Corporate cash holdings in Italy and its increase in the long recession

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Motivation

- Evidence of a rise in cash ratio for US firms in 2000s (mainly based on listed firms)
- Resurgence of interest in an old question "**Why do firms hold cash?**": transaction costs (Baumol, 1970; Miller and Orr, 1966), precautionary reasons (Keynes, 1936), information asymmetries (Holmström and Tirole, 2011; Pinkowitz et al. 2006), etc.
- The "**cash puzzle**": with financial market and technology improvements, shouldn't firms hold less cash now than in the past?

Motivation (cont'd)

- Analysis of corporate cash holdings is important for our understanding of the **leverage** of firms
- Enhanced attention to corporate liquidity management with the **crisis**: it can be crucial for corporate **survival and flexibility** in a liquidity crisis
- **Evidence for Italy is still scant**, but Italy is an interesting case for structural and cyclical reasons:
  - less developed financial markets
  - many non listed firms
  - firms' financial position has been severely challenged by recession and credit market downturn

Contribution

1. Evidence on corporate cash holding in **Italy** from 2002 to 2015, thus encompassing the **crisis** and the **recession**
2. **Very large panel dataset** based on balance sheet data from Cerved Group. Many unlisted firms. About 460 thousands firms per year on average
3. Assessment of the **main factors** associated to the cash-ratio dynamics in recent years

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What we do and what we find (in a nutshell)

1. We document **a clear increase of the cash-ratio in recent years**

2. We study the determinants of cash holdings **at firm level**, finding evidence in line with economic theory's predictions

3. We decompose the rise into the contributions of **factors common to all firms**, cash-determinants at the **firm level**, and the changing composition of firms' unobserved **fixed factors**. No causality claim.

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Related literature

- Analysis of **cash determinants at firm-level**: a set of firm variables identified as cash determinants: Opler et al. (1999), Bates et al. (2009)
- Extensions to a longer historical perspective and to the role of **macro factors**: Graham and Leary (2015)
- Studies focusing on further specific channels, e.g.:
  - R&D (Brown and Petersen, 2011)
  - economies of scope (Subramaniam et al., 2011)
  - cross-border activities (Pinkowitz et al., 2016)
  - fiscal issues (Foley et al., 2007)
  - institutional settings (Videla et al., 2004; Calcagnini et al., 2009)

A core-set of cash covariates at firm level

- ***firm size***: (-) e.g. economies of scale in cash management (Miller and Orr, 1966) table figure
- ***cash-flow level***: (+) e.g. "cash-flow sensitivity of cash" (Almeida et al, 2004) figure
- ***idiosyncratic uncertainty***, i.e. cash-flow volatility: (+) e.g. precautionary reasons (Opler, 1999) figure
- ***investment***: (-) e.g. pecking order theory (Myers and Majluf, 1984), credit market frictions (Hubbard, 1998) figure
- ***leverage***: (-) e.g. liquidity absorbed by debt repayment (Bates et al., 2009) table figure
- ***net working capital***: (-) e.g. a substitute for cash, affected by transaction costs (Bates et al., 2009) figure

Comprehensive Dataset Description

	Variable	Name	Description	Source
Dep var	liquid	Cash holdings	Ratio between cash and liquid financial assets	Cerved
Firm-specific variables	*size*	Firm size	Log of total assets	Cerved
	volatility	Volatility of cash flow	Standard deviations of cash flows 3-years rolling, over total assets; winsorized at 1st and 99th percentiles	Cerved
	cashflow	Cash flow to asset	Ratio of earnings after interest, dividend and taxes before depreciation and amortization, over total assets; winsorized at the 1st and 99th perc	Cerved
	inv	Net Investment	Ratio of yearly change in tangible and intangible assets and total assets; winsorized at the 1st and 99th percentiles	Cerved
	nwc	Net working capital	Ratio of current assets (net of cash and liquid financial securities) minus current liabilities over total assets; wins. at 1st and 99th percent.	Cerved
	leverage	Leverage	Ratio between financial debts and the sum of financial debt and net equity; winsorized at 1st and 99th percentiles taking into account non-negativity issues	Cerved
	loss	Loss	Dummy (1 if net earnings are negative)	Cerved
	divpay	Dividend payment	Dummy (1 if part of dividends are paid)	Cerved
	intang	Exp. on intangibles	Ratio between yearly change in intangible assets and revenues; winsorized at the 1st and 99th percentiles	Cerved
	bond_sh	Bond share	Ratio between outstanding bonds issued and total financial debts	Cerved
Macro-variables	*gdp_gr*	GDP growth	Growth rate of GDP (chain linked volumes, 2010)	Istat
	T-bill rate	T-bill rate	Average rate of 6-months T-Bill (at issuance)	B.of Italy
	mkt_vol	Euribor volatility	Standard deviation of 3 month Euribor	Reuters
	b_lend_yield	Bank lending yield	Average bank lending yield to non-financial corporate (different from c/c) in the year	B.of Italy

Non financial private firms. Unbalanced panel from 2002 to 2015 with an average of 460,000 firms per year.

Stats

The econometric approach

1. Baseline panel model (estimated by pooled OLS, Fama-MacBeth, **Fixed Effect**)

$$l_{i,t} = \boldsymbol{\beta}' \mathbf{X}_{i,t} + \boldsymbol{\delta}' \mathbf{Y}_t + \mu_i + \epsilon_{i,t} \tag{1}$$

   where $\mathbf{X}_{i,t}$ are firm variables and $\mathbf{Y}_t$ are year dummies

2. Augmented version (enriched with more firm variables)
3. Robustness checks
4. Models with macro variables (replacing year dummies)
5. Decomposition of the rise in the average cash-ratio:

$$\bar{\hat{l}}_t = \hat{\alpha} + \hat{\boldsymbol{\beta}}' \bar{\mathbf{X}}_t + \bar{\hat{\mu}}_t + \hat{\delta}_t \tag{2}$$

To curb simultaneity issues, the dependent variable is taken at the end of year t. All flow variables are taken are taken between $t-1$ and t, while stock variables are taken at $t-1$.

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Baseline model

	(1) OLS	(2) Fama-MacBeth	(3) Fixed-Effect
Size	-0.017***	-0.017***	-0.012***
	[0.000]	[0.001]	[0.000]
Volatility	0.185***	0.175***	0.041***
	[0.002]	[0.010]	[0.002]
Cashflow	0.193***	0.182***	0.156***
	[0.001]	[0.010]	[0.001]
Inv	-0.189***	-0.180***	-0.141***
	[0.001]	[0.011]	[0.001]
Nwc	-0.142***	-0.142***	-0.178***
	[0.001]	[0.002]	[0.001]
Leverage	-0.128***	-0.127***	-0.047***
	[0.000]	[0.003]	[0.000]
Year dummies	YES	NO	YES
Firm fixed effects	NO	NO	YES
R^2	0.249	0.245	0.154
Observations	3,998,049	3,998,049	3,998,049

The dependent variable is the liquidity cash ratio. All flow variables are taken are taken between t-1 and t, while stock variables are taken at time t-1. Volaitlity, cashflow, inv, nwc and leverage are winsorized at the 1st and 99th pecenrtiles. Robust standard errors clustered at the firm level are used. In the Fama-MacBeth regression the average R^2 is shown. Robust standard errors in brackets. $***p < 0.01$, $**p < 0.05$, $*p < 0.1$

