

An analysis of the reform of the
severance payments system in Italy:
its effects on the cost of capital for SMEs
and their access to bank credit

Riccardo Calcagno
Free University Amsterdam

A reason for reforming the TFR system

- In the current situation, the TFR is remunerated at a low rate of return
- firms have the possibility to invest in projects with low NPV, high private benefits, high risk profile

An alternative way of allocating the TFR is to leave the choice of investments to the “market”

- However, it is well known that for SMEs (Berger and Udell):
 - The cost of outside finance is **higher** than the cost of inside finance because of informational problems firm/market
 - SMEs get financment from financial intermediaries (agency problems)

Existing studies on the effect of the reform

- Banca di Roma: data from a sample of SMEs of MedioCreditoCentrale
 - Strong inverse correlation between TFR and total debt (particularly bank debt) especially in more traditional sectors → TFR is a substitute for short-term debt
 - SMEs finance their investments with inside capital (pecking-order holds) and short-term debt: the inside capital is lower in firms with 11-20 employees and in traditional sectors
 - A simulation based on *existing loan rates*, and *1-to-1* substitution of TFR with bank debt

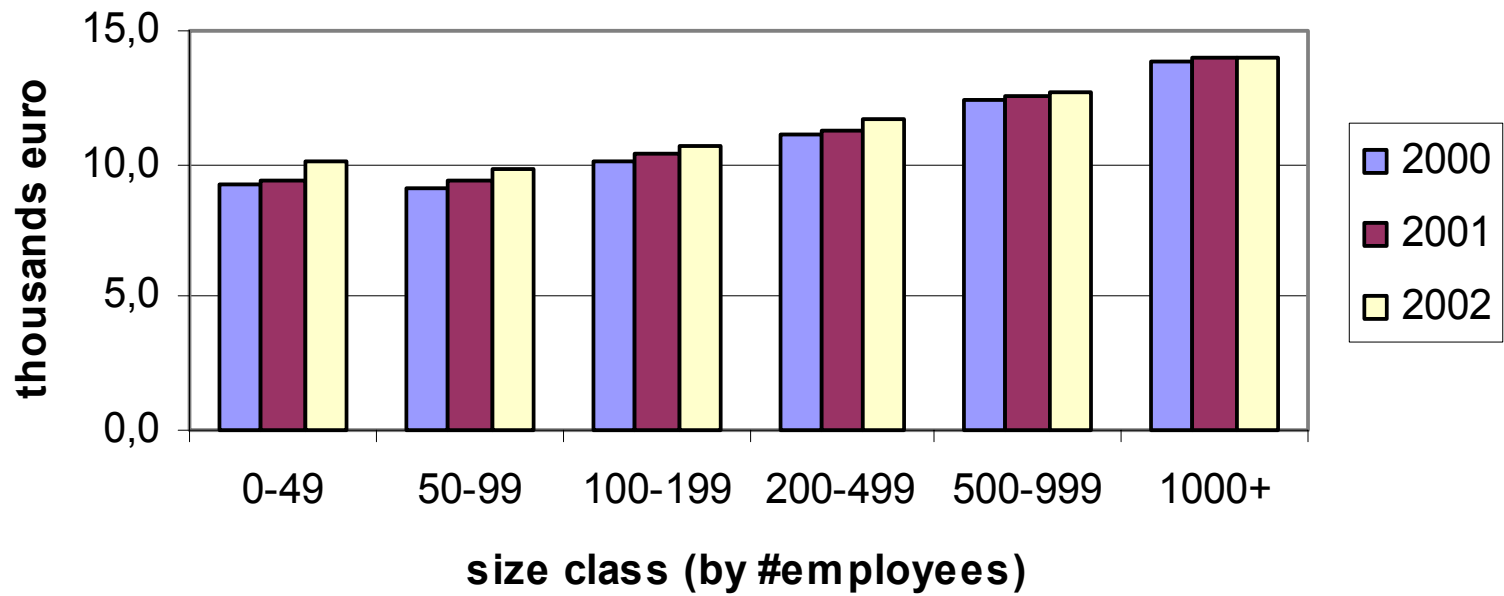
Existing studies on the effect of the reform

