How Resilient is Mortgage Credit Supply? Evidence from the COVID-19 Pandemic

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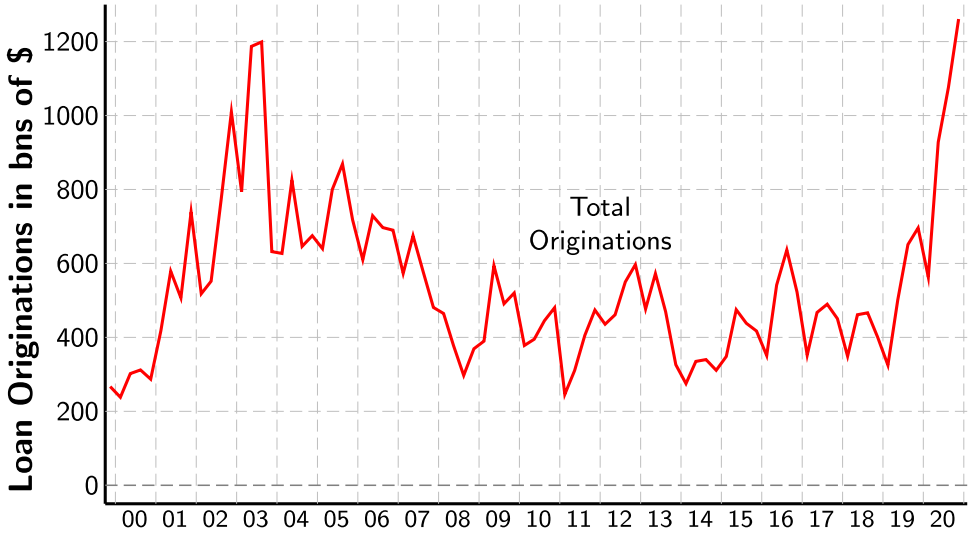
The mortgage marked boomed in 2020

- 2020 was an extraordinary year for the US mortgage market:
  - $\approx$ **$4tr** of mortgage originations, a new record
  - 30-year fixed rate fell below **3%** for first time
  - Surge in profits for lenders (e.g., Rocket: $9.4bn; up 950%)



2000-2020 Quarterly Originations, Source: Mortgage Bankers Association

Particularly striking given concerns at start of pandemic

- How would servicers make payments on mortgages in forbearance?
- Would mortgage intermediaries fail? (nonbank lenders, REITs etc.)
- With virus, lockdowns etc., how would loans get closed?
- Who would buy houses? Would home prices fall?

Virus scare creates perfect storm for mortgage lenders

By Kate Berry, Allissa Kline March 19, 2020, 9:30 p.m. EDT 9 Min Read

March 27, 2020

Mortgage Relief Could Cripple Loan Servicers

Forbearance programs would cause liquidity problems for nonbank mortgage providers, the industry says.

Social distancing likely to affect physical mortgage closings

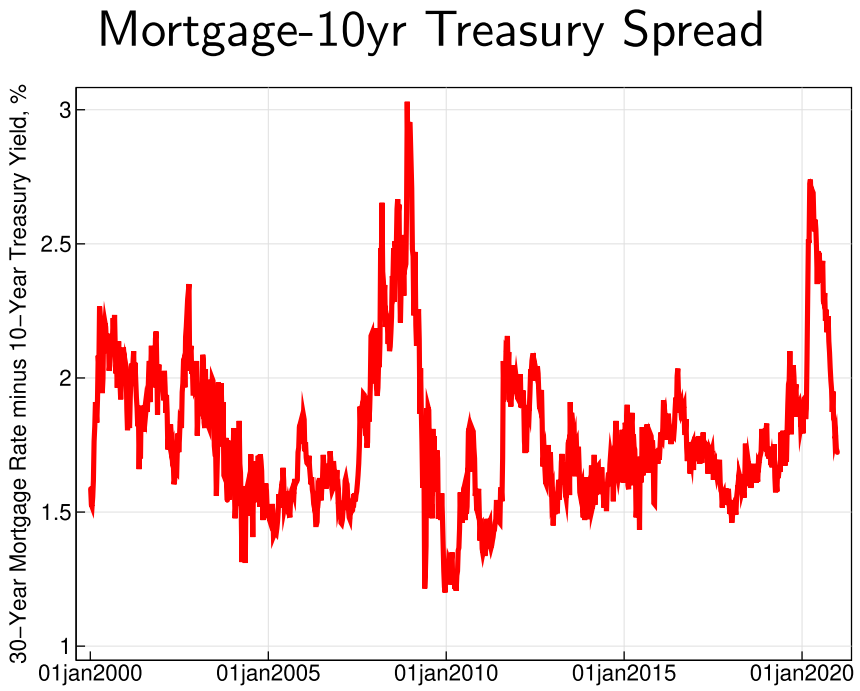
By Brad Finkelstein March 16, 2020, 12:41 p.m. EDT 6 Min Read

Mortgage REITs Come Under Stress That Even the Fed Might Not Be Able to Ease

By Alexandra Scaggs March 24, 2020 2:09 pm ET

But despite good news, market functioning far from normal

- Mortgage rate spread to Treasuries spiked 50-100bp, to levels near 2008 crisis
- Industry reports of tighter credit standards and rationing



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Question: Did pandemic lead to tighter mortgage credit supply? If so, *how* and *why*?

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Findings:

1. High mortgage spread entirely due to markup in primary market. MBS spread actually *down* (except March 2020). Stark contrast to 2008.

2. Markup usually rises with demand; but this explains only part of 2020 increase. Supply elasticity low. Interpretation: operational challenges / frictions.
   - Labor mkt frictions & shift to fintech (easier to scale).

