Instituciones Financieras

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Clase 4
UTDT Maestría en Finanzas

Today

- Review
- Global financial crisis: Other factors
  - Monetary policy
- Interest rate risk
  - Interest rate risk and capital (book value and market value)
- Shocks to credit supply and small businesses

Other factors that led to the 2008 crisis

- Accomodative monetary policy
  - Very low interest rates can increase risk taking in search for higher yields
  - E.g., banks lent to subprime borrowers and had large exposures to the real estate sector
- Financial innovation
  - Originate to securitize (pool and package loans and issue securities against them)
  - Reduce FI incentives to adequately screen borrowers
- Rating agencies
  - Generated ratings that were too high on structured finance products

Great recession: Monetary Policy

Low interest rate monetary policy and bank risk-taking

Evidence from Spain

Slides based on:

- "Hazardous times for monetary policy: What do twenty-three million bank loans say about the effects of monetary policy on credit risk-taking", by Jimenez, G., Ongena, S., Peydro, J., Saurina, J. in *Econometrica*, 2014, v 82 n 2, pp. 463-505.

Motivation

- Since the severe financial crisis of 2007-2009, the link between *monetary policy* and *bank risk-taking* has been at the center of an intense academic and policy debate

  - Market commentators argue that during the long period of very low interest rates (2002-2005), banks had softened their lending standards and taken on excessive risk.

Contribution

- The paper is the first to *empirically* study the impact of the monetary policy rate on the composition of the supply of credit, in particular on banks´ risk-taking.

- A low short-term interest rate makes riskless assets less attractive, and may lead to a search for yield by financial intermediaries with short-term horizons

Empirical strategy

- Why Spain?
  - Ideal setting for identification:
  - Economic system dominated by banks
  - Exogenous monetary policy shock: short term interest rates were decided in Frankfurt, not in Madrid

Data

- Loans applications and contracts
- Firms' and Banks' balance sheets

- Source: Credit Register (CIR - Banco de España)
  - Exhaustive monthly data on almost all loan applications from Spain (2002:02 and 2008:12)
  - +130,000 firms, 200 active banks, at any time

Estimation Strategy

1. Compare LCB (banks with low capital ratios with more incentives to take risk) vs HCB (banks with high capital ratios), that lend to the same firm
   - To be sure that the effect comes from the banks´ risk-taking (supply of credit rather than demand of credit)

r ↓ , what happens to lending by?

2. Two stage model
   - 1st Stage: granting of loan application
   - 2nd Stage: Once granted: loan amounts, likelihood of expost default, collateralization

Results

- A decrease of 1% in the overnight rate
  - increases the probability that a loan will be granted by a lowly versus highly capitalized bank to a firm with a bad credit history (firms with one or more NPL) by 8 percent
  - and the resultant committed amount of credit increases by 18%,
  - the future likelihood of loan default of these loans increases by 5%,
  - and the probability that loans are collaterallized decreases by 7 percent.

Conclusions

- Monetary policy affects the **composition** of supply of credit. A lower **overnight** interest rate:

  a) Induces banks to engage in higher risk-taking in their lending.

  b) Induces *lowly capitalized banks* to grant more loan applications to ex ante risky firms than *highly capitalized banks*

  c) Applications granted by lowly capitalized banks have a higher ex post likelihood of default

  d) Applications granted by lowly capitalized banks require less collateral

Policy implications

- The authors find that monetary policy drives bank risk-taking
- Monetary and macro prudential policies may indeed not be independent (Goodhart (1988), Stein (2012)).

Interest rate risk

Interest Rates and Capital (Net Worth)

- FIs exposed to risk due to maturity mismatches between assets and liabilities
- Interest rate changes can have severe adverse impact on net worth
  - Thrifts, during 1980s
- Models to measure IRR (interest rate risk)
  - Repricing model

Repricing Model

- Repricing or funding gap model based on book value
  - Contrasts with market value-based maturity and duration models
- Used by majority of banks, especially the small ones
- Repricing gap:
  - It is a measure of the difference between the value of assets and the value of liabilities that will reprice (because relevant interest rate will change) within a specific time period
  - GAP= Risk sensitive assets – Risk sensitive liabilities
    - GAP = RSA – RSL
  - Rate sensitivity means repricing due to changes in current interest rates
  - This is defined for a particular maturity bucket (within a certain time horizon)
  - The change in net interest income when interest rates change is related to the repricing gap.
- Refinancing risk and reinvestment risk

