

End of the Line: Behavior of Credit-constrained HELOC Borrowers

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FDIC Consumer Research Symposium

Arlington, VA

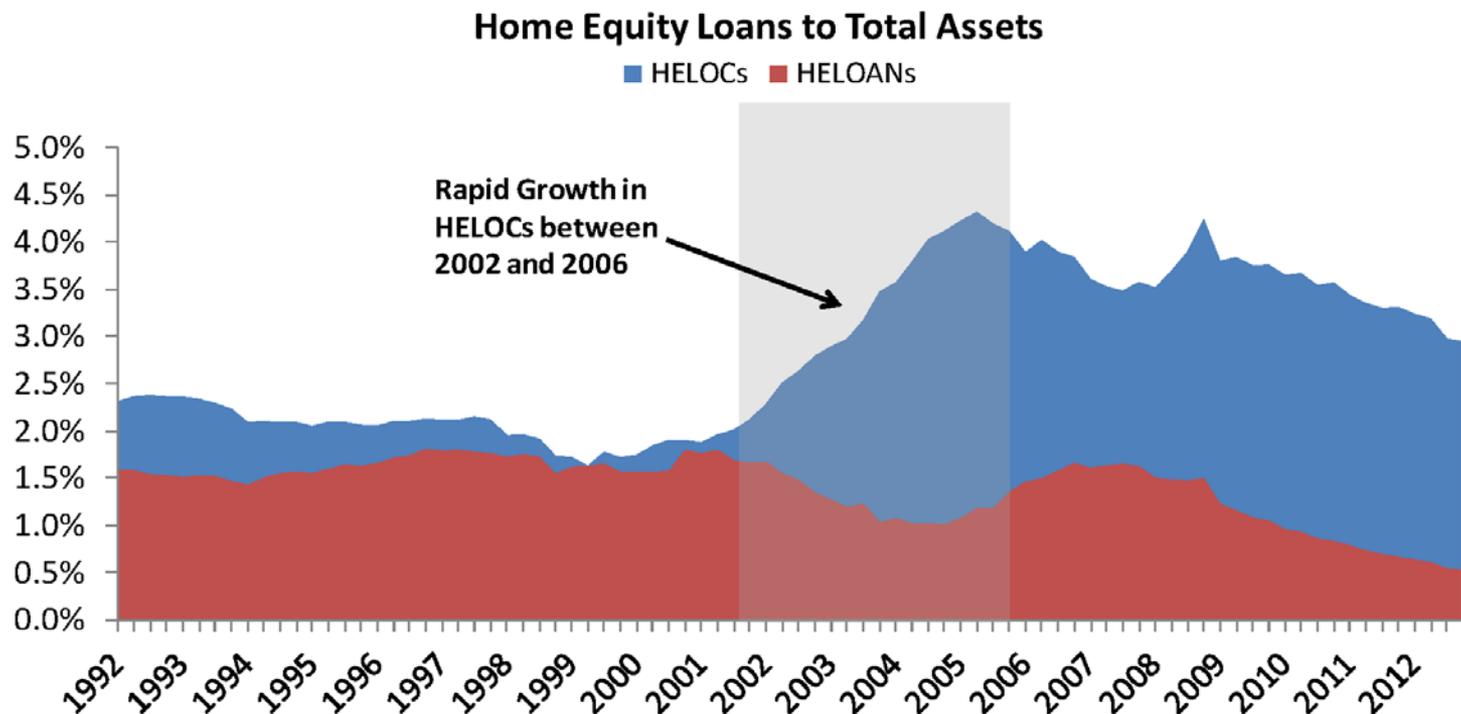
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Disclaimer

The opinions expressed here do not necessarily represent the views of the Federal Reserve Board or the Federal Reserve System.

Motivation

- HELOC balances at banks grew rapidly between 2002 and 2006, and now represent the majority of home equity exposure at banks.



Source: FR Y-9C, all BHCs.