3. Rates up for loans with high default risk for lender (e.g, jumbo, low-FICO FHA)

4. Fed QE supported mortgage supply. (Identification: features of TBA mkt)

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Data

- Optimal Blue: platform that processes $\approx 1/3$ of U.S. mortgage originations
  - Rate locks. Lock-level information including note rate, net points/rebates, date/time-stamp, loan characteristics, location, lender/branch ID.
  - Offer rates ("OB Insight"). Note rates and net rebates offered by lenders for menu of different mortgage contracts (held fixed over time). 20 cities.
- J.P. Morgan Markets: MBS prices, yields, OAS, option cost.
- SitusAMC: Values of mortgage servicing rights.
- MBA Quarterly Performance Report: Lender income and costs.
- Freddie Mac Primary Mortgage Market Survey: headline mortgage rates.
- HMDA: Geographic market characteristics (e.g., concentration).
- McDash: Composition of mortgage originations.
- Google trends; Ahrefs: Shopping.
- NY Times Github: County-level daily COVID cases & fatalities.

Decomposition of mortgage-treasury spread

$$FRM_{30yr} - UST_{10yr} = \underbrace{FRM_{30yr} - \text{MBS yield}}_{\text{primary-secondary spread}} + \underbrace{\text{MBS yield} - UST_{10yr}}_{\text{MBS yield spread}}$$

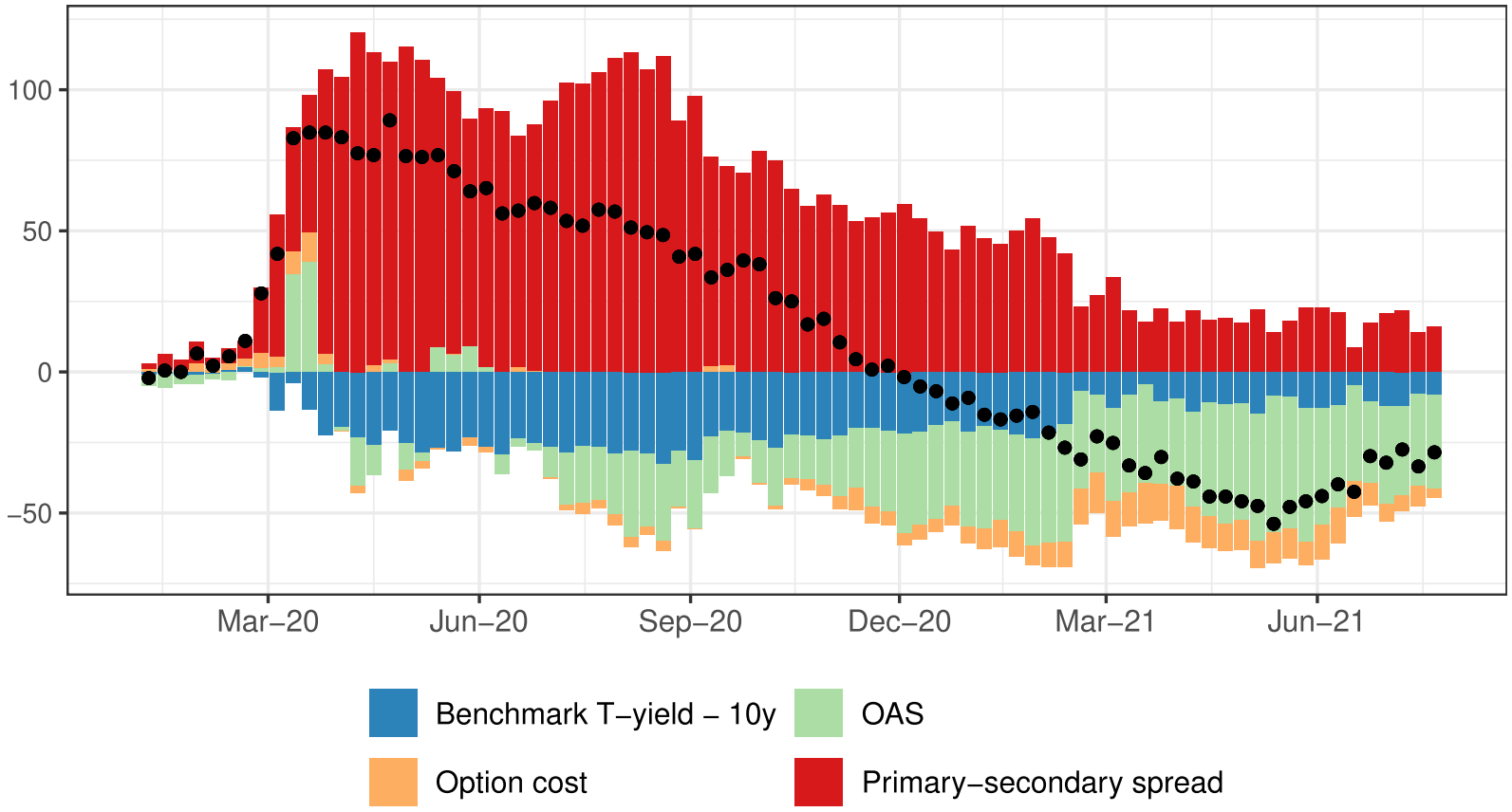
where *MBS yield* is the yield corresponding to new production MBS (with coupon $= \text{FRM}_{30yr} - 59\text{bp g-fee} - 25\text{bp servicing fee}$)

The second term can be further decomposed into:

$$\text{MBS yield} - UST_{10yr} \approx \underbrace{\left(UST_{dur} - UST_{10yr}\right)}_{\text{duration adjustment}} + \text{Option Cost} + \text{Option-Adjusted Spread (OAS)}$$

