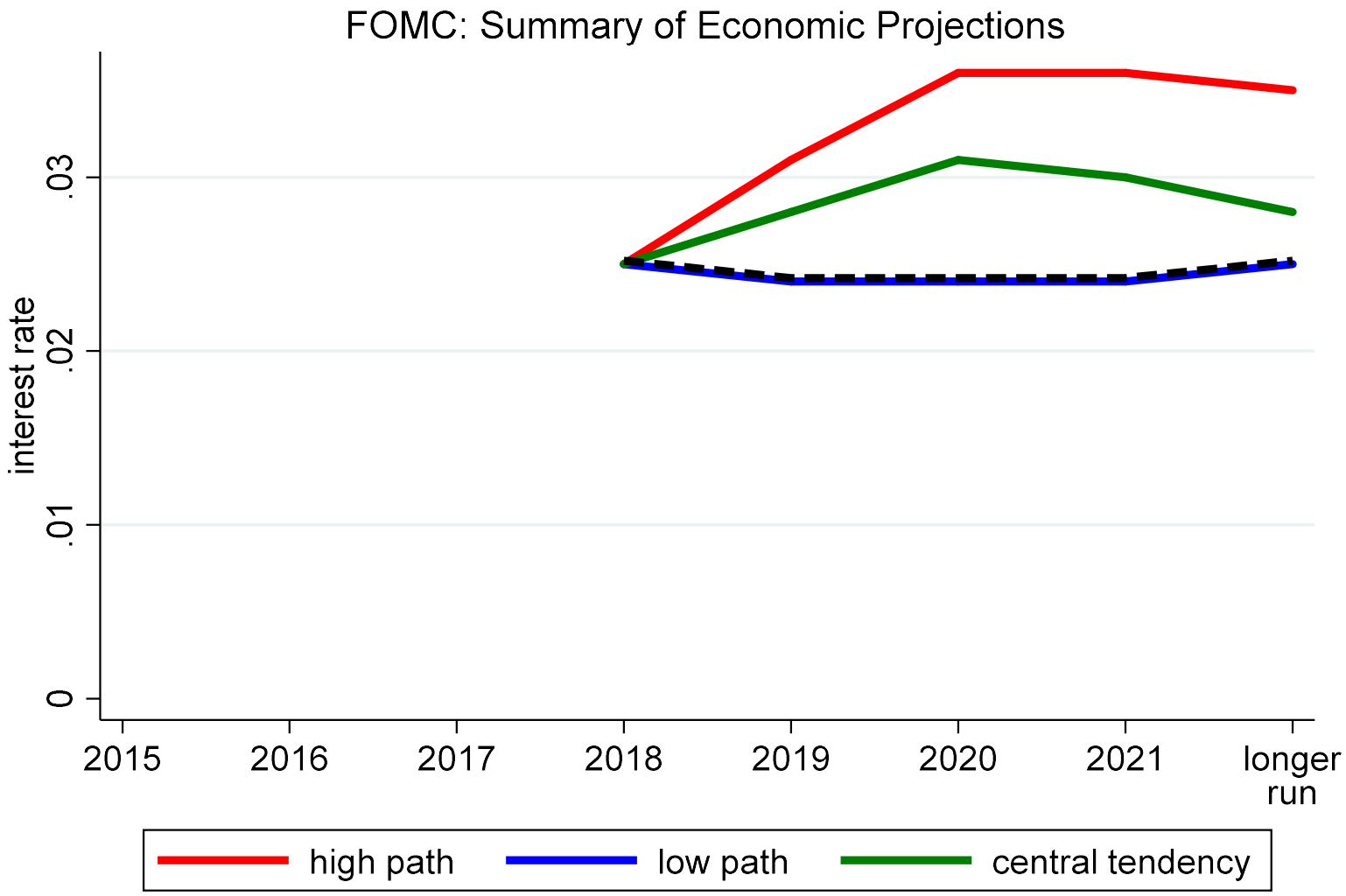


FG: current FFR + High(2019, 2020, 2021, LR)



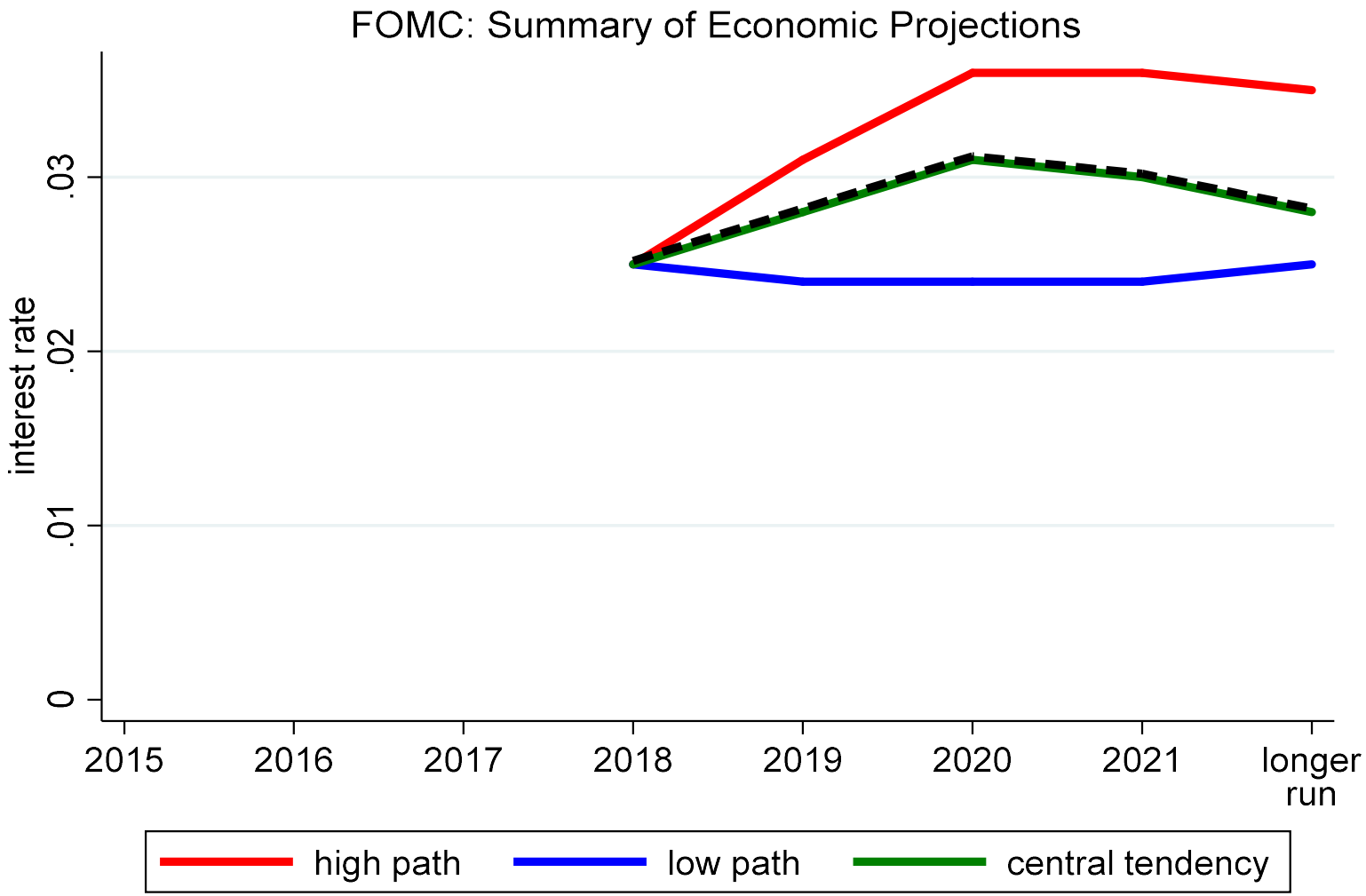
"*The interest rate set by the Federal Reserve, known as the Federal Funds Rate, is currently at 2.5%.* ***One forecast*** *from the Federal Reserve is that this interest rate will be 3.1% on average in 2019, 3.6% in 2020 and 2021, and 3.5% in the longer run.*"

FG: current FFR + Low(2019, 2020, 2021, LR)



