When Saving is Gambling

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FTC Microeconomics Presentation

Gambling and Financial Decisions

... "the difference between having fun and being smart"

- Some investors seek lottery-style stocks (Kumar 2009).
  - Highly skewed, high variance, lower return.
  - Problematic if... "financial gambling" crowds out textbook investing.
  - But, what if ... "financial gambling" crowds out gambling?

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This Paper

How do lottery-like financial products affect gambling?

- **Two Challenges**:
  1. Good data on gambling are hard to find.
  2. Lottery-style financial products do not usually happen randomly.

- **This Paper**:
  1. New data on casino gambling.
  2. Quasi-random assignment of lottery-like savings accounts.
     - Distinct from using lotteries as a source of randomness.

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Empirical Setting

Save to Win was introduced to Nebraska in 2012.

- Lottery instead of fixed rate of interest.
  - Monthly raffles: An entry per $25 deposit in one-year CD.

VS

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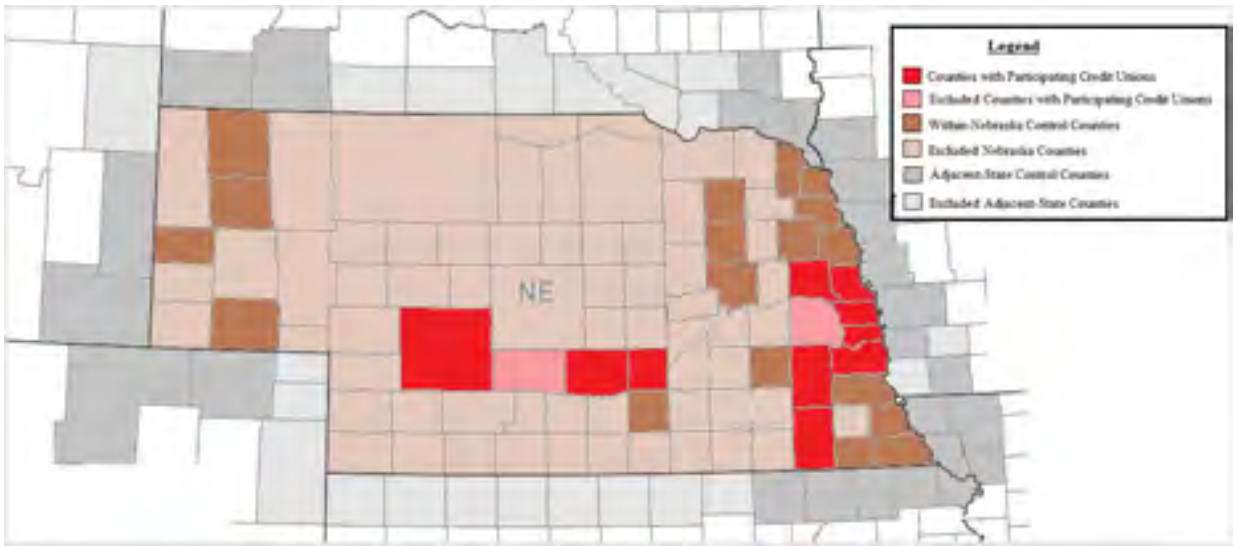
- Only available at participating credit unions.
  - Targeted: 10/93 Nebraska counties and 9/68 credit unions.
  - Control regions just across the border.



Casino Cash Access Data

Proprietary Transaction-Level Data Set.

- Cash withdrawals at U.S. casinos (May 2010 – June 2012).
  - US: 12 million transactions across 2 million patrons.
  - Greater Nebraska: 54,000 transactions across 12,000 patrons.

- Detailed data on cash withdrawals
  - Transactions: Timestamp, amount withdrawn, failed transactions, and method of withdrawal (credit, debit, etc.).
  - Patrons: Home ZIP code, gender and age.
  - Casinos: Location, amenities, and size.

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Preview of Findings

1. Savings lotteries substitute for casino gambling.
   - Magnitude: 1/2 of cash withdrawals, 1/9 of reported saving in STW accounts.
   - Extensive Margin: affected patrons are 15.4 pp more likely to not visit a casino at all in the post period.
2. Larger effects when savings lotteries are more like gambling.
   - Stronger effects for local gambling, dates when raffle is near, and low amenity casinos.
3. Effect is concentrated among the financially aware:
   - Stronger effects for patrons with lower "not sufficient funds" rates, and patrons who tend to pay low fees.