Maturity Buckets

- Commercial banks must report repricing gaps for assets and liabilities with maturities of:
  - Three months or less
  - More than three months to six months
  - More than six months to twelve months
  - More than one year to five years
  - Over five years

- Call reports: RC-C (pág. 24) and RC-E (pág. 34)

http://www.ffiec.gov/PDF/FFIEC_forms/FFIEC031_201106_f.pdf

A simple balance sheet

Assets		Liabilities	
1. Short-term consumer loans (one-year maturity)	$ 50	1. Equity capital (fixed)	$ 20
2. Long-term consumer loans (two-year maturity)	25	2. Demand deposits	40
3. Three-month Treasury bills	30	3. Passbook savings	30
4. Six-month Treasury notes	35	4. Three-month CDs	40
5. Three-year Treasury bonds	70	5. Three-month bankers acceptances	20
6. 10-year, fixed-rate mortgages	20	6. Six-month commercial paper	60
7. 30-year, floating-rate mortgages (rate adjusted every nine months)	40	7. One-year time deposits	20
		8. Two-year time deposits	40
	$270		$270

- Compute one year cumulative gap?
  - RSA? RSL? Difference?

A simple balance sheet: answer

Assets		Liabilities	
1. Short-term consumer loans (one-year maturity)	$ 50	1. Equity capital (fixed)	$ 20
2. Long-term consumer loans (two-year maturity)	25	2. Demand deposits	40
3. Three-month Treasury bills	30	3. Passbook savings	30
4. Six-month Treasury notes	35	4. Three-month CDs	40
5. Three-year Treasury bonds	70	5. Three-month bankers acceptances	20
6. 10-year, fixed-rate mortgages	20	6. Six-month commercial paper	60
7. 30-year, floating-rate mortgages (rate adjusted every nine months)	40	7. One-year time deposits	20
		8. Two-year time deposits	40
	$270		$270

- RSA = 50 + 30 + 35 + 40 = 155
- RSL = 40 + 20 + 60+ +20 = 140
- **One year GAP = 155 – 140 = 15 > 0**

Another Repricing Gap Example
Table A

	(1) Assets	(2) Liabilities	(3) Gaps	(4) Cumulative Gap
1. One day	$ 20	$ 30	$−10	$−10
2. More than one day–three months	30	40	−10	−20
3. More than three months–six months	70	85	−15	−35
4. More than six months–twelve months	90	70	+20	−15
5. More than one year–five years	40	30	+10	−5
6. Over five years	10	5	+5	0
	$260	$ 260		0

Applying the Repricing Model

$\Delta NII_i = (GAP_i)\ \Delta R_i = (RSA_i - RSL_i)\ \Delta R_i$

ΔNII_i = Change in **net** interest income in the ith bucket = change in interest **income** – change in interest **expense**

GAP_i = Dollar size of the gap between the book value of RSA and RSL of bucket i

ΔR_i = Change in the level of interest rates impacting assets and liabilities in the ith bucket

A financial institution has the following market value balance sheet structure:

Assets	Liabilities and Equity		
Cash	$1,000	Certificate of deposit	$10,000
Bond	$10,000	Equity	$1,000
Total assets	$11,000	Total liabilities and equity	$11,000

a. The bond has a 10-year maturity, a fixed-rate coupon of 10 percent paid at the end of each year, and a par value of $10,000. The certificate of deposit has a 1-year maturity and a 6 percent fixed rate of interest. The FI expects no additional asset growth. What will be the net interest income (NII) at the end of the first year?

Interest income	$1,000	$10,000 x 0.10
Interest expense	600	$10,000 x 0.06
Net interest income (NII)	$400	

b. If at the end of year 1 market interest rates have increased 100 basis points (1 percent), what will be the net interest income for the second year?

Interest income	$1,000	$10,000 x 0.10
Interest expense	700	$10,000 x 0.07
Net interest income (NII)	$300	

The decrease in net interest income is caused by the increase in financing cost without a corresponding increase in the earnings rate. The increase in market interest rates does not affect the interest income because the bond has a fixed-rate coupon for ten years.

$$\Delta NII_i = (GAP_i)\,\Delta R_i = (RSA_i - RSL_i)\,\Delta r_i = (0 - 10000) * 0{,}01 = -\$100$$

Short quiz

- De los 4 escenarios mencionados a continuación, cuáles son negativos para un banco:
  - Gap positivo y tasa de interés en aumento
  - Gap negativo y tasa de interés en aumento
  - Gap positivo y tasa de interés cayendo
  - Gap negativo y tasa de interés cayendo

