



Predicting Micro-Finance Loan Funding for kiva.org

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New York City
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<http://frederikdurant.com/projects/>

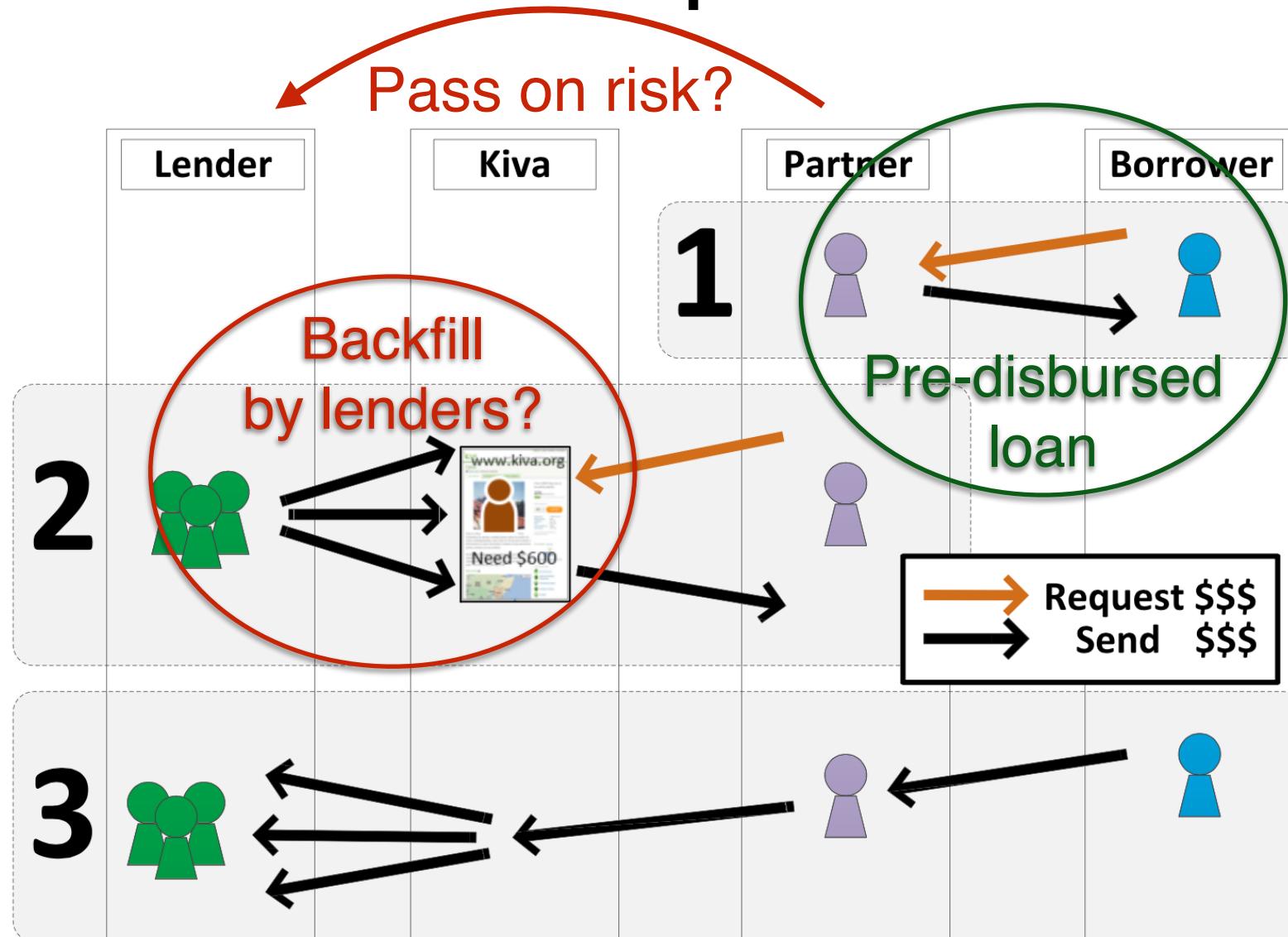
Frederik Durant

- ° Brussels, Belgium
- MA, MSc, MBA
- 20 years of **software engineering, research, management** and **consulting** positions in **Speech and Natural Language Processing**
- Currently R&D Manager of Natural Language Understanding at Nuance Communications
- On a 4-month **sabbatical** now



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Q: Will lenders backfill pre-disbursed loans?