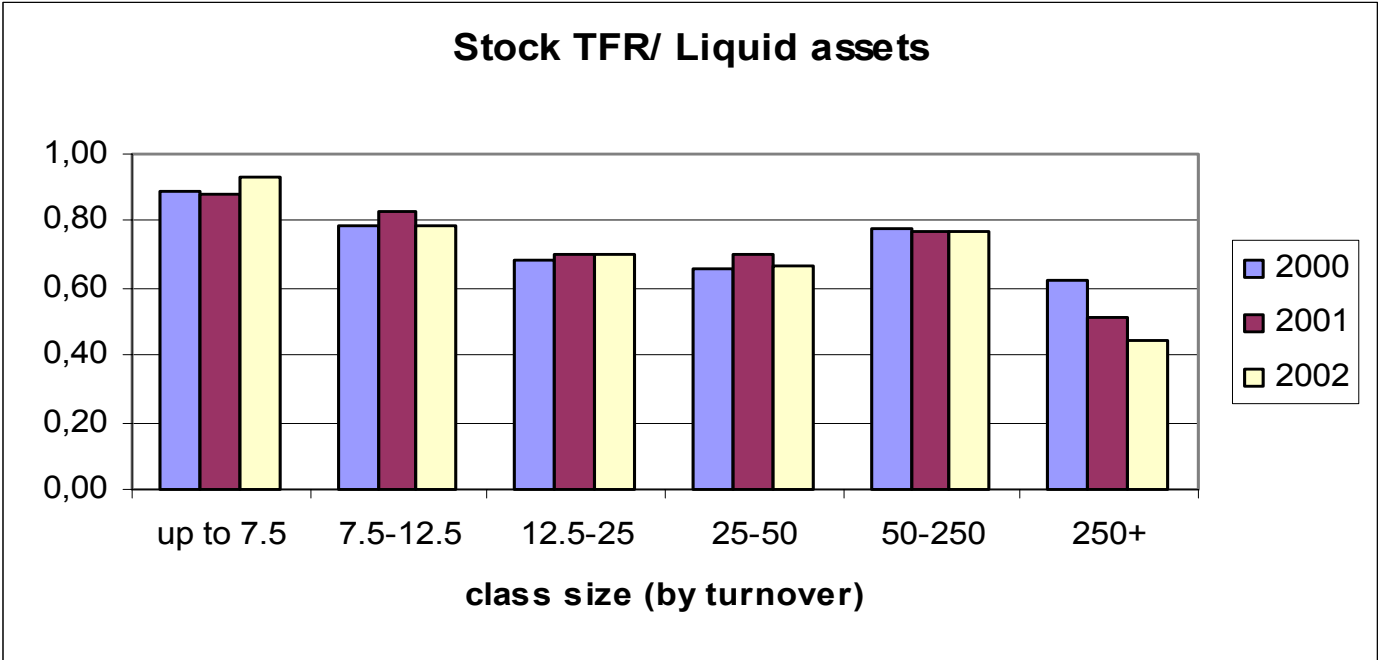
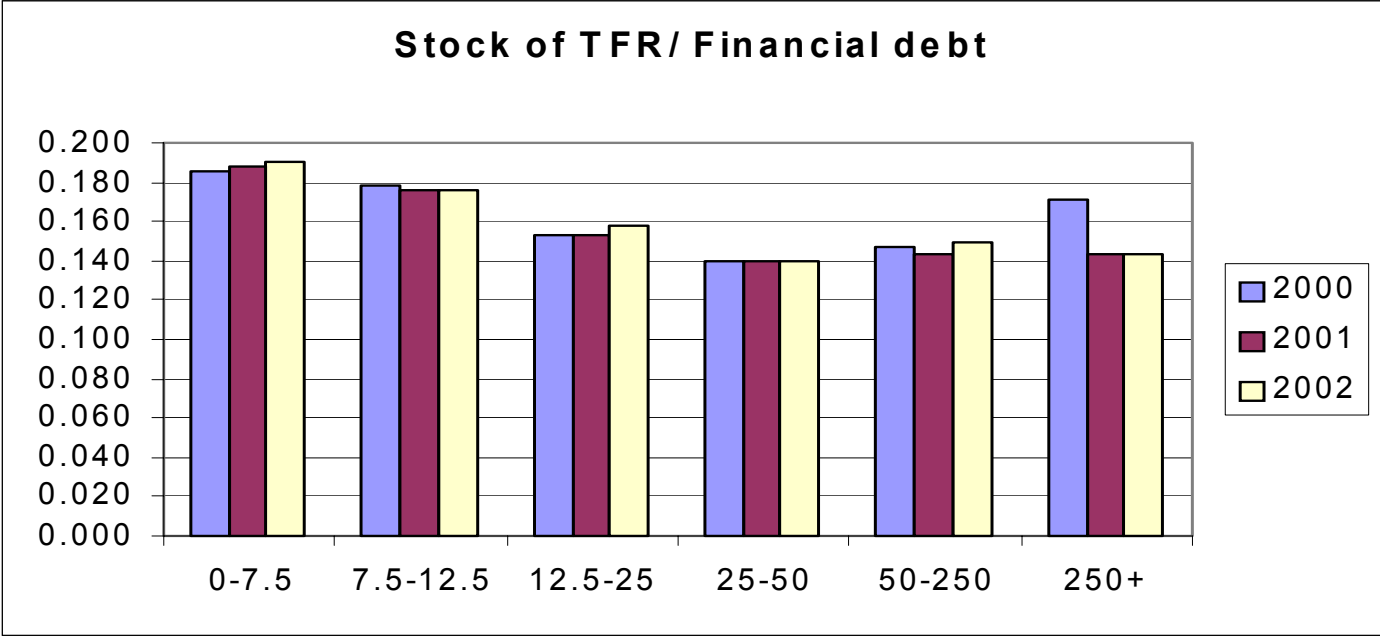
- CERM: the government has introduced some side-payments and guarantees to protect SMEs from perverse effects: are these instruments sufficient?
- Assumptions in these 2 papers:
 - BdR: additional financial costs = (market loan rate 7% - return paid on TFR 3%) = 4%
 - CERM:
 - Quantities are not considered!
 - Subsidized loan rate is linked to Euribor = alternative scenarios on that rate
 - Arbitrary discount rate