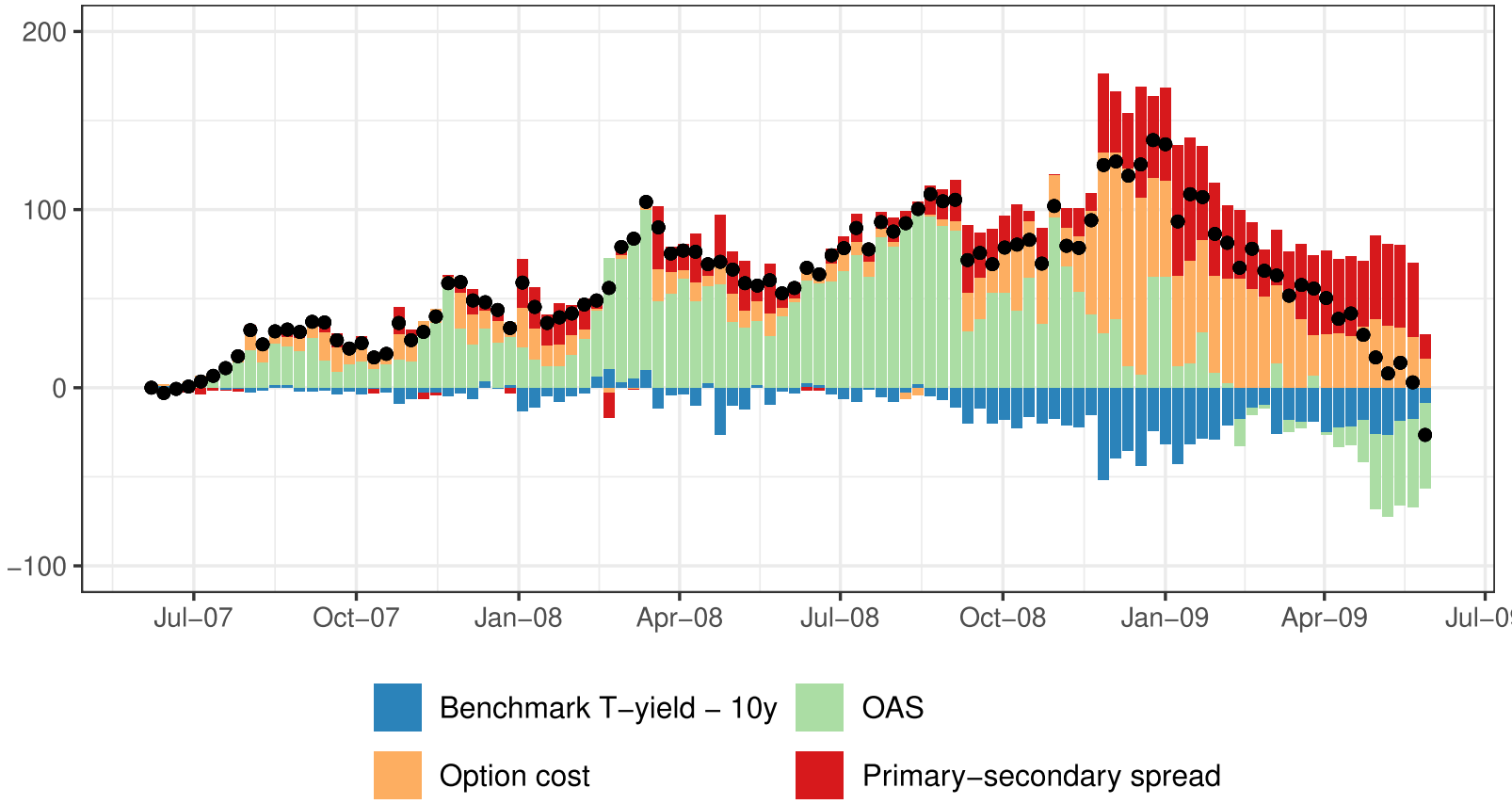
Decomposition of Mortgage-Treasury spread

High mortgage rate due to primary-secondary spread. Up 120bp (peak); 10-20bp (now)



Contrast to 2007-09 financial crisis

In 2007-09, high mortgage rates due to MBS mkt dislocation, not primary market



Gain-on-sale: alternative measure of price of intermediation

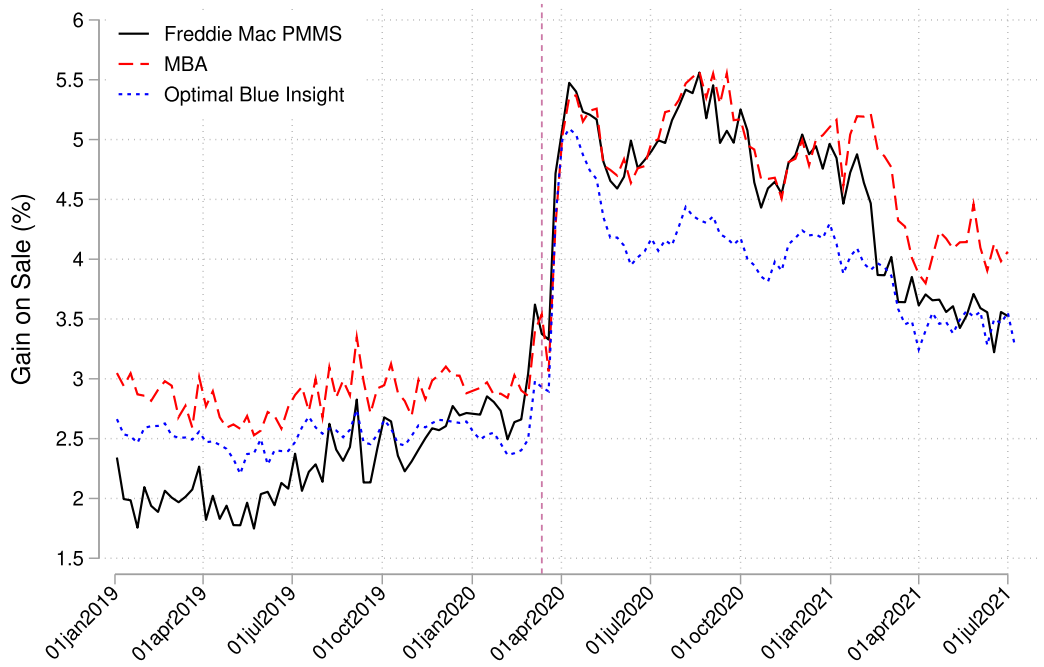
Net gain from originating mortgage, then securitizing it and selling servicing rights

