Non-financial sector balance sheets and financial stability: what can we learn from economic research?

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Outline

Household sector

- Aggregate picture
- Micro data

Non-financial firms

- Aggregate picture
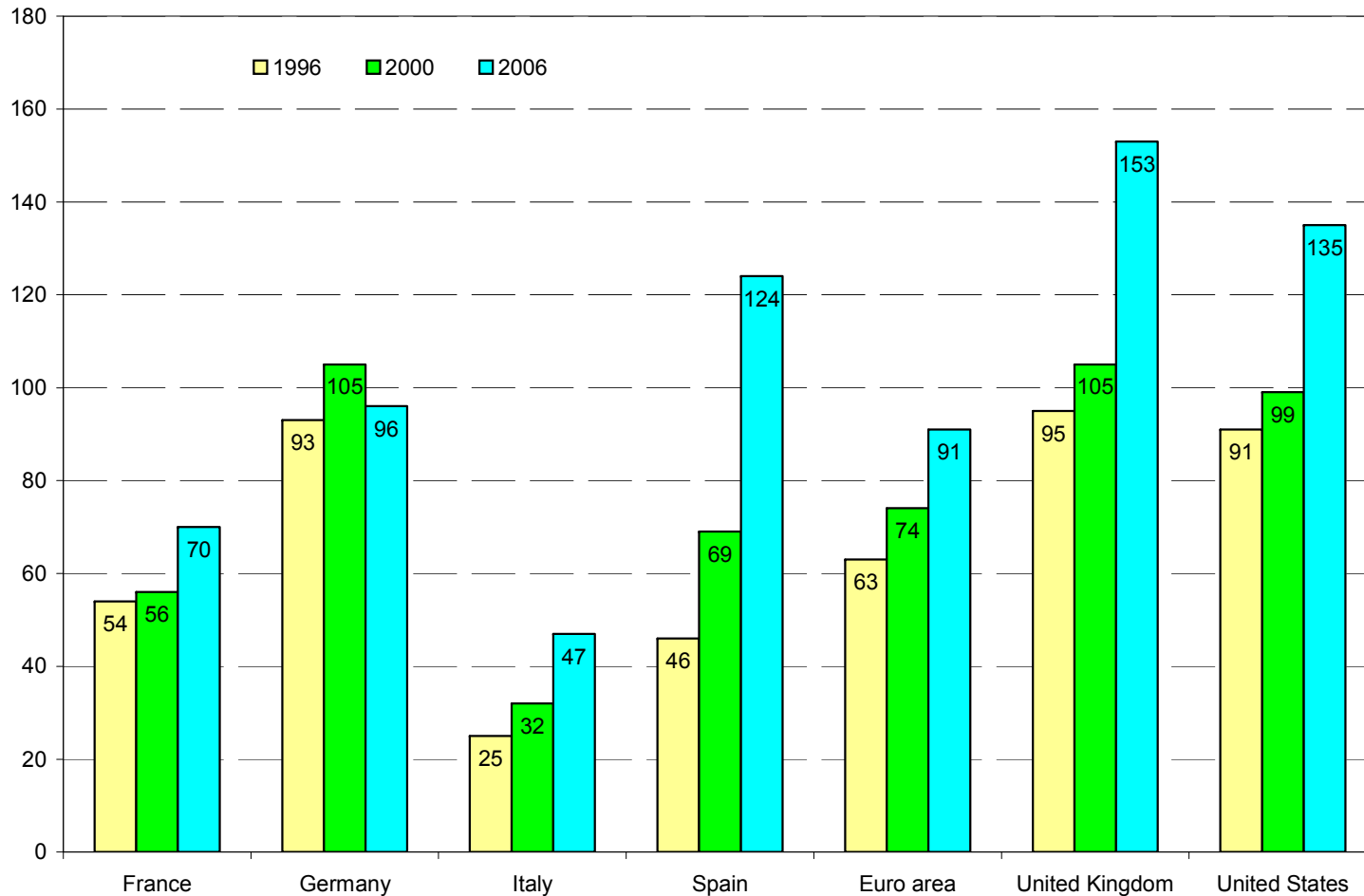- Micro data

The household sector: the aggregate picture

Recent trends in households' balance sheets

1. Debt growth (mainly in the longer-term component)

2. Increase in financial and real wealth

3. Change in the composition of assets (risky/safe assets)

The household sector: international comparison (1)

