Whatever it takes: The Real Effects of Unconventional Monetary Policy

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Draghi's Speech

- Mario Draghi stated on 26 July 2012, during a conference in London:

"Within our mandate, the ECB is ready to do whatever it takes to preserve the euro. And believe me, it will be enough."

- On 21 November 2014, Mario Draghi reflected on the ECB's policy by saying:

"Nevertheless, these positive developments in the financial sphere have not transferred fully into the economic sphere. The economic situation in the euro area remains difficult. The euro area exited recession in the second quarter of 2013, but underlying growth momentum remains weak. Unemployment is only falling very slowly. And confidence in our overall economic prospects is fragile and easily disrupted, feeding into low investment."

Draghi's Speech

- Three questions: Did the OMT announcement...
  1. ...affect banks? And how?
  2. ...impact bank lending?
  3. ...revert negative financial and real effects caused by credit crunch (cash, low employment growth, investment etc.)? (Acharya, Eisert, Eufinger, Hirsch (2015))

Contribution

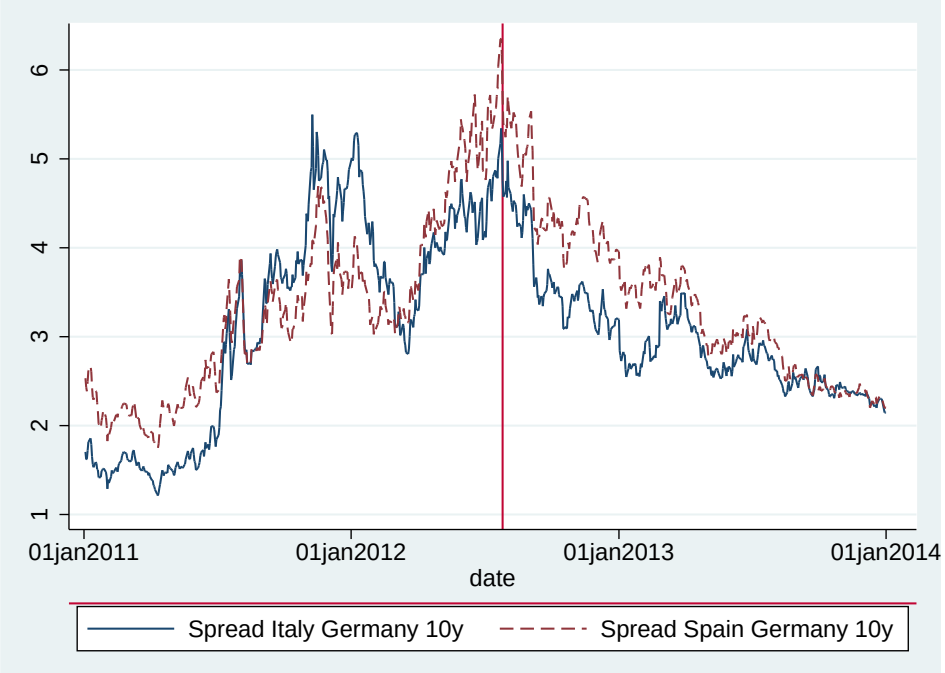
- Did the OMT announcement affect banks? And how?
  - Periphery country banks benefited significantly due to their large holdings of GIIPS sovereign debt
  - Capital gains on sovereign debt improved equity capitalization of periphery country banks
- OMT Program led to a backdoor (indirect) recapitalization of European banking sector
- Indirect recapitalization measure allows central banks to target recapitalization to banks holding troublesome assets
- Does not allow them to tailor the amount of recapitalization to a bank's specific capital needs

Contribution

- Did the OMT announcement impact bank lending?
  - Capital gains led to increase in loan supply mostly to below median quality borrowers (only at the intensive margin)
  - Partly driven by zombie lending of banks that regained some lending capacity due to OMT announcement, but remained weakly-capitalized
- Did OMT announcement lead to financial and real effects?
  - Non-zombie firms that benefit from increased loan supply significantly increase their cash holdings
  - No direct effect of increased lending on real economic activity (employment, investment)
  - Presence of zombie firms depresses
    - Employment growth (on average 3.6-4.4pp lower, up to 15pp lower for industries with a strong increase in the fraction of zombie firms)
    - Investment (on average 11.6%-13.3%, up to 44% of capital lower) of healthy firms in the same industry

OMT program

- Buying a theoretically unlimited amount of government bonds with one to three years maturity in secondary markets



- Krishnamurthy et al. (2014) and Altavilla et al. (2014) show OMT announcements led to a relatively strong decrease for Italian and Spanish government bond yields
- As of today, OMT program has still not been activated

Sample and Variables of Interest

- Hand matched sample at the intersection of Amadeus and Dealscan for all EU countries and period 2009-2014
- Loans issued to 980 private borrowers by 49 lead banks
- Relevant OMT announcement dates (Krishnamurthy et al. (2014)):
  - July 26, 2012: Draghi's "whatever it takes" speech
  - August 2, 2012: Announcement to undertake outright monetary transactions in secondary, sovereign bond markets
  - September 6, 2012: Release of technical details of the operations

Outline

1. **OMT Announcement: Effect on Bank Health**
2. Bank Lending
   1. Overall Lending
   2. Zombie Lending
3. Financial and Real Effects of Bank Lending Behavior
4. Zombie Distortions

Effect on Banks: More Equity

- OMT program announcement has improved the equity capital of banks with large GIIPS sovereign debt holdings
- Gains on sovereign bonds held in the banks' trading book are at least partly realized as valuation reserves in the banks equity because of mark-to-market accounting:

"The effects of the narrowing of the BTP/Bund spread entailed an improvement in the market value of debt instruments with a relative positive net impact on the fair value reserve of Euro 855 mn [...]."

(UBI Banca annual report 2012)

- Total equity of UBI in December 2012 was Euro 8,608 mn
- Gains amount to 9.9% of total equity

Main Variable of Interest

$$OMT\ windfall\ gain_{bj} = \frac{\Delta Value\ EU\ Sov.\ Debt_{bj}}{Total\ Equity_{bj}}.$$

- Gain on EU sovereign debt holdings as a fraction of a bank's total equity

	CDS return	OMT windfall gain	GIIPS/Assets
Non-GIIPS Banks	-0.23	0.011	0.010
	(-9.2)		
GIIPS Banks	-0.96	0.08	0.118
	(-3.4)		
t-test for difference	7.8	5.69	12.7

- GIIPS Banks hold on average 11.8% of their total assets in GIIPS sovereign debt
- Implies a gain on their sovereign debt holdings on the OMT announcement date of 8% of total equity
- GIIPS Banks see a more than three times larger reduction in CDS spreads

Evolution of Bank Capitalization

Total Assets/Total Equity ratio			
	pre-crisis	crisis/pre-OMT	post-OMT
weakly-cap. GIIPS	16.29	24.74	21.21
well-cap. GIIPS	12.37	13.57	12.39
non-GIIPS European	21.88	16.53	15.87
U.S. Banks	12.65	9.25	8.70
Quasi-leverage ratio			
	pre-crisis	crisis/pre-OMT	post-OMT
weakly-cap. GIIPS	10.49	63.91	45.86
well-cap. GIIPS	8.74	42.17	36.76
non-GIIPS European	14.69	37.34	34.46
U.S. Banks	8.5	10.1	9.9

- 43% of weakly capitalized GIIPS banks are from Italy (3), 28.5% from Spain (2) and Portugal (2), respectively (14 GIIPS banks in total).