$\rightarrow$ Direct markup (Fuster et al. 2017); reflects PV of primary-secondary spread.

$$\text{gain-on-sale}_{r_m} = \underbrace{p_{MBS}^{r_m-g-s} - fee_{GSE}}_{\substack{\textbf{mortgage value ex servicing rights} \\ \text{(net of upfront \& flow g-fees)}}} + \underbrace{(s \times m)}_{\substack{\textbf{value of} \\ \textbf{servicing} \\ \textbf{rights}}} - \underbrace{(100 - points)}_{\substack{\textbf{net amount} \\ \textbf{paid to borrower}}}$$

- To compute gain-on-sale:
  - MBS prices (p_{MBS}): J.P. Morgan Markets (TBA market)
  - servicing multiples (m): SitusAMC (based on secondary market trades etc.)
  - mtg rates r_m & points: Freddie Mac PMMS, MBA or Opt Blue Insight

Evolution of gain-on-sale



- Sharp rise in gain-on-sale ($\approx$ 150-250bp).
  - In line with industry data (e.g., Rocket/Quicken 10-Q: $\approx$ 200bp rise in 2020:Q2)
  - Given $>$\$3tr originations in Q2-Q4, estimate total gain-on-sale of \$162bn, or \$80bn additional income for lenders relative to gain-on-sale at 2.5%

Punchline: Sharp rise in intermediation markups. Why?

1. **Capacity constraints?** Mortgage markups typically rise during refi booms, because supply not perfectly elastic (Fuster et al. 2017)

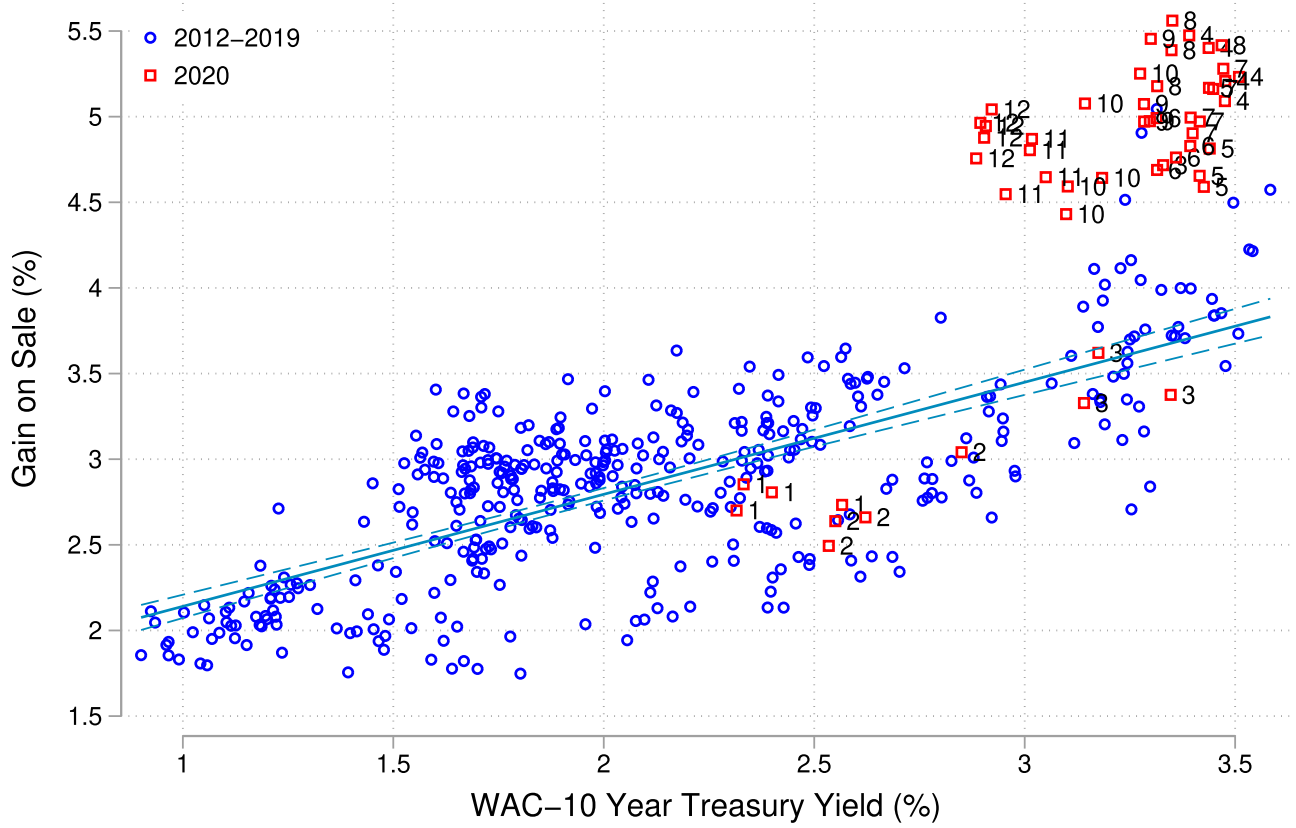
   $\Rightarrow$ Not sufficient to explain magnitude of increase in 2020