Household financial debt

as a percentage of disposable income
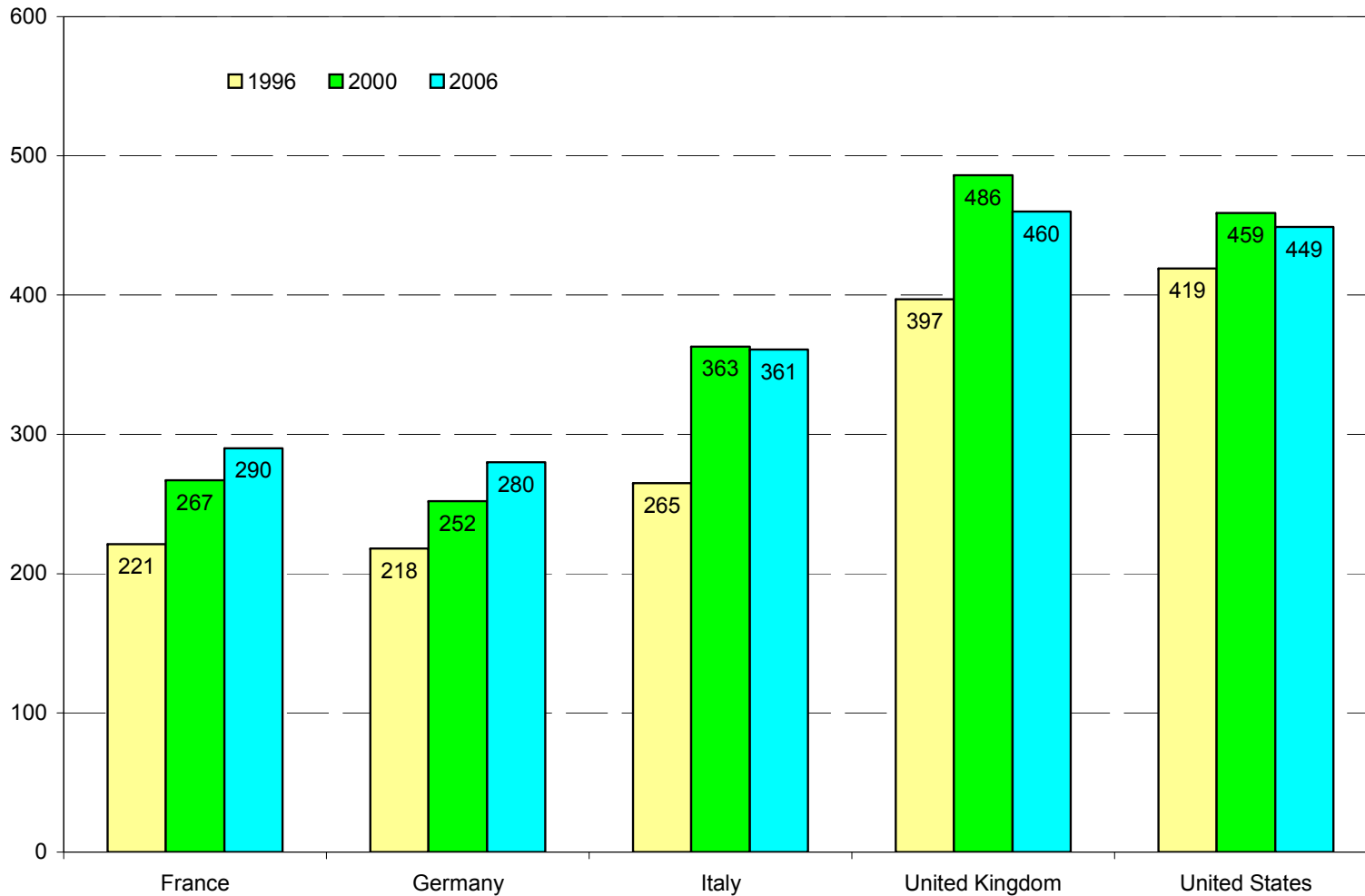
The household sector: international comparison (2)

Household net wealth

as a percentage of disposable income
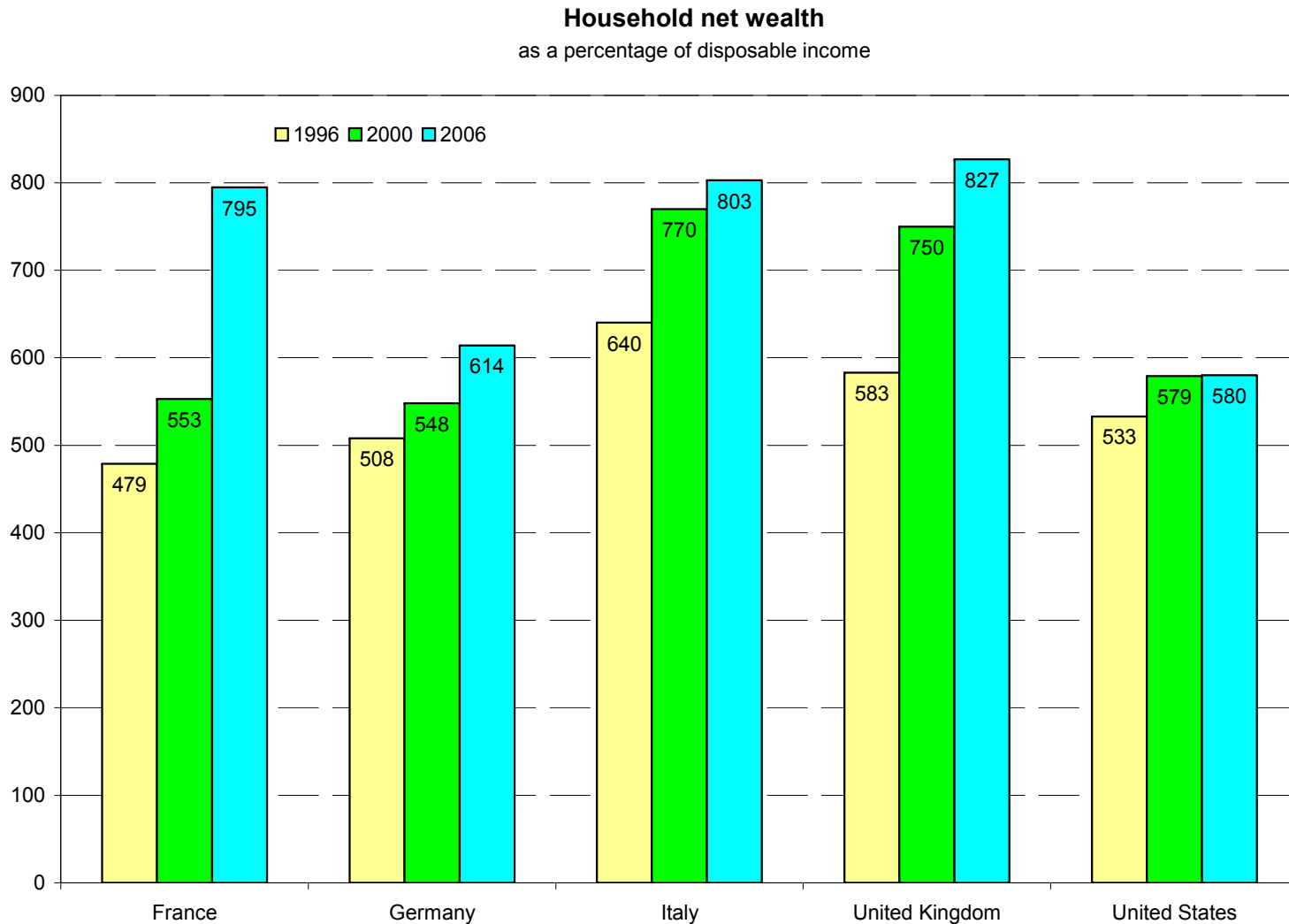
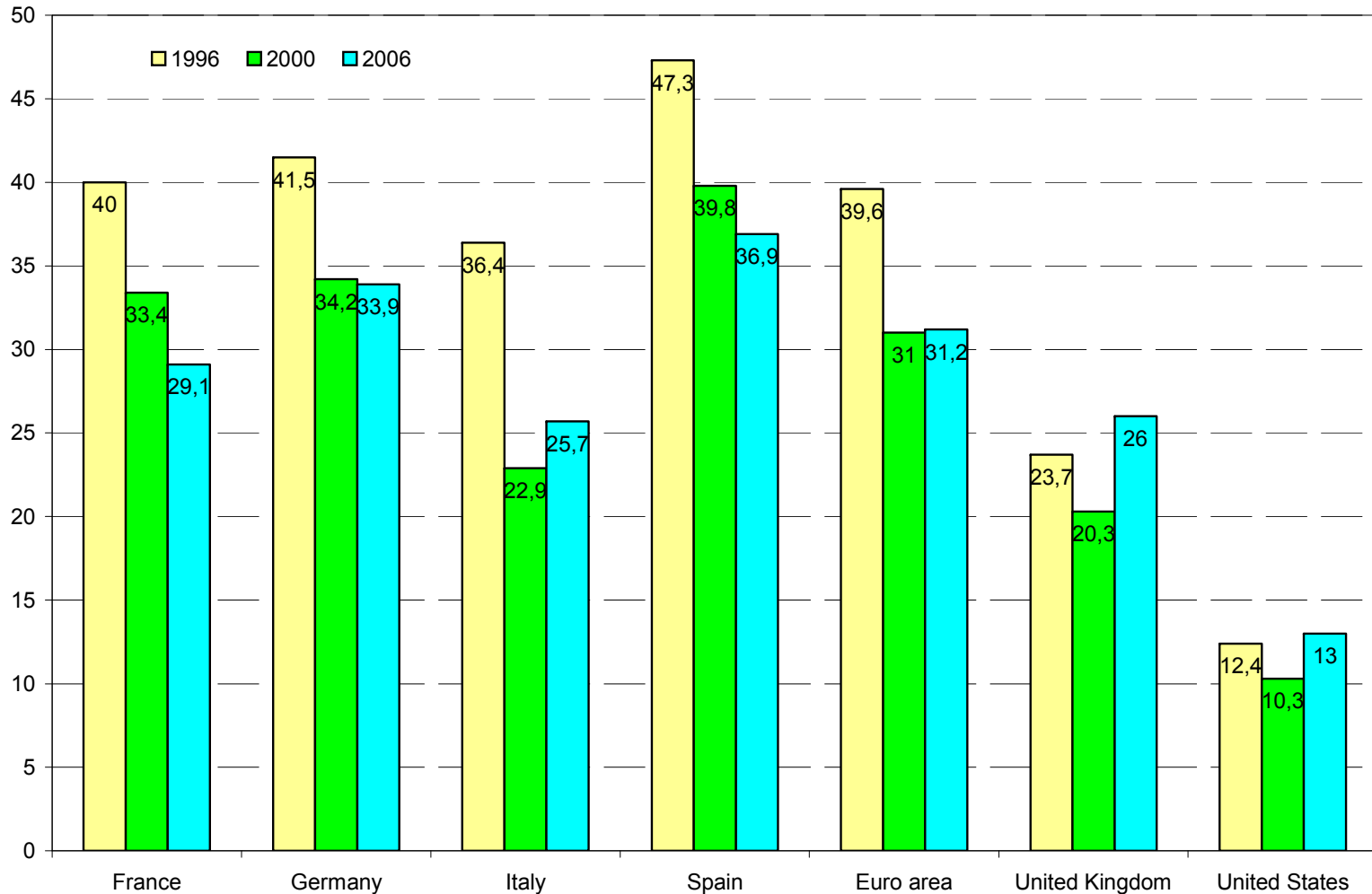# The household sector: international comparison (3)