Augmented model

	OLS		FE	
	(1) **Baseline**	(2) **Augmented**	(3) **Baseline**	(4) **Augmented**
size	-0.017***	-0.018***	-0.012***	-0.013***
	[0.000]	[0.000]	[0.000]	[0.000]
volatility	0.185***	0.192***	0.041***	0.044***
	[0.002]	[0.002]	[0.002]	[0.002]
cashflow	0.193***	0.181***	0.156***	0.154***
	[0.001]	[0.001]	[0.001]	[0.001]
inv	-0.189***	-0.201***	-0.141***	-0.144***
	[0.001]	[0.001]	[0.001]	[0.001]
nwc	-0.142***	-0.145***	-0.178***	-0.180***
	[0.001]	[0.001]	[0.001]	[0.001]
leverage	-0.128***	-0.124***	-0.047***	-0.045***
	[0.000]	[0.000]	[0.000]	[0.000]
loss		-0.016***		-0.011***
		[0.000]		[0.000]
divpay		0.032***		0.008***
		[0.001]		[0.000]
intang		0.039***		-0.003**
		[0.002]		[0.001]
bond_sh		0.002***		0.001***
		[0.000]		[0.000]
Year-dum	YES	YES	YES	YES
Firm FE	NO	NO	YES	YES

Robustness checks

- Some robustness checks are applied to the baseline model: the main cash determinants' effects are basically **confirmed**. Table
- **Non-linear** effect of investment:
  - *inv_square* has a negative coefficient. Interpretable as convex costs, possibly due to asymmetric information and credit market friction issues
  - the partial effect of investment at the 3^{rd} quartile is about 3.7 bp greater than at the median.
- **Dynamic persistence** in the cash ratio:
  - Sys-GMM cumbersome to apply, but the FE bias is mitigated by high T
  - There is evidence of persistence (0.28) but the covariate effects are not substantially affected
- Investigation of **subsamples** of interest:
  - Only firms **almost always present** throughout the sample period
  - Only **medium and big** firms
  - Only firms belonging to the **industrial sector**

The role of macro factors

- Time dummies account for all time-varying factors common to all firms: helpful, but it leaves little to say on specific **macro factors**
- We now replace time dummies with the following macro variables having an economic interpretation:

$$l_{i,t} = \boldsymbol{\beta}' \mathbf{X}_{i,t} + \boldsymbol{\delta}' \mathbf{M}_t + \mu_i + \epsilon_{i,t}$$

  - **T-bill rate** (-) (interest rate level, opportunity cost of holding cash)
  - **Volatility of the Euribor rate** (+) (uncertainty on money markets)
  - **GDP growth** (+) (if cash is pro-cyclical)
  - Average **bank lending yields** to non financial firms (?) (borrowing costs)

- We check that coefficients on firm-level covariates are not affected much, and the R^2 decreases only slightly.

	Baseline		Augmented	
	(1)	(2)	(3)	(4)
size	-0.012***	-0.009***	-0.013***	-0.010***
	[0.000]	[0.000]	[0.000]	[0.000]
volatility	0.041***	0.040***	0.044***	0.042***
	[0.002]	[0.002]	[0.002]	[0.002]
cash-flow	0.156***	0.153***	0.154***	0.151***
	[0.001]	[0.001]	[0.001]	[0.001]
inv	-0.141***	-0.141***	-0.144***	-0.143***
	[0.001]	[0.001]	[0.001]	[0.001]
nwc	-0.178***	-0.178***	-0.180***	-0.179***
	[0.001]	[0.001]	[0.001]	[0.001]
leverage	-0.047***	-0.047***	-0.045***	-0.044***
	[0.000]	[0.000]	[0.000]	[0.000]
loss			-0.011***	-0.010***
			[0.000]	[0.000]
divpay			0.008***	0.007***
			[0.000]	[0.000]
intang			-0.003**	-0.003**
			[0.001]	[0.001]
bond_sh			0.001***	0.000***
			[0.000]	[0.000]
Gdp_gr		0.002***		0.002***
		[0.000]		[0.000]
T-bill		-0.007***		-0.008***
		[0.000]		[0.000]
Mkt Vol		0.011***		0.011***
		[0.000]		[0.000]
b_lend_yield		0.003***		0.003***
		[0.000]		[0.000]
Time dummies	YES	NO	YES	NO
Firm FE	YES	YES	YES	YES
Observations	3,988,049	3,884,808	3,962,966	3,860,004
R^2	0.154	0.151	0.157	0.154

The cash-ratio growth

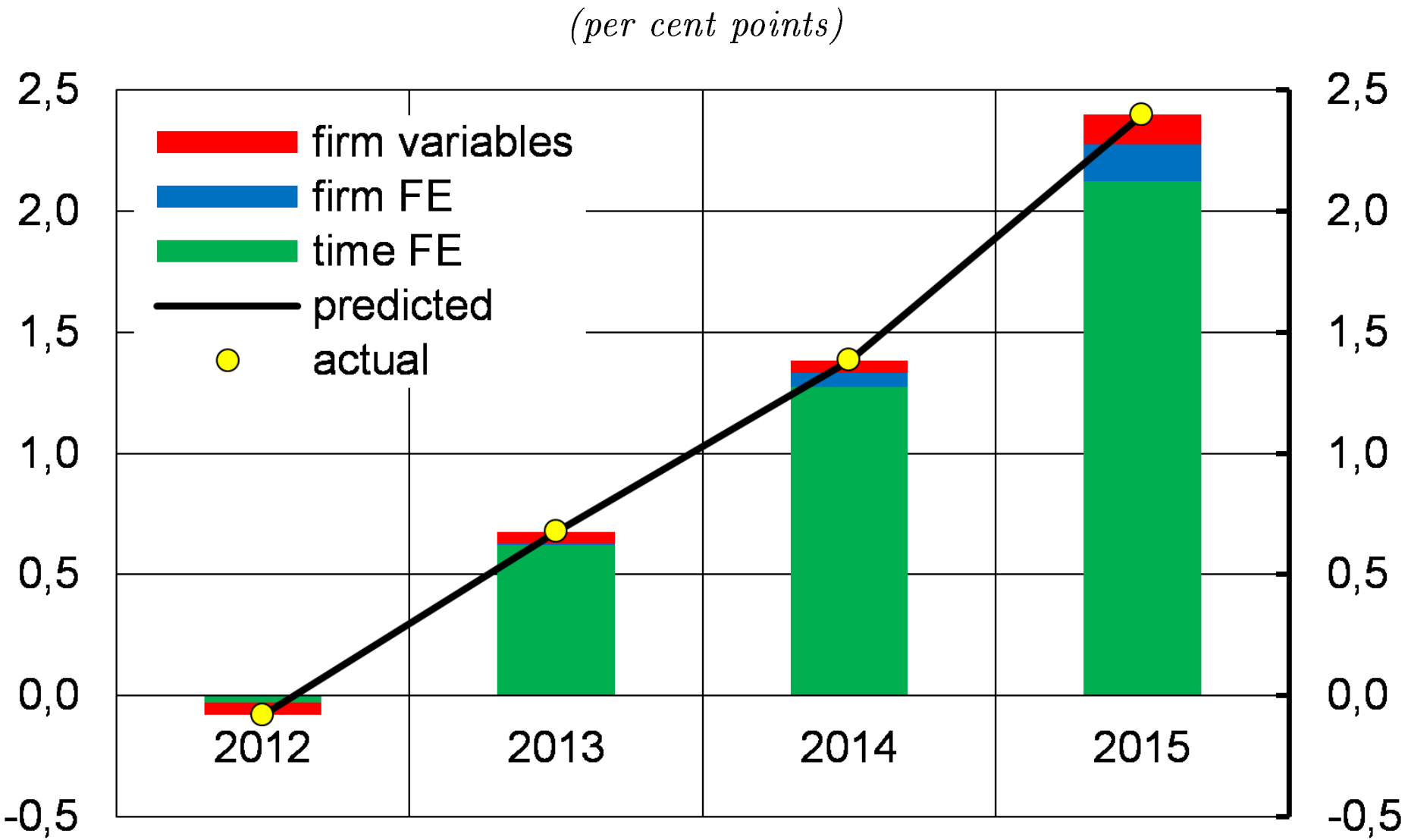
- We decompose the predicted average cash ratio as:

$$\bar{\hat{l}}_t = \alpha + \hat{\boldsymbol{\beta}}' \bar{\mathbf{X}}_t + \bar{\hat{\mu}}_t + \hat{\delta}_t$$

