Cyclicality of SME finance

Literature survey, data analysis and econometric analysis

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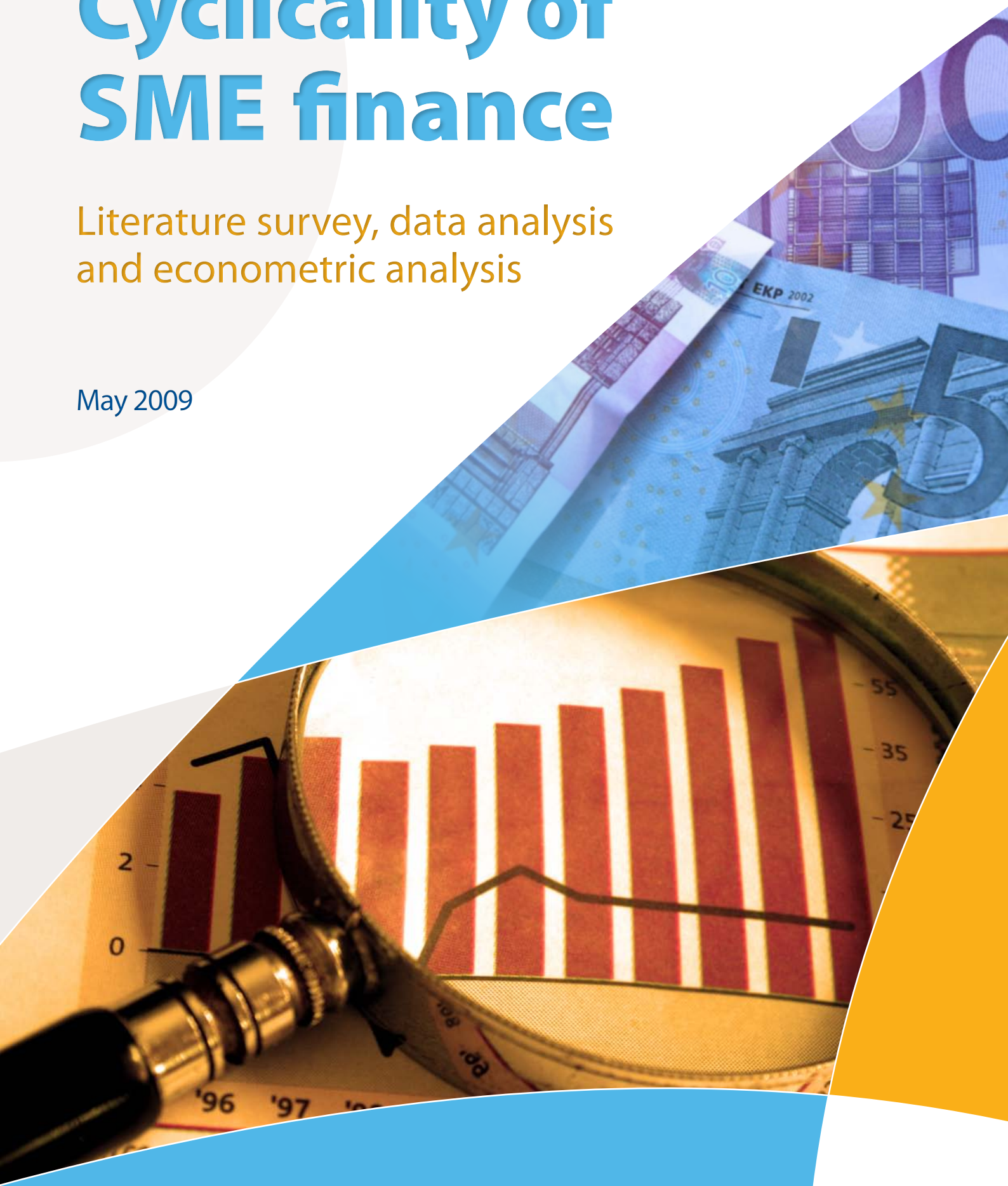

European Commission
Enterprise and Industry

Cyclicality of SME finance

Literature survey, data analysis and econometric analysis

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Summary

Introduction

This study deals with the cyclicality of SME finance. There are three main objectives of the study:

- Examining the extent to which the supply of loan and equity financing to SMEs is dependent on macroeconomic fluctuations;
- Analysing the effect of Basel II on the pro-cyclical relationship between the general business cycle and the supply of SME finance;
- Considering whether pro-cyclical patterns in the supply of capital requires further exploration of the possibility of developing further appropriate policy measures, given the importance of adequate access to finance for SME development.

Literature review

EU policy context

SMEs are vital in promoting economic growth, competitiveness, entrepreneurship and innovation, and in creating new jobs. Ensuring adequate access to finance so that SMEs can grow and achieve their full potential is central to achieving the objectives of the renewed Lisbon partnership for growth and jobs.

OECD research suggests that securing suitable financing remains an obstacle for SMEs, especially for the growth of innovative SMEs, whose technology and business models are not understood by many more traditional financial institutions and start-up enterprises and very young firms, which lack a track record and collateral against which to raise debt finance.

In terms of practical support, EU financial instruments such as the EU Structural Funds and the Competitiveness and Innovation Programme 2007-2013 (CIP) play an important role in stimulating improved access to finance for SMEs. Predecessor programmes also played an important role in this regard, notably the Multi-Annual Programme on SMEs 2001-2006 (MAP).

Internal and external sources of SME financing

Traditionally SMEs have been financed to a great extent by internal sources both from the business owner and through retained profit. Many SMEs also need external sources of finance. Here, a distinction can be made between informal sources, such as family and friends, and some types of business angel investment, and more formal sources such as bank loans, followed in order of relative importance by leasing, trade credits and factoring. Venture capital and funds of business angels are only important for a select group of high potential SMEs like seeders/start-ups, gazelles and management buy-outs and buy-ins.

Bank loans are the most important source of external finance. Problems with bank loans occur because of a lack of a track record, inadequate security, breach of a threshold limit and a credit rating outside an acceptable range. Close firm bank relations help to receive long term bank loans. Leasing and factoring might ease financial problems. By leasing the cash flow improves and SMEs do not need to finance an investment at once. By selling the accounts receivable (factoring) SMEs do not have to wait to receive payments from the debtor. Venture capitalists will take part in the management of a firm, especially in high potential start-ups, gazelles and in the case of family succession. They are specialists and

are looking for risky, but high potential activities. In return they ask for a high internal rate of return. Venture capitalists draw their investment funds from pools of money raised from public and private investors. Trade credit is useful in managing cash flow and no formal arrangement is needed, but is often more costly than bank loans. The informal venture capital market comprises individuals (business angels) who provide risk capital directly to new and growing businesses with which they had no previous relationship.

Financing sources of SMEs by stage of development

In the seed and start-up stage, informal equity and loans from founder and associates is needed most. Bank loan finance is also commonly used. During the expansion stage, all financing sources are used. During the stage of replacement, capital trade credits, venture capital or IPO are used mostly.

Cyclicality and SME financing

In the USA SMEs, particularly 'constrained firms' are vulnerable to business cycle fluctuations and more susceptible to credit rationing. Equity and net debt are correlated for small firms and net debt as well as net equity issues are procyclical for small firms. In contrast, for large firms net equity and net debt are not correlated and not cyclical. The criteria for bank lending to SMEs in the Euro zone are cyclical as well. During the stages of downswing and recession the criteria are tightened and the change is larger than the change in demand for bank loans. The supply of venture capital funding also has strong cyclical elements. During the expansionary phase of the cycle funds flow into venture capital firms, which then pursue deals aggressively, pushing valuations up. In the contraction phase equity prices fall, no new money enters into the sector, and valuations decline. The cyclicality of SME funding by bank loans is the consequence of the cyclical payment incidents.

Basel II rules and the impact on cyclicality

Basel II meant to make the financial system better able to manage risk during periods of economic downturns by ensuring that banks met more stringent capital requirements linked to increased risk sensitivity. Although concessions were made so that small firms with exposures of less than € 1 million will be treated as retail credits, concerns remain about the potential procyclical effects of Basel II and the Capital Requirements Directive. Several studies have been carried out, but conclusions are mixed with regard to the possible effects on SMEs.

Empirical framework and results

Data and model variables

For this study it appeared to be possible to construct a time series based database with four finance sources (bank loans, leasing, factoring and venture capital), supplemented with explanatory variables, like GDP, real interest rate, central government surplus, solvability of firms and banks and investment rate. As far as available the data were collected for 10 countries and for the period 1996-2006.

The datasets concerning leasing and factoring concern SMEs and large enterprises. Bank loans are split up into micro/small enterprises and medium-sized

enterprises No time series data could be found for the stages in the lifecycle and for business angels.
As such the database constructed is unique, but in future more efforts should be invested to get better time series on finance sources, especially for SMEs.

Results of the econometric analyses

The econometric analyses consisted of regression analysis. It was possible to make separate regressions with respect to bank loans (for small and medium-sized enterprises), leasing (no size class), factoring (no size class) and venture capital (SMEs up to 200 persons employed).
For bank loans separate regressions could be made for loans to small and medium-sized firms. For factoring, leasing and venture capital, data did not allow us to distinguish between firms of different sizes. In general, the variance in the sources of finance in the database that could be explained by the models was quite low, so that one has to be careful drawing conclusions from the regression exercises. Some conclusions can however be drawn from the analyses.

Bank loans

For bank loans to *small* firms a significant but small effect of the business cycle on these bank loans was found. The effect is valid only for a subset of the countries considered in the present study and the effect comes with a one year lag. The small effect suggests the business cycle does not have much impact on the amount of finance provided to small firms. This might point at the phenomenon of credit rationing, i.e. with small firms banks may find it difficult to screen the quality of the firm requesting a bank loan, and as a result many requests will be turned down. The results suggest that this phenomenon takes place in boom periods *as well as* in recession periods, i.e. it is independent of the business cycle.
For bank loans to *medium-sized* firms a significant positive effect of the business cycle on these bank loans was found too. However, these effects are bigger and they also hold for all countries. Again, there is a lag involved in the cyclicality effect. As medium-sized firms signal some quality to the banks in the sense that they already reached a certain scale, credit rationing might occur less often, and banks may be more willing to provide finance. The results suggest that the actual amount of bank loans to medium-sized firms then depends on the business cycle, suggesting that banks have more room to lend money in times of high economic growth.
An additional analysis using qualitative data from the ECB Bank Lending Survey showed that the cyclicality effects found in the regressions more likely refer to the supply side of the capital market than the demand side.

Factoring, leasing and venture capital

For the other three forms of finance to SMEs considered in the present study, i.e. factoring, leasing and venture capital, bigger effects (coefficients) of GDP growth than for bank loans were found. Contrary to bank loans, these effects materialize immediately and not with a lag. Of the different forms of finance the cyclicality of venture capital is by far the largest.

The impact of the current financial crisis

What do the findings from this study mean in terms of the current financial crisis? Of course, as the empirical analysis has been performed using historical data, caution is needed in interpreting the results. Nevertheless, the results seem to imply that there is a need for governments to stimulate access to fi-

nance for SMEs, especially in the venture capital market. It is a fact that currently banks are very reserved in providing loans, hence the role of other forms of finance, in particular venture capital, should become more important. However, the study has shown that venture capital is very cyclical and since we are currently in a period of recession in many European countries, this result implies the supply of venture capital should currently be low, possibly calling for government intervention. Governments might attempt making venture capital transactions more attractive to venture capital providers and help venture capitalists to acquire financial means to invest in risky but likely successful firms, like gazelles and innovative young firms. This might increase the supply of venture capital finance.
By way of illustration as to the possible scale of impact of a decline in economic growth on (the supply of) the four sources of capital analysed, the impact of a decline in GDP growth of -1.5%, -2.5% and -4% in 2009 *ceteris paribus*, was calculated. An estimate of the potential impact is reflected in the next table:

Table A Effect of negative economic growth on different sources of financing

	effect of decreasing economic growth on relative change of different types of financing		
	optimistic (-1.5%)	*realistic (-2.5%)*	*pessimistic (-4%)*
bank loans to small enterprises*	-3.0%	-5.0%	-7.9%
bank loans to medium sized enterprises	-4.4%	-7.4%	-11.8%
factoring	-10.3%	-17.1%	-27.4%
leasing	-6.8%	-11.4%	-18.2%
venture capital	-19.2%	-32.1%	-51.3%

* *This only holds for a subset of the countries, namely: Spain, Finland, France, Germany, Italy, Poland and the United Kingdom. For the total set of countries we did not find a significant cyclical effect.*

Exploring possible policy measures

It is worth considering policy responses within the EU adopted in response to the global financial crisis to stimulate the supply of SME finance (the availability of external finance) and to improve financing conditions for SMEs (the terms on which finance can be obtained, e.g. cost of capital, duration of loans, terms and conditions of loans including collateral requirements etc.).
In light of the current global financial crisis, a large number of policy measures have already been taken. The European Investment Bank announced an initiative in late 2008 to significantly increase the volume of lending to SMEs during 2008 and 2009 through the provision of loan guarantees for SMEs, with an additional €15 billion allocated over the next two years to be implemented through the EIB's network of private sector partner banks. The objective of making additional funds available is to keep 'banks lending to small firms' in recognition of the fact that credit supply will be considerably tightened during the recession, given the cyclical nature of lending to SMEs. Action has also been taken in some Member States to stimulate bank lending to firms adversely affected by the seizing up of credit markets. A number of public agencies have taken action to strengthen ac-

cess to finance for SMEs. Other measures concern export guarantees and venture capital.

Financial intermediaries should be actively encouraged to take advantage of the new loan guarantee commitments offered by the EIB. To enlarge the incentive for banks to make optimal use of this instrument the administrative burdens for banks to use this instrument should be as low as possible.

The econometric analysis - supported by the findings from the desk research - show that venture capital funding is susceptible to economic cycles. In addition there are the particular circumstances of this recession, which suggest a major retrenchment in VC is already underway. While recognising that VC only constitutes a small proportion of total SME external financing, it is especially important for young, fast growing and innovative firms. Public authorities should take note of the likelihood of a dramatic fall in venture capital availability during the present crisis and devise an appropriate response.

1 Introduction

Aims of this study

The study has three main objectives, namely:

- Examining the extent to which the supply of loan and equity financing to SMEs is dependent on macroeconomic fluctuations;
- Analysing the effect of Basel II on the pro-cyclical relationship between the general business cycle and the supply of SME finance;
- Considering whether pro-cyclical patterns in the supply of capital require further exploration of the possibility of developing further appropriate policy measures, given the importance of ensuring adequate access to finance for SME development.

Scope of the project

The project consisted of a focussed literature review covering international studies on SME financing and cyclicality aspects, the identification and analysis of existing data sources and running econometric models to estimate the correlation between 'finance' and the business cycle. The potential project scope of the study was therefore extremely wide. Given the relatively limited timescale of the present study, the issues have necessarily been addressed on a limited basis, given the study could not seek to be exhaustive.

In this analysis, the following elements are considered:

- Different providers of external SME financing such as banks, leasing companies, venture capital funds.
- Different forms of funding: equity, and loans.
- The various stages at which SMEs may need finance: start-up, growth, expansion, etc.
- The study covers the European Union, in presenting evidence based on statistical time series analysis of at least 6 Member States, including 2 new Member States.
- The study covers the period 2000 - 2008, and where possible longer time series to cover two business cycles.
- Financial instruments of the EU have been taken into account.

The study was conducted by a team of experts from EIM Business & Policy Research in the Netherlands (main contractor) and the Centre for Strategy & Evaluation Services (CSES) in the United Kingdom. In Chapter 2, the literature review is presented. In Chapter 3, the empirical framework is described and the results of the analyses presented. Chapter 4 is devoted to the impact of the current global credit crunch on SME finance. In Chapter 5 possible policy measures will be explored. Finally, Chapter 6 outlines the main conclusions of this study.

2 Literature review

2.1 Introduction and policy context

A literature review relating to the cyclicality of finance for small and medium sized enterprises (SMEs) was undertaken. The assessment includes:

- A summary highlighting the importance of access to finance for SMEs and the adverse implications of an 'SME financing gap';
- An analysis of the sources of access to finance for SMEs and of financing needs by phase of development within the context of the SME life cycle;
- An assessment of the correlation between business cycles and access to finance for SMEs;
- A review of the impact of the current global economic downturn on SME financing - and of counter-cyclical measures being taken to address this problem;
- Consideration of the (preliminary) impact on the cyclicality of SME finance of the implementation of the Basel II rules, in particular the Capital Requirements Directive;
- A review of European and joint EU-OECD initiatives to improve data availability on access to SME finance; and
- A summary of the main conclusions relating to the cyclicality of the supply of finance to SMEs.

SMEs are vital to promoting economic growth, competitiveness, entrepreneurship and innovation, and to creating new jobs. Ensuring adequate access to finance so that SMEs can grow and achieve their full potential is central to achieving the objectives of the renewed *Lisbon partnership for growth and jobs*. Moreover, the conclusions of the Spring 2006 European Council emphasised that *'fully integrated financial markets and sufficient access to finance are crucial for the growth of small and medium sized enterprises'*. The current crisis in the financial sector around the world has made such access even more critical.

Financing is necessary to help SMEs set up and expand their operations, develop new products, and invest in new staff or production facilities. Many small businesses start out as an idea from one or two persons, who invest their own money and/or have financial help of family and friends in return for a share in the business. But if they are successful, they need new investment to expand or innovate further. At this point they often run into problems, because they find it much harder than larger businesses to obtain financing from banks, capital markets or other suppliers of credit.
OECD research[1] suggests that securing suitable financing remains an obstacle, especially for the growth of innovative SMEs, a problem known as the 'SME financing gap'. While many SMEs are reliant upon internal sources of financing, including cash-flow, to fund investment in their development and growth, particularly at the start-up and early growth stage, they will necessarily have to consider external financing sources as they progress through the development phases of the SME lifecycle.

[1] OECD, The SME financing gap, 2006.

Addressing the "financing gap" is increasingly important in the context of a fast-changing, knowledge-based economy in which innovative SMEs with high growth potential are key in raising productivity and in maintaining competitiveness. The ability of small firms - particularly fast-growth 'gazelles' - to exploit investment opportunities is dependent on the extent to which low-cost external sources of financing are available.

The OECD report on the SME Financing Gap referred to above defines the financing gap as meaning that 'there are significant numbers of SMEs that could use funds productively if they were available, but cannot obtain finance from the formal financial system'. Its research suggests that in most EU countries, the financing gap particularly affects a sub-set of SMEs, such as innovative firms, whose technology and business models are not understood by many more traditional financial institutions and start-up enterprises and very young firms, which lack a track record and collateral against which to raise debt finance.

Data from the EU suggests that access to external sources of finance remains a concern for many SMEs. A Flash Eurobarometer survey in 2005 found that 14% of the EU's 23 million SMEs *'need better access to debt finance'*. A follow-up Eurobarometer survey with SME managers confirmed that access to finance for SMEs was equally an important issue in the new Member States (2006).[1]

2.2 Internal and external sources of SME financing

There are a variety of different sources of finance for SMEs. A distinction can be made between **'internal'** and **'external'** financing sources. Internal financing is the most common source of SME financing, and includes owner investment, as well as funding through retained profits, and / or the sale of assets.