Motivation

- Borrowers owed nearly \$390 billion on HELOCs to the largest bank holding companies as of December 2013
- Under a typical HELOC, borrowers make only interest payments on outstanding debt during the draw period, and the loan converts to close-end amortizing loans at the end of the draw period.
- Nearly 60 percent of outstanding HELOCs will reach the end of their draw (EOD) periods in the next several years
 - Required payments will increase for many borrowers, and
 - Renewed demand for credit if borrowers wish to maintain the same household leverage
- Often borrowers repay or refinance just prior to end of draw
 - But may have insufficient income or assets
 - Or may not be able to refinance
 - Will the increase in required payments that accompany EOD affect default rates?

Related literature

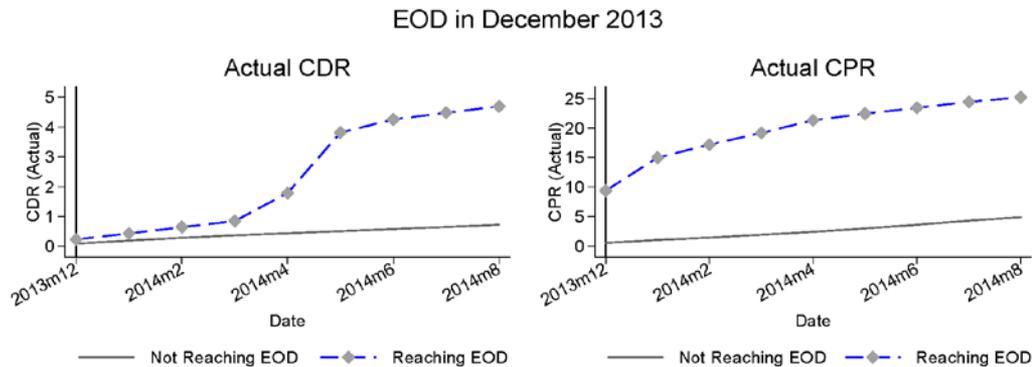
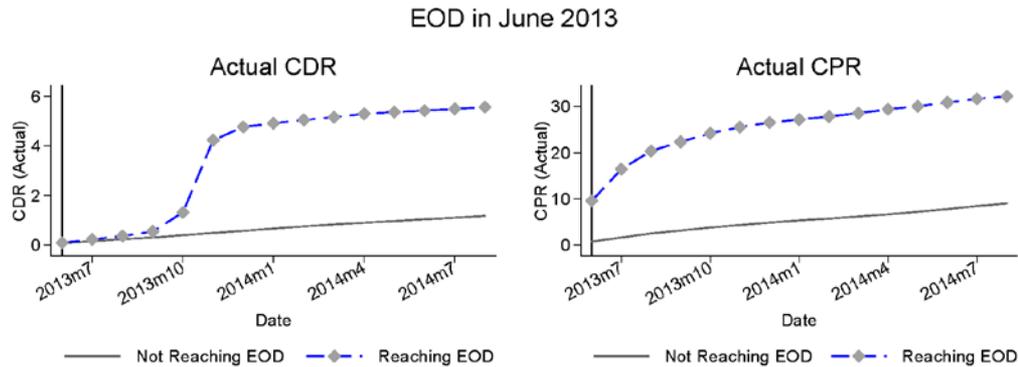
- Mortgage payment size and negative equity play roles
 - e.g. Deng, Quigley, and van Order (2000) or Campbell and Cocco (2011)
- Payment reductions can result in lower default rates
 - e.g. Fuster and Willen (2013), Tracy and Wright (2012)
- People versus products debate – Did complicated financial products exacerbate the crisis?
 - e.g. Mayer, Pence, and Sherlund (2009), Garmaise (2013)

This paper

- How do payment changes associated with HELOC recasts affect default behavior of borrowers with different credit characteristics?
- To identify the effect of a payment change stemming from end of draw on default and payoff decisions of borrowers, we
 - Use loan level data on interest-only HELOCs
 - Avoid the most severe selection bias by observing the payoff and default performance of pools of loans starting several months before the payment change occurs
- We can only identify when loans reach EOD since June of 2012, so we focus on HELOCs that survived until the second half of 2012, and reach EOD in the second half of 2013.
- What do the data look like?