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Bank Lending - Khwaja and Mian (2008): Our Approach

- Aggregate firms into clusters to generate enough time-series bank lending heterogeneity
- Cluster firms such that firms in a given cluster have same demand for bank loans and are of similar quality
- Criteria:
  - the country of incorporation
  - the industry
  - the firm rating (derived from 3-year median EBIT interest coverage ratio of each firm)

Bank Lending - Khwaja and Mian (2008)

- Unit of observation is at the firm cluster-quarter-bank level
- Intensive Margin:

$$\begin{aligned}\Delta Volume_{bmjt+1} &= \beta_1 \cdot OMT\ windfall\ gain_{bj} * PostOMT \\ &+ \gamma \cdot X_{bjt} + Firm\ Cluster_m \cdot Quarter\text{-}Year_{t+1} \\ &+ Firm\ Cluster_m \cdot Bank_{bj} + u_{bmjt+1}.\end{aligned}$$

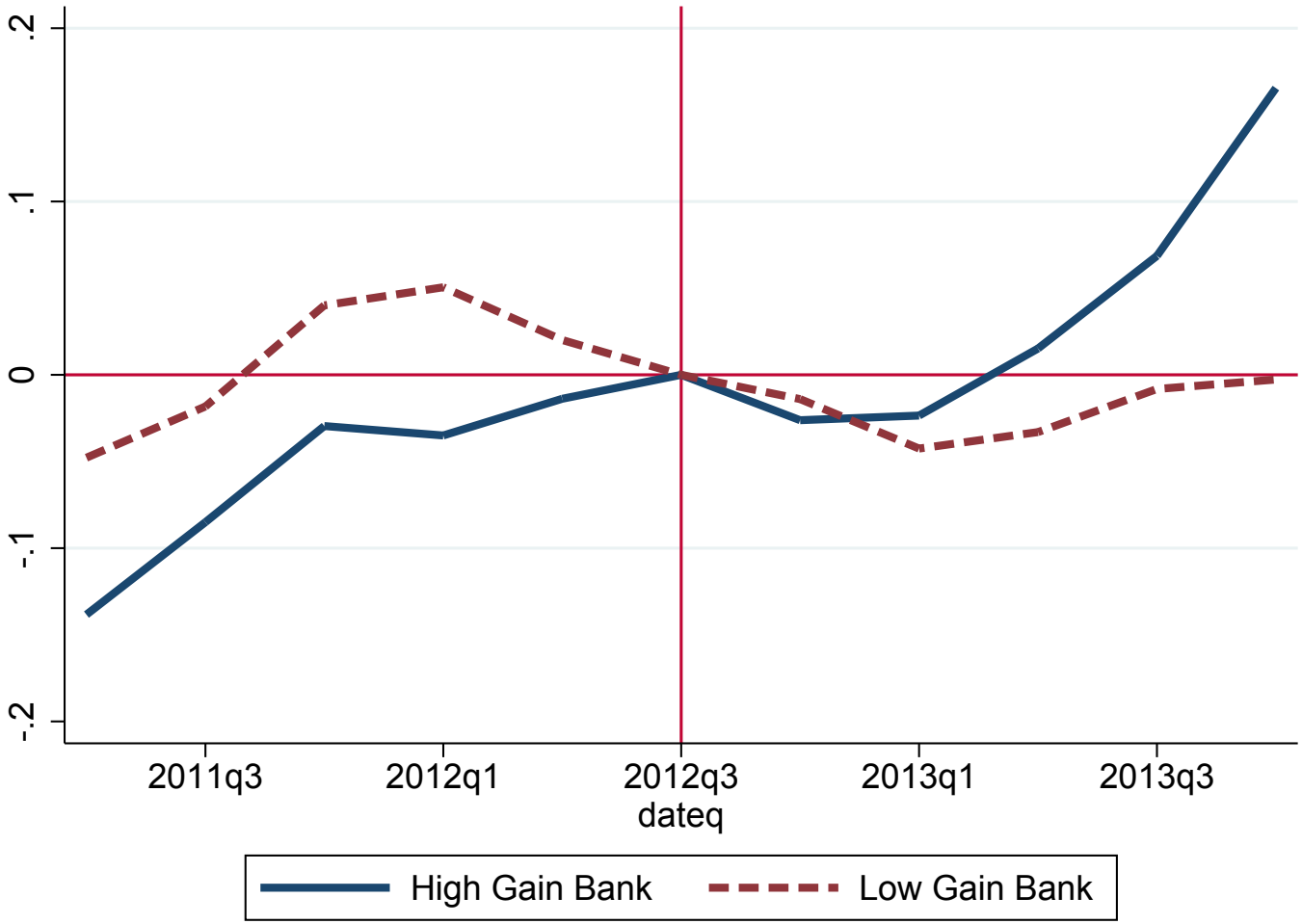
  - Cluster consists of firms that had existing relation to bank

- Extensive Margin:

$$\begin{aligned}NewLoan_{bmjt+1} &= \beta_1 \cdot OMT\ windfall\ gain_{bj} * PostOMT \\ &+ \gamma \cdot X_{bjt} + Firm\ Cluster_m \cdot Quarter\text{-}Year_{t+1} \\ &+ Firm\ Cluster_m \cdot Bank_{bj} + u_{bmjt+1}.\end{aligned}$$

  - Cluster consists of firms without existing relation to bank

Bank Lending - Evolution of Loan Volume: All Firms



Change in Loan Volume - Borrower Quality

- Below country median 3-year interest coverage ratio
- 3-year median based on period 2009 to 2011

Classification 2009-2011: Intensive Margin						
	All banks	All banks	All banks	All banks	All banks	GIIPS banks
	Δ Loans	Δ Loans	Δ Loans	Δ Loans	Loan Inc.	Δ Loans
OMT windfall gain*PostOMT	0.042	0.062	-0.004	-0.014	-0.030	0.038
	(0.68)	(0.80)	(-0.06)	(-0.18)	(-0.21)	(0.41)
OMT windfall gain*PostOMT*LowIC	0.280***	0.295***	0.212***	0.253***	0.364**	0.296**
	(5.66)	(5.02)	(3.25)	(3.02)	(2.03)	(2.89)
R^2	0.014	0.098	0.598	0.643	0.617	0.775
N	10879	10879	10879	10879	10879	4090
Classification 2009-2011: Extensive Margin						
	New Loan	New Loan	New Loan	New Loan		New Loan
OMT windfall gain*PostOMT	-0.013	-0.020	-0.015	-0.023		-0.188
	(-0.14)	(-0.20)	(-0.12)	(-0.17)		(-1.40)
OMT windfall gain*PostOMT*LowIC	0.060	0.074	-0.056	-0.045		0.109
	(0.71)	(0.81)	(-0.47)	(-0.36)		(0.99)
R^2	0.006	0.077	0.667	0.692		0.815
N	25874	25874	25874	25874		7255
Bank Fixed Effects	YES	NO	YES	NO	NO	NO
Time Fixed Effects	YES	YES	NO	NO	NO	NO
FirmCluster-Bank Fixed Effects	NO	YES	NO	YES	YES	YES
FirmCluster-Time Fixed Effects	NO	NO	YES	YES	YES	YES

- Qualitatively same results if we use CDS return on OMT announcement dates instead of OMT windfall gains

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Zombie Lending

FINANCIAL TIMES

January 8, 2013 7:29 pm

Companies: The rise of the zombie

"...the zombie problem is chiefly focused in the peripheries of Europe rather than the core. In Spain, Ireland, Portugal and Greece, banks have been reluctant to pull the plug on companies as it would have forced them to crystallise heavy losses."