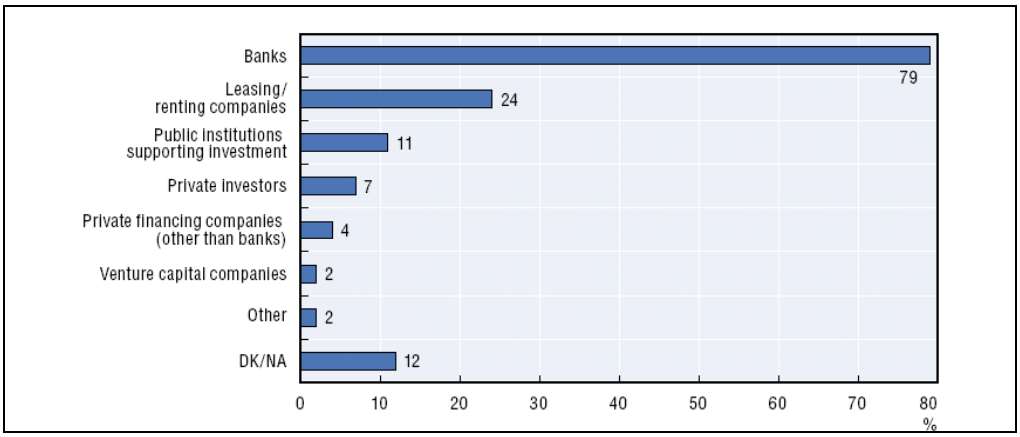
Many SMEs, especially fast-growth firms, will also need 'external' sources of finance. A differentiation can be made between 'informal' financing sources, for example money raised externally through the so-called three F's - 'friends, families and fools' and/ or through Business Angel investment and more conventional sources of (formal) external financing. These include traditional debt finance in the form of loans from bank and other financial institutions, micro credits (loans of less than € 25,000) and leasing and hire purchase. Other external financing sources include risk capital (venture capital, equity financing and mezzanine instruments), which may be appropriate for high-growth firms, factoring and trade credit. Often, SMEs will need to use a combination of financing sources, depending on the sector, and the stage in their growth and development. A key consideration in choosing the source of new business finance will be to strike a balance between equity and debt to ensure the funding structure suits the businesses needs.

The relative importance of different types of external financing for SMEs, and the extent to which this differs between Member States, needs to be taken into account when examining cyclicality issues. For example, a country where there is a strong reliance on one particular source of external finance, such as bank loans,

[1] Flash Eurobarometer 174, September 2005 (EU 15) and Flash Eurobarometer 184, July 2006 (EU 10).

may potentially be more adversely affected by cyclical changes in the supply of finance than one where there is a more diversified mix of financing sources. An illustration of the use of different types of 'external' SME finance in the EU is shown in Figure 1. The largest sources of SME finance are bank lending and hire purchase and leasing.

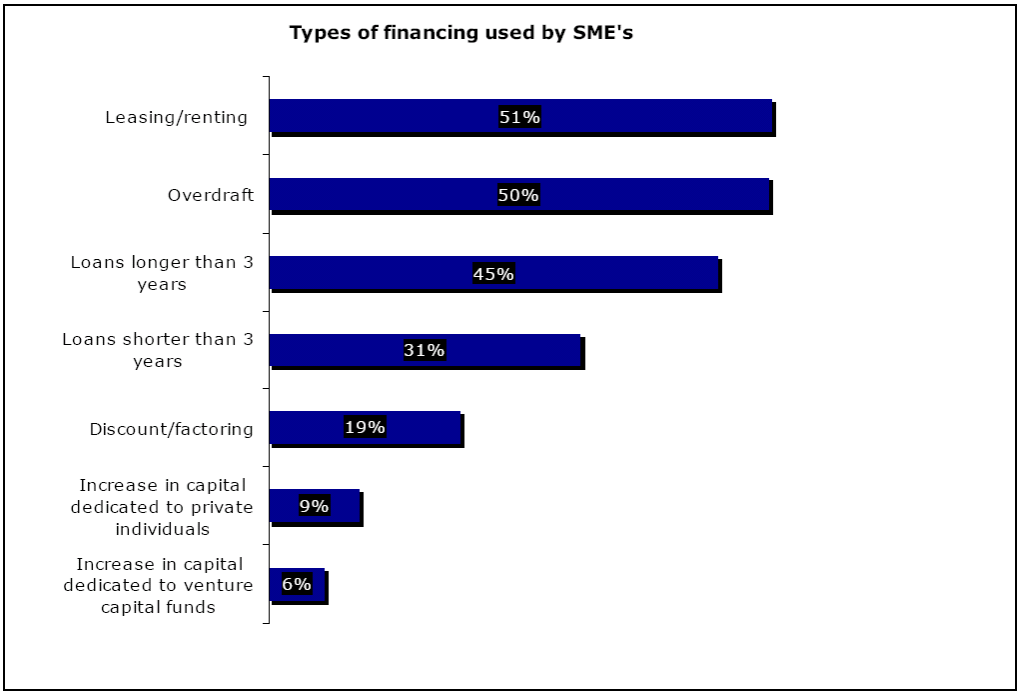
Figure 1 Institutions used by SMEs to obtain external financing, EU-15 (2005)



Source: EOS Gallup Europe (2005), "SME Access to Finance", Flash Eurobarometer 174, October.

Figure 2 shows the types of external financing used by SMEs in the EU.

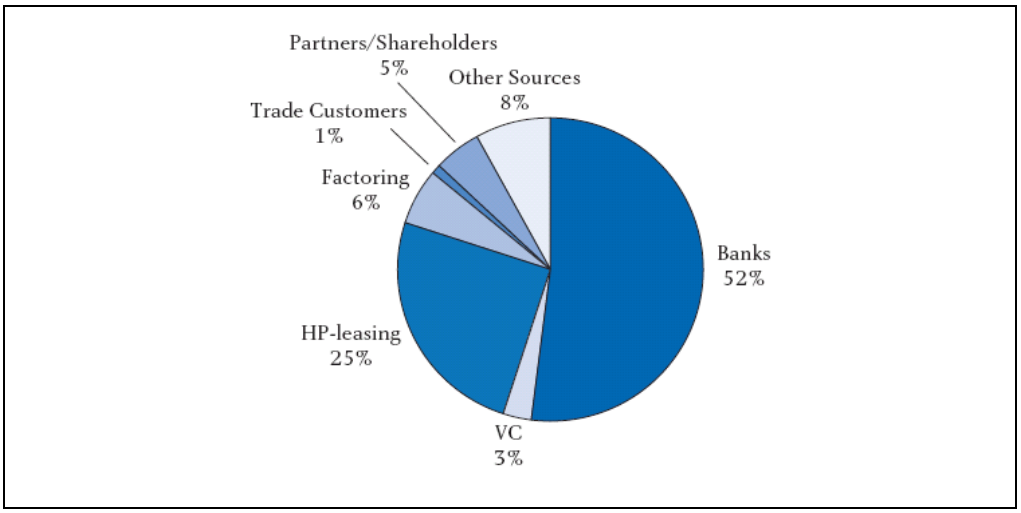
Figure 2 Types of financing used by SMEs to obtain external financing, EU-15 (2005)



Source: EOS Gallup Europe (2005), "SME Access to Finance", Flash Eurobarometer 174, October.

As an illustration the relative importance of the different types of external finance in the UK is shown in Figure 3.

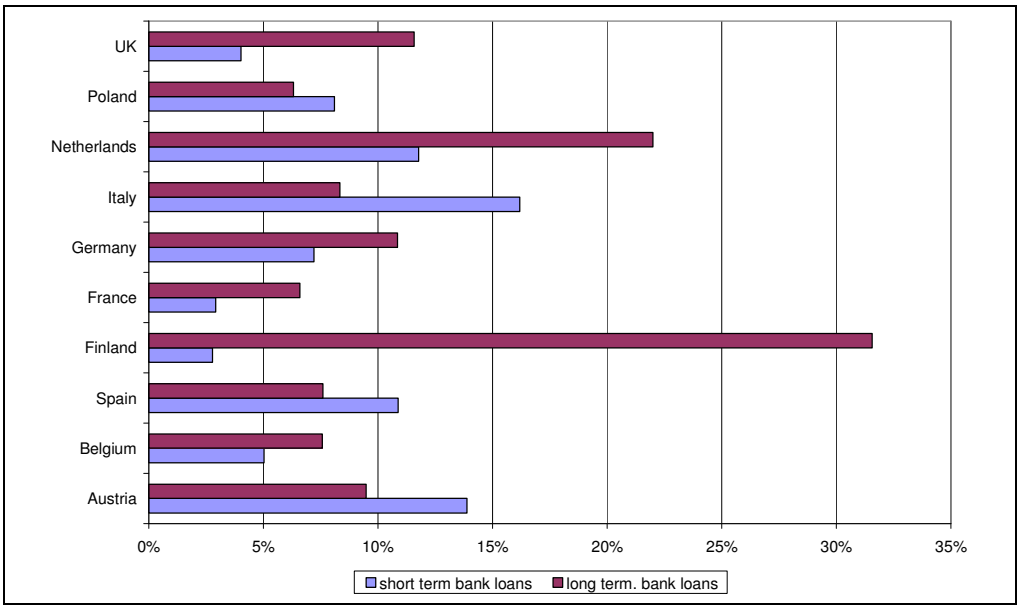
Figure 3 The relative importance of external finance in the UK (2000-2002)



Source: ESRC Centre of Business Research.

Although debt finance through traditional bank lending and leasing are the most important external sources of finance, there are variations within the EU with regard to the extent to which SMEs have recourse to different types of financial instruments, and the terms and conditions for which they are able to access these instruments. There are variations for example between counties in the duration of debt financing which SMEs are able to obtain. In some countries, like Italy and Austria banks tend to prefer lending to SMEs on a short-term basis through overdraft facilities (the same is true in the US, where SMEs depend heavily on credit lines) - while Finnish, Dutch, French and German banks typically provide debt financing on a longer-term basis. While other instruments, such as venture capital, only account for a small proportion of total SME finance, there are marked variations between countries as to the extent to which VC is available. Figure 4 shows the share of short and long term bank loans in total capital of SME corporations.

Figure 4 Share of short and long term bank lending* in total SME capital for 9 EU countries**



* *Short term is less than 1 year.*

** *SME corporations only.*

Source: Eurostat-Bach database, completed with domestic data for the UK and The Netherlands.

The various types of external financing available to SMEs are now summarised in brief:

Debt finance (by banks)

Bank lending is the largest source of external SME finance. Banks take a dominant position regarding external loan finance. Bank loans are used for financing investments, working capital and stock financing. Bank lending may be secured or unsecured and will depend on the credit rating of an SME. Previous work by the Commission and others suggest that a commercial bank may be unable to provide finance to a viable SME because of:

- Lack of a track record;
- Inadequate security;
- Breach of a threshold limit;
- A credit rating outside an 'acceptable range.

Close firm-bank relationships increase the likelihood of obtaining longer-terms bank loans. However, there are differences between countries. More specifically, small firms in Mediterranean countries, like France, Greece, Italy, Portugal, and in the UK are less likely to obtain long-term debt compared to firms in Nordic countries and the Netherlands. Firms in countries with high growth and a low interest rate are more likely to obtain bank loans with longer maturity. Firms in countries with more concentration in the banking sector benefit more from close firm-bank relationships.[1]

[1] See Hernandes-Cánovas, Ginés and Joanna Koëter-Kant, Debt maturity and relationship lending; An analysis of European SMEs in International Small Business Journal, volume 26, volume 5, 2008.

Leasing and hire purchase (asset financing)

The second largest source of external finance is leasing and hire purchase. Hire purchase or leasing represents secured financing - based on the existence of a tangible asset. By its nature the finance is secured on the leased asset so it can provide an effective source of finance to an SME. Leasing improves cash flow and are easier to finance than purchases. Before extending a capital equipment loan, banks will usually want to see two to three years of financial records - which most new companies do not have. Leasing companies, on the other hand, usually require only six months to a year of credit history before approving a car, furniture or office equipment lease.

Factoring

Factoring is a financial transaction whereby a business sells its accounts receivable (i.e., invoices) at a discount. The factor usually charges the seller a service charge, which is interest based, depending on how long the factor must wait to receive payments from the debtor. Factoring differs from a bank loan in three main ways:

- First, the emphasis is on the value of the receivables (essentially a financial asset), not the firm's credit worthiness.
- Secondly, factoring is not a loan - it is the purchase of a financial asset (the receivable).
- Finally, a bank loan involves two parties whereas factoring involves three.

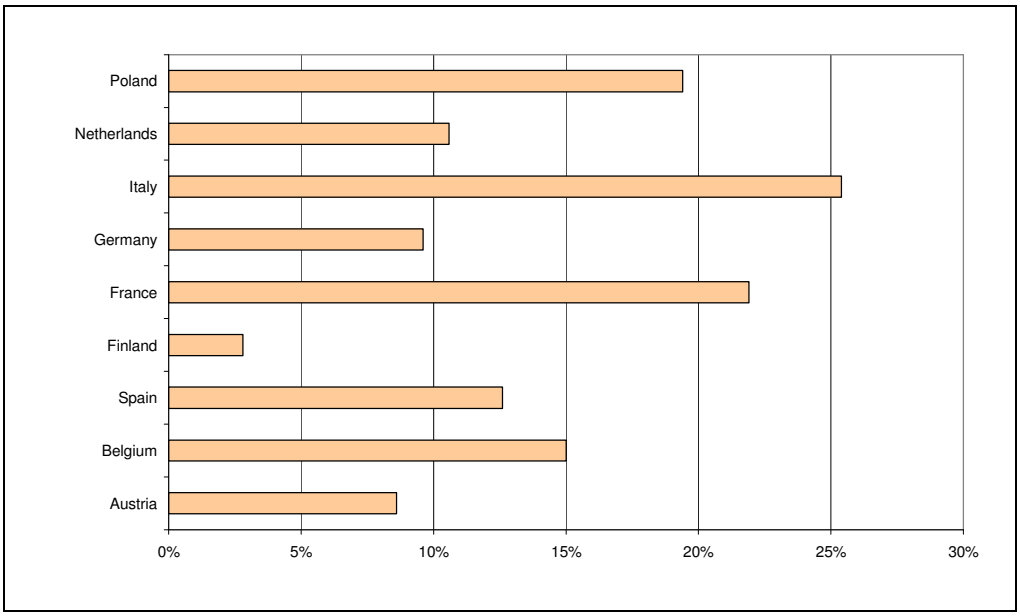
Factoring is interesting especially for (fast) growing firms, as the scope of financing grows with the scope of the receivables.

An alternative is invoice factoring/discounting, which enables SMEs to borrow on the security of invoices addressed to customers. Since the invoices are drawn on customers which may be larger, more credit worthy organisations, this source of financing can be attractive to SMEs.

Trade credit

Traditionally supplier credit is an important way of financing stock inventory held by SMEs. By using trade credit, SMEs are able to postpone payments for goods and services purchased, which is useful in managing cash flow. Trade credit is often an important aspect of a business-to-business relationship, substituting financing for short-term bank credit or other more formal arrangements. Trade credit is the second most important source of external financing for SMEs, although it is generally considered to be more costly than bank loans. See Figure 5.

Figure 5 Share of trade credits in total SME capital for 9 EU countries*



** SME corporations only.*

Source: Eurostat-Bach database, completed with domestic data for The Netherlands.

Venture capital

Venture capital (VC) is provided by full-time, professional enterprises (venture capitalists) or private persons who invest both capital and management expertise in ambitious, fast-growing companies with the potential to develop into significant businesses.

In addition to injecting cash into the business, the venture capitalist is likely to add considerably to the credibility of the company and to supply management expertise, support and access to contacts. As part of their mentoring and monitoring of their investment, they are likely to seek board membership.

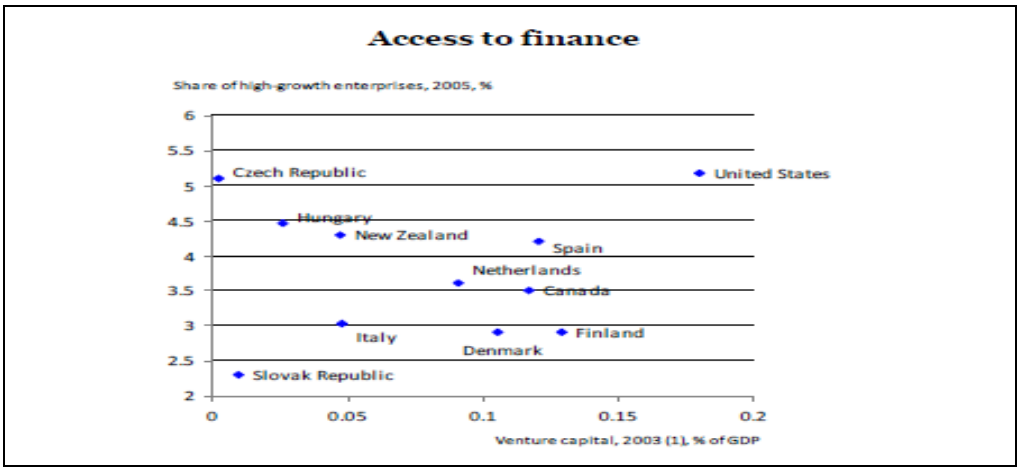
VC finance differs from bank finance as, in contrast to bank finance, venture capitalists are not looking for scheduled repayment, but for a minority of the share capital of the company in return for cash. The venture capitalists will typically look to realise their investment in five years, either through floatation on a public market, a trade sale or for their stake to be bought out by the business. They are looking for high returns related to risk (at least 20% internal rate of return).

VC can be an important source of external finance for SMEs, particularly for high potential start-ups, high growth businesses - known as 'gazelles' and in the case of family firm succession. However, it should be emphasised that VC accounts for only a relatively small proportion of external finance for SMEs. Figure 6 below draws on data included in the joint OECD-Eurostat report on *Measuring Entrepreneurship, A Digest of Indicators (2008)* [1]. It shows that although the share of high growth enterprises in the economy generally grows with venture capital as a

[1] Measuring Entrepreneurship, A Digest of Indicators, OECD - Eurostat Entrepreneurship Indicators Programme, 2008.

proportion of GDP, the relationship overall is by no means direct and that venture capital is less significant than commonly assumed, although it can be important in some sectors, especially for high-tech, high-growth enterprises.

Figure 6 Share of high-growth enterprises as proportion of total enterprise stock (2005) and share of venture capital as a proportion of GDP (2003)



Source: OECD-Eurostat, Measuring Entrepreneurship, A Digest of Indicators, 2008.

In 2007, the venture capitalists associated with the EVCA, the European Venture Capital Association, had about 5,300 investments in 3,290 SMEs (up to 200 employees) with a total amount of € 6.6 billion. The average investment amounted to € 1.2 million. The share of SMEs in the total investments is about 55%.

The provision of VC to SMEs is influenced by the ownership structure of the venture capital provider. In Japan, owner-manager venture capitalists (financial disintermediation) give rise to much smaller portfolios of SMEs and more advice to entrepreneurs than financial intermediation (e.g. bank's venture capital divisions)[1].

Venture capitalists draw their investment funds from pools of money raised from public and private investors. Private venture capital consists of both institutional venture funds, as well as funds run by high net worth individuals. Publicly backed venture capital funds are increasingly common, and include regional venture funds which have received Structural Funds assistance, as well as funds with support from regional and national authorities. There are also many hybrid funds, which are made up of both public and private sector investment.

Business angels

The informal venture capital market comprises individuals who provide risk capital directly to new and growing businesses with which they had no previous relationship. These individuals are often referred to as 'Business Angels'. In the US, this market has long been identified as the single most important source of risk capital for SMEs and data collected by the Canadian SME Financing Data Initia-

[1] Cumming Douglas, Grant Fleming and Armin Schwienbacher, Financial intermediaries, ownership structure and the provision of venture capital to SMEs; Evidence from Japan, 2007.

