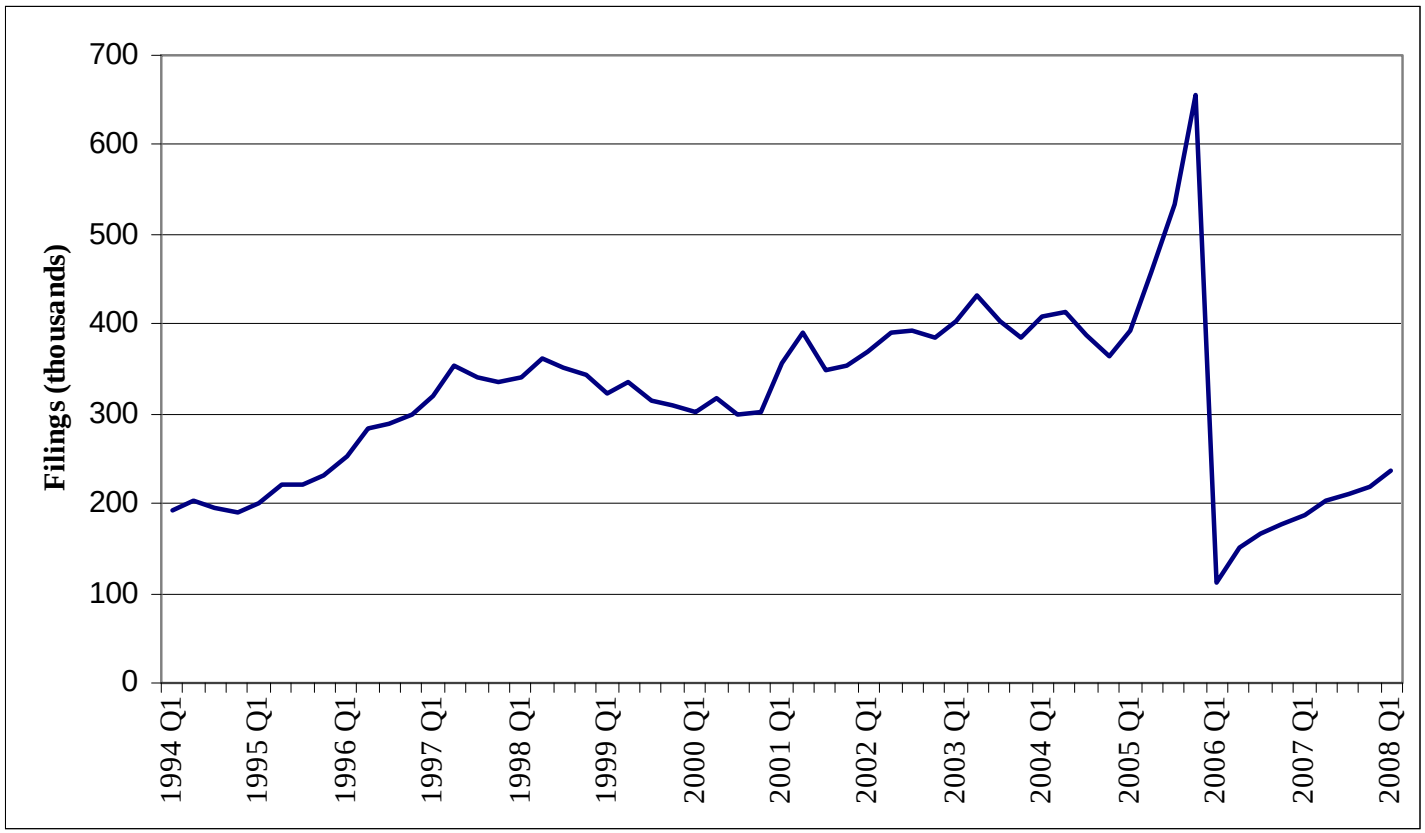
Pariahs or Pals: Understanding peer influences on the bankruptcy decision

Ethan Cohen-Cole and Burcu Duygan-Bump
Federal Reserve Bank of Boston

Presentation at the Chicago Bank Structure Conference

8 May 2009

Figure 1: Bankruptcy Filings



Existing Explanations:

- Commonly discussed explanations for rising bankruptcy rates:
  - Adverse events, such as unemployment, health shocks, and divorce.
  - Changes in the credit market environment:
    1. Decreased transaction costs, and expansion of credit including to riskier households (supply side);
    2. Decreased costs of filing for bankruptcy, including legal and information costs, as well as social stigma (demand side).
- Our focus is this last item—the role of social factors.