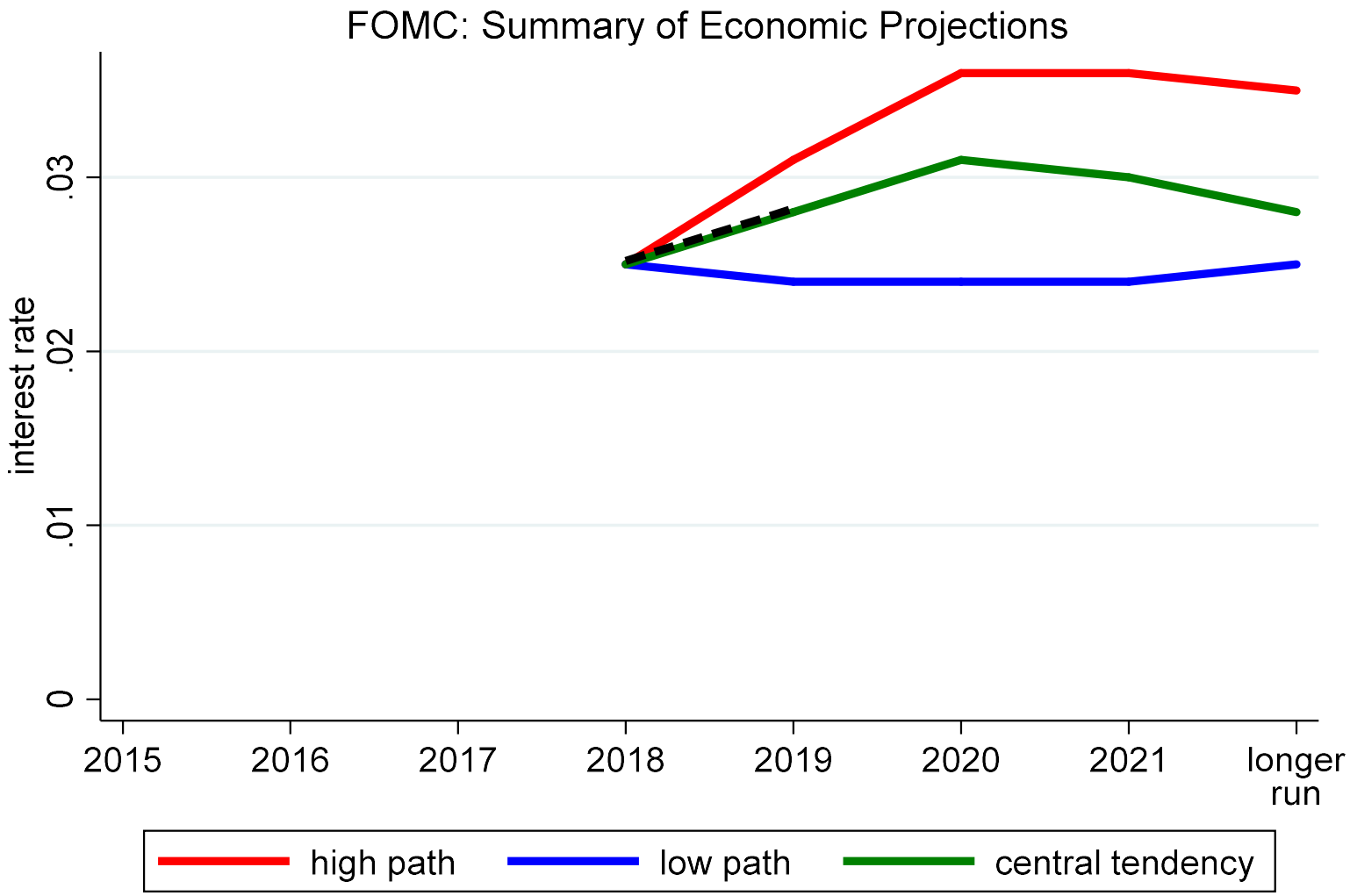
"The interest rate set by the Federal Reserve, known as the Federal Funds Rate, is currently at 2.5%. One forecast from the Federal Reserve is that this interest rate will be 2.4% on average in 2019, 2020 and 2021 and 2.5% in the longer run."

FG: current FFR + Central(2019, 2020, 2021, LR)



"The interest rate set by the Federal Reserve, known as the Federal Funds Rate, is currently at 2.5%. One forecast from the Federal Reserve is that this interest rate will be 2.8% on average in 2019, 3.1% in 2020, 3.0% in 2021 and 2.8% in the longer run."

FG: current FFR + Central(2019)



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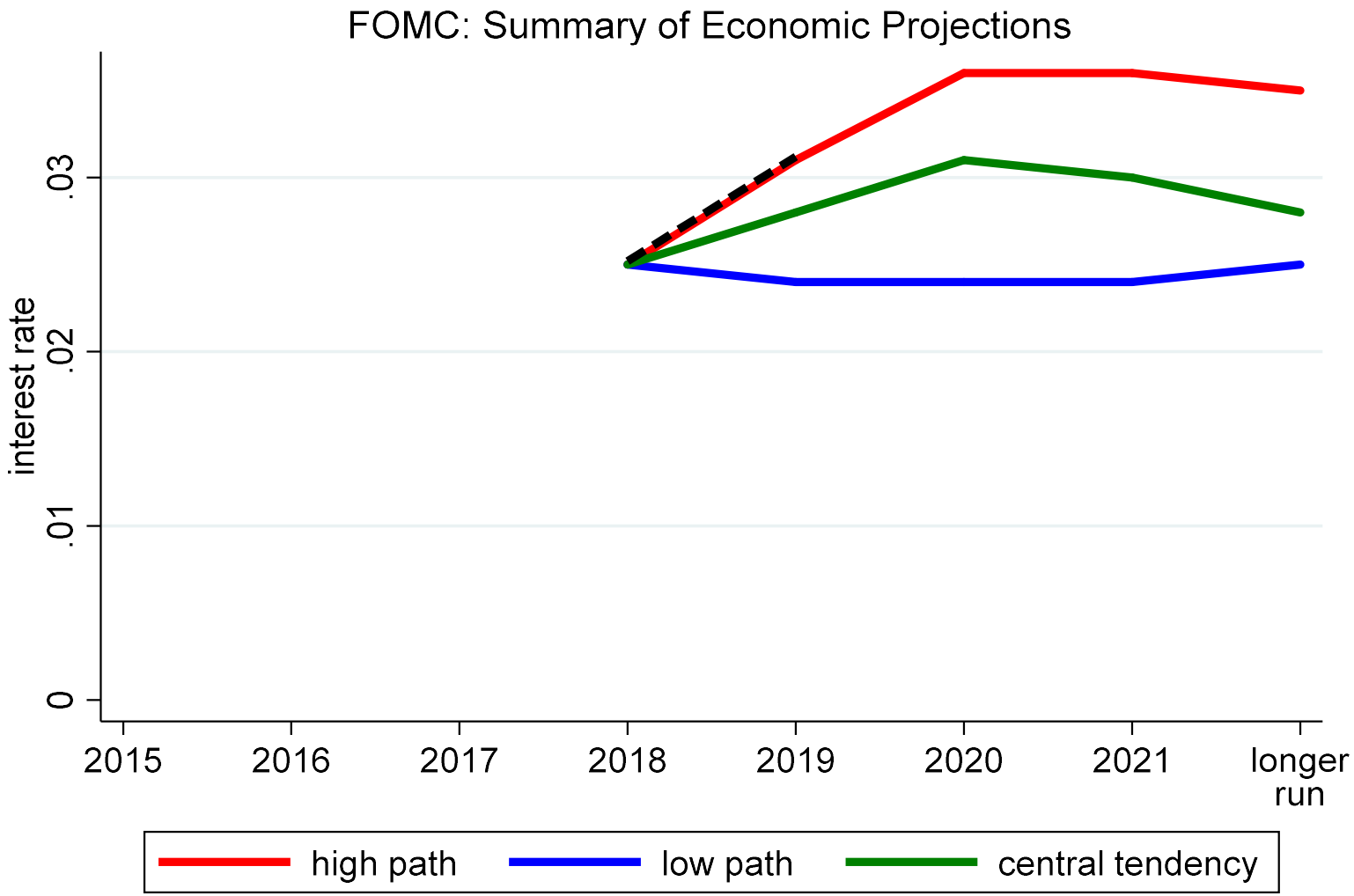

