Essays in Corporate Finance

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Structure of the Thesis

- **Is Financial Development affecting Economic Growth?**

$\Rightarrow$ Private Credit positively affects Economic Growth;
$\Rightarrow$ The relationship is persistent through time;
$\Rightarrow$ The degree of financial development and the level of initial income of a given country do not affect the finance-growth nexus;

- **Long Term Leverage and the Financial Crisis**

$\Rightarrow$ Firms with debts maturing at the time of the crisis experience a much pronounced drop in investment;
$\Rightarrow$ Results are robust to the Parallel Trend Test;

- **Comovements Across Countries**

$\Rightarrow$ Data are better described by an *EARCH model* meaning that positive innovation are more destabilizing than negative innovations;
$\Rightarrow$ Correlations among countries become stronger in period of crisis;

The Persistence of the Finance-Growth Relationship

Why do countries grow at different rates?

- Resouce Endowments?
- Macroeconomic Stability?
- International Trade?
- Ethnic and Religious Diversity?

$\Rightarrow$ *What is the impact of financial development on economic growth?*

Literature Review

1. **Jayaratne and Strahan** (1996);
   $\Rightarrow$ Per capita economic growth increases significantly following intrastate branch deregulation;
2. **Levine and Zevros** (1998);
   $\Rightarrow$ Bank development and income liquidity are positively correlated with economic growth;
3. **Rajan and Zingales** (1998);
   $\Rightarrow$ Industrial sectors that are in need of external finance grow faster in countries with more developed financial markets;
4. **Barra, Destefanis and Lavadera** (2013);
   $\Rightarrow$ Effect of cooperative banks on growth. Italian disaggregated data.

$\Rightarrow$ There exists a positive relationship between finance and economic growth;

Is the finance-growth nexus persistent?

Is the link between efficiency of the financial sector and economic growth still effective in the most recent past?

Data:

- Penn World Tables;
- 77 countries;
- Sample Period: 1960-2010.

Methodology:

- Cross-Country Regression model with Instrumental Variables;
- Panel Tecniques;

Cross-Sectional IV Estimator

$$Y_i = \alpha + \beta Finance_i + \gamma' X_i + \epsilon_i; \quad (1)$$

Y_i = Economic Growth;

$Finance_i$ = Private Credit $\Rightarrow$ Amount of private credits to the private sector;
Instrument for Financial Development: Legal origin for each country i

X_i = regressors related to economic growth;
ϵ_i = error term of the regression equation;

Disadvantages of the Cross-Country Regression Model?

1. No Analysis of the time series dimension of the data;
2. Estimates might be biased by the omission of country-specific effects;

Panel Technique

Panel Regression:

$$y_{i,t} = \alpha' X^1_{i,t-1} + \beta' X^2_{i,t} + \mu_i + \lambda_t + \epsilon_{i,t}; \quad (2)$$

$\mathbf{y}_{i,t}$: dependent variable;
$\mathbf{X}^1_{i,t-1}$, $\mathbf{X}^2_{i,t}$: lagged and contemporaneous explanatory variables;
μ_i : country specific effect;
λ_t : time specific effect;
$\epsilon_{i,t}$: time-varying error term;

Two techniques:

1. **Difference Estimator;**
   - $\Downarrow$ Cross-Country Dimension of the Data;
   - $\Uparrow$ Measurement Error Biases;
   - Poor Precision;
2. **System Estimator;**

Cross Sectional Model

⇒ *Simple* Conditioning Set; ⇒ *Policy* Conditioning Set;