The pre-reform situation: a description of the main variables

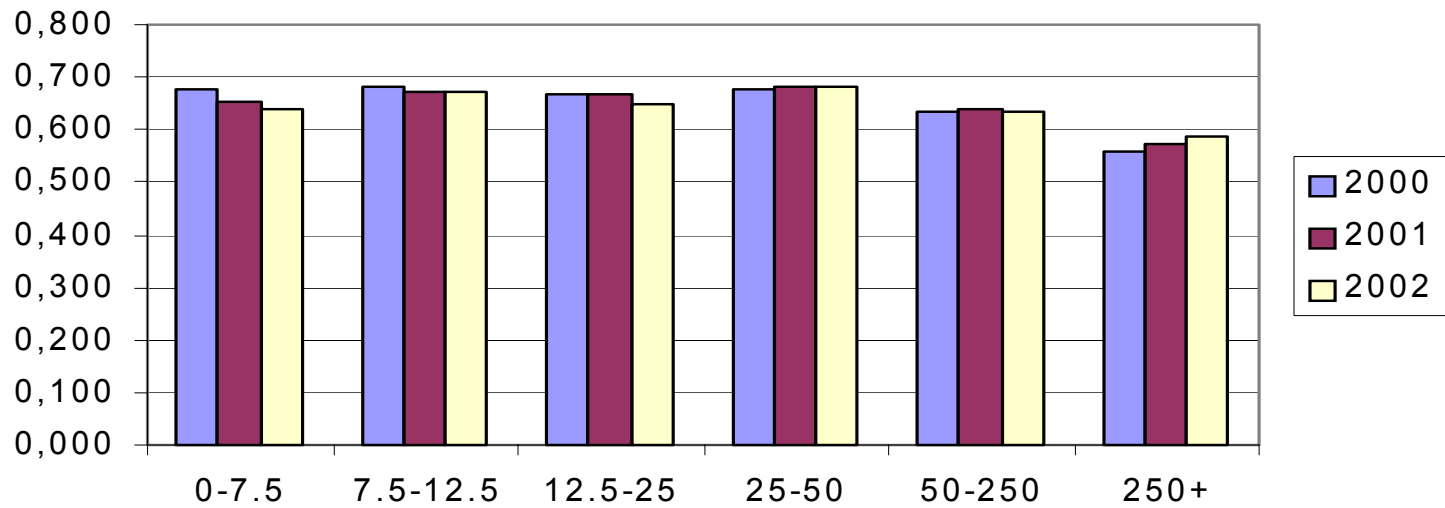
- Which are the main economic entities at play?
 - TFR
 - Capital structure of SMEs
 - Cost of capital for SMEs
 - pecking order theory is reasonable?
 - Cost of debt
 - Short-term
 - Long-term
 - Are Italian SMEs credit constrained (Guiso, Bianco)?