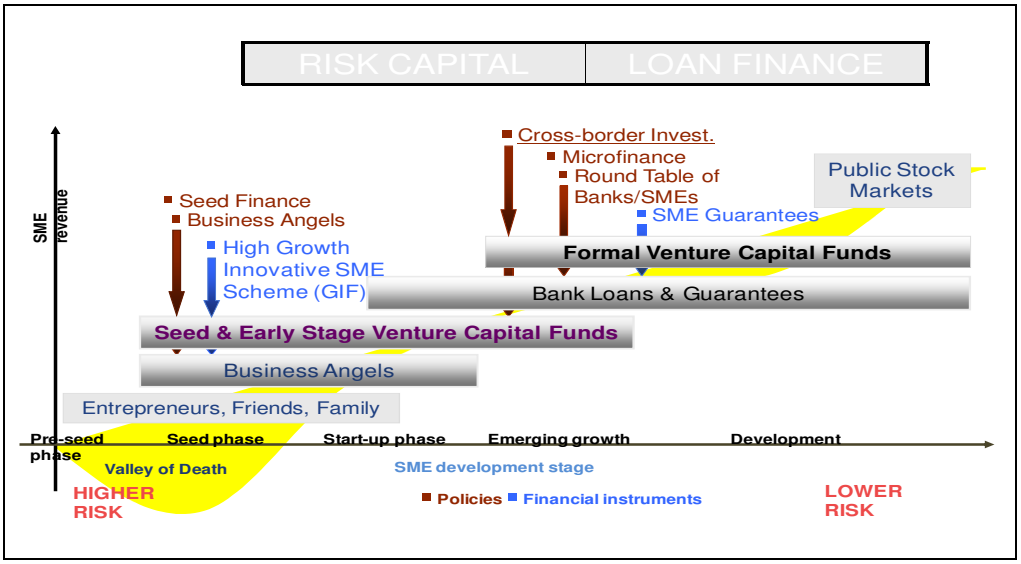
tive[1], derived from the Global Entrepreneurship Monitor and elsewhere suggest that in a number of European countries the sums invested are at least twice and in some instances many times as much as that of the institutional market. Moreover, because the average size of private investments is typically less than that of institutional venture capital, informal investors are likely to finance substantially more firms than the institutional VCs. Burke et al. (2008) report that in highly developed countries (mostly European) some 85% of all business angels invest 60,000 US$ or less, while some 30% invest a maximum of 5,000 US$.[2] Business angels invest in firms in the seed stage, the start-up stage, the expansion stage and the buy-out stage. The most popular ways of recruiting entrepreneurs are networking (word of mouth), events and information fairs and the regional press.

In 2008 EBAN (European Business Angel Network) identified a total of 297 networks of business angels in Europe.

2.3 SME financing needs at different stages in the SME life cycle

There are a number of stages in the SME life cycle. These include the initial start-up phase, the early development phase, and the growth and maturity phases. SME financing needs will vary depending on a number of variables including the stage of development of a business, its growth objectives, the sector in which the firm operates, and management attitudes towards risk. The various phases of the SME life cycle are set out in Figure 7.

Figure 7 The SME life cycle and financing needs



Source: DG Enterprise, 2007.

The source of finance most appropriate to fund SME growth and development varies according to the stage of development of the firm (see Table 1). For ex-

[1] http://www.sme-fdi.gc.ca/eic/site/sme_fdi-prf_pme.nsf/eng/Home.

[2] Burke, A., C. Hartog, A. van Stel and K. Suddle (2008), 'How Does Entrepreneurial Activity Affect the Supply of Business Angels?', EIM Research Report H200813, Zoetermeer, The Netherlands.

ample, research by the European Venture Capital Association (EVCA) examined the appropriateness of different financing sources by SME development phase:

Table 1 Financing sources of SMEs by stage of development

Phase in SME lifecycle	*Type of financing required*
Seed stage	Informal equity and loans from founder and associates. Bank loan if available and needed
Start-up stage	Informal equity and loans from founder and associates and contacts. Bank loan if available. Leasing for equipment
Expansion stage	Equity from original sources, plus trade investments or venture capital. Loans from bank. Other sources of finance including leasing and factoring. Retained profits
Replacement Capital	Trade investment, venture capital or IPO

Source: European Venture Capital Association (EVCA).

The definitions above apply particularly in the case of high growth companies - other companies may have more stable financing patterns. Internal sources of finance - informal equity, loans and retained profits - are particularly important in smaller SMEs and those with a low growth trajectory.

Bank lending, hire purchase (HP) and leasing, and factoring are the most important sources of external (formal) finance for SMEs. Equity capital - either formal or provided by business angels - is another important source of finance. In some Member States, loan guarantee schemes, including those backed by the European Commission through the European Investment Fund and the Fund separately facilitate access to finance and / or help to reduce the cost of finance for SMEs.

2.4 Cyclicality and SME financing

Having examined the main sources of SME financing across the different stages of the SME lifecycle, we now consider the correlation between the business cycle and the supply of SME financing. Demand side factors are also considered, but the focus is on assessing the extent to which financing supply is linked to cyclical factors.

The research has included an examination of work by the OECD, efforts by the European Commission to improve data on access to finance for SMEs (including over time series so as to address the cyclicality dimension), and working papers by the European Central Bank (ECB) and national central banks on financing conditions for SMEs. Additionally, a number of academic papers have been reviewed that examine the extent to which the implementation of the Basel II rules on capital adequacy requirements will potentially impact on access to SME finance. Finally, data was reviewed from European organisations such as EVCA (venture capital) and EBAN (business angels) on the level of venture capital and business angel activity over time.

2.4.1 SME financing constraints and the business cycle

Financing conditions for SMEs, the impact on the level of investment they make in their future growth and development, and linkages with business cycle fluctuations in the supply of external finance were considered.

The Federal Reserve Bank of Chicago addressed some of these questions in a working paper on *Bank Lending, Financing Constraints and SME Investment*[1]. The research found that SMEs - particularly 'constrained firms'[2] were especially vulnerable to business cycle fluctuations, and more susceptible to credit rationing. The implication is that if external financing conditions linked to cyclical factors are unfavourable, then 'SMEs' in general, and constrained firms in particular, will face greater difficulties in accessing finance, be less likely to make investment, and become more dependent on comparatively expensive sources of financing, such as trade credit.

The European Central Bank (ECB) has also examined financing constraints faced by different types of firms, including SMEs. It produced a working paper as part of the ECB working series *'Financing constraints and firms' cash policy in the euro area'*[3]. This report noted that 'the effect of financing conditions on corporate behaviour is quite important since investment decisions are determined not only by the profitability of the project, but also by the availability and costs of external financing'.

The OECD report referred to earlier on 'the SME Financing Gap'[4] examined evidence with regard to the supply of finance to SMEs. The report pointed out that there are evident linkages between the supply of finance, cyclical factors and overall levels of business confidence. It notes that bank lending is of a cyclical nature and may have a more pronounced effect on SMEs, and particular sub-categories of SMEs, notably start-ups and early stage growth firms.

2.4.2 Cyclicality and external sources of finance for SMEs

There are varying degrees to which different types of external SME finance instruments may be subject to cyclical factors.
Research suggests that economic cycles can have a considerable impact on demand and supply for **debt finance** in the form of traditional bank loans (this is confirmed in the analysis of datasets undertaken as part of this study).

On the supply side, in times of economic expansion, and/ or when interest rates and the cost of capital are low, banks will adopt different lending criteria and attitudes to risk than in periods of economic decline or stagnation. Similarly, demand from SMEs for bank loans has been shown in previous studies to be closely linked to economic cycles.

[1] Santiago Carbó-Valverde, Francisco Rodríguez-Fernández, and Gregory F. Udell, WP 2008-04 Federal Reserve Bank of Chicago.

[2] The definition in this context of a constrained firm is a firm which is either unable to access external finance, or only able to access from external sources at a higher cost of capital than 'unconstrained' firms.

[3] Rozália Pál and Annalisa Ferrando, ECB working series 642/ June 2006.

[4] OECD report: The SME Financing Gap - theory and evidence, Volume 1, November 2006.

In a 2007 working paper for the National Bank of Belgium, Nancy Masschelein notes that[1] pro-cyclicality in lending and borrowing, including by SMEs, can have a number of sources, including: fluctuations in the quality of banks' and borrowers' balance sheets; information asymmetries between borrowers and lenders, and inappropriate responses by financial system participants. The adverse impact on SMEs of pro-cyclicality linked to normal business cycle fluctuations in lending and borrowing behaviour was stressed. *'When economic conditions are depressed and collateral values are low, information asymmetries can mean that even borrowers with profitable projects find it difficult to obtain funding. When economic conditions improve and collateral values rise, the opposite situation may occur. This reasoning suggests that cyclical effects may be more pertinent for borrowers which are more prone to asymmetric information effects (such as SMEs)'.*

A Dutch study from 1999[2] confirmed that banks may experience problems during an economic downswing with an adverse impact on the supply of loans to SMEs. During an economic downturn, there are concerns about the immediate short term lending environment, together with an increased risk of loan repayment problems. The investment climate might deteriorate with a possible flywheel impact.

In the study *Identifying the demand and supply effects of financial crises on bank credit--evidence from Taiwan (2008)*[3] the effect of the Asian financial crisis in 1998 on the demand and supply of bank loans was studied for Taiwan. In this paper, two different yet complementary econometric models are used to identify the cause of credit contraction. First, aggregate data was used to estimate a model that measures the degree of credit tightness as the extent of excess demand in the market. The second model is a disequilibrium model for disaggregate data that accommodates the short-side rule of market transactions in a demand-based or a supply-based model. Estimation results from both the aggregate and disaggregate data clearly indicates that the credit growth decline in the post-1998 period in Taiwan was mainly caused by a large inward shift of supply. Deposit outflows and the increase in overdue loans were identified as the most important factors leading to that event.

There is also evidence which suggests a possible credit crunch effect in the data. The deposit drain coincided with the large-scale capital outflow in Taiwan after the Asian crisis, and the large increase in overdue loans not only increased the overall credit risk perceived by banks but also raised concerns regarding potential capital losses. Furthermore, substitution between bank credits and other types of financing (particularly public debt) was impaired after the financial crisis, which could also have contributed to the tightness in the bank credit market. Finally, it was found that smaller firms were more likely to have experienced unsatisfied loan demand, particularly after the financial crisis. This indicates that

[1] Monitoring pro-cyclicality under the capital requirements directive: preliminary concepts for developing a framework (October 2007 No 120), National Bank of Belgium, Nancy Masschelein.

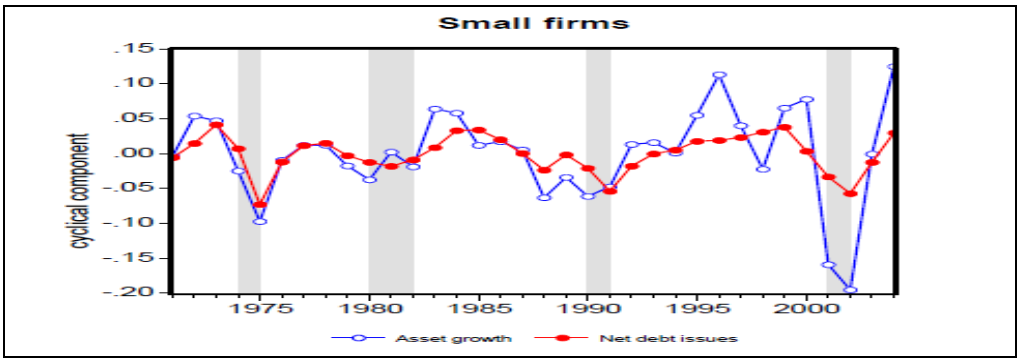
[2] De markt voor kredietverlening aan kleine en middelgrote ondernemingen (The market for granting credits to SMEs), Bureau Bartels, 1999.

[3] Chen, Nan-Kuang, Wang, Hung-Jen, Identifying the demand and supply effects of financial crises on bank credit--evidence from Taiwan, published in Southern Economic Journal, July 2008.

the credit decline in the aftermath of the crisis reflects the "flight to quality" behaviour of bank lending.

The *Role of Debt and Equity Finance over the Business Cycle*[1] compared differences between SMEs and larger firms in terms of the cyclical behaviour of retained earnings and asset growth, and the impact this has in relation to firms' net debt and equity issues. The research was based on an analysis of historical data in the US. An overview of the cyclical dimension is summarised in Figures 8 and Figure 9 below:

Figure 8 Asset growth and sources of financing: cyclical components*

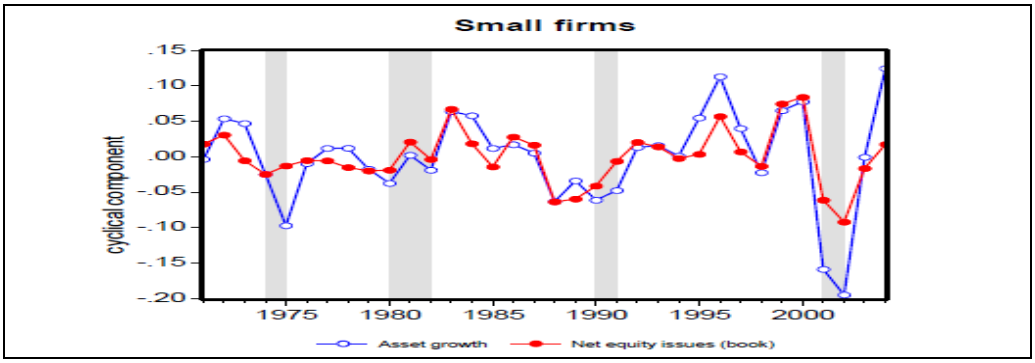


** Net debt issues small firms.*

Source: The Role of Debt and Equity Finance over the Business Cycle.

It should be pointed out that debt issuance was defined in the study as referring to a net change in balance sheet liabilities of a firm, which could include a number of different financing sources, not only traditional bank loans. Nevertheless, the study is useful in showing the correlation between asset growth, cyclical factors and the impact on the volume of different financing sources raised by firms of varying sizes.

Figure 9 Asset growth and sources of financing: cyclical components*



** Net equity issues small firms*

Source: The Role of Debt and Equity Finance over the Business Cycle.

Among the study's findings were that business cycle fluctuations can have a significant impact on the demand and supply of different forms of external debt and

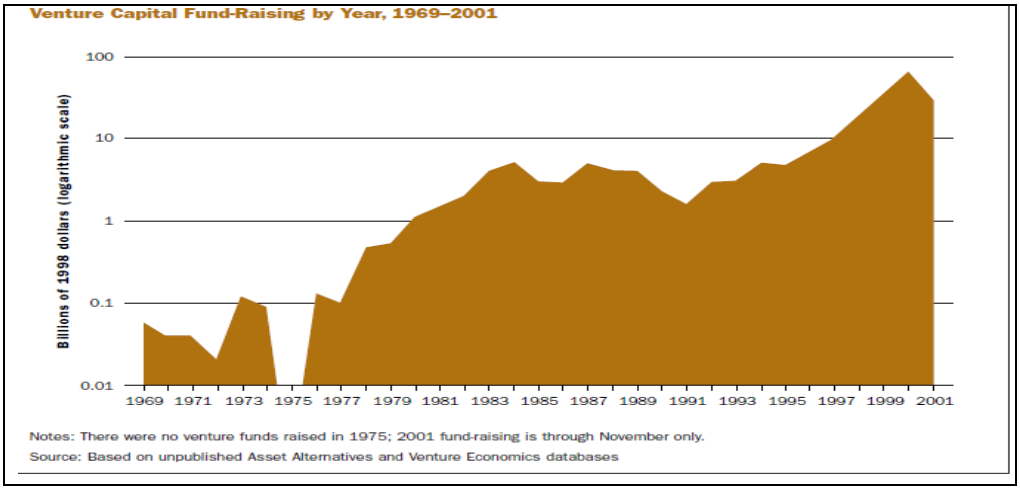
[1] Francisco Covas and Wouter J. den Haan, February 2006.

equity finance for SMEs. In particular, the data showed that 'net debt and net equity issues are pro-cyclical for small firms' and that the 'co-movement between net debt issues and net equity issues is substantial and significant for small firms'.

There is evidence that other sources of SME finance are also cyclical, such as **venture capital** and **business angel investment**. A working paper entitled *Boom and Bust in the Venture Capital Industry and the Impact on Innovation* by Professor Josh Lerner (2002)[1], considers the cyclical nature of the venture capital industry. Among the findings were that the level of activity was strongly linked to the potential return on investment for VC funds, which fluctuates considerably over time, and which is linked closely to economic cycles and the state of global stock markets. It found evidence that the supply of VC was closely influenced by stock market cycles. *'The stock market correction of 1987 led many investors, noting the extent of equity market volatility and the poor performance of small high-technology stocks, sought to scale back their commitments to venture capital'*. Following a significant increase in the supply of VC funding in the mid-1990s with considerable investment in high-technology firms and innovation, there was then again a marked decline in venture capital investment in the two years following the dot.com crash. Covac and De Haan (2006) also found in their study 'The Role of Debt and Equity Finance over the Business Cycle' that net equity issuance is procyclical for SMEs. For large enterprises this was not the case.

Figure 10 below illustrates the marked fluctuations in VC activity in the US over more than a 30 year time series. A significant contraction in the level of VC activity can be noted during economic shocks in 1974 and 1975, and a further downturn in the late 1980s. In contrast, during upturns and periods of economic recovery, there have been dramatic increases in VC funding.

Figure 10 Venture capital fund raising in the US by year, 1969-2001



While the level of venture capital activity subsequently picked up considerably since the dot.com crash led to reduced supply, the present economic crisis may lead to a further decline in VC activity which could adversely affect the ability of

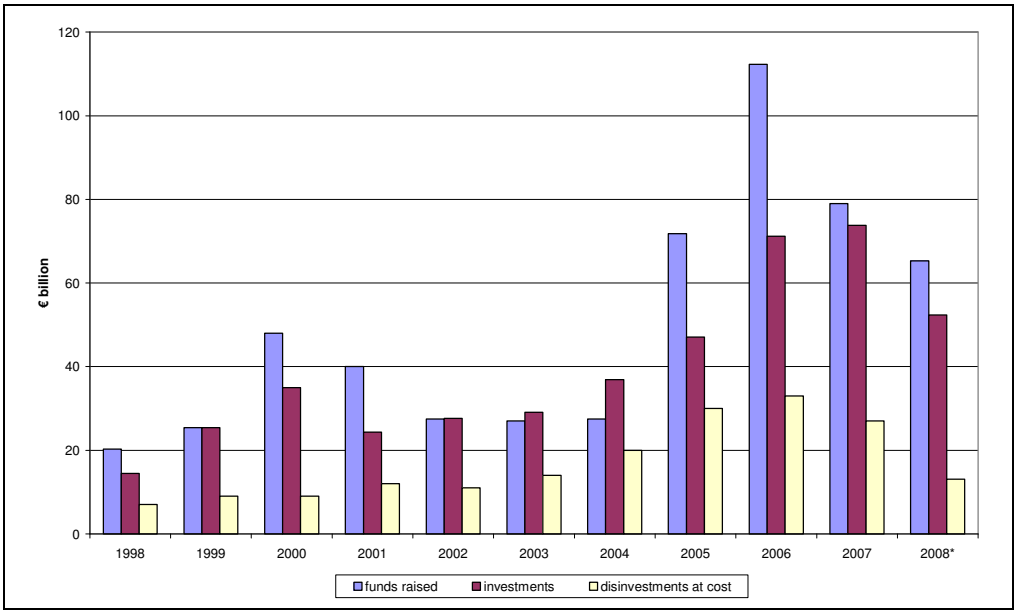
[1] Boom and Bust in the Venture Capital Industry and the Impact on Innovation, article published in Federal Reserve Bank of Atlanta Economic Review, Fourth Quarter 2002, Professor Josh Lerner, Investment Banking Faculty at Harvard Business School.

small, innovative firms to raise finance in this way. The scale of this supply-side reduction is difficult to quantify at this relatively early stage in the crisis. An interesting question in this context is whether VC and especially business angel investment is more closely related to net personal worth and stock market cycles than to the business cycle as such.
The paper of Lerner (2002) considers why the venture capital market tends to overreact to changes in the demand and supply side curve. Among the findings was that VC is highly pro-cyclical:

> 'Once the markets do adjust to changing demand conditions, they frequently go too far. The supply of venture capital ultimately will rise to meet increased opportunities, but these shifts often are too large. Too much capital may be raised for the outstanding amount of opportunities. Instead of shifting to the new steady-state level, the short-term supply curve may shift to an excessively high level. The same problem can occur in reverse. A downward shift in demand can trigger a wholesale withdrawal from venture capital financing'.