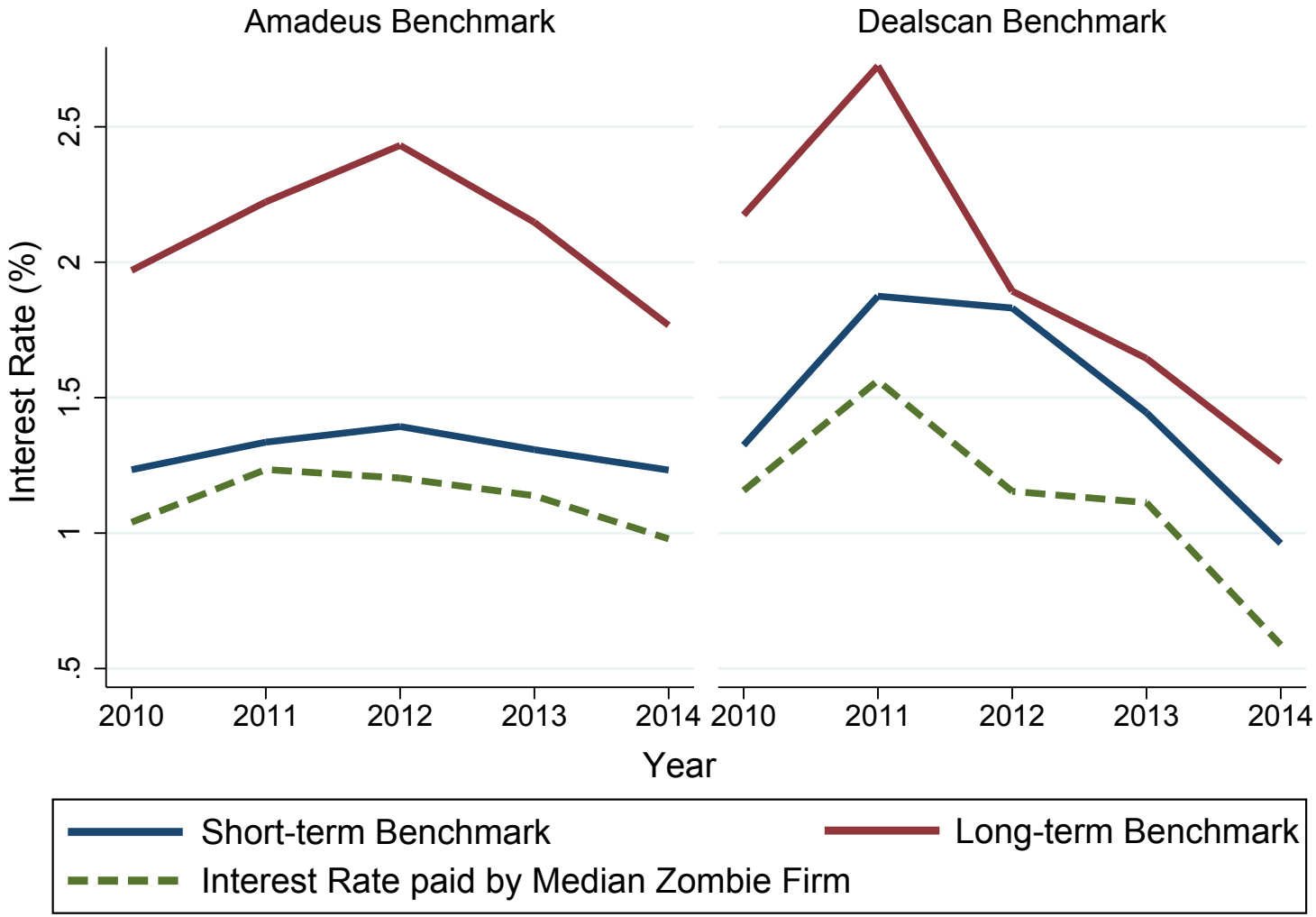
Zombie Lending

- Similar to Caballero, Hoshi, and Kashyap (2008), we identify zombie firms as firms that receive subsidizied credit (i.e., loans at very advantageous interest rate)
- Benchmark: interest expense that highest quality public borrower in non-GIIPS countries (AAA rating) pay in a given year
- Two approaches to determine benchmark:
  - Newly issued loans in Dealscan
  - Interest payments from Amadeus

Detecting Zombies

- Several criteria have to be met for a private firm to be classified as zombie
  1. Interest payments below benchmark (subsidized credit),
  2. Firm has to be of low quality (i.e., low interest coverage ratio),
  3. Syndicate has to remain constant compared to pre-OMT period or become smaller, that is, banks dropping out are not replaced by new banks (given that the first two criteria are met, this holds for 95% of the cases).
     - Banks that are dropping out of zombie syndicates have on average higher equity/assets ratio than banks that remain in syndicate

Benchmark Interest Rates



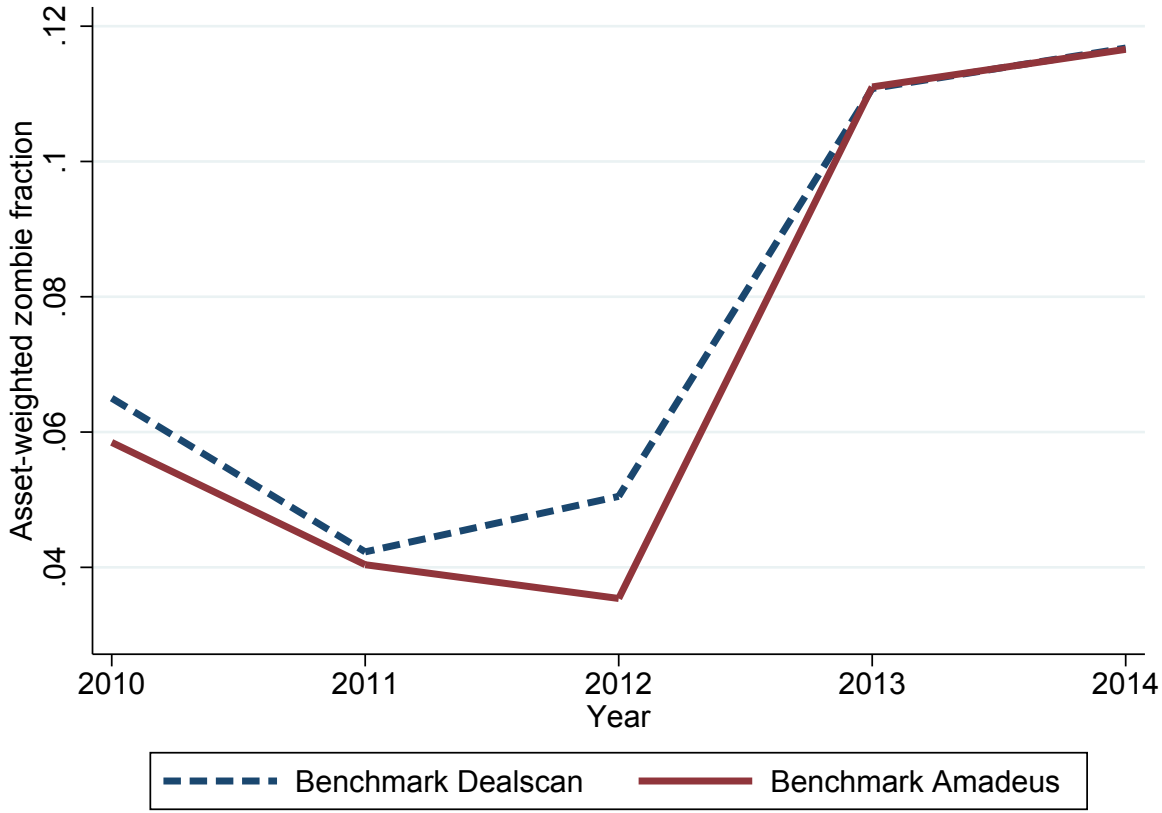
Benchmark examples

- Examples of benchmark firms

Amadeus ID	Name	Country	Average IC	Allindrawn	Maturity Benchmark
GB00719885	Rio Tinto Plc	GB	26.72	22.5	Short-term
DE7270000251	Hugo Boss AG	Germany	13.34	95	Long-term