Why focus on these social phenomena?

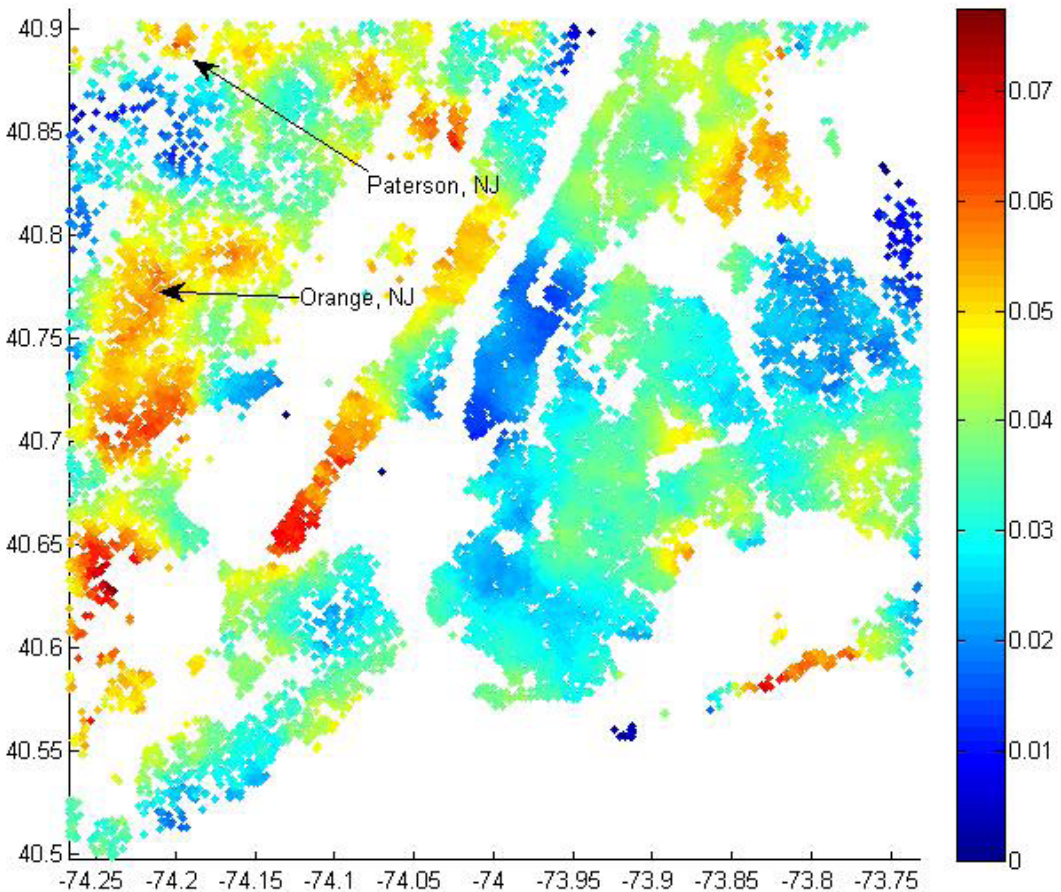
- Much discussion and anecdotal evidence about the role of stigma and changes in social attitudes:
  - A recent Wall Street Journal article: "Now, Even Borrowers With Good Credit Pose Risks."
  - Bank of America CEO: "There's been a change in social attitudes toward default."
  - Sociologists continue to provide quotes showing that stigma is still strong and alive: "I thought of [bankruptcy] as a mark against my name. . . It was too embarrassing. . . I feel like I failed. You know, to go bankrupt, that's a sign of failure."
- And also among economists: Gross and Souleles (2002), Fay et al. (2002), Athreya (2004), Chatterjee et al. (2007), Livshits et al. (2007)...

How do these social factors matter?