Data collected by the European Venture Capital Association[1] and through other sources of data, such as the European Private Equity Survey, demonstrate that the supply of venture capital funding has strong cyclical elements. In the figure below, fluctuations in the level of fundraising by European private equity over an eight year period are set out. As can be seen in Figure 6 there are considerable variations in the level of VC activity, with a marked drop in the level of funding raised following the collapse of high-tech companies' market capitalisations linked to the dot.com crash and a recovery in 2005 and 2006. In 2007 and 2008 there was a fall again.

Figure 11 Annual European private equity fundraising and disinvestment



** Preliminary data released 13 March 2009 at EVCA's Investors' Forum 2009 in Geneva.*
Source: EVCA Yearbook 2008 and EVCA press release of 13 March 2009.

[1] European Venture Capital Association Annual Yearbook.

Articles in US magazines suggest that in the second half of 2008 fund raising for venture capital was drying up.[1]

An OECD report from 2006[2] states that 'during the expansionary phase of the cycle, funds flow into venture capital firms, which then pursue deals aggressively, pushing valuations upwards. In the contraction phase, equity prices fall, no new money enters the sector, and valuations decline'. This clearly has implications in terms of the ability to raise equity financing for the small proportion of SMEs overall (but crucially some of the high-growth, 'gazelles') which seek VC finance.

Other types of SME financing instrument such as **loan guarantees** may conversely become more commonly used during economic downturns, thereby stimulating bank lending, especially to early stage firms and high-tech, high-growth firms. This was emphasised in the Commission Communication *'Implementing the Community Lisbon Programme: Financing SME Growth - Adding European Value'*[3] which argued that publicly-backed loan guarantees can lower the risk of bank lending, and have a large effect on lending to SMEs. Guarantees can therefore have a countercyclical effect by helping to maintain banks' lending volumes.

2.4.3 The global economic crisis, cyclicality and SME financing

The econometric analysis undertaken as part of this study (see next chapter) suggests that the correlation between funding supply and cyclicality is not always as clear-cut as might be assumed. It also reveals that the magnitude of the cyclicality of access to finance for SMEs differs between financial instruments.

Notwithstanding, a review of literature in respect of the (preliminary) impact of the current global economic downturn supports the hypothesis that access to finance for SMEs has a cyclical dimension. Financing supply through the most common sources of external SME finance already appears to have been adversely impacted, with policy makers having taken a number of steps to address this (policy measures to tackle the present crisis are examined in Chapter 5).

The European Central Bank (ECB) carries out regular surveys of bank lending (including to SMEs).[4] A survey from April 2008 highlighted the effect of the global financial crisis on lending to enterprises and provided separate information on lending to SMEs. Among the findings were that there had been a general tightening of credit and that was particularly likely to affect SMEs in accessing debt financing due to their lack of collateral:

[1] See for instance Bandyk, Matthew, A venture capital crunch?, in Small business and entrepreneurs, July 2008 and Tomkins, Benjamin, Financial Crisis: Venture Capital Drying Up, October 2008.

[2] OECD report: The SME Financing Gap - theory and evidence, Volume 1, November 2006.

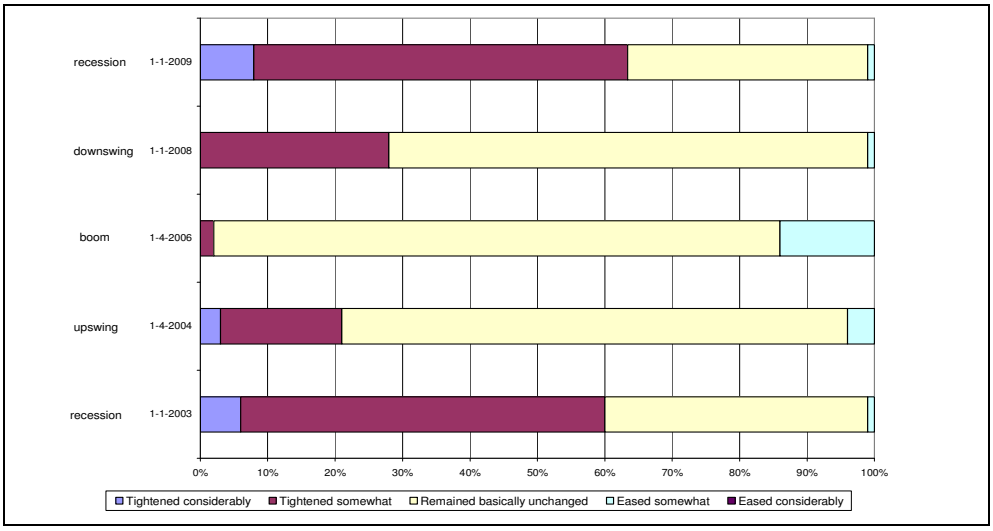
[3] COM(2006) 349 final.

[4] The survey is addressed to senior loan officers of a representative sample of euro area banks and is conducted four times a year. The sample group participating in the survey comprises around 90 banks from all euro area countries and takes into account the characteristics of their respective national banking structures. The UK, Hungary and Poland have similar surveys.

"Regarding the terms and conditions of credit, banks tightened credit standards further in net terms, especially by means of net increases in margins on both average loans (62%, up from 38% in the previous round) and riskier loans (72%, up from 58% in the previous round). Non-price terms and conditions also made an increased contribution to the stronger net tightening observed in credit standards in the first quarter of 2008, particularly the size of loans or credit lines, but also collateral requirements and other terms and conditions"[1].

Figure 12 draws on data from the ECB Bank Lending Survey. It shows appears to be the case that access to traditional loan finance for SMEs[2] are influenced by the macro economic situation. During downswings and recessions, banks tend to tighten their lending conditions, while these are eased during upswings and economic booms. The figure shows that the change in lending conditions at the present time are comparable with the situation in the beginning of the first quarter of 2003. The Euro zone was then in recession too.

Figure 12 Change in acceptance criteria for bank loans to SMEs in the Euro zone*



** Indicated by banks.*
Source: ECB, Bank Lending Survey.

Factors contributing to tightening loan standards include the costs related to the bank's capital position, their access to market financing, their expectations regarding general economic activity and the industry or firm-specific outlook. The conditions and terms of approving loans are getting changed by raising the bank's margin on loans (especially on riskier loans), non-interest charges, the size of the loan or credit line and the need for collateral requirements. The Bank Lending Survey shows that during the last four quarters (2008-q2 - 2009-q1) all these factors contributed to the tightening of the loan standards.

Not only are the changes in loan standards applied to the approval of loans or credit lines to enterprises cyclical, but also demand for loans. Factors influencing the demand for loans include investments in fixed tangibles, inventories and

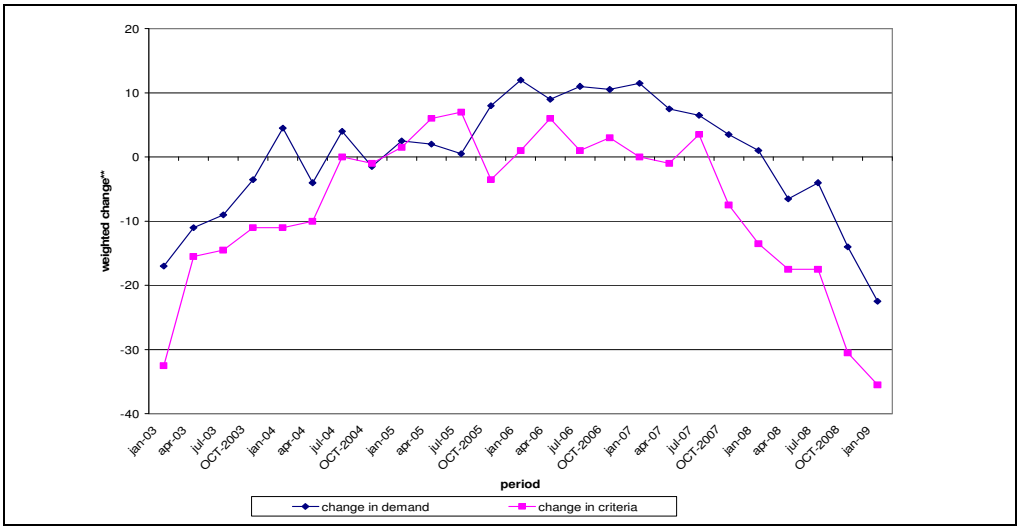
[1] The euro area bank lending survey, ECB, April 2008.

[2] Roughly speaking the same holds for large enterprises.

working capital, mergers and acquisitions, debt restructuring, internal financing, financing from other sources and the issuance of debt securities and equity. An unusual slowdown in demand could be due to a deterioration in borrowers' balance sheets, which in turn are the consequences of lowered collateral values, declining earnings, and debt overhangs in the post financial crisis era.

Figure 12 and Figure 13 show the cyclicality of both the changes in the criteria for SME bank lending and in demand for bank finance from SMEs with positive demand-side increases for lending and a relaxation in bank's lending criteria during economic upturns. Conversely, the opposite holds true during economic downturns and in recession periods, where there is evidence of a tightening of lending criteria. During most of the period examined, the change in lending criteria appears to lag behind the change in demand, which suggests that the supply of bank loans is the bottleneck (demand excess). However, the difference between changes in lending criteria and shifts in patterns of demand for bank lending during recession periods is typically larger than during boom periods.

Figure 13 Change in criteria for SME bank lending and change in SME demand for bank lending, 2003-I - 2009-I (on a quarterly basis)*



* *Indicated by banks.*

** *Weighting scheme:*
considerable positive change: 1; some positive change: 0.5; basically unchanged: 0.
considerable negative change: -1; some negative change: -0.5.

Source: ECB, Bank Lending Survey.

Some caution should however be exercised in interpreting the ECB Bank Lending Survey results, in that these are based on qualitative, opinion-based data, rather than quantitative data, and so at best an approximation, particularly with regard to the net effect of demand and supply changes. This places some limitations on the reliability of the findings. First, the perception of "considerable change" versus "some change" may vary from bank to bank and from one observation period to another. Secondly, the ranges indicated for "considerable changes" are rather wide, e.g., 50% and 25% might both still be attributed a weighting of 1. Thirdly, bank lending criteria extend beyond loan (or credit line) size alone, and include multiple other factors such as price, non-interest charges, loan covenants or collateral requirements.

The Bank Lending Survey however shows that these other factors moved in all quarters of 2008 in the same direction as the size of loans. Notwithstanding these limitations, an important advantage is that both demand and supply conditions are evaluated by the same banks, so that for a given bank, the classifications of (perceived) change in demand and (perceived) change in lending criteria are comparable to each other. Aggregation of individual bank responses then implies that the relative gap between demand and supply conditions as shown in Figure 13 are also comparable to each other, providing a reasonably accurate approximation of relative demand and supply conditions for bank loans. In addition, in recession periods an unknown number of small firms will anticipate that their application for a loan will be turned down causing them to not apply at all. Such anticipating behaviour contributes to a stronger positive correlation between SME demand for loans and GDP growth, while in fact such behaviour is really driven by supply conditions. Hence, the 'real' gap between demand and supply conditions may actually be even bigger than indicated in Figure 13.

Similar surveys in the US do confirm that the global economic crisis is having an adverse impact on the ability of small firms to raise external credit. A survey undertaken in 2008 for the National Federation of Independent Business (NFIB)[1] on small firms' access to credit found evidence of a deterioration in the conditions for obtaining credit. It examined access to a number of the most common SME financing instruments in the US, including bank loans, credit lines and credit cards, and trade credit.

The survey found that banks were continuing to lend to SMEs, but that the general tightening of credit meant that this tended to involve the renewal and renegotiation of existing credit facilities, rather than new loan agreements. There was also evidence that SME lending by banks at more onerous interest rates, with more stringent loan conditions attached, and that the amount of the loan or size of credit lines was sometimes being reduced.

> 'Financial institutions changed the terms or conditions of a loan, line or credit card for 18 percent of small employers. Approximately 4 in 10 survey respondents (having renegotiated credit agreements) had experience negative changes to their credit arrangements'.

In the survey, 14% of SMEs having applied for external finance since the financial crisis began could only obtain some of the credit they wanted, with 34% unable to obtain credit at all, a marked change compared with earlier surveys. With regard to the availability of trade credit, again, supply appears to be strongly correlated with the business cycle. The NFIB survey found that the supply of trade credit had considerably tightened. *'Businesses have become more wary of lending to one another although the [economic] slowdown has not taken on the dimensions of large bank refusal to lend short-term money to other banks and even to established and well-managed large businesses'.* In other words, while bank lending diminished as a source of SME finance, trade credit has not experienced the same magnitude of reduction.

It should be noted that both the ECB survey and the survey of small businesses in the US were undertaken prior to the worsening of the global economic crisis

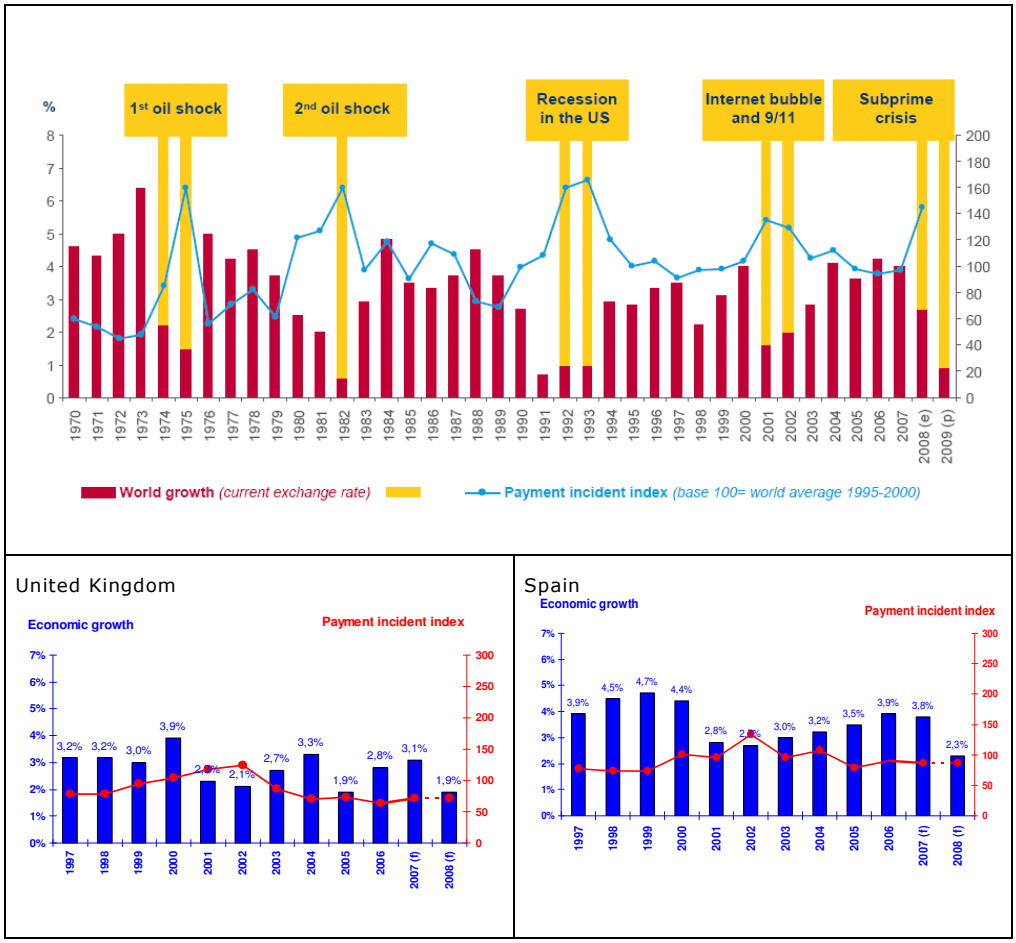
[1] National Small Business Poll (NFIB), Access to Credit, Volume 8, Issue 7 2008 ISSN - 1534-8326.

and credit availability in early autumn 2008.[12] It will be interesting to observe whether the position has ameliorated or deteriorated in follow-up surveys carried out in future.

2.4.4 *Payment incidents*

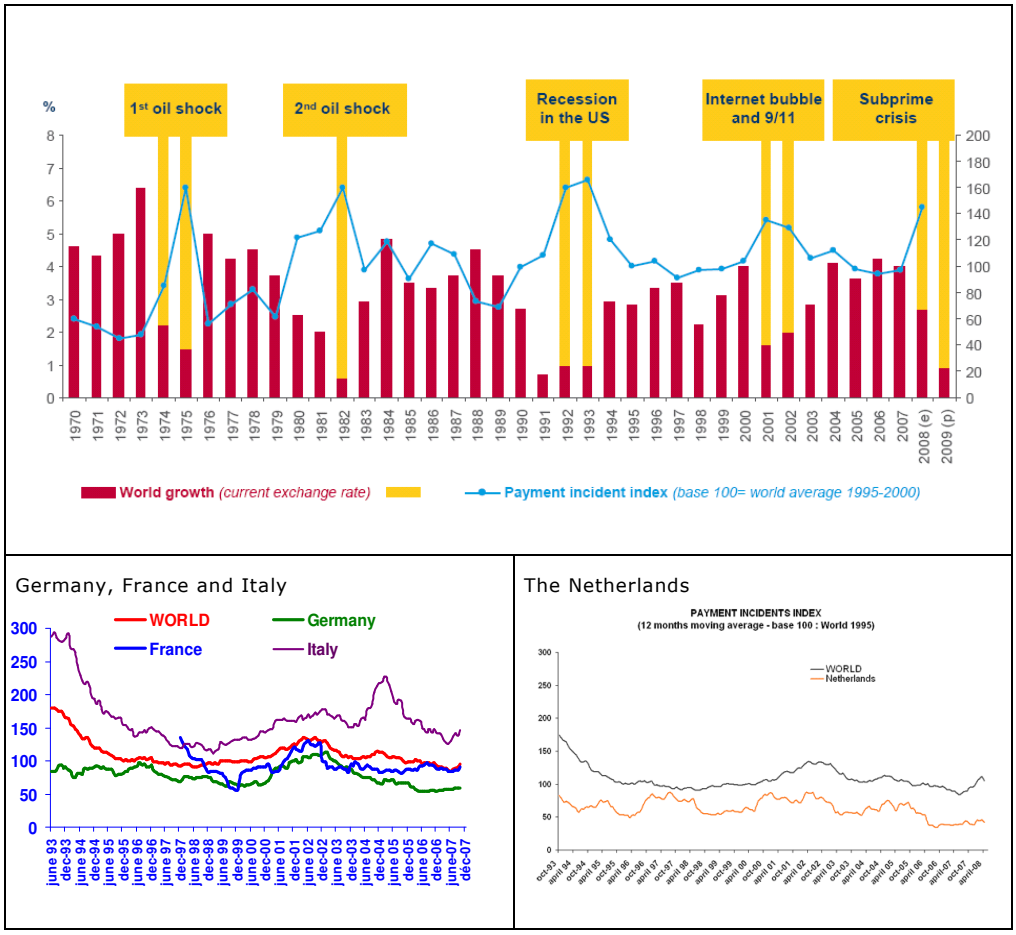
The tightening of bank lending criteria during downswings and recessions is the consequence of rise in payment incidents during those periods. During an economic downturn more firms show payment problems. The payment incident index reflects the evolution of non-payments on short term commercial transactions by enterprises. Payment incidents are counter cyclical, so financial risks vary with economic growth. The degree of the amplitudes of the payment incidents index differs by country. The relation between the payment incidence index and economic growth, and the difference in the degree of payment incidents between countries is presented in the next figures.