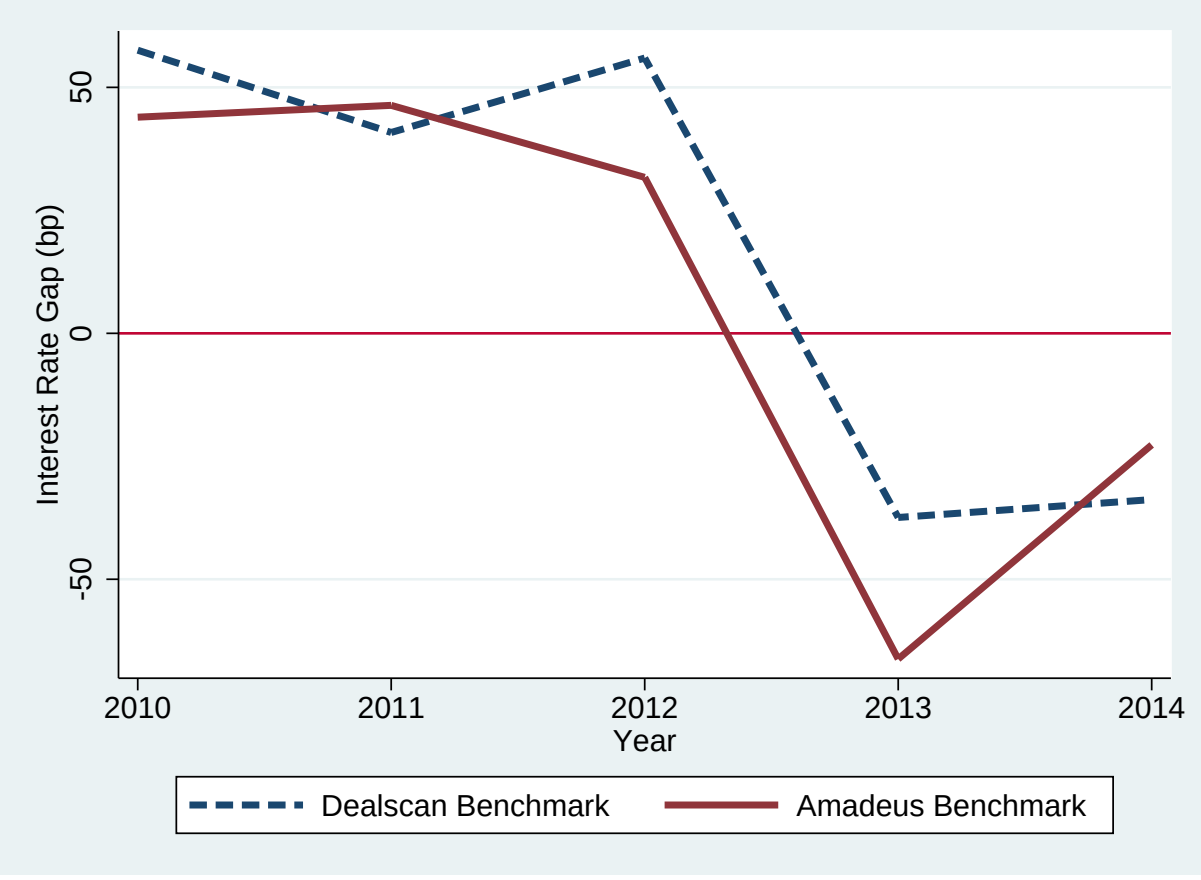
- LIBOR used as reference rate for syndicated loans
- Allindrawn expressed as spread over LIBOR
- Total cost of borrowing calculated by adding LIBOR to the allindrawn spread from Dealscan

Percentage of firms receiving subsidized loans in Europe



- Percentage of zombie firms increases post-OMT announcement for both benchmarks

Evolution of Interest Rate Gap



- Graph considers firms that were non-zombies before OMT and became zombies after OMT

Breakdown zombies by country

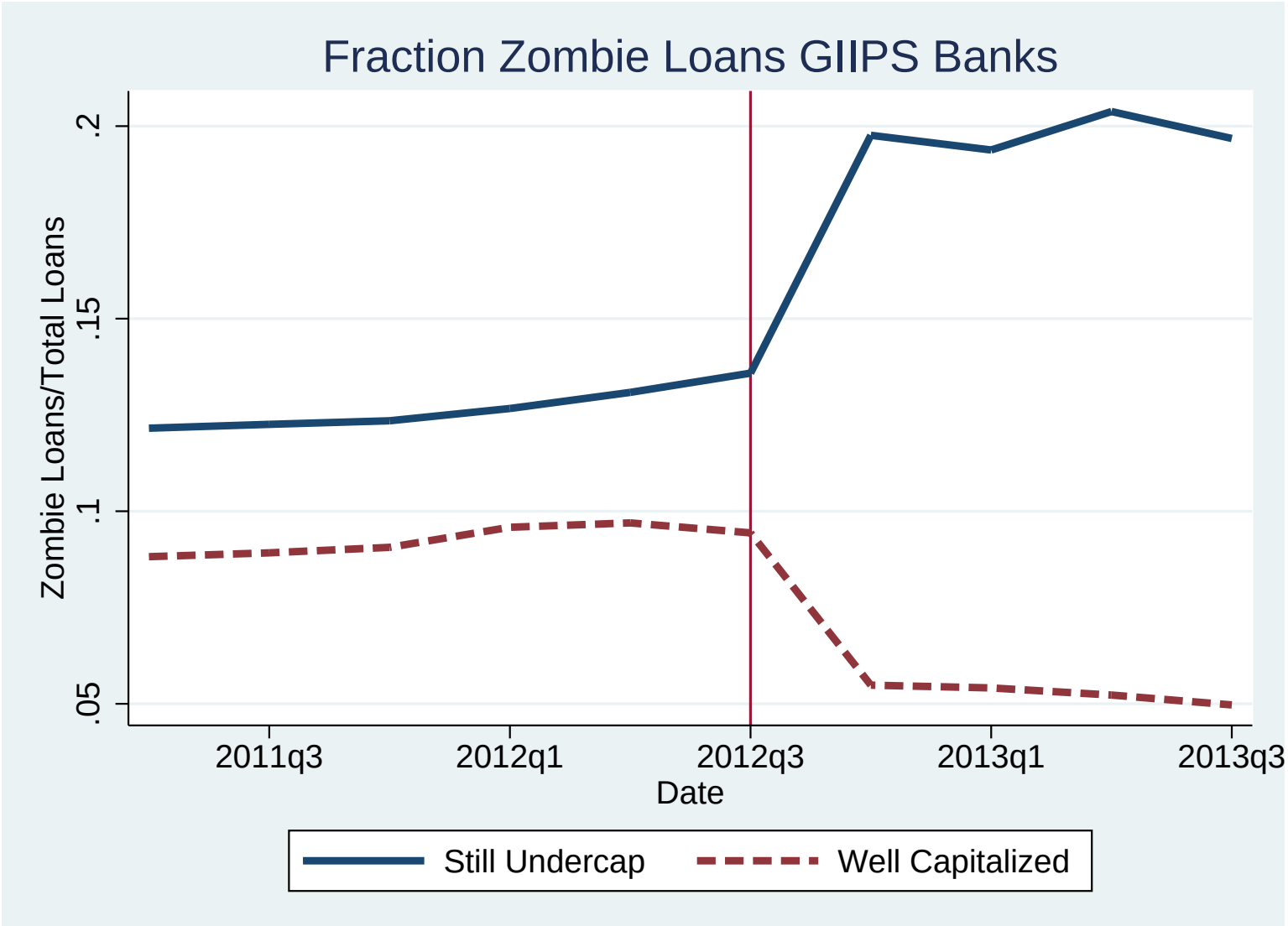
Panel A: Amadeus Benchmark		
Country	Number of Zombies	Number of private firms in sample
Germany	4	119 (3.4%)
Spain	29	177 (16.3%)
France	10	137 (7.2%)
UK	23	235 (9.8%)
Italy	35	172 (20.3%)
Panel B: Dealscan Benchmark		
Country	Number of Zombies	Number of private firms in sample
Germany	6	119 (5%)
Spain	31	177 (17.5%)
France	13	137 (9.5%)
UK	25	235 (10.6%)
Italy	34	172 (19.8%)