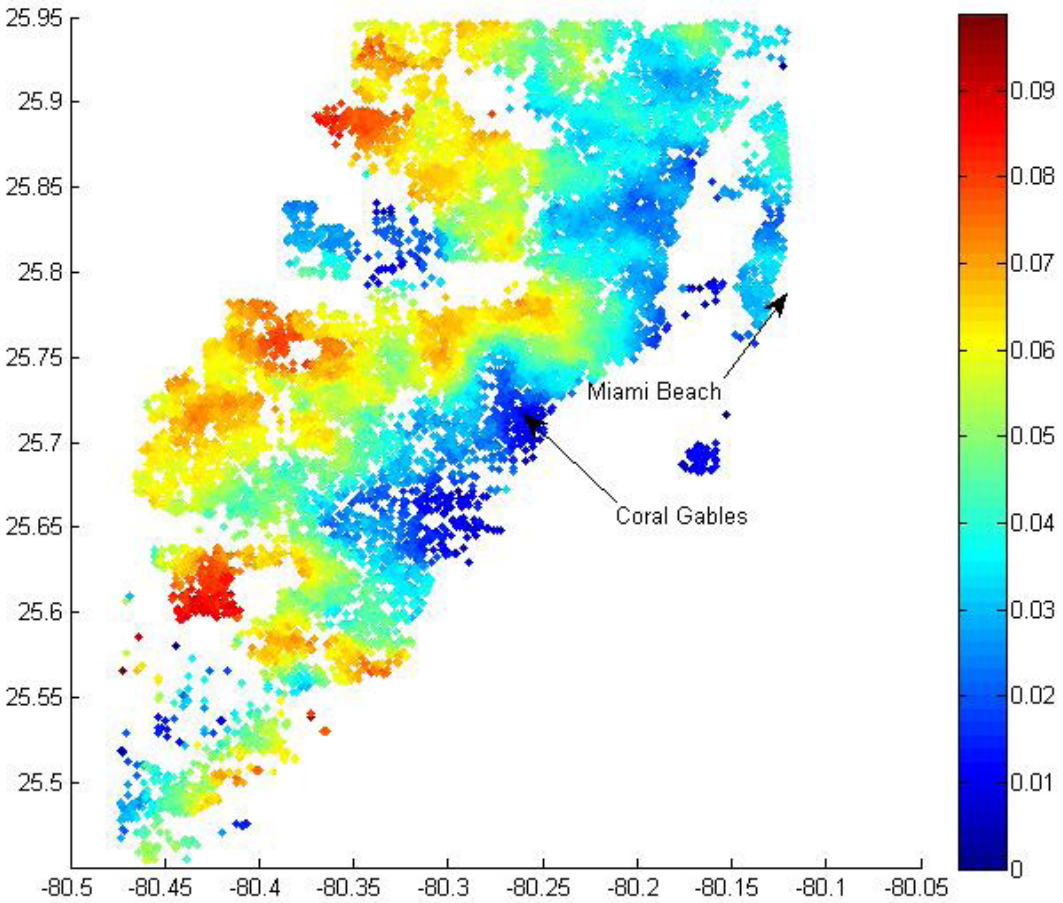
- Interacting with others who have gone bankrupt or are in the process may increase the likelihood of an individual going bankrupt herself, because:
  - The idea that "everybody does it" reduces the associated embarrassment, or social stigma associated with bankruptcy;
  - People share information and learn from one-another about eligibility, application procedures, and other bureaucratic details of filing.

New York/New Jersey Bankruptcy Rates

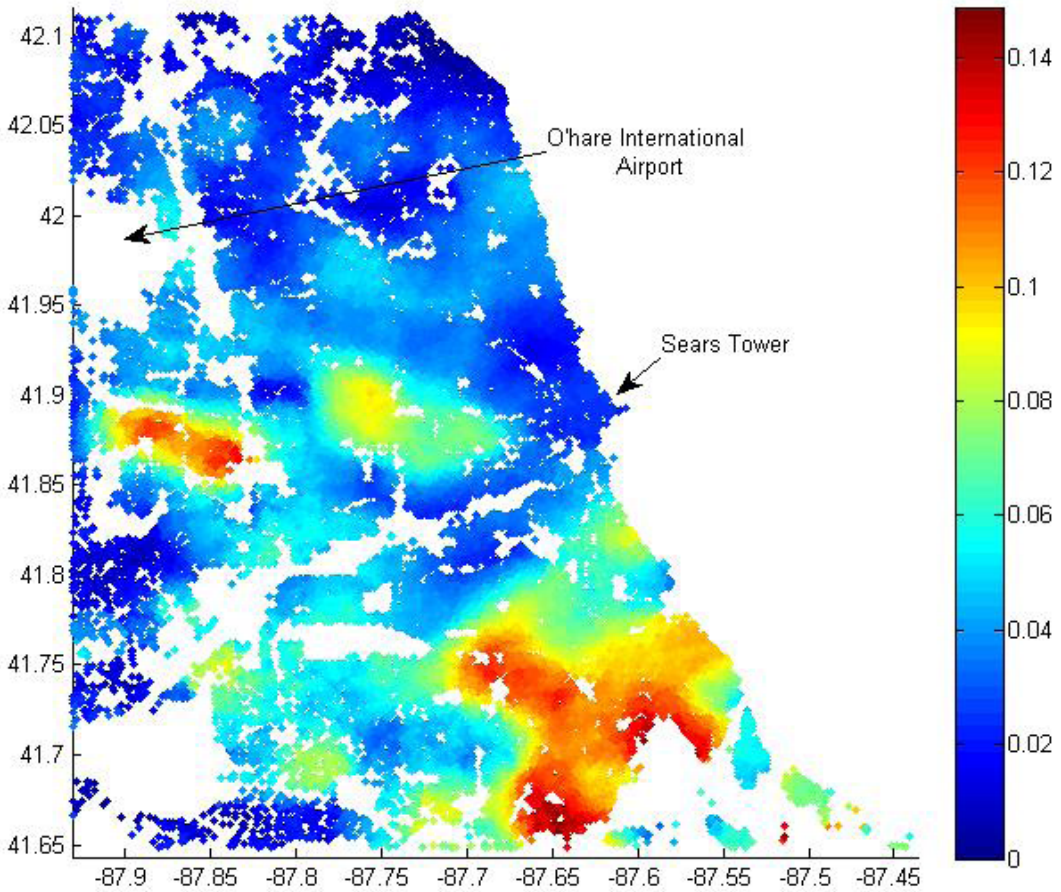
- Bankruptcies appear to 'cluster' - even in rich areas. Evidence that more than prices may play a role.