Figure 14 Development of the payment incident index in some countries, 1970-2008



[1] The Bank lending survey (BLS) of the ECB started in the beginning of 2003, during the last recession.

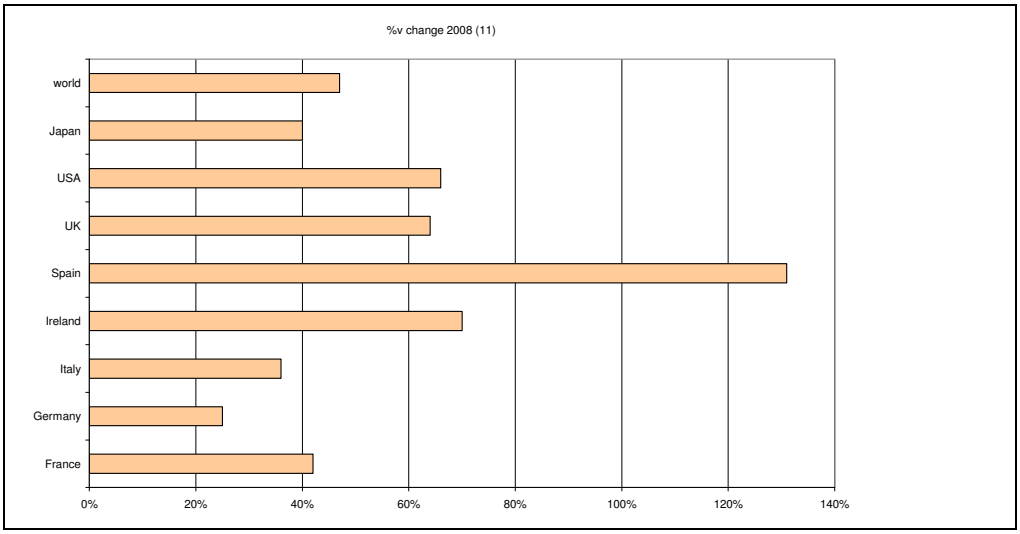
[2] The BLS shows in January 2009 that compared with October 2008 the bank lending criteria slightly deteriorated further for SMEs.



Source: Yves Zlotowski, Coface Risk Assessment, 2009, Coface (www.coface.com).

The impact of the current crisis on the payment incident index is large. In the first eleven months of 2008 the payment incident index dramatically increased for some western countries, as next figure shows. This holds in Europe especially for Spain and to a lesser degree for Ireland and the UK too.

Figure 15 Change of the payment incident index in some countries (%), 2008 (11 months)



Source: Coface 2009.

2.4.5 The impact on the cyclicality of SME finance of the Basel II rules

Another aspect of the research was to analyse the (preliminary) impact of the implementation of the new **Basel capital standards (Basel II)**[1] on the cyclicality of SME finance. The EU regulatory framework through which Basel II has been implemented was set out in the *Capital Requirements Directive (CRD)*. It came into effect at Member State level in January 2007. Since the Directive only came into force in January 2007, it should be emphasised that it is premature to deliver a robust assessment of its implications on access to finance for SMEs, and whether this has a cyclical dimension. The European Commission launched a review of the Directive in October 2008.

There are two main ways in which Basel II may impact on the cyclicality of SME finance. Firstly, increased risk sensitivity under Basel II could potentially adversely impact SME lending in a downturn firstly through the increased risk of default, which in turn may result in increases in the cost of capital. Secondly, traditional bank loans for SMEs could be affected in a situation where banks are obliged to reduce their overall volume of lending in order to maintain capital adequacy ratios, due to write-downs under 'mark-to-market' principles.

Basel II, like the previous Basel accord, was implemented under 'mark-to-market' principles, whereby the value of an asset or liability must be adjusted to reflect the current market price or 'fair value', compared with the historical cost price. Under the CRD Directive, if a bank experiences a decrease in the value of their assets (for example, linked to falling equities or write-downs in respect of more risky assets), then they should adjust the underlying asset value accordingly and ensure that sufficient capital is retained to reflect the new risk-adjusted bank capital ratio requirements.

While this is meant to make the financial system better able to manage risk, in periods of economic downturn, concerns have been expressed regarding the pro-cyclical impact of Basel II's risk-sensitive regulatory capital requirements, when combined with 'mark to market' fair-value accounting. In particular, there is a risk this may lead to a tightening of credit markets, and potentially knock-on consequences in terms of a reduction in bank lending to SMEs.

A background paper[2] conducted for the European Parliament in 2003 on the consequences for SMEs of the implementation of Basel II pointed out that 'risk-sensitive regulatory capital charges are likely to rise in situations of economic downturns. Consequently, capital requirements may become a limitation for granting loans and the resulting capital shortage may stimulate banks to minimize lending in an excessive way, which in turn could intensify the economic slowdown ("pro-cyclicality").

[1] Basel II is the second of the international Basel Accords, made by the Basel Committee on Banking Supervision, and made recommendations on banking laws and regulations, particularly regarding banks' capital adequacy ratios. The objective was to create an international standard for regulating how much capital banks need to set aside in order to ensure adequate systemic protection for the global financial system against risk.

[2] Background paper conducted for the European Parliament "The New Framework for Capital Adequacy (Basel II): Consequences for Small and Medium Sized Enterprises (SME) and Presentation of Political Options for the Implementation" EP/IV/A/2003/07/02.

The Basel Committee paid attention when devising the regulatory framework to the potential impact of the new rules on SMEs. In particular, concessions were made so that small firms with exposures of less than €1 million, and turnover of less than €75 million, will be treated as retail credits, rather than corporate loans. According to an ex-ante impact assessment report[1] by PWC in 2003:

> 'About 60% of bank loan exposures to SMEs are treated as corporate exposures and subject to the corporate IRB approach (with discounts applied to smaller companies depending on sales turnover). The remainder are treated as retail exposures, and are subject to the retail approach'.

Various papers have examined the potential impact of Basel II on SMEs on an ex-ante basis. There were mixed views as to whether Basel II would adversely impact the supply of access to finance for SMEs, and secondly whether there would be a pro-cyclical impact. EU-level organisations representing the interests of SMEs, such as UEAPME and Eurochambres, expressed some concerns in position papers[2] prior to CRD being adopted that despite some exemptions for small firms meeting defined criteria, there was a risk that banks may be reluctant to lend money to higher-risk ventures or only be willing to lend to SMEs at higher interest rates.

A research paper by the Bank of Spain (Banco de España) on the impact of Basel II on *Lending to small-and medium-sized firms: a regulatory policy assessment based on the Spanish Credit Register*[3] found that the risk-sensitive approach at the core of Basel II *'implies that credit financing to SMEs would probably require more capital than for larger firms requiring funding from banks'*. However, the paper also argued that this was justified since *'the probability of default (PD) by SMEs is greater than that of larger firms and the main aim of Basel II is to establish a closer link between credit risk and capital requirements'*.

The paper argued that the threshold for new capital requirements for lending to SMEs may have been set too high since the value of the asset correlation for SMEs was substantially lower than that for larger firms. An excessive level of capital requirements might have discouraging effects on the willingness of banks to grant loans to SMEs. *'Under the IRB-approach, the financing costs depend on the handling of the credit by the financial institution. If the credit is below one million Euro, a bank under certain conditions may consider the credit as retail businesses. On the other hand, financing cost typically increase, if the company has to be ranked under the IRB Approach in the risk category "corporate" and is hardly able to provide any collateral or other risk mitigation instruments. That is very likely and a threat for high-tech SMEs in particular'.*

[1] Study on the financial and macroeconomic consequences of the draft proposed new capital requirements for banks and investment firms in the EU, PWC report for DG MARKT, 2003.

[2] Review of Capital Requirements UEAPMEs comments on the 3rd Consultative Document issued by the European Commission, 22nd October 2003.

[3] Impact of Basel II on lending to small-and medium-sized firms: a regulatory policy assessment based on the Spanish Credit Register Jesús Saurina and Carlos Trucharte, Bank of Spain (note: research paper, not formal position of Bank).

The extent to which Basel II and the CRD Directive may be procyclical and the possible impact on access to finance for SMEs was also considered. The 2003 ex-ante impact assessment by PWC pointed out that:

> 'The extent to which risk-sensitive capital requirements will exacerbate economic cycles by ramping up capital requirements as credit quality worsens - has engendered considerable debate. {...}. It can be argued that the proposals will result in less, and in less damaging, pro-cyclicality. The greatest defence against pro-cyclicality will be the risk awareness of the lending institutions themselves and a more forward-looking approach to granting credit'.

In the National Bank of Belgium working paper referred to earlier[1], it is noted that, Nancy Masschelein writes that *'a number of central banks have raised concerns about the potential cost of pro-cyclicality that could come with the Basel II framework'*. While recognising these concerns, the paper found that although capital constraints play a role in *'reducing the availability of loans and that weakly capitalised banks may sometimes substitute away from high risk-weighted assets, it is unlikely that the CRD itself will have an effect on firms funding options and on the link between the credit cycle and the business cycle'.* It was argued that because financial systems are inherently pro-cyclical, Basel II will not in itself necessarily lead to greater cyclicality.

The paper identified a number of factors which suggest that bank lending is inherently pro-cyclical over and above the possible impact of Basel II, including: fluctuations in the quality of banks' and borrowers' balance sheets; information asymmetries between borrowers and lenders, and inappropriate responses by financial system participants, along with the notion that bank lending behaviour can be explained using theories of behavioural finance. The adverse impact on SMEs of pro-cyclicality linked to normal business cycle fluctuations in lending and borrowing behaviour was also noted.

[1] Monitoring pro-cyclicality under the capital requirements directive: preliminary concepts for developing a framework (October 2007 No 120).

3 Empirical framework and results

In this chapter, the results are presented of regression analyses of the impact of changes in the business cycle on changes in the supply of various forms of finance provided to SMEs. The analyses cover a range of European countries for the period 1996-2007. In section 3.1 the data and the model variables are presented. Section 3.2 provides some further methodological background to the analyses performed. The final sections describe the estimation results including discussion and interpretation.

3.1 Data and model variables

In this section a short description is provided of the data and key variables used. The aim of the empirical analysis is to explain variations, across countries and over time, in the supply of different forms of finance provided to SMEs. The main explanatory variable of interest is the effect of the business cycle, which is measured through changes in GDP. In order to capture the effect of the business cycle alone, several other variables with potential to influence the amount of financing supply had to be included in the model as well. The design of this particular part of the empirical study required a considerable effort in terms of data collection as data on various types of finance are not readily available on a harmonised basis for different countries. In fact, in order to construct a proper data set, various different sources had to be consulted. Not only data for various forms of finance from different sources had to be collected, but also for a given variable, available data sources did not generally include all countries considered in the present study at the same time. Hence, sometimes data also had to be collected for certain variables from country-specific sources. As a result of the diffuse way in which data had to be collected, many harmonisation checks between the different data sources had to be performed as well. For more details about the sources of the data and the construction of the data sets reference is made to Appendix I. Time series concerning the stages of the life cycle and business angels were not available for the countries selected.

Current actions to strengthen data on SME finance

There remains an issue around the lack of comprehensive data availability on the cyclicality of SME finance within the EU - an issue which this study has sought to address. There is much better data availability for some external sources of SME finance than others, as well as country-specific differences.

A challenge ahead is to build on the data analysis in the present study focused on 6-10 Member States and to improve the comparability and reliability of data on SME access to finance so that the cyclicality dimension can be tracked longitudinally more effectively. To this end, DG Enterprise and Industry (DG ENTR) commissioned a study in 2007 to map out data availability on access to finance for SMEs and to identify gaps. The aim of the *Evaluation of data and sources un-*

derlying the analysis of market gaps in access to finance for SMEs in the EU[1] was to assess the relevance, effectiveness and utility of the sources, types and methods of collection of information used by DG ENTR to analyse access to finance for SMEs in the EU.
Cooperation has also taken place between the Organisation for Economic Co-operation and Development (OECD) and the European Commission's Eurostat to develop indicators to measure developments in the area of entrepreneurship, including improving SME access to finance. *The Entrepreneurship Indicators Programme (EIP)* was launched in September 2006 and has led to the publication of an initial report[2], which includes some useful benchmarks.

A further relevant initiative to improve knowledge about access to SME finance was the launch of DG Enterprise's Enterprise Finance Index (EFI) website[3] in May 2008. This aims to provide user-friendly data and to identify trends in relation to the supply of access to finance for SMEs across EU Member States over time. The goal is to enable policy makers to better assess the effects of policies on SME finance across Europe.

3.1.1 Model variables

Four sources of financing

Four sources of financing to SMEs were examined through the research, viz. *bank loans*, *factoring*, *leasing* and *venture capital*. In the case of bank loans, we concentrate on long term bank loans (payable after more than one year), which can be divided into bank loans to small enterprises (with a turnover of less than € 10 million) and medium sized enterprises (with a turnover between € 10 million and € 50 million). The other three types of financing cover SMEs as well, but the data did not allow us to differentiate between small and medium-sized enterprises. For leasing and factoring, it appeared to be impossible to construct valid SME datasets at all.
For all types of financing we consider the change in total yearly amount[4] that was realised in actual market transactions (i.e. we consider realisations of finance to SMEs which is considered to be the market equilibrium clearing demand and supply for finance. Separate data on demand and supply of the various forms of finance are not available.

The database has been constructed by using several overall databases, supplemented with domestic databases from the countries selected for the study.

Explanatory variables

The main question is whether SME finance is cyclical and if so, whether this is determined (mainly) by supply or demand. GDP growth will be used as an indicator of the business cycle. The relationship between GDP growth and the four dif-

[1] Evaluation of data and sources underlying the analysis of market gaps in access to finance for SMEs in the EU, European Commission's DG Enterprise & Industry, 2007.

[2] Measuring Entrepreneurship: A digest of indicators OECD-Eurostat Entrepreneurship Indicators Programme.

[3] http://ec.europa.eu/enterprise/entrepreneurship/financing/enterprise_finance_index/index_en.htm.

[4] The data series used are at constant prices, so that inflation will not influence the developments over time.

ferent types of financing (i.e. the dependent variables) will tell us something about the cyclicality of SME finance. If it is indeed the case that SME finance is cyclical, then we would expect a positive correlation between GDP growth and (one or more of) the four types of financing examined.

Besides GDP growth there are of course additional variables that determine the supply and demand of credit. In this respect, the following control variables can be considered: *central government surplus*, *real interest rate*, *investment rate, solvability of enterprises* and *solvability of banks* (in the case of bank loans). Below these explanatory variables and their expected effect on the market equilibrium will be briefly discussed.

- *Central government surplus*: this variable is defined as the difference between the revenues and expenditure of central government. The lower the surplus (or the higher the deficit), the higher the need for the government to make use of external resources. This will increase the demand for credit. As a result, there will be less room for the private sector (i.e. firms) to get access to finance. Moreover, the increase in demand from the public sector will increase the price of credit (i.e. the interest rate), which makes it less attractive for firms to ask for credit. Hence a lower surplus is associated with lower amounts of external finance. Therefore central government surplus is expected to have a positive effect on the amount of credit that is provided to enterprises;
- *Real interest rate*: the real interest rate is the difference between the long term (nominal) interest rate and the inflation rate[1]. A higher inflation rate makes it more attractive to take credit (because of the lower value of money), but less attractive to provide credit. For the nominal interest rate it is just the other way around. In practice, the inflation rate and the nominal interest rate will most of the time go in the same direction. A higher real interest rate is expected to decrease the demand for credit;
- *Investment rate*: the investment rate is defined as total investment as a percentage of GDP and indicates to what extent countries are investing. Most investment requires external financing resources, therefore a higher investment rate can be expected to correspond with a higher amount of credit realisations;
- *Solvency of enterprises*: this variable is defined as the amount of capital and reserves as a percentage of total assets. It indicates how 'healthy' a firm is and to what extent it is able to make use of its own resources to finance for example an investment. Especially banks make use of solvency criteria when providing bank loans to firms. On the one hand, a higher solvency makes it easier to get access to finance (positive effect). On the other hand, the need to make use of external resources becomes smaller when the solvency is high (negative effect). Whether the positive effect or the negative effect dominates is an empirical matter;
- *Bank solvency*: this variable is defined similarly to the solvency of enterprises, namely the amount of capital and reserves as a percentage of total assets. The solvency indicates whether a bank is able to manage the risk that is attached to providing credit. The Basel I agreement required that the solvency

[1] The exact way to compute the real interest rate is to solve the following equation for ri: (1+ni) = (1+ri) * (1+i), where 'ni' denotes the nominal interest rate, 'ri' denotes the real interest rate and 'i' stands for the inflation rate. Taking the difference between ni and i provides an accurate approximation though.

must be at least 8% of the risk-weighted assets. Since Basel II (01-01-2008) the rules has somewhat changed. The assessment of the riskiness of each category was much cruder under Basel I than under Basel II. A higher solvency of banks is expected to increase the supply of credit, in this case bank loans.

Countries involved

The terms of reference for this study required at least 6 countries to be taken into account through the empirical research. In order to get a more robust dataset it was decided to extend country coverage. In the analyses, the following ten countries have been studied: *Austria*, *Belgium, Finland, France, Germany, Hungary, Italy, the Netherlands, Poland en the United Kingdom*. Unfortunately, for the Netherlands, data on bank loans to SMEs were not available. Hence, this country was replaced by Spain, for which data about bank loans to SMEs are available. Finally, in some specific cases, one or more countries dropped out because of a lack of data. More details about this are provided in section 3.3.

Time period

For every country/variable combination data have been collected from 1996 to 2007. However, for a few countries and/or variables data were not available for the whole period and consequently for those cases we were forced to work with a shorter time span. For more details about the exact countries and variables for which this holds, reference is made to Appendix I.

Finally, it is important to mention that the data allow us to say something about the realised market equilibrium, but that it is not a priori clear whether the final outcome is determined (mainly) by demand or by supply of the type of finance involved. In the case of bank loans an additional analysis is preformed investigating supply conditions.

Bank Lending Survey (BLS)

In order to get a better idea about the relation between supply and demand, the dataset of the Bank Lending Survey (BLS) of the ECB for 9 countries was also collected. The BLS is a quarterly survey where most private banks in the Euro zone, the UK, Hungary and Poland, are questioned about bank loans and criteria. The survey started for the Euro zone in the first quarter of 2003 and the last measurement was in the first quarter of 2009. The period includes the complete conjuncture cycle: two recession periods, a period of upswing, a period of boom and a period of downswing.

3.2 Methods and estimation strategy

When estimating the models, several empirical problems were encountered which required important methodological choices to be made. These problems relate to multicollinearity, outliers, and non-consistency of the estimated relations across different subgroups of countries.

Multicollinearity

Inspection of the data for the explanatory variables revealed that all of them are heavily correlated with GDP growth, a key indicator of the business cycle. Therefore, the inclusion of both GDP growth and the other explanatory (control) variables would lead to insignificant estimates, not because there would be no effect, but because of the very strong correlations among the explanatory variables. To overcome this problem, and since the main area of interest was in examining the effect of the GDP growth variable (measuring cyclicality), it was decided to adjust the other explanatory variables in such a way that estimation of the effect of GDP growth on SME finance would not be affected. To reach this aim, a set of auxiliary estimations was performed regressing each of the control variables (i.e. central government surplus, real interest rate, investment rate and solvability of enterprises) on GDP growth.