Applying the Repricing Model

$\Delta NII_i = (GAP_i)\,\Delta R_i = (RSA_i - RSL_i)\,\Delta R_i$

- Example I: Refinancing risk

  If the one year gap is -$15 million (as in table A), and the one-year rate rises by 1%,

  $\Delta NII = (-\$15 \text{ million}) \times .01 = -\$150{,}000$

Applying the Repricing Model

- Example II: Reinvestment risk

  If the one year gap is $15 million (as in the balance sheet example), and the one-year rate falls by 1%,

$$\Delta NII = (CGAP)\ \Delta R = (\$15 \text{ million})(-0.01)$$
$$= \$-150{,}000$$

Applying the Repricing Model

- $\Delta NII_i = (GAP_i)\,\Delta R_i = (RSA_i - RSL_i)\,\Delta R_i$

- Refinancing risk
  - A negative gap exposes FI to refinancing risk
  - A rise in interest rates lowers FI's net interest income (interest expense increases more than interest income)
- Reinvestment risk
  - A positive gap exposes FI to reinvestment risk
  - A drop in interest rates lowers FI's net interest income (interest income drops more than interest expense)

Possible outcomes

- Equal Rate Changes

Row	CGAP	Change in Interest Rates	Change in Interest Income		Change in Interest Expense	Change in NII
1	>0	⇑	⇑	>	⇑	⇑
2	>0	⇓	⇓	>	⇓	⇓
3	<0	⇑	⇑	<	⇑	⇓
4	<0	⇓	⇓	<	⇓	⇑

Weakness of Repricing Model

- Ignores market value effects of interest rate changes
- When interest rate change, the market value of assets and liabilities (and therefore FI net worth) change
- Market value accounting reflects the true value of the assets and liabilities of a FI if these securities would be liquidated today
- Regulators and big banks increasingly use market value accounting and the duration model

The Maturity/duration Model

- Explicitly incorporates market value effects
  - Marking to market
  - Net worth at current market prices

- For fixed-income assets and liabilities:
  - Rise (fall) in interest rates leads to fall (rise) in market price
  - The longer the maturity, the greater the effect of interest rate changes on market price

- Duration is a measure of the interest rate risk exposure for an FI: how much a change in interest rates affects the bank´s net worth
  - If the durations of liabilities and assets are not matched, then there is a risk that adverse changes in the interest rate will increase (decrease) the present value of the liabilities more (less) than the present value of assets.

Market value of capital and interest rate risk

Balance sheet (market values)

Assets		Liabilities	
Long-term securities	$ 80	Liabilities (short-term, floating-rate deposits)	$ 90
Long-term loans	20	Net worth	10
	$100		$100

Market value of capital and interest rate risk

TABLE 20–3
An FI's Market Value Balance Sheet after a Rise in Interest Rates (in millions of dollars)

Assets		Liabilities	
Long-term securities	$75	Liabilities	$90
Long-term loans	17	Net worth	2
	$92		$92

In the example liabilities have floating rate, then no effect on market value

Book value of capital and interest rate risk

- With changes in interest rates, book value of capital does not change!
- This is what happened in the 80s (S&L crisis)
- Thrifts continue to report long-term fixed rate mortgages at the historical book values, and therefore showed a positive capital position, when they were actually insolvent

Savings and loan crisis (thrifts) 80s and 90s

- These specialized institutions made long-term residential mortgages backed by short-term savings deposits.
- At the end of the 1970s, slightly fewer than 4,000 savings associations had assets of approximately $0.6 trillion.
- Over the period October 1979 to October 1982, the Federal Reserve's restrictive monetary policy action led to a sudden and dramatic surge in interest rates, with rates on T-bills rising as high as 16 percent.
- Interest rate risk together with regulatory forbearance led to the failure of 1,043 out of the 3,234 savings and loan associations in the United States from 1986 to 1995

Credit supply shocks and small businesses

Small firms and access to credit

- Small firms are more likely to have credit availability problems
- Exogeneous shocks that illustrate these problems
  - Change in **debtor protection laws**
    - US case study
    - Its effect on small firms credit availability
    - Its effects on small firms´real performance
    - Its effect on firm entry and exit
  - **Liquidity shock to the banking system**
    - Portugal case study
    - Its effect on small firms credit availability

Debtor protection laws

Slides based on:

- "How does personal bankruptcy law affect startups?", by Cerqueiro, G. and Penas, M.F, in Review of Financial Studies, 2017, 30 (7), 2523-2554.
- "Debtor protection and business dynamism", by Cerqueiro, G., Penas, M.F, and Seamans, R., in Journal of Law and Economics, 2019, No. 62 (3), 521-549.