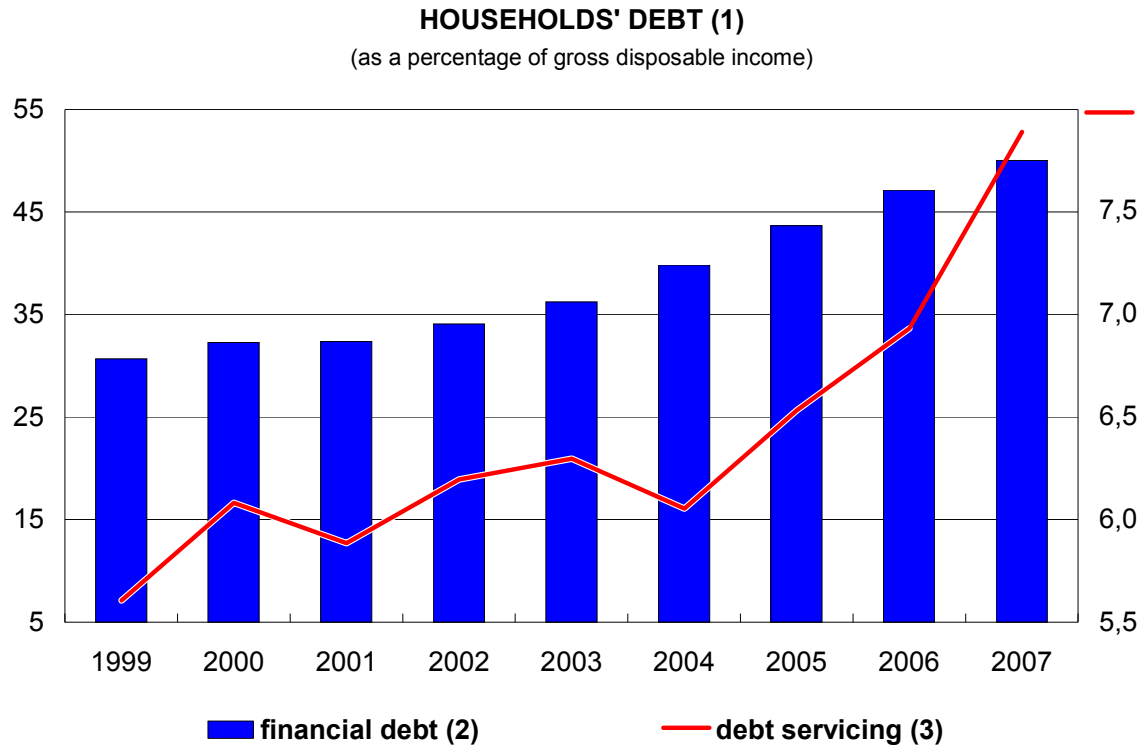**Household financial assets**
as a percentage of disposable income