Stock of TFR per employee

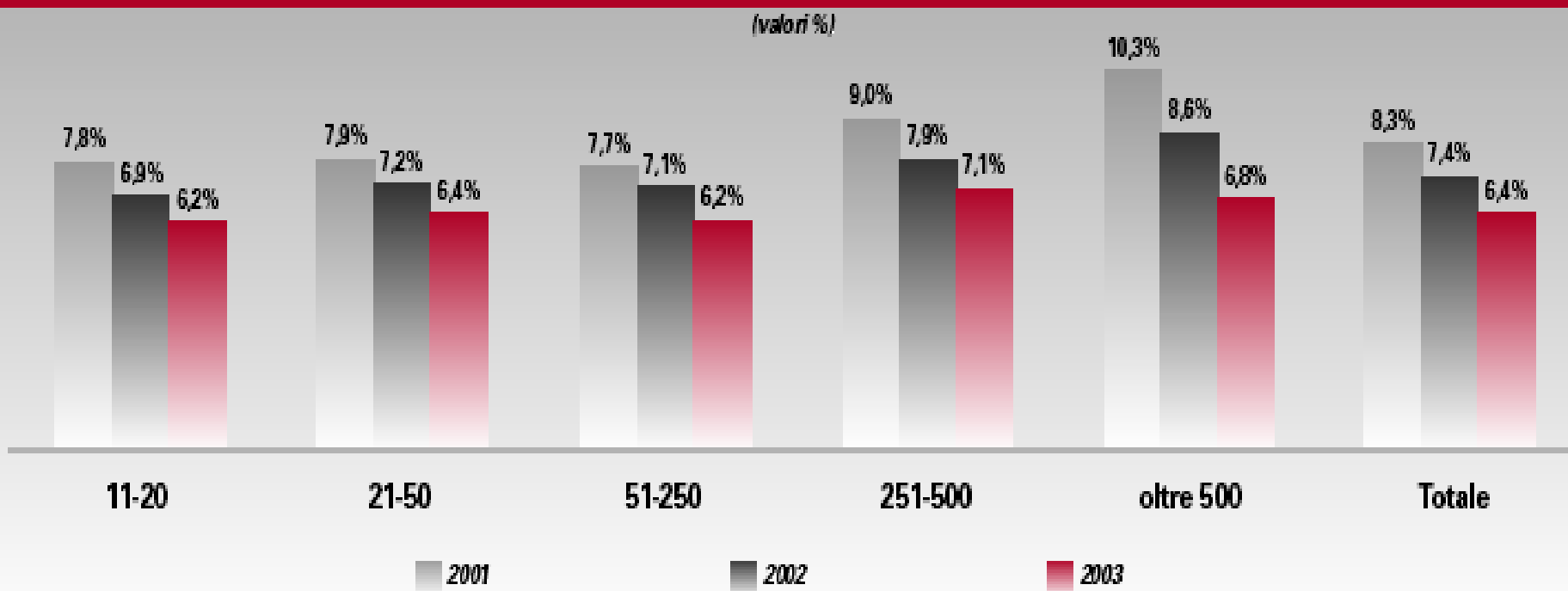




Short term financial debt (% tot financial debt)



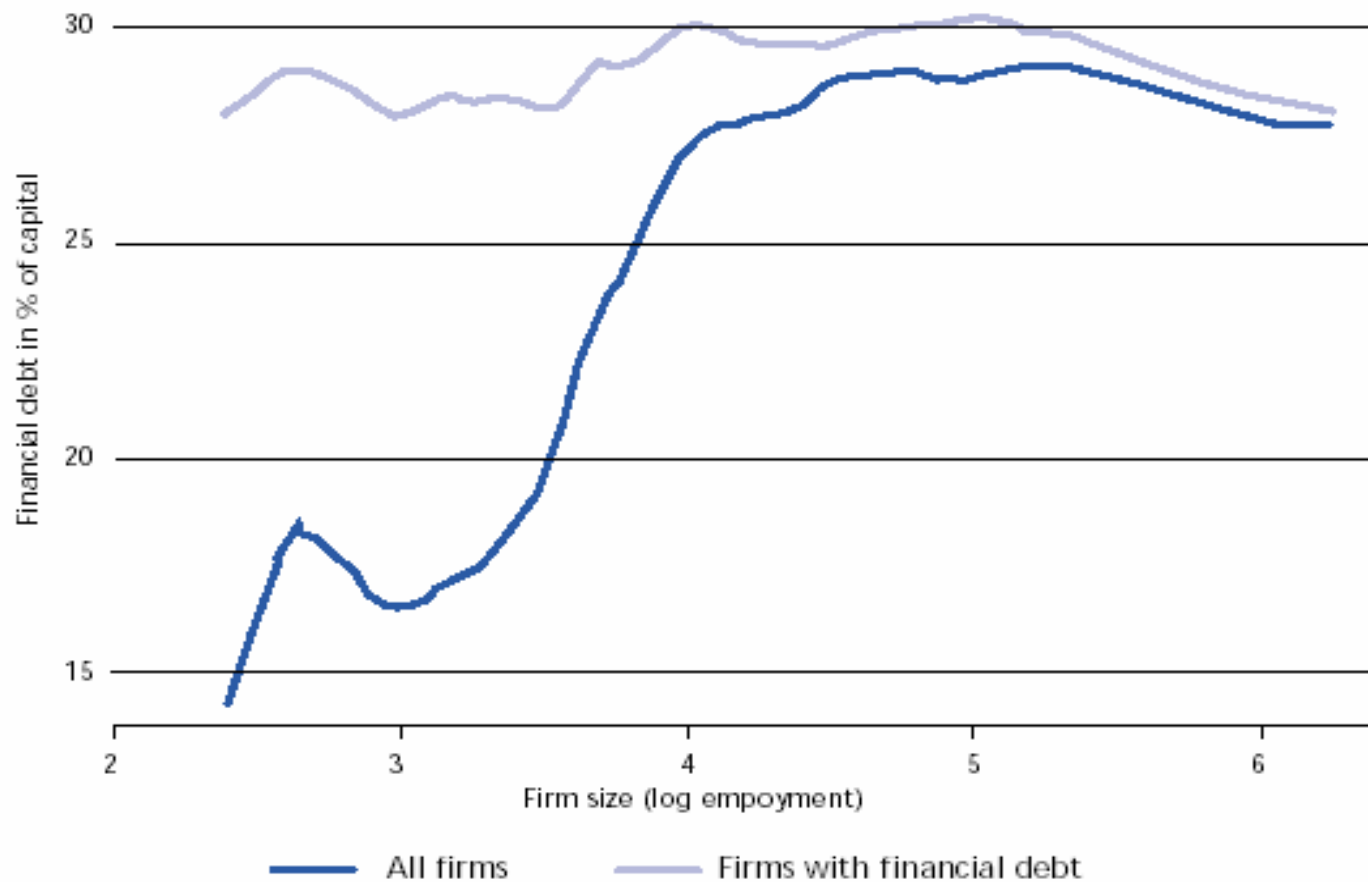
Graf. 44 - Costo dei mezzi di terzi onerosi nelle imprese manifatturiere nel triennio 2001-2003 per classi di addetti