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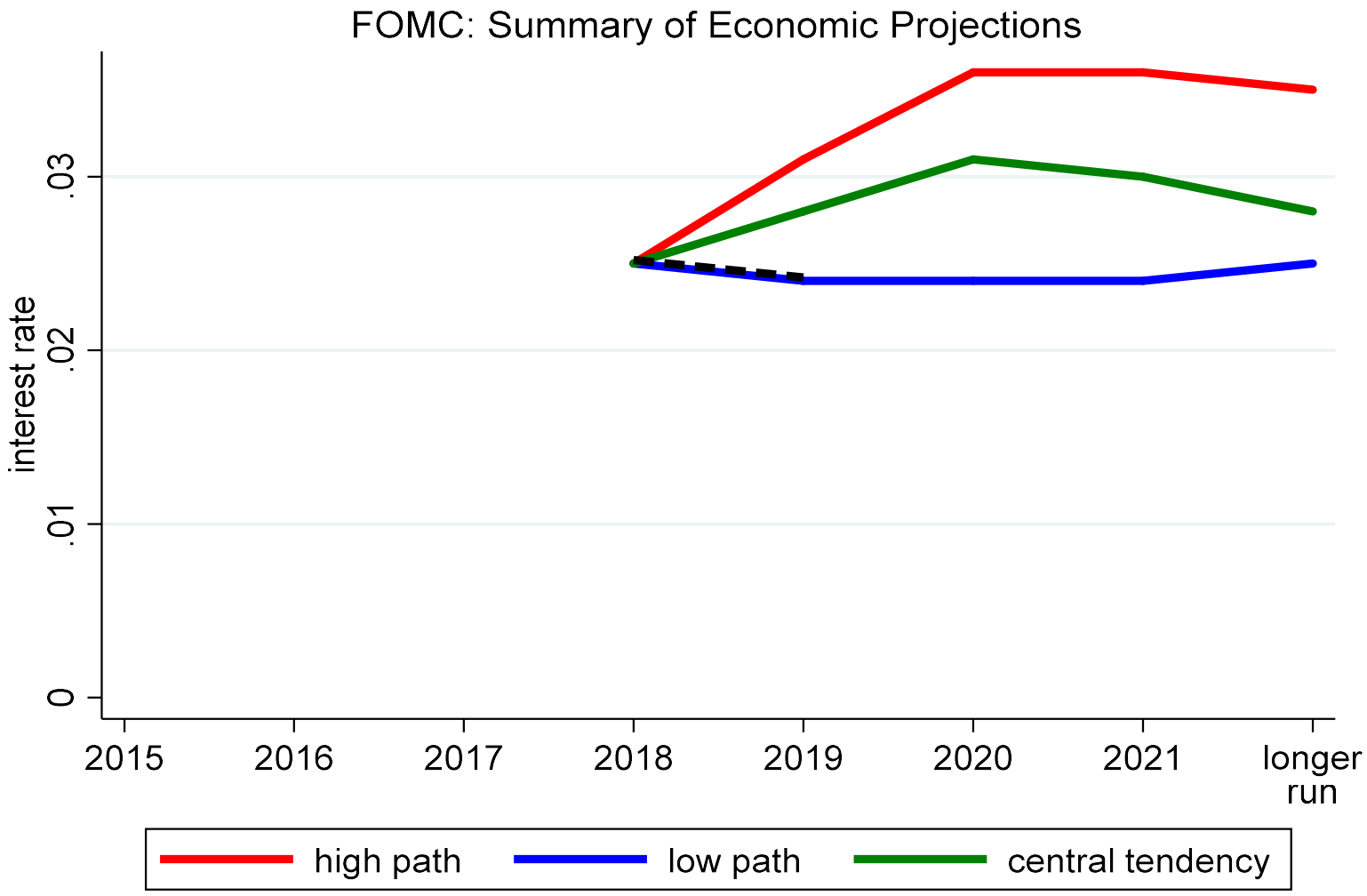
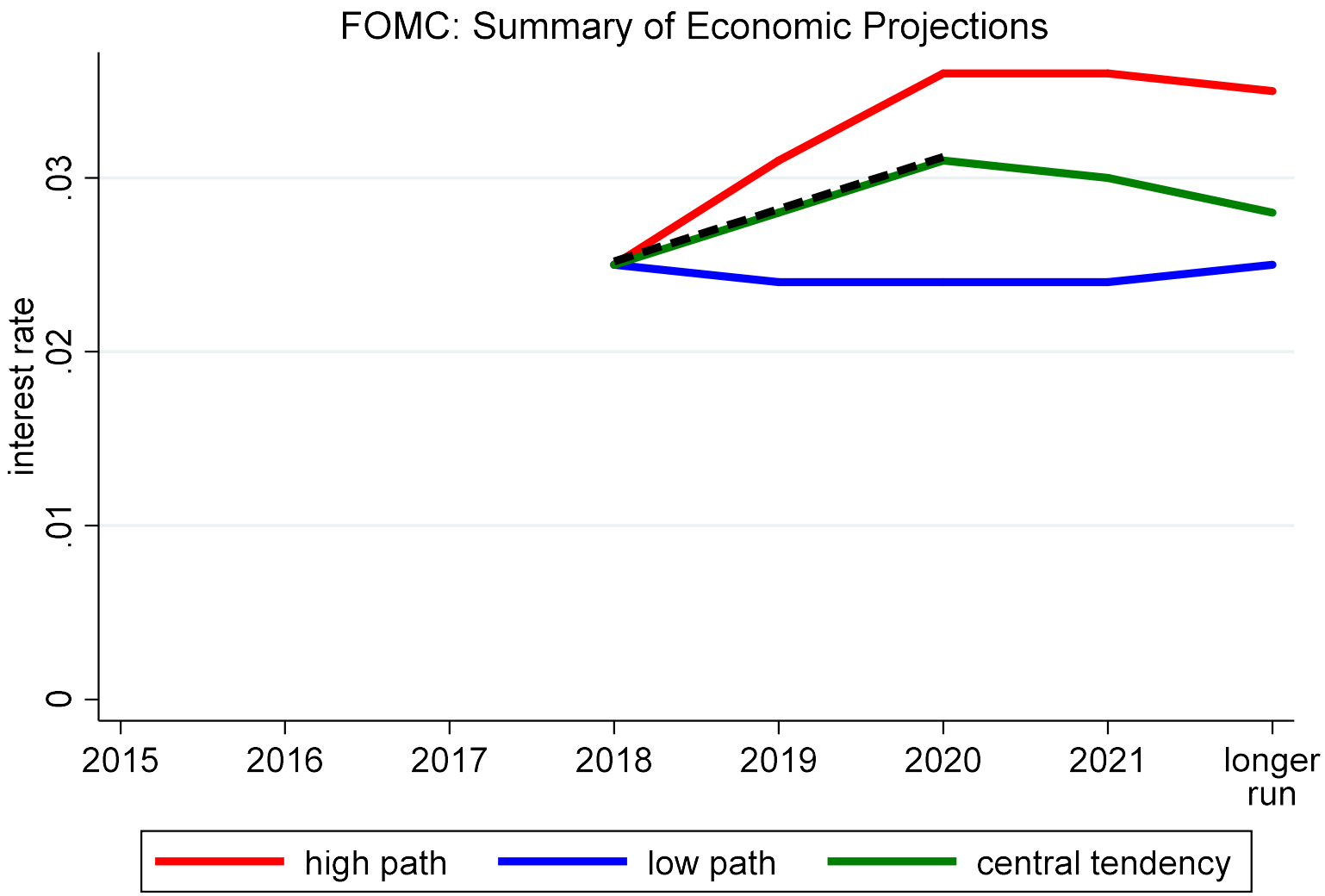


"The interest rate set by the Federal Reserve, known as the Federal Funds Rate, is currently at 2.5%. One forecast from the Federal Reserve is that this interest rate will be 2.4% on average in 2019."

FG: current FFR + Central(2019) + Central(2020)



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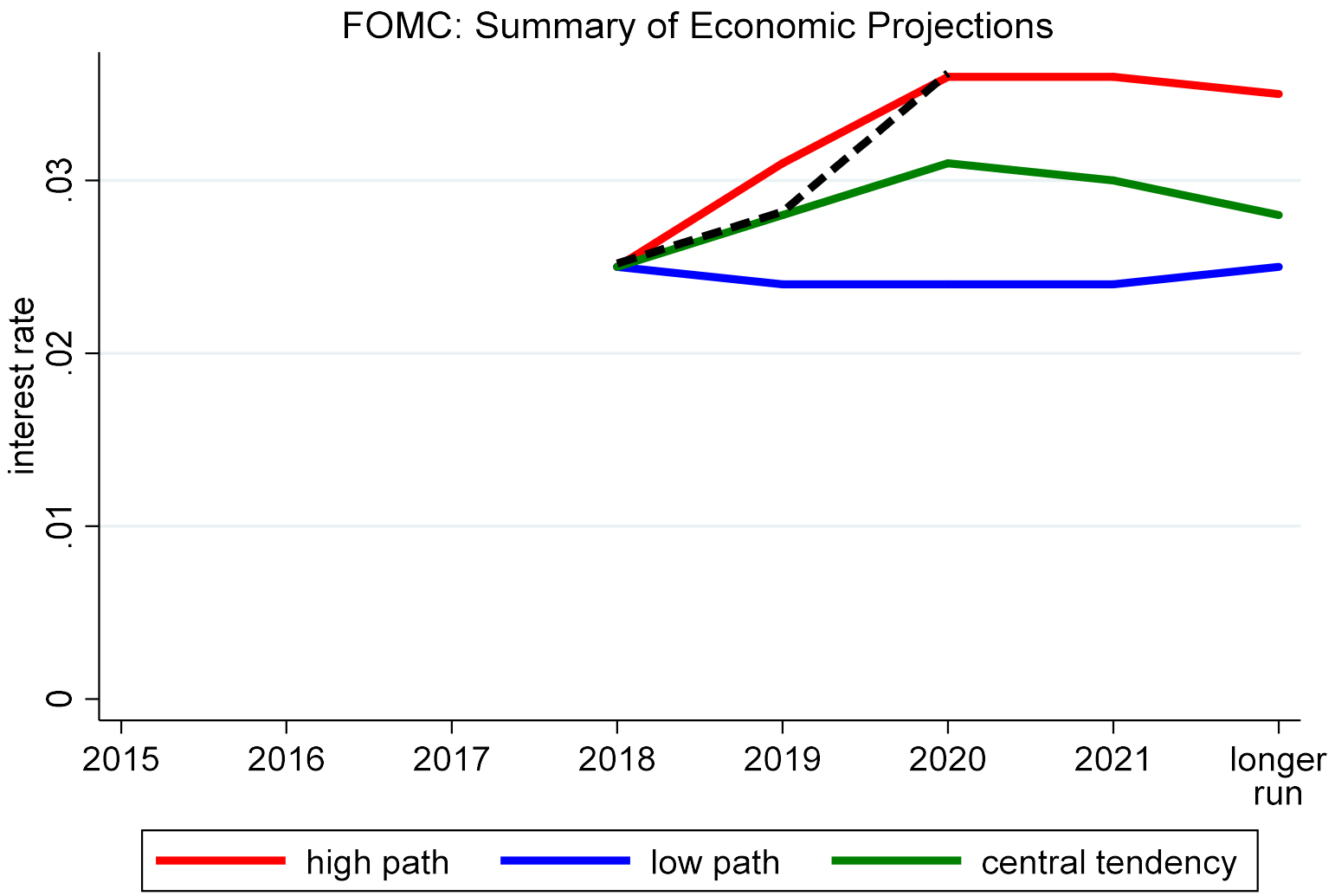