Table: Cross-section, 1960-1995

	(1) Simple	(2) Policy
Private Credit	2.515***	2.977***
	(3.10)	(2.82)
Initial Income per capita	-1.689***	-1.954***
	(-3.94)	(-4.88)
Average years of schooling	1.046	1.339
	(1.34)	(1.58)
Openness to Trade		0.607
		(1.61)
Inflation		4.220*
		(1.69)
Gov. size		0.0414
		(0.19)
Black Mkt Premium		-0.238
		(-0.18)
Constant	4.849*	1.642
	(1.95)	(0.41)
N	71	63
Hansen statistic	0.147	0.286
p-value of Hansen statistic	0.929	0.867

t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

First Difference Model

Table: First Differencing Panel

	(1) D1GMM-s	(2) D2GMM-s	(3) DWind-s	(4) D1GMM-p	(5) D2GMM-p	(6) DWind-p
Private Credit	1.697*	1.314*	1.314	0.224	0.0872	0.0872
	(1.68)	(1.70)	(0.82)	(0.23)	(0.41)	(0.10)
Initial Income	-7.927***	-6.779***	-6.779***	-8.371***	-9.215***	-9.215***
	(-3.68)	(-6.28)	(-2.72)	(-3.25)	(-15.51)	(-3.37)
Av.yrs schooling	-7.867***	-6.084***	-6.084**	-6.865**	-4.621***	-4.621
	(-3.44)	(-3.88)	(-2.09)	(-2.32)	(-2.82)	(-1.13)
Openness				0.817	2.065***	2.065
				(0.63)	(3.14)	(0.94)
Gov. size				-0.875	0.0428	0.0428
				(-0.59)	(0.07)	(0.03)
Inflation				-3.126	-4.593***	-4.593*
				(-1.21)	(-5.43)	(-1.95)
Black Mkt Premium				-1.113	-1.183***	-1.183
				(-1.58)	(-4.05)	(-1.46)
N	402	402	402	374	374	374
Sargan statistic	24.44	24.44	24.44	56.25	47.06	47.06
p-value of Sargan	0.437	0.437	0.437	0.167	0.470	0.470
AR(2) test statistic	-0.0356	-0.109	-0.108	0.495	0.459	0.441
p-value of AR(2)	0.972	0.913	0.914	0.621	0.646	0.659
Countries	78	78	78	78	78	78

t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

System Estimator

Table: System Estimator Panel

	(1) S1GMMs	(2) S2GMMs	(3) SWinds	(4) S1GMMp	(5) S2GMMp	(6) SWindp
Private Credit	1.688***	1.968***	1.968***	0.0473	0.185	0.185
	(3.13)	(7.98)	(4.10)	(0.09)	(1.42)	(0.33)
Initial Income	-0.953	-0.932**	-0.932	-0.364	-0.278**	-0.278
	(-1.10)	(-2.36)	(-1.28)	(-0.55)	(-2.14)	(-0.47)
Av.yrs schooling	1.875	1.505	1.505	2.039	1.582***	1.582
	(0.92)	(1.52)	(0.81)	(1.29)	(4.88)	(0.99)
Openness				1.292	1.130***	1.130
				(1.29)	(7.97)	(1.12)
Gov. size				0.242	0.280*	0.280
				(0.25)	(1.69)	(0.31)
Inflation				-0.424	-0.332	-0.332
				(-0.27)	(-1.09)	(-0.20)
Black Mkt Premium				-1.473***	-1.440***	-1.440***
				(-2.82)	(-16.90)	(-3.30)
N	481	481	481	452	452	452
Sargan statistic	45.08	45.08	45.08	62.58	62.58	62.58
p-value of Hansen statistic	0.232	0.232	0.232	0.883	0.883	0.883
AR(2) test statistic	-0.367	-0.413	-0.412	0.0539	0.0726	0.0721
p-value of AR(2) test statistic	0.714	0.680	0.681	0.957	0.942	0.943
Countries	78	78	78	78	78	78

t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Persistence over Time

Table: Panel, 1991-2010

	(1) SWind
Public Consumption	-0.000847 (-0.17)
Openess	0.000744 (0.70)
Private Credit	0.000557*** (3.62)
Initial GDP	7.16e-08 (0.04)
N	308
Sargan statistic	25.86
p-value of Hansen	0.0561
AR(2) test statistic	-1.345
p-value of AR(2)	0.179
Countries	77

t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Final Remarks

- Private Credit has a positive impact on Economic Growth;
- The relationship is persistent over time;
- The relationship is persistent across different methodologies;
- The degree of financial development and the level of income of a given country do not impact the finance-growth nexus;
- The level initial income is negatively correlated with economic growth.