A closer look to the data in the pre-reform situation:

- Guiso: access to bank credit only above a size threshold (in terms of #employees)
- Sapienza: an estimate of the demand/supply of credit:
 - Demand of credit reduces with profitability (internal finance is the cheapest)
 - The supply increases with the size of the firm
- Bianco: in Italy SMEs have *multiple banking relations*, and have almost only *short-term debt* (lines of credit, or stage-financing)

Figure 1. The relation between leverage and firm size



Notes: The relation is estimated non-parametrically using locally weighted smoothing of the dependent variable (leverage) on the explanatory variable (firm size).

Source: Own calculation based on the 1999 Survey of Manufacturing Firms (SMF) of *Mediocredito Centrale*.

Digression: The trade-off for relationship banking

- (Unique) relationship banking:
 - *reduces the information wedge* between firm and main bank (Berger and Udell 1995, Petersen and Rajan 1994),
 - *increases the ex-post rent* the bank can extract from the firm (“hold up” problem, Rajan 1992)
- these effects *increase the access to credit, but also the cost of debt* (Petersen e Rajan 1995 and many other papers on the effects of bank concentration)

The trade-off for relationship banking

- **Italian evidence:** (M. Bianco, P. Sapienza)
 - firms with a leading bank have higher access to credit (their leverage is less sensitive to internal cash) and do not seem to pay higher interests → puzzle...why do Italian SMEs open many banking relations?
 - Hellwig (1991): multiple lenders reduce the “hold up” problem
 - Detragiache et al.: bank liquidity shocks are high or banks are small

Long vs. short-term debt:

- **Long-term debt:**

- **Advantages:**

- it *reduces the risk of inefficient liquidation*
 - it creates room for *implicit contracts* enforced by concerns for reputation of future rents

- **Disadvantages:**

- It gives the opportunity to firms to strategically renegotiate debt and to divert cash flows (when cash-flows are not easily verifiable, Bolton-Scharfstein & Hart-Moore → stage financing);

Long vs. short-term debt (end digression)

- **Evidence:**

- the prevalence of short-term debt for Italian SMEs and the presence of multiple bank relations seems to suggest that :

- either cash-flows can be easily diverted,
- or banks have high bargaining power, so prefer short-term debt they can renegotiate to their advantage
- or the hold-up problem caused by a unique relationship can be particularly severe

What do we learn from the theory about the Italian SMEs

- The dimension of the firm is crucial to have access to credit
- For SMEs the diversion models probably capture important aspects of reality → short-term debt
- BUT: Short-term debt gives banks with high bargaining power the possibility to renegotiate the debt in their advantage (Rajan 1992), since they have the (credible) threat to liquidate
 - multiple bank relations

The direct effect of the reform

- *Less internal capital* to firms, keeping fixed technology and investment opportunities set
- *No direct effect on banks' own capital*, riskiness of its portfolio of loans, capital requirements
- Claim: *The reform is not directly affecting the reasons why SMEs have short-term debt and hold multiple banks relations:*

The direct effect of the reform

- *Less internal capital* to firms:
- First order approximation:
 - Demand shifts up
 - Supply unaffected
 - higher loan rate
- This argument does not consider information problems and the activity of financial intermediaries
- Holmstrom and Tirole (1997): a moral hazard model where the firm capital affects its lending capacity