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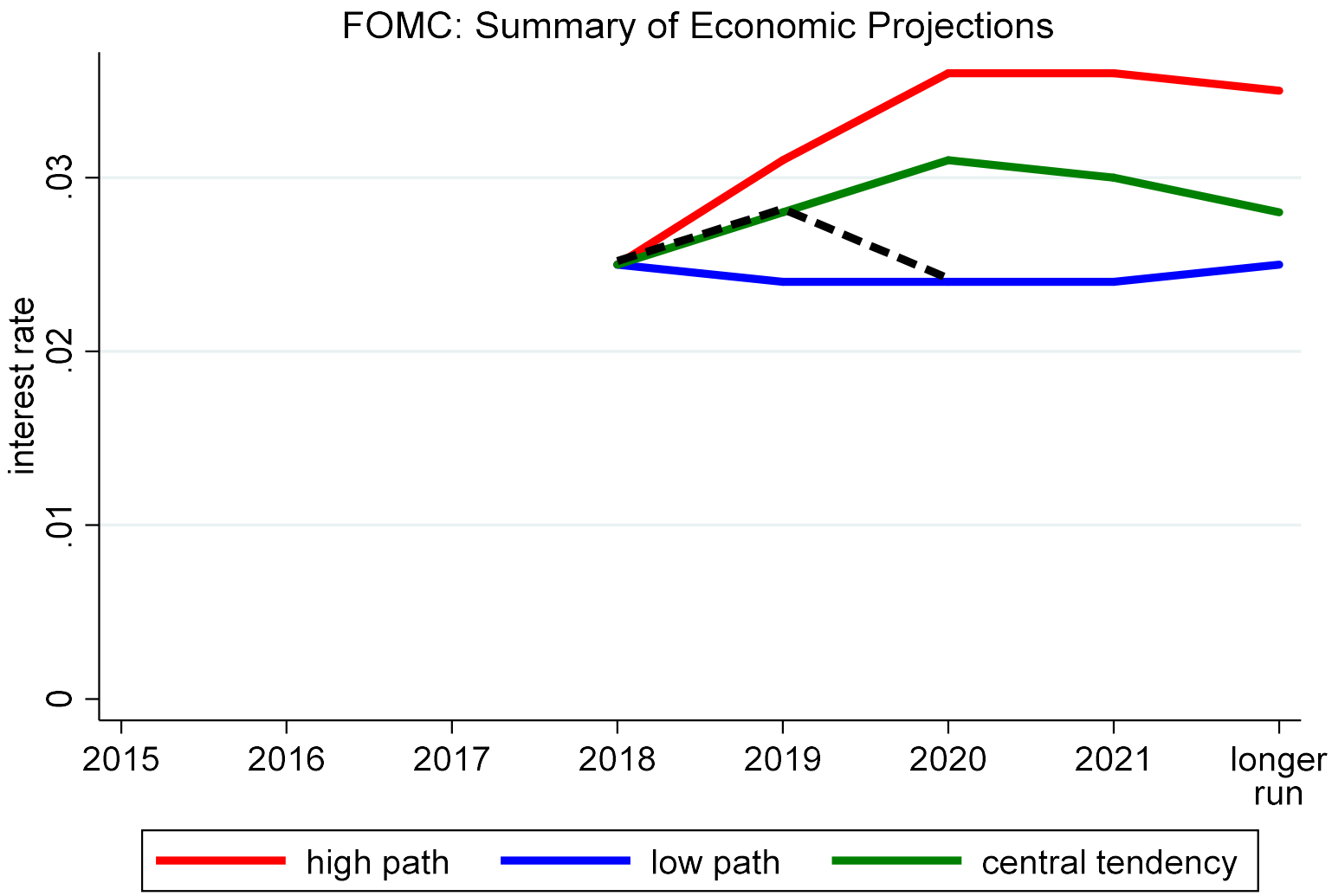
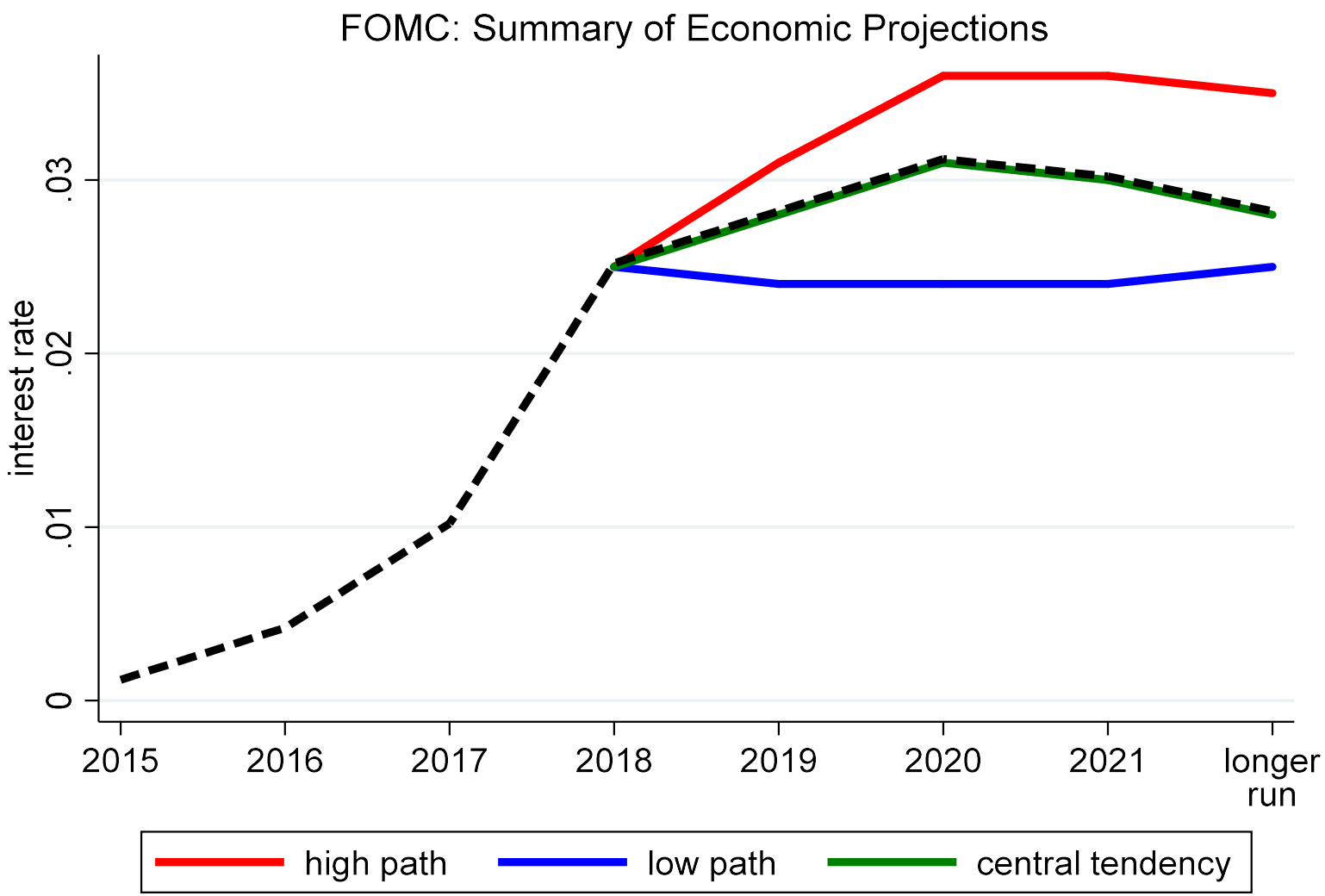
FG: current FFR + Central(2019) + Low(2020)