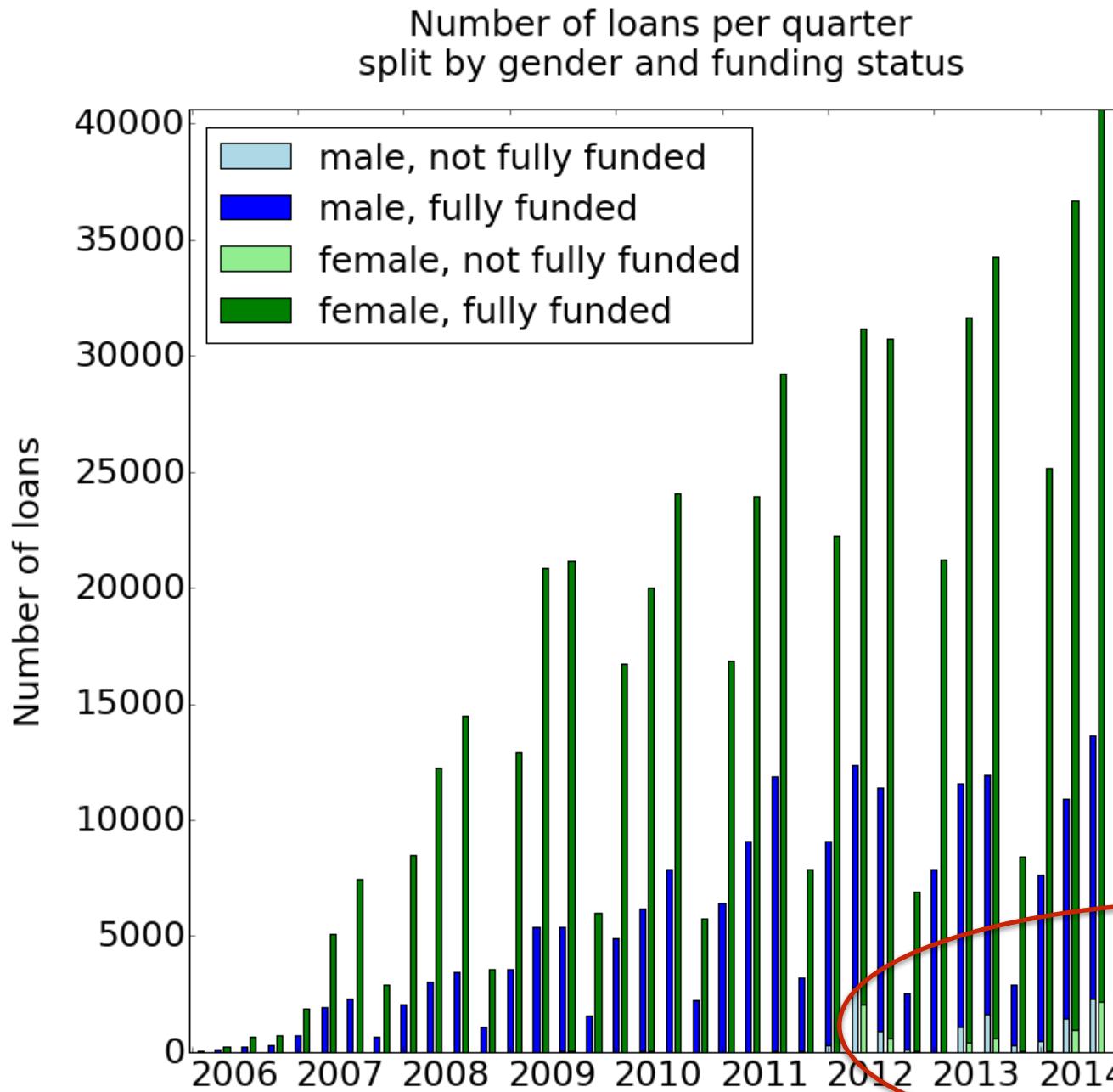


Source: http://www.cc.gatech.edu/~joyfull/resources/2014_wsdm_kiva.pdf



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Non-backfilled loans appeared in 2012



5% of loans not
fully funded!

Kiva Micro-Finance is Big

2012 through 2014

Lending regions and countries

Borrowing countries and regions

Canada \$23M

USA \$145M

Unknown \$65M

Europe \$56M

Oceania \$16M

Asia \$6M



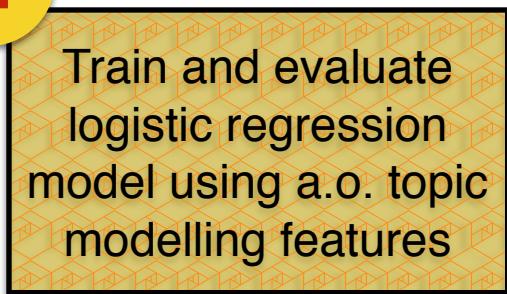
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The image features a yellow diagonal banner with the text "Interactive D3 Sankey diagram]" in black, sans-serif font. The banner is positioned at an angle from the bottom-left towards the top-right. To the right of the banner is a large, solid orange five-pointed star. Inside the star, the word "TRY" is written in a bold, black, sans-serif font, with a horizontal line underneath the "T". The background consists of several curved, overlapping bands in shades of pink, purple, and blue.