The basic model on lending capacity

- Adapting HT to the SMEs, without access to public debt
- Two agents: firms, intermediaries
- Firms have initial liquid capital A (that can be invested, or that can be pledged as collateral)
- Assumption: the flow of TFR is in A
- Each firm has a project that costs $I > A$ at $t=1$ and generates a random verifiable financial return $(0, R)$ per euro invested

Moral hazard: projects run by entrepreneurs

- High effort by entr. $\rightarrow pr(R) = p_H$
- Low effort by entr. $\rightarrow pr(R) = p_L < p_H$; private benefits $BI \gg 0$ to entrepreneur
- Assumption:

$$(p_H R - 1)I > 0 > (p_L R - 1 + B)I$$

- Incentive-compatibility determines pledgeable income to the bank

$$R^b = \left(R - \frac{B}{p_H - p_L} \right) I$$

Lending capacity

- The expected income for the bank is:

$$E(R^b)I = p_H \left(R - \frac{B}{\Delta p} \right) I$$

- given the desired rate of return β , the bank supplies capital $I(b)$ up to

$$I^b = \frac{E(R^b)I}{\beta}$$

- So that the firm with initial assets A can invest up to

$$I = \frac{A}{1 - \frac{E(R^b)}{\beta}} > A$$

Equilibrium

- Aggregate supply of intermediated capital is upward sloping: $K_b(\beta)$
- Individual firm demand is decreasing in beta and equal to:

$$I - A = \frac{A}{1 - \frac{E(R^b)}{\beta}} - A = \frac{A}{1 - \frac{E(R^b)}{\beta}} \frac{E(R^b)}{\beta}$$

- Aggregate demand:

$$\frac{K_f}{1 - \frac{E(R^b)}{\beta}} \frac{E(R^b)}{\beta}$$

- hence eq. rate on loans:

$$E(R^b)(K_f + K_b(\beta^*)) = \beta^* K_b(\beta^*)$$

The effect of the reform

- Comparative statics around the old equilibrium when the firm aggregate assets K_f reduce
- Economically:
 - since A reduces, each firm can afford a lower investment $I' < I$; return of the project reduces to RI'
 - The bank reduces its investment since $\beta^* I^b > E(R^b)I'$
 - whenever the supply of bank capital is not perfectly elastic, also the equilibrium loan rate decreases

- Formally:

$$\frac{d\beta}{dK_f} = \frac{E(R^b)}{K_b^* + (\beta^* - E(R^b))K_b'}$$

The effect of the reform

- Reduces the volume of investment (access to credit), but it does not on the increase the loan rate
- Estimated reduction in investment higher than the outflow of TFR! Formally:

$$\frac{dI}{dA} = \frac{1}{1 - \frac{E(R^b)}{\beta^*}} > 1$$

- The reduction of the loan rate depends on the elasticity of banks aggregate supply of loan capital
- (Are compensations put in place by the gvt. appropriate?)

The role of banks

- The previous analysis considers financial intermediaries as passive decisors (supply of capital not modelled)
- Intermediaries monitor borrowers (Diamond 1984)
- The incentives for the bank to monitor depend on her stake in the final cash-flow (e.g. Caminal and Matutes 1997, Chiesa 2001, Carletti et al. 2005)
- Costly monitoring enhance the value of investment projects (Boot and Thakor 2000)
 - Here: increases the probability of success

Bank monitoring

- In HT: monitoring as a substitute for (firm) capital, in the sense that it reduces moral hazard by the entrepreneur
→ less capital = more monitoring?
- But, due to moral hazard caused by the presence of depositors, bank monitoring increases only if her own stake in the project increases

Bank monitoring

- Bank has own capital E and can raised deposits D up to kE , with $k > 1$
- On deposits it pays a rate r_D
- Given its investment in the firm, $I(b)$ the bank chooses its optimal level of (costly) monitoring:

$$\max_m \Pi^b = E \left[\max \left\{ \tilde{R}^b I - r_D D; 0 \right\} \right] - \frac{cI}{2} m^2$$

$$\text{given } \tilde{R}^b = \left\{ \begin{array}{ll} R - \frac{B}{\Delta p} & \text{with prob. } p_H(m) \\ 0 & \text{with prob. } 1 - p_H(m) \end{array} \right\}$$

Bank monitoring

- The bank must break-even:

$$\beta(E + D) = \left(p_H(m)R^b - \frac{c}{2}m^2 \right) I$$

and $I = A + I^b$

- For simplicity, we exclude here any diversification effect (everything is linear in the dimension of the project, I)

→ without moral hazard due to deposits the monitoring level would be independent of I