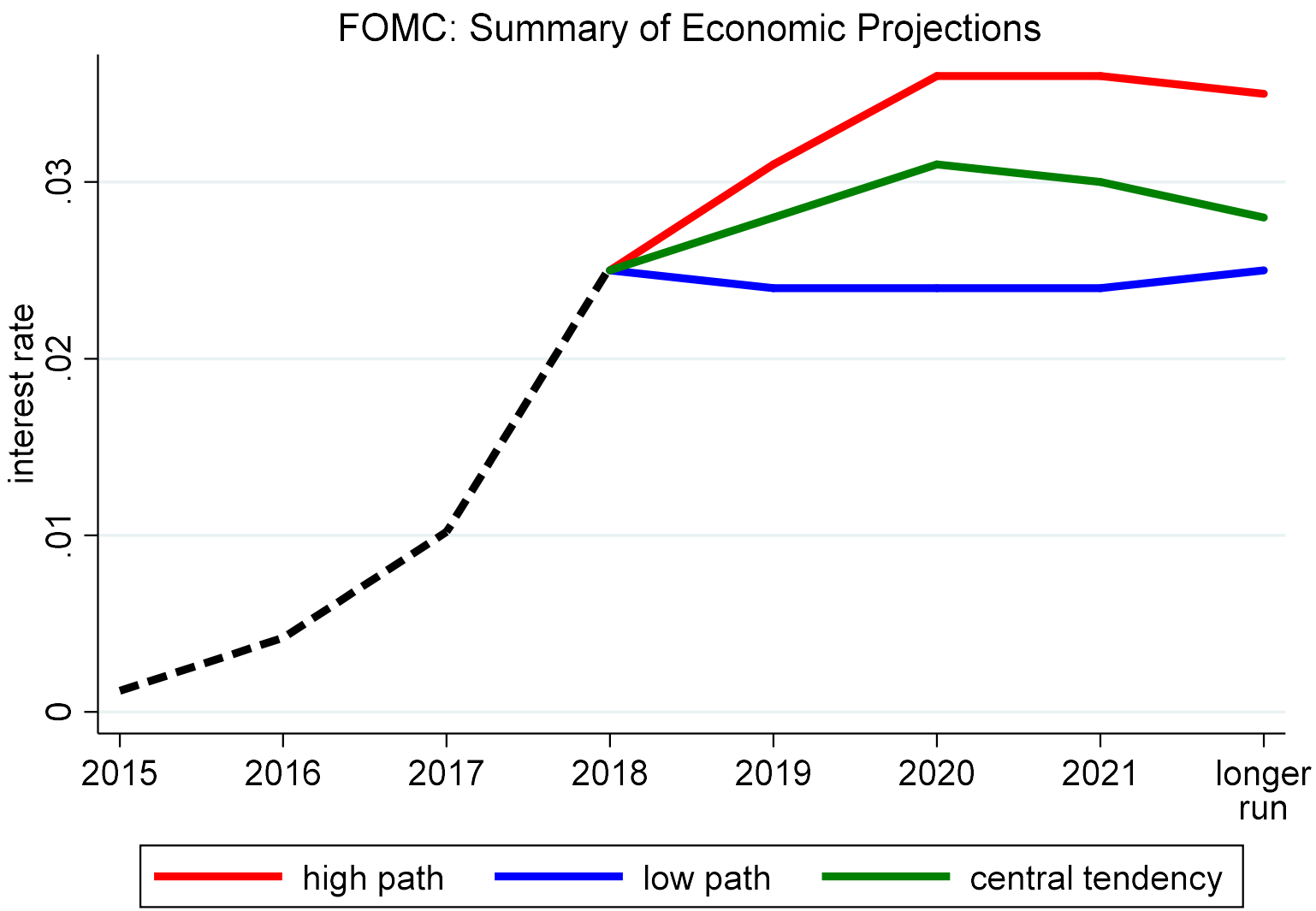
"The interest rate set by the Federal Reserve, known as the Federal Funds Rate, is currently at 2.5%. One forecast from the Federal Reserve is that this interest rate will be 2.8% on average in 2019 and 2.4% in 2020."

FG: past FFR + current FFR + Central(2019, 2020, 2021, LR)



"The interest rate set by the Federal Reserve, known as the Federal Funds Rate, is currently at 2.5%. This rate was 1.0% on average in 2017, 0.4% in 2016, and 0.1% in 2015. One forecast from the Federal Reserve is that this interest rate will be 2.8% on average in 2019, 3.1% in 2020, 3.0% in 2021 and 2.8% in the longer run."

FG: past FFR + current FFR



"The interest rate set by the Federal Reserve, known as the Federal Funds Rate, is currently at 2.5%. This rate was 1.0% on average in 2017, 0.4% in 2016, and 0.1% in 2015."

TREATMENTS

- Control group
- Placebo group (population growth)
- **Policy rates**
  - Current FFR
  - Current FFR + past FFR
  - Current FFR + future FFR: 1y FG; 2y FG; 3y FG; longer-run FG, combined with: central tendency; upper range; lower range
- **Mortgage rate** (current for *30-year fixed rate* mortgage)
- **Inflation rates**
  - Last year
  - Average over last 3 y
  - Last year + 3 y ahead inflation path forecast
  - Last year + 3 y ahead inflation average forecast

RESPONSE OF CONSUMER BELIEFS

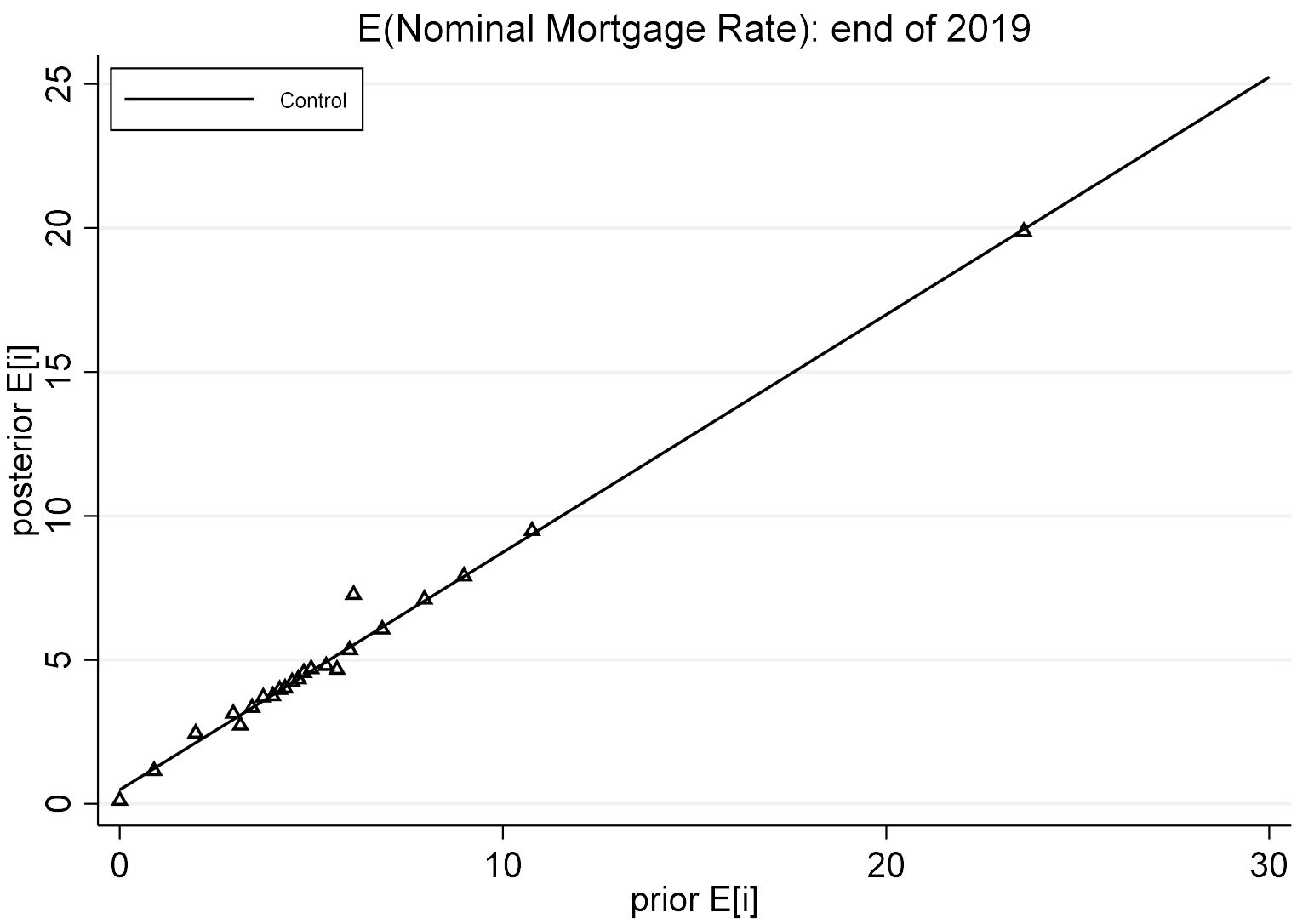
$$X_j^{post} = \alpha X_j^{pre} + \sum_{k=2}^{24} \beta_k \, Treatment_j^{(k)} + \sum_{k=2}^{24} \gamma_k \, Treatment_j^{(k)} \times X_j^{pre} + \boldsymbol{W}_j \boldsymbol{\psi} + error_j$$

α persistence of expectations for control group

β_k 'level' effect: signal relative to the initial belief (positive or negative)