Motivation

- Legal changes in debtor protection (concerning pledgeability of assets) can change loans credit risk
- Banks can respond to these shocks by reallocating credit among their customers
- If these customers are firms, this in turn could have real effects on economic activity

Contribution

- The paper studies how debtor protection affects:
  - the financing structure of startups (via changes in access to bank credit)
  - the performance of start-ups (firm employment, efficiency and probability of failure)
- Paper links financial frictions to real effects

- Debtor protection measure: Bankruptcy exemptions
  - Amount of personal wealth protected in bankruptcy
  - Varies across US states and in time

- Dataset used: Kauffman Firm Survey
  - Panel of almost 5,000 start-ups that began operations in 2004 and are followed until 2011

U.S. Personal Bankruptcy Law

- Two bankruptcy procedures
  - Chapter 7 (liquidation)
  - Chapter 13 (reorganisation)
- Main personal bankruptcy procedure is Chapter 7
  - All unsecured debts are discharged
  - Filers keep their future income (fresh start)
  - Filers may keep their assets up to the state's exemption limit
  - Nonexempt assets are used to repay debt
- 2005 Reform (BAPCPA) unlikely to affect firm owners

Why does personal bankruptcy affects firms?

- Personal bankruptcy applies to all personal debts of firm owners
- Unlimited liability firms (sole proprietorships)
  - All debts are personal
- Limited liability firms (corporations, LLCs)
  - Firm owners not liable for the firms' business debts, unless:
    - They borrow at the personal level to finance the firm
    - They personally guarantee these business loans

Types of exemptions

1. Homestead exemptions
   - Equity in the debtor's residence
   - Highest in value in most states
2. Personal property exemptions
   - Other types of personal property: Cash and deposits, jewellery, motor vehicle, and wildcard

- We aggregate the two types of exemptions into a single measure

Example

- When an individual files for bankruptcy:

Scenario	Debtor keeps...	Creditor gets...
EXEMPTION ≥ H. EQUITY	HOME EQUITY	0
EXEMPTION < H. EQUITY	EXEMPTION	HOME EQUITY – EXEMPTION

Timing of exemption laws

Year	States
2005	DE, IN, KY, MO, NV, NY
2006	ID, IL, MN, NC, OR, RI
2007	CO, CT, HI, KY, MI, MN, MT, NE, NJ, NM, NV, PA, WA
2008	AK, ID, ME, MN, OH, RI, SC
2009	CA, NC, ND, OR, WI

Changes in exemption limits

Magnitude of exemption limit increase			States
$5,000 >	ΔExemption		MO, MN, CT, HI, MI, KY, PA, NJ, AK, ID
$25,000 >	ΔExemption	≥ $5,000	KY, IN, NC, IL, OR, SC, RI, ND
$100,000 >	ΔExemption	≥ $25,000	NY, SC, ID, NE, WA, NM, CO, MN, OH, ME, CA, NC
	ΔExemption	≥ $100,000	DE, NV, RI, MT, MN, WI

How do increases in exemptions affect credit to firms?

- Two effects of the exemptions:
  - Agency problems/credit risk $\Longrightarrow$ Reduction in credit supply
  - Wealth insurance $\Longrightarrow$ Increase in credit demand

- Papers share the conclusion that high exemptions reallocate credit from poorer to richer individuals
  - (Gropp, Scholz & White (1997 QJE), Lilienfeld-Toal & Mookherjee (2008 WP)

Example

- Consider: Idaho raised its homestead exemption in 2006 from $50,000 to $100,000

Wealth group	Wealth ($)	Pledgeable wealth ($)	
		Before ($50K)	After ($100K)
Low	50K	0	0
Intermediate	70K	20K	0
High	250K	200K	150K

- Papers predicen que en equilibrio general las exenciones producen reasignación de crédito desde el grupo Intermediate al grupo High

Data

- State exemptions hand-collected from individual state codes
- Firm data from the Kaufman Firm Survey (KFS)
  - Tracks 4,928 start-up firms born in 2004
  - Longitudinal survey (2004-2009)
  - Information collected includes: financial sources, credit scores, (from D&B), industry, legal form, and about firm owners (demographics, education, experience, and owner wealth bin)
- State-level controls for the Census Bureau
  - House prices, median income, unemployment rate, entry rate