   $\Rightarrow$ We find evidence that **operational challenges** related to pandemic made credit supply particularly inelastic

2. **Other explanations?** Able to rule out several alternatives (see paper for details)
   - Forbearance and default risk
   - Macro and health shock
   - Market power and shopping

Capacity constraints: evidence

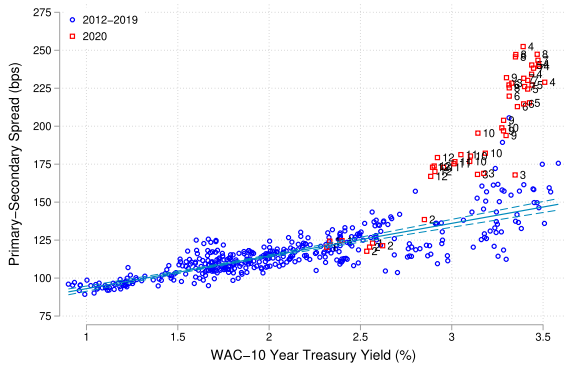
Gain on sale vs refinancing incentive [Mortgage WAC - 10 yr Tsy]



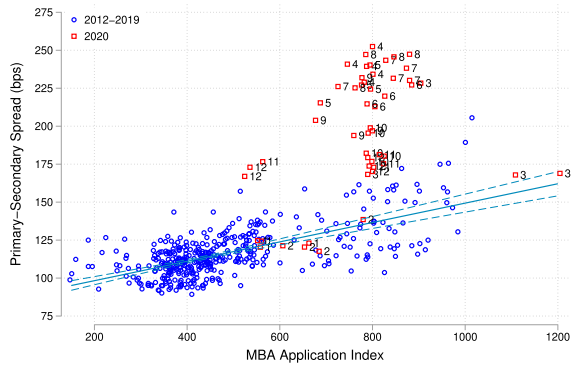
Notes: numbers next to red squares denote the calendar month in 2020. Trend line based on data from 2012-2019.