Debt Maturity and the Financial Crisis

Introduction

Factors that may worsen a crisis:

1. Increase in interest rates;
2. Increase in lender uncertainty;
3. Asset market effect on balance sheets;
4. Problems in the banking sector;

Should we care about the debt maturity structure?

Intuition: firms with debts maturing at the time of the crisis can invest less since they have to repay their obligations.

$\uparrow$ *debts maturing at the time of the crisis* $\Rightarrow \downarrow$ *average investment*

Literature Review

- **Determinants of debt maturity**;

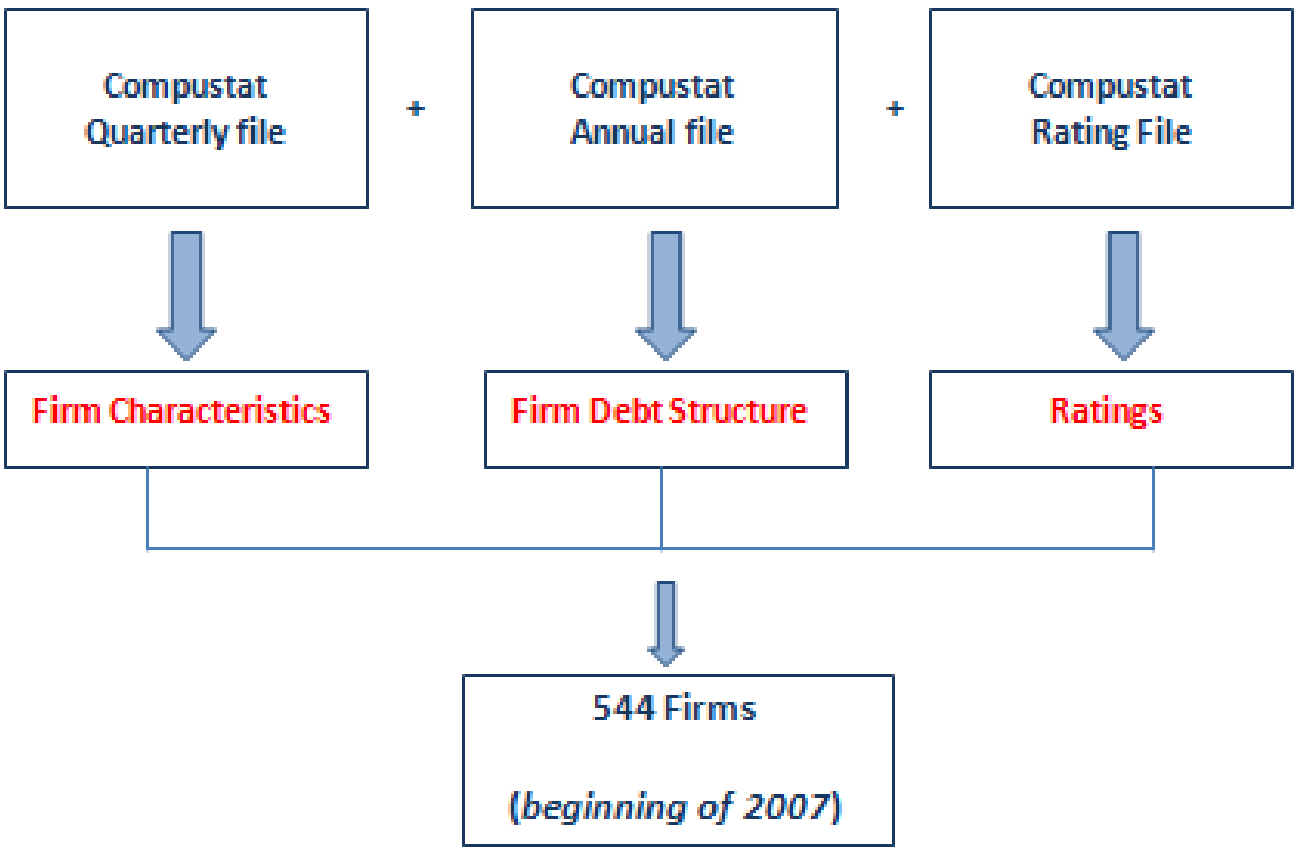
1. Barclay and Smith (1995);
2. Stohs and Mauer (1996);
3. Guedes and Opler (1996);

