

The New Basel Capital Accord and its Impact on Small and Medium-sized Companies

The Basel Committee on Banking Supervision has presented its proposals for the New Basel Capital Accord (Basel II) in three Consultative Papers. The third Consultative Paper has just appeared in May 2003. The Committee plans to publish the final version of the new regulations in autumn 2003, while implementation is planned for the end of 2006. The basic thrust of Basel II is to increase the dependency of banks' minimum capital requirements (regulatory capital) on the risk profiles of the loans they have extended. Generally, the new regulations only concern internationally active banks, but all German banks will be obliged to apply them as they are implemented into national law in virtually unchanged form on the basis of corresponding EU directives which extend them to all credit institutions.

The impending introduction of the new minimum capital standards has sparked off a heated debate in Germany about their consequences. The discussion focuses in particular on the potential effects of capital regulations that depend on the creditworthiness of the borrower on financing conditions for small and medium-sized enterprises (SMEs). This focus is not surprising given that 99.7% of German companies are SMEs. After internal financing, bank loans are the second-most important source of financing for SMEs.¹ There are widespread fears that Basel II will increase the cost of borrowing for SMEs or even reduce the supply of credit to this sector. This development, the argument goes, would seriously damage the German economy. But these fears are not justified. A general increase in lending rates is unlikely, and there will probably be no reduction in the supply of loans to SMEs. The German economy would not suffer even if Basel II forced banks to increase the capital requirement for the SME sector as a whole. Larger equity cushions in the banking sector – insofar as they are required for the stability of the banking system – enhance investor protection (protection of

¹ Institut für Mittelstandsforschung (IfM): 'Mittelstand – Definition und Schlüsselzahlen.' Bonn 2002 (<http://www.ifm-bonn.org/>); Kreditanstalt für Wiederaufbau (KfW): 'Unternehmensfinanzierung in schwierigem Fahrwasser: Wachsende Finanzierungsprobleme im Mittelstand. Ergebnisse der Unternehmensbefragung 2002.' Frankfurt/Main 2002 (<http://www.kfw.de/DE/Research/Sonderthem68/Unternehme.jsp>).

savings deposits). This benefits rather than damages a national economy.

The Basel capital adequacy framework

According to the current capital regulations under Basel I, the ratio of a bank's qualifying capital to its risk-weighted assets (made up of credit risks and market risks) must not fall below 8% on any given day. This principle is to be maintained. However, Basel II changes the method of calculation for risk-weighted assets and also introduces measures for operational risks.² Because the concern about financing for SMEs arose as a result of the new method of calculation for exposures, the following analysis focuses on banking book exposures and in particular on the new approach to calculating credit exposures. Up to now, borrowers have been classified in different creditworthiness classes with prescribed weighting factors (government: 0; banks: 0.2; private non-banks: 1). This means, in accordance with the following formula, that today's enterprise loans must be backed by at least 8% capital irrespective of the individual risk.

$$\text{book value} \times \text{weighting factor} \times \text{solvency coefficient} \\ = \text{capital requirement}$$

$$\text{euro 1 million} \times 1 \times 0.08 = \text{euro 80 000}$$

Banks that do not carry out ratings (classification of exposures in different risk categories), thus, tend to cross-subsidise loans in two ways. 'Bad' risks are subject to only average risk premiums, while the 'good' risks also subsidise the bad risks in relation to the capital cost component. For banks that have already implemented adequate rating procedures, cross-subsidisation is limited to the capital requirement.³

The Basel Committee's declared aim is to allocate an individual risk weight – derived directly from a rating – to each and every loan. The Committee has proposed two different procedures to this end: the Standardised Approach and the Internal Ratings-based Approach. Banks that choose the internal ratings-based approach (IRB approach) can opt for either the IRB foundation approach or the IRB advanced approach. The basic dif-

² Operational risks are risks created by the lending institution itself, for example human error or malfunctions in a bank's computer system.

³ The generally demanded minimum requirement of 8% leads to capital costs which are not risk-sensitive. This cost-based cross-subsidisation also arises when the bank uses a rating system to calculate the risk premium for each individual loan.