Intermediation markups vs demand: four measures

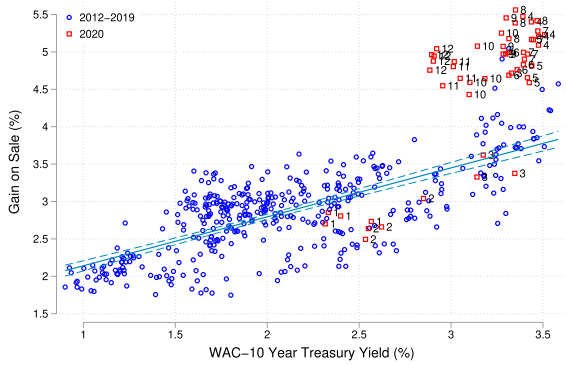
prim-sec spread vs. refi incentive



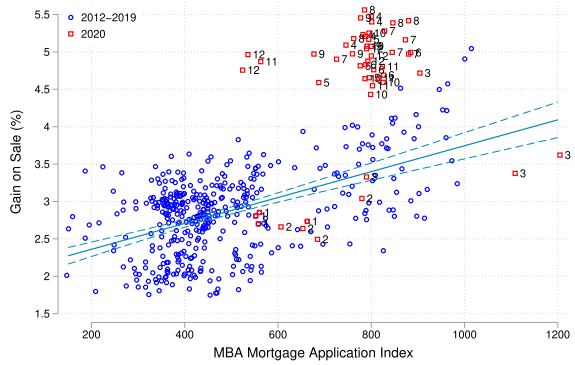
prim-sec spread vs application vol



gain-on-sale vs. refi incentive



gain-on-sale vs. application vol

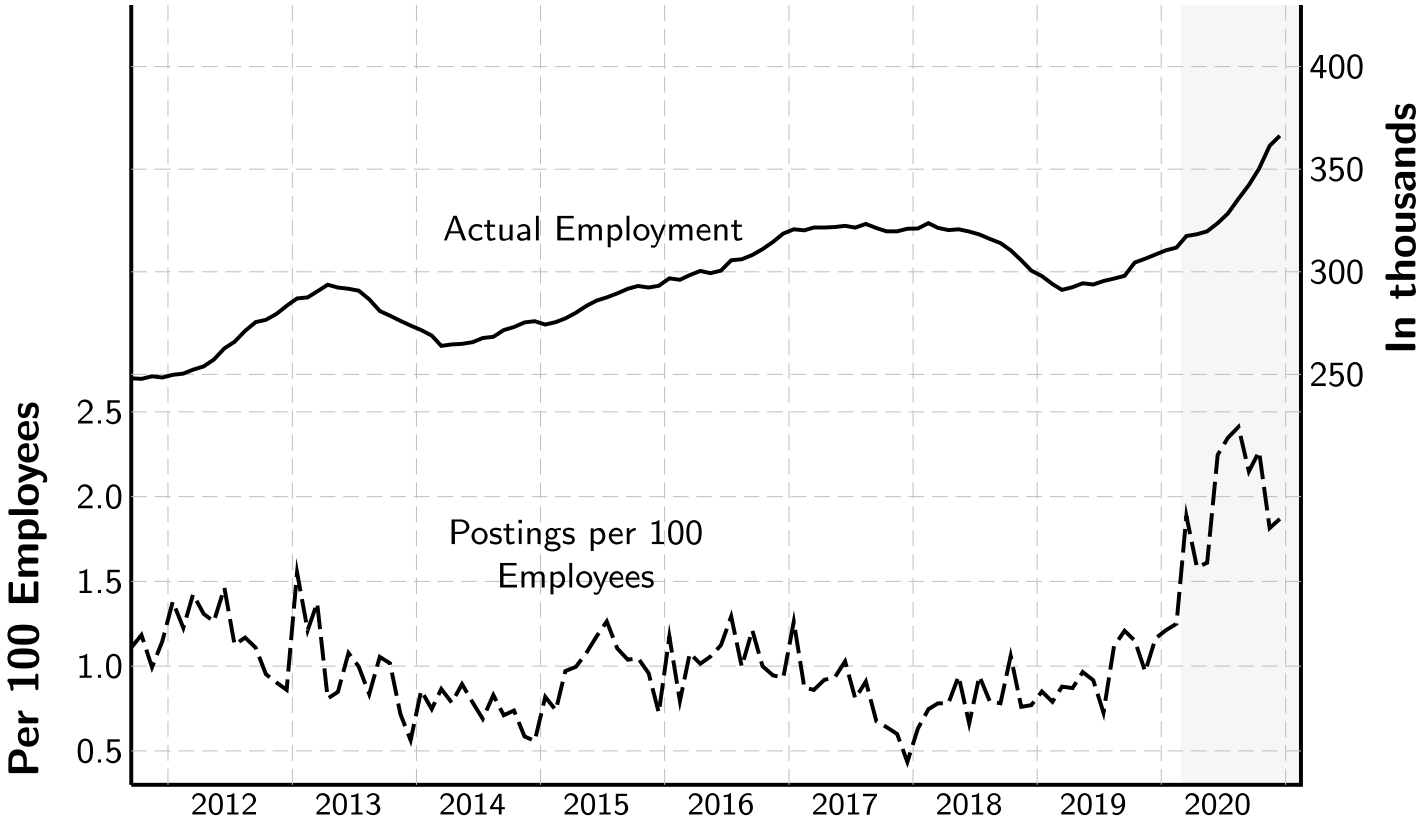


Regressions: "excess" GOS of \$1-1.50; historical relation explains only 20-40% of rise.

Operational issues contributing to less elastic mortgage supply

1. Challenges in originating and closing loans:
   - Hard to document borrower employment & income (many businesses closed + high rate of job loss required frequent rechecking of employment status)
   - County recorder offices closed or on limited schedules
   - Property appraisals, notarized closing etc. more difficult due to social distancing
2. Labor market frictions:
   - Practitioners say hard to train & monitor new mtg employees due to remote work
   - Preference for experienced, well-trusted hires (often poached from competitors)
3. Licensing:
   - New loan officers (or moving across banks / states) must be licensed through NMLS
   - Most testing and fingerprinting locations closed in first phase of pandemic

Figure: **Mortgage Loan Officer Job Postings and Employment Growth**



Sources: BLS Establishment Survey and Burning Glass Technologies.