Dependent variables

- Bank financing
  - Personal loans versus business loans
  - Credit cards (amount used and limit) versus other loans
- Employment
  - Number of employees
  - Dummy for employer firm
- Firm performance
  - Revenue
  - Efficiency = Average revenue per employee
  - Failure

Independent variables

- Exemptions
- Owner wealth bins
  - "Low" < $50,000
  - "Intermediate" $50,000 to $250,000
  - "High" > $250,000

- Credit score percentiles from Dun & Bradstreet (credit bureau that provides business credit information)
  - Ranges from 1 (minimum risk) to 5 (maximum risk)
- State controls
  - Average house prices, unemployment rate, median income, and firm entry rate

Descriptive stats

Dependent variable	Low wealth	Intermediate wealth	High wealth
Personal credit ($000)	35.92	18.74	68.80
Business credit ($000)	8.11	10.29	88.16
Credit card balance ($000)	2.84	2.68	2.77
Credit card limit ($000)	5.74	8.78	10.11
Other bank loans ($000)	5.02	6.67	27.43
Number of employees	2.65	3.21	5.43
Employer firm	0.44	0.51	0.55
Revenue ($000)	137.07	382.53	811.62
Efficiency ($000)	26.49	104.84	88.16
Failed	0.05	0.01	0.05

Results

Start-ups bank financing

Personal loans of int wealth owners fall 6% after a $10000 increase in exemptions

Variable	Ln(Personal credit)	
Low Wealth × Exemptions ($10K)	3.85	
	(1.25)	
Intermediate × Exemptions ($10K)	-6.18**	
	(-2.26)	
High Wealth × Exemptions ($10K)	0.42	
	-0.14	
State controls	Yes	
Firm controls	Yes	
Firm fixed effects	Yes	
Wealth group × Year fixed effects	Yes	
Number of observations	20150	

Variable	Ln(CC balance)	Ln(CC limit)	Ln(Bank loans)
Low Wealth × Exemptions ($10K)	1.85	0.57	0.72
	(0.97)	(0.24)	(0.21)
Intermediate × Exemptions ($10K)	-3.78**	-5.45***	-3.52**
	(-2.16)	(-2.69)	(-2.27)
High Wealth × Exemptions ($10K)	0.55	3.34**	-0.44
	(0.39)	(2.04)	(-0.29)
State controls	Yes	Yes	Yes
Firm controls	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes
Wealth group × Year fixed effects	Yes	Yes	Yes
Number of observations	20150	20150	20150

Distribution of credit from interm. wealth owners to high wealth owners (see credit card limits)

Variable	Ln(CC balance)	Ln(CC limit)	Ln(Bank loans)
Low Wealth × Exemptions ($10K)	1.85	0.57	0.72
	(0.97)	(0.24)	(0.21)
Intermediate × Exemptions ($10K)	-3.78**	-5.45***	-3.52**
	(-2.16)	(-2.69)	(-2.27)
High × Exemptions ($10K)	0.55	3.34**	-0.44
	(0.39)	(2.04)	(-0.29)
State controls	Yes	Yes	Yes
Firm controls	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes
Wealth group × Year fixed effects	Yes	Yes	Yes
Number of observations	20150	20150	20150

Results

Start-ups real performance

Number of employees falls for interm. wealth owners and increases for high wealth owners

Variable	Ln(Employees)	Employer firm
Low Wealth × Exemptions ($10K)	-0.34	-0.10
	(-0.97)	(-0.32)
Intermediate × Exemptions ($10K)	-0.69**	-0.56**
	(-2.06)	(-2.13)
High Wealth × Exemptions ($10K)	1.55***	0.71***
	(3.00)	(3.07)
State controls	Yes	Yes
Firm controls	Yes	Yes
Firm fixed effects	Yes	Yes
Wealth group × Year fixed effects	Yes	Yes
Number of observations	20150	20150

Firm revenue and efficiency (sales per worker) fall for interm. wealth owners

Variable	Ln(Revenue)	Ln(Efficiency)
Low Wealth × Exemptions ($10K)	-0.95	-0.66
	(-0.22)	(-0.51)
Intermediate × Exemptions ($10K)	-4.97***	-1.45**
	(-2.64)	(-2.20)
High Wealth × Exemptions ($10K)	0.50	-0.64
	(0.21)	(-0.97)
State controls	Yes	Yes
Firm controls	Yes	Yes
Firm fixed effects	Yes	Yes
Wealth group × Year fixed effects	Yes	Yes
Number of observations	20150	20150