Miami Bankruptcy Rates



Chicago Bankruptcy Rates



This Paper

- Main Questions:
  - To what extent can we explain the two patterns?
  - To what extent can de-coupling information and stigma effects help us understand the patterns?
- Using (a lot of) data from a credit bureau and a new methodology based on the social psychology literature, we
  - analyze the empirical relevance of aggregate influences on individual decisions,
  - disentangle the role of separate channels—stigma and informational factors;
  - and comment on their role in explaining the observed bankruptcy trends.

Summary of Findings

- Social Factors (3-11%) matter more than other controls including risk factors ($<<$.1%):
  - On average societal stigma dominates the role of information, especially post 2005;
  - Both information costs and stigma seems to have indeed decreased in this period;
  - But changes in information sharing, not stigma, is the more likely factor behind the observed bankruptcy patterns.

Summary of Findings

- More interestingly, these aggregate patterns hide a very high degree of heterogeneity:
  - Social factors are stronger amongst the poorer and less-well educated communities;
  - Stigma has declined principally amongst all but the poorest and least well educated;
  - Information costs decreased uniformly across socioeconomic groups.

Personal Bankruptcy in the US: An overview

- Historically, bankruptcy was seen as anything but an individual choice:
  - Creditors would file and show that the debtor 'committed an act of bankruptcy'—akin to fraud;
  - Associated with truly draconian penalties.

Example

'To disgrace the bankrupt, [his] hair would be cut off..his palm would be branded with the "T" for thief and he would be mandated to stand in a public square for two hours with an ear nailed to the pillory and then cut off.'

- Currently, the US has two different personal bankruptcy procedures, Chapter 7 and 13.

Social Interactions models

- SI analyze interplay between individual decisions and social processes:
  - How do characteristics and choices of others impact individual decision making?
  - How are social influences reflected in equilibrium group behavior?
- Evaluate interdependencies that are not price mediated.
- Otherwise, follows classic 'rational' analysis.

$$\omega_i = \arg \max_{\omega \in \Omega_i} V\left(\omega_i, X_i, Y_g, \bar{\omega}_{-i}\right)$$

- ω_i: individual action of agent i (e.g. bankruptcy);
- X_i: individual characteristics of agent i (e.g. credit quality);
- Y_g: neighborhood-specific characteristics.

Basic social effect modeling

- Define g as some neighborhood or reference group that impacts individual decisions:
  - through 'price' externalities;
  - through social effects.
- A price-only mediation of the bankruptcy decision does not capture the variation (clustering) of bankruptcies shown above.
- A portion of the residual variation appears to be explained by 'social' phenomena, modeled for example by including the mean bankruptcy rate in the state. Fay et al. (2002), Gross and Souleles (2002).