The household sector: international comparison (4)

Household deposits over total financial assets

percentage

The household sector: Italy

HOUSEHOLDS' DEBT (1)

(as a percentage of gross disposable income)

financial debt (2)   debt servicing (3)

Sources: Bank of Italy, ISTAT.
(1) Consumer households, producer households and non-profit institution serving households. The figure for gross disposable income in 2007 is a Bank of Italy estimate. (2) Left-hand scale. End-of period stocks.
(3) Right-hand scale. The indicator relates only to consumer households. The figure for debt servicing (total payment of interest and principal) is a Bank of Italy estimate.

The household sector: Italy

The analysis of the aggregate data for Italy gives a quite comforting picture.

Debt and the cost of debt service have increased, but debt remains lower than that of other countries.

Wealth is high and so leverage measures (ratio of debt to assets) are low.

Italy: other indications

Factors related to the "soundness" of the households sector in Italy:

-The share of mortgages granted at variable rates is higher in Italy than in other countries: 75 % considering new mortgages on average in 2003-07 as opposed to 20% in Germany and 30% in France and the Netherlands

-Loan to value ratios increased in the decade reaching around 70% in 2006. They are still lower than in other countries

-Recovery procedures are rather lengthy, affecting banks' loss given default

Household sector: micro data

Macro data give a "weighted" average measure of the household sector financial position.

Debt might well be concentrated among lower income/lower wealth households. It is impossible to gauge any evidence on this from macro data.

In this sense, "analysis using micro data can help identify pockets of fragility within the sector".

Household sector: source of micro data

SHIW: Bi-annual survey covering a representative sample of around 8,000 households. Panel component is present.

Information on main socio-economic variables, income, assets and liabilities of the households.

Advantages: detailed information on households portfolios and link to main characteristics of the household.

Disadvantages: the main one is timeliness.

Household sector: what the SHIW tells us

In 2006 according to the Bank of Italy's SHIW 12% of households had a mortgage loan and 13% some form of consumer credit.

The corresponding percentages for both categories of loan were close to 20 per cent in Spain (on data for 2001) and to 30 and 50 per cent respectively in France and the United States (in 2004).

Overall, the percentage of Italian households with some form of debt has fluctuated around 20% since the mid-1990s, showing a slight tendency to rise since 2002.

Household sector: micro data

PARTICIPATION IN THE CREDIT MARKET (1)
(percentages)
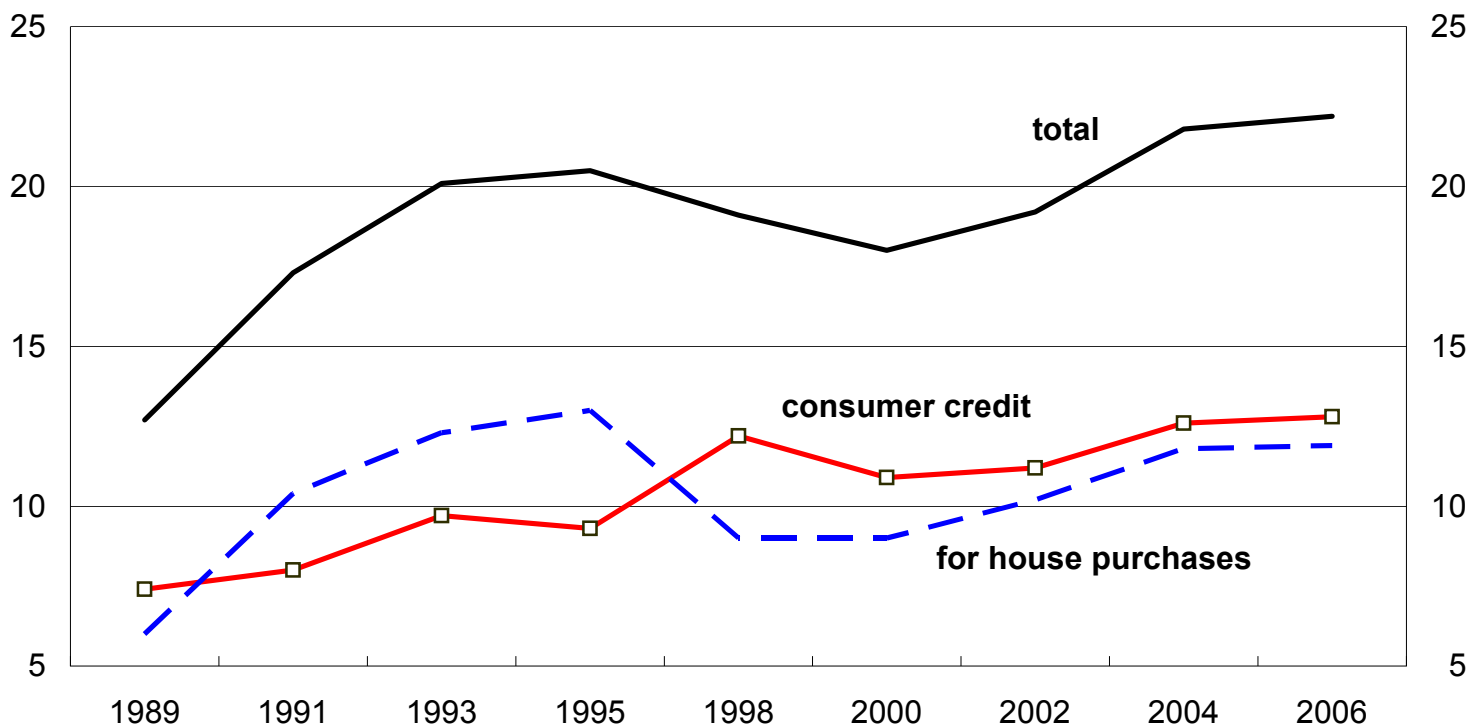
Source: Bank of Italy, Survey on Household Income and Wealth.
(1) Percentages of households with debt out of total households covered by the survey. Excludes debts contracted for professional reasons.