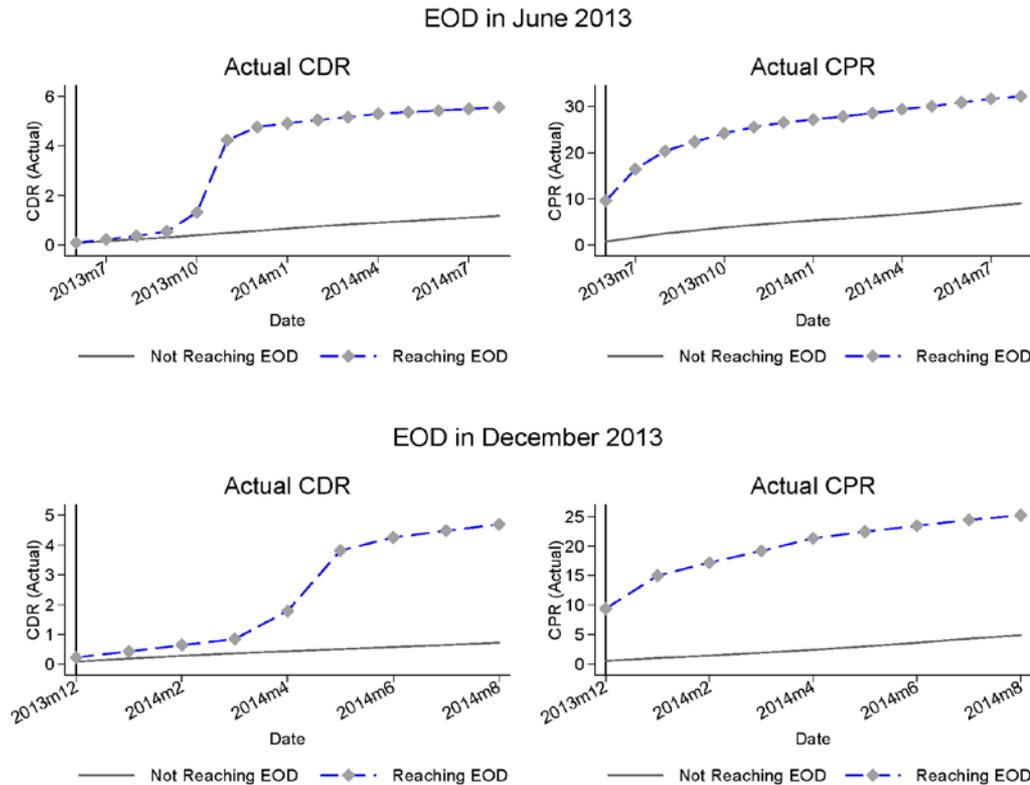
Some pictures...

- A first look at empirical CDRs starting at EOD suggest there is an effect.



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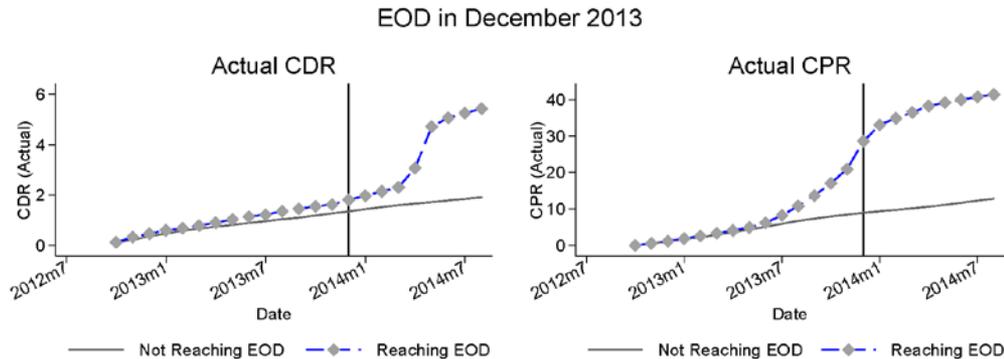
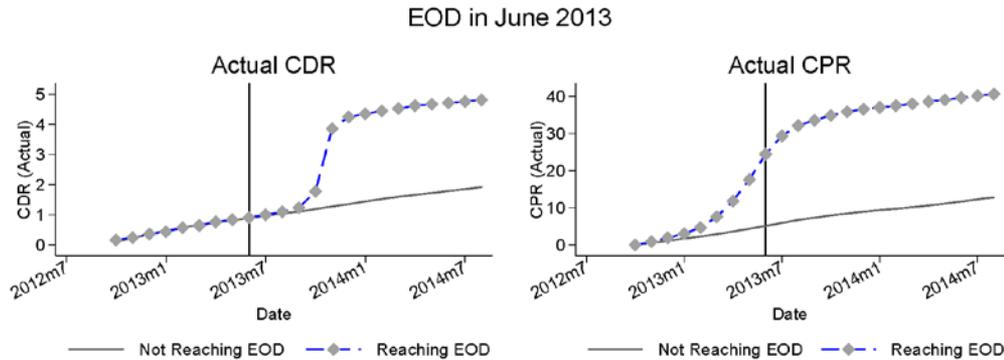
- A first look at empirical CDRs starting at EOD suggest there is an effect.