- The change between a reference year s and a following year t is given by:
  1. the change in the effect of firm **observable features**: $\hat{\boldsymbol{\beta}}'(\bar{\mathbf{X}}_t - \bar{\mathbf{X}}_s)$
  2. the change in **time factors** common to all firms $\hat{\delta}_t - \hat{\delta}_s$
  3. the change in the effect of time-invariant firms' **unobservable heterogeneity** $\bar{\hat{\mu}}_t - \bar{\hat{\mu}}_s$

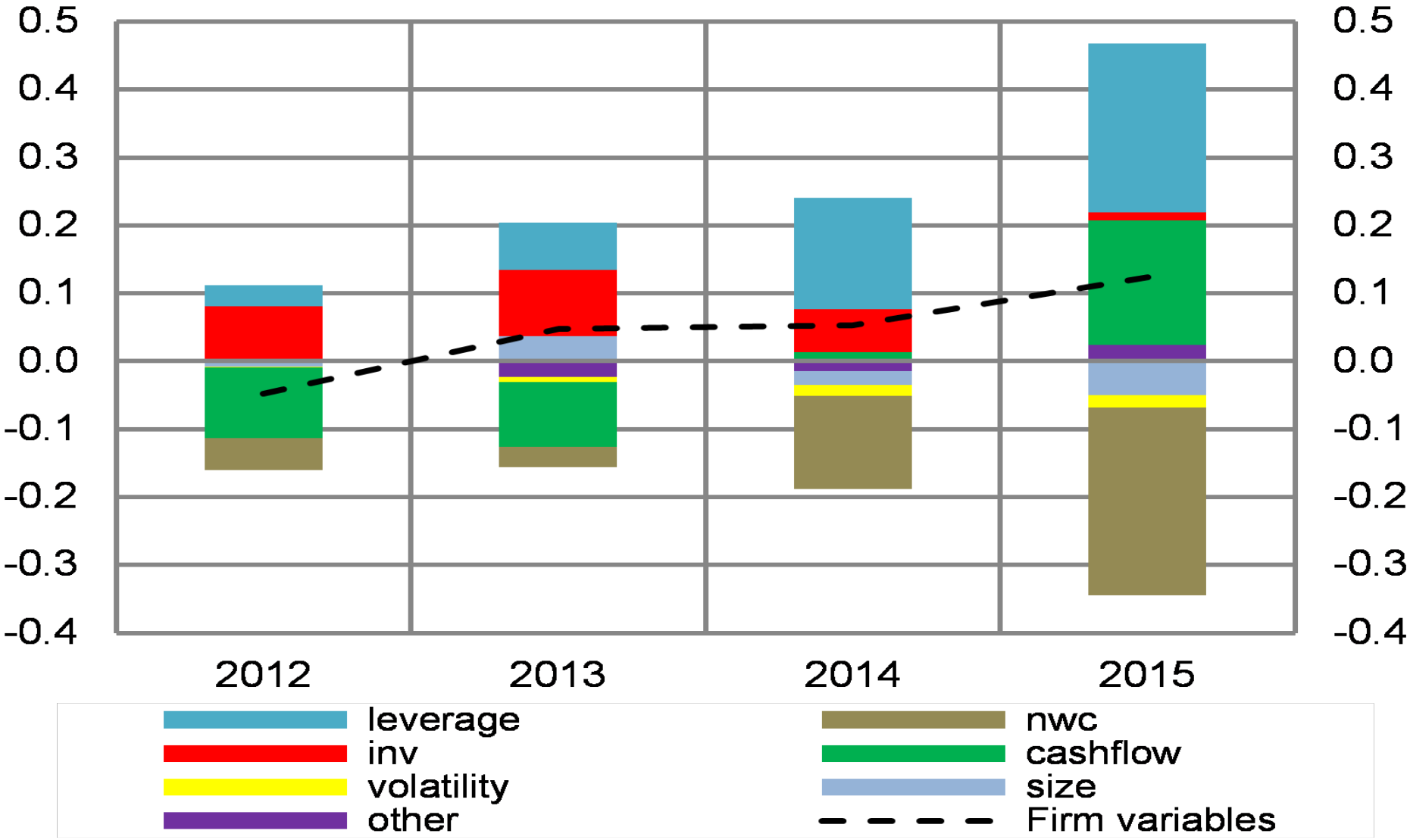
- Our s is 2011 and we let t vary from 2012 to 2015

Decomposing the rise in cash ratio



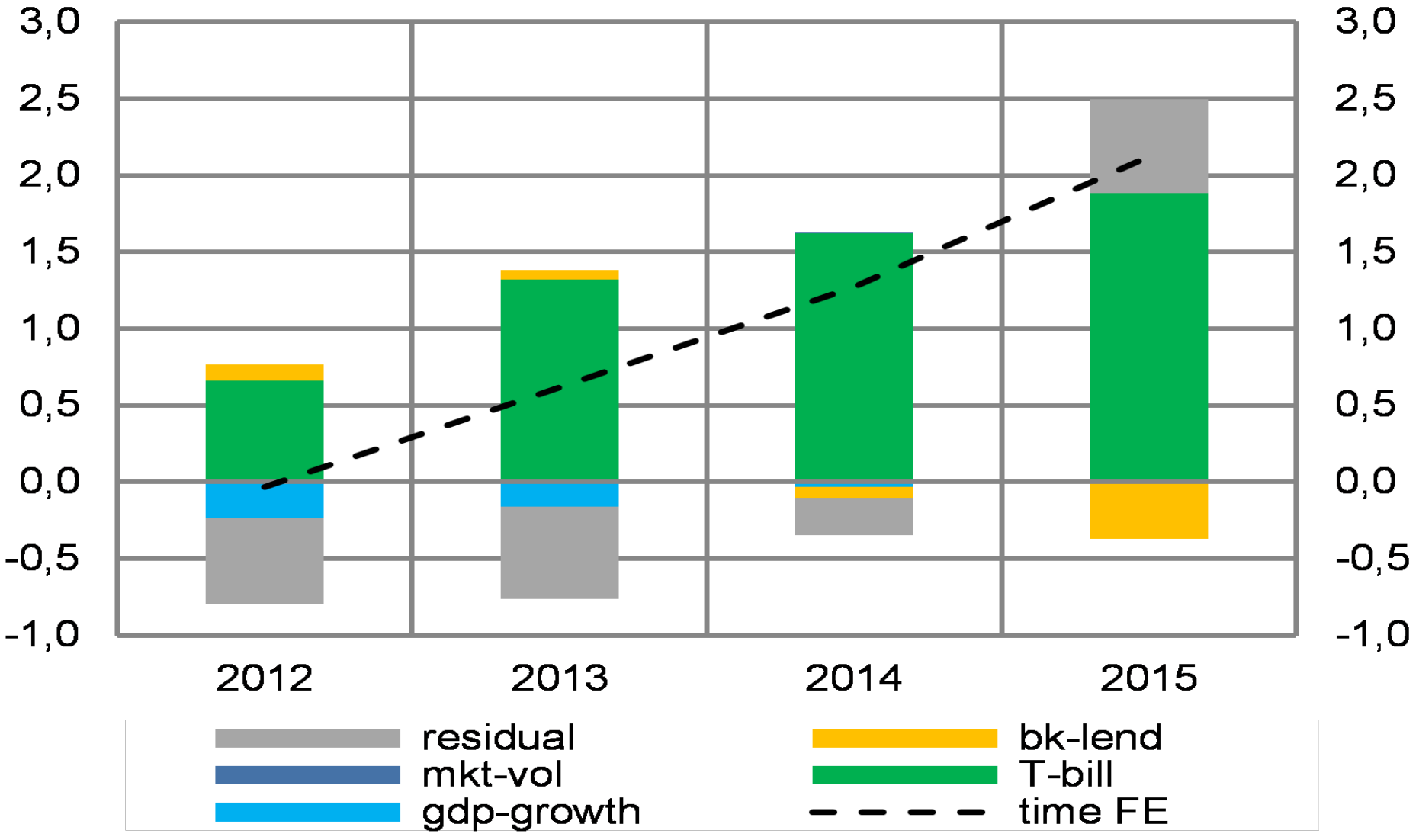
Table

Decomposition of micro factors



Table

Decomposition of macro factors



Extension: allowing for slope changes

- So far, cash-ratio responsiveness is assumed to be constant over time
- We allow for a slope change since 2011. Let $D_{t\geq 2011}$ be a dummy equal to 1 since 2011