Household sector: what the SHIW tells us

The growth in aggregate household debt in recent years mainly reflects an increase in the average individual debt (intensive margin) rather than broader participation (extensive margin).

Loans for house purchases (60 per cent of total lending to Italian households) growth reflected a substantial increase in the average debt of the indebted households (~+50% in real terms in the decade) rather than broader participation in the credit market.

Participation rates for consumer credit show a more clear upward trend.

Household sector: what the SHIW tells us

HOUSEHOLD DEBT			
	1989	**1995**	**2006**
Share of households with debt (%)	12,7	20,5	22,2
by income quartiles			
1°	5,4	10,5	11,3
2°	12,9	16,9	18,1
3°	15,7	24,8	27,9
4°	16,9	29,7	31,7
Share of households with consumer credit (%)	7,4	9,3	12,8
by income quartiles			
1°	3,5	6,3	8,3
2°	8,2	8,2	10,2
3°	8,4	11,9	15,4
4°	9,3	10,8	17,2
Share of households with mortgage debt (%)	6,0	13,0	11,9
by income quartiles			
1°	2,0	4,8	3,8
2°	5,0	9,7	9,1
3°	7,9	15,7	16,1
4°	9,1	22,0	18,6
Debt/disposable income	23,9	31,8	35,6
by income quartiles			
1°	56,4	47,6	37,9
2°	30,2	40,9	35,1
3°	23,0	36,1	42,3
4°	15,3	24,4	27,8

Household sector: what the SHIW tells us

For mortgages the growth in participation recorded during the current decade has not extended to the lowest-income households.

The increase in the average size of mortgage loans reflected, in particular, the increase in the loan-to-value ratio, which in 2006 reached an average of about 70 per cent.

In addition, it was possible to take out larger mortgages (lengthening of average maturity), which for contracts signed in 2006 exceeded 20 years.

Household sector: what the SHIW tells us

For consumer loans the growth in participation rates was more widespread among the different income classes.

For indebted households the median of total debt to income rose in the period of analysis.

Household sector: micro data

DEBT SERVICING ON MORTGAGE LOANS BY INCOME CLASS (1)

(as a percentage of disposable income; medians)
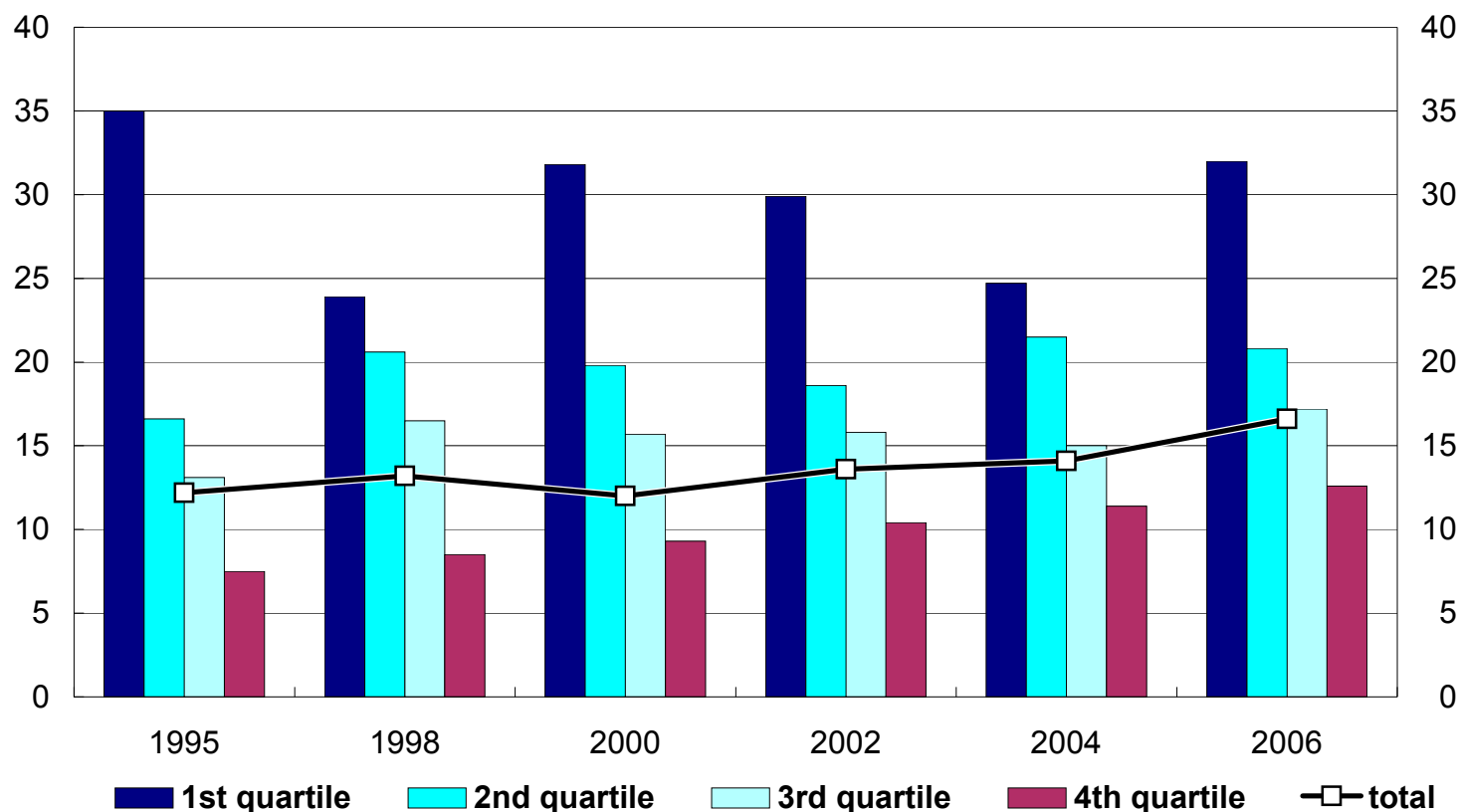
Source: Bank of Italy, Survey on Household Income and Wealth.
(1) Payment of interest and repayment of principal only on motgage loans for the primary residence and only by households with this type of loan. Households are divided into income quartiles (ascending order). Excludes debt contracted for professional reasons.