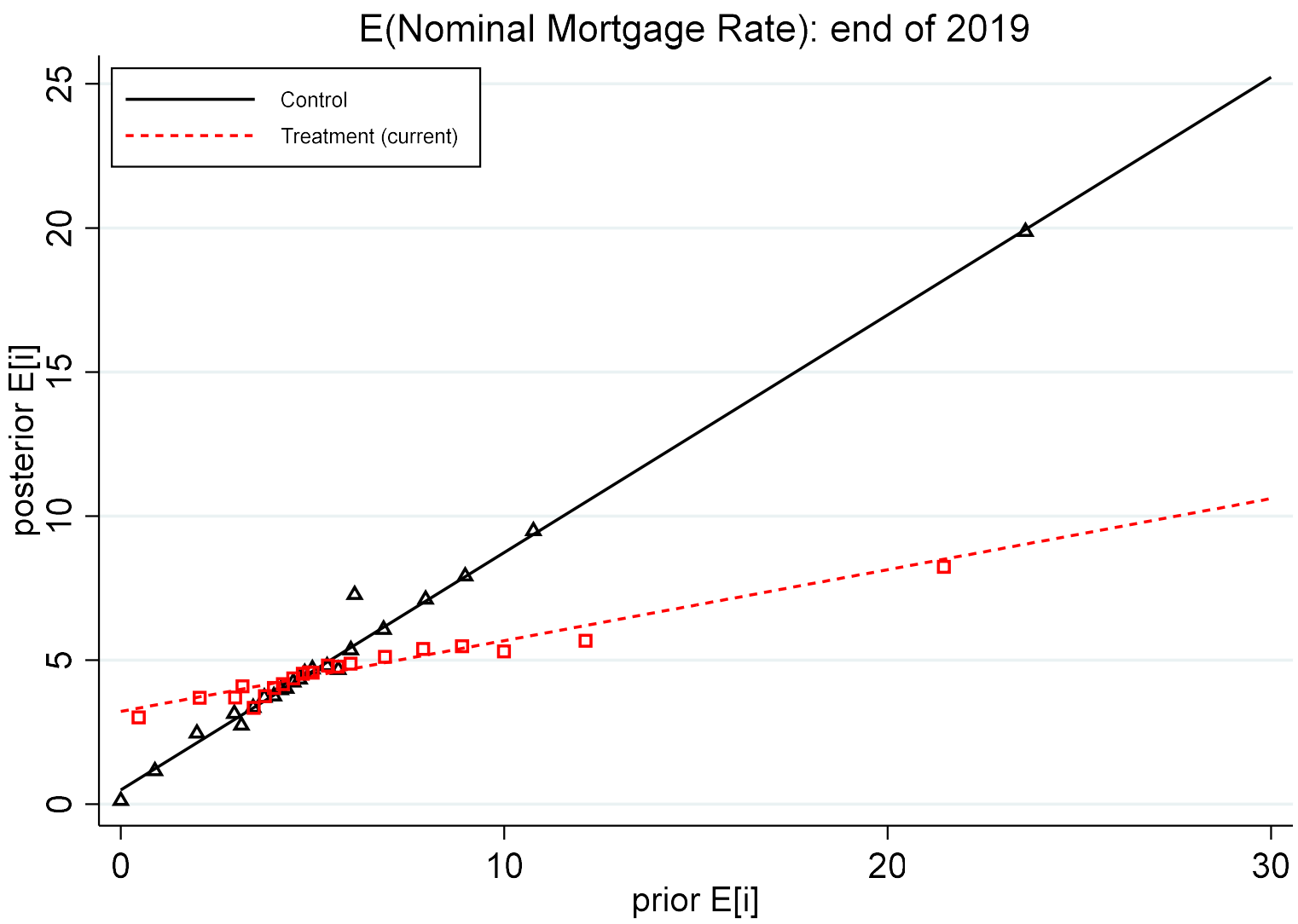
γ_k under Bayesian updating (respondent's posterior belief is a weighted average of her prior beliefs and a signal): negative

RESPONSE OF NOMINAL MORTGAGE RATE EXPECTATIONS BY FG HORIZON



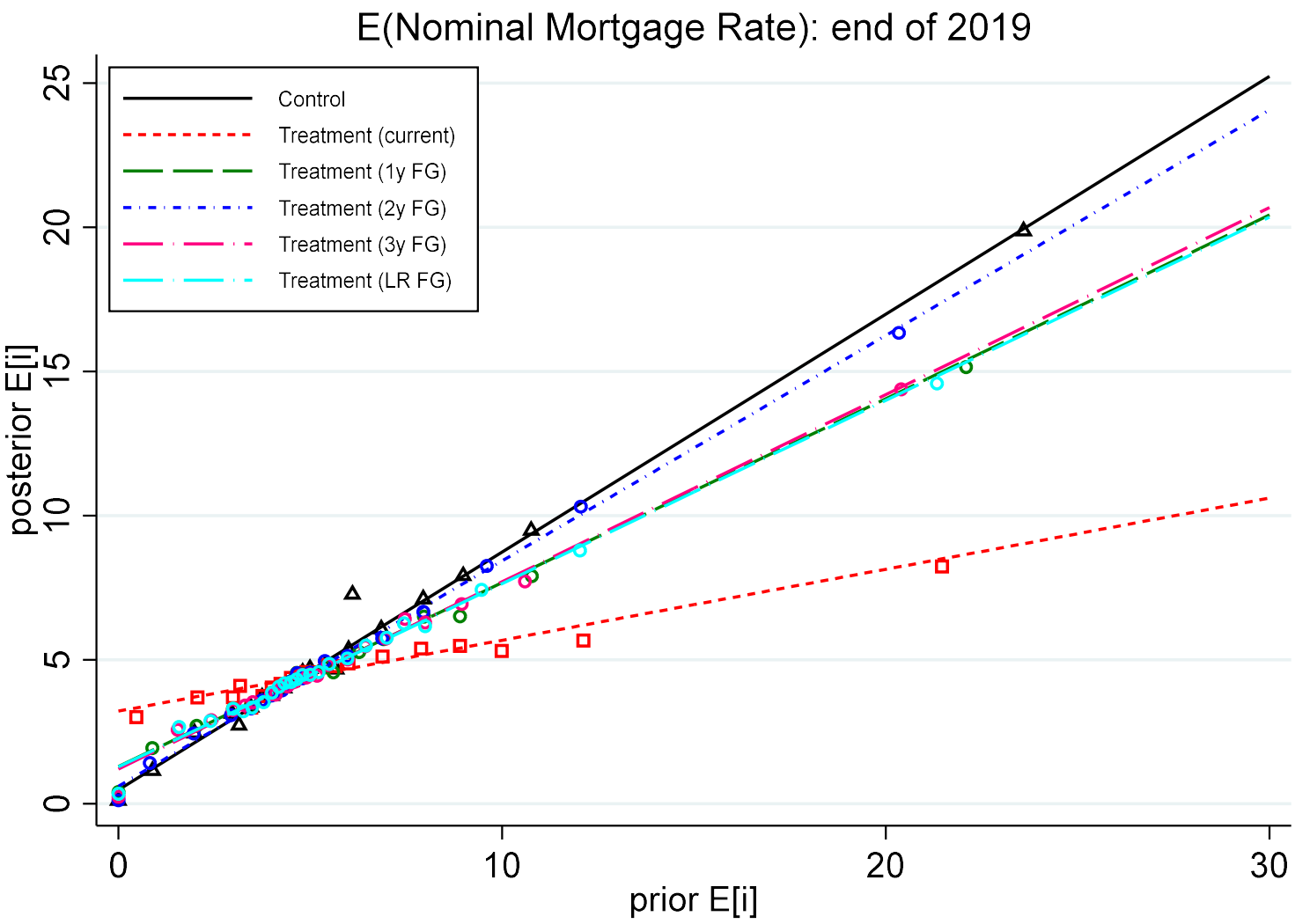
Control group: similar mortgage rate expectations pre- and post-treatment

RESPONSE OF NOMINAL MORTGAGE RATE EXPECTATIONS BY FG HORIZON



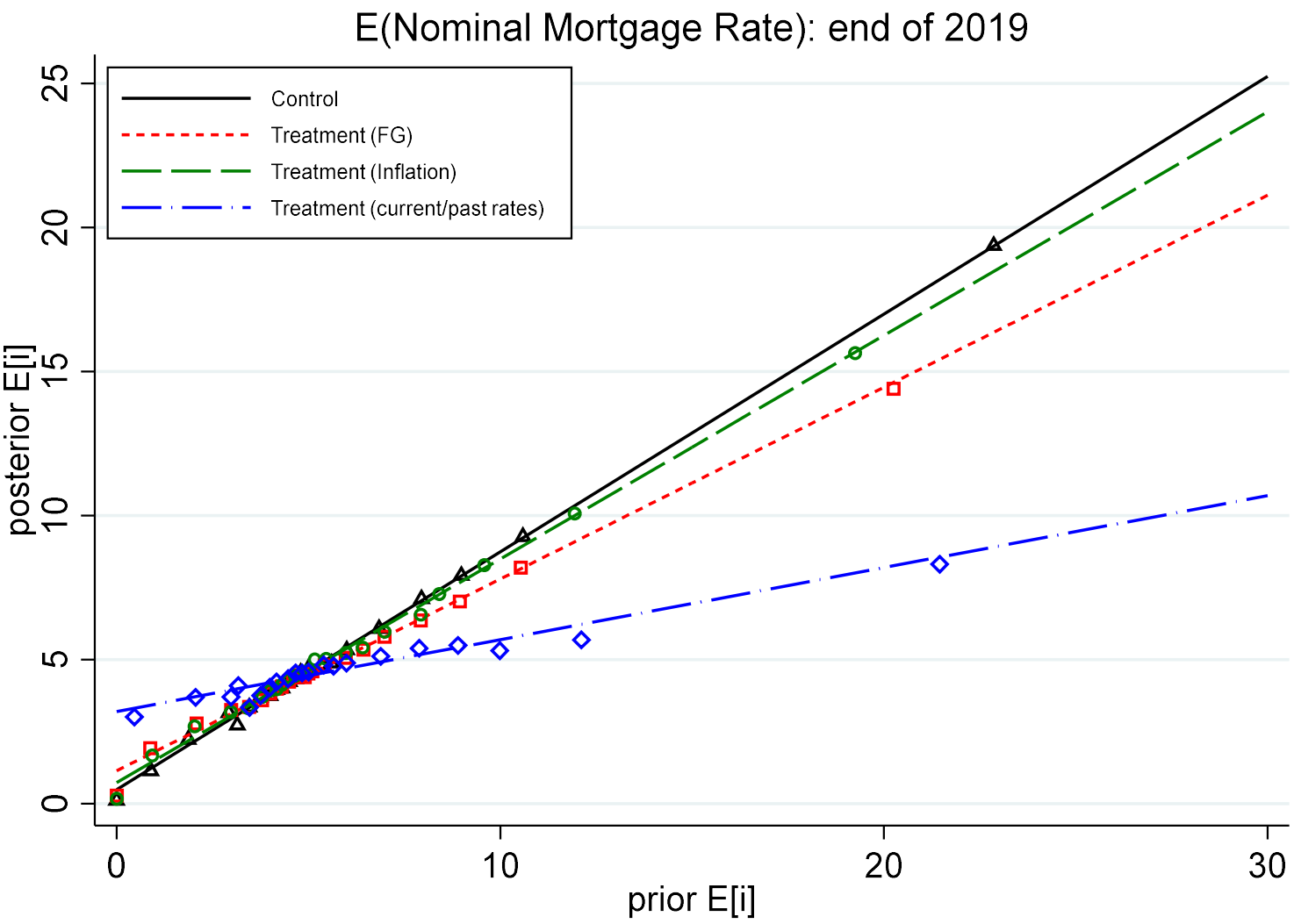
Information about current interest rates is quite powerful.