Solution: an end2end loan funding predictor

2



1

GET data snapshot

http://s3.kiva.org/snapshots/kiva_ds_json.zip



<http://www.kiva.org/lend/844974>

3

Deploy model

6

GET loan from Kiva

<http://api.kivaws.org/v1/loans/844974.json>

5

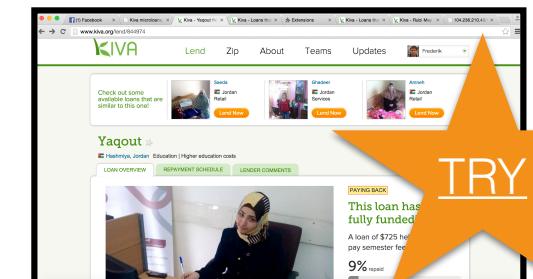


Get prediction from predictor

<http://104.236.210.43/kivapredictor/api/v1.0/loanprediction?loanid=844974>

4

GET page from Kiva



Google Chrome with self-developed plugin

<http://www.kiva.org/browse>



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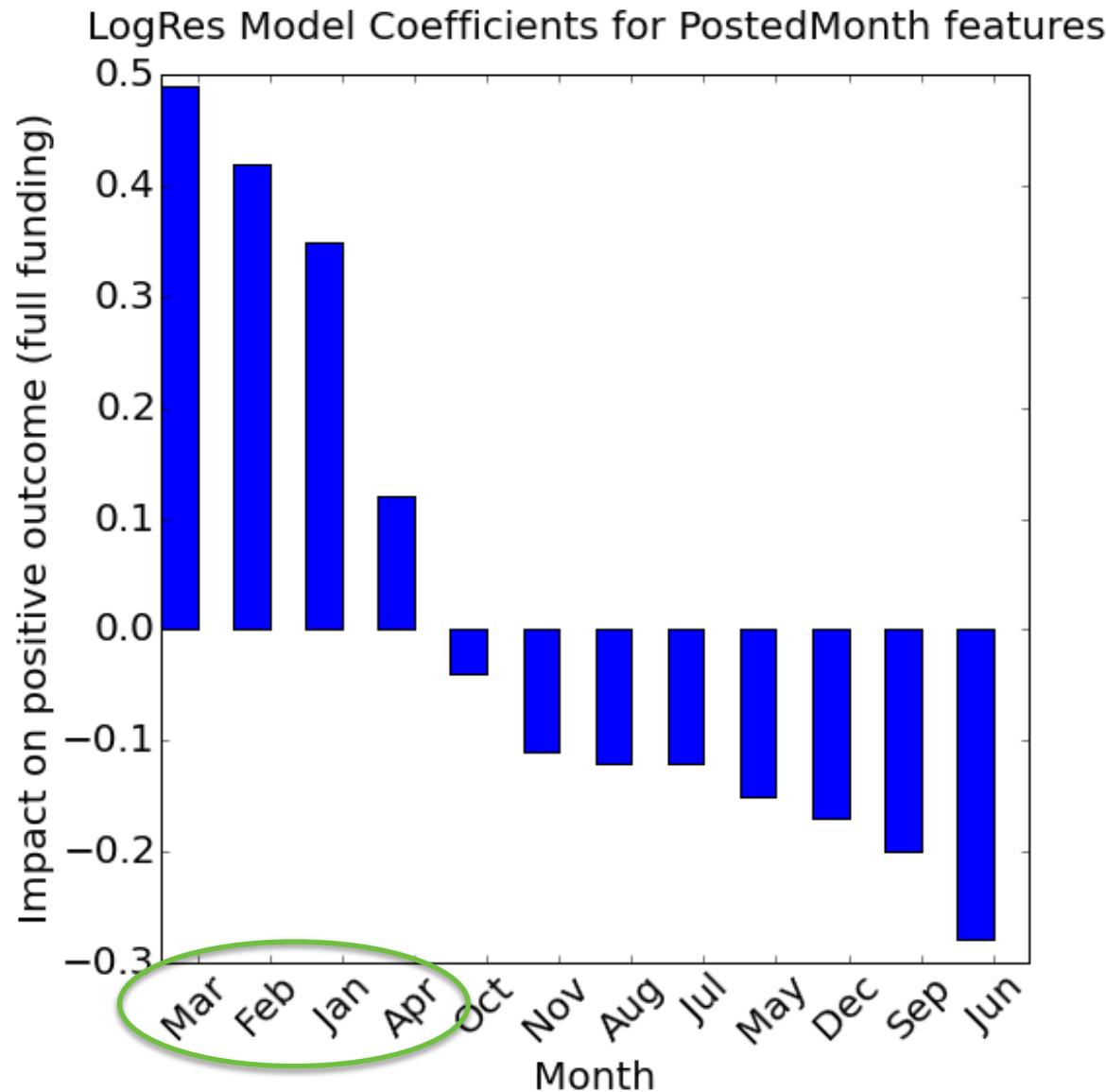
Incremental feature contributions