Household sector: what the SHIW tells us

Debt servicing by indebted households alone can be analyzed using the data of the Survey on Household Income and Wealth. The survey has collected data on the debt servicing of mortgage loans only on households' primary residence since 1995.

For the median household, debt servicing costs on these loans amounted to 17 per cent of disposable income in 2006, compared with 12 per cent in 1995 and 2000.

Household sector: what the SHIW tells us

Between 2004 and 2006 the largest increase was recorded for households in the lowest income quartile, whose mortgage loan installments reached 32 per cent of disposable income; this high level had already been equaled and exceeded in previous periods (1995 and 2000).

For households with above-median income, debt servicing was close to 15 per cent of disposable income in 2006, rising with respect to the past especially for households in the top income quartile.

Household sector: risk

In 2006 the portion of households whose total debt installment amounted to 30 per cent or more of household income was 1.4 per cent (332,000 households scaled to the universe); 143,000 of these households (0.6 per cent of the total) belonged to the lowest income quartile and were among the most vulnerable to a rise in the cost of debt.

Households whose debt installment amounted to 50 per cent or more of income numbered 93,000 (0.4 per cent of the total), including 55,000 in the lowest income quartile (0.2 per cent of the total).

Household sector: risk

Overall this evidence indicates that there are no particular signs of a deteriorating financial position of the household sector.

The quality of credit to households remains high; the ratio of new bad debts to outstanding loans was 0.8 per cent, the same as in 2006.

The expansion in the market in real-estate loans in recent years may have increased the financial vulnerability of households, especially in the lower income brackets, but without yet being reflected in an increase in bad debts.

Household sector: risk

The rise in property prices and in the loan-to-value ratio led to an increase in the average size of new mortgages.

According to Central Credit Register data, for which the reporting threshold is €75,000, it rose from €125,000 in 2004 to €138,000 in 2007.

Household sector: risk

The increase in interest rates from the end of 2005 onwards, at a time when the proportion of variable-rate borrowing was high, was reflected in a rapid increase in households' debt servicing costs.

Analysis of Central Credit Register data on mortgage lending to households between 2004 and 2006 indicates that in the four years ending in 2007 3.5 per cent of borrowers were late with at least one repayment installment and that more than 1 per cent were reported as a bad or impaired debt.

Household sector: risk

The proportion of households that have difficulties in repaying the installments in a year after the contract has been signed grows for the more recent loan cohorts.

Variable rates mortgages are in general more risky than fixed rate ones.

Household sector: pricing of risk

Is the risk adequately priced?

A test using consumer loans interest rates drawn from the SHIW
Research by Silvia Magri at the Bank of Italy

Aim of the research: verify if in Italy the prices of consumer loans, such as the loans to purchase a motor vehicle, furniture or for other purposes, are based on the *specific* risk of the borrower

Important issue in understanding banks' behavior and perception of risk

Methodology:
(both OLS and Heckman estimations)

Rate = f [(<u>individual characteristics aimed at capturing individual risk</u> (e.g. *age, employment status, income, wealth*), <u>characteristics of the local credit market</u> (e.g. *geographical area of residence, concentration of credit markets, efficiency of the recovery procedures*)]

Household sector: pricing of risk

Is the risk adequately priced?

Results: the price charged by Italian lenders is barely influenced by the traditional proxies of the specific risk of the borrower, such as income, net wealth, type of occupation, education, employment status, being a single parent or facing difficulties with the disposable income.

These variables are important in determining <u>whether or not</u> a household has a consumer loan, but not its price.

Overall, there appears to exist different prices for few categories of products, primarily differentiated according to the residence of the borrower (a sort of *background* risk), the borrower being married or not (a proxy of the household income variability) and the borrower having also a mortgage (a sort of *information effect*).

Non financial firms: aggregate data
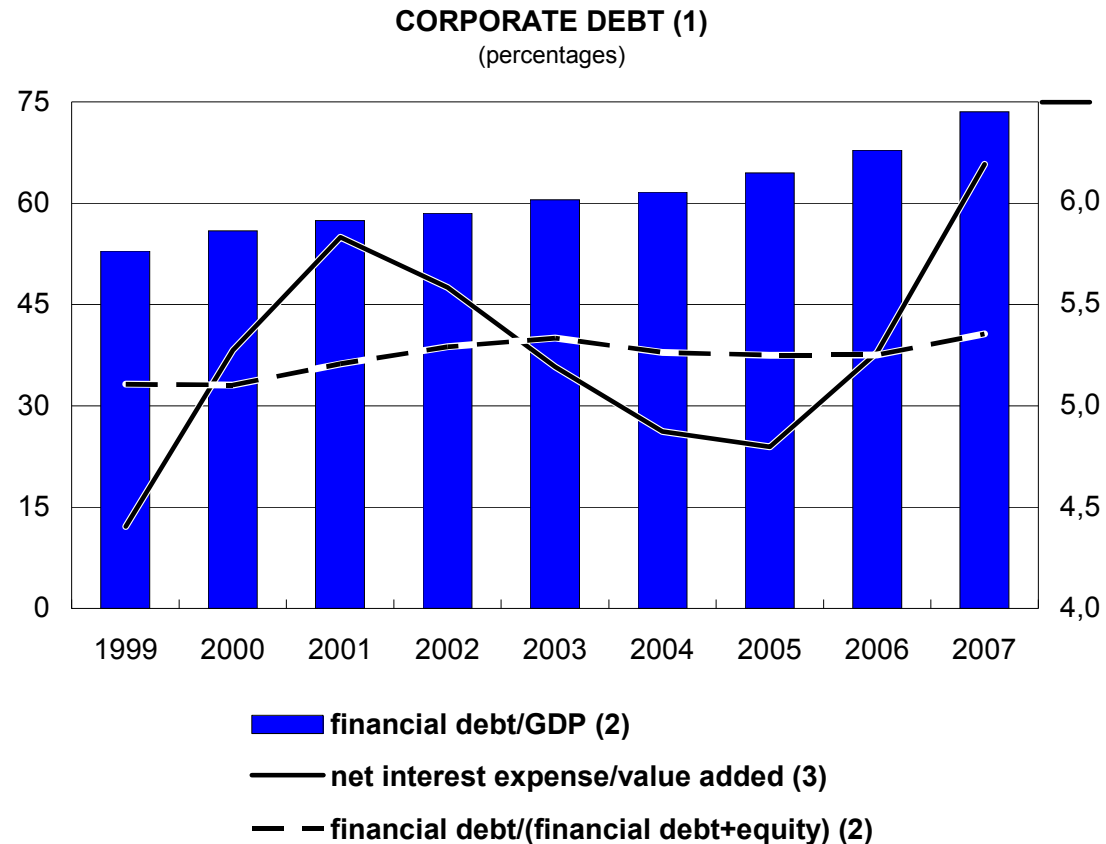
Main indicators used in the current analysis