Firms owned by interm. wealth owners are more likely to fail

Variable	Failed
Low Wealth × Exemptions ($10K)	0.05
	(0.03)
Intermediate × Exemptions ($10K)	4.10***
	(3.21)
High Wealth × Exemptions ($10K)	1.61
	(1.56)
State controls	Yes
Firm controls	Yes
Firm fixed effects	Yes
Wealth group × Year fixed effects	Yes
Number of observations	20150

Wrapping-up

- Following an increase in a state's exemptions, we find:

  - If the entrepreneur has **intermediate** wealth:
    - A reduction in personal bank financing, lower employment, lower efficiency, and higher rate of failure

  - If the entrepreneur has **high** wealth:
    - Slight increase in credit card limits, higher employment, and no effect on firm performance

Note:
Firms with better credit scores obtain substantially larger inflows of credit

	(1)
	Personal credit
Exemptions	
Exemptions × No wealth	3.85
	(1.25)
Exemptions × Low wealth	-6.18**
	(-2.26)
Exemptions × High wealth	0.42
	(0.14)
State time-varying controls	
Average home price (Log)	-0.30
	(-0.47)
Median income (Log)	0.83
	(0.69)
Unemployment rate	0.034
	(0.47)
Entry rate	0.18*
	(2.00)
Firm time-varying controls	
Credit risk 1	0.84***
	(3.16)
Credit risk 2	0.58**
	(2.62)
Credit risk 3	0.52***
	(3.16)
Credit risk 4	0.30
	(1.67)
Credit risk 5	-0.19
	(-0.86)
Firm fixed effects	Included
Year × Owner wealth fixed effects	Included
Number of observations	20,150
R-squared	0.02

- Firm entry and exit

Data

- Debtor protection: Exemptions
  - Amount of personal assets protected in personal bankruptcy
- Public and non-public data from US Census
- Employer firms (1994-2013)
  - Non-public data: LBD
    - Granted access following accepted project proposal
  - Public data: BDS
- Control variables to proxy for macroeconomic determinants of entry and exit rates from other sources

Empirical methodology

- 4 Panel regression models with state-year data

$$y_{st} = \alpha_s + \alpha_t + \beta Exemptions_{st} + Controls_{st} + u_{st}$$

- Y_{st} (dependent variables):
  - Firm birth rate (number of new firms over existing firms)
  - Job creation rate (number of new jobs over existing jobs)
  - Firm exit rate (number of firms that stop operations over existing firms)
  - Job destruction rate (number of lost jobs over existing jobs)

Firm entry and job creation

- Splits between small firms (1-4 workers) and larger firms (5-20 workers)

- Dependent variables:

  - Firm birth rate
  - Job creation rate

First result - Entry

- Exemptions have no significant effect on aggregate entry
- However, the composition of entrants change
  - Higher entry in sectors with lower startup capital needs
    - Analysis with state-industry-year data (LBD)
    - Classify industries according to entry barriers (amount of capital needed to enter an industry)
      - Low entry barrier industry is an industry with below-median startup capital needs
  - Consistent with the idea that positive demand effect dominates when the sector is not dependent on credit to begin operations

Firm exit and job destruction

- Splits between small firms (1-4 workers) and larger firms (5-20 workers)

- Dependent variables:

  - Firm exit rate
  - Job destruction rate

Second result - Exit

- Exemptions increase small firm exit rates and job destruction
  - No effect for larger firms (5-20 workers)

Firm exit and job destruction

- For small firms (1-4 workers),
  - splits between:
    - very young firms (1-5 years old)
    - young (6-15 years old)
    - Older firms (more than 15 years old)

- Dependent variables:

  - Firm exit rate
  - Job destruction rate

Third result - Exit and firm age

- We find that the stronger effect is for the very young firms and it fades with age

Wrapping-up (2)

- Increasing debtor protection leads to:
  - Higher entry rates in sectors with low entry barriers
    - Economically small effect
  - Higher exit rates
    - Effect confined to small firms (1-4 employees)
    - Effect fades with firm age

Policy relevance

- Unintended consequences in the design of personal bankruptcy law?
  - Main argument in favor of lenient bankruptcy rules is the protection of socially vulnerable individuals
  - However, our results indicate that lenient personal bankruptcy laws may harm less wealthy individuals.
- Several European countries adopted or intend to adopt more debtor friendly bankruptcy systems, imitating the US