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Why substitution?

1. Similar attributes / categories of consumption.
   - Attribute-based substitution?
   - Mental accounting?
2. Complementarity among gambles.
   - Yes, but in this context, not as likely as other contexts (dopamine responses are not as likely to create a feedback).
3. Behaviorally – why should lotteries substitute for gambling?
   - Barberis (2012): prospect theory, sequence of gambles looks like a lottery payoff.
     - Strong prediction: sophisticates substitute strategically.

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     - Strong prediction: sophisticates substitute more strongly.

Sample Coverage Statistics

Table: Characteristics of Sample and Region

	Nebraska	Adjacent to Nebraska
# of Transactions	26,312	28,053
# of Casino Patrons	5722	6033
2010 Population (1000s)	1484.38	833.42
Average Per Capita Income ($1000s)	37.61	37.19

Empirical Strategy: Treatment and Control

- Use cash access data to measure casino demand by county and month.
- Observe the effect of being treated by availability of savings lotteries: difference-in-difference estimate.

	Treated	Not Treated
# of Counties	10	44
# of Months	26	26
# of Observations	207	1183
... Before	159	907
... After	48	276

Balance of Attributes

	Treated	Not Treated
Mean Transaction Amount ($)	537.40	453.97
Mean # of Transactions	63.85	25.27
% Male	58.44	55.10
% Not Sufficient Funds	14.45	11.53
% Use Credit Card for Cash	54.96	40.18
% Daytime Transactions	34.22	35.91
% Weekend Transactions	46.41	48.54
Per Capita Personal Income ($1000s)	41.54	39.91
Population (1000s)	122.25	25.47
% with Population $>$ 100,000	30.15	4.61

- Treated counties are bigger and use credit card for cash more often.
  - Condition on population and income in empirical tests.
  - Placebo: do credit unions affect credit card usage?

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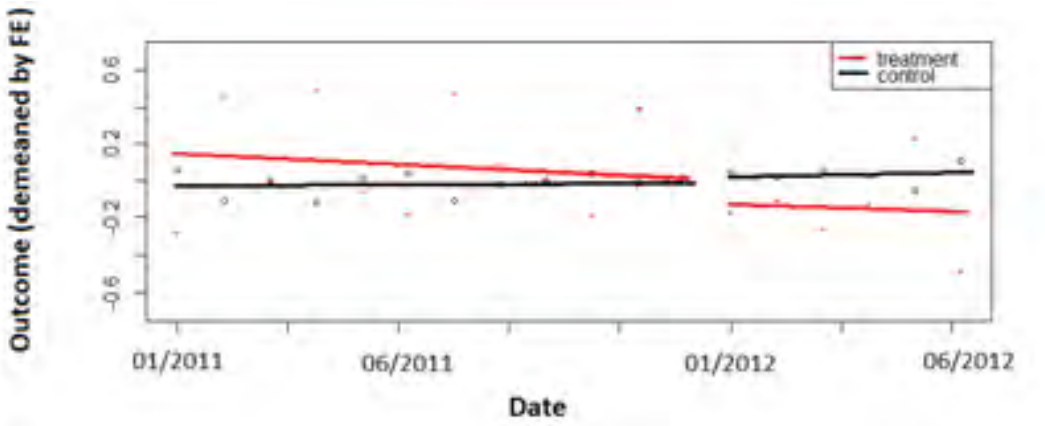
No Significant Pre-Trends



- Robustness also allows for different pre-trends by large population and low unemployment regions.

Main Specification

County-month panel.

Table: Dependent Variable: logged cash withdrawals

	(1)	(2)
post × # of participating CUs	−0.188***	−0.197***
	(0.047)	(0.049)
# of participating CUs	−0.132	
	(0.097)	
Population and Income Controls	x	x
Month-Year FE	x	x
County FE		x
R^2	0.488	0.675
N	1390	1390

County clustered standard errors in parentheses. ***, **, and * indicate statistical significance at the one, five, and ten percent level.