- But...treatment and sample selection effects comingled

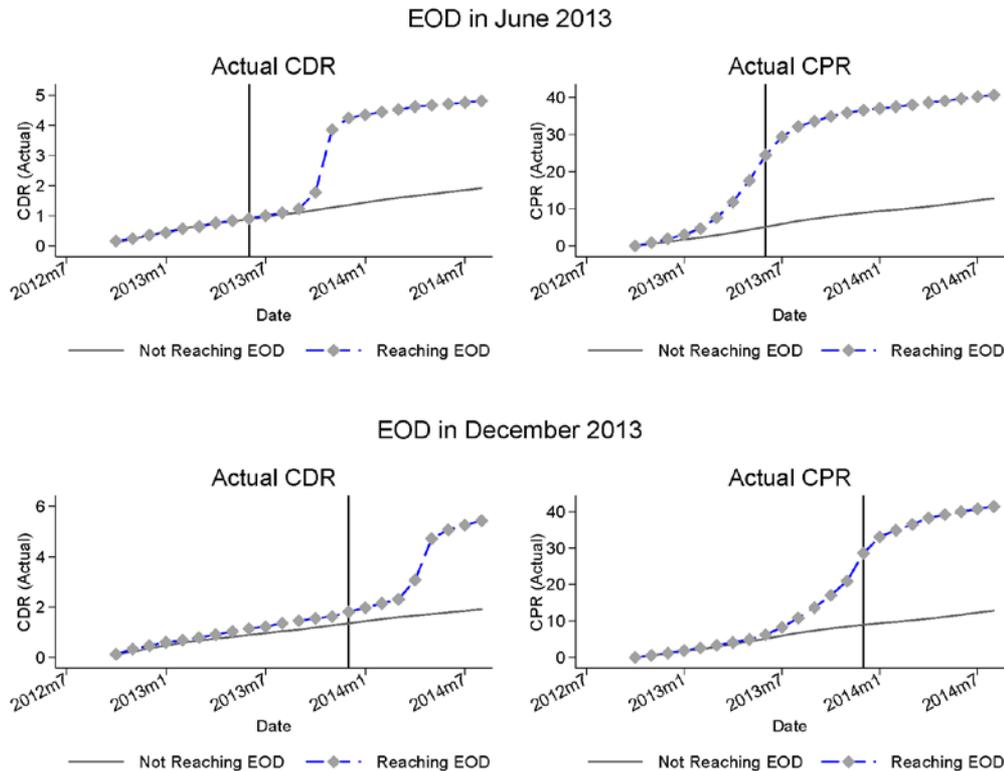
Some more pictures...

- To get a sense of the selection bias, we calculate CDRs starting several months before EOD.



Some more pictures...

- To get a sense of the selection bias, we calculate CDRs starting several months before EOD.



- But...we're not controlling for differences in collateral, loan and borrower characteristics.