Next, for each control variable, the residuals of this auxiliary regression were used in the estimates explaining finance. In this way, GDP growth is no longer correlated with the control variables so that its impact can be measured properly, while still competing with other explanatory variables in a multiple regression framework. Concerning the measurement of the control variables, multicollinearity among these variables could still play a role, and therefore, next to a full model variant (variant I in the regression tables below), a variant is estimated that includes only the significant control variables from the full model (variant II) so that the impact of multicollinearity is reduced to a minimum.

Outliers

Outlier analyses were performed for each variant. In those cases where the (absolute) standardised residual of an observation exceeded three, the observation was mitigated to three times the standard deviation. This way the effect of the outlier on the estimations is reduced while the observation is still included in the estimation sample.

Differences in estimation results for different groups of countries

When inspecting correlations between SME finance and GDP growth on a country by country basis, we were struck by the variation in these correlations between the countries included in the present study. This variation makes it possible that full sample estimations (i.e. including all countries) do not provide a complete picture in the sense that negative and positive relations may be compensating each other, possibly resulting in a zero effect, while in fact for some countries the relation would be positive and for others the relation would be zero or negative.

To gain more insight into possible differences in the estimated relations between the countries, a variant was estimated using only those countries for which the correlation between (lagged) GDP growth and the type of finance concerned was positive. These estimates are reported in variant III of the regression tables below. In each case the exact sample of countries included in these variants is reported. It has to be stressed that these exercises provide insight in country differences in the investigated relations (i.e. it is possible to detect subgroups of countries for which there is a significant relation), it can however not be explained why the relation is different for one group of countries compared to another group of countries. These types of explanations are outside the scope of the present study.

3.3 Results of the econometric analysis

Below the results of the regression analyses been performed for the four different types of financing are outlined. From the analyses it appeared that the solvency of banks did not have a significant influence in any of the regressions[1], so this variable will not be presented in the tables below. Furthermore, the data about the solvency of enterprises is lacking for Hungary and the United Kingdom. This means that including this variable in the model, those two countries would not be investigated and as a consequence, the total number of observations would decrease. In the tables below therefore the solvency of enterprises variable is excluded, so that data for Hungary and the UK are included in the empirical analysis. However, the analyses including the solvability of enterprises has also been performed, the results of which can be found in Appendix II.

For each type of financing different variants have been estimated. Variant I is the full model, while variant II only includes GDP growth and other significant explanatory variables. Variant III includes only those countries for which the direct correlation between GDP growth and the type of finance concerned, is positive. These three variants are estimated for both current GDP growth (period t) and lagged GDP growth (period t-1), because the effects may emerge with a lag.

3.3.1 Bank loans

The first type of SME financing to be examined is bank loans. As mentioned in section 3.1, a distinction is made between bank loans to small enterprises and bank loans to medium-sized enterprises. The bank loans were scaled on the number of enterprises, because for some countries the main data source BACH provided the amounts for a subset of enterprises only: they are affected by changes in the composition of the sample population and therefore cannot directly be compiled as time-series.

The annual percentage change of bank loans per enterprise is the dependent variable in the analyses below (hereafter called bank loans). As mentioned before, a third variant is also introduced, because it was discovered that (the strength of) the relationship between GDP growth and bank loans differs between countries. This third variant covers only countries that have a positive correlation between GDP growth and bank loans[2].

Small enterprises

Table 2 shows the regression results for bank loans to small enterprises. In the full model there is no significant relationship between GDP growth (t) and bank loans. The same holds true for the other explanatory variables. All the variables have the expected sign, except for the real interest rate. This variable is, however, significantly correlated with the investment rate, so multicollinearity is likely to cause the coefficient and t-value to be inaccurate. Excluding Italy and Poland (III-a), which show a negative correlation between GDP growth (t) and bank loans, slightly improves the model. The t-value of GDP growth (t) has increased, but is still insignificant. The coefficient of government surplus is nearly significant (p-value =0.107). The interpretation of this coefficient is as follows: a

[1] In fact, t-values are always lower than one.

[2] This correlation does not necessarily have to be significant, a positive correlation is sufficient.

1%-point increase in government surplus will increase bank loans per enterprise with 1%.

The research did not identify a significant correlation between GDP growth (t-1) and bank loans using the full model (I-b) either. All variables have the expected sign, except again for the real interest rate. The significant coefficient can be ignored in this case, because of multicollinearity: removing government surplus and the investment rate causes the coefficient of the real interest rate to be insignificant (see variant II-b).

Excluding Belgium and Hungary considerably improves the relationship between GDP growth (t-1) and bank loans. This suggests that for the rest of the countries (Spain, Finland, France, Germany, Italy, Poland and the United Kingdom) there is a positive correlation between GDP growth (t-1) and bank loans. A 1%-point increase in GDP growth will increase bank loans per (small) enterprise with almost 2%. The other explanatory variables have no significant influence. It should be noted that the overall explanatory power of the models is quite low. For example, model III-c can explain only 9% of the variance in changes in the amount of bank loans per enterprise.

From Table 2 one can conclude that for the whole estimation sample (i.e. including all countries) there is no significant relation between bank loans to small enterprises and current GDP growth. However, for seven out of nine countries (Belgium and Hungary excluded) we have found a significant lagged effect of GDP growth on bank loans. For this majority of countries, the total amount of provided bank loans to small enterprises is cyclical, and the effect of the business cycle emerges with a one year lag.

Table 2 Regression analyses explaining annual relative change in bank loans per enterprise, small enterprises

	I-a[a]	*II-a*[a]	*III-a*[b]	*I-b*[a]	*II-b*[a]	*III-b*[c]
expl. variables	*GDP growth (t)*			*GDP growth (t-1)*		
GDP growth (t)	0,96	1,11	1,97			
	(0,83)	(0,95)	(1,28)			
GDP growth (t-1)				1,02	0,96	1,98**
				(0,90)	(0,85)	(2,55)
government surplus (% of GDP)	0,70		1,00[d]	0,68		
	(1,24)		(1,64)	(1,21)		
real interest rate	2,13			2,40*	1,20	
	(1,48)			(1,70)	(1,06)	
Growth of investment rate (%-point change)	1,16			1,42		
	(0,55)			(0,75)		
N	81	81	62	81	81	66
F	1.18	0.91	2.42	1.33	1.39	6.51
R^2	0.06	0.01	0.08	0.07	0.03	0.09

*t-values between brackets, * significant on the 10% level, ** significant on the 5% level, *** significant on the 1% level.*

[a] *this option involves the following countries: Belgium, Spain, Finland, France, Germany, Hungary, Italy, Poland and the United Kingdom.*

[b] *Italy and Poland are excluded in this option.*

[c] *Belgium and Hungary are excluded in this option.*

[d] *p-value = 0.107.*

Medium-sized enterprises

Tale 3 presents the results of the regression analyses for bank loans to medium-sized enterprises. The full model shows that there is no significant relation between GDP growth (t) and bank loans. The other variables are far from significant too. All variables, except for the real interest rate again, have the expected sign. For a subgroup of the investigated countries (Belgium, France, Germany, Hungary and the United Kingdom) there is a strong positive significant correlation between GDP growth (t) and bank loans. The other control variables do not have a significant influence here either. This model (III-a) can explain 18% of the variance in bank loans per enterprise.

The full model using GDP growth (t-1) presents a positive significant correlation between GDP growth (t-1) and bank loans. The other explanatory variables have more or less the same sign and t-values as in the full model under I-a. By removing these variables one may conclude that a 1%-point increase in GDP growth (t-1) causes bank loans per enterprise to rise with almost 3% (see II-b). The explanatory power of the model is, however, rather low. Excluding Austria, Hungary and Italy results in a stronger positive correlation and a higher coefficient of GDP growth (t-1). For the remainder group of countries the rest of the explanatory variables are insignificant too.

Table 3 Regression analyses explaining annual relative change in bank loans per enterprise, medium-sized enterprises

	I-a[a]	*II-a*[a]	*III-a*[b]	*I-b*[a]	*II-b*[a]	*III-b*[c]
expl. Variables	*GDP growth (t)*			*GDP growth (t-1)*		
GDP growth (t)	0,80	1,03	5,25***			
	(0,41)	(0,58)	(3,11)			
GDP growth (t-1)				3,11*	2,95*	3,97*
				(1,77)	(1,74)	(1,91)
government surplus (% of GDP)	0,29			0,26		
	(0,31)			(0,29)		
real interest rate	0,77			1,25		
	(0,35)			(0,57)		
Growth of investment rate (%-point change)	0,82 (0,25)			0,67 (0,23)		
N	93	93	47	93	93	67
F	0.15	0.33	9.67	0.84	3.02	3.63
R^2	0.01	0.04	0.18	0.03	0.03	0.05

*t-values between brackets, * significant on the 10% level, ** significant on the 5% level, *** significant on the 1% level.*

[a] *this option involves the following countries: Austria, Belgium, Spain, Finland, France, Germany, Hungary, Italy, Poland and the United Kingdom.*

[b] *Austria, Spain, Finland, Italy and Poland are excluded in this option.*

[c] *Austria, Hungary and Italy are excluded in this option.*

As for small enterprises, there is a significant positive relationship between GDP growth and bank loans for medium-sized enterprises. Again, the effect is lagged, which means that the negative consequences of a decreasing business cycle with respect to bank loans will not occur immediately, but after a period of time (in this case one year). The cyclicality of bank loans is stronger for medium-sized enterprises compared to small enterprises. First, the (lagged) effect of GDP is significant for the whole sample of countries instead of only a subgroup of countries. Second, coefficients are much stronger for medium-sized enterprises compared to small enterprises.

It is worth mentioning that although a significant positive correlation was found between lagged GDP growth and bank loans, only a small fraction of the variance in bank loans can be explained by GDP growth. For five countries (i.e. Belgium, France, Germany, Hungary and the United Kingdom) an immediate effect of the business cycle on bank loans is observed and moreover, the effect is stronger and explains a higher proportion of the variance in bank loans (see III-a).

Finally there is a difference between countries in terms of the degree of cyclical effect on bank loans. For both small and medium sized enterprises, Belgium, France and Germany in particular show a positive correlation between GDP growth (t) and bank loans. This holds somewhat less strongly for Hungary and the United Kingdom. For Austria, Italy and Poland there is no such correlation at all. Concentrating on the impact of GDP growth (t-1) on bank loans, it can be

concluded that for both small and medium sized enterprises there is a lagged cyclical effect on bank loans for Spain, Finland, France, Germany, Poland and the United Kingdom. Such a correlation is not found at all for Austria and Hungary.

ECB Bank Lending Survey

Having seen that GDP growth and the supply of bank loans are closely related to one another, the question still remains whether a lower total amount of bank loans in times of decreasing economic growth is mainly caused by lower demand or a lower supply of finance to SMEs. The latter cause would imply that access to finance (bank loans in this case) becomes more difficult in times of low (or even negative) economic growth. In order to answer this question the ECB Bank Lending Survey was examined. The main objective of this survey is to enhance the Euro system's knowledge of financing conditions in the Euro area and hence to help the Governing Council of the ECB to assess monetary and economic developments as an input into monetary policy decisions[1].

The survey contains 17 specific questions on past and expected credit market developments. The former cover developments over the past three months, while the latter focus on the subsequent three months. The survey is carried out once every quarter. One particular question included in the ECB survey is especially relevant to this study. It is formulated as follows:

Over the past three months, how have your bank's credit standards as applied to the approval of loans or credit lines to enterprises changed?

There are five possible answers to this question: 1) *tightened considerably*; 2) *tightened somewhat*; 3) *remained basically unchanged*; 4) *eased somewhat* and 5) *eased considerably*. The question is answered for bank loans with respect to SMEs and those with respect to large enterprises. For this study, the focus is on the first category only. For several countries the answers on this question were collected and the weighted average of all answers was calculated. Hence one standard was created, which can be compared over time and across countries. The standard is constructed so that a higher value corresponds to a more tightened lending policy of banks with respect to the approval of loans or credit to SMEs. The data is collected from the first quarter of 1996 until the third quarter of 2008 (for some countries available data covered a shorter time span, see Appendix I).

For several countries[2] the correlation between the outcome of the ECB Bank Lending Survey and GDP growth (quarterly) is presented in Table 4. Considering the total group of countries, there appears to be a significant negative correlation between the change in criteria of supplying bank loans to SMEs of the ECB Bank Lending Survey and GDP growth. This means that it does indeed become more difficult to get access to finance when GDP growth is decreasing. For individual countries there is no significant negative correlation in Austria, the Neth-

[1] See http://www.ecb.int/stats/money/lend/html/index.en.html#description for more details about the survey.

[2] Unfortunately these countries do not completely overlap with the countries we used in the regression analyses regarding bank loans. However, most of the investigated countries are the same.

erlands en Poland, while for the remainder of the countries there an inter-relationship was identified. For all countries the correlation is negative though. To a large extent, this corresponds with the relationship between GDP growth and bank loans for each country that was presented above in the regression tables.

Nevertheless it could still be possible that the correlation between GDP growth and the *demand* for bank loans is even stronger than the correlation between GDP growth and the *supply* of bank loans presented in Table 4. In that case demand conditions would be the main driver of the cyclicality results obtained in the regression analysis. However, based on Figure 13 presented in section 2.3.3 we consider this unlikely. By and large, the figure shows that changes in supply conditions lag behind changes in demand, and moreover, that the gap is bigger during recession periods compared to boom periods. Based on the results from Table 4 in combination with the findings from Figure 13, we consider it likely that the findings from the regression tables concerning cyclicality of bank loans to SMEs mainly refer to the supply side of the capital market and to a smaller extent to demand-side effects.[1] As also seen in Chapter 2, more studies confirm that a financial crisis as we have now and was going on in 1998 in Asia is having an adverse impact on the ability of firms, especially SMEs, to raise bank loans.

[1] We recognise that the ECB bank lending survey results are based on qualitative rather than quantitative data, and at best are only an approximation of demand and supply dynamics. As explained in section 2, there are several indications that most of the time the supply side is leading. The tightening of the terms of approving loans deals include multiple factors such as price, non-interest charges, the size of the loans, loan covenants or collateral requirements. In 2008 they all strengthened the tightening of the loan terms.

Table 4 Correlation between outcome ECB Bank Lending Survey and quarterly GDP growth

country		*GDP growth (t)*
all countries	Pearson correlation	-0.37***
	N	154
Euro zone	Pearson correlation	-0.55***
	N	24
Austria	Pearson correlation	-0.27
	N	24
Belgium	Pearson correlation	-0.43**
	N	24
France	Pearson correlation	-0.73*
	N	6
Germany	Pearson correlation	-0.37*
	N	24
Italy	Pearson correlation	-0.47**
	N	24
Netherlands	Pearson correlation	-0.33
	N	24
Poland	Pearson correlation	-0.15
	N	21
United Kingdom	Pearson correlation	-0.83**
	N	7

* *Significant on the 10% level.*

** *Significant on the 5% level.*

*** *Significant on the 1% level.*

In the next three subsections the econometric analyses for factoring, leasing and venture capital are presented.

3.3.2 Factoring

Factoring is the second type of financing that will be discussed. The dependent variable in the analyses is the annual percentage change of the total value of factoring for SMEs. Results from the regression analyses for factoring are presented in Table 5. The results show that there is a strong positive significant correlation between current GDP growth (i.e. period t) and factoring. The investment rate as well as the government surplus do not have a significant effect on the amount of factoring. The coefficient of the real interest rate is quite significant at 10% level and it shows that a higher real interest rate will lower the amount of factoring (see variant II-a). Model II-a explains 13% of the variance in factoring and it can be concluded that a 1%-point increase in GDP growth (t) will increase the amount of factoring with almost 7%-point. The same conclusions hold to a large extent for the lagged model (II-b).

Considering demand and supply effects, the data used for the regressions refer to transactions actually realised, so we cannot distinguish between these separate effects. Unlike bank loans, for factoring we have no additional information available concerning supply and demand conditions. However, we speculate that supply side effects may be more important. On the one hand, in recession peri-

ods it will be more difficult to cash outstanding claims with debtors, *increasing* the demand for factoring. On the other hand, factoring companies will tighten conditions under which they are willing to take over a set of (risky) outstanding claims. Based on this reasoning the lower amount of factoring realised in recession periods (i.e. the significant cyclicality result presented in Table 5) is more likely to be due to a lower supply of factoring (i.e. higher costs for SMEs who would like to outsource the cashing of their claims to a factoring company), than to a lower demand for factoring services.

Table 5 Regression analyses explaining annual relative change in factoring

	I-a	*II-a*	*I-b*	*II-b*
explanatory variables	*GDP growth (t)*		*GDP growth (t-1)*	
GDP growth (t)	6,93***	6,85***		
	(3,38)	(3,36)		
GDP growth (t-1)			6,83***	7,07***
			(3,30)	(3,46)
government surplus (% of GDP)	-1,13		-1,43	
	(-1,00)		(-1,26)	
real interest rate	-2,53	-2,99[a]	-2,08	
	(-1,20)	(-1,47)	(-0,98)	
Growth of investment rate (%-point change)	-0,26		2,65	
	(-0,07)		(0,72)	
N	109	109	109	109
F	4.02	7.57	3.97	11.97
R^2	0.13	0.13	0.13	0.10

*t-values between brackets, * significant on the 10% level, ** significant on the 5% level, *** significant on the 1% level.*

Countries involved: Austria, Belgium, Finland, France, Germany, Hungary, Italy, the Netherlands, Poland and the United Kingdom.

[a] p-value = 0.145.

3.3.3 Leasing

From the regression results, as presented in Table 6 below, it is clear that there is a cyclical effect on the amount of leasing. Models I-a and II-a show a strong significant relation between GDP growth (t) and leasing. Moreover, the amount of leasing also depends on the investment rate, which is positively correlated with leasing. The effect of GDP growth (t) is somewhat lower than for factoring, but it is still substantial. Furthermore, the explanatory power of the model is relatively high, since it explains 29% of the variance in the amount of leasing.

The lagged model shows almost similar results with respect to GDP growth and the investment rate. In addition, the coefficient of government surplus is significant too and it has a negative correlation with leasing, which is unexpected. Note however that the effect of GDP growth is consistently positive across all model variants. It can also be noted that for leasing the current effect of GDP is higher than the lagged effect, suggesting an immediate impact of the cycle on the amount of leasing.

Again, our data do not allow us to distinguish between demand and supply effects. In the case of leasing we speculate that in recession periods leasing companies are more careful with leasing tangible assets to small firms (lower supply). On the other hand, firms will cut down on terms of employment causing a decrease in, for instance, the use of lease cars by employees (lower demand for leasing services). It is not clear which effect dominates.

Table 6 Regression analyses explaining annual relative change in leasing

	I-a	*II-a*	*I-b*	*II-b*
explanatory variables	*GDP growth (t)*		*GDP growth (t-1)*	
GDP growth (t)	4,54***	4,56***		
	(4,33)	(4,38)		
GDP growth (t-1)			3,12***	3,05***
			(2,97)	(2,90)
government surplus (% of GDP)	-0,87	-0,85	-1,16**	-1,12**
	(-1,58)	(-1,56)	(-2,11)	(-2,03)
real interest rate	0,67		1,75	
	(0,46)		(1,19)	
Growth of investment rate (%-point change)	3,73*	3,41*	5,77***	5,09***
	(1,96)	(1,94)	(3,27)	(3,04)
N	67	67	67	67
F	6.26	8.38	5.78	7.18
R^2	0.29	0.29	0.27	0.26

*t-values between brackets, * significant on the 10% level, ** significant on the 5% level, *** significant on the 1% level.*

Countries involved: Austria, Belgium, Finland, France, Germany, Hungary, Italy, the Netherlands, Poland and the United Kingdom.