Table 1
**Standardised Approach:
 Credit Assessment and Risk Weight**

Rating categories (Standard & Pooers)	Probability of default (%)	Weighting factor (RW)
AAA to AA-	up to 0.04%	0.20
A+ to A-	up to 0.11%	0.50
BBB+ to BB-	up to 1.95%	1.00
below BB-		1.50
Unrated		1.00
Past due loans		1 to 1.50

Source: Basel Committee on Banking Supervision: The New Basel Capital Accord, Third Consultative Paper, Basel 2003, pp. 10-13.

ference between the latter two procedures is that in the advanced approach, certain variables, e.g. the remaining maturity, are not standardised, but rather must be estimated by the bank. According to a survey carried out within the German Savings Bank Financial Group, around 15% of banks plan to use the standardised approach, while 62% will opt for the IRB foundation approach. Only around 2% of banks plan to use the IRB advanced approach.⁴ Ernst & Young also recently predicted that the large majority of banks will decide in favour of the IRB foundation approach.⁵

Standardised approach

The standardised approach provides for a rating by an external credit assessment institution which is recognised by the bank's national supervisory authority. Basel II then defines a binding risk weight (RW) on the basis of the external rating. The standardised approach is described in table 1.⁶ The basic principle is that loans to enterprises with a low credit rating must be backed by higher equity, while borrowers with a high rating enjoy a lower capital requirement. Loans to unrated enterprises are allocated a risk weight of 1 (100%). Thus, for the present the status quo is maintained for this group.⁷

⁴ M. Theis: 'Umfrage innerhalb der Sparkassen-Finanzgruppe über den aktuellen Stand und die Planungen im Bereich Kreditrisikomanagement.' Munich 2002 (<http://download.kmf.bwl.uni-muenchen.de/praxis-kontakte/kreditrisikomanagementstudie.pdf>), p. 12.

⁵ Ernst & Young, Finance and Hypovereinsbank: 'Basel II ist jetzt! Deutschlands große Bankenbefragung: Wie ist der Stand der Vorbereitungen?' Frankfurt/Main 2002 (http://ey.com/Global/content.nsf/Germany/Basel_II).

⁶ The rating grades follow the notation used by Standard & Pooers.

Internal ratings-based approach

In the IRB approach, the bank determines the rating of the loan. All the required variables for determining the weighting factor RW are derived from an internal rating system. The assessment of a borrower is fundamentally based on subjective and objective factors. The main objective components are ratios derived from the balance sheet (profit-turnover ratio, capital ratio, debt-to-equity ratio, liquidity ratio, etc.) and sectoral data. The 'subjective' category includes factors such as the implementation of strategic goals, the quality of management, the regulations on succession and the enterprise's capacity for innovation. The quality attributed to an enterprise as regards the subjective factors depends not least on its relationship with its house bank. An analysis of the rating systems used by five German commercial banks suggests that subjective factors have a decisive influence on the rating of the borrower.⁸ In addition, the assessment of individual subjective factors turned out to be more positive on average than the assessment of objective factors. Subjective factors will remain a component of internal rating systems even after the implementation of Basel II. Thus, the quality of the communication between house bank and enterprise will have an even greater influence on loan decisions than up to now. In the long term, however, the significance of the subjective factors primarily depends on whether the banks' assessments are confirmed. Figure 1 depicts the functioning of a rating system.

The rating matrix gives the ratio R as the sum of the weighted subjective and objective component ratings R_1 and R_2 . The component ratings, in turn, are composed of the weighted ratios R_{ij} . Given a 30/70 weighting of subjective and objective factors,⁹ the calculation model for the rating ratio would be:

$$R = \sum_{i=1}^2 k_i \sum_{j=1}^n k_{ij} R_{ij} = 0.3 \times (k_{11} \times R_{11} + \dots + k_{1n} \times R_{1n}) + 0.7 \times (k_{21} \times R_{21} + \dots + k_{2n} \times R_{2n}).$$

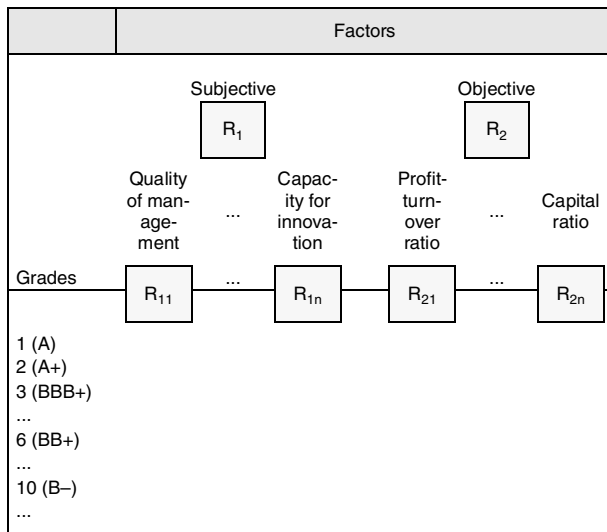
The expected probability of default (PD) is thus a function of the rating ratio R. The mapping procedures PD(R) has not yet been finalised, but it is certain that at