RESPONSE OF NOMINAL MORTGAGE RATE EXPECTATIONS BY FG HORIZON



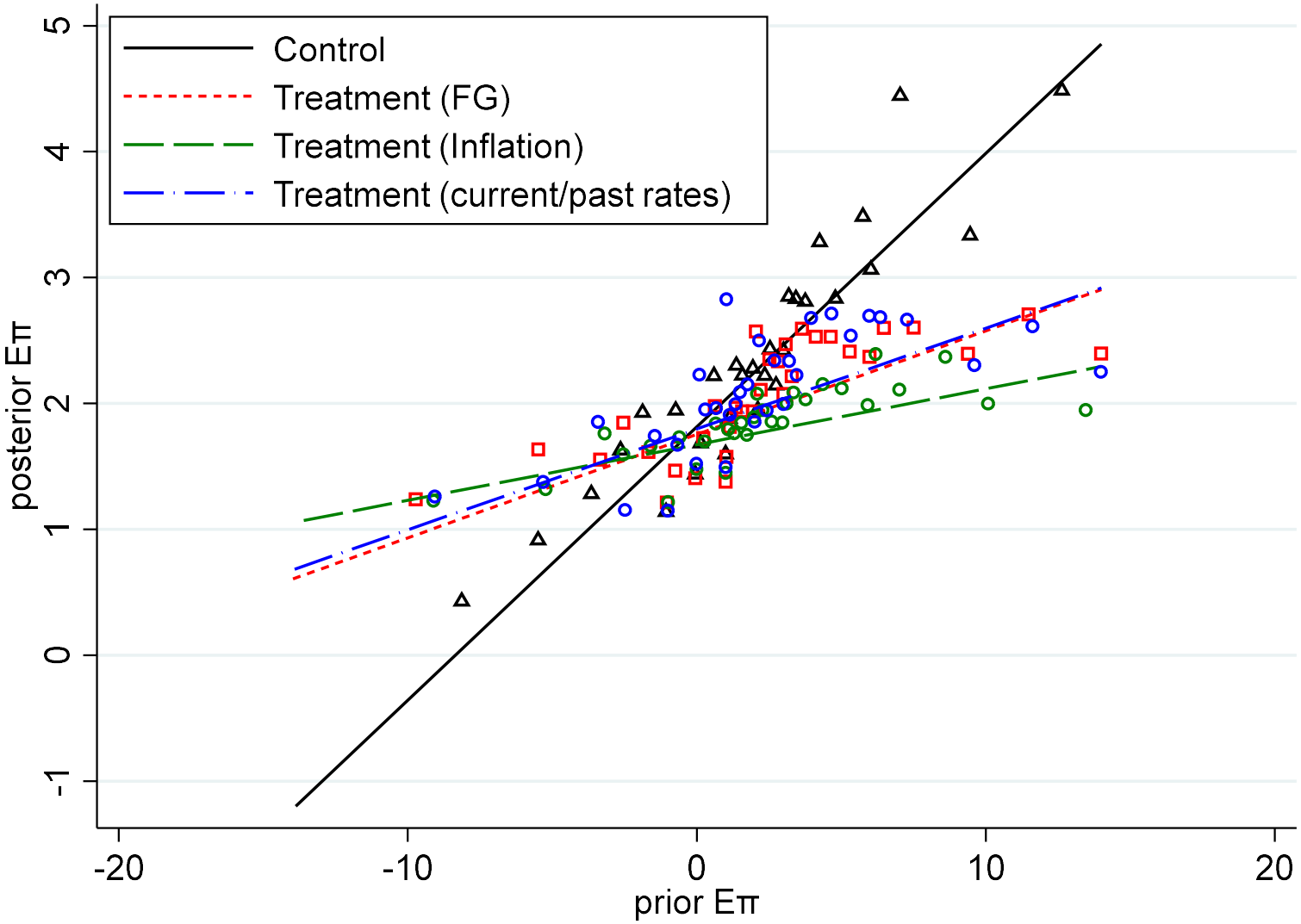
Small differences between short and longer term FG: effects are much smaller.

RESPONSE OF NOMINAL MORTGAGE RATE EXPECTATIONS BY TREATMENT



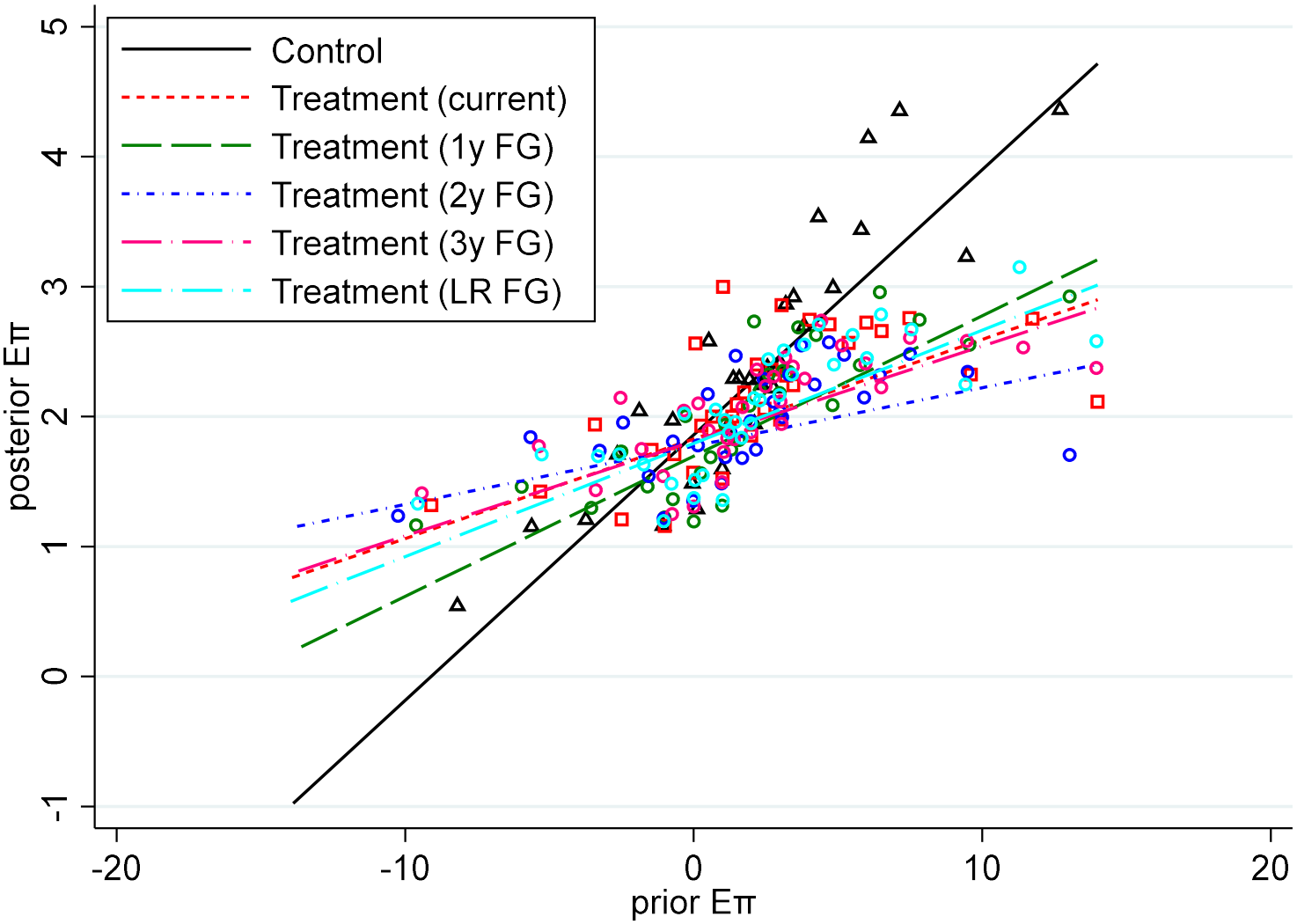
Same is true with treatment about inflation expectations: small effect on mortgage rate expectations.

RESPONSE OF INFLATION EXPECTATIONS BY TREATMENT



Inflation expectations respond to all treatments!