$$y_{i,t} = \alpha + \boldsymbol{\beta}'\mathbf{X}_i t + \boldsymbol{\gamma}' D_{t\geq 2011}\mathbf{X}_{i,t} + \mu_i + \delta_t + \epsilon_{i,t}$$

- γ coefficients: generally significant and with the same sign as the β coefficients $\Rightarrow$ enhanced effects in recent years. Table
- But the common macro factors are confirmed to have had the greatest role. Table

Conclusion

- Corporate cash holdings in Italy **has been increasing since 2011**. Traditional **motives** to hold cash are at work: transaction costs, information asymmetries, precautionary reasons
- Main **factors** associated to the **rise** in cash-holdings:
  - a **strong common trend**: time factors common to all firms explain a lot
  - among macro factors, there is a high correlation with the **decline in the interest rate level**, in connection with the lower opportunity cost of holding cash
  - among firm-level factors the main link is initially with the **fall in investment** and then with **improved cash-flows** and **enhanced deleveraging**
- The **decline in firms' leverage** is even sharper if debt is measured **net of cash**

Open issues

- Preliminary evidence from 2016 data suggests that the cash-ratio growth is keeping on
- Why are firms remaining so liquid?
  - wait-and-see attitude given firms' uncertainty over future demand (Hicks)?
  - perception of low investment opportunities matched with low opportunity costs of cash (liquidity trap)?
  - willingness to strengthen financial and liquidity conditions after the severely challenging years of crisis?
  - worries that the experienced downturns in credit markets could come back again?
  - ...

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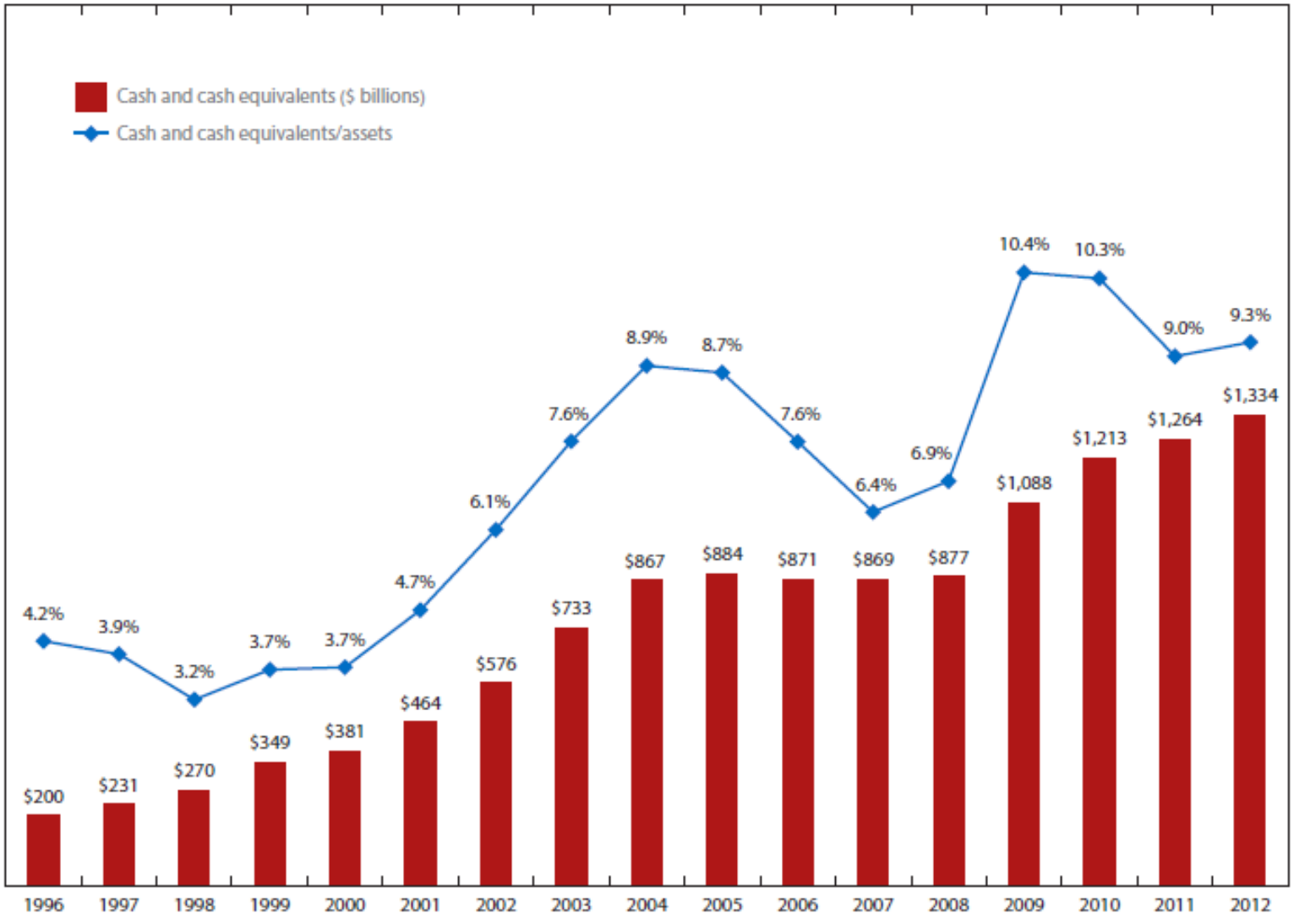
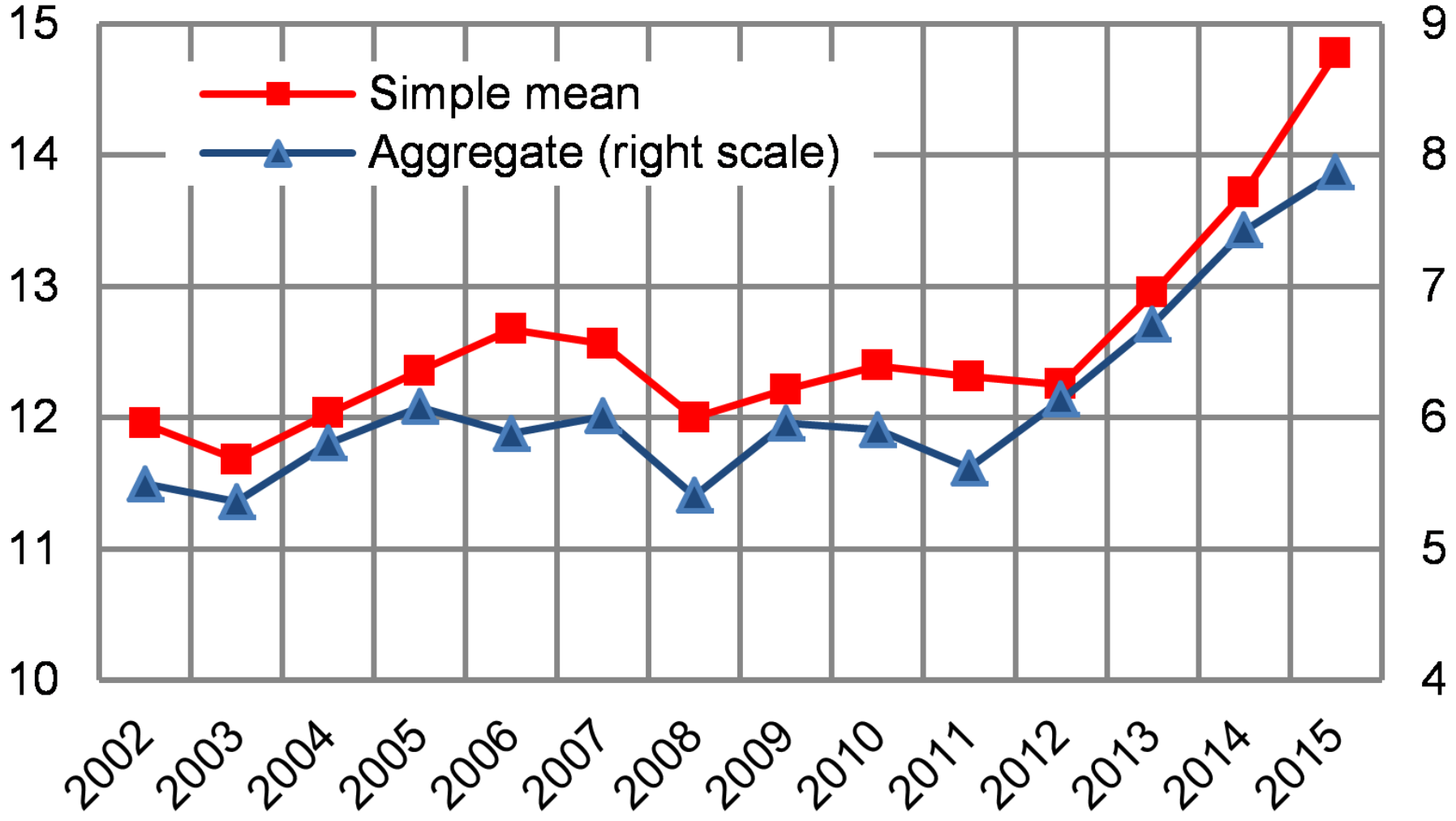
Thank you for your attention