⁷ Should it emerge that banks using the standardised approach have a higher concentration of bad risks, then this type of bank would probably have higher refinancing costs. In this case, the status quo will probably only be maintained in the short term.

⁸ A. Brunner, J. P. Krahen and M. Weber: 'Information Production in Credit Relationships: On the Role of Internal Ratings in Commercial Banking.' *Working Paper*, no. 10, Center for Financial Studies. Frankfurt/Main 2000.

⁹ $k_1 = 0.3$ and $k_2 = 0.7$. Thus, the individual subjective components are weighted with k_{1j} , while the objective factors are weighted with k_{2j} .

Figure 1
Rating Matrix for Classifying Exposures



Source: DIW Berlin.

least eight rating grades will be required, at least one of which is for defaulted loans.¹⁰ Moreover, the rating model applied by the bank, including the procedures for determining the weighting factors k_{ij} , must be certified by the supervisory authorities.¹¹ Certification is awarded on condition that the rating model is not only used to calculate the minimum capital requirement, but also for risk management and loan pricing.

Risk weight and minimum capital requirement

Once the PD has been determined, the minimum capital requirement is calculated as the product of the expected exposure at default (EAD), the risk weight (RW) and the solvency coefficient (8%):

$$K = EAD \times RW (LGD, PD, M) \times 8\%.$$

The risk weight consists of the loss expected given default (LGD), the estimated probability of default (PD) and the effective maturity of the loan (M). In principle, all three variables are positively associated with the risk weight. However, because the large majority of banks initially plan to use the IRB foundation approach, the

risk weight for enterprise loans in a particular segment will actually only be determined by the expected probability of default. In the foundation approach, effective maturity and loss in the event of default are prescribed by the Committee.

In addition to probability of default, the financing segment to which a borrower belongs is also decisive for the minimum capital requirement. The relevant segments for SMEs are the enterprise, the private or retail, and the equity segment.

Credit protection

Collateral may only be used to a limited extent to reduce the risk weight. On the one hand, prescribed deductions (haircuts) reduce the secured portion of the loan. On the other, the secured portion must also be backed by a minimum capital ratio. The system of calculation implies that capital would be double-counted if the client's rating were also influenced by the amount of collateral. The degree of credit protection thus may not play any role in the rating of a bank's client.

Consequences for SMEs

The debate about the effects of Basel II on SMEs is based on two main theories:

- Basel II will lead to an overall increase in the cost of borrowing for SMEs.
- Basel II will jeopardise the supply of credit to SMEs in general.

Both effects, the argument goes, would have a negative impact on growth and employment, and thus Basel II would seriously damage the German economy. Before assessing the validity of these theories, it is useful to first acquaint oneself with the main characteristics of the SME sector:¹²

- 89.5% of SMEs have a maximum of nine employees and an annual turnover of less than euro 1 million.
- 87% are owner-managed.
- The average capital ratio is less than 25%.¹³
- The typical collateral for SMEs is either internal assets (machinery, stocks, receivables) or chattel mortgages on life assurance policies and home savings agreements.

¹⁰ German Bundesbank: "The new 'minimum requirements for the credit business of credit institutions' and Basel II." *Monthly report*, January 2003, p. 51.

¹¹ *Ibid.*, p. 50.

¹² F. Wallau: 'Finanzierung des Mittelstandes. Institut für Mittelstandsforschung (IfM), Bonn 2002; G. Kayser: 'Basel II - Mittelstand vor neuen Herausforderungen.' Institut für Mittelstandsforschung (IfM), Bonn 2001 (<http://www.ifm-bonn.org/>).