leverage = debt/(debt + equity)

debt/GDP

financial expense/value added

liability composition

Non financial firms: aggregate data

CORPORATE DEBT (1)
(percentages)

Legend:
- financial debt/GDP (2)
- net interest expense/value added (3)
- financial debt/(financial debt+equity) (2)

Sources: Bank of Italy, ISTAT.
(1) The data relate to "non-financial corporations".(2) Left-hand scale. (3) Right-hand scale. The figures for net interest expense are Bank of Italy estimates. Value added for 2007 is estimated from national accounts data.

Non financial firms: aggregate data

Linking real and financial flows
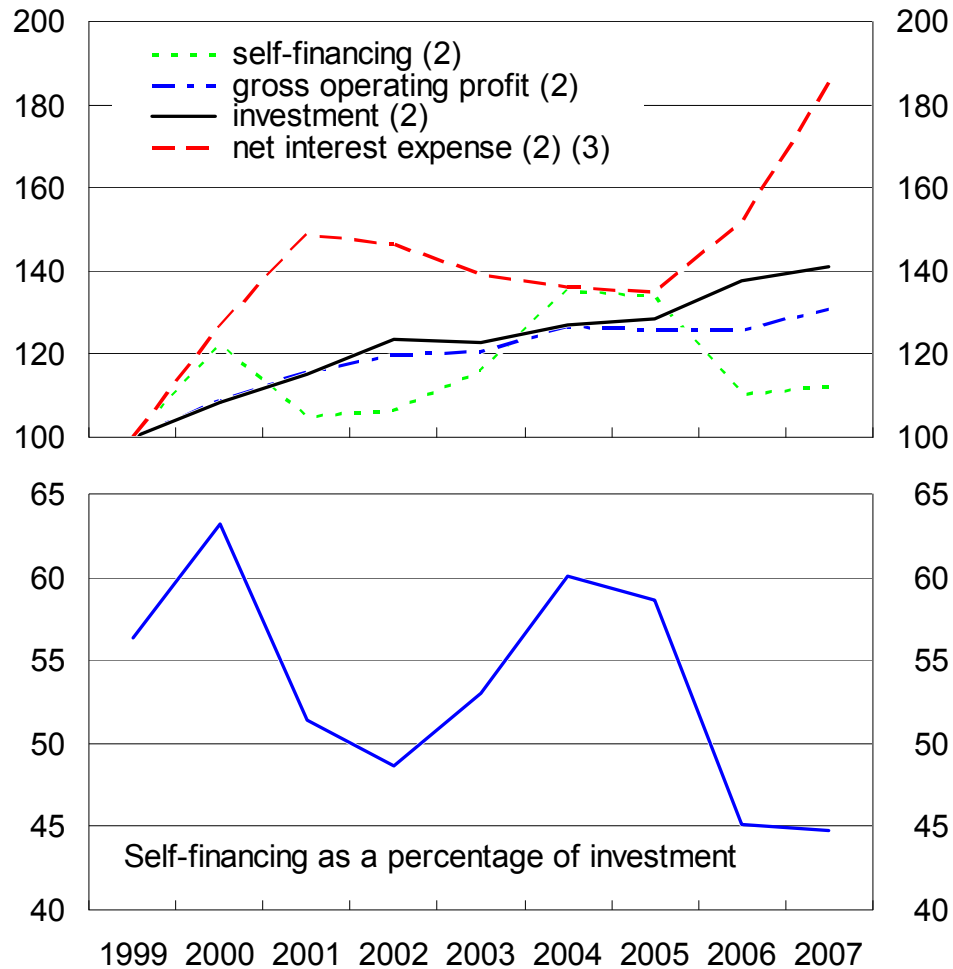
Identity: $S - I = \Delta FA - \Delta FL$ (theoretically)

Data on self-financing (a proxy for S) and investment drawn (estimated) from institutional national accounts

Ratio of self-financing over investment helps interpret the financial flows (external funding requirement)

Non financial firms: aggregate data

THE EXTERNAL FUNDING REQUIREMENT OF FIRMS (1)
(annual data)

Sources: Bank of Italy, ISTAT.
(1) Estimates based on national accounts data for the sector "non-financial corporations", 1999-2006. The data for 2007 are estimated on the basis of the national accounts for the year. Investment includes inventories.
(2) Indices, 1999=100. (3) Bank of Italy estimates.

Non financial firms: aggregate data

Ratio of debt to GDP on an increasing trend, though lower than in other major countries (with the exception of Germany). It was 74 % in 2007.

Firms' leverage increased in 2007 to 41 %: higher than in the euro area and in the US but lower than in the UK.

Primarily reflecting the increase in interest rates, net interest expense rose from 5.2 per cent of value added in 2006 to 6.2 per cent last year

Composition of Italian firms' financial debt differs from that in the other industrial countries primarily on account of lower fund-raising in the bond market

Short-term debt more important in Italy

Lower stock market capitalization

Non financial firms: micro data

Limits of the aggregate data

Need to address firms' heterogeneity

Micro data: assess the dispersion in financial conditions

Analyze some specific features (e.g. differences according to size, sector of economic activity, geographical location, distributive effects of tax reforms)

Specific research questions (e.g. balance-sheet channel, firms' listing decisions, venture capital financing)

Non financial firms: micro data

The Company accounts database

Open sample with balance sheet and income statements for some 35,000 non-financial firms each year.