The cash-ratio growth in the US



Source: Almeyda et al. (2014). Non financial S&P 500 firms

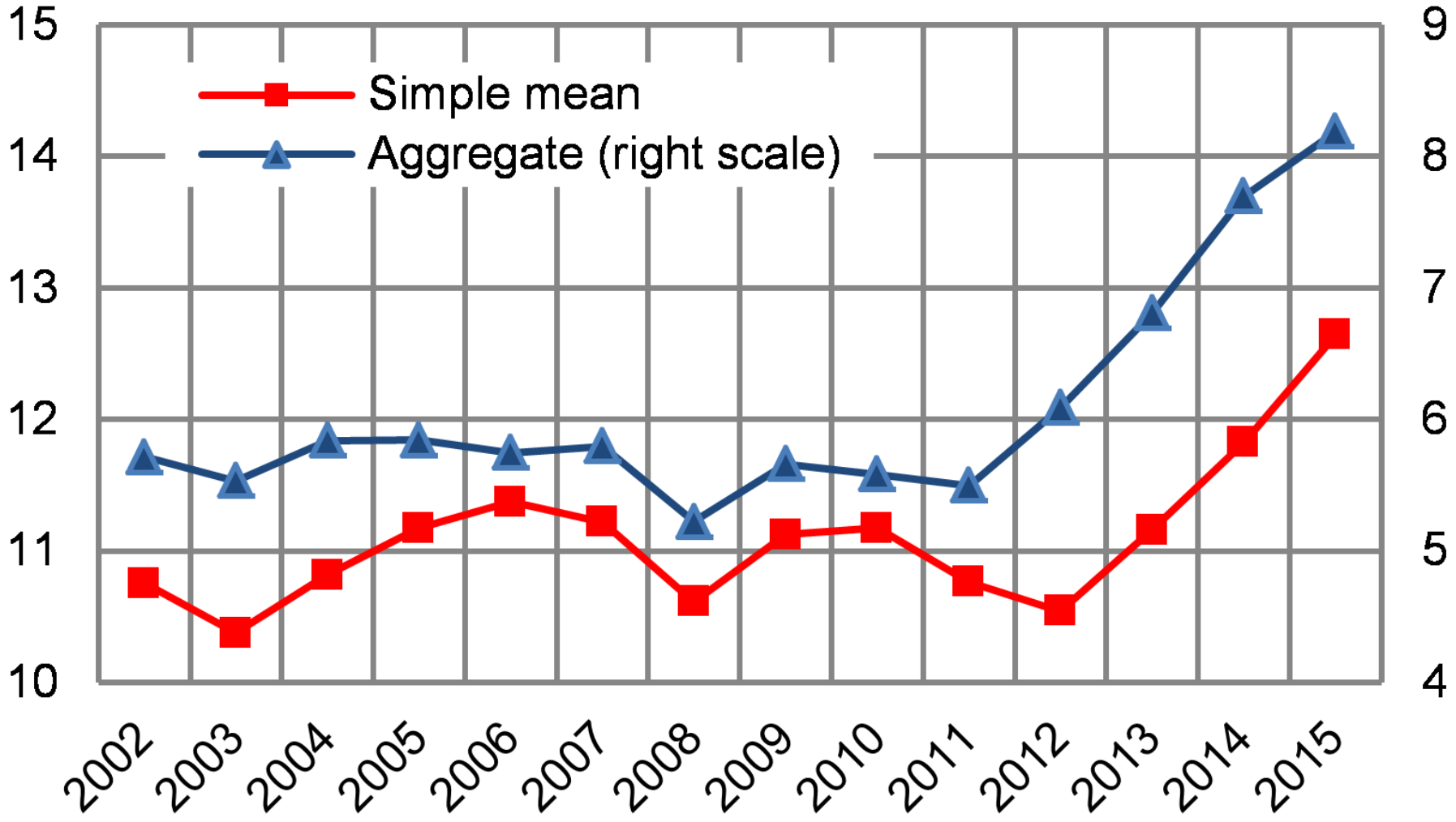
Cash to assets ratio in Italy (per cent)



The rise is robust if the sample is restricted to firms present throughout all the sample years

Figure

The average level is lower but the rising trend is not wiped out if the sample is restricted to firms present throughout all years



Summary statistics

Variable	Obs	Mean	St. Dv.	Min	Max	Wth std	Btw Std
liquid	6,472,572	0.1259	0.1777	0.0000	1.0000	0.1008	0.1693
size	5,105,480	6.4681	1.7274	0.0000	18.254	0.4161	1.6502
volatility	4,350,733	0.0516	0.0731	0.0000	0.4565	0.0459	0.0734
cash-flow	5,105,480	0.0407	0.1382	-0.5913	0.5839	0.0989	0.1349
inv	4,813,107	0.0078	0.1124	-0.2962	0.9632	0.0951	0.0884
nwc	5,105,480	-0.0037	0.3727	-1.5250	0.9919	0.2121	0.3654
leverage	5,033,979	0.5206	0.4429	0.0000	2.8750	0.2487	0.4357
loss	5,105,480	0.3139	0.4641	0.0000	1.0000	0.3576	0.3544
divpay	5,105,480	0.0407	0.1977	0.0000	1.0000	0.1413	0.1350
intang	4,960,309	-0.0025	0.0574	-0.3299	0.3532	0.0471	0.0491
bond_sh	5,105,480	0.0736	1.2450	0.0000	501.50	0.7964	0.8822