Feature	ROC Area Under Curve	Percentage point delta
Baseline	50.00%	-
Log10LoanAmount	76.50%	+ 26.50
20 Loan Desc. Topics	80.72%	+ 4.22
PostedMonth[Jan..Dec]	83.55%	+ 2.83
MajorityGender	85.99%	+ 2.44
Log10NumberOfBorrowers	87.13%	+ 1.14
[Partner] LoansPosted + TotalAmountRaised	87.42%	+ 0.29
GeoLatitude + GeoLongitude	87.63%	+ 0.21
RepaymentTerm	87.77%	+ 0.14
[Partner] DelinquencyRate + Rating	87.77%	+ 0.00
BonusCreditEligibility	87.82%	+ 0.05



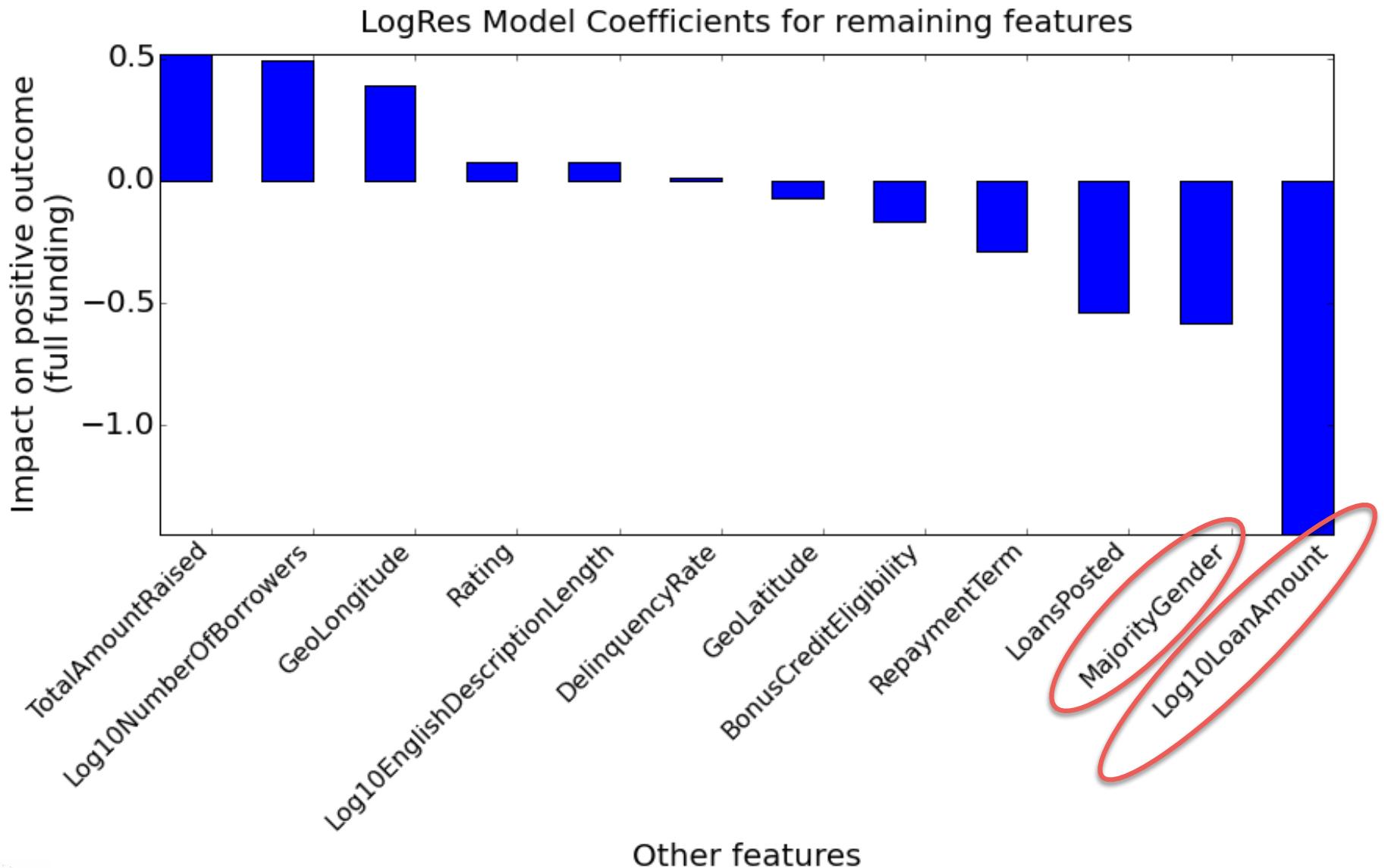
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Loan posted early in year => funded more easily