Comparison within High Indirect Gain firms

Panel A: Amadeus Benchmark				
	High Quality	Low Quality Non-Zombie	Zombie	Difference (3)-(4)
Total Assets (mn)	1390	1730	900	830
				(1.19)
Tangibility	0.544	0.614	0.665	-0.051
				(-1.33)
Int. Cov.	4.602	1.187	0.394	0.793*
				(1.80)
Net Worth	0.248	0.174	0.113	0.061**
				(2.12)
EBITDA/Assets	0.108	0.064	0.035	0.029***
				(3.78)
Leverage	0.566	0.583	0.625	-0.042*
				(-1.84)

- Zombie firms are significantly worse in terms of interest coverage ratio, net worth, and EBITDA/total assets

Evolution of Zombie Lending Volume - GIIPS Banks



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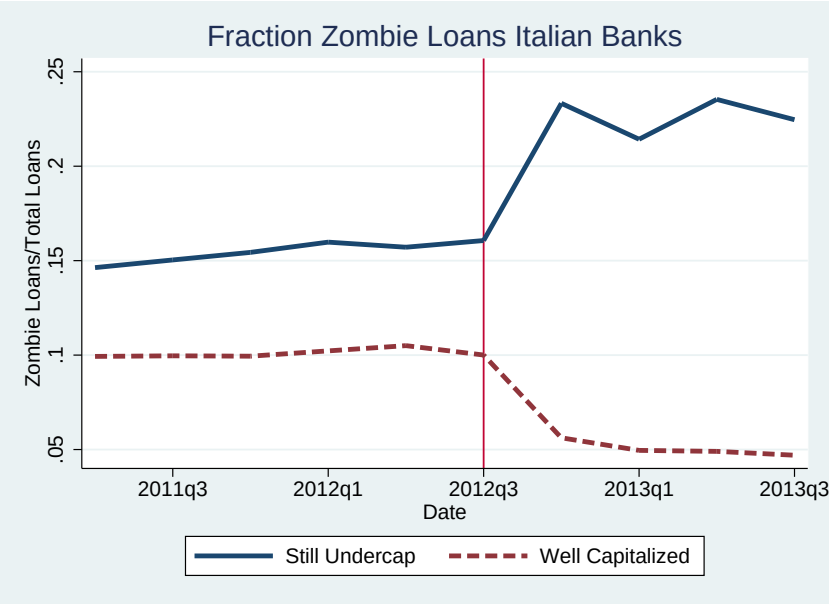

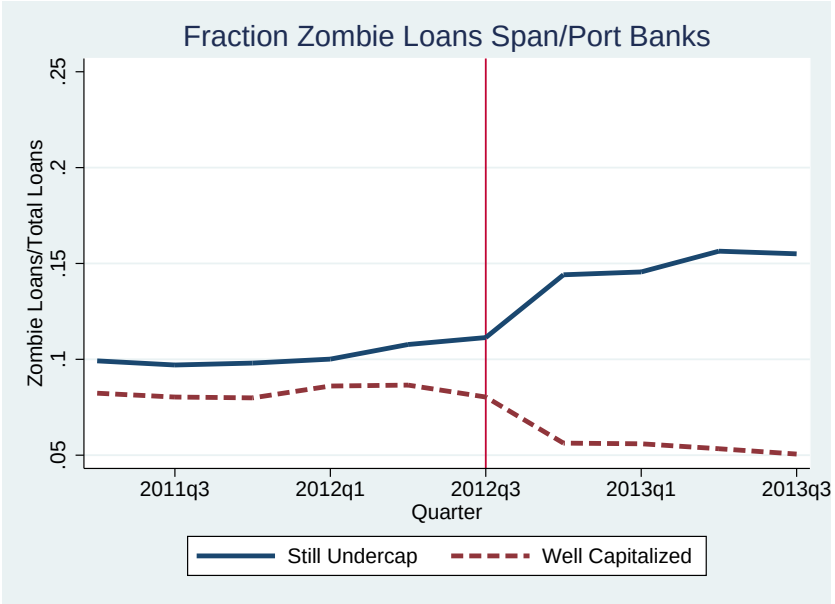

- Increase in zombie loan volume in Italy as well as Spain and Portugal
- Increase more pronounced for Italian banks that are still undercapitalized

Zombie Firms - Example: Feltrinelli

- Feltrinelli is a private Italian publishing company and operates bookstores throughout Italy
- Came under severe stress during the sovereign crisis
- La Repubblica wrote in 2013: "Feltrinelli announces solidarity contracts for 1,370 employees, for a period of one year. [...] this will allow to save up to 216,000 working hours. 2012 was a particularly difficult year [...] The company has recorded a contraction of net sales by 11% over the last two years. And 2013 is going to be just as critical."
- Receives a new loan from UniCredit and Intesa Sanpaolo after OMT, when its interest coverage ratio was -1.1
- The interest rate on its debt for 2015 was 1.3%, the corresponding benchmark rate was 1.4%
- The interest rate on its debt at time of pre OMT loan was 4.7% when benchmark rate was 2.0%

Bank Lending - Khwaja and Mian (2008)

- Unit of observation is at the firm cluster-quarter-bank level
- Intensive Margin:

$$
\begin{aligned}
\Delta Volume_{bmjt+1} &= \beta_1 \cdot OMT\ windfall\ gain_{bj} * PostOMT \\
&+ \beta_2 \cdot OMT\ windfall\ gain_{bj} * PostOMT * Still\ Undercap_{bj} \\
&+ \beta_3 \cdot OMT\ windfall\ gain_{bj} * PostOMT * Zombie_{mt} \\
&+ \beta_4 \cdot OMT\ windfall\ gain_{bj} * PostOMT * Zombie_{mt} \\
&* Still\ Undercap_{bj} \\
&+ \gamma \cdot X_{bjt} + Firm\ Cluster_m \cdot Quarter\text{-}Year_{t+1} \\
&+ Firm\ Cluster_m \cdot Bank_{bj} + u_{bmjt+1}.
\end{aligned}
$$

- Controlling for all other pairwise and triple interaction terms
- For our modified KM regressions, we add additional criterion whether firm is a zombie or not when forming clusters
- This allows us to clearly differentiate between loan changes to zombie and non-zombie firms