Sample statistics

	Reaching EOD?	
	No	Yes
Number of Loans:	77,973	54,534
Higher Risk, %	22%	32%
Junior Lien, %	63%	74%
In CA, FL, AZ, or NV, %	16%	34%
UPB > \$50,000, %	30%	38%

- Of HELOCs reaching EOD:
 - Larger share are *higher risk* – FICO < 725 and CLTV > 80
 - Larger share junior lien
 - Larger share in “sand states”
 - Large share have more than \$50 k in UPB

So we build a model

- Competing hazard model of default and payoff estimated on panel of HELOC performance data covering January 2002 to June 2012
- Model captures factors influencing
 - Payoff incentive
 - Rate spread
 - Term spread
 - Strategic default incentive
 - Refreshed CLTV
 - Other factors
 - FICO at origination
 - Change in unemployment rate since origination
- Other controls
 - Dummies for junior lien and states
- Baseline hazard modeled as piecewise linear spline function of duration

Identification strategy

- We calculate the effect of end of draw on default:

$$\epsilon_{eod=1}^D(T) = H^D(T) - \widehat{H^D(T)}$$

$$\epsilon_{eod=0}^D(T) = H^D(T) - \widehat{H^D(T)}$$

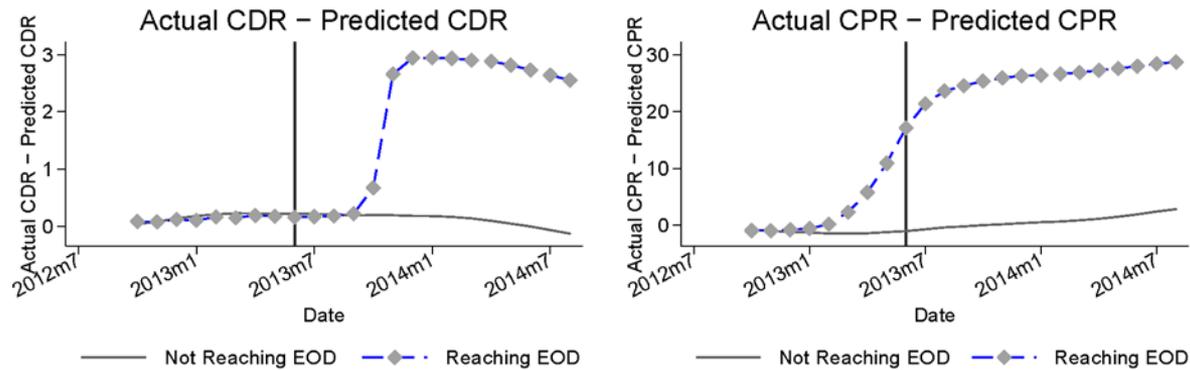
$$EOD(T) = \epsilon_{eod=1}^D - \epsilon_{eod=0}^D$$

- $H^D(T)$: T period empirical cum. default rate
- $\widehat{H^D(T)}$: T period model predicted cum. default rate
- Identification assumption:
 - Prediction errors calculated over period that includes all attrition driven by change in payment size