$$B_{ig} = b + cX_i + dY_g + \mathbf{J}_g\mathbf{m}_g + \varepsilon_{ig}$$

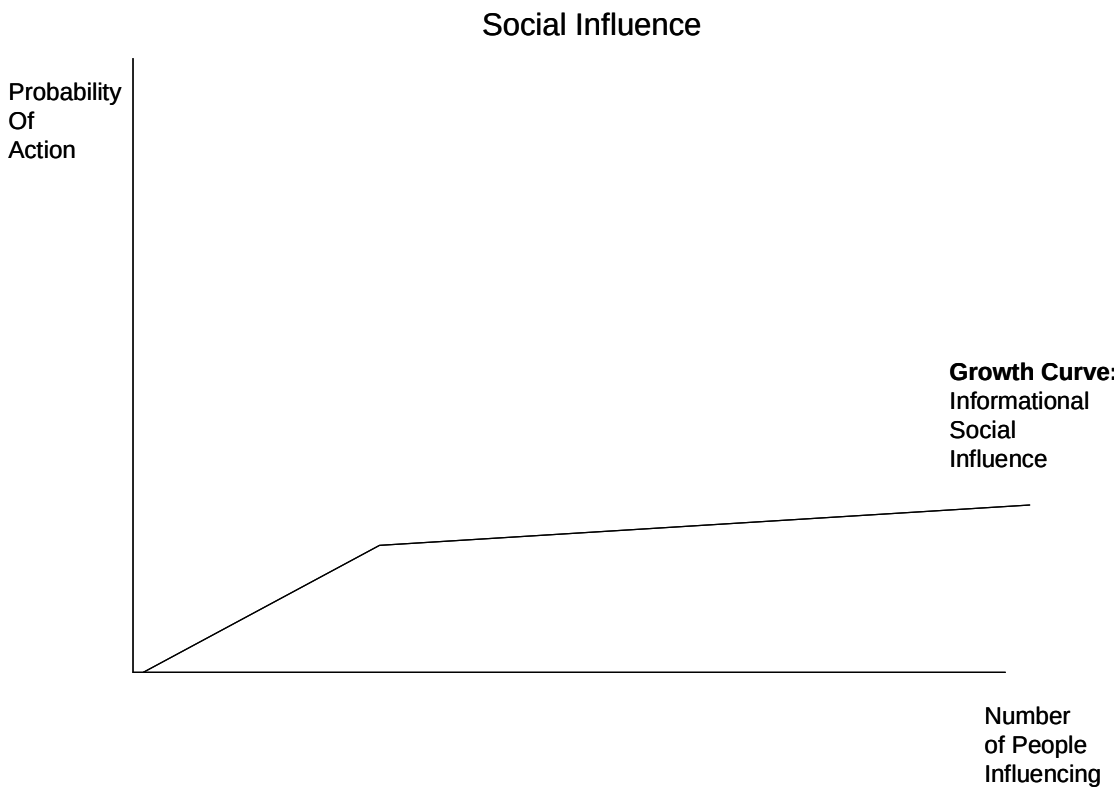
- Find a significant and positive coefficient (J_g).

Social Influence, continued

- Recall that we are interested in understanding the social components of the bankruptcy decision.
- Social Psychologists have long studied two forms of social influence:
  - Informational
    - "influence to accept information obtained from another as evidence about reality"
  - Normative (stigma)
    - "influence to conform to the positive expectation of behavior"
- Why does this help?
- Individual response depends on type of influence.

Social influence

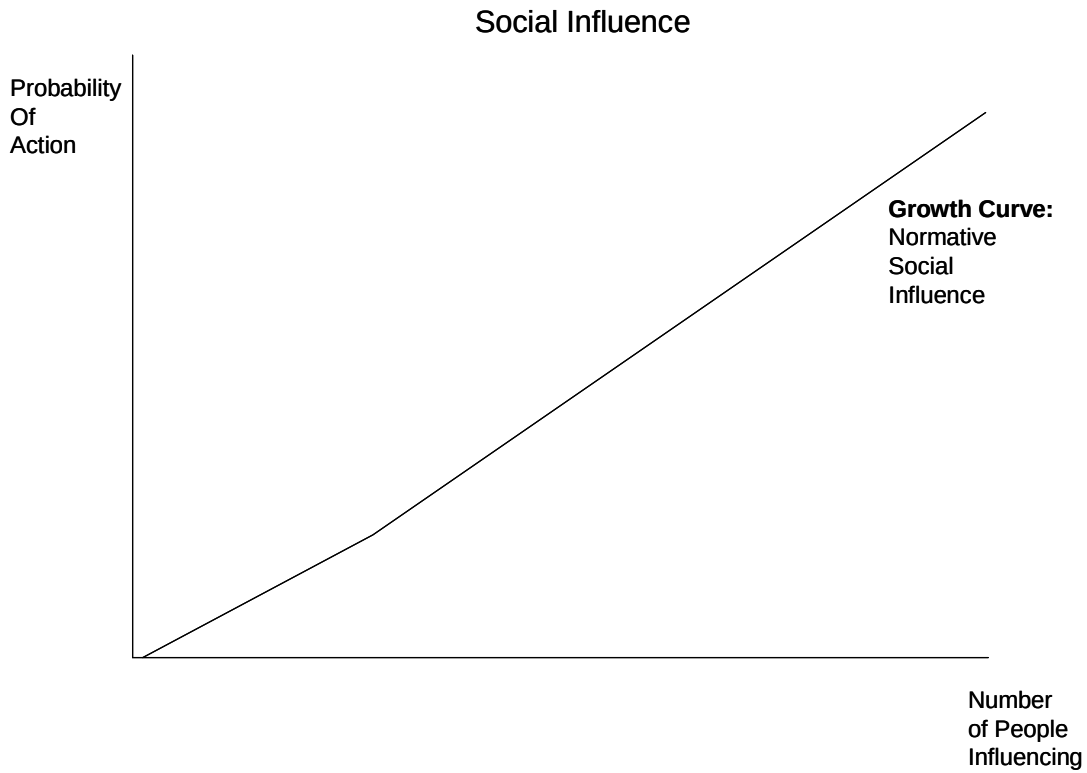
- Informational influence:



- More people providing information does not necessarily increase probability, even if resolve some uncertainty.

Social influence, continued

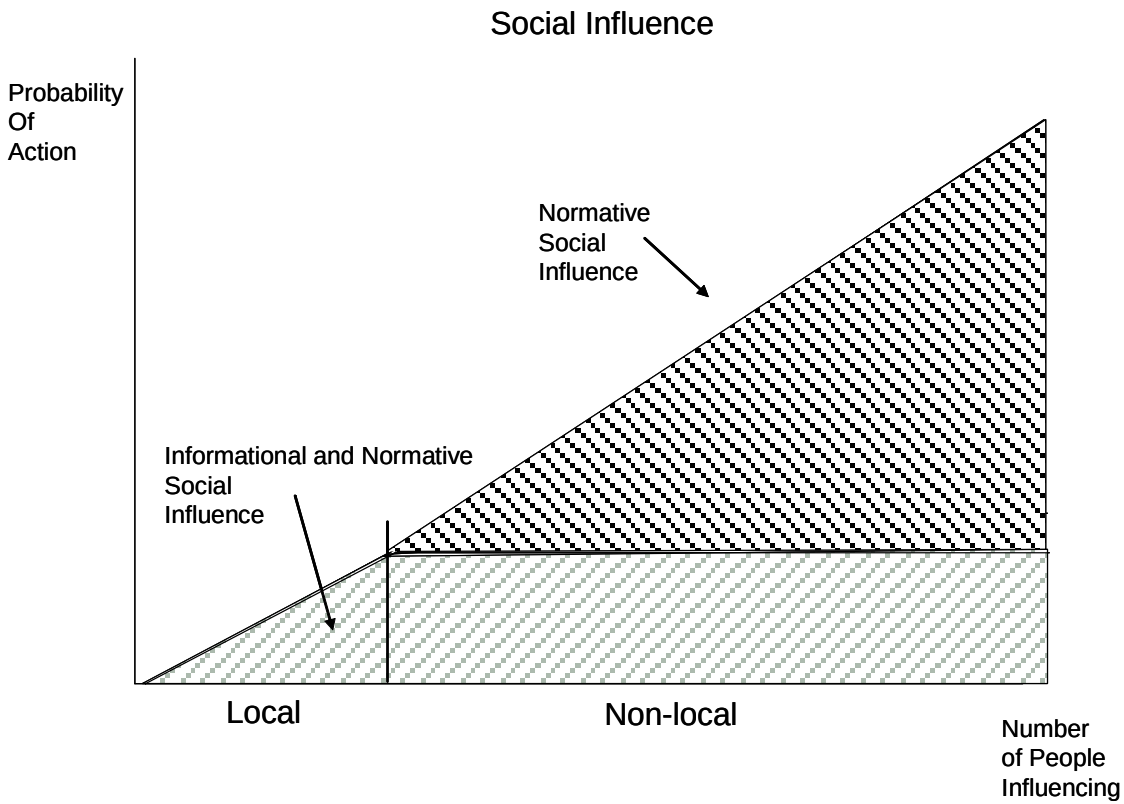
- Normative social influence:



- More people providing pressure does increase probability.