ΔLoan Volume to Zombie Borrower - Amadeus Benchmark

	Δ Loans All banks	Δ Loans All banks	Δ Loans All banks	Δ Loans All banks	Loan Increase All banks	Δ Loans GIIPS banks	ΔLoans Span/Port. banks	Δ Loans Italian banks
OMT windfall gain*PostOMT	0.444***	0.450***	0.393***	0.414***	0.569***	0.587**	0.320*	0.552***
	(5.03)	(4.79)	(3.05)	(3.01)	(2.82)	(1.99)	(1.92)	(3.52)
OMT windfall gain*PostOMT*Zombie	-0.526***	-0.573***	-0.468***	-0.543***	-0.585**	-0.697**	-0.513***	-0.635***
	(-3.16)	(-2.74)	(-4.53)	(-2.75)	(-2.04)	(-2.55)	(-3.32)	(-3.76)
OMT windfall gain*PostOMT*Still Undercap	-0.405**	-0.460**	-0.431***	-0.433***	-0.560***	-0.663**	-0.430**	-0.551***
	(-2.13)	(-2.33)	(-2.75)	(-2.83)	(-2.78)	(-2.83)	(-2.10)	(-3.12)
OMT windfall gain*PostOMT*Still Undercap*Zombie	0.722***	0.701***	0.768***	0.756***	0.865**	0.998***	0.746*	1.01***
	(3.17)	(4.50)	(4.12)	(3.58)	(2.42)	(3.66)	(1.79)	(4.05)
R^2	0.011	0.111	0.726	0.759	0.695	0.834	0.832	0.906
N	13600	13600	13600	13600	13600	4280	2878	1402
Bank Level Controls	YES	YES	YES	YES	YES	YES	YES	YES
Bank Fixed Effects	YES	NO	YES	NO	NO	NO	YES	YES
Time Fixed Effects	YES	YES	NO	NO	NO	NO	NO	NO
FirmCluster-Bank Fixed Effects	NO	YES	NO	YES	YES	YES	NO	NO
FirmCluster-Time Fixed Effects	NO	NO	YES	YES	YES	YES	YES	YES

- Well capitalized banks: One SD higher OMT windfall gain increase loan volume to non-zombies by 2.5%
- High gain Banks that remain undercapitalized after OMT do not increase loan supply in general
- Only provide new loans to zombie firms (increase in loan volume of 1.1% for one SD higher OMT windfall gains)
- Effects more pronounced for Italian than for Spanish/Portuguese banks

Zombie Lending due to Government Pressure?

- Are governments exerting pressure on banks to provide cheap loans in order to avoid rising default and unemployment rates?
- If this causes our results, governments would have to pressure especially weakly-capitalized banks to engage in zombie lending (well capitalized banks cut back on zombie firms)
- Still, we use three approaches to rule out this alternative story
  1. If zombie lending is due to government pressure, existing lending relation should not play a role $\rightarrow$ We do not find evidence that zombie lending occurs at the extensive margin
  2. No evidence that government owned banks engage in zombie lending
  3. Zombie firms do not have a higher propensity to be government owned and excluding government owned firms does not affect results

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Financial and Real Effects - Main Variable

- Compute the *Average OMT windfall gain* for all the banks that act as lead arranger in a given syndicate.
- Defined for firm i in country j in industry h at time t as:

$$\textit{Indirect OMT windfall gains}_{ijht} = \frac{\sum_{l \in L_{ijht}} \textit{Avg. OMT windfall gain}_{lijh} \cdot \textit{Loan Amount}_{lijht}}{\textit{Total Loan Amount}_{ijht}}$$

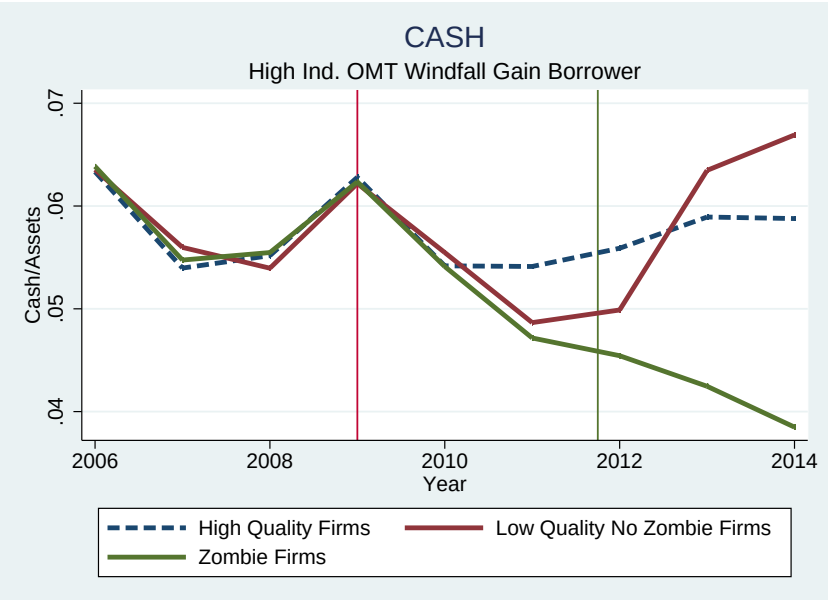
- L_{ijht} are all of the firm's loans outstanding at time t.
- Measures the benefit of a firm via bank relationships

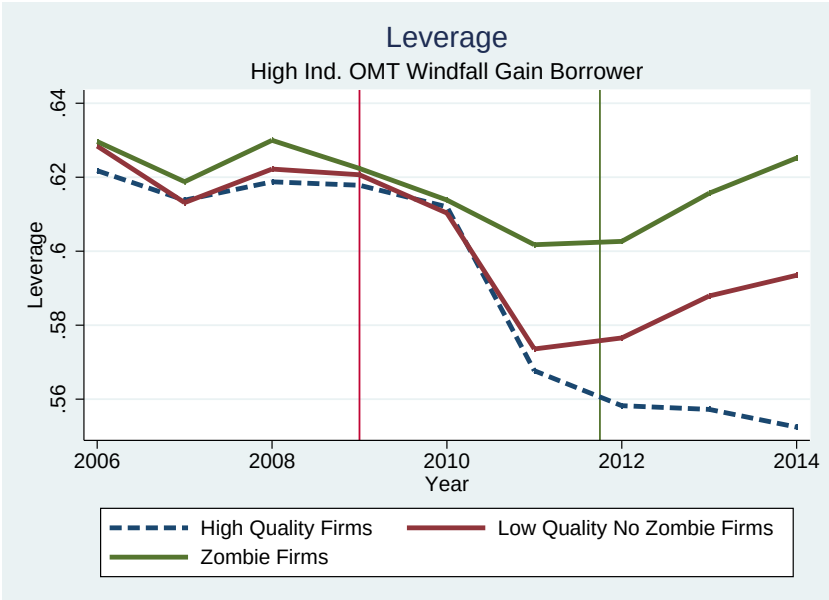
Financial and Real Effects - Specification

$$
\begin{aligned}
y_{ijht+1} &= \beta_1 \cdot \textit{Indirect OMT windfall gains}_{ijh} \cdot \textit{PostOMT}_t \\
&+ \gamma \cdot X_{ijht} + \textit{Firm}_{ijh} + \textit{Industry}_h \cdot \textit{Country}_j \cdot \textit{Year}_{t+1} + u_{ijht+1} \\
&+ \textit{ForeignBankCountry}_{k \neq j} \cdot \textit{Year}_{t+1}.
\end{aligned}
$$