Bank monitoring

- Maximizing bank profit:

$$\Pi^b = p_H(m)R^b(A + E + D) - (r_D - S)D - \frac{cI}{2}m^2$$

$$S = (1 - p_H(m))r_D$$

$$m^* = \frac{1}{c} \left(\Delta R^b - r_D \frac{D}{I} \right)$$

- Lower $I \rightarrow$ higher $D/I \rightarrow$ higher MH \rightarrow lower monitoring (Caminal e Matutes 1997)
- Lower $E(R(b))$ so even lower $I(b)$!
- ***The “first effect” of before is strenghtened***

Bank monitoring

- The (IR) at aggregate level reads now as

$$K_b^*(\beta) = \frac{\left(p_H(m) R^b - \frac{c}{2} m^2 \right)}{\beta} (K_f + K_b^*(\beta))$$

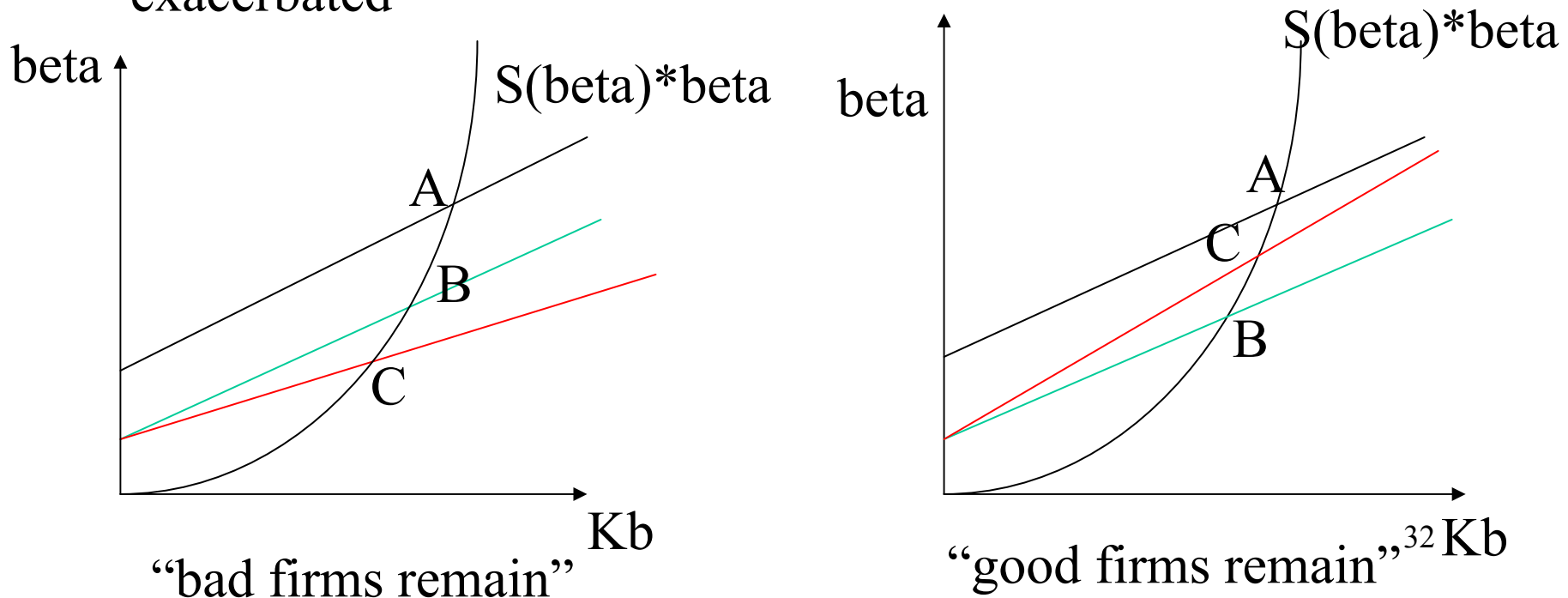
- K_f reduces $\rightarrow I$ reduces
 - but also, through the reduction of m^* \rightarrow the first term on RHS reduces
- \rightarrow the reduction in $I(b)$ (and β) is higher (or equal) than before

Reaction of SMEs to the outflows of TFR

- The main idea: since inside finance is cheaper than outside finance, some firms could substitute the outflow of TFR with “inside equity” (= new funds by the owner, or retained earnings)
- If the “average quality” of firms demanding loans to the bank increases, this countervailing effect would be efficiency-improving

Reaction of SMEs to the outflows of TFR

- The framework of HT can be used to analyze the consequences of the reform in such a case
- However, if the “average quality” decreases, it is exacerbated



Reaction of SMEs to the outflows of TFR

- Which of the 2 cases is more likely?
 - If “good” firms can signal their quality *after* the reform (investing more inside capital) why they did not do this *before*?
- Argument:
 - firms with good projects could signal their quality to the market not investing all their liquid assets (costly signal), while bad firms do this
 - But then, the outflow of TFR affect 1-to-1 the bad firms and less the good firms
 - the average quality of firms demanding loans would decrease...