Social Influence and identification

- Wedge provides identification method



Modeling with *composite* social effects

- We'll look at both local (1 mile) and non-local (1–4 mile) effects.
- For each, we include the average bankruptcy rate (primary model):

$$B_{ig} = b + cX_i + dY_g + \mathbf{J}_g^{SI}\mathbf{m}_g + \tilde{\mathbf{J}}_o^{S}\mathbf{m}_o + \varepsilon_{ig}$$

- Auxiliary model

$$B_{ig} = b + cX_i + dY_g + \mathbf{J}_g^{I}\mathbf{m}_g + \mathbf{J}_{go}^{S}\left(\alpha_g\mathbf{m}_g + (1-\alpha_g)\,\mathbf{m}_o\right) + \varepsilon_{ig}$$

- Note α_g: the marginal rate of substitution between stigma from local vs. non-local groups, which is proportional to population shares in each group (frequency of contact).

Credit Bureau Data

- US credit bureau
  - 4 national samples: June 2003, December 2004, June 2006, December 2007;
  - First two are large samples of about 285,780 individuals each;
  - Latter two are HUGE samples of 27,000,000 individuals each.
    - 1 in 9 sample of all US households with credit.
- Includes typical information available in a credit history on all open credit accounts.
  - Many advantages w.r.t. measurement error;
  - Detailed geo-code info;
  - No individual level income and employment information.

Baseline Specification

- Re-estimate basic regressions using state-level social interactions only:

$$B_{ig} = b + cX_i + dY_g + \mathbf{J}_g \mathbf{m}_g + \varepsilon_{ig}$$

- X_i: individual-specific credit risk controls, e.g. age, total outstanding debt, etc.;
- Y_g: community level controls for the economic environment, e.g. unemployment rate, poverty rate;
- m_g: average bankruptcy rate in the state.

Baseline Results

- Note the relatively large magnitude of 'social' effect:

TABLE 2: BASELINE SPECIFICATION

	2003	2004	2006	2007
mortgage_limit ($ thousands)	0.00000426**	0.00000599***	-0.00000327***	-0.00000762***
	(0.000002)	(0.0000022)	(0.00000023)	(0.00000020)
revolve_cred ($ thousands)	-0.000572***	-0.000497***	-0.000467***	-0.000499***
	(0.000014)	(0.000014)	(0.0000014)	(0.0000012)
credit_util ($ thousands)	0.0000508	-0.00000479	-0.0000416***	0.000278***
	(0.000038)	(0.000039)	(0.0000038)	(0.0000028)
credit_utilsq ($ thousands)	0.000000864***	0.000000933***	0.000000374***	0.000000108***
	(0.00000013)	(0.000000088)	(0.0000000032)	(0.0000000025)
c.score	-0.000117***	-0.000150***	-0.000138***	-0.0000967***
	(0.0000042)	(0.0000042)	(0.00000040)	(0.00000033)
gt_eq_HS_01	0.0139***	0.0135***	0.00350***	0.00236***
	(0.0028)	(0.0032)	(0.00037)	(0.00034)
public_assistance_01	0.0236***	0.0361***	0.0442***	0.0376***
	(0.0086)	(0.01)	(0.0012)	(0.0011)
incgrowth_inflation	0.000148**	0.000159*	0.0000749***	0.0000537***
	(0.000075)	(0.000091)	(0.00001)	(0.00001)
median_HH_inc	0.0000000184	-0.0000000476	-0.0000000657***	-0.000000104***
	(0.000000034)	(0.000000041)	(0.000000004)	(0.000000004)
unemployment	0.0000237	0.0000246	0.00000124	0.000138***
	(0.00017)	(0.00019)	(0.00002)	(0.00002)
avgbkrpt_state	0.345***	0.404***	0.289***	0.260***
	(0.019)	(0.021)	(0.0024)	(0.0024)
Number of observations	145,567	152,441	12,300,000	12,400,000

Stigma vs. Information: national level results and trends

TABLE 3: TOTAL STIGMA AND INFORMATION

	2003	2004	2006	2007
Stigma	0.0275**	0.0384**	0.118***	0.106***
	(0.0141)	(0.0157)	(0.0018)	(0.0016)
Information	0.0532***	0.0638***	0.0948***	0.0746***
	(0.00612)	(0.00709)	(0.0014)	(0.0013)
Number of Observations:	131,430	135,046	12,300,000	12,300,000

- Interestingly, the changes in stigma coefficients move against the bankruptcy trends.

Stigma and Information by Social Context

The role of education and Income

- Variation suggests a link between social context and the strength of social interactions:
  - Do higher income groups share less information?
  - Does bankruptcy stigma differ by education level?
- An individual's bankruptcy decision depends on:
  1. Changes in price information, including shocks to income and employment,
  2. The decisions of others in one's network, e.g. the perception of stigma,
  3. And the interaction between the first two: an economic shock may influence social stigma, e.g. increasing wealth undermines social fabric.