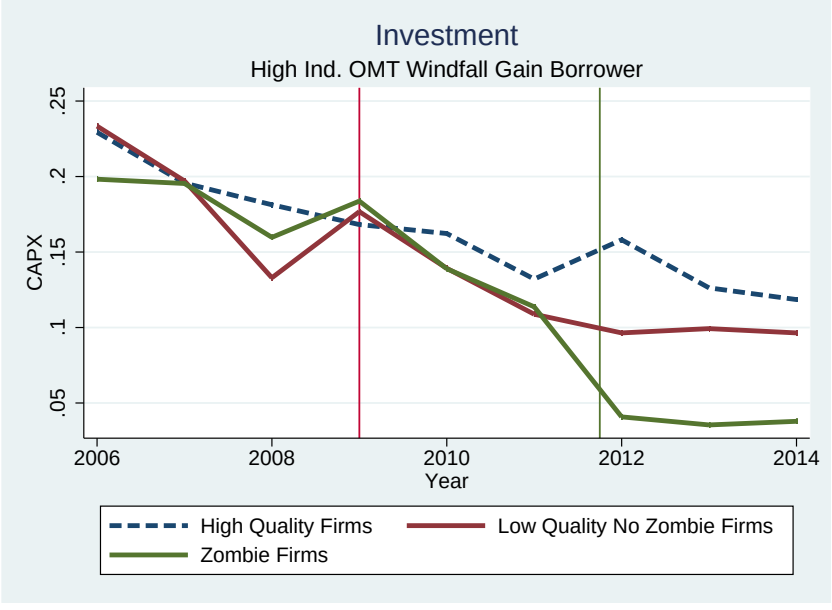
- Indicator variable *PostOMT*
  - Zero in fiscal years 2009 to 2011
  - Equal to one in fiscal years 2012 and 2013

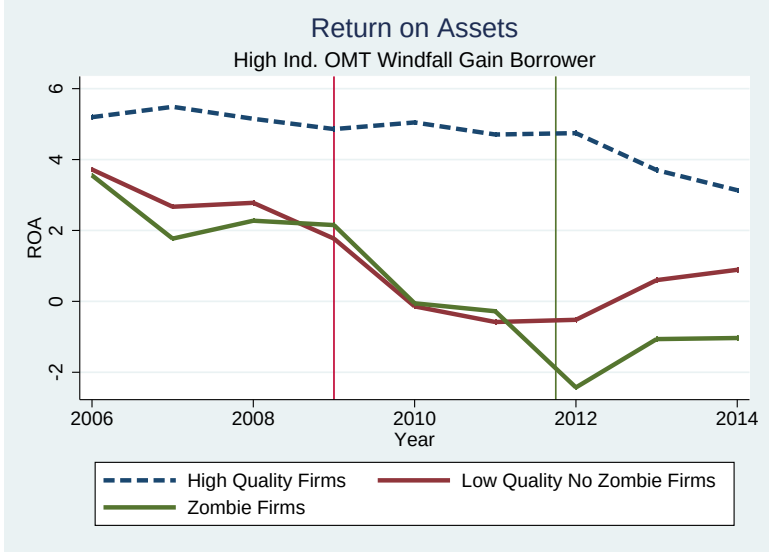
Cash and Leverage - Within High Indirect Gain Firms





Real Effects - Within High Indirect Gain Firms





Financial and Real Effects - All Firms

	ΔCash	ΔDebt	ΔDebt-ΔCash	Emp. Growth	CAPX	ROA
Indirect OMT windfall gains*PostOMT	0.376***	0.368***	-0.008	0.070	-0.248	0.051
	(2.82)	(2.87)	(-0.04)	(0.15)	(-0.59)	(0.43)
R^2	0.485	0.576		0.458	0.496	0.460
N	3198	3982		3163	3948	3919
Firm Level Controls	YES	YES		YES	YES	YES
Firm Fixed Effects	YES	YES		YES	YES	YES
Industry-Country-Year Fixed Effects	YES	YES		YES	YES	YES
ForeignBank-Country-Year Fixed Effects	YES	YES		YES	YES	YES

- Cash holdings and leverage increase significantly
- Coefficients do not differ statistically or economically
- No change in employment, investment or return on assets
- Results suggest that proceeds from new loans go into cash
- One standard deviation higher *Indirect windfall gains* imply 1.9 pp increase in cash and leverage

Financial and Real Effects - Zombie

Panel A: Zombie Lending - Amadeus Benchmark						
	Δ Cash	Δ Debt	Δ Debt-Δ Cash	Emp. Growth	CAPX	ROA
Indirect OMT windfall gains*PostOMT*Low IC	0.519**	0.557**	0.038	-0.418	-0.618	0.185
	(2.30)	(2.05)	(0.1)	(-0.98)	(-0.93)	(0.82)
Indirect OMT windfall gains*PostOMT*Low IC*Zombie	-0.384**	-0.028	0.356**	0.346	0.044	0.125
	(-2.00)	(-0.19)	(2.15)	(1.36)	(0.11)	(1.12)
R^2	0.514	0.619		0.471	0.500	0.482
N	2856	3431		2773	3361	3405
Panel B: Zombie Lending - Dealscan Benchmark						
Indirect OMT windfall gains*PostOMT*Low IC	0.568**	0.582**	0.014	-0.398	-0.931	0.176
	(2.45)	(2.17)	(0.2)	(-0.57)	(-1.37)	(0.77)
Indirect OMT windfall gains*PostOMT*Low IC*Zombie	-0.385**	-0.107	0.278**	0.534	0.371	0.072
	(-2.27)	(-0.98)	(2.12)	(1.09)	(1.16)	(0.63)
R^2	0.513	0.617		0.466	0.501	0.481
N	2856	3431		2773	3361	3405

- Non-zombie low quality firms use new loans to build up cash reserves (cash and leverage increase by the same amount)
- Zombies save significantly less cash out of the increase in leverage

Financial and Real Effects - Zombie

"The concern is that these companies - which spend so much of their cash servicing interest payments that they are unable to invest in new equipment or future growth areas - could be at least partly to blame for the weak recovery in Europe, hogging resources that could go to more productive areas"
(Financial Times: Companies: The Rise of the Zombie, January 8th, 2013)

- Anecdotal evidence suggests that zombie firms use new loans to service interest payments and/or repay loans
- Suggests that zombie lending might lead to distortions for healthy firms

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   1. Overall Lending
   2. Zombie Lending
3. Financial and Real Effects of Bank Lending Behavior
4. **Zombie Distortions**

Zombie Distortions - Theory (Caballero, Hoshi, and Kashyap, 2008)

- Two potential channels through which non-zombie firms could be negatively affected by zombies
- Lower loan supply
  - Undercapitalized banks might shift loan supply to existing borrowers that struggle to service debt
  - Leads to lower loan supply for creditworthy firms
- Distorted market competition
  - Normal competitive outcome would be that impaired firms shed workers and lose market share
  - But, zombies are artificially kept alive and congests markets
  - Distorting effects include, e.g., depressed product market prices, higher market wages
  - Since non-zombies primarily reduce investments in projects with low productivity, their average productivity increases

Industry effects on Non-zombie Firms - Method

- Investigate effect of rising fraction of zombie firms on healthy (non-zombie) firms in the same industry.
- Similar to Caballero, Hoshi, and Kashyap (2008), we run the following regression:

$$\begin{aligned} y_{ijht+1} &= \beta_1 \cdot \textit{Non-Zombie}_{ijht} + \beta_2 \cdot \textit{Non-Zombie}_{ijht} \cdot \textit{Fraction Zombies}_{jht} \\ &+ \beta_3 \cdot \textit{Non-Zombie}_{ijht} \cdot \textit{Fraction Zombies}_{jht} \cdot \textit{High IC Firm}_{ijht} \\ &+ \gamma \cdot X_{ijht} + \textit{Firm}_{ijh} + \textit{Industry}_h \cdot \textit{Country}_j \cdot \textit{Year}_{t+1} + u_{ijht+1}. \end{aligned}$$