- **Effect of credit supply shocks on corporate decisions;**

1. Chava and Purnanandam (2008);
2. Lemmon and Roberts (2008);

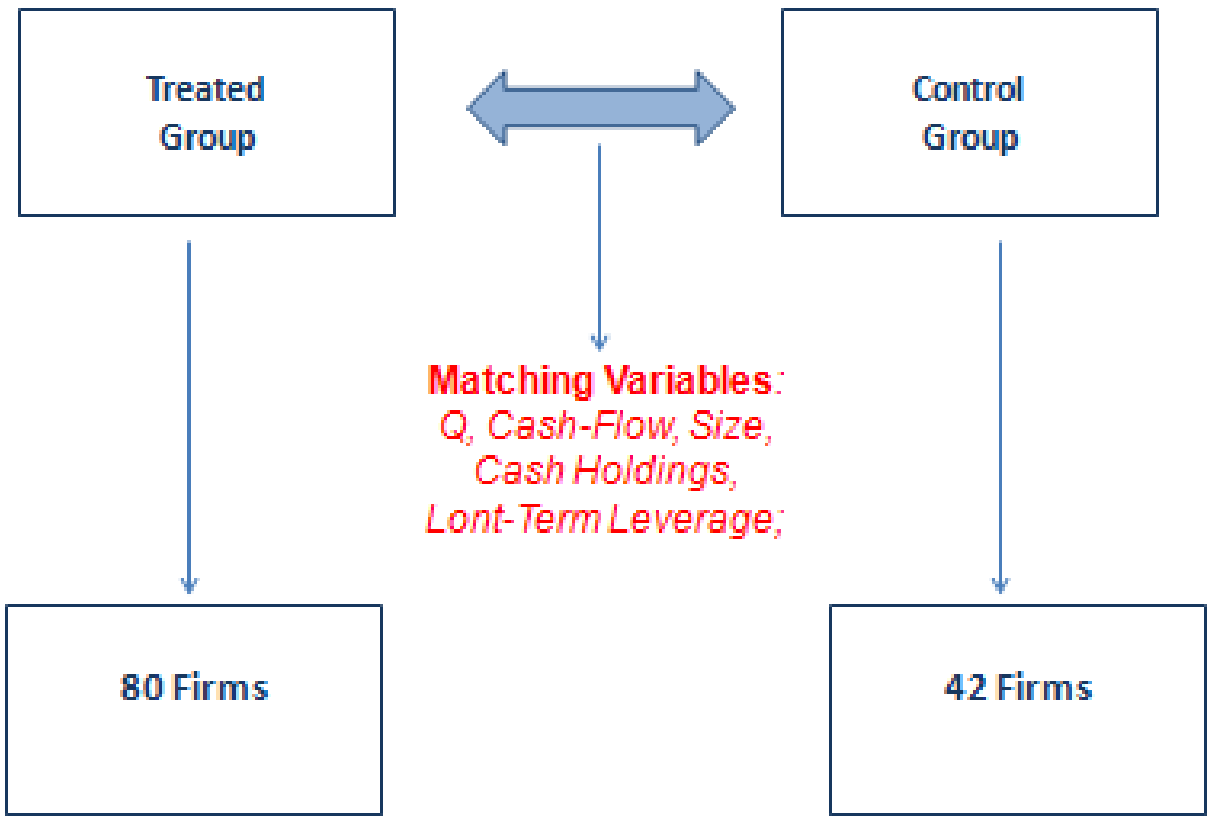
⇒**Contribution:** Effect of credit supply shoks on corporate decisions *through* debt maturity;

Data


Compustat Quarterly file
+
Compustat Annual file
+
Compustat Rating File
Firm Characteristics
Firm Debt Structure
Ratings
544 Firms
(beginning of 2007)

Methodology

Matching Estimator Approach:



Summary Statistics

Data Main Features:

	Q	Cash Flow	Size	Cash	LT Leverage	Investment
Panel A: Medians for Treated and Non-Treated Firms in 2007						
Treated	1.765	0.109	5.571	0.068	0.213	0.174
Non-Treated	1.623	0.051	5.76	0.089	0.289	0.115
Difference	0.142	0.058	-0.189	-0.021	-0.076	0.059
Median Test p-value	0.345	0.218	0.468	0.333	0.001	0.146

Treatment group:

$\Uparrow$ Q, cash flow and investment;

Control group:

$\Uparrow$ size, cash and long-term leverage.