Stigma and Information by social context (cont'd)

- We evaluate these three possibilities by exploiting the richness of the data-set.
- We subdivide the data into 25 groups (five education and income quintiles) and re-estimate social interactions effects for each.
- We find that:
  - Social factors are stronger amongst the poorer and less-well educated communities;
  - Changes in these factors are dependent on context as well. (see social multiplier)

Table 4b.

TABLE 4b: STIGMA AND INFORMATION ACROSS EDUCATION AND INCOME QUINTILES

2007

Stigma:	**Income Quintile**				
	1	2	3	4	5
Education					
1	0.168***	0.0903***	0.116***	0.129***	0.045
2	0.152***	0.212***	0.166***	0.119***	0.0354*
3	0.154***	0.169***	0.146***	0.130***	0.0697***
4	0.0983***	0.191***	0.193***	0.130***	0.0734***
5	0.0526***	0.170***	0.173***	0.136***	0.0570***

2007

Informatio	**Income Quintile**				
	1	2	3	4	5
Education					
1	0.144***	0.116***	0.0234*	-0.017	0.023
2	0.151***	0.0963***	0.0691***	0.0400***	0.0235*
3	0.105***	0.0887***	0.0874***	0.0453***	0.0449***
4	0.0353**	0.0722***	0.0509***	0.0540***	0.0511***
5	0.0354**	0.029	0.0243*	0.0424***	0.0519***

Table 4c.

- Also, stigma shows increases in upper left of table, where most number of bankruptcies occur!

TABLE 4c: STIGMA AND INFORMATION ACROSS EDUCATION AND INCOME QUINTILES

Change in Stigma: 2006 - 2007

Stigma:	**Income Quintile**				
	1	2	3	4	5
Education					
1	(0.146)	(0.107)	(0.060)	0.046	0.036
2	0.047	(0.033)	(0.031)	(0.042)	(0.104)
3	0.026	0.029	(0.008)	0.013	(0.035)
4	(0.008)	0.021	0.015	0.017	0.013
5	0.003	0.038	0.036	0.006	(0.004)

Change in Information: 2006 - 2007

Informatio	**Income Quintile**				
	1	2	3	4	5
Education					
1	0.009	(0.006)	(0.053)	(0.037)	0.023
2	(0.072)	(0.029)	(0.005)	(0.007)	0.026
3	(0.031)	(0.042)	(0.031)	(0.037)	0.009
4	0.021	(0.023)	(0.024)	(0.033)	(0.019)
5	(0.003)	(0.023)	(0.048)	(0.033)	(0.014)

Sensitivity Analysis

To provide further support our for identification/interpretation of the estimated social effects, we check the sensitivity of our results:

- Look at the behavior of movers, using prior place of residence to measure information sharing and current to measure stigma.
- Different radii definitions

Summary and what's next

- We've investigated the role of social influences on bankruptcy decisions and found:
  - an important distinction between stigma and information effects;
  - a non-trivial time trend in stigma that *does not* match the secular increases in the overall rate;
  - a relationship between economic factors and these social influences.
- Feature that confirms social psychology and current economic research
  - Stigma more transient (Dick et al 2008) (Zitek and Hebl 2007)
- Future investigation:
  - other economic drivers of social effects;
  - further evaluation of the economic risk component;
  - true cost of bankruptcy, e.g. access to credit.

Movers

TABLE 7: MOVERS

	Baseline	Movers
Stigma	0.155***	0.167***
	(0.0250)	(0.015)
Information	0.0952***	0.263***
	(0.0190)	(0.017)
Number of Observations	108,700	109,023

Different radii definitions

TABLE 8: ALTERNATIVE STIGMA DEFINITIONS

2003

	Information	Stigma	Stigma1	Stigma2	Stigma3
Baseline	0.0532***	0.0275*			
Stigma (Multiple)	0.0549***		0.00477	0.210***	0.293***

2004

	Information	Stigma	Stigma1	Stigma2	Stigma3
Baseline	0.0638***	0.0384**			
Stigma (Multiple)	0.0664***		0.0107	0.262***	0.376***

2006

	Information	Stigma	Stigma1	Stigma2	Stigma3
Baseline	0.0948***	0.118***			
Stigma (Multiple)	0.116***		0.0634***	0.0901***	0.110***

2007

	Information	Stigma	Stigma1	Stigma2	Stigma3
Baseline	0.0746***	0.106***			
Stigma (Multiple)	0.0938***		0.0622***	0.0711***	0.0979***