- SMEs generally take on long-term loans.
- Very few SMEs have an external rating.¹⁴
- The insolvency rate for SMEs was 1% in 2001.¹⁵

Small, owner-managed enterprises with little liable equity capital represent a higher statistical risk and, thus, tend to receive a lower rating than large enterprises with high equity capital. For a long time, the Basel Committee did not consider SMEs' typical collateral to be risk-mitigating. In addition, long-term loans are considered riskier than short-term loans. In the light of the first two Consultative Papers (1999, 2001), these factors did indeed constitute a serious problem for German SMEs. However, their impact has been considerably weakened by the Committee's resolutions of July 2002.¹⁶ These resolutions are also part of the new consultative paper that has appeared in May 2003.

Concessions to the SME sector

The adjustments made by the Basel Committee that have a specific impact on SMEs are characterised by two main elements. First, the menu of risk-weight functions was extended by a special function for corporate exposures to SME borrowers where the aggregate amount of loans is higher than euro 1 million and the annual sales are less than euro 50 million.¹⁷ Second, the eligibility criteria for classification in the private/retail segment have been made much less stringent. All enterprise loans under euro 1 million are now classified in this segment as long as they are given a standardised loan and lending treatment.¹⁸ Classification in the retail segment also has the advantage that the rating procedure is less complicated. Instead of an individual rating, multiple rating pools can be formed. Only the collateral

and the delinquency status of the individual borrower are verified. These loans are also exempted from the obligatory annual update required in the case of full-scale rating.¹⁹

Figure 2 shows the current IRB risk-weight functions based on the probability of default. The horizontal line at weighting factor 1 represents the status quo. The risk-weight functions for retail exposures (private clients) and SME loans (SMEs) are clearly lower than the risk-weight functions for enterprise loans (large exposures), and especially for equity exposures (equity).²⁰ The lower limit for equity exposures is a weighting factor of 2 and thus a 16% capital requirement.²¹

The new SME function (annual sales less than euro 5 million) achieves the status quo at a default probability of 2%. Loans in this risk category are considered to be speculative and to carry interest-rate and redemption risks. Retail loans must be backed by higher equity capital than to date only from a default probability of 7.2% upwards (low credit rating, relatively high risk of default).²²

The instruments for risk mitigation also contain elements that specifically concern SMEs. The typical collateral held by SMEs is now recognised as risk-mitigating, but only on condition that the ratio of the value of the collateral to the value of the loan does not fall below 30% (0% for receivables). The secured part of the loan is then calculated on the basis of a minimal degree of over-collateralisation, which varies according to the type of collateral. This amounts to 125% for receivables and to 140% for real estate and other collateral. The ratio of actual collateral to the required degree of over-collateralisation is the secured portion of the loan. Table 2 shows the portions of a fully secured loan that are considered secured and unsecured depending on the type of collateral. The specific LGDs are prescribed by the Basel Committee. Different LGDs for the secured and unsecured parts of the loan imply different risk-weight functions RW (LGD, PD, M) and thus a different capital requirement for the secured and the unsecured parts of the loan.

¹³ M. Scheuer: 'Ertrags- und Finanzierungsverhältnisse kleiner und mittlerer Unternehmen in West- und Ostdeutschland.' In: *KfW-Beiträge zur Mittelstands- und Strukturpolitik*, no. 23/2001, p. 9. The German Savings Bank Financial Group estimates the median of the capital ratio at less than 6%. Cf. Sparkassen- und Giroverband: 'Diagnose Mittelstand: Reformen jetzt!' Berlin 2002, p. 12.

¹⁴ Apart from the banking sector, only around 30 enterprises in Germany have an external rating. Cf. H. Krämer-Eis: 'Rating, Basel II und die Finanzierungskosten von KMU.' In: *KfW-Beiträge zur Mittelstands- und Strukturpolitik*, no. 16/2002, p. 22.

¹⁵ Mittelstand – Definition und Schlüsselzahlen, loc. cit.

¹⁶ Basel Committee reaches agreement on New Capital Accord issues. Basel Committee press release, 10 July 2002.

¹⁷ Basel Committee on Banking Supervision: The New Basel Accord, Third Consultative Paper. Basel 2003, p. 50.

¹⁸ However, banks must provide their own estimates of PD, LDG and EAD, since there is no distinction between a foundation and advanced approach for this asset class. Cf. Basel Committee on Banking Supervision, loc. cit., p. 47.