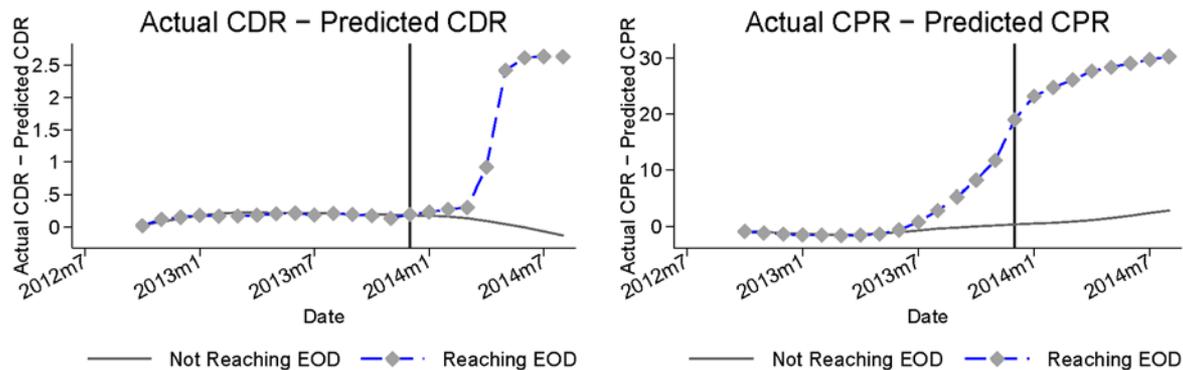
EOD effects in months around EOD

- Controlling for differences in loan and borrower characteristics using model

EOD in June 2013

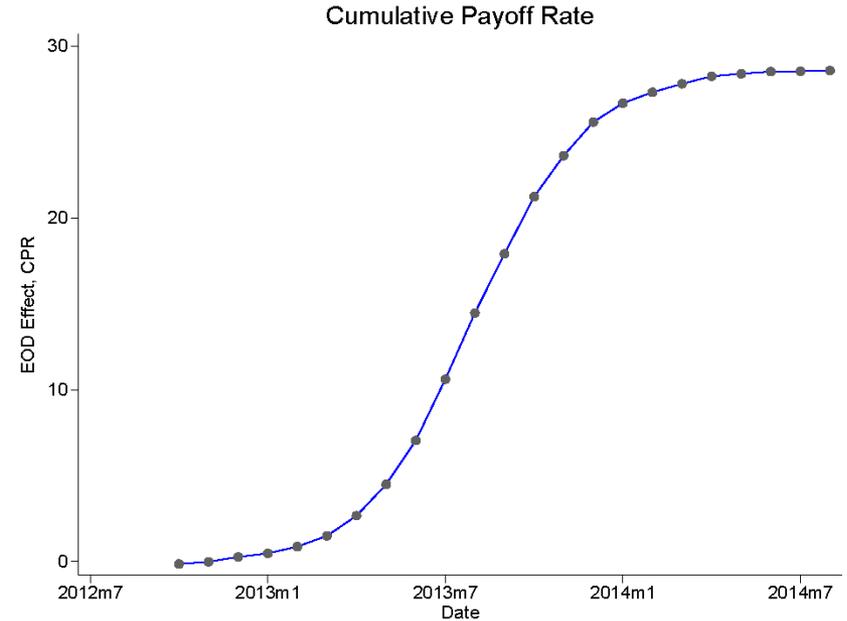
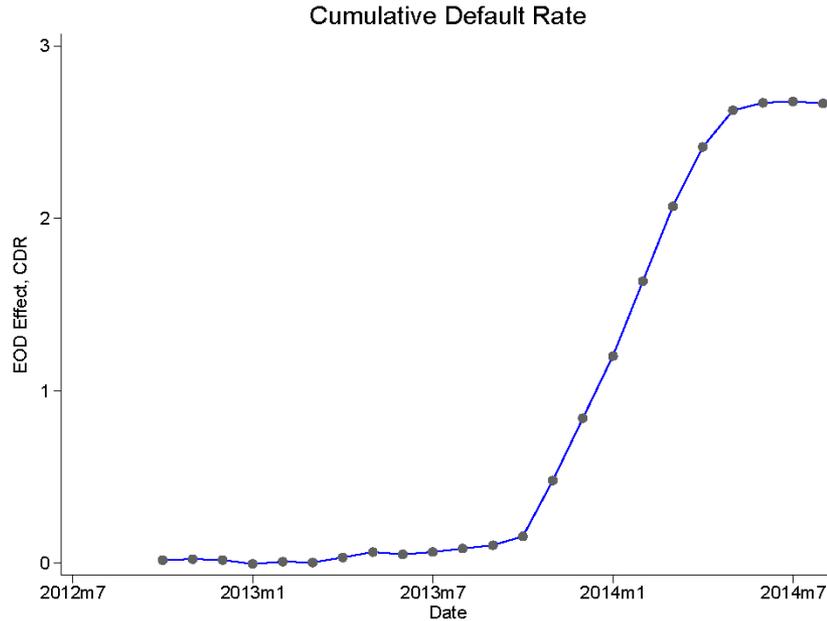