The impact of the reform on overall efficiency

- Up to now, we have pointed out two effects of the reform:
 - The lower aggregate volume of firm's liquid assets, K_f , reduces the aggregate investment by SMEs (first effect)
 - There is a (adverse / positive) selection among the firms that still get financemement
- We can formally determine the amount of the first effect:

$$\text{loss in investment} = \frac{dI}{dA} = \frac{1}{1 - \frac{p_H}{\beta} \left(R - \frac{B}{\Delta p} \right)} dA > dA$$

$$\text{aggregated} : \frac{1}{1 - \frac{p_H}{\beta} \left(R - \frac{B}{\Delta p} \right)} dK_f = d(I_{agg}) > dK_f$$

$$\text{loss in created value} = (p_H R - 1) d(I_{agg})$$

The impact of the reform on overall efficiency

- Efficiency gains:

- 1) the average quality of loan demanders increase:

Need of a signalling model in which good firms find profitable to signal their quality *only after* the reform (and not before)

- 2) the bank capital not invested in SMEs after the reform is instead invested in more productive projects

Predictions

- In presence of MH the outflow of TFR *reduce their aggregate investment of SMEs (macroeconomic effect)*
- *We do not anticipate an increase in the loan rate, (contrarily to traditional models of banking without information problems); however, credit rationing can increase (SME lending decreases)*
- The reduction in the credit supply is likely to be *higher* than the outflow of TFR
- Bank monitoring activity is *not going to increase*, if nothing else changes (*bigger banks? more competition from foreign banks?*)

Predictions

- Gains in efficiency are possible if:
 - 1) banks have alternative investment opportunities (outside SMEs) with rate of return *higher* than the future return on SMEs projects, but *lower* than the return they nowadays make on SMEs investments
 - 2) the monitoring activity of banks changes (through shocks on the bank industry)
 - 3) the (average) quality of SMEs demanding loans increases after the reform

Empirical analysis

(Potential joint with Dr. Roman Kräussl, Free University Amsterdam)

- Objectives:
 - 1) Quantify the reduction of investment by SMEs / reduced access to credit
 - Impact on SME lending
 - Impact on the Italian macroeconomy
 - 2) Predicting the effect of the regulatory changes for the (average) Italian commercial bank

Methodology: Calibration and Simulation

Calibration:

- Analyzing the effects of previous external shocks on the Italian banks, in particular on SMEs
 - How did the (average) Italian bank reacted so far to external shocks like
 - Argentina default 2001 (Italian bondholders)
 - Basel II regulation
 - European recession
- Simulation:
 - the external shock would be the regulation change

Data

- **Necessary:**
 - Bank's lending positions, over longest period possible
 - How much credit goes to which SME? (min. monthly basis)
 - Industry, Company Size, Region, Length of credit, Size of credit
 - Positions in bank's other investments: international equities, bonds, derivatives...
- **Basic question:** where do they cut first when external shock pops up
- Where do they cut during recession, where do they offer more during expansion
- We do not need borrower names!!

Empirical Results

- Clear-cut scenario analysis of impact of regulatory changes for Italy
- Impact of regulatory change on SMEs investing and financing
- Impact on SMEs bankruptcy (default rates)
- Impact on banks international (European) position
- SME effects:
 - Industry effects: Which industry is in most trouble
 - Size effects: Does it depend on the size of the company
 - Does it depend on the length of the bank-customer relationship
 - Regional effects
 - Contagion: Potential spillover effects from one industry to the other and its impact on default rates

Relevant Literature

- Estrella (2004): “The Cyclical Behavior of Optimal Bank Capital”
- Jacobson, Linde and Roszbach (2005): “Credit Risk versus Capital Requirements under Basel II – Are SME Loans and Retail Credit Really Different?”
- Koopman, Kräussl, Lucas and Monteiro (2006): “Credit Cycles and Macro Fundamentals”
- Kräussl (2003): “A Critique on the Proposed Use of External Sovereign Credit Ratings in Basel II”

Le garanzie dello stato

- Nel Dl n. 203, 25/IX/2005, il governo offre alle imprese:
 - Protocollo di intesa con l'ABI con tetto al tasso di interesse massimo: Euribor a 6 mesi + 2%
 - Un fondo di garanzia per le imprese che debbano sostituire il TFR con debiti bancari: 154 mln. nel 2006; una copertura del 100% verso le banche sui rischi dei nuovi crediti così erogati
 - Deduzioni dal reddito di impresa e riduzione dei versamenti a carico del datore di lavoro nel fondo di garanzia

Critiche (Tito Boeri):

- UE: aiuto di stato?
- Le banche non fanno + monitoring / screening (il ruolo del mercato si perde...)