Robustness Checks

Estimated effect size ranges from 10.4 pp to 20.4 pp.

Table: Dependent Variable: logged cash withdrawals

Robustness Test	Estimated Effect
Within Nebraska Controls Only	-0.135^{**}
	(0.062)
Adjacent to Nebraska Controls Only	-0.185^{***}
	(0.055)
Only January through June Observations (seasonality)	-0.137^{***}
	(0.049)
Difference Relative to 2011 Trend	-0.104^{**}
	(0.049)
Diffential Trend by $>$ 50,000 residents	-0.133^{**}
	(0.058)
Diffential Trend by $>$ 100,000 residents	-0.164^{**}
	(0.064)
Diffential Trend by $>$ median unemployment	-0.195^{**}
	(0.058)
Diffential Trend by $>$ 90th percentile unemployment	-0.176^{**}
	(0.050)
Controlling for Jackpot Lottery Sales	-0.204^{**}
	(0.048)

County clustered standard errors in parentheses. ***, **, and * indicate statistical significance at the one, five, and ten percent level.

On the Magnitude of the Effect

A back-of-the envelope calculation.

- The effect is 24.98 percent (2.402 x 0.104) of cash withdrawals using the smallest estimate.
- Relative to total gambling cash:
  - Effect is -8.3 percent if one dollar is brought per dollar accessed at the casino.
    - Call report data: +5.7 percent ($2.3 million) in deposits at STW credit unions versus not.
- Dollar for dollar substitution is approximately $100 for the median patron.
  - STW White Paper: $857 in PLS deposits by July.

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Substitution with Other Lotteries

Not just a change in withdrawals. Lottery substitution is stronger on dollar-for-dollar basis.

Table: Dependent Variable: logged expenditure on scratch tickets

	(1)	(2)
post × # of participating CUs	-0.025^{***}	-0.018^{***}
	(0.009)	(0.006)
Game × Month-Year FE	x	x
County FE	x	
ZIP Code FE		x
R^2	0.556	0.714
# of Counties	35	35
# of Months	24	24
# of Games	13	13
N	2006	2006

County clustered standard errors in parentheses. ***, **, and * indicate statistical significance at the one, five, and ten percent level.

Heterogeneity Resembles Substitution

Stronger substitution when savings lotteries and casino gambling are similar.

Table: Dependent Variable: logged cash withdrawals

Sample Split	Estimated Effect
Similar	
Close Transactions (within 120 miles)	-0.222^{**}
	(0.101)
Short Time Until Lottery (week 4 transactions)	-0.239^{***}
	(0.083)
Casinos without Nightlife	-0.218^{***}
	(0.055)
Differentiated	
Far Transactions (outside of 120 miles)	-0.063
	(0.086)
Long Time Until Lottery (week 1 transactions)	-0.157
	(0.113)
Casinos with Nightlife	0.053^{**}
	(0.024)

Stronger Substitution among Sophisticates

More sophisticated are more prone to substituting.

Table: Dependent Variable: logged cash withdrawals

Sample Split	Estimated Effect
Sophisticated	
Infrequent Use of Credit Card for Cash	-0.329^{**}
	(0.076)
Never Use a Credit Card for Cash	-0.247^{***}
	(0.092)
Infrequently Requesting Unavailable Funds	-0.353^{***}
	(0.066)
Not Sophisticated	
Frequent Use of Credit Card for Cash	-0.017
	(0.076)
Use a Credit Card for Cash	-0.039
	(0.092)
Frequently Requesting Unavailable Funds	-0.039
	(0.066)

Estimates are computed from one standard deviation above/below the mean in a regression that interacts the effect with measures of sophistication.

Substitution at the Patron Level

Visitation, Moderation, and/or Sophistication.

	Log(Cash Withdrawn)		No Withdrawals Dummy		Log(Fees)	
	(1)	(2)	(3)	(4)	(5)	(6)
post × # of participating CUs	−0.156***		0.036***		0.007	
	(0.055)		(0.007)		(0.016)	
post × STW Accounts Available		−0.674***		0.154***		0.004
		(0.223)		(0.026)		(0.074)
ZIP Code FE	x	x	x	x	x	x
R^2	0.149	0.150	0.479	0.479	0.404	0.404
# of ZIP Codes	482	482	654	654	482	482
N	7262	7262	18730	18730	7262	7262

ZIP code clustered standard errors in parentheses. $***$, $**$, and $*$indicate statistical significance at the one, five, and ten percent level.