3.3.4 Venture capital

The final type of financing that will be discussed is venture capital investments.[1] Here too, a significant positive correlation was found with GDP growth (t). The cyclical effect was moreover very strong; a 1%-point increase in GDP growth causes the amount of venture capital to increase with almost 13% (see variant II-a). The other explanatory variables are all far from significant. The explanatory power of the model is with only 6% quite low.

Remarkably, no significant relationship with GDP growth was identified (t-1). This implies that the cyclical effect is working immediately or in other words, that demand and supply of venture capital to SMEs will react instantly on a change in economic growth.

[1] For VC, investment figures have been used. On the country level no fund raising data were available.

Again, we do not have data concerning demand and supply conditions for venture capital for the separate countries.[1] However, it seems more likely that during recessions VC investments are limited by the raised funds (supply side effect). The aggregated data for Europe for the period 1998-2007 (source EVCA) confirm that fund raising is more cyclical than investments. There are strong signs that at this moment venture capitalists have problems to attract money. In the USA investors, alarmed by uncertainty in the economy, shut the initial public offering window for venture-backed companies in the first quarter of 2008. The last time that this happened was in 1978.[2] In the third quarter of last year there was only 1 initial public offering (IPO).[3]

Table 7 Regression analyses explaining annual relative change in venture capital

	I-a	*II-a*	*I-b*	*II-b*
explanatory variables	*GDP growth (t)*		*GDP growth (t-1)*	
GDP growth (t)	13,64**	12,82**		
	(2,45)	(2,34)		
GDP growth (t-1)			-0,21	0,10
			(-0,03)	(0,02)
government surplus (% of GDP)	-1,37		-1,77	
	(-0,48)		(-0,61)	
real interest rate	6,67		6,13	
	(1,21)		(1,08)	
Growth of investment rate (%-point change)	6,51		13,92	
	(0,63)		(1,38)	
N	82	82	82	82
F	1.76	5.48	0.65	0.00
R^2	0.08	0.06	0.03	0.00

*t-values between brackets, * significant on the 10% level, ** significant on the 5% level, *** significant on the 1% level.*

Countries involved: Austria, Belgium, Finland, Germany, Hungary, Italy, Poland and the United Kingdom.

3.4 Conclusions and discussion

In this chapter the effect of the business cycle on various forms of finance to SMEs is investigated. Data have been collected and a regression model constructed where variations in the amount of finance of a specific type were explained by (lagged) GDP growth and various control variables. The data have been collected from many different sources, as harmonized data on a country-by-country basis on the various forms of finance were not available from one source.

[1] As shown in Chapter 2 both investments and raised funds are cyclical.

[2] Bandyk, Matthew, A venture capital crunch?, in Small business and entrepreneurs, July 2008.

[3] Tomkins, Benjamin, Financial Crisis: Venture Capital Drying Up, October 2008.

3.4.1 Data availability

For this study it appeared to be possible to build a dataset for four types of financing SMEs. The financing types are:

- long term bank loans for micro/small and medium sized enterprises;
- venture capital for SMEs;
- leasing (no size classes);
- factoring (no size classes).

The period covered through the research was generally 1996 - 2007, but this differed between countries depending on data availability. As only a few complete international databases were available databases had to be constructed. The databases for the four financing types have been constructed by bringing together several databases and making 'best guesses' of missing data. Beside these datasets of financing types several explanatory variables have been collected, like GDP, central government surplus, real interest rates, and solvability of SME firms and bank. In addition the dataset of the Bank Lending Survey (BLS) of the ECB for the Euro zone and 9 countries was collected.

It was not possible to collect a time series dataset for the stages in the life cycle and for business angels.

As such, the database constructed in the framework of the present report has a unique value in its own right, as this type of data are not usually brought together for different countries in one database.

3.4.2 The results of the econometric analysis

For bank loans it was possible to make separate regressions for loans to small and medium-sized firms. For factoring, leasing and venture capital, data did not allow us to distinguish between firms of different sizes, and the regression results for these types of finance refer to the aggregate group of SMEs. In general, the variance in the various forms of finance in the database that could be explained by the models was quite low, so that one has to be careful when drawing conclusions from the regression exercises. Notwithstanding this limitation, various conclusions can be drawn from the analysis. The results can be summarized as follows.

For bank loans to *small* firms a significant but small effect was found of the business cycle on these bank loans. The effect is valid only for a subset of the countries considered in the present study (although the countries included represent a majority of the total sample), and the effect comes with a one year lag. The small effect suggests the business cycle does not have much impact on the amount of finance provided to small firms. This might point to the phenomenon of credit rationing, i.e. a situation in which banks providing finance to small firms may find it difficult to screen the quality of the firm requesting a loan, and as a result, that many requests will be turned down. The results of the analyses suggest that this phenomenon takes place in boom periods as well as in recession periods, i.e. it is independent of the business cycle.

Also for bank loans to *medium-sized* firms a significant positive effect of the business cycle on these bank loans was found. However, these effects are bigger and they also hold for all countries (not only a subset), although for certain countries the effect is bigger than for other countries. Again, there is a lag involved in the cyclicality effect. As medium-sized firms signal some quality to the

banks in the sense that they already reached a certain scale, credit rationing might occur less often, and banks may be more willing to provide finance. The results suggest that the actual amount of bank loans to medium-sized firms then depends on the business cycle, suggesting that banks have more room to lend money in times of high economic growth.

Although these regression analyses refer to the realizations of bank loan transactions (i.e. we do not know the demand and supply of bank loans), an additional analysis using data from the ECB Bank Lending Survey showed that the cyclicality effects found in the regressions are likely to refer to the supply side of the capital market instead of the demand side.

For the other three forms of finance to SMEs considered in the present study, i.e. factoring, leasing and venture capital, bigger effects (coefficients) of GDP growth than for bank loans have been found. Contrary to bank loans, these effects materialize immediately and not with a lag. Of the different forms of finance the cyclicality of venture capital is by far the largest.

One may wonder what this study means in terms of the current financial crisis. Of course, as the empirical analysis has been performed using data prior to the crisis, one has to be careful in interpreting the results in the light of the financial crisis. Nevertheless, the results seem to imply a need for governments to stimulate the venture capital market. It is a fact that currently banks are very reserved in providing loans, hence the role of other forms of finance, in particular venture capital, should become more important. However, as venture capital has proven to be very cyclical and since we are currently in a period of recession in many European countries, this result implies the supply of venture capital should currently be low, possibly calling for government intervention. Governments might attempt making venture capital transactions more attractive to venture capital providers and help venture capitalists to get financial means to invest in risky but likely successful firms, like gazelles and innovative young firms. This might increase the supply of venture capital finance.

4 The analysis in the context of the financial crisis

4.1 Impact of the financial crisis

A credit crunch is a reduction in the general availability of loans (or credit) or a sudden tightening of the conditions required to obtain a loan from the banks. It generally involves a reduction in the availability of credit independent of a rise in official interest rates. In such situations, the relationship between credit availability and interest rates has implicitly changed. Credit becomes less available at any given official interest rate, or there ceases to be a clear relationship between interest rates and credit availability, so credit rationing might occur.

The current financial crisis severely affects access to finance for SMEs. The tightening of market conditions for access to credit and late payment issues from clients are making it hard for SMEs worldwide to meet their working capital requirements. They are seeking alternative ways to source finance for the growth of their business, in particular through equity financing if they are at the early stage of their development.

A side effect of the crisis is that it has generated an unexpected flow of capital to business angel networks (BAN) across Europe which could suggest that there are presently supply-side problems for SMEs in accessing more traditional bank credit. This is creating some important challenges for early stage investors but also opportunities which policy makers should help to tackle and leverage.[1]

If one looks at the change in the criteria banks use, we see according the BLS of the ECB a great similarity between the situation now and that in the beginning of 2003, despite all reports in the media. See for this Figure 12 in Chapter 2. In that period we had a recession too and the change in bank lending criteria for SMEs (tightening) with respect to the preceding quarter was almost identical.

4.2 'What if' analysis to assess possible effects on financing SMEs

In this section the effect of decreasing economic growth on the four different types of financing will be illustrated, using the results from the econometric analyses. To do this, use will be made of three different scenarios; an optimistic, a realistic and a pessimistic scenario.

The optimistic scenario is characterized by annual economic growth of -1.5% (which is again measured by changes in GDP growth). The realistic scenario assumes annual growth of -2.5%. Finally, the pessimistic scenario presumes annual growth of -4%. The average economic growth across all countries will probably not be that low, however, not all countries are harmed equally by the current financial and economic crisis, so that this pessimistic scenario could appear to be reality for some specific countries. The same reasoning holds the other way around for the optimistic scenario. The scenarios give in fact the range of forecasts for several European countries for 2009.

[1] EBAN statement on the financial crisis, February 6th, 2009.

These scenarios will show us how the four different types of financing will be affected by an economic downturn. It is important to note that the effect of GDP growth is presented under the ceteris paribus assumption (so, all other factors are assumed to stay unchanged). The outcome of the different scenarios is based on the effect of economic growth on SME finance in the past ten years. Besides the decreasing economic growth nowadays, the low degree of trust between financial organizations, that provide loans and credit to enterprises, will only strengthen the negative effects on the provision of the different types of financing. On the other hand, a low degree of trust leads to less provision of loans and credit, which will decrease investments and ultimately economic growth. So, in a way this is included in the analysis below.

The outcome of the three different scenarios is presented in Table 8 below. For bank loans the value per enterprise is used (see appendix I for more details). Therefore one has to assume that the number of enterprises is constant over time, which makes it possible to say something about the precise effect of GDP growth on the relative change in bank loans per enterprise. Furthermore, as a result the cyclical effect across the different types of financing can also be compared.

For bank loans to small enterprises it can be concluded that the cyclical effect is relatively small. Moreover, the effect only holds for a subset of countries, which we have seen in the previous chapter as well. In the realistic scenario, the total amount of bank loans to small enterprises is decreased by 5%. The cyclical effect on bank loans to medium sized enterprises is somewhat larger though. In the realistic scenario a negative effect occurs of 7.4% on the realization of bank loans to medium-sized enterprises. In the pessimistic scenario the decrease would even be larger, that is 11.8%. Note that cyclical effect is even larger for a subset of the countries (i.e. Belgium, France, Germany, Hungary and the United Kingdom), see also Table 3 model III-a. For those countries the realistic scenario would imply a decrease of 13.1% and the pessimistic scenario would result in 21% less bank loans for medium sized enterprises.

Table 8 Effect of decreasing economic growth on different types of financing

	effect of decreasing economic growth on relative change of different types of financing		
	optimistic (-1.5%)	*realistic (-2.5%)*	*pessimistic (-4%)*
bank loans to small enterprises*	-3.0%	-5.0%	-7.9%
bank loans to medium sized enterprises	-4.4%	-7.4%	-11.8%
factoring	-10.3%	-17.1%	-27.4%
leasing	-6.8%	-11.4%	-18.2%
venture capital	-19.2%	-32.1%	-51.3%

** This only holds for a subset of the countries, namely: Spain, Finland, France, Germany, Italy, Poland and the United Kingdom. For the total set of countries we did not find a significant cyclical effect.*

The cyclical effect on the realised amount of factoring is substantial. Even in the optimistic scenario there will be a decrease of 10.3%. In the realistic and pessi-

mistic scenarios, the decline would raise to 17.1% and 27.4% respectively. The same conclusions hold to a somewhat smaller extent for leasing too. Finally, venture capital will be harmed most by a decrease in economic growth. In the realistic scenario, the regression results predict a decline of 32.1%. The amount of venture capital is thus seriously influenced by the business cycle. If things turn out to be even worse than expected now (i.e. if economic growth is -4%), the amount of venture capital will be more than halved.

The results above show that a substantial decrease in economic growth has a considerable negative effect on the provision of the four types of financing presented in the table above. Moreover, the outcome presented above is only the result of a ceteris paribus decline in GDP growth. In reality, the negative effects of decreasing economic growth, increasing government budget deficits, lower investments and a lower level of trust between financial and monetary institutions could strengthen each other, which will ultimately result in even less provision of loans and credit to enterprises than is expected now.

5 Policy measures to stimulate access to finance for SMEs

In this chapter, we examine:
- The role of the public sector in addressing market failures and in tackling the cyclical nature of some types of access to finance for SMEs
- EU and national instruments to stimulate the provision of access to finance
- Additional measures having been adopted at EU and national level to address the global economic crisis and to stimulate access to finance for SMEs
- Measures that might reduce the cyclicality of SME finance.

During economic downturns, obtaining access to finance on reasonable terms and conditions is widely perceived to be a worse problem for SMEs than their larger counterparts. This has been partially confirmed through the econometric analysis and in the literature review, although the extent to which there is a correlation varies between financial instruments. A key issue is what role the public sector should play in promoting access to finance, and in addressing supply-side bottlenecks linked to cyclical downturns. This is especially relevant in the context of the current global credit crisis.

The role of the public sector in increasing the supply of finance to SMEs is driven by the need to address market failures in particular areas, including failures linked to cyclical factors. While there is no general market failure in the supply of SME finance, there is evidence of market failure in some specific areas, including: a gap in seed and early stage finance, especially for high-growth and medium and high technology firms; an insufficient supply of funds and inadequacy on the demand side (in terms of investment-readiness) and a gap in the provision of venture capital funding up to €0.5 million. In some EU countries, there is a lack of interest from VC's in investing in SMEs unless the funding sought is in excess of € 3 - 5 million, due to the high administrative costs of investing in individual smaller firms.
There may also be more general market failures in the supply of finance to SMEs during particular periods of time due to business cycle fluctuations which closely influence demand and supply for credit. The present global economic crisis provides a good illustration of how the supply of credit to SMEs may rapidly change, with a consequent need for public intervention. For example, recent surveys of SMEs' financing conditions suggest there has been a tightening of credit availability (see Chapter 2).

5.1 New measures adopted to address market failures

While the focus of this study is on establishing the extent of a correlation between cyclicality and access to SME finance across 4 different types of financial instruments, it is also important, in the context of the current economic crisis, to consider measures already being adopted to address market failures.
We firstly summarise examples of publicly funded measures at EU and national level which help directly and/ or indirectly stimulate the supply of finance to SMEs. Policy responses to the cyclicality of SME finance are then examined.

EU financial instruments such as the EU Structural Funds and the Competitiveness and Innovation Programme 2007-2013 (CIP) play an important role in stimulating improved access to finance for SMEs. Through the CIP, the European Investment Fund (EIF) manages various instruments designed to improve access to finance, including:

- The High Growth Innovative Scheme, providing risk capital for innovative SMEs in their early stages (GIF1) and in their expansion phase;
- The SME Guarantee Facility, providing loan guarantees to encourage banks to make more debt finance available to SMEs, including microcredit and mezzanine finance, by reducing the banks' exposure to risk;
- The Seed Capital Action and the Partnership Action, which helps reinforce the capacity of financial intermediaries to invest in and lend to SMEs.

These instruments provide a stimulus to banks and venture capital funds to work with the public sector so as to increase the supply of finance to SMEs at national level (the EIF does not provide financing directly to SMEs). SME financing instruments supported by the CIP have a budget of over one billion Euros over the 2007-2013 period. The European Commission estimates that this should leverage approximately €30 billion of new finance for SMEs from the private sector. The EIF is also responsible for managing a new €1 billion facility set up by the European Investment Bank (EIB) to provide mezzanine finance to SMEs.
The Joint European Resources for Micro to Medium Enterprises (JEREMIE) is another important instrument in the 2007-2013 period to improve SMEs' access to finance in European regions. The fund is backed by the European Investment Bank (EIB) and will be implemented by the European Investment Fund (EIF). The purpose of JEREMIE is to enable EU Member States and regions to use the EU Structural Funds' European Regional Development Fund (ERDF) to develop financial instruments specifically designed to support micro and small and medium enterprises. JEREMIE is designed to achieve regional policy objectives and focuses on equity and venture capital and guarantees (both for micro credit loans and SME loans).
The role played by publicly-backed SME financing schemes at national level, such as the Regional Venture Capital Funds in the UK, should also be mentioned. These contribute towards increasing the overall supply of risk capital finance for SMEs. While some of these funds receive a combination of EU funding and national co-financing, others are funded through national public money alone.
It is now worth considering policy responses within the EU to the global credit crisis to stimulate the supply of SME finance (the availability of external finance) and to improve financing conditions for SMEs (the terms on which finance can be obtained, e.g. the cost of capital, duration of loans, terms and conditions of loans including collateral requirements etc.).

We now set out examples of some specific recent initiatives adopted by EU and national policy makers in response to the current credit crisis.

With regard to measures taken to support the supply of finance to SMEs at EU level, the European Investment Bank in late 2008 announced an initiative to significantly increase the volume of lending to SMEs during 2008 and 2009 through the provision of additional loan guarantees for SMEs, with an additional €15 billion being earmarked over the next two years to be implemented through the EIB's network of private sector partner banks. The objective was to keep 'banks lending to small firms' in recognition of the fact that credit supply may be con-

siderably tightened during the recession, given the cyclical nature of some types of SME finance, particularly traditional bank loans (evidence of cyclicality was presented in the ECB banking survey, as well as in Chapter 4, which outlined the statistical findings, although the datasets used pre-date the present ongoing crisis).

Policy actions have also been taken in a number of Member States to stimulate bank lending to firms adversely affected by the seizing up of credit markets.

In Finland, for example, Finnvera, a company owned by the Finnish state specialised in the provision of SME financing instruments, has adopted a number of counter-cyclical financing measures in January 2009. This was designed to address the increased difficulties SMEs face in obtaining financing from alternative sources and also reflected the consequent increase in demand from SMEs for state-backed loans, loan and export guarantees and venture capital. As part of this initiative to improve access to finance, Finnvera significantly increased the threshold of its financial commitments to different types of financial instruments for SMEs.

In the UK, public authorities, working together with private banks, have provided funding of €3.5 billion in order to assist SMEs through the credit crisis. The types of finance being provided include traditional debt finance with lower loan interest rates, flexible business loans, and short-term trade finance essential to keep imports and exports flowing. The funds will be distributed by twelve regional funds.

In instances where national authorities have intervened to support the capital position of banks, such as the UK and France, 'bail-out' funding has been made conditional upon a certain proportion of the funds being made available to ensure the continuation of lending activities to SMEs, including some provision for new lending.

In the Netherlands, the government has taken several initiatives to fight the impact of the financial crisis on the ability of SMEs to access finance. These include tax reductions for business angels, expanding the availability of guarantees on personal and SME savings, allowing the more rapid depreciation of assets and the enlargement of EIB-backed funding schemes being implemented by national intermediaries such as the growth facility (loan guarantee for financing risky investments of SMEs), micro-financing for start-ups, and enlargement of the SME loan guarantees for SME. In order to avoid that innovation plans in SMEs will break down, the possibility of registering on the SBIR programme[1] is enlarged.

[1] The Dutch government experiments since 2004 with a small scale Small Business Innovation Research (SBIR) pilot programme inspired by the US SBIR programme. Contracts are awarded in a three-phase competition: feasibility, research phase and commercialization. The unique feature of the SBIR programme is that the contracting authority fully funds the first two phases, whilst the resulting intellectual property remains with the company. This way, especially SMEs are encouraged to become more innovative.