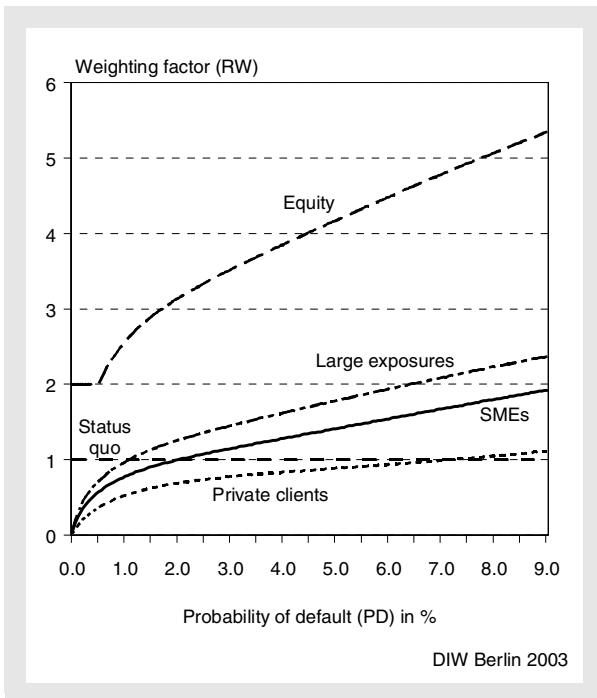
¹⁹ The standardised approach also provides exemptions for loans classified in the retail segment, where the weighting factor is reduced from 1 to 0.75.

²⁰ Cf. Basel Committee on Banking Supervision, loc. cit., pp. 60-61, p. 50 and pp. 62-65.

²¹ Certain long-term investments are allocated a minimum risk weight of 1 (8%). Cf. Basel Committee on Banking Supervision, loc. cit., pp. 63-64.

²² In the rating terminology used by Standard & Poors, an expected default probability of 7.2% is between grades B (7%) and B- (13%).

Figure 2
**Risk Weights for Enterprise Loans
 and Equity Exposures**



Source: DIW Berlin calculations.

General increase in cost of borrowing unlikely

The adjustments introduced in July 2002 are extremely important as regards the first theory, i.e. that Basel II will lead to an increase in the cost of borrowing. The size structure of SMEs in Germany suggests that most SME loans can be classified as private/retail exposures. If the 2001 insolvency rate of 1% is taken as a rough indicator of the average probability of default, then presumably only very few SME loans will have a default probability in excess of 7.2%. Thus, most future loans will be burdened with lower equity capital costs than today. This conclusion is supported by an analysis carried out by the German Development Bank: the Bank's SME portfolio contained only a minimal number of loans with a credit rating below B+ (default probability of 3.2%).²³

The status quo-default probability for borrowers with annual sales between euro 5 million and euro 50 million is between 2% (5 million) and 1.07% (50 million). There is as yet no empirical answer to the question of

how many borrowers of this size category have a default probability that exceeds their status quo-default probability. However, since the statistical probability of default decreases as the size of the enterprise increases, an average increase in the capital requirement is also unlikely in this size category.

All are agreed that the capital requirement will increase for marginal segments. SME loans with an extremely weak credit rating and those that are either too large for classification in the private/retail segment or are largely unsecured will require more equity capital than to date. However, even for this category it is difficult to estimate to what extent this will result in an increase in borrowing costs. On the one hand, the possibility to pass on increased capital costs suggests that the margins will not change from the situation under Basel I. However, it will be less the bank itself than the competitive situation that will decide to what extent this can occur. On the other hand, there is always the possibility that loans will open the door to other profitable transactions with the enterprise in question (e.g. administration of assets for the management, management of interest and exchange risks). In such cases, it can be more profitable for the bank to refrain from passing on increased capital costs in full. The Ernst & Young study confirms such considerations. The banks surveyed plan to continue avoiding passing on costs in full if they are adequately compensated by other transactions.²⁴

The segment in which there will undoubtedly be a higher capital requirement and thus higher financing costs is that of equity investments. Given a capital requirement of at least 16%, banks and their venture capital subsidiaries will do little to narrow the equity capital gap in the SME sector.

Reduced credit supply equally unlikely

A reduction in lending to SMEs can originate either on the demand or the supply side. A decline in demand would be likely if loans to SMEs became more expensive overall,²⁵ but it has been shown above that the Basel proposals on capital requirements are unlikely to lead to an increase in borrowing costs. A supply-side reduction would be possible if three conditions were fulfilled:

- Regulatory capital is scarce; in other words, the banks are operating close to the limit prescribed by the supervisory authority.