Robustness checks

	baseline (1)	non-linear (2)	dynamic (3)	alm-always (4)	medium-big (5)	industrial (6)
size	-0.012***	-0.012***	-0.009***	-0.009***	-0.002**	-0.007***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.001]	[0.001]
volatility	0.041***	0.043***	0.028***	0.053***	0.038***	0.062***
	[0.002]	[0.002]	[0.002]	[0.004]	[0.007]	[0.005]
cash-flows	0.156***	0.157***	0.152***	0.182***	0.153***	0.171***
	[0.001]	[0.001]	[0.001]	[0.002]	[0.004]	[0.002]
inv	-0.141***	-0.130***	-0.161***	-0.130***	-0.091***	-0.114***
	[0.001]	[0.001]	[0.001]	[0.001]	[0.002]	[0.002]
nwc	-0.178***	-0.178***	-0.172***	-0.187***	-0.167***	-0.172***
	[0.001]	[0.001]	[0.001]	[0.001]	[0.002]	[0.001]
leverage	-0.047***	-0.047***	-0.032***	-0.072***	-0.061***	-0.055***
	[0.000]	[0.000]	[0.000]	[0.001]	[0.001]	[0.001]
inv_squared		-0.030***				
		[0.002]				
liquid (t-1)			0.299***			
			[0.001]			
Time dummies	YES	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES	YES
Observations	3,988,049	3,988,049	3,988,049	1,371,391	401,087	935,017
R^2	0.154	0.154	0.238	0.16	0.143	0.143

	2012			2013			2014			2015		
	Lower	Central	Upper	Lower	Central	Upper	Lower	Central	Upper	Lower	Central	Upper
Size	-0.005	-0.005	-0.005	0.039	0.037	0.036	-0.021	-0.021	-0.020	-0.051	-0.049	-0.047
Vol	-0.001	-0.001	-0.001	-0.006	-0.007	-0.008	-0.014	-0.016	-0.017	-0.017	-0.019	-0.020
Cash-flow	-0.103	-0.104	-0.105	-0.095	-0.096	-0.097	0.013	0.013	0.014	0.181	0.183	0.185
Inv	0.082	0.081	0.080	0.098	0.097	0.096	0.064	0.063	0.062	0.011	0.011	0.011
Nwc	-0.047	-0.047	-0.046	-0.030	-0.030	-0.030	-0.138	-0.137	-0.136	-0.278	-0.276	-0.274
Leverage	0.032	0.031	0.031	0.071	0.070	0.069	0.166	0.164	0.161	0.253	0.249	0.245
Loss	-0.002	-0.002	-0.002	-0.021	-0.021	-0.020	-0.014	-0.013	-0.013	0.024	0.023	0.023
Divpay	-0.001	-0.001	-0.001	-0.002	-0.002	-0.002	-0.001	-0.001	-0.001	0.001	0.001	0.001
R&d	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.000	0.000	0.001	0.001	0.000
Obbpass	0.000	0.000	-0.001	0.000	-0.001	-0.001	0.000	0.000	-0.001	0.000	0.000	0.000
Firm var	**-0.045**	**-0.048**	**-0.050**	**0.053**	**0.048**	**0.042**	**0.056**	**0.053**	**0.050**	**0.124**	**0.124**	**0.123**
Gdp	-0.240	-0.237	-0.233	-0.163	-0.161	-0.158	-0.034	-0.034	-0.033	0.011	0.011	0.011
T-bill	0.656	0.659	0.662	1.313	1.319	1.325	1.611	1.619	1.626	1.862	1.871	1.879
Mkt-vol	0.000	-0.002	-0.004	0.000	0.002	0.005	0.000	0.001	0.003	0.000	0.002	0.004
Bk_lend	0.106	0.106	0.107	0.062	0.062	0.062	-0.070	-0.070	-0.071	-0.371	-0.373	-0.375
Residual	-0.555	-0.559	-0.562	-0.595	-0.603	-0.610	-0.239	-0.241	-0.244	0.612	0.613	0.613
Time FE	**-0.033**	**-0.032**	**-0.030**	**0.616**	**0.620**	**0.623**	**1.268**	**1.274**	**1.281**	**2.114**	**2.123**	**2.132**
Firm FE	**-0.001**	**-0.001**	**0.000**	**0.006**	**0.008**	**0.011**	**0.057**	**0.057**	**0.057**	**0.155**	**0.153**	**0.150**
Predicted	**-0.079**	**-0.080**	**-0.080**	**0.675**	**0.676**	**0.676**	**1.380**	**1.383**	**1.387**	**2.393**	**2.399**	**2.405**
Actual	**-0.080**	**-0.080**	**-0.080**	**0.676**	**0.676**	**0.676**	**1.383**	**1.383**	**1.383**	**2.399**	**2.399**	**2.399**

	Fixed Slope	Slope Change
	(1)	(2)
size	-0.013***	-0.013***
	[0.000]	[0.000]
volatility	0.044***	0.035***
	[0.002]	[0.002]
cash-flow	0.154***	0.123***
	[0.001]	[0.001]
inv	-0.144***	-0.116***
	[0.001]	[0.001]
nwc	-0.180***	-0.178***
	[0.001]	[0.001]
leverage	-0.045***	-0.039***
	[0.000]	[0.000]
loss	-0.011***	-0.007***
	[0.000]	[0.000]
divpay	0.008***	0.008***
	[0.000]	[0.000]
intang	-0.003**	-0.002
	[0.001]	[0.002]
bond_sh	0.001***	0.001***
	[0.000]	[0.000]
size_D		-0.002***
		[0.000]
volatility_D		0.041***
		[0.003]
cash-flow_D		0.077***
		[0.002]
inv_D		-0.087***
		[0.002]
nwc_D		-0.011***
		[0.001]
leverage_D		-0.011***
		[0.000]
loss_D		-0.010***
		[0.000]
divpay_D		-0.001
		[0.001]
intang_D		0.004
		[0.003]
bond_sh_D		0.000***
		[0.000]
Firm dummies	YES	YES
Time dummies	YES	YES
Observations	3,860,004	3,860,004
R-squared	0.154	0.187
Number of groups	756,216	756,216