5.2 Measures to stimulate access to finance for SMEs and to fight cyclicality in the SME's access to finance

The econometric research established evidence of linkages between some forms of access to finance for SMEs and business cycles, with an especially strong correlation between GDP and the demand and supply of bank loans and venture capital. In this section, we examined the role of the public sector in addressing general market failures (e.g. for example, the lack of venture capital below a certain size threshold in less favoured regions benefiting from cohesion policy interventions), as well as failures linked to cyclical factors (e.g. steps taken by policy makers during the global crisis to address access to finance issues and encourage renewed lending by banks).

The research shows that a number of steps have already been taken at EU and Member State level to address the negative effects of cyclicality. While these initiatives are primarily linked to the credit crunch, they are policy mechanisms which could be used to help address cyclical downturns of varying degrees of magnitude in future.

The most significant development at EU level has been the marked increase in the commitment by the EIB, working through the EIF, in extending the volume of loan guarantees for SMEs to financial intermediary organisations.

Financial intermediaries at national and / or regional level should be actively encouraged to take advantage of the new loan guarantee commitments offered by the EIB. This would enable the policy commitment to be translated into increased volume of actual loan offers to SMEs and micro-entities as quickly as feasible. To enlarge the incentive for banks to make optimal use of this guarantee the administrative burdens for banks to use this instrument should be as low as possible.

At the national level, a major policy concern across the Member States has been to ensure continued bank lending in general, with a preoccupation on maintaining bank lending to individuals and to SMEs. Various measures have been adopted, including making government support for the banking sector conditional upon ensuring that SMEs receive assistance.

All Member States should be encouraged to adopt additional policy measures as appropriate to stimulate access to finance for SMEs, given the pro-cyclical nature of the supply of financing instruments such as traditional bank loans, as established in the econometric analysis (and supported by the findings from the literature review) presented in this report.

The econometric analysis - supported by the findings from the desk research - show that venture capital funding is susceptible to economic cycles. In addition there are the particular circumstances of this recession, which suggest a major retrenchment in VC is already underway. While recognising that VC only constitutes a small proportion of total SME external financing, it is especially important for young, fast growing and innovative firms. Such firms, known as 'gazelles' play an important role in stimulating economic growth.

Public authorities should take note of the likelihood of a dramatic fall in venture capital availability during the present crisis and devise an appropriate response - possibly by reinforcing EU mechanisms already in place such as JESSICA, but

also looking to ensure that publicly-backed VC support continues to be made available in regions not covered by the Structural Funds.

SMEs have significant gaps in information that would enable them to know their environment better. In particular, a lack of clear, transparent information tends to harm their financial relationships with lenders. A policy that is focussed on improving the transparency of the position of individual SMEs could lead to less tightened conditions for achieving capital during recessions.

It appeared that lending has been rather lenient during the last boom period and so contributed to a build-up of (excessive) credit risk. Now, in the midst of the crisis, the banks' credit granting seems to have tightened prodigiously, and this has dragged the real economy further down. Tighter supervision of the financial system, public intervention to ease the credit crunch, and urgent monetary-policy response to banks' lending behaviour could reduce these risks in future.

More transparency and stability in the conditions banks apply during economic recessions and booms, could deter less firms from asking for a loan during a recession. At this moment many SMEs don't even try to get a loan, although the financial situation of these firms is basically healthy.

6 Conclusions

The following conclusions can be drawn from the study:

- Overall, the research demonstrates that there is a correlation between the supply (and demand) of (external) finance for SMEs and the expansion and contraction phases of the business cycle.
- The available literature appears to suggest a (strong) link between GDP growth and the availability of bank loans for SMEs. Leasing, factoring activity and venture capital also appear to be significantly correlated with GDP growth. This link is confirmed by the empirical research done for this study.
- In the econometric analysis carried out for this study, there were clear indications of the cyclicality of finance for bank loans to medium-sized firms, factoring, leasing and venture capital to SMEs. Only weak indications of cyclicality for bank loans to small firms were identified however. Although no strong correlation could be identified through the empirical assessment, the literature review suggests that bank loans to small firms can be severely affected during a downturn, such as the present global crisis.
- The degree of cyclicality of venture capital finance is by far the largest, compared to other types of finance.
- Based on literature and additional empirical analysis we consider it likely that the cyclicality results for bank loans to a bigger extent refer to the supply side of the market for bank loans than to the demand side.
- Based on economic reasoning we consider it likely that the cyclicality results found for factoring and venture capital to a bigger extent refer to supply side effects compared to demand side effects. For leasing we cannot predict which type of effect dominates the regression results.
- The cyclicality of VC fund raising appears to be stronger than of VC investments.
- With the exception of the regression for leasing, the explanatory power of the empirical models that have been used is relatively low.
- A 'what-if' analysis of the econometric results shows that the impact of GDP decline on the sources of finance for SMEs is quite large, especially for venture capital. If GDP were to decrease by 2.5%, then bank loans for micro and small enterprises would according to the model results decrease by 5%, bank loans for medium-sized businesses would decrease by 7.4%, while venture capital would decrease by 32.1%, nothing else changes. Leasing and factoring would decrease by 11.4 and 17.1% respectively.
- From literature there is evidence that the level of venture capital activity is closely linked to economic (and stock market) cycles, and that changes in the demand and /or supply side curve tend to be exacerbated due to the pro-cyclical nature of VC.
- Business angel activity also appears to have a strong cyclical dimension, with high net-worth individuals being much more active during economic upturns than downturns.
- In the context of the current global economic crisis, there has been a worsening of the 'financing gap' faced by SMEs in accessing external finance.
- As financial institutions intend to tighten their conditions for supplying funds, the public sector has an important role to play in overcoming cyclicality in the supply of external sources of finance during periods of economic difficulty.

- The impact of the implementation of the new Basel capital standards (Basel II) on the cyclicality of SME finance is still unclear. Several studies on this subject have been carries out, but their conclusions are preliminary given that Basel II only came into effect at Member State level in 2007 (through the Capital Requirements Directive).
- Progress has been made in improving the availability of data on access to finance for SMEs, but there is a need to build up sufficient time series data in order to develop a better understanding of the cyclicality of financing supply.
- Important databases, like bank loans and venture capital, necessary for the econometric analyses had to be constructed from multiple sources.
- In response to the present global downturn, the EIB and a number of Member States have actively stimulated the supply of SME finance through instruments designed to 'keep banks lending', such as loan guarantees. This is implicitly based on the assumption that the availability of SME financing has a strong cyclical dimension. Extra attention is needed for the administrative burdens of loan guarantees for banks.
- Public authorities should take note of the likelihood of a dramatic fall in venture capital availability during the present crisis and devise an appropriate response by reinforcing EU mechanisms already in place (such as Structural Funds-backed venture capital financing schemes, the JESSICA instrument administered by the EIF) to ensure that publicly-backed VC support is available both in regions eligible for cohesion fund support, as well as in regions not eligible for Structural Funds support (EFRO).
- The firm specific outlook is of greater importance during recessions. Policy should make SMEs aware that they should focus more on transparency of information. On the other hand the conditions of banks for approving a loan should be more transparent and stable.

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Appendix I - Data

Availability of data

Table 9 Available data per country

	Austria	*Belgium*	*Spain*	*Finland*	*France*	*Germany*	*Hungary*	*Italy*	*The Netherlands*	*Poland*	*United Kingdom*
bank loans small enterprises	n/a	1994-2007	1989-2007	1999-2005	1989-2007	1998-2006	2001-2007	1989-2006	n/a	1997-2006	1993-2007*
bank loans medium sized ent.	1991-2006	1994-2007	1989-2007	1999-2005	1989-2007	1998-2006	2001-2007	1989-2006	n/a	1997-2006	1993-2007*
factoring	1996-2007	1996-2007	n/a	1996-2007	1996-2007	1996-2007	1996-2007	1996-2007	1996-2007	1996-2007	1996-2007
leasing	2000-2007	2000-2007	n/a	2000-2007	2000-2007	2000-2007	2000-2007	2000-2007	2000-2007	2000-2007	2000-2007
venture capital	1996-2007	1996-2007	n/a	1996-2007	n/a	1996-2007	1996-2007	1996-2007	n/a	2000-2007	1996-2007
ECB Bank Lending Survey	Jan '03 - Oct '08	Jan '03 - Oct '08	n/a	n/a	Jul '07 - Oct '08	Jan '03 - Oct '08	Jan 03 - Jan 08**	Jan '03 - Oct '08	Jan '03 - Oct '08	Oct '03 - Oct '08	Apr '07 - Oct '08
GDP growth	1996-2007	1996-2007	1996-2007	1996-2007	1996-2007	1996-2007	1996-2007	1996-2007	1996-2007	1996-2007	1996-2007
government surplus	1996-2007	1996-2007	1996-2007	1996-2007	1996-2007	1996-2007	1996-2007	1996-2007	1996-2007	1996-2007	1996-2007
real interest rate	1996-2007	1996-2007	1996-2007	1996-2007	1996-2007	1996-2007	1996-2007	1996-2007	1996-2007	1996-2007	1996-2007
investment rate	1996-2007	1996-2007	1996-2007	1996-2007	1996-2007	1996-2007	1996-2007	1996-2007	1996-2007	1996-2007	1996-2007
solvability of enterprises	1991-2006	1994-2007	1989-2007	1999-2005	1989-2007	1998-2006	n/a	1989-2006	1996-2006	1997-2006	n/a
solvability of banks	1997-2007	1997-2007	1997-2007	1997-2007	1997-2007	1997-2007	2000-2007	1997-2007	n/a	1997-2007	1998-2007

* *Used SME bank loans as a proxy for both small and medium sized enterprises.*

** *Data available on a half year basis.*

Sources of data

Below we present the several sources that we have used in order to create a useful and appropriate data set. In Chapter 3 we have already indicated that it appeared to be rather difficult to collect all the essential data for each country. Data has to be available for a some period of time (preferably ten years or more), which is not always that easy to find. Moreover, country specific data is most of the time not available in one source for all countries, but has to be collected form many data sources. Ultimately, it took quite some time and effort to search and collect the essential and appropriate data.

Furthermore, not all data is suitable to work with in first instance, but needs to be edited before it can be applied in the econometric analysis. This problem mainly occurred at the Eurostat Bach database for bank loans to SMEs. The data base is partly created by aggregation of annual accounts of non-financial companies, which have the obligation to file their annual account with the CBSO and partly by using bi-annual paneldata. The problem is, however, that the number of enterprises in this data base is not stable over time and that as a result, the total amount of provided bank loans to SMEs is not either. In other words, in each year the amount of bank loans is associated with a different number of reporting firms to CBSO, so that annual changes in the amount of finance may be caused by changes in the number of firms captured by the data base (i.e. changes concerning the success rate of CBSO in capturing firms with an obligation to file their annual account). These changes have nothing to do with developments in the market for bank loans to SMEs, hence we correct for the number of firms the reported amounts of bank loans relate to.

All relevant sources we have used in this study are presented below.

1. Bank loans small and medium sized enterprises

sources:

Austria[1]*, Belgium, Spain, Finland, France, Germany, Italy and Poland*: ECfin-Bach database

Hungary: Magyar Nemzeti Bank (Central Bank of Hungary)

United Kingdom: Bank of England, publications of Finance for small firms

2. Factoring

source:

all countries: factors Chain International

3. Leasing

source:

all countries: Lease Europe

4. Venture capital

sources:

EU total: PEREP Analytics and EVCA

Austria: AVCO

Belgium: Belgian Venture Capital and Private Equity Association (BVA)

Germany: Bundesverband Deutscher Kapitalbeteiligungsgesellschaften (BVK)

[1] For Austria data concerning bank loans for small enterprises are lacking.

Finland: FVCA
Hungary: HVCA
Italy: AIFI and PEM
Poland: PPEA
United Kingdom: BVCA

5. ECB, Bank Lending Survey
sources:
Eurozone: ECB
Austria: Österreichische Nationalbank
Belgium: Nationale Bank van België/ Banque Nationale de Belgique
Germany: Deutsche Bundesbank
France: Banque de France
Hungary: Magyar Nemzeti Bank
Italy: Banca d'Italia
The Netherlands: De Nederlandsche Bank
Poland: Narodowy Bank Polski (National Bank of Poland)
United Kingdom: Bank of England

6. GDP growth (annual)
source:
all countries: Eurostat and OECD

7. GDP growth (quarterly)
source:
all countries: OECD - quarterly national accounts, vol. 2009

8. Government surplus
source:
Austria, Belgium, Finland, France, Germany, Hungary, Italy, the Netherlands, Poland and the United Kingdom: Eurostat
Spain: International Monetary Fund, World Economic Outlook Database, October 2008

9. Real interest rate (= long term interest rate - inflation)
source:
Austria, Belgium, Finland, France, Germany, Hungary, Italy, the Netherlands, Poland and the United Kingdom
- long term interest rate: Eurostat
- Consumer Price Index: Eurostat

Spain
- long term interest rate: Eurostat
- Consumer Price Index: International Monetary Fund, World Economic Outlook Database, October 2008

10. Investment rate
source:
all countries: Eurostat

11. Solvability enterprises (= equity as a % of total assets)
sources:
all countries

- total assets: Eurostat, Bach database
- equity: Eurostat, Bach database

12. Solvability banks (= equity as a % of total assets)

sources:

Austria, Belgium, Spain, Finland, France, Germany and Italy

- total assets: Eurostat, Bach database
- equity: Eurostat, Bach database

Hungary

- total assets: Magyar Nemzeti Bank (pszafen_timeseries)
- equity: Bank of England

Poland

- total assets: Narodowy bank Polski (National Bank of Poland)
- equity: Narodowy Bank Polski (National Bank of Poland)

United Kingdom

- total assets: Bank of England
- equity: Bank of England

Appendix II - Regression analyses

The results of the regressions analyses when the solvability of enterprises is included as one of the explanatory variables, are presented below. As a result, Hungary and the United Kingdom will drop out, because we do not have data about the solvability of enterprises available for these two countries. The results can be interpreted the same as those presented in Chapter 3.

Bank loans small enterprises

Table 10 Regression analyses explaining bank loans to small enterprises

	I-a[a]	*II-a*[a]	*III-a*[b]	*I-b*[a]	*II-b*[a]	*III-b*[c]
expl. variables	*GDP growth (t)*			*GDP growth (t-1)*		
GDP growth (t)	1,81*	1,85*	3,74***			
	(1,67)	(1,76)	(2,75)			
GDP growth (t-1)				1,41	1,42	2,03**
				(1,29)	(1,40)	(2,37)
solv. ent. (%)	-0,12			-0,09		
	(-0,87)			(-0,70)		
government surplus (% of GDP)	0,13			0,08		
	(0,21)			(0,12)		
investment rate (%-point change)	-1,83			-0,10		
	(-0,91)			(-0,06)		
N	64	64	45	64	64	55
F	1.16	3.11	7.58	0.60	1.95	5.61
R^2	0.07	0.05	0.15	0.04	0.03	0.10

*t-values between brackets, * significant on the 10% level, ** significant on the 5% level, *** significant on the 1% level.*

[a] *This option involves the following countries: Belgium, Spain, Finland, France, Germany, Italy and Poland.*

[b] *Italy and Poland are excluded in this option.*

[c] *Belgium is excluded in this option.*

Bank loans medium sized enterprises

Table 11 Regression analyses explaining bank loans to medium-sized enterprises

	I-a[a]	*II-a*[a]	*III-a*[b]	*I-b*[a]	*II-b*[a]	*III-b*[c]
expl. variables	*GDP growth (t)*			*GDP growth (t-1)*		
GDP growth (t)	-0,25	0,09	3,96***			
	(-0,13)	(0,05)	(4,13)			
GDP growth (t-1)				2,54	2,63	3,45[d]
				(1,38)	(1,48)	(1,59)
solv. ent. (%)	-0,71	-0,82*		-0,98**	-0,97**	-1,71***
	(-1,44)	(-1,72)		(-2,16)	(-2,25)	(-2,99)
government surplus (% of GDP)	0,78			0,27		
	(0,67)			(0,23)		
investment rate (%-point change)	2,10			1,88		
	(0,60)			(0,62)		
N	76	76	30	76	76	56
F	0.96	1.49	17.05	1.94	3.71	6.22
R^2	0.05	0.04	0.38	0.10	0.09	0.19

*t-values between brackets, * significant on the 10% level, ** significant on the 5% level, *** significant on the 1% level.*

[a] *this option involves the following countries: Austria, Belgium, Spain, Finland, France, Germany, Italy and Poland.*

[b] *Spain, Finland, Italy and Poland are excluded in this option.*

[c] *Austria and Italy is excluded in this option.*

[d] *p-value = 0.118.*

Factoring

Table 12 Regression analyses explaining factoring

	I-a	*II-a*	*I-b*	*II-b*
expl. variables	*GDP growth (t)*		*GDP growth (t-1)*	
GDP growth (t)	8,23***	8,26***		
	(3,39)	(3,43)		
GDP growth (t-1)			6,84***	7,25***
			(2,77)	(2,96)
solv. ent. (%)	0,54		0,88	
	(0,76)		(1,32)	
government surplus (% of GDP)	-2,50	-2,66*	-2,69*	-2,88*
	(-1,64)	(-1,78)	(-1,74)	(-1,87)
real interest rate	-9,51**	-9,66***	-6,59*	-8,25**
	(-2,61)	(-2,97)	(-1,87)	(-2,47)
investment rate (%-point change)	-1,40		3,91	
	(-0,28)		(0,92)	
N	77	77	77	77
F	4.47	7.33	4.30	6.20
R^2	0.24	0.23	0.23	0.20

*t-values between brackets, * significant on the 10% level, ** significant on the 5% level, *** significant on the 1% level.*

Countries involved: Austria, Belgium, Finland, France, Germany, Italy, the Netherlands and Poland.

Leasing

Table 13 Regression analyses explaining leasing

	I-a	*II-a*	*I-b*	*II-b*
expl. variables	*GDP growth (t)*		*GDP growth (t-1)*	
GDP growth (t)	7,97***	8,46***		
	(3,21)	(3,60)		
GDP growth (t-1)			3,13	4,18*
			(1,26)	(1,78)
solv. ent. (%)	0,50		0,83	
	(0,77)		(1,40)	
government surplus (% of GDP)	0,37		0,00	
	(0,27)		(0,00)	
real interest rate	2,83		4,84	
	(0,73)		(1,34)	
investment rate (%-point change)	5,67		9,07**	7,74**
	(1,36)		(2,45)	(2,35)
N	48	48	48	48
F	3.00	12.98	2.75	4.31
R^2	0.26	0.22	0.25	0.16

*t-values between brackets, * significant on the 10% level, ** significant on the 5% level, *** significant on the 1% level.*
Countries involved: Austria, Belgium, Finland, France, Germany, Italy, the Netherlands and Poland.

Venture capital

Table 14 Regression analyses explaining venture capital

	I-a	*II-a*	*I-b*	*II-b*
expl. variables	*GDP growth (t)*		*GDP growth (t-1)*	
GDP growth (t)	11,87	13,77*		
	(1,36)	(1,74)		
GDP growth (t-1)			-4,15	-1,82
			(-0,49)	(-0,22)
solv. ent. (%)	0,45		0,94	
	(0,23)		(0,53)	
government surplus (% of GDP)	0,03		1,08	
	(0,01)		(0,23)	
real interest rate	11,14		15,07	
	(0,77)		(1,18)	
investment rate (%-point change)	27,45*	20,61[a]	30,68**	25,55**
	(1,72)	(1,60)	(2,28)	(2,12)
N	51	51	51	51
F	1.18	2.79	1.21	2.28
R^2	0.12	0.10	0.12	0.09

*t-values between brackets, * significant on the 10% level, ** significant on the 5% level, *** significant on the 1% level.*

Countries involved: Austria, Belgium, Finland, Germany, Italy and Poland.

[a] *p-value = 0.116.*