RESPONSE OF INFLATION EXPECTATIONS BY FG HORIZON



Little additional value in providing information about policy rates more than 2 years out

RESPONSE OF REAL MORTGAGE RATE EXPECTATIONS BY FG HORIZON

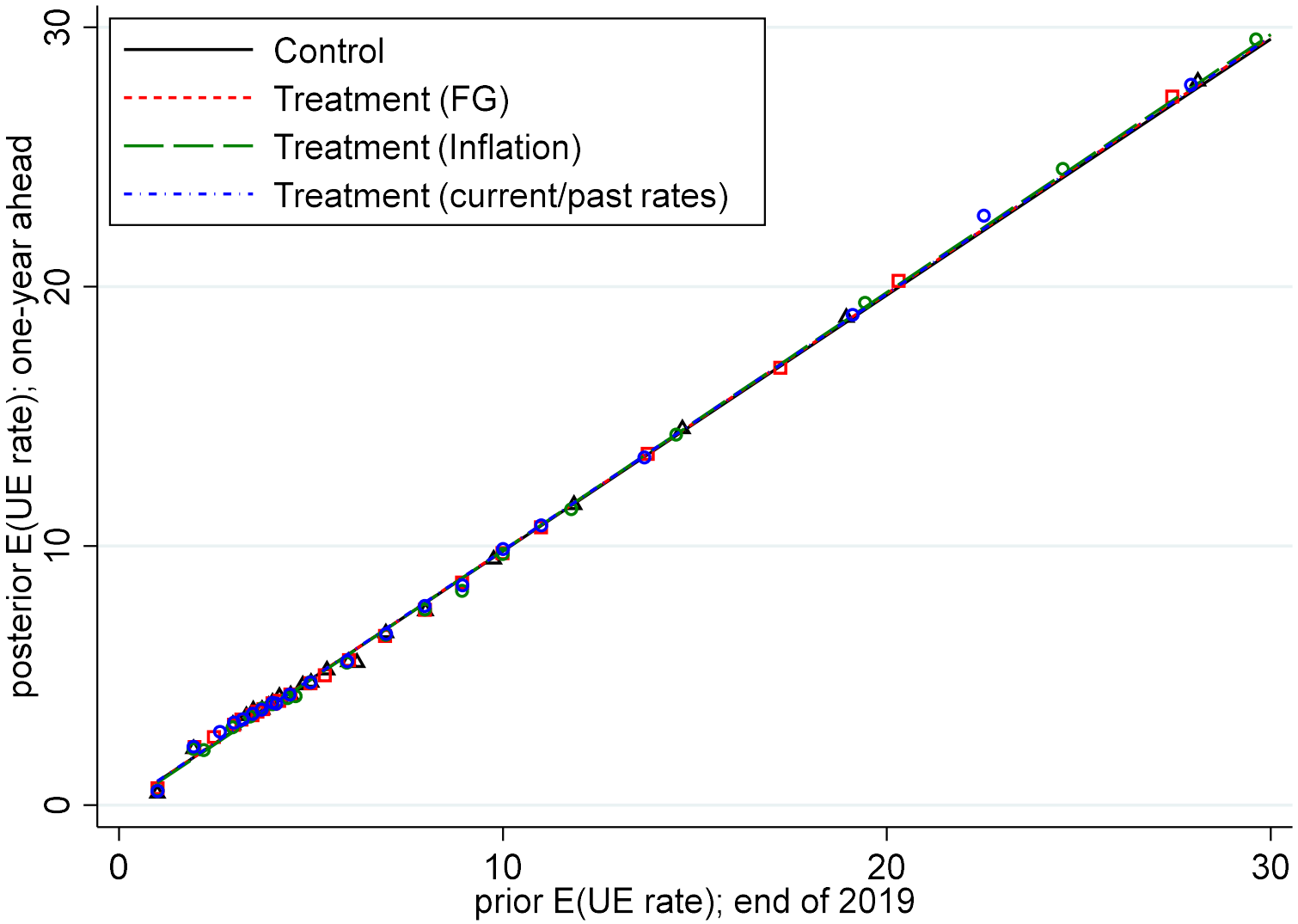
- Real mortgage rate expectations: expected nominal mortgage rate at a given horizon minus the (one-year-ahead) expected inflation

- Treatments dampen the variation in post-treatment beliefs about real interest rates relative to the corresponding pre-treatment variation
- Providing information about future policy rates beyond the one-year horizon leads to no material differences.

- When households revise their nominal interest rate expectations downwards, they also tend to revise their inflation expectations downward albeit by less (and vice versa), so that their **real interest rate expectations are less sensitive to news**

- The **size of the effect for real rates does not decline with the horizon as strongly** as it does for inflation and nominal rate expectations

RESPONSE OF UNEMPLOYMENT RATE EXPECTATIONS BY TREATMENT



Different treatments have no effect on UE expectations.

PERSISTENCE OF TREATMENT EFFECTS

- **Short-lived effects** on inflation and unemployment expectations (i.e. in line with earlier information experiments on inflation)

- **Longer-lived effects** on nominal/ real mortgage rate expectations

- Policy announcements targeting difference variables: differences in persistence of FG

    - Inflation: larger but short-lived effects

    - Interest rates: more persistent effects

RESPONSE OF (PLANNED) SPENDING TO REAL INTEREST RATE EXPECTATIONS

$$Y_j^{post} = \phi_1\left(E_j^{post} i - E_j^{post} \pi\right) + \phi_2\left(E_j^{pre} i - E_j^{pre} \pi\right) + \boldsymbol{W}_j \boldsymbol{\kappa} + error_j$$

Y = 1 if a respondent says that now is a good time to buy a durable good

Ei : expected mortgage rate in the end of 2020

$E\pi$: one-year-ahead inflation forecast

W : vector of household/ individual characteristics

- Use different treatments (FG; inflation; current/ past rates; pooled) to instrument for $\left(E_j^{post} i - E_j^{post} \pi\right)$ and consistently estimate ϕ_1

RESPONSE OF (PLANNED) SPENDING TO REAL INTEREST RATE EXPECTATIONS BY TREATMENT

	Type of treatment			
	Forward guidance	Inflation	Current/past interest rates	Pooled
	(1)	(2)	(3)	(4)
Good time to buy a durable good				
Post-treatment $Ei - E\pi$	-0.093***	-0.072**	-0.005	-0.050***
	(0.030)	(0.030)	(0.028)	(0.019)
Pre-treatment $Ei - E\pi$	0.015***	0.011**	-0.001	0.010***
	(0.004)	(0.005)	(0.004)	(0.002)
Observations	17,071	5,370	3,387	23,081
R-squared	0.107	0.023	0.061	0.001
1st stage F-statistic	18.39	48.19	37.52	37.21

Revisions in expected real interest rates lead to changes in perceptions of whether now is a good time to buy.

CONCLUSION AND IMPLICATIONS

- Use a large scale RCT to compare the **causal effects of FG on households' expectations**
- Communications **beyond one year into the future**: **small effects** on expectations
    - consistent with individual *cognitive limitations* having broader economic effects
    - *contrasts* with financial markets (more weight on longer run forecasts)
- Communication about current and next period policy rates **as effective as** communication about current inflation or mortgage rates
- Households **revise** their views about nominal interest rates and inflation **in the same direction**
    - dampens the response of real interest rates to new information

CONCLUSION AND IMPLICATIONS

Forward Guidance Design

- **Optimal Horizon**: *shorter horizons* much more effective in moving household expectations as they *also convey information* about the current level of variables (which households are otherwise quite uninformed about)

- **Future instruments or targets**: persistence of treatment effects on expectations differs significantly
    - *transient effects* for inflation treatments/ *more persistent* for mortgage rates

Thank You!

NIELSEN CONSUMER PANEL

- Wave I (March 2019):
  - Collect:
    - background information (current demographics, recent spending, liquidity constraints, financial/numeric literacy, etc.)
    - expectations/ perceptions: mortgage rates, inflation (probability distribution), unemployment, etc.

What do you think is the percent chance that, over the next 12 months…

[RANGE OF EACH OPTION BELOW: 0-100 ALLOW FOR UP TO 2 DECIMAL POINTS]

the rate of *deflation (opposite of inflation)* will be 12% or more	_____
the rate of *deflation (opposite of inflation)* will be between 8% and 12%	_____
the rate of *deflation (opposite of inflation)* will be between 4% and 8%	_____
the rate of *deflation (opposite of inflation)* will be between 2% and 4%	_____
the rate of *deflation (opposite of inflation)* will be between 0% and 2%	_____
the rate of *inflation* will be between 0% and 2%	_____
the rate of *inflation* will be between 2% and 4%	_____
the rate of *inflation* will be between 4% and 8%	_____
the rate of *inflation* will be between 8% and 12%	_____
the rate of *inflation* will be 12% or more	_____
% Total	_____

NIELSEN CONSUMER PANEL

- Wave I (March 2019):
  - Collect:
    - background information (current demographics, recent spending, liquidity constraints, financial/numeric literacy, etc.)
    - expectations/ perceptions: mortgage rates, inflation (probability distribution), unemployment, etc.

What is your best guess about what the current unemployment rate in the U.S. is and what it will be in 12 months?

Current UE rate: _____% [RANGE: 0-100, ONE DECIMAL]

UE rate in 12 months: _____% [RANGE: 0-100, ONE DECIMAL]

EXPECTED UNEMPLOYMENT RATE