²⁴ Ernst & Young: 'Finance und Hypovereinsbank', loc. cit.

²⁵ However, a reduction in demand for this reason is not inevitable, for the quantity response depends on the price elasticity of demand in the various credit-rating segments.

²³ G. Taistra: 'Basel II - aktueller Stand und Auswirkung auf die Mittelstandsfinanzierung.' *KfW Arbeitspapier*. Frankfurt/Main 2003, p. 17.

- Basel II leads to an increase in the capital requirement for a bank's entire SME loan portfolio.
- The bank has more profitable alternatives, e.g. loans to large enterprises or investment banking activities.

The scarce regulatory capital hypothesis is based on dubious considerations. According to a study carried out by the German Bundesbank, numerous banks were well above the required minimum threshold of 8% in 2000. The regulatory capital quota amounted to an average of 13% for large banks, 12.9% for regional banks and no less than 10.7% for savings banks.²⁶ However, the gap between prescribed and actual capital has probably narrowed in the meantime owing to the sustained weak earnings situation in German banks.

Overall, there is currently nothing to suggest that the capital requirement for SME loan portfolios is rising. But even if this were the case, a reduction in credit supply could not be blamed directly on such a development. Capital costs are opportunity costs. Given that equity capital must be kept on hand for investment activities (banking book) and trading activities (trading book), the opportunity costs for SME loans where capital is available are measured according to the lost earnings from securities transactions or from loans to large enterprises. If the banks can earn higher profits from such alternative uses than from SME loans, then a supply-side reduction in lending can be expected. However, it is difficult to achieve higher profits in securities trading and in the highly competitive large loans segment. If the margins are low enough (low opportunity costs), then additional capital will be freed up which could be used to back SME loans.

Benefits to the German economy

The declared aim of Basel II is to differentiate between good and bad risks and to distribute risk costs according to the quality of the respective risks. If this approach really forces SME banks to keep more capital on hand than in the past, then the increase would indicate that there has been inadequate protection against unexpected default risks to date. An expansion of the equity cushion strengthens the stability of the banking system and increases investor protection, both of which are more beneficial than harmful to a national economy. However, it cannot be denied that the goals of a stable banking system and sufficient financing for SMEs may clash, at least in the short term.²⁷ Because of the extreme

²⁶ German Bundesbank: 'Credit institutions' capital viewed from a business and a regulatory perspective.' *Monthly report*, January 2002, p. 48.

Table 2

Risk Mitigation through Non-financial Collateral

in %

	Portion: secured	Portion: unsecured	LGD: secured	LGD: unsecured
Receivables	0.80	0.20	0.35	0.45
Real estate	0.71	0.29	0.35	0.45
Other collateral	0.71	0.29	0.40	0.45

Sources: Basel committee on Banking Supervision, loc. cit., pp. 53-54; DIW Berlin calculations.

importance of a stable banking system for the economy, a conflict of goals of this kind certainly cannot be resolved by subordinating the goal of stability to that of financing. One way to avoid the conflict might be to consider expanding the programmes that promote better creditworthiness. However, this solution would also lead to opportunity costs, whose economic effects would have to be assessed.

Until recently, the discussion about the impact of Basel II on SME financing was held largely under the assumption of the worst-case scenario. Following the adjustments agreed in 2002 it is unlikely that such a scenario will ever become reality. In addition, one of the basic assumptions in the discussion is that the SME sector is not capable of responding with adjustments of its own. In fact, Basel II could also act as a kind of mandatory cure that compels SMEs to adopt risk-mitigating measures in their own interests and to thus improve their ratings. There is a widespread belief that banks are already extending loans in line with the new capital adequacy framework. If one follows this argument, then the German Bundesbank's view that the most recent reduction in net lending is mainly cyclically determined is a further indication that Basel II will not lead to any dramatic changes in SMEs' access to loans.²⁸

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²⁷ The German government is pursuing the macroeconomic goal of 'Securing Financing for SMEs'. Cf. Ministry of Economics and Labour press release of 15.1.2003.

²⁸ German Bundesbank: 'The development of bank lending to the private sector.' *Monthly report*, October 2002, p. 40.