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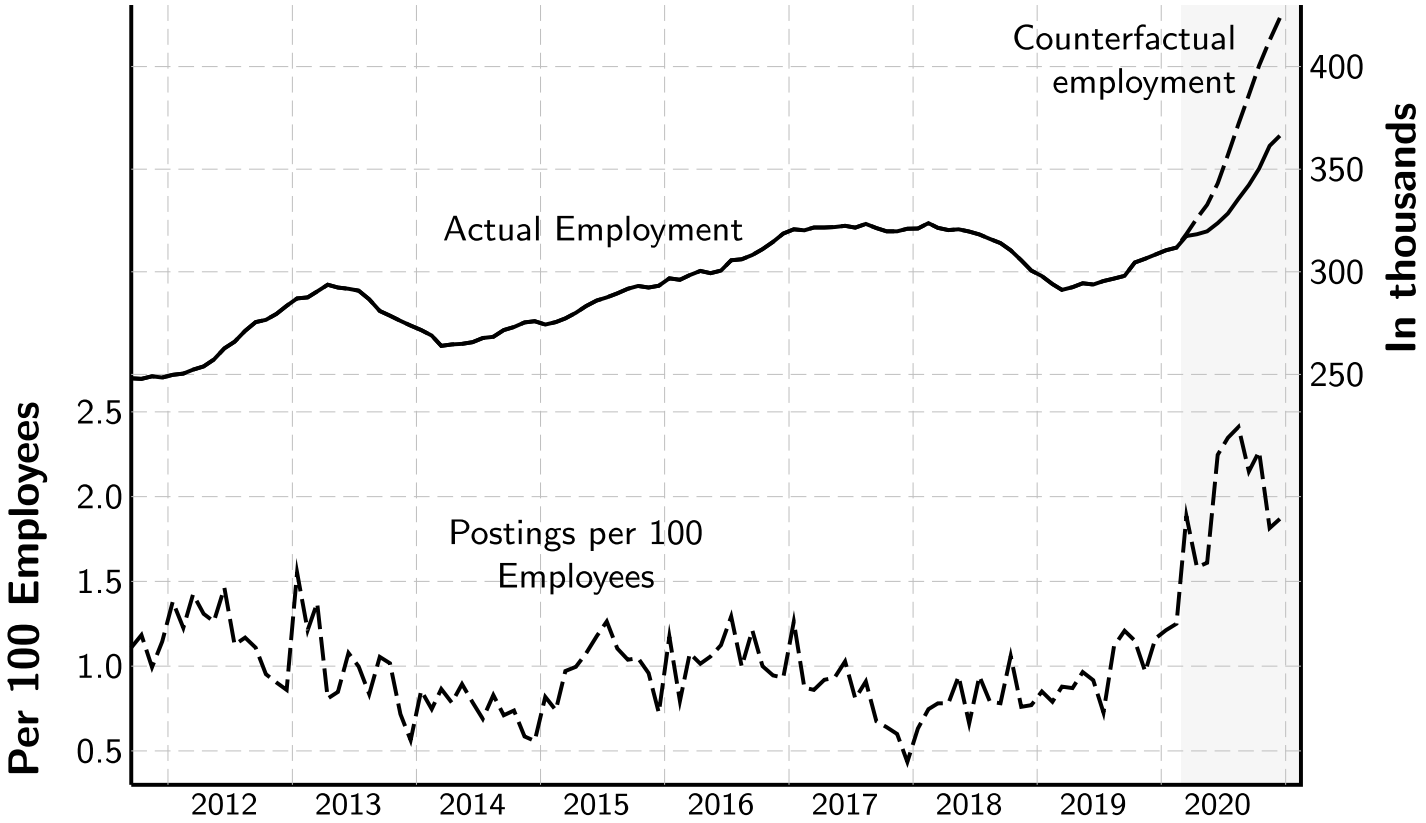
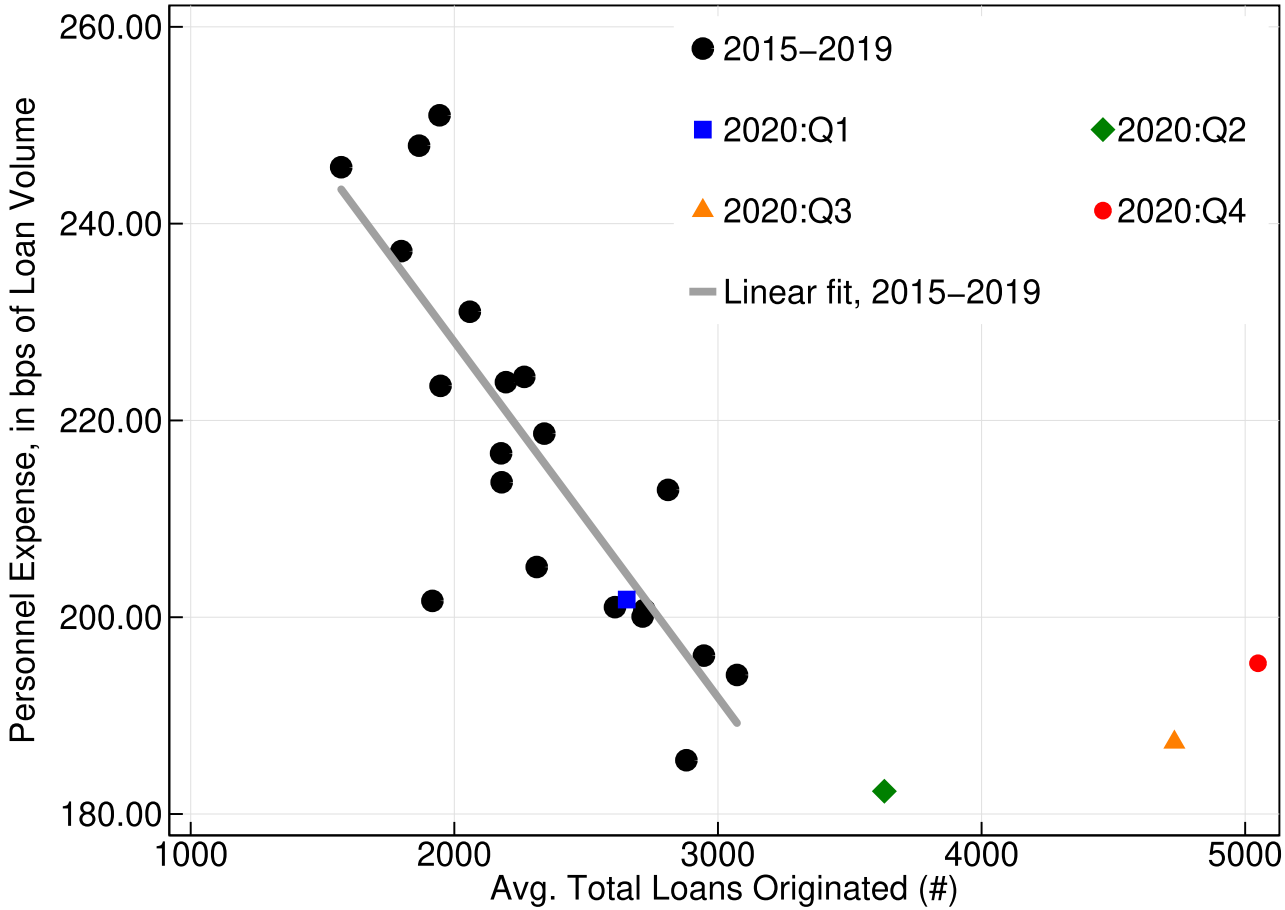


Sources: BLS Establishment Survey and Burning Glass Technologies. Counterfactual based on regression $\log MLO_{t+1} - \log MLO_t = \alpha + \beta_1 p_t + \beta_2 p_{t-1} + \beta_2 p_{t-2} + \varepsilon_t$ over 3/2012-12/2020.