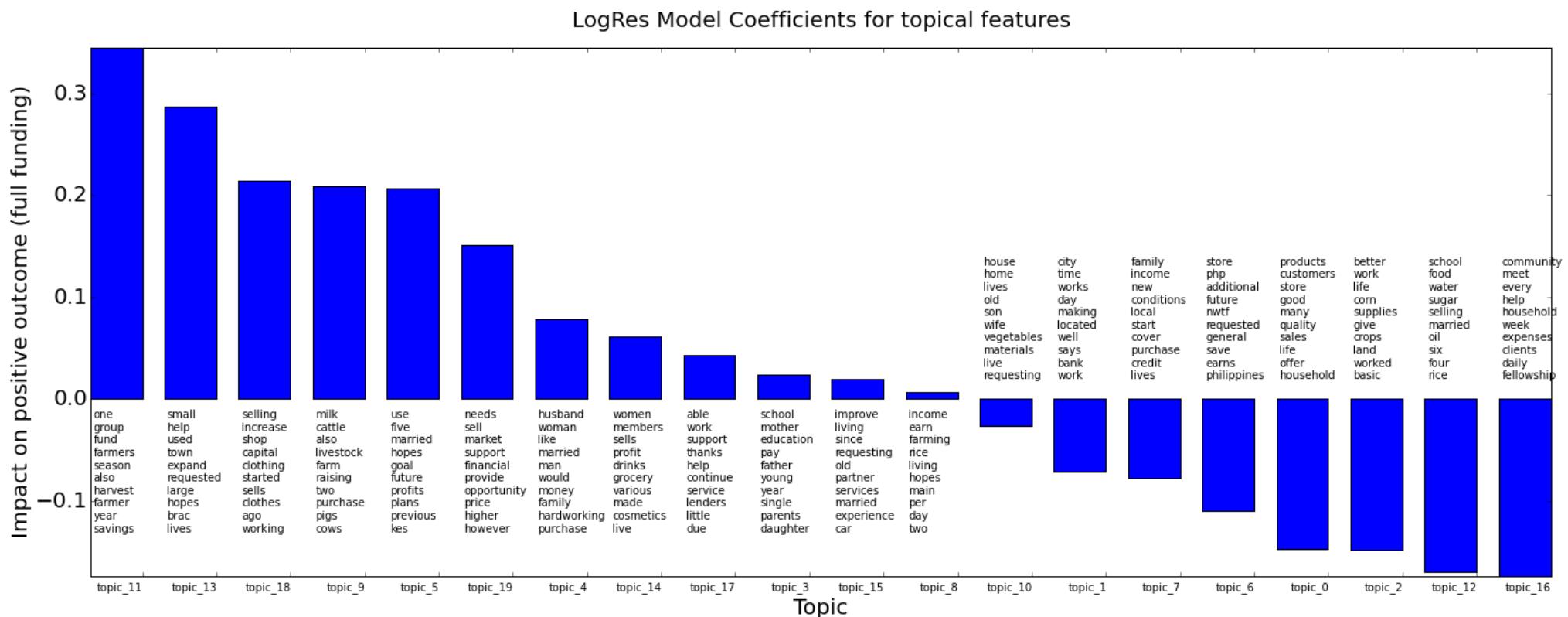
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Bigger loans to male borrowers get funded less easily



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Feature polarity: topics in loan descriptions



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What's next?

- Contact Kiva to check interest in **live deployment**
- Cool idea: *automated trust/ sympathy detection in images*
 - See Jenq, Pan & Theseira: “What Do Donors Discriminate On? Evidence from kiva.org”
(based on image assessment by humans)



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Thank you!



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