	2012			2013			2014			2015		
	Lower	Central	Upper	Lower	Central	Upper	Lower	Central	Upper	Lower	Central	Upper
Size	-0.005	-0.005	-0.005	0.038	0.037	0.035	-0.021	-0.020	-0.019	-0.051	-0.049	-0.047
Vol	-0.001	-0.001	-0.001	-0.005	-0.006	-0.006	-0.011	-0.012	-0.014	-0.013	-0.015	-0.017
Cash-flow	-0.082	-0.083	-0.085	-0.075	-0.077	-0.078	0.011	0.011	0.011	0.144	0.146	0.149
Inv	0.067	0.066	0.064	0.080	0.079	0.078	0.052	0.051	0.050	0.009	0.009	0.009
Nwc	-0.046	-0.046	-0.046	-0.030	-0.029	-0.029	-0.137	-0.136	-0.135	-0.275	-0.273	-0.271
Leverage	0.028	0.028	0.027	0.062	0.061	0.060	0.147	0.144	0.141	0.224	0.219	0.215
Loss	-0.001	-0.001	-0.001	-0.014	-0.013	-0.012	-0.009	-0.008	-0.008	0.015	0.014	0.014
Divpay	-0.001	-0.001	-0.001	-0.002	-0.002	-0.003	-0.001	-0.001	-0.001	0.001	0.001	0.001
Intang	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.000	0.000
Obbpass	0.000	-0.001	-0.001	-0.001	-0.001	-0.001	0.000	0.000	-0.001	0.000	0.000	0.000
Firm var	**-0.041**	**-0.045**	**-0.048**	**0.056**	**0.049**	**0.043**	**0.032**	**0.028**	**0.024**	**0.054**	**0.053**	**0.052**
y Size	-0.001	-0.001	-0.001	-0.006	-0.007	-0.008	-0.012	-0.015	-0.017	-0.015	-0.018	-0.021
y Vol	-0.001	-0.052	-0.054	-0.046	-0.048	-0.050	0.006	0.007	0.007	0.087	0.091	0.095
y Cash-flow	-0.050	0.049	0.047	0.061	0.059	0.057	0.040	0.038	0.037	0.007	0.007	0.007
y Inv	0.051	-0.003	-0.002	-0.002	-0.002	-0.002	-0.009	-0.008	-0.007	-0.018	-0.016	-0.015
y Nwc	-0.003	0.008	0.007	0.018	0.017	0.015	0.043	0.039	0.036	0.065	0.060	0.054
y Leverage	0.008	-0.002	-0.001	-0.019	-0.018	-0.017	-0.012	-0.011	-0.011	0.021	0.020	0.019
y Loss	-0.002	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
y Divpay	0.000	0.000	-0.001	0.000	0.000	-0.001	0.000	-0.001	-0.001	0.000	-0.001	-0.001
y Intang	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
y Obbpass	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
y firm-effect	**0.004**	**-0.001**	**-0.006**	**0.008**	**0.002**	**-0.005**	**0.056**	**0.049**	**0.043**	**0.147**	**0.142**	**0.138**
Gdp	0.135	0.170	0.206	0.091	0.116	0.140	0.019	0.024	0.029	-0.006	-0.008	-0.009
T-bill	0.889	0.908	0.928	1.777	1.816	1.855	2.181	2.229	2.277	2.521	2.577	2.632
Mkt-vol	-0.354	-0.385	-0.415	0.404	0.438	0.473	0.217	0.236	0.254	0.325	0.353	0.381
Bk_lend	0.207	0.215	0.223	0.121	0.125	0.130	-0.137	-0.142	-0.147	-0.727	-0.755	-0.782
Residual	-0.887	-0.917	-0.947	-1.725	-1.823	-1.921	-0.946	-1.006	-1.066	0.056	0.009	-0.037
Time FE	**-0.011**	**-0.008**	**-0.006**	**0.668**	**0.673**	**0.677**	**1.335**	**1.341**	**1.348**	**2.169**	**2.176**	**2.184**
Firm FE	**-0.027**	**-0.027**	**-0.027**	**-0.048**	**-0.046**	**-0.044**	**0.014**	**0.014**	**0.014**	**0.171**	**0.170**	**0.168**
Predicted	**-0.079**	**-0.080**	**-0.081**	**0.676**	**0.676**	**0.676**	**1.381**	**1.383**	**1.386**	**2.394**	**2.399**	**2.404**
Actual	**-0.080**	**-0.080**	**-0.080**	**0.676**	**0.676**	**0.676**	**1.383**	**1.383**	**1.383**	**2.399**	**2.399**	**2.399**

Cash ratio and leverage

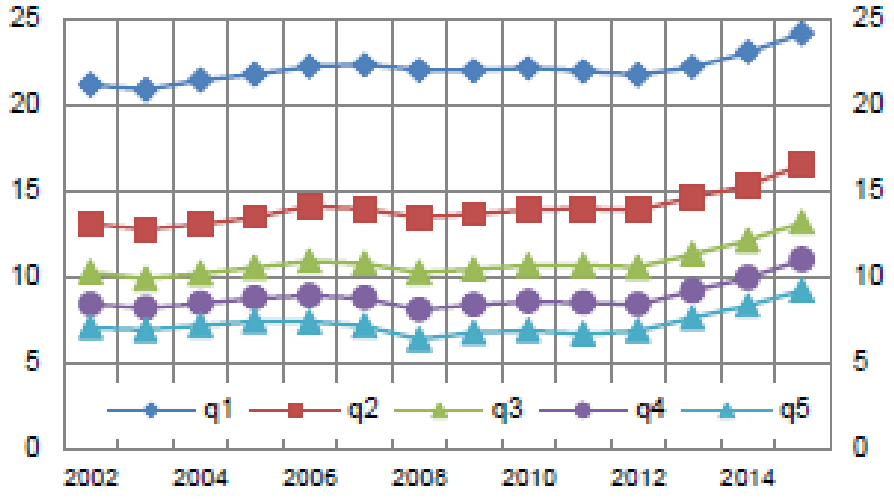
(aggregate, average and median levels)

	Cash ratio			Leverage			Net Leverage		
	Aggr	Avg	Med	Aggr	Avg	Med	Aggr	Avg	Med
2002	5.5	12.0	4.7	51.6	52.6	55.2	47.5	50.9	63.0
2003	5.4	11.7	4.5	51.0	52.7	56.1	47.1	50.0	63.4
2004	5.8	12.0	4.6	51.6	53.5	56.5	47.5	49.4	63.2
2005	6.1	12.4	5.0	51.8	53.1	55.9	47.4	51.1	62.9
2006	5.9	12.7	5.2	52.0	51.1	56.1	47.7	47.7	63.3
2007	6.0	12.6	5.1	53.8	52.6	56.5	49.6	49.4	63.6
2008	5.4	12.0	4.4	52.4	51.6	53.6	48.8	46.3	60.0
2009	6.0	12.2	4.5	52.5	51.3	52.4	48.6	47.5	58.8
2010	5.9	12.4	4.7	52.1	51.6	51.6	48.1	41.0	58.0
2011	5.6	12.3	4.7	53.0	48.9	50.0	49.4	42.1	56.7
2012	6.1	12.3	4.5	52.7	48.0	47.4	48.5	38.2	53.9
2013	6.7	13.0	5.0	51.5	46.1	43.9	46.9	37.9	51.7
2014	7.4	13.7	5.7	49.7	43.1	40.9	44.7	35.9	49.4
2015	7.9	14.8	6.6	47.9	42.7	39.0	42.2	35.4	47.3

Cash ratio by firm dimensional class

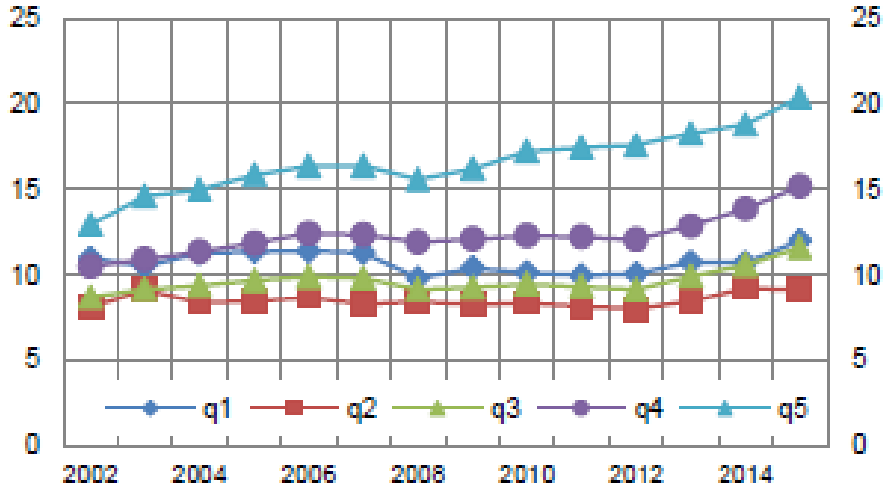
	Aggregate			Average		
	Small	Medium	Large	Small	Medium	Large
2002	7.6	6	4.3	12.3	7.2	5.6
2003	7.3	6.8	3.9	12	7.2	5.4
2004	7.7	6.5	4.6	12.3	7.6	5.9
2005	8.2	6.7	4.8	12.7	7.8	6.1
2006	7.9	6.9	4.5	13	7.9	6.2
2007	7.9	6.5	5	12.9	7.5	6.1
2008	6.9	5.6	4.5	12.3	7	5.6
2009	7	6.4	5.2	12.4	7.6	6.4
2010	7.1	6.6	5	12.6	7.9	6.3
2011	7	6.4	4.6	12.6	7.6	6
2012	7.1	6.6	5.4	12.5	7.9	6.2
2013	7.7	7.8	5.8	13.2	8.9	7
2014	8.5	8.4	6.6	14	9.6	7.4
2015	9.2	9.1	6.9	15.1	10.4	8.2