EOD in December 2013



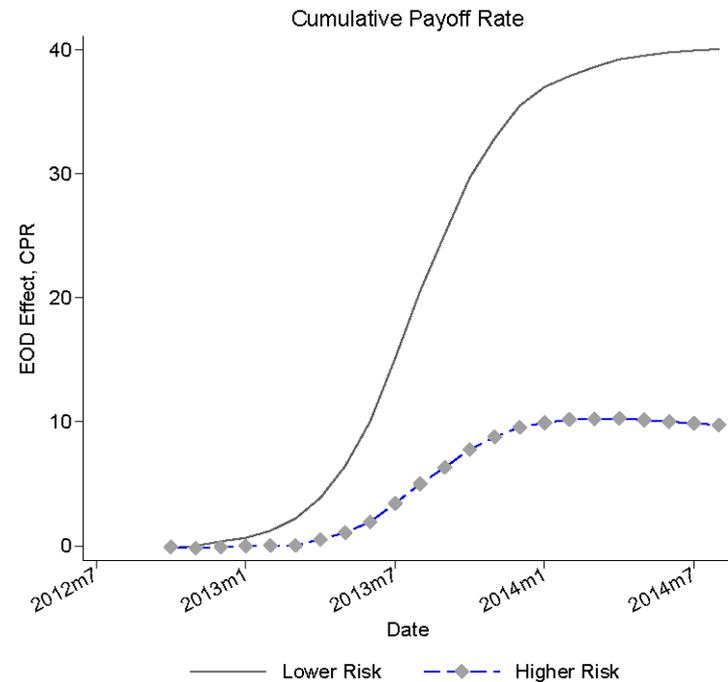
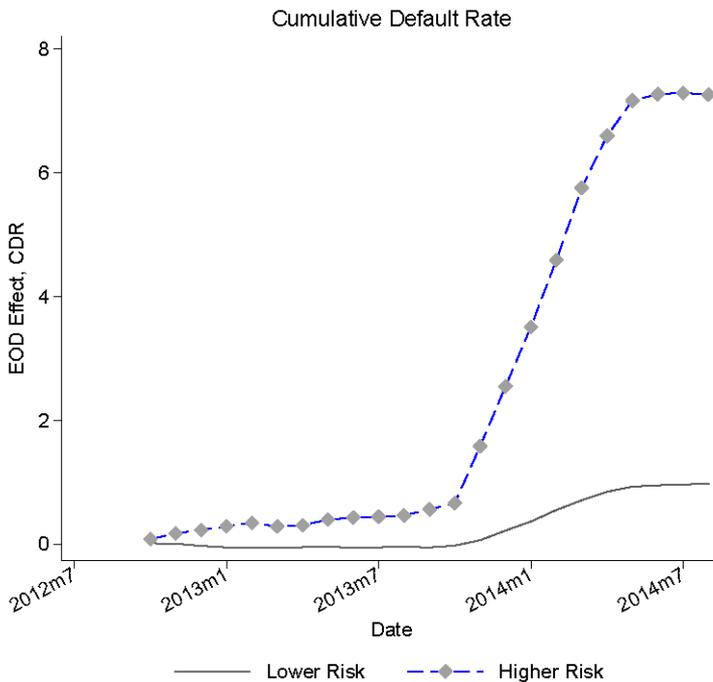
EOD effect

- Now we pool all HELOCs into two groups: (1) reaching EOD in second half of 2013 and (2) reaching EOD in 2015 or later