Robustness and Placebos

The effect...

1. is unrelated to daytime or weekend gambling. Table
2. does not change credit card usage or the frequency of not sufficient funds. Table
3. is robust to using distance to credit union rather than treatment/control. Table
4. is greater for patrons who gamble more (quantile regressions).

Discussion
Two main takeaways

- In this context, "financial gambling" and gambling are substitutes.
  - Maybe utilizing gambling motives to increase saving is welfare enhancing.
- Innovative financial products do not (completely) substitute for financial education.
  - Greater awareness enhances the effectivenss of innovative financial products when takeup matters.

Thank you

Thank you!

Sample Composition: Characteristics

Back

	% Daytime	% Weekend	% Male
post × # of participating CUs	0.000	−0.008	0.038*
	(0.005)	(0.005)	(0.023)
Month-Year FE	x	x	x
County FE	x	x	x
R^2	0.088	0.112	0.339
# of Counties	54	54	54
# of Months	26	26	26
N	1390	1390	1091

County clustered standard errors in parentheses. ***, **, and * indicate statistical significance at the one, five, and ten percent level.

Sample Composition: Behavior

Back

	% NSF	% Credit Card
post × # of participating CUs	0.004	0.011
	(0.006)	(0.010)
Month-Year FE	x	x
County FE	x	x
R^2	0.193	0.447
# of Counties	54	54
# of Months	26	26
N	1390	1390

County clustered standard errors in parentheses. ***, **, and * indicate statistical significance at the one, five, and ten percent level.

Controlling for Differential Pre-Trends by Urban/Rural

Back

	Pre-Trends by 50,000 residents			Pre-Trends by 100,000 residents		
	(1)	(2)	(3)	(4)	(5)	(6)
post × # of participating CUs	−0.120**	−0.120**	−0.133**	−0.154**	−0.153**	−0.164**
	(0.054)	(0.055)	(0.058)	(0.060)	(0.061)	(0.064)
Month-Year FE		x	x		x	x
County FE			x			x
R^2	0.472	0.500	0.678	0.491	0.519	0.676
# of Counties	54	54	54	54	54	54
# of Months	26	26	26	26	26	26
N	1390	1390	1390	1390	1390	1390

County clustered standard errors in parentheses. ***, **, and * indicate statistical significance at the one, five, and ten percent level.

Controlling for Jackpot Lottery Sales

Back

	Full Sample		Within-Nebraska Sample	
	(1)	(2)	(3)	(4)
post × # of participating CUs	−0.197***	−0.204***	−0.129*	−0.137*
	(0.049)	(0.048)	(0.067)	(0.074)
log(*jackpot_sales*)		−0.373		−1.041
		(0.312)		(1.554)
Month-Year FE	x	x	x	x
County FE	x	x	x	x
Dummy for Missing		x		
R^2	0.675	0.676	0.662	0.663
# of Counties	54	54	26	26
# of Months	26	26	26	26
N	1390	1390	629	629

County clustered standard errors in parentheses. ***, **, and * indicate statistical significance at the one, five, and ten percent level.

Distance to Credit Union

Back

	Logged Withdrawal Amount			Indicator for No Withdrawals		
	(1)	(2)	(3)	(4)	(5)	(6)
post × log(distance)	0.148**			−0.036***		
...nearest branch	(0.051)			(0.006)		
post × log(distance)		0.141*			−0.043***	
...nearest five branches		(0.071)			(0.008)	
post × log(distance)			0.149*			−0.040***
...nearest headquarters			(0.063)			(0.009)
ZIP Code FE	x	x	x	x	x	x
R^2	0.149	0.147	0.148	0.480	0.480	0.480
# of ZIP Codes	482	482	482	653	653	653
N	7262	7262	7262	18728	18728	18728

ZIP clustered standard errors in parentheses. ***, **, and * indicate statistical significance at the one, five, and ten percent level.