firm size quintiles



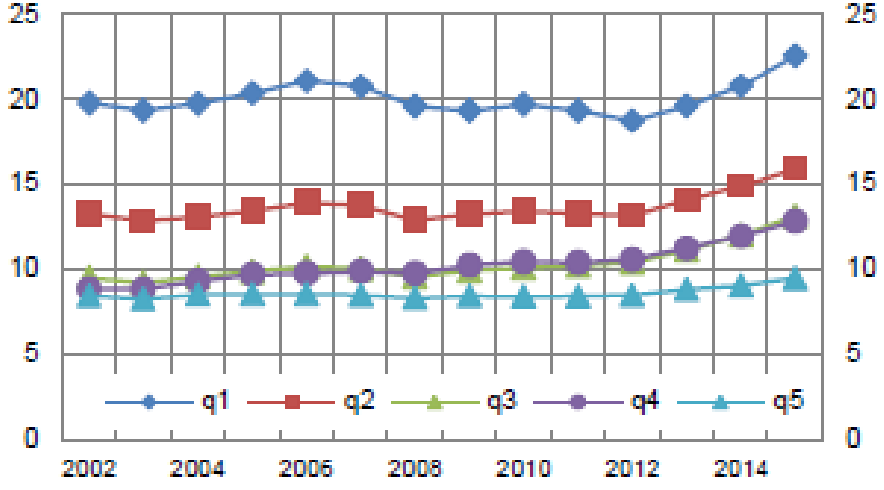
Firm size is measured by total assets

cash-flow quintiles



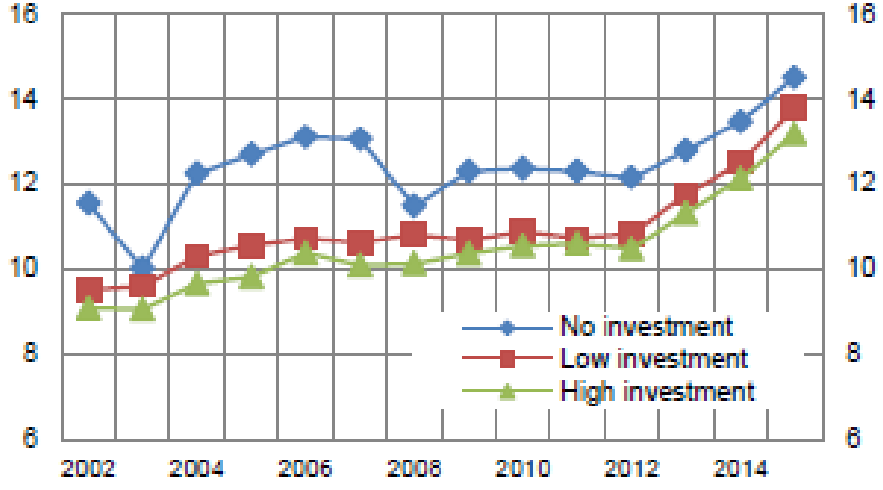
Cash flows are computed as earnings after financial debt interest payments, taxes and dividend distribution but before amortization and depreciation, plus other (non-ordinary) net earnings. Cash flows are normalized by total assets.

net working capital quintiles



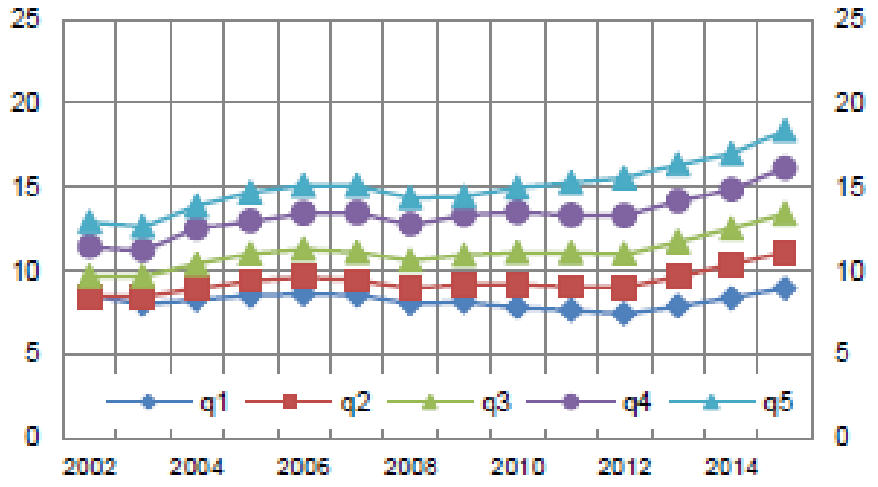
Net working capital is computed as current assets (net of cash and liquid financial securities) minus current liabilities, normalized by total assets

investment class



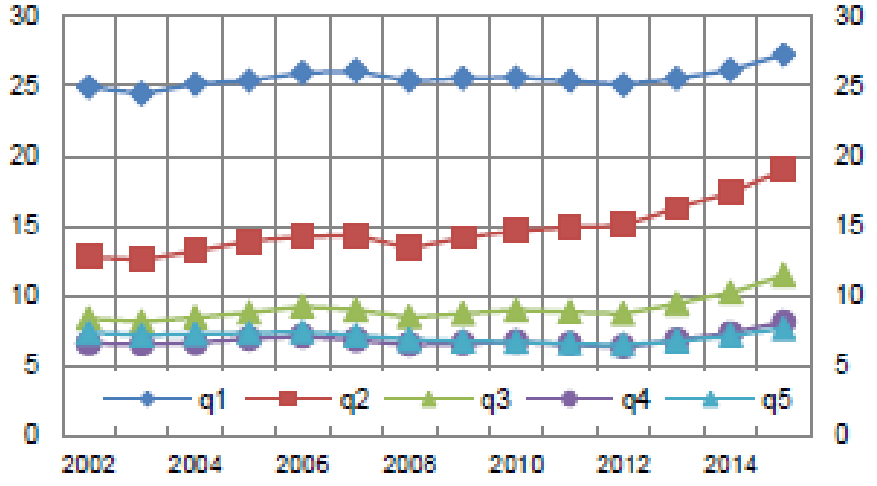
Investment classes are computed on the basis of the annual change in tangible and intangible assets over total assets: the no investment class is assigned when the ratio is negative; the low (high) investment class corresponds to ratio below (above) the median taken of positive ratios in each year. The 2003 and 2008 data is interpolated because of a monetary re-evaluation of tangible and intangible assets occurred in that year.

cash flow volatility quintiles



Cash flows volatility is computed as 3 years rolling standard deviation of cash flow to total assets. At least three valid observations are required

leverage



Leverage is defined as the ratio between financial debt and the sum of financial debt and net worth. Leverage is ensured to be non-negative as described in Section 4.