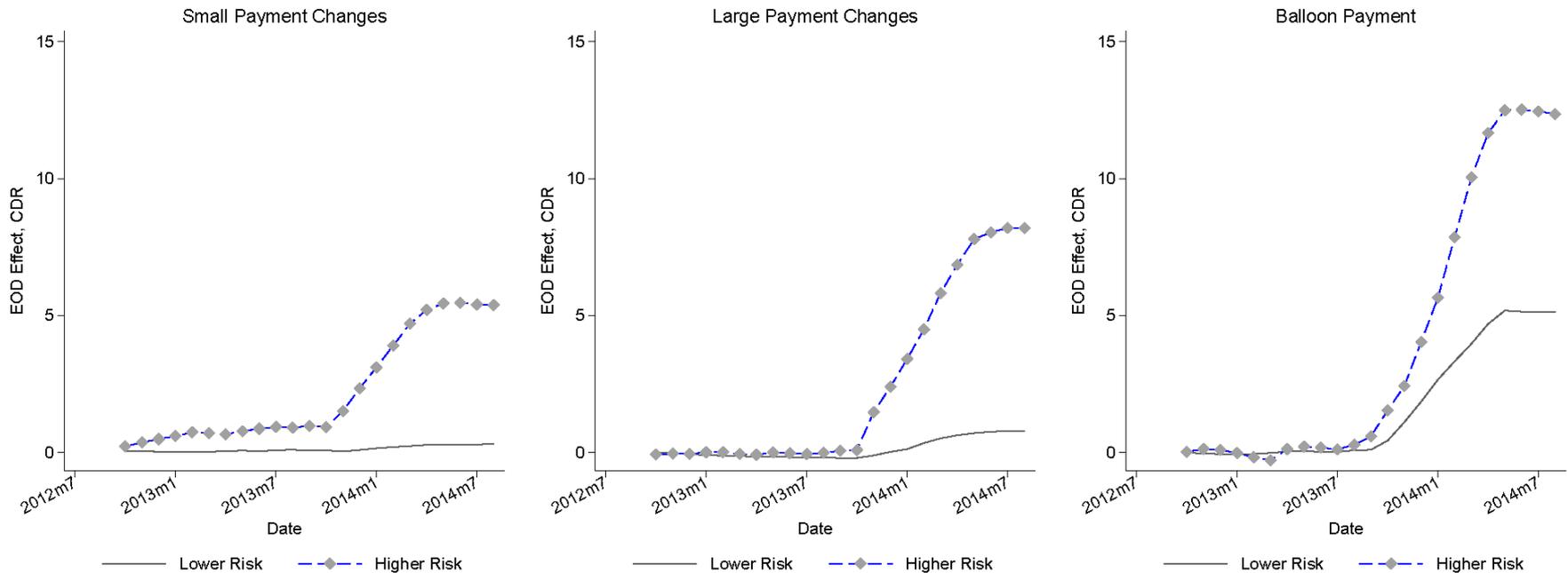
Does borrower credit quality matter?

- EOD effect for lower and higher risk HELOCs
 - Lower risk HELOCs have orig. FICO above 725 and CLTV below 80
 - Higher risk HELOCs have orig. FICO below 725 and CLTV above 80



What is the role of the size of payment change?

- EOD effect for lower and higher risk HELOCs, by payment change size segments



Assessing the significance of the EOD effect

- We want to test:

$$EOD(T) = \epsilon_{eod=1}^D - \epsilon_{eod=0}^D > 0$$

- We use a bootstrap-like approach to construct a sample of model errors by:
 - Whether or not loans reach EOD
 - Credit quality segments
 - Payment change size segments
- Regressions of model errors on segment dummies are in the table on next slide

Assessing the significance of the EOD effect

	(1)	(2)	(3)	(4)
Constant	0.034*** [0.000]	0.021*** [0.000]		
EOD Dummy		0.029*** [0.001]		
Lower Risk			0.010*** [0.000]	0.010*** [0.000]
Other			0.028*** [0.000]	0.028*** [0.000]
Higher Risk			0.044*** [0.001]	0.044*** [0.000]
EOD, Lower Risk			0.006*** [0.000]	
EOD, Other			0.030*** [0.000]	
EOD, Higher Risk			0.088*** [0.001]	
EOD, Lower Risk, Small Paychange				0.002*** [0.000]
EOD, Lower Risk, Large Paychange				0.004*** [0.000]
EOD, Lower Risk, Balloon HELOC				0.036*** [0.001]
EOD, Other, Small Paychange				0.014*** [0.000]
EOD, Other, Large Paychange				0.028*** [0.000]
EOD, Other, Balloon HELOC				0.108*** [0.001]
EOD, Higher Risk, Small Paychange				0.066*** [0.001]
EOD, Higher Risk, Large Paychange				0.092*** [0.001]
EOD, Higher Risk, Balloon HELOC				0.161*** [0.001]
Observations	16,000	16,000	16,000	16,000
Adjusted R-squared	0.47	0.55	0.87	0.96

Conclusions

- HELOCs reaching EOD are more likely to default than those not reaching EOD.
 - Effect significantly larger for higher risk HELOCs (FICO < 725 and CLTV > 80).
- EOD effect on default sizable for higher risk HELOCs, even for moderate payment increases.
 - For lower risk HELOCs, effect is modest for non-balloon payment HELOCs.
- People or products?
 - Balloon HELOCs problematic for all types of borrowers
 - Non-balloon HELOCs perform well through the recast for certain types of borrowers

Thank you

Please send any feedback you have to Kathleen Johnson (kathleen.w.johnson@frb.gov) or Rob Sarama (robert.f.sarama@frb.gov)