Similar results when I compare the treatment group to the control group.

Main Result

Average Quarterly Investment/Capital Stock (in Percentage points)

Panel A: Investment Before and After the Fall 2007 Credit Crisis

Investment in 2008 (Q1 to Q3) vs. Investment in 2007 (Q1 to Q3)

	2007	2008	2008-2007
	5.967***	4.313***	-1.654
Treated Firms	(1.333)	(1.772)	(3.088)
	7.420***	9.079***	1.658
Non-Treated Firms	(2.529)	(2.199)	(2.574)
	-1.454	-4.765	
Difference	(3.421)	(5.409)	

- The average level of investment for the *treated* firms falls after 2007 $\Rightarrow \downarrow$ 1.65 percentage points;
- The average level of investement for the *non treated* firms behaves in the opposite way;
- Results confirmed by the comparison between *treated* and *control* firms.

Tests and Final Remarks

Parallel Trend Test:

- No significant difference between the two groups before the 2007 crisis;

Further Tests:

- Test the results with a *different methodology*;
- Test the *rating effect*: Is the debt structure still important when the rating category is taken into account?;

Intuition:

Higher ratings $\Rightarrow$ Easier access to the capital market $\Rightarrow$ Lower impact of the debt structure

Comovements across Countries

Introduction

Is the relationship among international volatilities important?

- **International Portfolio Diversification;**

$\Rightarrow$ The benefits that investors can get from a given portfolio increase with its level of diversification.
$\Rightarrow$What about *emerging markets*?

- **Recurrence of Financial Crisis;**

$\Rightarrow$ "*Contagion Effect*": if a crisis happens, it affects not only the neighboring countries, but also distant markets if they are related enough;

Literature

- **Hamao et al.** (1990)
  $\Rightarrow$ earliest work to analyze the spillover of prices;
- **Gilmore et al.** (2007);
  $\Rightarrow$ distinction between short-term and long-term comovements;
- **Bekaert et al.** (2002)
  $\Rightarrow$ effect of liberalization on emerging markets;
- **Choudry** (1997)**, Arouri, Bellalah and Nguyen** (2008);
  $\Rightarrow$ comovements in Latin American markets;

What do we know about comovements affecting Italy?

Does the strenght of the comovement become stronger after period of crisis?

Data

Monthly stock prices from January 1, 2000 through August 1, 2014;

Countries:

1. Italy;
2. Germany;
3. France;
4. Belgium;
5. Austria;
6. Sweden;
7. Greece;
8. United States;

Time Series Properties:

- *Negative Skewness;*
- *Leptokurtosis Behaviour*
- *Leverage Effect;*
- *Volatility Clustering.*

GARCH Model

What is the best fit in terms of GARCH models?

1. GARCH;
2. T-GARCH;
3. E-GARCH⇒ **best fit!**
4. Asymmetric P-GARCH;

Basic model:

- Mean Equation: Italian stock return as a function of foreign stock returns;
- Variance Equation: to account for past volatilities and shocks.

MGARCH Model

Three main models:

1. Constant Conditional Correlation Model;
2. Varying Conditional Correlation Model;
3. Dynamic Conditional Correlation Model.

They differ for how the matrix of conditional correlations is specified.

- Results consistent across different models;
- Comparison between the Pre and Post Great Recession period

$\Rightarrow$ Stronger correlations in the Post Recession period;

Future Works

Is the Effect of the Dodd-Frank Act Homogenous across Credit Rating Agencies?

Credit Rating Agencies and Equity Analysts: Equity Market and Bond Market Responses

(coauthored with Thomas Chemmanur and Igor Karagodsky)