Per unit labor costs vs. volume



Source: Mortgage Bankers Association Quarterly Performance Report

Growth in technology-based lending

- **Finding:** shift to fintech (greater automation) for loans that are labor-intensive to underwrite and close: purchase mtgs, low FICO loans (Sharpe & Sherlund, 2016)

Dependent variable = 100 if mortgage originator is a fintech lender, zero otherwise

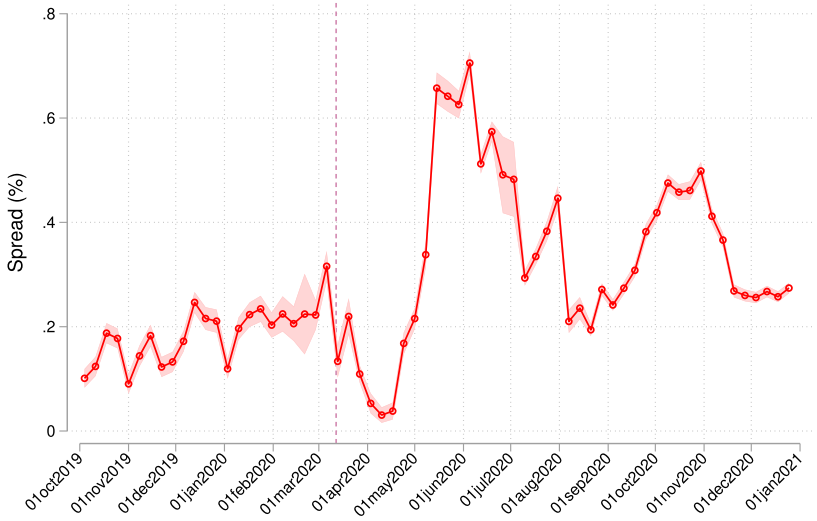
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Purchase Mortgages			Refinancings			All Loans		
Pandemic	2.74***	2.17***	1.48***	-0.78	-0.33	-0.79∼	4.20***	1.71***	1.32***
	(0.28)	(0.27)	(0.26)	(0.62)	(0.35)	(0.39)	(0.29)	(0.27)	(0.26)
Pandemic × FICO<680			2.67***			4.04***			2.10***
			(0.26)			(0.34)			(0.21)
Num obs.	5147358	5147358	5147358	5473513	5473513	5473513	10620871	10620871	10620871
Mean of dep. var.	10.74	10.74	10.74	27.14	27.14	27.14	19.19	19.19	19.19
Loan controls	N	Y	Y	N	Y	Y	N	Y	Y

Standard errors clustered by state. $\sim p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

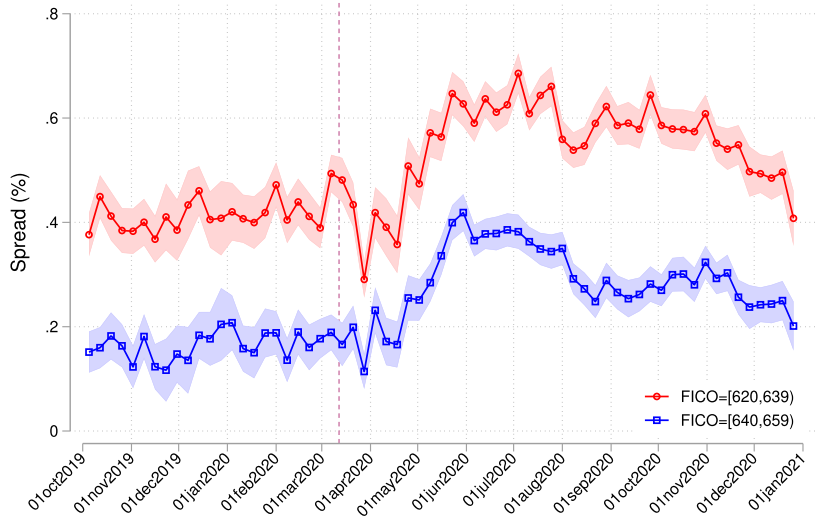
FHA market: Delinquency/forbearance risk priced into mortgage rates

- Higher rates for FHA loans to low-FICO borrowers.
  - **Other evidence:** Many lenders also exit FHA + drop in low FICO share of purchase loans + rise in FHA-conforming rate spread (see paper)

Offer Rate Spread: FICO 640 vs 680



Rate lock spread by FICO (vs 680-699)



$$\text{rate}_{ilmt} = \alpha_{mt} + \delta_{lt} + \beta_t \times \text{FICO bin}_i + \Gamma X_{ilmt} + \varepsilon_{ilmt},$$

Jumbo lending and the role of government interventions

- Relative drop in origination volume above thresholds for:
  1. Jumbo loans: no govt guarantees (above conforming limit)
  2. "Superconforming" loans: still guaranteed but lower eligibility for Fed QE
- Highlights role of government interventions in supporting credit supply

Dependent Variable = 100 if mortgage is above national or local conforming loan limit

	superconforming (> nat. CLL)			jumbo (> local CLL)		
	(1)	(2)	(3)	(4)	(5)	(6)
Pandemic	-5.175***	-6.487***	-7.825***	-8.604***	-12.68***	-11.14***
	(0.319)	(0.191)	(0.179)	(0.293)	(0.372)	(0.273)
Origination type	Purchase	Refinance	All	Purchase	Refinance	All
Loan controls	Y	Y	Y	Y	Y	Y

Sample: mortgages in high-cost areas within 10% of applicable loan limit.

Closing remarks

- Record boom, but intermediation frictions limited pass-through of low rates
  - Capacity constraints exacerbated by operational challenges during pandemic
  - **150-250bp** rise in gain-on-sale. **$80bn** in super-normal intermediation margins.

- Govt played significant role (credit guarantees + QE) in supporting credit supply
  - ... but guarantees not enough to fully insulate riskier lending in FHA market

- Results highlight benefits of mortgage designs that adjust automatically to downside shocks (e.g. ARMs; Eberly-Krishnamurthy 2014 design)