- The fraction of zombies is measured at the industry-country-year level

Industry effects on Non-zombie Firms - Results

Panel A: Amadeus Benchmark	(1) Interest	(2) Emp. Growth	(3) CAPX	(4) Productivity
Industry Frac Zombie*Non-Zombie	-0.001	0.000	0.002	-0.001
	(-1.44)	(1.57)	(1.36)	(-0.39)
Industry Frac Zombie*Non-Zombie*High IC	0.031**	-0.005**	-0.015**	0.011***
	(2.03)	(-2.05)	(-2.43)	(2.87)
R^2	0.523	0.453	0.468	0.441
N	3327	2773	3361	2860
Panel B: Dealscan Benchmark				
Industry Frac Zombie*Non-Zombie	-0.001	0.000	0.002	0.001
	(-0.88)	(1.53)	(1.54)	(1.30)
Industry Frac Zombie*Non-Zombie*High IC	0.029**	-0.004**	-0.013**	0.011**
	(2.13)	(-2.55)	(-2.08)	(2.38)
R^2	0.520	0.456	0.470	0.471
N	3327	2773	3361	2860
Firm Level Controls	YES	YES	YES	YES
Firm Fixed Effects	YES	YES	YES	YES
Industry-Country-Year Fixed Effects	YES	YES	YES	YES

- No effect on low quality non-zombie firms in industries with a high zombie fraction
- However, high quality non-zombie firms, invest less and have lower employment growth rates

Industry effects on Non-zombie Firms - Results

	Interest	Emp. Growth	CAPX	Productivity
Panel A: Dealscan Benchmark - Competitive Industries				
Industry Frac Zombie*Non-Zombie	-0.000	0.000	0.001	0.001
	(-0.60)	(1.28)	(0.58)	(1.36)
Industry Frac Zombie*Non-Zombie*High IC	0.030**	-0.004**	-0.015**	0.013**
	(2.04)	(-2.32)	(-2.21)	(2.30)
R^2	0.565	0.477	0.427	0.587
N	1685	1345	1702	1398
Panel B: Dealscan Benchmark - Non-Competitive Industries				
Industry Frac Zombie*Non-Zombie	-0.001	0.000	-0.000	-0.000
	(-1.43)	(0.52)	(-0.20)	(-0.37)
Industry Frac Zombie*Non-Zombie*High IC	0.029**	-0.000	0.001	0.003
	(2.18)	(-0.48)	(0.67)	(1.04)
R^2	0.646	0.644	0.682	0.570
N	1642	1428	1659	1462
Firm Level Controls	YES	YES	YES	YES
Firm Fixed Effects	YES	YES	YES	YES
Industry-Country-Year Fixed Effects	YES	YES	YES	YES

- Effects driven by firms operating in competitive industries

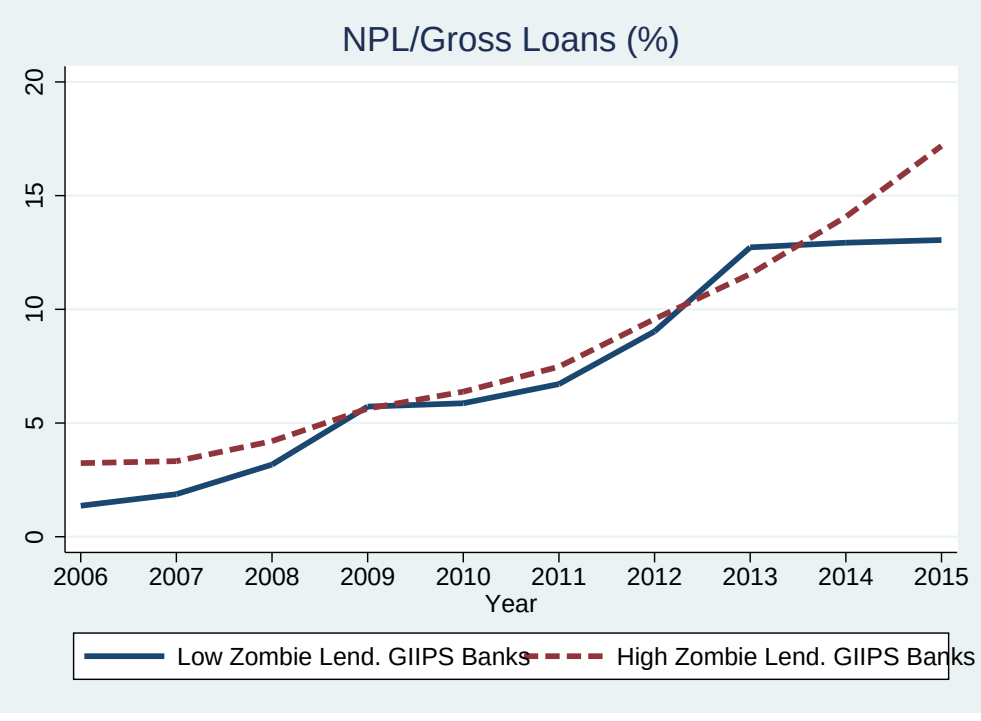
Industry effects on Non-zombie Firms - Results

- Average increase in zombie fraction in GIIPS countries was 8.9 pp, this implies
  - High quality non-zombie firms invest between 11.6% and 13.3% of capital less
  - High quality non-zombie firms have 3.6pp to 4.4pp lower employment growth rates
  - High quality non-zombie firms pay 0.28pp more on their debt (average interest rate was at 3% before in 2012)
- Increase in zombie fraction at the 95th percentile was 30pp, this implies
  - High quality non-zombie firms invest between 39% and 44% of capital less
  - High quality non-zombie firms have 12pp to 15pp lower employment growth rates
  - High quality non-zombie firms pay 0.93pp more on their debt (average interest rate was at 3.2% before in 2012)

Industry effects on Non-zombie Firms - Results

Panel A: Investment				
Industry	Avg. Investment (% of Capital)	Δ Fraction Zombie	Investment Loss (% of Capital)	Investment Years lost
Construction	9.58%	23.26pp	34.89%	3.7
Manufacturing	12.3%	7.21pp	10.83%	0.9
Trade	10.6%	13.0pp	19.50%	1.8
Service	12.5%	17.31pp	25.97%	2.1
Other	8.9%	4.78pp	7.17%	0.8
Panel B: Employment				
Industry	Avg. Emp. Growth	Δ Fraction Zombie	Employment Loss	
Construction	-2.26%	23.26pp	11.63pp	
Manufacturing	0.65%	7.21pp	3.61pp	
Trade	0.44%	13.0pp	6.50pp	
Service	-1.0%	17.31pp	8.66pp	
Other	-2.1%	4.78pp	2.39pp	

What happens in the "longer" run?



- "[...] Italian banks have Eur 200bn worth of non-performing loans of which Eur 85bn are not already written down, according to the Bank of Italy." (Source: Financial Times)
- Banks engaging in zombie lending have significantly higher NPL after 2013

Are we back to the Japan of the 1990s?

"The growing fear is that the continent could be following the path of Japan, where low interest rates, looser government policy and the failure of the big banks to foreclose on unprofitable and highly indebted companies is thought to have contributed to two decades of weak growth." (Source: Financial Times)

- Similar questions arise as in the Japanese case
- Key issue in both crises: Adequate recapitalization of banks necessary to ensure "efficient" allocation of credit (Caballero, Hoshi, Kashyap (2008), Gianetti and Simonov (2013))
- Restoring bank lending channel important for bank dependent economies

Conclusion

- OMT program announcement led to increase in bank health
- Banks with improved health increase credit supply to low quality borrower
- Partly driven by zombie lending
- Cash and leverage increase significantly almost one to one for non-zombie low quality firms
- Leverage increases by more for zombie low quality firms
- No significant increase in employment and investment
- Increasing fraction of zombie firms depresses investment and employment of high quality firms in the same industry
- Capital gains from OMT announcement not enough for some struggling banks