Data collected by a consortium of banks; firms enter the sample by borrowing from one of the banks in the consortium.

The sample includes a large number of unlisted companies

May be biased towards firms with multiple banking relationships, which in turn are likely to be larger.

Non financial firms: micro data

Micro data permit to calculate the same set of indicators as the one used in the aggregate analysis plus other important variables for profitability, flow of funds and composition of assets and liabilities (e.g. tangible vs. intangible assets).

Limits of micro data: main one is the lag in updating of the information.

Historically, by looking at the main indicators, the trend is coherent with that observed at the aggregate level.

Non financial firms: micro data

	Leverage				
	2002	2003	2004	2005	2006
Class of employees					
1-49	59,5	59,2	57,3	55,5	56,2
50-249	54,3	53,7	53,3	53,3	51,8
250-999	51,5	48,5	46,9	46,1	48,0
>1000	46,7	46,0	47,7	48,6	48,0
Geographical Area					
North West	51,1	51,7	49,4	48,1	48,8
North East	55,1	52,3	50,8	49,4	49,2
Center	50,9	46,4	51,2	53,1	51,8
South	52,2	52,1	51,1	50,7	51,4
Sectors of activity					
Agricolture	54,0	54,6	55,9	53,5	52,2
Energy	36,1	33,3	35,3	35,7	36,9
Construction	60,7	62,9	65,2	66,2	61,0
Services	56,1	53,3	53,8	54,7	54,2
Manufacturing	51,9	51,0	49,4	47,6	48,2
TOTAL SAMPLE	**51,9**	**50,2**	**50,5**	**50,5**	**50,2**

Non financial firms: micro data

Heterogeneity in firms financial conditions implies that indicators based on aggregate data might hide potential vulnerabilities

We can have a stable average of the indicator (e.g leverage), but higher dispersion (see work developed on micro data, e.g. by the Bank of Spain)

Need to document heterogeneity to detect pockets of risks

A simple way is to try to quantify the relevance of firms that can be considered "fragile" according to some metrics

Non financial firms: micro data

NON FINANCIAL FIRMS FINANCIAL CONDITIONS INDICATORS (CB SAMPLE)
(percentages of total sample turnover)
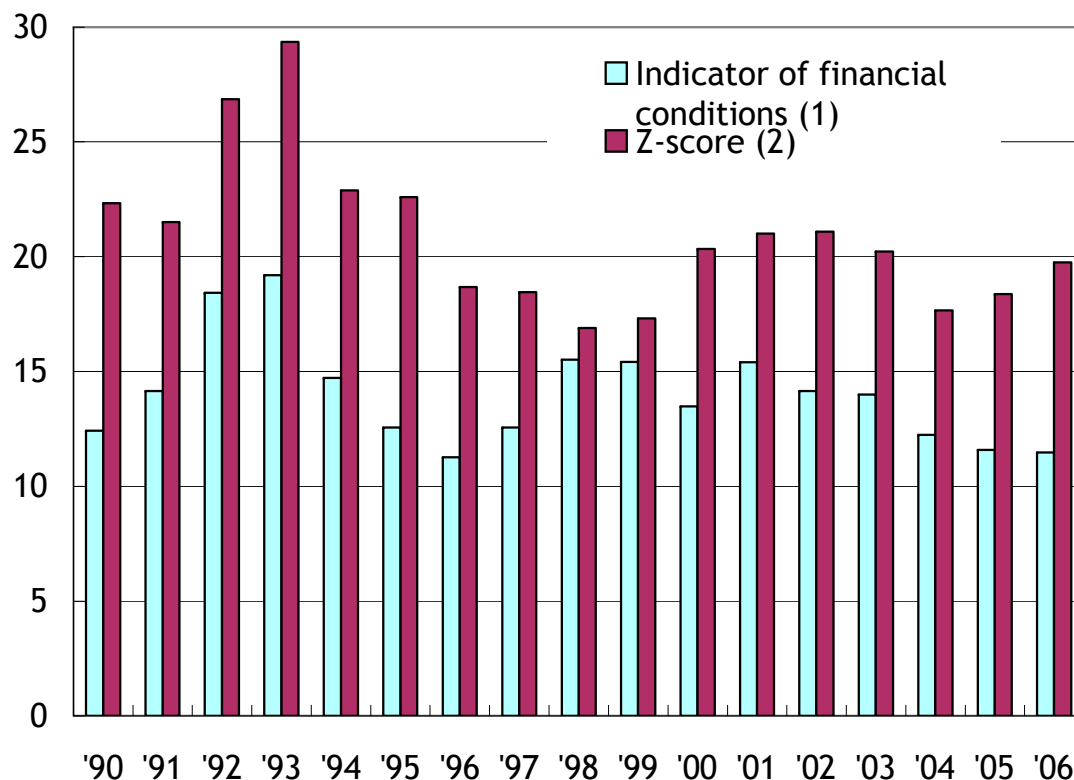
(1) Percentage of total sample turnover accounted for by firms in at least two of
the following four conditions: leverage above 75 per cent, ratio of current assets to
current liabilities below 75 per cent, debt-to-turnover ratio above 50 per cent, interest
expense coverage ratio below 100 per cent. An increase in the indicator denotes
greater financial vulnerability. (2) Percentage of total sample turnover accounted for
by firms with a Z score higher than 6 (risky firms).

Non financial firms: micro data

What micro data tell us on firms' financial conditions

Analysis of the joint distribution of a group of balance-sheet indicators (leverage, financial debt/sales, the coverage ratio and the ratio of short-term assets to short-term liabilities) shows that in 2006 the share over total sales of firms with at least two indicators over given (bad) thresholds was lower than in previous recessionary periods.

The "relevance" of firms with "bad" Z scores decreased.

Non financial firms: micro data

Can use micro analysis to assess the probability of default
Application

Sample: 600,000 non-financial firms representative of 95 per cent of total lending to corporate sector matched with data on firms' banking debt drawn from the Central credit register.

PD = **Probabilities of default** (estimated by means of logit models)

LGD = Loss given default (hypothesis=45%)

Losses = PD*LGD*Amount of loan

Estimated PD for current year were multiplied by 4 in order to reproduce the frequency of defaults of the 1993 recession

Estimated decrease in regulatory capital of 7 %

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